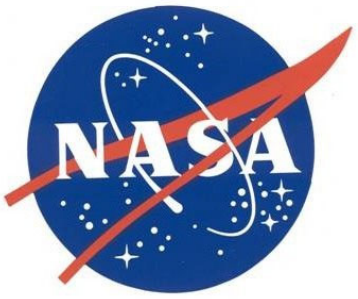
COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS FACILITY, HOT SPOT 1
SWMU #041
YEAR 3 ANNUAL PERFORMANCE MONITORING REPORT
KENNEDY SPACE CENTER, FLORIDA

Prepared for:



National Aeronautics and Space Administration
Kennedy Space Center, Florida

May 2023
Revision 0

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FOR
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HOT SPOT 1, SWMU #041
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PROFESSIONAL ENGINEER CERTIFICATION

This Performance Monitoring Report for the Components Refurbishment and Chemical Analysis (CRCA) facility, Solid Waste Management Unit 041, at Kennedy Space Center, Florida, dated May 2023, has been prepared by or under the responsible supervision, direction, or control of the Florida-licensed professional engineer whose signature and seal appear below. This document and the work described herein complies with standard professional practices and requirements of Chapter 62-780, Florida Administrative Code (F.A.C.) and other rules of the Florida Department of Environmental Protection according to Rule 62-780.400(1), F.A.C.

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ABBREVIATIONS AND ACRONYMS

ADP	Advance Data Package
AS	Air Sparging
BART	Biological Activity Reaction Test
bls	below land surface
cDCE	cis-1,2-dichloroethene
Cells/mL	Cells per milliliter
COC	Contaminant of Concern
CRCA	Components Refurbishment and Chemical Analysis
CVOC	Chlorinated Volatile Organic Compound
DFP	2H,3H-decafluoropentane
Dhc	*Dehalococcoides*
DoD	U.S. Department of Defense
DPT	Direct Push Technology
ENCO	Environmental Conservation Laboratories, Inc.
EPA	United States Environmental Protection Agency
EQ Tank	Equalization Tank
EW	extraction well
FDEP	Florida Department of Environmental Protection
GCTL	Groundwater Cleanup Target Level
gpm	gallon per minute
HCP	High Concentration Plume
HCS	Hydraulic Containment System
HDPE	High-Density Polyethylene
hp	horsepower
HPT	Hydraulic Profiling Tool
HS	Hot Spot
IDIQ	Indefinite Delivery Indefinite Quantity
IDW	Investigation Derived Waste
IM	Interim Measure

ABBREVIATIONS AND ACRONYMS (Continued)

IMWP	Interim Measure Work Plan
ISCO	In-Situ Chemical Oxidation
IW	Injection Well
IWP	Implementation Work Plan
KSC	Kennedy Space Center
KSCRT	KSC Remediation Team
LC/MS/MS	Liquid Chromatography Tandem Mass Spectrometry
LCP	Low Concentration Plume
MDL	Method Detection Limit
MEE	Methane, Ethane, and Ethene
mg/L	milligram per liter
MNA	Monitored Natural Attenuation
msl	mean sea level
mV	millivolt
NADC	National Attenuation Default Concentration
NASA	National Aeronautics and Space Administration
NTU	Nephelometric Turbidity Unit
O&M	Operation and Maintenance
OM&M	Operations, Maintenance, and Monitoring
ORP	Oxidation-Reduction Potential
OSHA	Occupational Safety and Health Administration
Pace	Pace Analytical Services, LLC
PEL	Permissible Exposure Limit
PFAS	Per- and Polyfluoroalkyl Substances
PMR	Performance Monitoring Report
PQL	Practical Quantitation Limit
QED™	QED Environmental Systems
QSM	Quality Systems Manual
RAE	Remedial Alternatives Evaluation

ABBREVIATIONS AND ACRONYMS (Continued)

RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
RPM	Remediation Project Manager
SA	SWMU Assessment
SOP	Standard Operating Procedure
SSHASP	Site-Specific health and Safety Plan
SVE	Soil Vapor Extraction
SWMU	Solid Waste Management Unit
tDCE	trans-1,2-dichloroethene
TOC	Total Organic Carbon
TWA	Time-Weighted Average
µg/L	microgram per liter
$\mu g/m^3$	microgram per cubic meter
µS/cm	microSiemens per centimeter
V	Volt
VC	Vinyl Chloride
VISL	Vapor Intrusion Screening Level
VMP	Vapor Monitoring Pin
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

This Year 3 Annual Performance Monitoring Report (PMR) presents the operations, maintenance, and monitoring activities for the Hydraulic Containment System (HCS) Interim Measure (IM) at the Components Refurbishment and Chemical Analysis (CRCA) facility located at John F. Kennedy Space Center (KSC), Florida. The primary objective of the HCS is to attain hydraulic control of the dissolved-phase chlorinated volatile organic compound (CVOC) plume, with the secondary objective to reduce concentrations of CVOCs in the high-concentration plume to support transition to monitored natural attenuation (MNA). CRCA has been designated Solid Waste Management Unit 041 under the KSC Resource Conservation and Recovery Act Corrective Action Program.

The timeframe for activities documented in this Year 3 PMR extends from September 2021 through October 2022. Baseline sampling activities were completed in June 2019, and full-scale startup of the HCS IM was completed in July-August 2019. The operational runtime of the HCS for the Year 3 reporting period was approximately 91%, with the majority of downtime attributed to system maintenance and repair. This is generally consistent with Year 1 and Year 2 runtimes of 85% and 92%, respectively. To help reduce downtime, an anti-scaling amendment, Redux 390, has been used to reduce scaling and help maintain system design parameters. Over nine million gallons of groundwater were treated during Year 3 of HCS operations, and concentrations of the site's contaminants of concern (trans-1,2-dichloroethene and vinyl chloride) have been reduced by over 97%.

This PMR describes the activities that were performed during Year 3 to operate and monitor the HCS IM, which includes three extraction wells, seven injection wells, and conveyance piping to a modular structure containing the control panel and an air stripper. Influent and effluent sampling results from the air stripper show that the system is operating as designed and is reducing concentrations of contaminants of concern to below detection limits. In addition to HCS operation, this PMR also discusses performance monitoring that has been implemented to assess progress of the HCS IM and overall plume conditions through scheduled groundwater (quarterly and semi-annual) and sub-slab soil gas (quarterly) sampling and analysis. Two ambient air samples were also collected on a quarterly basis in the vicinity of the modular structure and the

paved driveway east of the Solvent Reclamation Area during routine operation and maintenance (O&M) activities to ensure safe breathing zone air quality for on-site personnel. All sub-slab soil gas and ambient air sampling conducted during the Year 3 operational period showed results below applicable regulatory air screening limits.

Predictions made during the Year 2 groundwater model updates were in close correlation to post Year 3 plume conditions. Therefore, it can be assumed that the projected path remains valid for transition to MNA in one to two years of continuous HCS operation.

The contents of this Year 3 PMR were presented during the February 2023 KSC Remediation Team meeting, where Team consensus was reached on several items including continued O&M of the HCS, and continued monitoring of groundwater, ambient air, and sub-slab soil gas. Replacement of MW0019 and VMP04 was also recommended, as well as additional direct-push technology sampling to further delineate the downgradient plume and confirm overall site-wide low-concentration plume boundaries. Sampling for per- and polyfluoroalkyl substances at CRCA is ongoing and will be submitted under separate cover.

SECTION I
INTRODUCTION

This Performance Monitoring Report (PMR) presents the Year 3 operations, maintenance, and monitoring (OM&M) activities for the Hydraulic Containment System (HCS) Interim Measure (IM) at the Components Refurbishment and Chemical Analysis (CRCA) facility located at John F. Kennedy Space Center (KSC), Florida (Figure 1-1). The CRCA facility has been designated Solid Waste Management Unit (SWMU) 041 under KSC's Resource Conservation and Recovery Act (RCRA) Corrective Action Program. This PMR was prepared by Tetra Tech, Inc. for the National Aeronautics and Space Administration (NASA) under Indefinite Delivery Indefinite Quantity (IDIQ) Contract 80KSC019D0011-80KSC019F0066.

The Year 3 operational timeframe for HCS IM activities documented in this PMR extends from September 2021 through October 2022. The following activities were completed during this timeframe:

- Full-scale operation and maintenance (O&M) of the HCS IM from September 2021 to October 2022;
- Quarterly and semi-annual performance monitoring (October 2021, January 2022, April 2022, July 2022, and October 2022); and,
- Sub-slab soil gas sampling and ambient air sampling (conducted quarterly).

Note, a direct push technology (DPT) sampling event was conducted in March 2022 to delineate and confirm overall plume boundaries; however, this sampling event is not documented in this report as additional DPT sampling is being completed. All DPT data will be presented in one report once sampling is complete.

The HCS IM has been operational since August 2019. The system includes three extraction wells (EWs) and seven injection wells (IWs) with associated treatment trailer with air stripper. The primary objective is to obtain and maintain hydraulic control of the dissolved-phase chlorinated volatile organic compound (CVOC) plume, and the secondary objective is to reduce

concentrations of CVOCs to support transition to monitored natural attenuation (MNA). Additional details on HCS implementation are presented in the following sections.

1.1 SITE LOCATION

The CRCA facility is located east of Contractors Road, approximately 1,500 feet south of the intersection of Contractors Road and Saturn Causeway, in Section 18, Township 22 South, and Range 37 East at KSC, Florida (Figure 1-1). The Vehicle Assembly Building is approximately 0.75 miles north of CRCA and the Shuttle Landing Facility (now known as the Launch and Landing Facility) is about 2.3 miles to the northwest. Launch Complex 39A/B is situated approximately 3.5 miles northeast of CRCA, while the KSC Industrial Area is approximately 3.5 miles to the south. KSC is located on Merritt Island, part of a barrier island complex bordered to the east by the Banana River and to the west by the Indian River. Cape Canaveral Space Force Station comprises the eastern boundary of this barrier island complex known collectively as the Indian River Lagoon; a brackish estuarine environment connected to the Atlantic Ocean by natural tributaries and dredged navigational waterways.

1.2 SITE DESCRIPTION AND LAYOUT

The CRCA buildings and structures were constructed in 1998 in support of the NASA space program. The property is an approximately three-acre rectangular parcel, primarily paved, and houses numerous support structures and buildings. Operations performed at CRCA include the cleaning and refurbishment of mechanical and operation parts in the main building (Building K6-1696), the storage of hydrogen gas cylinders (Building K6-1697A), decontamination of parts contaminated with fuel or oxidizers (Building K6-1747), solvent reclamation (Building K6-1696B), a satellite accumulation area for hazardous waste (Building K6-1748A), and storage of miscellaneous goods, pallets, and spent chemical totes (Building K6-1748D). The solvent used for cleaning at CRCA is Vertrel™ MCA, a mixture of trans-1,2-dichloroethene (tDCE) and 2H,3H-decafluoropentane (DFP), and is stored in Building K6-1696A. Figure 1-2 presents the CRCA site layout.

Detailed descriptions of the site background, area setting, site history, RCRA Facility Investigation (RFI) findings, and other pre-IM data are presented in the March 2015 CRCA RFI

Progress Report (NASA, 2015) and the November 2018 CRCA RFI Progress Report, Revision 1 (NASA, 2018d). The November 2018 Progress Report also includes site information dating from the initial SWMU Assessment (SA) in October 2004.

To further describe site conditions, the following sections present a general description of the soil stratigraphy, surface water features, and groundwater flow at CRCA.

1.2.1 Soil Stratigraphy. Soil boring data collected during subsurface investigations from June 2006 to March 2019 at 21 locations, to a maximum depth of 80 feet below land surface (bls), were studied to classify the varying stratigraphic layers found beneath the study area. This information was used to differentiate and collate soil layers for a better understanding of site stratigraphy and hydrogeologic trends at CRCA.

At CRCA, clayey and silty sands were encountered near the surface in the vicinity of the main building (Building K6-1696) to a depth of approximately five feet bls. Below this depth, the site stratigraphy consists of fine to very fine sand with trace of silt grading into medium to very fine sand and the introduction of shell fragments at about 10 feet bls. Fine to very fine sand with varying amounts of shell fragments and silt are found to about 25 feet bls. Shell fragments exist in greater abundance to about 60 feet bls, interspersed with layers predominated by fine to very fine and coarse to very fine sands. Generally, the occurrence of shell fragments increases to the west of the study area. The soils become more clayey at approximately 60 feet bls, where fine to very fine sand with trace to some shell, clay and trace to little shell were found. A homogeneous clay with trace to some silt, very fine sand, and shell was consistently encountered from approximately 70 to 80 feet bls, the vertical extent of soil borings conducted at CRCA. A more detailed discussion of the site stratigraphy is presented in the CRCA Year 2 Groundwater Flow and Solute Transport Model Construction, and Calibration Report (groundwater modeling report) presented as Appendix A of the Year 2 Annual PMR (NASA, 2022). For reference, the geologic cross-sections from the modeling report are included in this report as Figures 1-4, 1-5, and 1-6.

1.2.2 Surface Water Features. The CRCA study area is a relatively flat (less than 10 feet of total relief) predominantly paved area with a relatively shallow water table. Surface elevations decrease to the west of the CRCA facility toward a densely wooded area. Drainage swales are

located on both the eastern and western sides of Contractors Road, west of CRCA. There are no surface water bodies on or immediately adjacent to CRCA. The swales and wooded area west of Contractors Road periodically have ephemeral standing water during the wet season.

The Turning Basin, which connects to the Banana River and ultimately Port Canaveral by an approximately 300-foot-wide dredged canal system, is located approximately 0.75 miles to the northeast of CRCA. This roughly circular water body, constructed to transport large space-related parts such as rocket boosters, is south of a meandering water body which runs roughly east-west and is situated approximately 1.0-mile northwest of the study area. Regionally, the Indian River is located approximately four miles west of CRCA and the Banana River is approximately five miles to the east. Refer to Figure 1-3 for an aerial map showing surface water features in the vicinity of the study area.

1.2.3 Groundwater Flow. June 2019 baseline groundwater flow conditions (prior to HCS startup) at shallow depths were generally from east to west, with a depressional area of radial flow observed west of the Solvent Reclamation Area at MW0003, probably due to surface stormwater drainage features. Slight mounding to the southwest beneath the building was observed converging toward MW0008 and resolving in western and northwestern flow with a more relaxed gradient toward Contractors Road. At intermediate depths, flow occurred to the northwest from the Solvent Reclamation Area and to the northeast from Contractors Road, converging toward the northern parking area. Baseline flow within the deep intervals was predominately to the northwest, with a more westerly bend toward Contractors Road and across the railroad tracks (NASA, 2021a).

Since start-up of the HCS, fluctuations in the water table at CRCA range from about 0.5 feet to 3.5 feet above mean sea level (msl). The hydraulic gradient generally slopes to the west at shallow, intermediate, and deep intervals within the surficial aquifer, typically mimicking site topography. Fluctuations in flow direction are primarily observed in the vicinity of the main building at shallow depths, becoming more radial as extraction well pumping continues. General flow remains to the west, likely discharging to surface water features such as drainage ditches, wetlands, and ultimately the Indian River. At intermediate depths, the hydraulic gradient has become more uniform following commencement of HCS operations, with a predominately

westward flow pattern. Like the shallower depths, deep groundwater flow is generally to the west, but is influenced by HCS pumping and injection schedules resulting in steeper hydraulic gradients and radial flow. A more detailed discussion of the potentiometric surface at shallow, intermediate, and deep intervals within the surficial aquifer at CRCA during HCS operation is presented in Section IV of this report.

1.3 CONTAMINANTS OF CONCERN

Historically, the contaminants of concern (COCs) in groundwater at CRCA were identified as cis-1,2-dichloroethene (cDCE), tDCE, and vinyl chloride (VC). At the time of the HCS implementation in May 2019, VC and tDCE were observed with the highest concentrations in groundwater. cDCE has not been observed above the State of Florida Groundwater Cleanup Target Level (GCTL) since 2014. VC was observed with concentrations exceeding the 100 micrograms per liter (µg/L) Florida Department of Environmental Protection (FDEP) National Attenuation Default Concentration (NADC), and tDCE was observed with concentrations exceeding the 100 µg/L State of Florida GCTL. These CVOCs were detected in groundwater in the vicinity of the CRCA Solvent Reclamation Area. The study area is defined based on contaminant concentrations and presented in the March 2018 Site Characterization advance data package (ADP) (NASA, 2018a):

- Hot Spot (HS) 1 – defined as the area where CVOC concentrations exceed 10 times FDEP NADC;
- High Concentration Plume (HCP) – defined by CVOC concentrations exceeding the FDEP NADC; and
- Low Concentration Plume (LCP) – defined by CVOC concentrations exceeding the State of Florida GCTL.

HS1 is defined in the March 2018 Site Characterization ADP as a 0.8-acre area with a maximum contaminant depth of 57 feet bls. The HCP is described as an area encompassing 2.07-acres, with a maximum depth of 57 feet bls, and the LCP is defined as a 6.54-acre area, with a maximum depth of 62 feet bls. The vertical extent of HS1, HCP, and LCP are marked by the clayey layer

found consistently across the site at these depths. The majority of contaminant mass resides within the fine sand to shelly zone, 40 to 52 feet bls. Extraction well screen interval placement was selected to target this groundwater contaminant mass. Deeper samples were not pursued to avoid creating a preferential pathway for further vertical migration. The footprints of the CRCA HS1, HCP, and LCP as identified in the 2018 Site Characterization are presented on Figure 1-7.

1.4 REMEDIAL APPROACH

This hydraulic containment IM consists of extracting groundwater through deep zone EWs (screened from 43 to 63 feet bls), treating recovered groundwater via an air stripper, and discharging groundwater back into the subsurface via deep zone IWs (screened from 41 to 61 feet bls). Figure 1-7 presents the layout of the resulting HCS installation with an overlay of the groundwater plume, as identified in the 2018 Site Characterization ADP (NASA, 2018a).

The HCS was primarily implemented to mitigate the migration of groundwater CVOCs by positioning EWs downgradient of HS1 and the HCP. Extracted groundwater is then treated through a treatment system consisting primarily of an air stripper that aerates the groundwater, volatilizing the CVOCs, and as a secondary benefit, promote aerobic degradation of the HS and HCP via recirculation of the aerobic water. The treated groundwater is injected upgradient and side-gradient of the HS and HCP via a network of deep zone IWs.

The treatment timeframe to reduce VC concentrations appropriate for transition to MNA was initially estimated to be 35 years based on preliminary pumping calculations, as stated in the April 2019 CRCA HS1 Implementation Work Plan (IWP) (NASA, 2019b). However, aquifer testing, lithologic and geochemical data collection within the target treatment zone, and the Year 1 performance evaluations of the HCS were used to re-evaluate treatment of the HS and HCP. These data were processed and analyzed via 3-dimensional groundwater modeling, predicting a transition to MNA after 12 years (NASA, 2020b). This treatment timeframe was re-visited following Year 2 of HCS operation and presented in the groundwater modeling section of the Year 2 Annual PMR. Both non-pumping and pumping scenarios were evaluated, with continued HCS operation projected to reach GCTLs in 11 years (NASA, 2022).

To determine whether DFP needed to be addressed by active remediation, in August 2018 groundwater samples collected from eight monitoring wells were analyzed for DFP. The monitoring wells sampled were selected by targeting different lithologic layers and depths relative to the existing groundwater plume and proximity to different operational rooms within and adjacent to Building K6-1696. The maximum DFP concentration was 23.2 µg/L, below the GCTL of 1,800 µg/L derived by the University of Florida on behalf of the FDEP (NASA, 2019c). In February 2019, the vapor samples collected from four sub-slab locations were also analyzed for DFP. Results detected DFP in two of these sub-slab samples at concentrations below the calculated commercial vapor intrusion screen level (VISL). Based on these findings, DFP was not carried forward as a standard analyte for the IM project (NASA, 2019c).

During the Year 2 Annual PMR reporting period, groundwater samples collected from the performance monitoring wells were analyzed for *Dehalococcoides* (*Dhc*), VC reductase, and methane, ethane, and ethene (MEE). These results suggested that passive detoxification was possible in the present environment, but to a minimal extent. Further, since significant CVOC reduction was observed after two years of HCS operation, it was determined that the option to implement additional HCS treatment amendments was not necessary for Year 3 (NASA, 2022).

1.5 SITE CHARACTERIZATION AND REMEDIAL ACTIVITIES

This section summarizes previous investigations and remedial activities conducted at CRCA leading up to current COC identification (tDCE and VC), remedial approach discussions, HCS design, and system OM&M. KSC Remediation Team (KSCRT) meeting highlights are presented to chronicle the progression of site characterization and remedial activities. KSCRT Meeting Minutes are included in Appendix A. A detailed report of the remedial activities, prior to HCS implementation, at CRCA is provided in the RFI Progress Report (NASA, 2018d).

1.5.1 HS1 Site Characterization ADP. The Site Characterization ADP for CRCA HS1 was presented at the March 2018 KSCRT Meeting. This ADP summarized field investigations that began with the initial SA in June 2004 and discussed the results of HS, HCP, and LCP delineation via DPT data collected from September 2016 through February 2018. Based on these data, the HS was defined as the area of the groundwater plume with COC concentrations greater

than 10 times FDEP NADCs. The HCP and LCP were also characterized, which are defined as areas of groundwater with concentrations of COCs greater than FDEP NADCs and State of Florida GCTLs, respectively. Groundwater samples and lithologic cores collected and analyzed during the DPT studies, along with monitoring well sampling results, were presented as part of the Site Characterization. A total of 512 DPT groundwater samples and eight monitoring well samples were collected between September 2016 and February 2018. Team consensus was reached for the delineation of CRCA HS1 and the HCP and LCP (Meeting Minute 1803-M05, Decision 1803-D23).

The Site Characterization for CRCA HS1 also proposed the screening of technologies for the HS and HCP. Team consensus was reached for the following technologies to be evaluated in the Remedial Alternatives Evaluation (RAE) (Meeting Minutes 1803-M05, Decision 1803-D24):

- Air sparging (AS) curtain for the HCP, including soil vapor extraction (SVE) to mitigate potential vapor issues, and in-situ chemical oxidation (ISCO) for the HS;
- AS for the HCP, including SVE to mitigate potential vapor issues, and biostimulation for the HS;
- Hydraulic control for the HCP, including air stripping, and ISCO for the HS; and,
- Hydraulic control for the HCP, including air stripping, and biostimulation for the HS.

1.5.2 HS1 Remedial Alternatives Evaluation ADP. The CRCA HS1 RAE was presented at the May 2018 KSCRT Meeting (NASA, 2018b). The medium of concern, COCs, and cleanup criteria were included in the RAE. The IM objectives identified in the RAE included reducing concentrations within the HS and HCP via an IM to support transition to MNA, mitigating plume migration, and minimizing risk to workers in Building K6-1696 by preventing vapor intrusion. Team consensus was reached to proceed to an Interim Measure Work Plan (IMWP) for HS1 via hydraulic containment. Consensus included the need for additional data collection via aquifer tests, total organic carbon (TOC) analysis, and further lithologic characterization in the target treatment zone (Meeting Minute 1805-M08, Decision 1805-D22). The additional data collected was to be used to evaluate the potential application of additional amendments to enhance

treatment of the HS.

1.5.3 HS1 IMWP. The CRCA HS1 IMWP was presented at the June 2018 KSCRT Meeting, providing details of the proposed hydraulic containment IM. An overview of the design of the HCS and supporting construction details and calculations were included in the IMWP. Additionally, the IM objective was modified from the RAE to the following:

- Primary IM objective: obtain hydraulic control of the dissolved phase CVOC plume;
- Secondary objective: reduce concentrations of CVOCs in HS1 and the HCP via an IM to support transition to MNA; and
- Deferred: the portion of the objective involving the need to minimize risk to workers in Building K6-1696 by preventing vapor intrusion and will be evaluated based on Air Sampling Plan results (addressed in Section IV of this PMR).

Team consensus was reached for the design of the HCS (Meeting Minute 1806-M02, Decision 1806-D02). An IMWP (NASA, 2018c), including supplemental information, was approved by FDEP on October 30, 2018.

1.5.4 HS1 IWP. The CRCA HS1 IWP (NASA, 2019b) was prepared based on the IMWP, which outlined the design and implementation of an HCS. To support the IWP, air sampling activities were presented at the April 2019 KSCRT Meeting to determine if the IM objective may need to be modified to include minimizing risk to workers in Building K6-1696 by preventing vapor intrusion. This meeting presented information summarizing the Phase I (January 2018) and Phase II (August 2018) air monitoring events. Based on the Phase II sub-slab soil gas sampling results, it was determined that ambient air sampling was not necessary as the CVOC groundwater plume beneath Building K6-1696 is not presenting a vapor intrusion risk to the workers present. This meeting discussed that the IWP for the HCS IM was in development, including a provision to include the sub-slab sampling at VMP01 through VMP04 as part of the quarterly monitoring plan. Team consensus was reached that the air monitoring evaluation was complete and further ambient air samples within Building K6-1696 were not needed at that time (Meeting Minute 1904-M16, Decision 1904-D40). As a result, an Air Monitoring Report was

prepared for the FDEP documenting these Phase I and Phase II studies and outlining the quarterly soil gas sampling planned as part of the performance monitoring program (NASA, 2019d). This plan was approved by the FDEP in April 2020.

1.5.5 HS1 IM. The CRCA HS1 IM was presented at the June 2019 KSCRT Meeting. This meeting discussed IM field activities including the installation of 12 monitoring wells (MW0021 to MW0032), installation of three EWs (EW0001 to EW0003), seven IWs (IW0001 to IW0007), and associated infrastructure including treatment system, hydraulic profiling tool (HPT) data collection, slug testing, a step pump test at EW0002, constant rate tests, and IW testing. Based on injection test results, anticipated capacities for IW0001, IW0002, and IW0007 were discussed. The HCS was deemed complete and system commissioning, startup, and baseline sampling were proposed (Meeting Minute 1906-M09). Construction of the HCS was documented in an IM Implementation Report (NASA, 2019c).

1.5.6 HS1 PMR Mid-Year Update ADP. The HS1 PMR Mid-Year Update was presented at the June 2020 KSCRT Meeting, which summarized the groundwater IM, HCS startup, and O&M activities (NASA, 2020a). This meeting documented initial startup activities completed July 22 to 26, 2019, including an overview of the HCS testing, IW flow rates, and HCS maintenance. Troubleshooting activities involving scaling issues with the system effluent bag filters, and anti-scaling measures including biological activity reaction test (BART) and Redux 390 injection pilot tests were presented. Since tDCE was not detected at concentrations above its GCTL from June 2019 to April 2020, VC became the targeted analyte for groundwater plume remediation. Baseline sampling results for groundwater, soil-gas, and ambient air were also presented and discussed. The KSCRT agreed that the path forward for the HCS was to continue operation and evaluation to maintain hydraulic control of the groundwater plume and further reduce VC concentrations; continue the quarterly sampling of four monitoring wells and the semi-annual sampling of 16 monitoring wells; and to prepare and submit a groundwater model in conjunction with the Year 1 PMR (Meeting Minute 2006-M02).

1.5.7 HS1 Annual PMR ADP. The Year 1 Annual PMR was presented at the October 2020 KSCRT Meeting, and included activities completed from June 2019 through August 2020. The purpose of this briefing was to present the progress of the HCS after one year of operation. The

following topics were discussed: baseline sampling results; one year of performance monitoring results (including groundwater, sub-slab soil gas, and ambient air); an overview of HCS O&M; HCS performance milestones; and the groundwater model. During this meeting, the path forward for performance monitoring was discussed, with monitoring well sampling locations and sampling frequency adjusted accordingly. This included removing eight monitoring wells (MW0003 and MW0020 through MW0026) from the performance sampling program, changing two wells from semi-annual to quarterly sampling (MW0027 and MW0029), and transitioning one well (MW0028) to semi-annual sampling. In addition, sulfate, sulfide, nitrate, nitrite, carbon dioxide, iron, dissolved iron, and RCRA metals analyses were discontinued from groundwater sampling events (Meeting Minute 2010-M02, Decisions 2010-D02 to D04). The contents of this ADP were included in the Year 1 PMR (NASA, 2021a).

1.5.8 HS1 Year 2 Annual PMR ADP. The Year 2 Annual PMR was presented at the November 2021 KSCRT Meeting, and included activities completed from September 2020 through August 2021. The purpose of this meeting was to present the progress of the HCS after two years of operation. The following topics were discussed: one year of performance monitoring results (including groundwater, sub-slab soil gas, and ambient air); an overview of HCS O&M; HCS performance milestones; and the results of the groundwater model after two years of HCS operation. During this meeting, the path forward for performance monitoring was discussed, with monitoring well sampling locations and sampling frequency modified in anticipation of Year 3 HCS operation. Consensus was reached to continue operation of the HCS, remove five monitoring wells from the sampling plan due to non-detect results (MW0012, MW0015, MW0028, MW0029, and MW0030), continue performance monitoring at four wells on a quarterly basis and an additional three wells on a semi-annual basis, and to continue ambient air and vapor monitoring during Year 3 with the addition of a background ambient air sample to assist in distinguishing potential contributions from routine facility operations (Meeting Minute 2111-M04, Decisions 2111-D12 through D14. The contents of this ADP were included in the Year 2 Annual PMR (NASA, 2022). Previous *Dhc* and VC reductase data and the updated groundwater model determined that no additional amendments were needed to supplement HCS performance at that time.

1.5.9 HS1 Year 3 Annual PMR ADP. The Year 3 Annual PMR ADP was presented at the February 2023 KSCRT Meeting, and included activities completed from September 2021 to October 2022. The purpose of this meeting was to present progress of the HCS after three years of operation. The following topics were discussed: five quarters of performance monitoring results; an overview of HCS O&M; HCS performance milestones; and ambient air and sub-slab soil gas sampling results. During this meeting, the path forward for performance monitoring was discussed, with monitoring well sampling locations and sampling frequency modified in anticipation of Year 4 HCS operation. The contents of the Year 3 Annual PMR ADP are included in this report.

1.6 INTERIM MEASURES OBJECTIVE

The primary IM objective for CRCA HS1 is to obtain and maintain hydraulic control of the dissolved-phase CVOC plume. The secondary objective is to reduce concentrations of CVOCs in HS1 and the HCP (defined as VC greater than 100 µg/L) to support transition to MNA. The objectives were developed to provide a flexible treatment train approach where certain metrics such as remedial performance, plume dynamics, and natural attenuation characteristics can be evaluated to determine whether the remediation objectives have been met and ultimately reach an endpoint to the IM. Based on the treatment performance of the HS1 IM, HCS operations may be modified, as appropriate, to achieve IM objectives.

1.7 REPORT ORGANIZATION

The remainder of the PMR is organized as follows:

Section II: Hydraulic Containment System Process Description – presents a general summary of the components of the treatment train of the HCS.

Section III: System Operation, Maintenance, and Monitoring – details the O&M plan, which was implemented for system operation, discusses maintenance activities conducted, and evaluates the overall HCS performance.

Section IV: Performance Monitoring Results and Discussion – presents the strategy for and summarizes the results of groundwater sampling, groundwater level surveys, field measurements, sub-slab vapor monitoring analysis, and ambient air monitoring.

Section V: Conclusions and Recommendations – summarizes the findings of this PMR and discusses further options based on this information.

Section VI: References – provides a list of references cited in this report.

FIGURE 1-1 LOCATION OF KENNEDY SPACE CENTER AND CRCA
SWMU 041, KENNEDY SPACE CENTER, FLORIDA

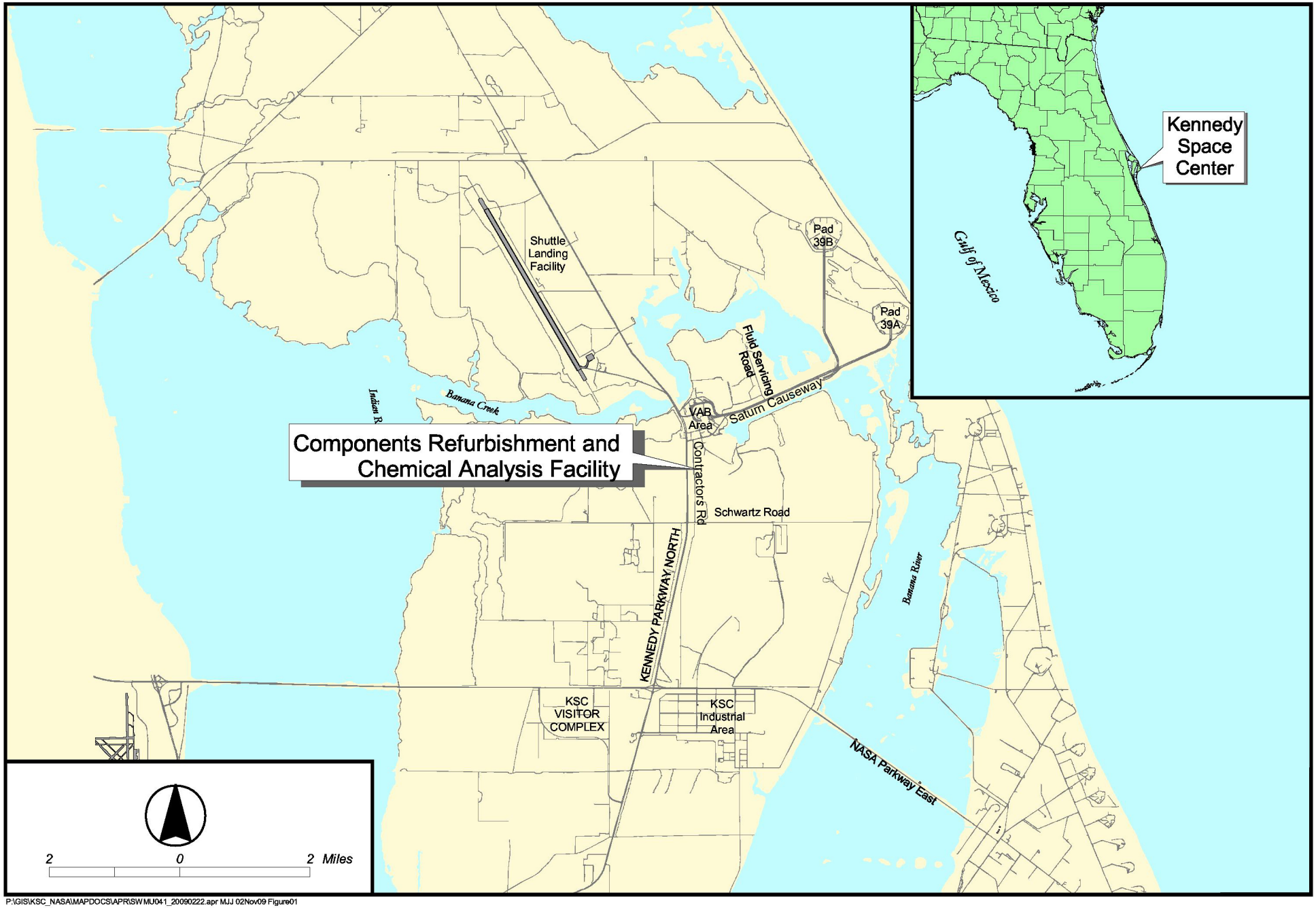

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FIGURE 1-2 CRCA SITE LAYOUT MAP

SWMU 041, KENNEDY SPACE CENTER, FLORIDA

CRCA Year 3 PMR
Revision 0
May 2023

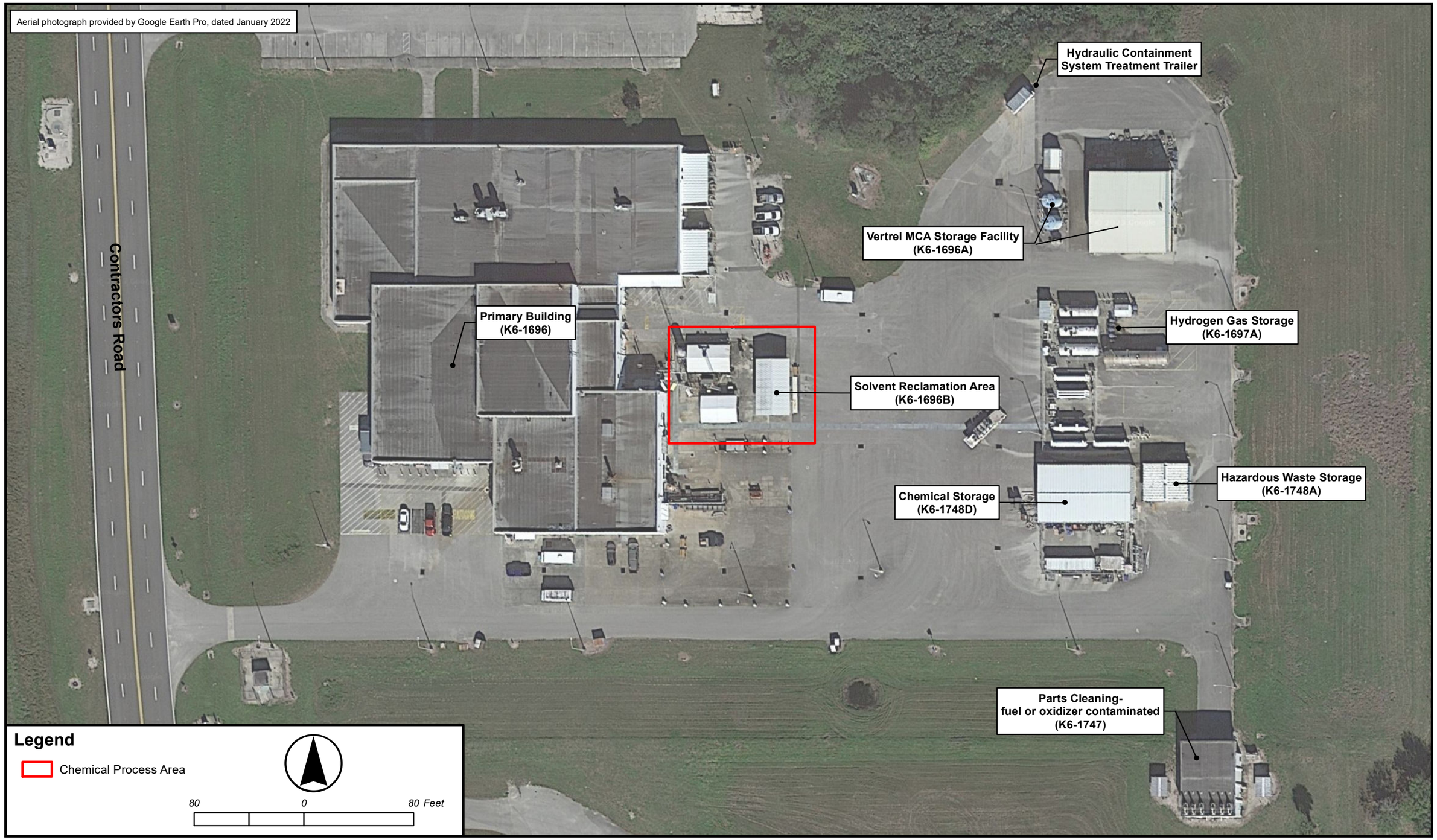

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FIGURE 1-4 CRCA SOIL BORING TRANSECT MAP

SWMU 041, KENNEDY SPACE CENTER, FLORIDA

Aerial photograph provided by Google Earth Pro, dated January 2022

Contractor Rd

IW0001
IW0002
SB-33 (MW0030)
CRCA-SB0034
EW0003
IW0003
B'
CRCA-DPT0114
IW0007
CRCA-DPT0113
CRCA-SB0033
CRCA-DPT0115
EW0002
SB-32 (MW0031)
EW0001
CRCA-SB0036
A
IW0005
SB-28 (MW0028)
IW0006
IW0004
CRCA-SO0031
A'
B
CRCA-DPT0112

Legend

- DPT Location
- Soil Boring Location
- Extraction Well Location
- Injection Well Location
- Geologic Cross-Section Line

100 0 100 Feet

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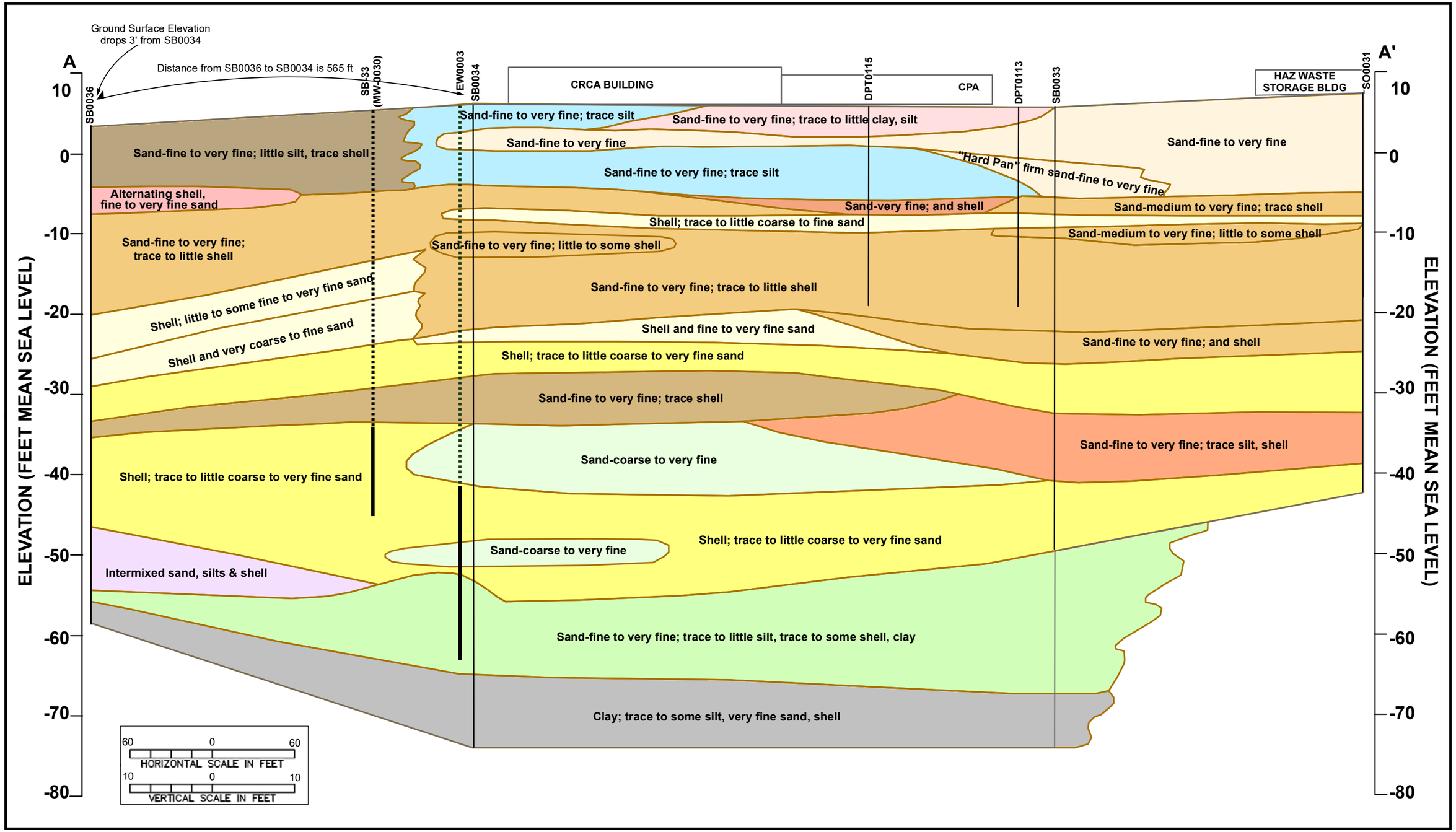

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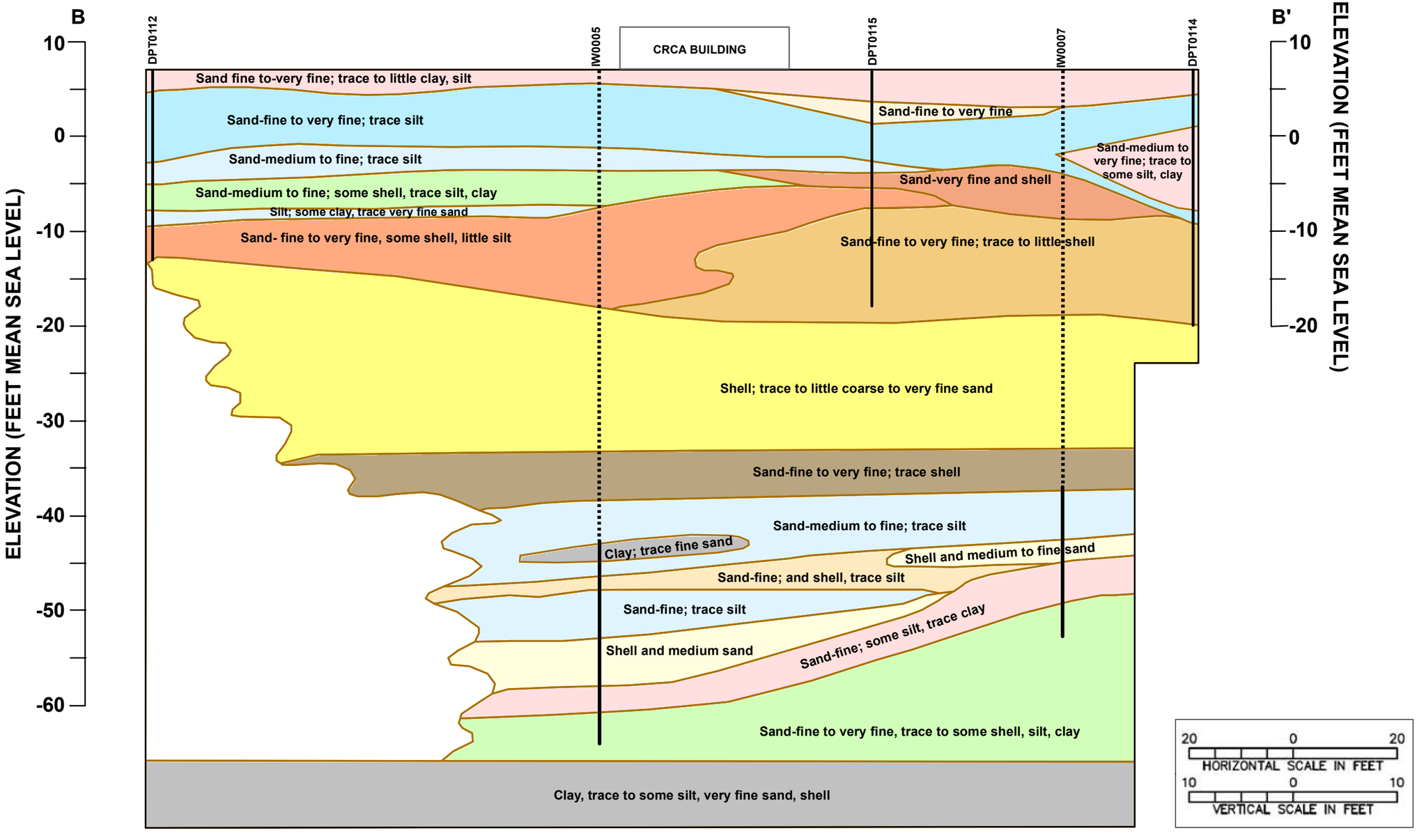

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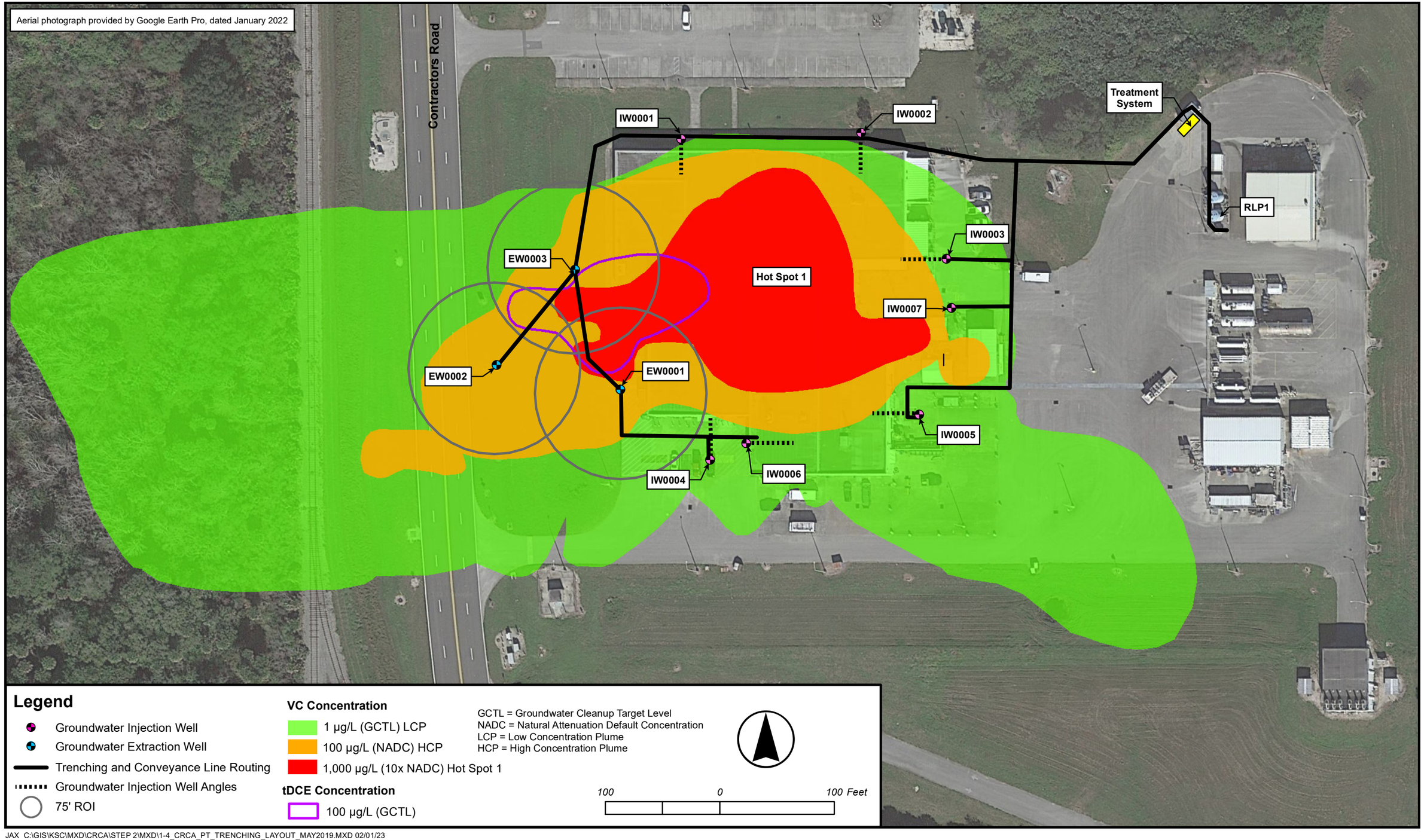
FIGURE 1-7 CRCA 2018 HOT SPOT 1 GROUNDWATER PLUME AND HYDRAULIC CONTAINMENT SYSTEM LAYOUT
SWMU 041, KENNEDY SPACE CENTER, FLORIDA



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SECTION II
HYDRAULIC CONTAINMENT SYSTEM PROCESS DESCRIPTION

The HCS was installed during a series of events between November 2018 and May 2019, in accordance with the October 2018 HS1 IMWP (NASA, 2018c) and the April 2019 HS1 IWP (NASA, 2019b). Components of the HCS include three EWs, seven IWs, a network of conveyance piping, and a treatment trailer. Additionally, 12 monitoring wells (MW0021 through MW0032), as detailed in the IMWP, were installed during HCS implementation and sampled at the prescribed frequency during Year 1 (NASA, 2020b), Year 2 (NASA, 2021a), and Year 3 (presented in Sections IV and V of this report) to monitor performance of the HCS. As discussed in Section IV of this report, three of these wells were part of the Year 3 performance monitoring plan (MW0027, MW0031, and MW0032). HCS installation activities were documented in the IM Implementation Report (NASA, 2019c).

Three EWs (EW0001, EW0002, EW0003) were installed to depths of 63-feet bls in strategic locations downgradient from HS1 with overlapping radii of influence (see Figure 1-7). Groundwater is extracted from the three deep zone EWs using dedicated 230-volt (V), two-horsepower (hp), single-phase, electric Grundfos 10E5 submersible pumps with a pump range of zero to 15 gallons per minute (gpm). EWs draw contaminated groundwater with a design flow rate of 7.0 gpm. Extracted water is conveyed through dedicated one-inch high-density polyethylene (HDPE) piping installed approximately 24-inches bls. Flowrates of extracted fluids from individual EWs are individually totalized. Two 25-micron bag filters, plumbed in parallel arrangement, remove sediment from the water prior to entry into a 500-gallon polyurethane equalization tank (EQ tank). A three-hp, 460-V pump transfers groundwater from the EQ tank into a QED Environmental System (QED™) E-Z Tray Model 4.4 SS air stripper with a three-phase, 460-V three-hp blower. The treated water from the air stripper sump is pumped by a three-hp 460-V transfer pump through two 50-micron bag filters plumbed in parallel.

Treated water is conveyed away from the HCS to dedicated one-inch HDPE piping installed 24-inches bls to the IWs. Seven IWs (IW0001 through IW0007) were installed at strategic locations upgradient of HS1 to encourage contaminated water to migrate towards the EWs. The IWs were designed to accept treated groundwater at a flowrate of 3.0 gpm.

SECTION III
SYSTEM OPERATION, MAINTENANCE, AND MONITORING

This section identifies the activities conducted and results obtained during full-scale Year 3 HCS OM&M activities at CRCA from September 2021 to October 2022.

3.1 SITE VISITS

From September 2021 to October 2022, system O&M was conducted at least monthly by a field technician, per the 2019 CRCA HS1 IWP (NASA, 2019b) and following guidance from the Site-Specific Health and Safety Plan (SSHASP; NASA, 2021b). During each O&M visit, the system was checked for abnormal conditions (noises, leaks, temperature, and vibration). The HCS was inspected for leaks at each connection to the conveyance lines and in the bag filters, EQ tank, and air stripper. The HCS was also checked for excessive vibration, noise or temperature at each pump, the conveyance lines, the air stripper, and the bag filters. Lubrication was inspected as applicable; differential pressures and flow rates across bag filter units and process equipment were assessed; system operation data was recorded and compared to the previous month's data; and filter bags, tanks, and strippers were inspected for solids build-up and the air stripper trays were cleaned with a pressure washer.

The system was shut down (partially or completely) for a total of 36.8 days from September 1, 2021, through October 31, 2022. The shutdowns were associated with groundwater sampling events, maintenance events, and a facility shut down due to Hurricane Ian. Minimal downtime was needed for performance monitoring sampling conducted in October 2021, January 2022, April 2022, July 2022, and October 2022. The most downtime was due to maintenance and replacement of equipment, which is summarized in Section 3.4.

3.2 REMOTE MONITORING

The system was evaluated in person via monthly site visits (Section 3.1) and remotely by reviewing telemetry daily reports. Flowrates in each EW were monitored and average flowrates ranged from 6.82 to 7.14 gpm during operation, slightly less than or generally consistent with the design criteria of 7.00 gpm per extraction well pump. Flowrates in each IW were also monitored.

Average flowrates ranged from 4.29 to 12.00 gpm per IW during operation, exceeding the minimum design criteria of 3.00 gpm for IW pumps as presented in the IMWP. As water is extracted from the EWs, it accumulates in the EQ tank and then is pumped via a transfer pump through the treatment system into the IWs. The IWs have shown to be able to take on enough water to not allow the treatment system to back up. Additionally, the area around the IWs is consistently monitored for groundwater mounding to ensure that increased flowrates do not cause over-saturation.

3.3 OPERATIONAL SUMMARY

O&M activities conducted for the HCS during the Year 3 operating period included routine data collection (operational and analytical) and maintenance of system components. Full-scale O&M of the system was initiated on August 16, 2019. The prove-out O&M phase initially involved weekly sampling and daily system monitoring. System sampling frequency transitioned to monthly after September 2019, and this frequency has been maintained throughout the three-year operational period.

In summary, the cumulative runtime for the HCS was approximately 91% from September 10, 2021, to October 24, 2022. Based on totalizers from EW001, EW0002, and EW0003, a total of 10,252,436 gallons of groundwater were treated during this timeframe. Analytical data from system influent and effluent show the system is effectively treating extracted groundwater.

Operational data (flowrates, pressures, recovery volumes) for the reporting period is included in Table 3-1. Laboratory analytical results for system influent and effluent samples are summarized in Table 3-2 (further discussed in Section 3.6). Table 3-3 presents runtime data for Year 3 operation of the HCS. Table 3-4 presents significant maintenance events, operational issues, and corrective actions associated with operations (further discussed in Section 3.4). Laboratory analytical reports are included in Appendix B. The O&M field notes are included in Appendix C.

Additional details about O&M activities are included in subsequent sections.

3.4 MAINTENANCE ACTIVITIES

Routine maintenance and inspection activities were conducted while the system was operating in a manner that minimized emergencies or unscheduled shutdowns. O&M was performed in accordance with the 2019 CRCA IWP (NASA, 2019b).

3.4.1 System General Maintenance Activities. In general, routine O&M consists of observing and adjusting process conditions and checking the system for abnormal conditions (e.g., noise, leaks, temperature, and vibration). During each site visit, the following routine activities were performed:

- Inspection of the HCS for leakage and excessive vibration noise, or temperature;
- Inspection of lubrication, as applicable;
- Assessment of differential pressure and flow rates across bag filter units and process equipment;
- Recording of system operation data and comparing data to design conditions and previous operating data;
- Observing and noting solids build-up in filter bags, the EQ tank, and the air stripper; and
- Cleaning of air stripper trays, replacement of bag filters (if necessary), and replacement of pump seals (if necessary).

All equipment was depressurized and drained prior to conducting maintenance activities.

3.4.2 System Repairs and Modifications. System repairs and modifications implemented during Year 3 HCS operation include:

- **Blower Motor Malfunction –** On September 13, 2021, the air stripper blower motor failed. This failure was attributed to improper procedures causing the air stripper water level to overfill, resulting in a strain on the motor, blower motor overload, and failure. A

new blower motor was ordered and installed, and the system was restarted on October 1, 2021.

- **Breaker Tripped –** On October 19, 2021, the EQ tank's breaker was tripped during flowmeter cleaning. The system was restarted on October 20, 2021, after cleaning was complete.

- **High EQ Tank –** On March 9, 2022, a high EQ tank reading caused the system to shut-down. The system was restarted on March 14, 2022, after scheduled maintenance was complete.

3.5 EVALUATION OF MAJOR TREATMENT COMPONENTS

The evaluations discussed in this section were completed to confirm achievement of the IM objective, proper functioning of system process components, and verification of treatment system performance. The following provides an overview of the current operational status of major system process components:

Extraction Wells – EWs are performing at the intended groundwater extraction rates.

Groundwater Extraction Pumps – The Grundfos RediFlo 10E5 submersible pumps have operated effectively since initial startup. No evidence of sediment, mineral, or biological pump head fouling has been observed.

Bag Filters – There are two influent bag filters upstream of the EQ tank and two bag filters downstream of the air stripper. The influent bag filters are replaced approximately monthly, and the bag filters downstream of the air stripper are replaced approximately monthly now that the scaling reduction amendment, Redux 390, has been applied to the system (bag filters were replaced weekly or bi-weekly prior to amendment).

Equalization Tank – The double-walled, 500-gallon, EQ tank has operated reliably since initial startup with the exception of the original level-sensor installation, and the overflow event, as documented in the Year 1 Annual PMR (NASA, 2021a), as well as the breaker that was tripped as stated in Section 3.4.2. Subsequently, the pump controls within the tank have operated without

issue. Typical maintenance of the EQ tank includes cleaning and replacement of floats and the totalizer. Future removal of settled solids from the tank may be required if sediments accumulate to a level that interferes with process operations.

Air Stripper – The QED™ air stripper has operated as designed since installation. Factors influencing treatment efficiency, such as biofouling, is being controlled to the maximum extent possible to maintain removal efficiencies. The trays are cleaned monthly to remove solids. Air stripper blower motor replacement was necessary as a result of improper water level maintenance.

Transfer Pumps – The transfer pumps from the EQ tank and air stripper are in acceptable condition and can be operated without modification. On-going maintenance activities will include replacement of pump and stator seals, as required, for normal operations.

Injection Wells – IWs have functioned adequately during the period of performance. Discharges to the IWs are adjusted to maintain a flowrate of 2 to 3 gpm per well. However, based on site conditions, higher flowrates have been achieved since system startup. Groundwater mounding is consistently monitored around IWs to ensure increased flowrates do not cause over-saturation. Slight increases in injection pressures were recorded from the 2019 startup through the first year of HCS operation and continued to increase during the second year. During Year 3, injection pressures were maintained at a constant rate at pressures generally lower than the previous year. No further adjustments are anticipated at this time.

3.6 PROCESS SYSTEM SAMPLING RESULTS

Combined influent and effluent samples of extracted groundwater were collected prior to and after being treated by the air stripper to analyze system efficacy. During Year 3 of HCS operation, influent and effluent samples were collected on a monthly basis, with the exception of September 2021 as the system was off for blower maintenance and January 2022 due to an apparent oversight.

All samples were analyzed for volatile organic compounds (VOCs) by U.S. Environmental Protection Agency (EPA) Method 8260D during each sampling event by Environmental

Conservation Laboratories, Inc. in Orlando, Florida (ENCO) or Pace Analytical Services, LLC in West Columbia, South Carolina (Pace). Samples collected in April through October 2022 were also analyzed for per-and polyfluoroalkyl substances (PFAS) by Liquid Chromatography Tandem Mass Spectrometry (LC/MS/MS) Compliant with Table B-15 of the U.S. Department of Defense (DoD) Quality Systems Manual (QSM) version 5.3. This PFAS data is being evaluated as part of an independent PFAS Site Assessment Report, which will be submitted under separate cover.

The following summarizes VOC results from the influent and effluent samples collected during the Year 3 operating period:

- Influent and effluent tDCE concentrations were all non-detect.

- VC concentrations going into the HCS system during Year 3 of operation ranged from non-detect (April and June 2022) to 11 µg/L (October 2021). Effluent concentrations remained below the 1 µg/L GCTL except for April 2022 and June 2022, with concentrations of 2.6 µg/L and 2.9 µg/L, respectively. Once these concentrations were received from the lab, the NASA Remediation Project Manager (RPM) was notified. After consultation with the RPM and the field sampler, it was concluded that sample identifications were likely accidentally switched during those field events. Therefore, it can be reasonably asserted that the April and June 2022 VC results of 2.6 µg/L and 2.9 µg/L apply to the influent concentrations and the non-detect values apply to the effluent concentrations.

- During the November 2021 event, several other VOCs were detected in the influent sample above the method detection limit (MDL), including o-xylene (16 µg/L), acetone (25 µg/L), methyl acetate (5.5 µg/L), and chloromethane (48 µg/L). Of these compounds, only acetone (15 µg/L) and chloromethane (26 µg/L) were detected in the effluent, in addition to bromomethane (1.3 µg/L; non-detect in influent sample). Because acetone and the halomethanes can be common laboratory cleaning agents, these detections may be attributed to a false-positive occurring during sample analysis and are therefore not likely site-related. None of these compounds were detected in subsequent sampling events, with

the exception of chloromethane in the June 2022 event (0.59 µg/L influent; non-detect effluent) and September 2022 event (0.86 µg/L influent; 1.8 µg/L effluent).

Overall, influent concentrations have continued to decrease during the third year of HCS operation. Since system startup, the combined influent concentration of VC has decreased from 130 µg/L in July 2019 to 2.0 µg/L in October 2022. The VC concentrations initially increased after startup, with the highest result of 260 µg/L in August 2019, but this was not unexpected as the system is designed to hydraulically draw in more contamination based on placement of EWs and IWs. All tDCE influent concentrations have been below GCTLs or non-detect since baseline. All effluent concentrations of tDCE and VC were non-detect during Year 3 of HCS operation, with the understanding of labels inadvertently switched during the April and June 2022 sampling events, as discussed above.

Influent and effluent data for the site's COCs (tDCE and VC) from baseline through the third year of HCS operation are presented in Table 3-2.

Table 3-1. Hydraulic Containment System Year 3 Operational Details

Date	PID Air Stripper outlet	Blower Pressure	After Damper Pressure	Air Stripper Differential Pressure	Equalization Tank Pump			Air Stripper Pump		
					Totalizer	Pressure	Flow Rate	Totalizer	Pressure	Flow Rate
	ppmv	in wc	in wc	in wc	gal	psi	gpm	gal	psi	gpm
09/10/21	0	20	20	20	19,210,391.00	26	30.00	16,631,495.00	30	37.50
10/07/21	0	21	20	20	19,517,467.00	26	30.00	16,663,150.00	30	37.50
11/10/21	0	21	20	20	20,510,425.00	26	30.00	16,831,544.00	30	37.50
12/12/21	0	21	20	20	21,503,383.00	26	30.00	16,999,937.00	30	37.50
01/21/22	0	21	20	20	22,496,340.00	26	30.00	17,168,331.00	30	37.50
02/25/22	0	21	20	20	23,489,298.00	26	30.00	17,168,331.00	30	37.50
03/28/22	0	21	20	20	24,482,256.00	26	30.00	17,168,331.00	30	37.50
04/25/22	0	21	20	20	25,453,597.00	26	30.00	17,168,331.00	30	37.50
05/19/22	0	20	20	20	25,864,776.00	26	30.00	17,336,724.00	30	37.50
06/20/22	0	20	20	20	26,275,955.00	26	30.00	17,505,118.00	30	37.50
07/25/22	0	20	20	20	26,687,134.00	26	30.00	17,673,511.00	30	37.50
08/22/22	0	20	20	20	27,541,435.00	26	30.00	18,527,812.00	30	37.50
09/19/22	0	20	20	20	28,396,327.00	26	30.00	19,382,704.00	30	37.50
10/24/22	0	20	20	20	29,462,827.00	26	30.00	20,449,204.00	30	37.50

Table 3-1. Hydraulic Containment System Year 3 Operational Details (continued)

Date	Injection wells									
	IW0001		IW0002		IW0003		IW0004		IW0005	
	Pressure	Flow Rate	Pressure	Flow Rate	Pressure	Flow Rate	Pressure	Flow Rate	Pressure	Flow Rate
	psi	gpm	psi	gpm	psi	gpm	psi	gpm	psi	gpm
09/10/21	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
10/07/21	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
11/10/21	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
12/12/21	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
01/21/22	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
02/25/22	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
03/28/22	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
04/25/22	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
05/19/22	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
06/20/22	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
07/25/22	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
08/22/22	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
09/19/22	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
10/24/22	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00
Average	16	7.50	12	7.50	18	6.00	18	6.00	18	5.00

Table 3-1. Hydraulic Containment System Year 3 Operational Details (continued)

Date	Injection Wells				Extraction Wells					
	IW0006		IW0007		EW0001		EW0002		EW0003	
	Pressure	Flow Rate	Pressure	Flow Rate	Pressure	Flow Rate	Pressure	Flow Rate	Pressure	Flow Rate
	psi	gpm	psi	gpm	psi	gpm	psi	gpm	psi	gpm
09/10/21	14	4.29	15	4.39	23	6.90	32	7.14	28	6.82
10/07/21	14	4.29	15	5.00	20	6.90	30	7.14	26	7.06
11/10/21	14	4.29	15	5.00	22	6.90	30	7.14	26	7.06
12/12/21	14	4.29	15	5.00	21	6.90	30	7.14	26	7.06
01/21/22	14	4.29	15	5.00	21	6.90	30	7.14	26	7.06
02/25/22	14	4.29	15	5.00	21	6.90	30	7.14	26	7.06
03/28/22	14	4.29	15	5.00	20	6.90	30	7.14	26	7.06
04/25/22	14	4.29	15	5.00	20	6.90	34	7.14	26	7.06
05/19/22	14	4.29	15	5.00	22	6.90	32	7.14	26	7.06
06/20/22	14	4.29	15	5.00	21	6.90	32	7.14	26	7.06
07/25/22	14	4.29	15	5.00	24	6.90	30	7.14	26	7.06
08/22/22	14	4.29	15	5.00	24	6.90	30	7.14	26	7.06
09/19/22	14	4.29	15	5.00	24	6.90	30	7.14	26	7.06
10/24/22	14	4.29	15	5.00	24	6.90	30	7.14	26	7.06
Average	14	4.29	15	5.00	24	6.90	30	7.14	26	7.06

Table 3-1. Hydraulic Containment System Year 3 Operational Details (continued)

Date	(1) Total Extracted	Avg Extraction Rate	Bag Filter			
			Influent		Effluent	
			First Filter	Second Filter	First Filter	Second Filter
	gallons	gpm	psi	psi	psi	psi
09/10/21	19,210,391	9.52	1	1	25	25
10/07/21	19,517,467	7.75	1	1	25	25
11/10/21	20,510,425	17.21	1	1	25	25
12/12/21	21,503,383	18.28	1	1	25	25
01/21/22	22,496,340	14.63	1	1	25	25
02/25/22	23,489,298	16.72	1	1	25	25
03/28/22	24,482,256	18.87	1	1	25	25
04/25/22	25,453,597	18.38	1	1	25	25
05/19/22	25,864,776	25.28	1	1	25	25
06/20/22	26,275,955	18.96	1	1	25	25
07/25/22	26,687,134	10.30	1	1	25	25
08/22/22	27,541,435	21.19	1	1	25	25
09/19/22	28,396,327	21.20	1	1	25	25
10/24/22	29,462,827	21.16	1	1	25	25

Notes:

(1) Based on totalizers from EW0001, EW0002 and EW0003

PID = Photoionization Detector

gpm = gallons per minute

psi = pounds per square inch

gal = gallon

in wc = inches of water column

ppmv = parts per million by volume

The differences in recorded flow between the influent, equalization tanks, air stripper meters, and the calculated readings from other meters may be attributed to water quality sensitivity, meters failing, pausing, and plugging up from time to time between maintenance events. During maintenance, these issues are assessed to see if cleaning or replacement is needed.

Table 3-2. trans-1,2-Dichloroethene and Vinyl Chloride Influent and Effluent Analytical Results

Date	tDCE		VC	
	Influent	Effluent	Influent	Effluent
07/23/2019	**2.3**	0.73 U	**130**	0.71 U
07/24/2019	**4.1**	0.73 U	**160**	0.71 U
07/25/2019	0.73 U	0.73 U	**160**	0.71 U
07/29/2019	**3.2**	0.73 U	**150**	0.71 U
07/30/2019	**4.3**	0.73 U	**160**	0.71 U
08/12/2019	**3.9**	0.73 U	**260**	0.71 U
08/13/2019	**6.8**	0.73 U	**220**	0.71 U
08/20/2019	**7.6**	0.73 U	**230**	0.71 U
08/26/2019	**9.2**	0.73 U	**220**	0.71 U
09/11/2019	**6.3**	0.73 U	**200**	0.71 U
10/02/2019	**7.4**	0.73 U	**170**	0.71 U
11/05/2019	**4.5**	0.73 U	**110**	0.71 U
12/10/2019	**3.5**	0.73 U	**97**	0.71 U
01/14/2020	**3.3**	0.73 U	**79**	0.71 U
02/13/2020	**4.6**	0.73 U	**87**	0.71 U
03/12/2020	**3.2**	0.73 U	**54**	0.71 U
04/09/2020	**2.8**	0.73 U	**48**	0.71 U
05/14/2020	**3.1**	0.73 U	**70**	0.71 U
06/08/2020	**1.7 I**	0.73 U	**42**	0.71 U
07/14/2020	**2.1**	0.73 U	**50**	0.71 U
08/13/2020	**1.1 I**	0.73 U	**26**	0.71 U
09/16/2020	**1.2 I**	0.73 U	**18**	0.71 U
10/27/2020	1	0.73 U	**20**	0.71 U
11/11/2020	**1.2 I**	0.73 U	**23**	0.71 U
12/21/2020	**1.3 I**	0.73 U	**16**	0.71 U
01/19/2021	0.73 U	0.73 U	**13**	0.71 U
02/17/2021	0.73 U	0.73 U	**19**	0.71 U
03/18/2021	0.73 U	0.73 U	**13**	0.71 U
04/22/2021	**0.81 I**	0.73 U	**19**	0.71 U
05/20/2021	**0.76 I**	0.73 U	**13**	0.71 U
06/17/2021	0.73 U	0.73 U	**12**	0.71 U
07/23/2021	0.73 U	0.73 U	**12**	0.71 U
08/24/2021	0.73 U	**2.9**	**9.8**	0.71 U
10/07/2021	0.73 U	0.73 U	**11**	0.71 U
11/10/2021	0.73 U	0.73 U	**3.0**	0.71 U
12/14/2021	0.73 U	0.73 U	**3.3**	0.71 U
02/14/2022	0.73 U	0.73 U	**2.8**	0.71 U
03/22/2022	0.73 U	0.73 U	**2.9**	0.71 U
04/18/2022	0.80 U	0.80 U	0.80 U*	**2.6***
05/24/2022	0.80 U	0.80 U	**3.0**	0.80 U
06/29/2022	0.80 U	0.80 U	0.80 U*	**2.9***
07/21/2022	0.80 U	0.80 U	**3.2**	0.80 U
08/15/2022	0.80 U	0.80 U	**2.9**	0.80 U
09/08/2022	0.80 U	0.80 U	**3.8**	0.80 U
10/27/2022	0.80 U	0.80 U	**2.0**	0.80 U

Table 3-2. trans-1,2-Dichloroethene and Vinyl Chloride Influent and Effluent Analytical Results (continued)

Notes:
Concentrations in µg/L
tDCE = trans-1,2-dichloroethene
VC = vinyl chloride
I = Value was reported above the laboratory method detection limit, but below the practical quantitation limit
U= Value was reported as below the method detection limit, therefore the detection limit is shown
Shading indicates State of Florida Groundwater Cleanup Target Level (GCTL) exceedance, tDCE = 100 µg/L, VC = 1 µg/L
Bolding indicates a concentration is greater than the method detection limit
No influent/effluent samples were collected in September 2021 due to system shutdown for blower repair
No influent/effluent sampling records located for January 2022, assumed technical oversight
* indicates that the influent and effluent samples were likely switched

Table 3-3. CRCA Year 3 Hydraulic Containment System Runtime

Month	Hours in the Month	Hours System Down	Days in the Month	Days System Down	Operational Run Time	Primary Downtime Contributing Factor
Sep-21	720	332	30	13.8	54%	Blower motor shorted after restart; replacement ordered. Monthly Operation and Maintenance event and air strippers cleaned.
Oct-21	744	96	31	4.0	87%	Blower motor replaced. Monthly Operation and Maintenance event and air strippers cleaned; Breaker tripped by technician during flowmeter cleaning.
Nov-21	720	12	30	0.5	98%	Monthly Operation and Maintenance event and air strippers cleaned.
Dec-21	744	12	31	0.5	98%	Monthly Operation and Maintenance event and air strippers cleaned.
Jan-22	744	12	31	0.5	98%	Monthly Operation and Maintenance event and air strippers cleaned.
Feb-22	672	12	28	0.5	98%	Monthly Operation and Maintenance event and air strippers cleaned.
Mar-22	744	144	31	6.0	81%	System down due to EQ high level and underwent maintenance; Monthly Operation and Maintenance event and air strippers cleaned.
Apr-22	720	24	30	1.0	97%	Monthly Operation and Maintenance event and air strippers cleaned.
May-22	744	24	31	1.0	97%	Monthly Operation and Maintenance event and air strippers cleaned.
Jun-22	720	24	30	1.0	97%	Monthly Operation and Maintenance event and air strippers cleaned.
Jul-22	744	24	31	1.0	97%	Monthly Operation and Maintenance event and air strippers cleaned.
Aug-22	744	24	31	1.0	97%	Monthly Operation and Maintenance event and air strippers cleaned.
Sep-22	720	120	30	5.0	83%	Monthly Operation and Maintenance event and air strippers cleaned; Powered down for Hurricane Ian.
Oct-22	744	24	31	1.0	97%	Monthly Operation and Maintenance event and air strippers cleaned.
Total	10,224	884	426	36.8	91%	

Notes:
EQ= Equalization

Table 3-4. CRCA Year 3 Hydraulic Containment System Maintenance Events

System Component	Issue	Issue Date	Resolution	Resolution Date
Blower Motor	Failed after restart	9/13/2021	Ordered new blower motor and replaced.	10/1/2021
Breaker	Tripped during flowmeter cleaning	10/19/2021	Restarted after scheduled cleaning.	10/20/2021
High EQ tank	System tripped	3/9/2022	Restarted after scheduled maintenance.	3/14/2022
System Component	Hurricane Ian	9/26/2022	Powered down for Hurricane Ian; continued as normal after shut down.	9/30/2022

Notes:

EQ = Equalization

SECTION IV
PERFORMANCE MONITORING RESULTS AND DISCUSSION

This section includes sampling activities and results from the Year 3 HCS operating period, conducted between September 2021 to October 2022. Samples were collected from groundwater, sub-slab soil gas, and ambient air.

As noted in Section I, the DPT groundwater sampling event conducted in March 2022 is not documented in this report; this event will be documented with additional DPT groundwater data being collected to delineate and confirm overall plume boundaries.

4.1 GROUNDWATER SAMPLING

Groundwater monitoring was implemented at CRCA to ensure that hydraulic containment of the groundwater plume is maintained during HCS operation. The monitoring program also evaluates the overall extent of the plume and how it changes over time. Reduction in CVOC concentrations is monitored to support transition to MNA once IM objectives are achieved. Figure 4-1 illustrates the Year 3 sampling plan, as well as monitoring well, IW, and EW locations.

The Year 3 sampling plan was consistent with the Year 2 sampling plan, with the exception of removing monitoring wells MW0012, MW0015, MW0028, MW0029, and MW0030 from the Year 3 plan based on recommendations presented in the Year 2 Annual PMR (due to non-detect results) (NASA, 2022).

Five separate sampling events were conducted during the Year 3 reporting period. A total of 26 groundwater samples were collected during these events with four monitoring wells sampled on a quarterly basis and an additional three sampled on a semi-annual basis, as summarized in the table below.

Year 3 Groundwater Monitoring Events

Date of Groundwater Sampling	Number of Monitoring Wells Sampled
October 7, 2021	4
January 14, 2022	7
April 18, 2022	4
July 21, 2022	7
October 26-28, 2022	4

Quarterly: MW0018, MW0019, MW0031, and MW0032
Semi-annual: MW0002, MW0013, and MW0027

Quarterly performance monitoring wells (MW0018, MW0019, MW0031, and MW0032) were sampled and analyzed by a fixed-base laboratory (ENCO for the October 2021 and January 2022 sampling events and Pace for the April, July, and October 2022 sampling events) for VOCs via EPA Method 8260D (all events) and/or MEE via RSK-175 (all events, except October 2022). Additionally, select wells (MW0018, MW0019, and MW0031) were analyzed for *Dhc* and VC reductase bacterial analyte group during the October 2021, January 2022, and July 2022 sampling events by Microbial Insights, Inc. in Knoxville, Tennessee. Note, during the October 2022 sampling event, samples were also collected for PFAS analysis from several wells on-site. This PFAS data is being evaluated as part of an independent PFAS Site Assessment Report, which will be submitted under separate cover.

Semi-annual monitoring wells (MW0002, MW0013, and MW0027) were sampled and analyzed by a fixed-base laboratory (ENCO or Pace) for VOCs only via EPA Method 8260D.

Table 4-1 outlines the Year 3 groundwater monitoring plan. Groundwater results are discussed in Section 4.6 of this report.

Groundwater sampling and analyses were performed in accordance with the KSC Sampling and Analysis Plan for the RCRA Program (NASA, 2017), KSC Decision Process Document (NASA, 2019a), and FDEP Standard Operating Procedure (SOP) FS 2200 (FDEP, 2017). Field forms and the associated notes for each sampling event are provided in Appendix D. Purge water collected during the groundwater sampling activities was treated as investigation derived waste (IDW),

managed in accordance with the KSC IDW Management Plan (NASA, 2006), then put back into the treatment system for processing. Miscellaneous trash and personal protective equipment generated during sampling activities were disposed of in an appropriate container.

4.2 SUB-SLAB SOIL GAS SAMPLING

As part of performance monitoring, sub-slab soil gas samples were collected from four pre-installed vapor monitoring pins (VMPs) located beneath, or near, the foundation of the main building (Building K6-1696), as shown on Figure 4-2. The purpose of sub-slab soil gas sample collection is to evaluate the potential for VOC vapors to migrate into the occupied building due to operation of the HCS.

Baseline samples were collected in February 2019 in accordance with the CRCA IWP (NASA, 2019b), with samples collected on a routine basis since HCS operation was initiated. The sampling dates for the Year 3 reporting period were October 21, 2021; January 14, 2022; April 25, 2022; July 22, 2022; and, October 27, 2022, at locations VMP01, VMP02, VMP03, and VMP04. SUMMA® canisters, with 1-hour time-weighted average (TWA) regulators, were used to capture the samples for transport to ENCO in Orlando, Florida for the October 2021 and January 2022 sampling events, and Pace in West Columbia, South Carolina for the April, July, and October 2022 sampling events. These soil gas samples were analyzed for VOCs via EPA Method TO-15. Refer to Appendix B for the complete laboratory reports. The sub-slab soil gas results are discussed in Section 4.8 of this report.

4.3 AMBIENT AIR SAMPLING

Ambient air samples were collected at two designated sample locations: (1) In the vicinity of the HCS treatment trailer to evaluate the potential for VOC vapors to impact field engineers and technicians during maintenance activities due to HCS operations (AMB01), and (2) In the parking lot behind the CRCA main facility (AMB02), as recommended in the Year 2 Annual PMR, to assist in distinguishing potential contributions from routine facility operations. The sample locations are shown on Figure 4-2. The air samples were passively collected using SUMMA® canisters over an 8-hour period to determine if contaminants are present in the ambient air surrounding the treatment system or near CRCA facility operations. These samples

were collected in concert with the sub-slab air sampling events on October 21, 2021; January 14, 2022; April 25, 2022; July 22, 2022; and October 27, 2022. During the October 2022 sampling event, a SUMMA® canister valve malfunction occurred at one of the locations, necessitating re-sampling on November 1, 2022. The ambient air samples were analyzed for VOCs via EPA Method TO-15 at a fixed-based laboratory (ENCO or Pace). These results are further discussed in Section 4.9 of this report.

4.4 WATER LEVELS

Water levels were measured at 35 permanent monitoring wells as a baseline in June 2019, and then quarterly after HCS start-up in conjunction with groundwater performance monitoring activities. Synoptic measurements collected from monitoring wells were converted to groundwater elevations (see Table 4-2), organized into shallow (5 to 15 feet bls), intermediate (25 to 40 feet bls), and deep (53 to 63 feet bls) zones based on the screened intervals of the wells, and interpreted onto groundwater contour maps.

During the five quarterly sampling events within the Year 3 reporting period, the same 35 permanent monitoring wells from baseline were measured. The quarterly water level events were conducted in October 2021, January 2022, April 2022, July 2022, and October 2022 to continually monitor groundwater level fluctuations. The resulting potentiometric surface maps, presented as Figures 4-3 through 4-17, were used to illustrate the behavior of groundwater flow specific to each zone and measurement event and how flow may be affected by HCS operations.

In general, the slope of the water table continues to vary with depth within the surficial aquifer, well location, and time lapsed relative to system operation. The observations made during the Year 3 synoptic events are presented below. Hydrogeologic conditions observed at the site during baseline and the first two years of HCS operation are presented and discussed in the groundwater modeling report section of the Year 2 Annual PMR (NASA, 2022).

4.4.1 Potentiometric Surface of Shallow Zone. During the first quarter of Year 3 HCS operation (October 2021, Figure 4-3), groundwater flow within the shallow zone of the surficial aquifer system occurred to the south in the vicinity of the Solvent Reclamation Area (within the “Chemical Process Area” on figures), becoming more southwestern toward Contractors Road.

Slight mounding was noted in the vicinity of MW0009 with radial flow to the southeast and southwest. In January 2022, groundwater flow exhibited similar trends to the previous quarter with the highest groundwater elevation noted at MW0011, located in the vicinity of the injection wells flowing radially to the southeast toward the Solvent Reclamation Area, to the south, and southwest toward Contractors Road (Figure 4-4). In April 2022, mounding continued toward the center of the site in the vicinity of MW0009 and MW0011, with a general radial flow maintained to the southwest, becoming more westward toward Contractors Road (Figure 4-5). In July 2022, the area of MW0009 became depressional, with radial flow indicated (Figure 4-6). This depressional area is most likely due to increased hydraulic gradients and altered flow patterns by surrounding injection wells. From the center of the site, flow continued to the west toward the three EWs and Contractors Road. During October 2022, the area of MW0009 was no longer depressional, resuming to subtle mounding with flow to the south and east toward a gently sloping depressional area at MW0005 (Figure 4-7).

The lower areas noted within the shallow zone are most likely due to the increased hydraulic gradient and higher groundwater elevations induced by IWs (IW0003, IW0007, and IW0005) in the Solvent Reclamation Area. The higher groundwater elevations consistently found to the north in the area of the injection wells, appear to flow radially toward the southeast, south, and southwest. Stormwater drainage features would be expected to further affect these shallow drainage conditions, as observed during baseline conditions (June 2019).

4.4.2 Potentiometric Surface of the Intermediate Zone. During Year 3 of HCS operation, intermediate groundwater flow in October 2021 generally flowed to the northwest from the southeast corner of the building, with a decreased gradient and general westward flow west of the HCS, toward Contractors Road (Figure 4-8). An isolated depressional area is noted at MW0002, near the center of the Solvent Reclamation Area. In January 2022, flow occurred more to the west and southwest with more uniform contours and a decreased hydraulic gradient. MW0002 no longer marked a depressional area, becoming the area of highest groundwater elevation during this measuring event (Figure 4-9). In April 2022, uniform flow was noted to the west, then northwest toward MW0029 (Figure 4-10). Intermediate flow became more uniform in July 2022, with flow generally occurring to the west and northwest, and gradients decreasing

(Figure 4-11). In October 2022, flow continued to the west, with a southern and northwestern flow component emanating from slight mounding at MW0002, located within the Solvent Reclamation Area. Groundwater contours became more uniform and resolved to a predominately westerly flow west of the main building, toward Contractors Road (Figure 4-12).

4.4.3 Potentiometric Surface of the Deep Zone. During the third year of HCS operation, the October 2021 deep potentiometric surface showed a flow that is generally westward, with a slight southwestern and southeastern convergence toward MW0030 (Figure 4-13). The January 2022 potentiometric surface map shows the flow consistent with the pattern three months prior, occurring uniformly to the west, with slight convergence toward MW0030 (Figure 4-14). The April 2022 data demonstrates a flow within the deep intervals continuing to the west, northwest, and southwest (Figure 4-15). In July 2022, groundwater contours indicated a uniform flow pattern to the west and northwest from the Solvent Reclamation Area toward Contractors Road (Figure 4-16). In October 2022, groundwater flow patterns changed significantly with flow from the north (MW0020) to the southeast and southwest near IWs, IW0001 and IW0002. A depressional area with radial flow was observed to develop toward MW0019, located east of EWs, EW0001, EW0002, and EW0003, along with a higher elevation and converging flow to the northeast and southwest from MW0031 (Figure 4-17).

4.5 FIELD MEASUREMENTS

Temperature, pH, specific conductance, dissolved oxygen, turbidity, and oxidation reduction potential (ORP) were measured and recorded in the field during monitoring well sampling activities. These field measurements from the Year 3 groundwater sampling events are summarized in Table 4-3. Sample log sheets prepared in the field are included in Appendix D.

Field measurements were collected to ensure that groundwater conditions were fully stabilized in accordance with FDEP's SOP for groundwater sampling (FS 2200) before groundwater sample collection, ensuring samples are representative of surficial aquifer conditions (FDEP, 2017). The water pumped from each well was collected and managed as IDW and put into the HCS for processing.

The following presents a summary of field measurements taken prior to each of the quarterly and semi-annual sampling events conducted during Year 3 of HCS operation at CRCA. During the October 2021 groundwater sampling event (Quarter 1), groundwater temperatures in the four wells sampled ranged from 22.80 to 28.30°C, with an average of 25.58°C. Readings of pH ranged from 6.86 to 7.04, with an average of 6.95. Specific conductance ranged from 718.0 to 2,914.0 microSiemens per centimeter (µS/cm), with an average of 1,426.5 µS/cm. Dissolved oxygen values varied from 0.02 to 0.15 milligrams per liter (mg/L), with an average of 0.09 mg/L. Turbidity readings ranged from 0.67 to 13.20 nephelometric units (NTU), with an average value of 5.66 NTU. ORP readings ranged from -98.5 to -84.6 millivolts (mV), with an average reading of -89.7 mV.

The second quarter (Quarter 2) and first semi-annual round of groundwater sampling in January 2022 exhibited groundwater temperatures in the seven wells sampled ranging from 22.0 to 25.10°C, with an average of 23.45°C. Readings of pH ranged from 6.34 to 7.96, with an average of 7.23. Specific conductance ranged from 259.0 to 1509.8 µS/cm, with an average of 900.42 µS/cm. Dissolved oxygen values varied from 0.04 to 0.15 mg/L, with an average of 0.09 mg/L. Turbidity readings ranged from 0.78 to 28.20 NTUs, with an average value of 7.93 NTUs. MW0032 had a high level of turbidity, exceeding the stabilization limit of less than 20 NTUs. Per the FDEP SOP (FDEP, 2017), five volumes of the screened interval were purged to achieve stable conditions. All other parameters were stable and sampled per FDEP SOP, and therefore purging was discontinued. ORP values ranged from -171.3 to 28.5 mV, with an average reading of -58.13 mV.

During the third quarterly sampling event (Quarter 3) in April 2022, groundwater temperatures at the four wells sampled ranged from 22.92 to 27.09°C, with an average of 25.01°C. Readings of pH ranged from 6.61 to 6.79, with an average of 6.70. Specific conductance ranged from 1,089.2 to 2,137.0 µS/cm, with an average of 1,461.2 µS/cm. Dissolved oxygen values varied from 0.04 to 0.13 mg/L, with an average of 0.08 mg/L. Turbidity readings ranged from 0.77 to 26.31 NTU, with an average value of 9.75 NTU. Like the previous event, MW0032 had a high level of turbidity, exceeding the stabilization limit of less than 20 NTUs. Per the FDEP SOP (FDEP, 2017), five volumes of the screened interval were purged, all to achieve stable conditions. All

other parameters were stable and sampled per FDEP SOP, and therefore purging was discontinued. ORP values ranged from 19.6 to 58.2 mV, with an average reading of 37.6 mV.

For the fourth quarter (Quarter 4) and second semi-annual sampling event in July 2022, groundwater temperatures in the seven wells sampled ranged from 22.91 to 29.92°C, with an average of 26.79°C. Readings of pH ranged from 6.08 to 6.95, with an average of 6.61. Specific conductance ranged from 316.5 to 1,953.9 µS/cm, with an average of 1,142.24 µS/cm. Dissolved oxygen values varied from 0.04 to 0.14 mg/L, with an average of 0.09 mg/L. Turbidity readings ranged from 0.88 to 17.51 NTU, with an average value of 10.10 NTU and ORP values ranged from -84.7 to -17.5 mV, with an average reading of -43.29 mV.

For the fifth quarter event (Quarter 5) in October 2022, groundwater temperatures in the four wells sampled ranged from 23.10 to 27.20°C, with an average of 25.18°C. Readings of pH ranged from 6.80 to 7.19, with an average of 7.05. Specific conductance ranged from 788.0 to 1,168.0 µS/cm, with an average of 960.75 µS/cm. Dissolved oxygen values varied from 0.01 to 0.24 mg/L, with an average of 0.10 mg/L. Turbidity readings ranged from 1.34 to 63.7 NTU, with an average value of 20.03 NTU. MW0019 had a high level of turbidity, exceeding the stabilization limit of less than 20 NTUs. Per the FDEP SOP (FDEP 2017), five volumes of the screened interval were purged, all to achieve stable conditions. All other parameters were stable and sampled per FDEP SOP, and therefore purging was discontinued. ORP values ranged from -159.0 to -79.2 mV, with an average reading of -15.63 mV.

4.6 GROUNDWATER ANALYTICAL RESULTS

Quarterly and semi-annual performance monitoring groundwater samples were collected and analyzed in accordance with the prescribed schedule and analyte list (Table 4-1). A summary of results for baseline and all performance monitoring events to date for the site's COCs (tDCE and VC) are presented in Table 4-4. The Year 3 field measurements recorded prior to the collection of each groundwater sample are presented on Table 4-3 and discussed in the previous section. Results for miscellaneous parameters including *Dhc*, VC reductase, and MEE are presented in Table 4-5. Laboratory analytical reports are provided in Appendix B. The groundwater sampling log sheets and chain-of-custody forms are provided in Appendix D. The VOC data is shown on

Figures 4-18 and 4-19 for the intermediate and deep zones, respectively. Figure 4-20 illustrates the combined intermediate and deep plumes, and includes sampling data from other monitoring wells previously sampled as part of the performance monitoring program.

The following summarizes VOC findings from each sampling event completed during the Year 3 reporting period. *Dhc*, VC reductase, and MEE results are also presented below. Evaluation of overall plume conditions and HCS performance is provided under Section 4.7.

4.6.1 October 2021 (Year 3, Quarter 1). On October 7, 2021, the initial round of quarterly sampling for the Year 3 HCS operation reporting period was conducted. During this sampling event, four monitoring wells were sampled (MW0018, MW0019, MW0031 and MW0032) and analyzed for VOCs. All four wells have a screened interval from 53-63 feet bls. There were detections of VC in all four samples, with results ranging from 0.78 to 42 µg/L, exceeding the GCTL of 1 µg/L at three locations (MW0018, MW0031, and MW0032). All wells were non-detect for tDCE.

Year 3 results showed oscillating VC concentrations since the baseline event, with GCTL exceedance at MW0018 (42 µg/L) and a slight detection of 0.78 µg/L at MW0019, both in the vicinity of the main building and the EW and IW system. Groundwater samples collected from monitoring well, MW0031, indicate a steady decline of VC concentrations from 680 µg/L (baseline) to 13 µg/L (October 2021). To the west of the railroad tracks, MW0032 showed an increase of VC levels from non-detect during baseline, 17 µg/L in October 2020, and reducing to 8.7 µg/L in October 2021. This trend indicates that downgradient LCP plume migration is occurring beyond the capture zone of the HCS within the 53-63 feet bls zone.

In addition to VOC analysis, three of the wells (MW0018, MW0019, and MW0031) were also analyzed for MEE and microbial analyses in October 2021. For MEE, methane was the only compound detected with concentrations ranging from 425 to 1,140 µg/L. For microbial, *Dhc* was the only detection with concentrations of 130 Cells per milliliter (Cells/mL) (MW0018), 108 Cells/mL (MW0019), and 258 Cells/mL (MW0031).

4.6.2 January 2022 (Year 3, Quarter 2). The second round of quarterly sampling for the Year 3 HCS operation reporting period, as well as the initial semi-annual round of sampling, was

conducted on January 14, 2022. During this sampling event, four quarterly samples were collected from the deep wells (MW0018, MW0019, MW0031 and MW0032) and analyzed for VOCs. The three semi-annual wells (MW0002, MW0013, and MW0027) were also sampled for VOCs. Results showed one sample with a low-level detection of tDCE (1.1 µg/L at MW0002) with the other six samples non-detect for tDCE. VC was detected at five of the seven wells, ranging from 1.1 µg/L at intermediate well MW0013 to 34 µg/L at deep well MW0018. The other two deep wells with detections (MW0031 and MW0032) showed concentrations of 7.8 µg/L and 14 µg/L, and the intermediate well, MW0002, detected VC at 6.6 µg/L. VC was non-detect in wells MW0019 and MW0027.

Within the area of hydraulic control, results indicate a continued low-level VC detection at MW0013 (1.1 µg/L), slightly lower than the 1.4 µg/L detected in July 2021, but has increased since HCS operation (non-detect at baseline). The highest VC concentration within the intermediate zone was found at MW0002, located east of the main building and within the Solvent Reclamation Area, with a concentration of 6.6 µg/L, above the GCTL; however, showing a reduction from the baseline detection of 28 µg/L. MW0027, located downgradient from the main building, showed a VC concentration of 7 µg/L within the intermediate zone in January 2021 (previous reporting period), warranting further observation as this was the first occurrence of a positive VC detection at this location. During this Year 3, January 2022 sampling event, VC was non-detect at MW0027. Three of the four deep wells revealed positive concentrations of VC, while groundwater collected from MW0019 showed a non-detect level. This non-detect value at MW0019 dramatically decreased since baseline sampling from 250 µg/L to 0.78 µg/L during October 2021 sampling, and now non-detect in January 2022.

Deep wells MW0018 and MW0031 (located within the hydraulic control area), and MW0032 (located downgradient of the hydraulic control area) showed VC detections of 34 µg/L, 7.8 µg/L, and 14 µg/L, respectively, all exceeding the GCTL. Although remaining above the GCTL, MW0018 concentrations have decreased from 140 µg/L during baseline sampling, showing a constant decrease with subsequent sampling events. Similarly, deep well MW0031 (7.8 µg/L) represents the lowest detected VC concentration since baseline sampling (680 µg/L). Groundwater data from downgradient location, MW0032, have exhibited a fluctuation of VC

concentrations since baseline sampling (non-detect), with a slight increase from the Year 3, Quarter 1 sampling (October 2021) of 8.7 µg/L to this sampling event (14 µg/L). This is currently the most downgradient monitoring well; however, as noted previously, a DPT sampling event is being conducted to evaluate the extent of the LCP.

In addition to VOC analysis, three of the deep performance wells (MW0018, MW0019, and MW0031) were sampled for MEE and microbial analyses. The results of these analyses are presented on Table 4-5. Three of the four dissolved gases (ethane, ethene, and propane) from the MEE analyses suite were undetected at all locations sampled. Conversely, methane was found at all three wells (1,150 µg/L at MW0018, 346 µg/L at MW0019, and 657 µg/L at MW0031). MEE and microbial analyses findings in January 2022 are generally consistent with October 2021 results.

4.6.3 April 2022 (Year 3, Quarter 3). The third round of quarterly sampling for the Year 3 HCS operation reporting period occurred on April 18, 2022. Four samples were collected from the deep wells (MW0018, MW0019, MW0031, and MW0032) and analyzed for VOCs. All wells were non-detect for tDCE. VC levels ranged from 0.52 µg/L to 33 µg/L within the deep zone during this sampling event.

Results at MW0018 continue to show a slight VC reduction from 34 µg/L in January 2022 to 33 µg/L during this April 2022 sampling event. Beneath the main building at MW0019, VC levels were detected at 0.52 µg/L. The VC concentrations at MW0031, west of the main building slightly increased to 12 µg/L from 7.8 µg/L in the previous sampling event, but overall, still a reduction from baseline sampling of 680 µg/L. MW0032 showed a slight reduction in VC of 12 µg/L, as compared to the Year 3, Quarter 2 concentration of 14 µg/L at this downgradient location.

During the April 2022 sampling event, groundwater samples were analyzed at three deep performance wells (MW0018, MW0019, and MW0031) for MEE, as summarized in Table 4-5. Microbial parameters were not analyzed during this sampling event. Similar to the October 2021 and January 2022 MEE results, only methane was detected, with concentrations of 800 µg/L, 260 µg/L, and 420 µg/L at MW0018, MW0019, and MW0031, respectively.

4.6.4 July 2022 (Year 3, Quarter 4). The fourth quarterly and second semi-annual sampling event for the Year 3 HCS operation reporting period was conducted on July 21, 2022. Four quarterly samples were collected from the deep wells (MW0018, MW0019, MW0031, and MW0032) and analyzed for VOCs. The three semi-annual wells (MW0002, MW0013, and MW0027) were also sampled for VOCs. tDCE was non-detect in all samples. VC was detected at 2.0 µg/L at two intermediate wells (MW0002 and MW0013); however, the third intermediate well (MW0027) showed no detection. VC concentrations within the deep zone ranged from 1.7 µg/L (MW0019) to 31 µg/L (MW0018).

MW0002, with a VC detection above GCTL at 2.0 µg/L, showed a reduction from Year 3, Quarter 2 sampling of 6.6 µg/L, and a reduction from baseline sampling of 28 µg/L. A VC concentration of 31 µg/L was detected at MW0018, but this location has shown a continuous reduction since its baseline concentration of 140 µg/L. MW0019 showed a VC detection of 1.7 µg/L, slightly above the GCTL, oscillating since July 2020, but has shown an overall reduction from its baseline VC result of 250 µg/L. VC levels have continued to decrease in MW0031, with a reading of 12 µg/L in April 2022, and 4.6 µg/L during the July 2022 sampling event. West of the railroad tracks at deep well, MW0032, VC levels increased slightly from 12 µg/L in April 2022 to 14 µg/L three months later, indicating an oscillating trend at this location since baseline and further substantiating LCP migration to the west.

In July 2022, three of the four quarterly monitoring wells (MW0018, MW0019, and MW0031) were also sampled for MEE and microbial analyses. As shown on Table 4-5, MEE results continued to show methane as the only detected dissolved gas (580 µg/L at MW0018, 520 µg/L at MW0019, and 390 µg/L at MW0031), with concentrations continuing to decrease at MW0018 and MW0031 since October 2021, but slightly increasing at MW0019. Of note, methane results from all three wells in July 2022 were flagged with laboratory qualifier “B”, meaning this compound was also detected in the method blank (laboratory control sample) at a concentration above the MDL but below half the practical quantitation limit (PQL). This indicates methane results could be influenced by potential laboratory contamination or interferences in the analytical system; therefore, results may not be fully associated with the site-specific samples. The only detected microbial was *Dhc* at 18.2 Cells/mL (MW0018), 21.1 Cells/mL (MW0019),

and 9.8 Cells/ml (MW0031). After July 2022, NASA decided to forgo any further MEE or microbial sampling through the remainder of active remediation (see Section 4.7 for further discussion).

4.6.5 October 2022 (Year 3, Quarter 5). The fifth round of quarterly sampling for the Year 3 HCS operation reporting period occurred from October 26 to 28, 2022. Four quarterly samples were collected from the deep wells (MW0018, MW0019, MW0031, and MW0032) and analyzed for VOCs. tDCE was non-detect in all samples. VC was detected at all four wells, ranging from 0.46 µg/L at MW0019 to 26 µg/L at MW0018. At MW0018, VC levels decreased slightly from 31 µg/L in July 2022 to 26 µg/L in October 2022. Note, the VC result at MW0018 had a lab qualifier, M-03, which indicates the laboratory manually selected the peak for analysis due to chromatographic interference and was re-checked via extra samples after holding time. The subsequent analysis showed a level of VC similar to the other, with a concentration of 23 µg/L. This result was given lab qualifier, H, which shows that since an extra sample was analyzed, this sample did not meet the referenced method's holding time.

At MW0031, located approximately 20 feet west of the main CRCA building, VC levels increased slightly from 4.6 µg/L detected three months prior to 5.3 µg/L. At MW0032, the westernmost well, VC concentrations decreased from 14 µg/L in July 2022 to 9.2 µg/L three months later, continuing to represent the downgradient flank of the LCP, connecting with MW0031 to the east and showing separation from MW0018 isolated farther east within the Solvent Reclamation Area.

4.7 HCS PERFORMANCE AND PLUME CONDITIONS EVALUATION

This section evaluates the results of the October 2021 through October 2022 performance monitoring events conducted during Year 3 of HCS operation at CRCA. The intermediate and deep groundwater CVOC plume reshaping within the surficial aquifer at CRCA over time will be discussed, starting with the implementation of the June 2019 baseline sampling, and culminating into the fifth quarter of performance monitoring sampling conducted during the Year 3 HCS operation period, as presented on Table 4-4. Other parameters sampled (MEE and microbial analyses) are also discussed in this section.

VOCs: From baseline to Year 3 performance monitoring, tDCE was detected at one location within the intermediate plume and at three locations within the deep portions of the CVOC plume. All tDCE detections were at concentrations between the MDL and PQL, significantly below its GCTL of 100 µg/L. VC was detected above regulatory limits within both the intermediate and deep zones of the surficial aquifer at CRCA. These results are illustrated on maps depicting the horizontal extent of the VC intermediate plume at 25-40 feet bls (Figure 4-18) and the VC deep plume at 53-63 feet bls (Figure 4-19). The following presents a discussion of these CVOC detections and trends at the intermediate and deep levels from baseline (June 2019) to the Year 3 HCS operation reporting period through October 2022.

Within the intermediate depths at CRCA, tDCE was detected at one location, MW0002, located within the Solvent Reclamation Area, east of the primary building. This parameter was found during the July 2021 (Year 2) performance monitoring event at 0.73 µg/L and during the January 2022 sampling event (Year 3) at 1.1 µg/L. These values, between MDL and PQL, are significantly below the GCTL for tDCE but serve as data points providing information on plume tracking and site characterization. Like the Year 2 HCS operations performance monitoring well data, the intermediate VC plume at the conclusion of Year 3 HCS operations is of LCP levels, with concentrations in exceedance of the GCTL, but significantly below the NADC. After Year 3, the intermediate VC plume continues to become more elongated, with slight GCTL exceedances remaining at MW0002 (30-35 feet bls) located in the Solvent Reclamation Area east of the main building, and MW0013 toward the center of the CRCA primary building, both of which are located in the HCS captures zone. Specifically, at MW0002, a VC concentration of 6.6 µg/L was detected in January 2022, decreasing to 2.0 µg/L in July 2022. This well had the highest VC level detected (28 µg/L) within the intermediate zone during the baseline sampling event in June 2019. Over time, VC has steadily declined in this well to 1.8 µg/L in July 2020, then increased slightly in January 2021 (3.1 µg/L) and oscillating but remaining below 10 µg/L through July 2022. At MW0013, VC concentrations were 1.1 µg/L in January 2022, but increased to 2.0 µg/L in July 2022, slightly above the GCTL for this compound.

The fluctuations in VC concentrations within the intermediate zone further support the idea that EW and IW operations influence plume behavior by altering groundwater flow patterns.

Depressional areas within the surficial aquifer system of CRCA are created by EWs and conversely, IWs induce mounding with re-introduction of treated groundwater. At the end of the third year of HCS operation, the intermediate LCP continues to extend beneath the building, from MW0013 near the center of the primary building and MW0012. At MW0012 (25-30 feet bls), located between the primary building and the Solvent Reclamation Area, a steady decrease of VC concentrations was observed from 2.6 µg/L during baseline to non-detect in January 2021, and remaining non-detect during the July 2021 sampling event of Year 2 (NASA, 2022). MW0012 was not included in the Year 3 sampling plan based on these non-detect results, but provides good spatial data to evaluate plume conditions (see Figure 4-20). Trend analysis graphs for VC in the intermediate wells sampled during Year 3 are shown on Figure 4-21.

The resulting northwest to southeast orientation of the intermediate VC plume is defined by the slight GCTL exceedance to the northwest at MW0013 and to the southeast at MW0002. The elongated nature and low GCTL exceedances of the present intermediate VC plume are in general agreement with the simulated plume predicted under pumping conditions after three years of HCS operation; however, one difference noted is that actual Year 3 plume conditions do not indicate a continued presence of VC west of the CRCA facility. Figure 4-22 shows a comparison of groundwater model predictions (Years 1, 3, and 5), previously presented in the Year 1 Annual PMR (NASA, 2021a), to the actual Year 3 intermediate plume. Of note, the original groundwater model was re-calibrated as part of the Year 2 Annual PMR (NASA, 2022); however, results were similar and therefore the original model was used for comparison purposes.

Within the deep zone of the CRCA surficial aquifer, for the sampling events completed during the Year 3 reporting period (October 2021 to October 2022), no tDCE concentrations were detected in the groundwater. Slight detections of tDCE were identified during baseline within the deep plume (1.91 µg/L at MW0019, 0.97 µg/L at MW0030, and 4.41 µg/L at MW0031), but did not persist during subsequent sampling events.

Since baseline conditions, the deep VC plume has generally decreased in concentration in the vicinity of the Solvent Reclamation Area and the primary building, but increased near MW0032, located in the low-lying area west of Contractors Road and beyond the railroad tracks. Further,

based on the most recent sampling results, the LCP plume appears to separate into an isolated eastern component encompassing MW0018 and an elongated western component stretching from MW0031 to the east, to MW0032 to the west, as shown on Figure 4-19.

At the eastern LCP in the vicinity of MW0018, VC levels went from 140 µg/L during baseline and generally decreased through October 2022 with some oscillation to 23 µg/L. The separation occurred due to the decrease of VC concentrations to below the GCTL at MW0019 (0.46 µg/L) during the October 2022 sampling event. Here, concentrations were 250 µg/L during the June 2019 baseline sampling event, reducing to below the NADC in January 2020 (34 µg/L) and continuing to decrease to below the GCTL in October 2021 (Year 3, Quarter 1) to non-detect in January 2022 (Year 3, Quarter 2), then hovering above the GCTL in July 2022 (at 1.7 µg/L), before finally decreasing to 0.46 µg/L in October 2022.

The upgradient extent of the western LCP starts at MW0031, west of the primary building, persists toward the three EWs, across Contractors Road, and continues past the railroad tracks to MW0032. MW0031 showed VC concentrations exceeding the NADC during baseline and October 2019 events (680 µg/L and 310 µg/L, respectively). These VC concentrations decreased to below the NADC in January 2020 (87 µg/L), then steadily decline to 5.3 µg/L in October 2022, during the fifth quarter of performance monitoring of the Year 3 HCS operation reporting period. Here, the deep plume extends approximately 200 feet westward to MW0032, where VC concentrations have increased from non-detect during baseline, to 17 µg/L in October 2020 (Year 1 of HCS operation), and then remaining above the GCTL after one non-detect event in January 2021. The increase in VC concentrations at this downgradient location may be attributed to the general westward groundwater flow direction from the CRCA property and the location of MW0032 outside the radii of influence of the three EWs to the east. Trend analysis graphs for VC in the deep wells sampled during Year 3 are shown on Figure 4-21.

The resulting shape and separation of the deep VC plume resembles the three-year projection of the groundwater model under pumping conditions, as depicted in the modeling report included in the Year 1 Annual PMR (NASA, 2021a); however, some differences were noted. For example, the model predicted VC exceedances in the area of MW0019; however, this well was less than GCTLs during four of the five Year 3 quarterly sampling events. Figure 4-23 shows a

comparison of groundwater model predictions (Years 1, 3, and 5), previously presented in the Year 1 Annual PMR (NASA, 2021a), to the actual Year 3 deep plume. Of note, the original groundwater model was re-calibrated as part of the Year 2 Annual PMR (NASA, 2022); however, results were generally similar and therefore the original model was used for comparison purposes.

From the June 2019 baseline sampling event to October 2022, the plume has continued to decrease in size and in concentration. Overall, the plume centerline concentrations of tDCE have decreased to non-detect concentrations (going from 4.4 µg/L at MW0031 in June 2019 to non-detect in all Year 3 sampling events) and the plume centerline concentrations of VC has decreased by 97% (with the geomean going from 153 µg/L in June 2019 to 3.99 µg/L in October 2022). The VC mass reductions are summarized in Table 4-6. VC concentration trend analysis graphs are shown on Figure 4-21.

Other Parameters: Dissolved gases were analyzed to evaluate whether conditions are favorable for reductive dechlorination. As shown on Table 4-5, from October 2021 to July 2022, methane concentrations gradually decreased at the deep wells sampled for MEE parameters (MW0018, MW0019, and MW0031). The highest concentration occurred at MW0018, with a peak methane concentration of 1,150 µg/L in January 2022. Concentrations steadily decreased in this well to 580 µg/L in July 2022. No ethane, ethene, or propane were detected during the Year 3 sampling events. The presence of methane in the Year 3 groundwater samples is indicative of anaerobic conditions, which can be favorable for reductive dechlorination; however, the absence of ethene and ethane does not indicate reductive dechlorination is occurring with the low-level VC concentrations remaining in these wells.

Microbial parameters were analyzed to identify if organisms are present that have the ability to complete the reductive dechlorination process. Groundwater samples collected for microbial analysis within the deep zone showed positive *Dhc* concentrations, with the highest found at MW0031 (258 Cells/mL) in October 2021, which subsequently decreased to 9.8 Cells/mL in July 2022. The remaining microbial parameters were undetected at the three deep well locations, screened from 53 to 63 feet bls.

Positive *Dhc* detections can indicate that reductive dechlorination is occurring, facilitating the reduction of hydrogen and chlorine atoms from compounds such as VC, ultimately reducing to inert ethene. However, with *Dhc* levels significantly below 100,000 Cells/mL, coupled with the absence of VC reductase genes, the potential for natural reductive dechlorination within the deep subsurface of CRCA is expected to be minimal. Further, the absence of ethene within the 53-63 feet bls interval may indicate that complete reductive dechlorination is not appreciable at these depths. This accounts for why the MEE and microbial analytes have been removed from the Year 4 performance monitoring plan.

4.8 SUB-SLAB VAPOR MONITORING ANALYTICAL RESULTS

During Year 3 of HCS operations, the four sub-slab vapor monitoring locations were sampled in October 2021, January 2022, April 2022, July 2022, and October 2022. Low levels of tDCE were encountered at all VMP locations during various sampling events, with the highest detection of 18 micrograms per cubic meter ($\mu g/m^3$) occurring in October 2021 at VMP03. At the remaining three locations, tDCE levels detected in October 2021 include 6.0 $\mu g/m^3$ at VMP01, 11 $\mu g/m^3$ at VMP02, and 14 $\mu g/m^3$ at VMP04. In January 2022, the only tDCE detection was 3.3 $\mu g/m^3$ at VMP02. In April 2022, tDCE was detected at all locations except VMP01, with concentrations ranging from 3.37 to 4.16 $\mu g/m^3$. The July 2022 sampling event resulted in four positive tDCE concentrations, ranging from 0.951 to 7.09 $\mu g/m^3$. The October 2022 sampling event resulted in tDCE detections at all four sampling locations, ranging from 1.07 to 7.25 $\mu g/m^3$. VC was not detected at any of the four sub-slab vapor monitoring locations during Year 3.

Analytical results were compared to EPA VISLs for Year 3 HCS operation sub-slab soil gas sampling events. VC, the primary COC in the groundwater plume beneath Building K6-1696, was detected at a concentration of 0.24 $\mu g/m^3$ at one of the sub-slab monitoring locations (VMP03) during the initial year of HCS operation (October 19, 2019) and has not been detected since. CVOC analytical results from sub-slab soil gas sampling are presented in Table 4-7 and summarized on Figure 4-24 (tDCE and VC).

4.9 AIR MONITORING ANALYTICAL RESULTS

During Year 3 quarterly performance monitoring events, air quality samples were taken approximately 50 feet from the outlet of the HCS trailer containing the air stripper and within the paved driveway east of the Solvent Reclamation Area, as shown on Figure 4-24. Air samples were collected over an 8-hour period and analyzed for VOCs via EPA Method TO-15.

Air sample results were compared to Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs). During the third year of HCS operation performance sampling, all ambient air results were significantly below OSHA PELs for the respective parameters tested. For full analytical results of ambient air samples, refer to Table 4-8, and to Figure 4-24 for a summary of the ambient tDCE and VC results presented in concert with the sub-slab soil results.

Table 4-1. Year Three Monitoring Plan

Monitoring Well	Screen Interval	Monitoring Function	October 2021	January 2022	April 2022	July 2022	October 2022
(CRCA-)	(ft bls)		Sample for VOCs via EPA Method 8260D				
MW0002	[30-35]	Monitor east region of the LCP	-	X	-	X	-
MW0013	[25-30]	Monitor beneath building footprint Monitor northern edge of LCP	-	X	-	X	-
MW0018	[53-63]	Monitor treatment performance in HS Monitor LCP	X	X	X	X	X
MW0019	[53-63]	Monitor treatment performance in HS Monitor LCP	X	X	X	X	X
MW0027	[30-40]	Provide coverage in western portion of the site downgradient of the LCP	-	X	-	X	-
MW0031	[53-63]	Central location to extraction wells for performance monitoring	X	X	X	X	X
MW0032	[53-63]	Monitor west region of the LCP	X	X	X	X	X

Notes:

bls = below land surface.

ft = feet.

VOC = volatile organic compound.

EPA = United States Environmental Protection Agency.

LCP = Low concentration plume.

HS = Hot spot.

" X " = Sampling took place.

" -" = Sampling did not take place.

Shading indicates sampling events for microbial analysis

Sampling conducted for MEE (Method RSK-175) analysis at MW0018, MW0019, and MW0031 through July 2022

MEE = methane, ethene, ethane

Table 4-2. CRCA Year Three HCS Operation Groundwater Elevations

Well ID (CRCA-)	TOC	Screened Interval (ft bls)	Oct-21		Jan-22		Apr-22		Jul-22		Oct-22	
			DTW (ft bls)	GW Elevation	DTW (ft bls)	GW Elevation	DTW (ft bls)	GW Elevation	DTW (ft bls)	GW Elevation	DTW (ft bls)	GW Elevation
MW0001	6.11	5-15	3.47	2.64	3.29	2.82	3.93	2.18	3.82	2.29	2.83	3.28
MW0002	6.14	30-35	5.48	0.66	3.28	2.86	3.93	2.21	3.86	2.28	2.81	3.33
MW0003	6.99	5-15	4.40	2.59	4.18	2.81	4.88	2.11	4.77	2.22	3.77	3.22
MW0004	6.30	5-15	3.60	2.70	3.42	2.88	4.04	2.26	3.99	2.31	2.98	3.32
MW0005	6.69	5-15	4.28	2.41	3.99	2.70	4.60	2.09	4.52	2.17	3.86	2.83
MW0005A	6.55	5-10	3.98	2.57	3.70	2.85	4.40	2.15	4.25	2.30	NM	NM
MW0005B	6.69	12-17	4.14	2.55	3.96	2.73	4.58	2.11	4.48	2.21	NM	NM
MW0005C	6.85	2-7	4.23	2.62	3.91	2.94	4.58	2.27	4.20	2.65	NM	NM
MW0006	6.58	5-15	3.95	2.63	3.78	2.80	4.44	2.14	4.30	2.28	3.35	3.23
MW0007	6.54	5-15	3.96	2.58	3.76	2.78	4.40	2.14	4.32	2.22	3.34	3.20
MW0008	7.36	5-15	4.75	2.61	4.56	2.80	5.25	2.11	5.14	2.22	4.15	3.21
MW0009	6.84	5-15	4.09	2.75	3.91	2.93	4.58	2.26	4.98	1.86	3.48	3.36
MW0010	6.66	5-15	4.09	2.57	3.91	2.75	4.50	2.16	4.41	2.25	3.46	3.20
MW0011	7.40	5-10	4.46	2.94	4.21	3.19	4.90	2.50	4.81	2.59	3.85	3.55
MW0012	7.07	25-30	4.47	2.60	4.31	2.76	4.95	2.12	4.87	2.20	3.96	3.11
MW0013	7.46	25-30	5.05	2.41	4.82	2.64	5.53	1.93	5.42	2.04	4.49	2.97
MW0014	6.86	5-10	4.36	2.50	4.18	2.68	4.86	2.00	4.72	2.14	3.78	3.08
MW0015	6.82	25-30	4.45	2.37	4.16	2.66	4.88	1.94	4.73	2.09	3.89	2.93
MW0016	6.18	5-10	3.62	2.56	3.41	2.77	4.06	2.12	3.97	2.21	3.02	3.16
MW0017	6.16	25-30	3.61	2.55	3.45	2.71	4.05	2.11	3.94	2.22	3.31	2.85
MW0018	7.05	53-63	4.41	2.64	4.22	2.83	4.92	2.13	4.81	2.24	3.80	3.25
MW0019	7.13	53-63	4.90	2.23	4.62	2.51	5.34	1.79	5.17	1.96	4.66	2.47
MW0020	7.27	53-63	4.88	2.39	4.70	2.57	5.39	1.88	5.27	2.00	3.80	3.47
MW0021	7.54	30-40	5.06	2.48	4.88	2.66	5.59	1.95	5.47	2.07	4.51	3.03
MW0022	6.44	30-40	3.82	2.62	3.62	2.82	4.27	2.17	4.22	2.22	3.16	3.28
MW0023	6.50	53-63	3.86	2.64	3.66	2.84	4.34	2.16	4.27	2.23	3.24	3.26
MW0024	6.22	53-63	3.62	2.60	3.42	2.80	4.08	2.14	3.95	2.27	3.19	3.03
MW0025	6.91	53-63	4.59	2.32	4.28	2.63	5.05	1.86	4.94	1.97	3.98	2.93
MW0026	4.45	5-15	2.20	2.25	2.02	2.43	2.78	1.67	2.57	1.88	1.62	2.83
MW0027	4.33	30-40	2.15	2.18	1.95	2.38	2.73	1.60	2.52	1.81	1.54	2.79

Table 4-2. CRCA Year Three HCS Operation Groundwater Elevations (continued)

Well ID (CRCA-)	TOC	Screened Interval (ft bls)	Oct-21		Jan-22		Apr-22		Jul-22		Oct-22	
			DTW (ft bls)	GW Elevation	DTW (ft bls)	GW Elevation	DTW (ft bls)	GW Elevation	DTW (ft bls)	GW Elevation	DTW (ft bls)	GW Elevation
MW0028	4.34	53-63	2.19	2.15	1.98	2.36	2.77	1.57	2.55	1.79	1.59	2.75
MW0029	4.79	30-40	2.66	2.13	2.45	2.34	3.23	1.56	3.00	1.79	2.01	2.78
MW0030	4.77	53-63	2.71	2.06	2.53	2.24	3.25	1.52	3.09	1.68	2.07	2.70
MW0031	6.92	53-63	4.74	2.18	4.57	2.35	5.24	1.68	5.05	1.87	4.11	2.81
MW0032	4.70	53-63	2.69	2.01	2.48	2.22	3.39	1.31	3.05	1.65	NM	NM

Notes:

All elevations are in feet above mean sea level (North America Vertical Datum of 1988)

ft bls = feet below land surface

TOC = Top of casing (elevation)

DTW = Depth to water in feet below TOC

NM = Not measured

Monitoring wells MW0005, MW0005A, MW0005B, and MW0005C are aligned along a shared transect running north to south. Representative wells from this group are typically selected for contouring purposes.

The following wells were not measured in October 2022:

MW0005A, MW0005B, MW0005C since data was found to be inconsistent with surrounding area (measurements deferred to MW0005)

MW0032 not measured due to inaccessibility

Table 4-3. Year Three Field Measurements

Well ID (CRCA-)	Sample Date	pH (S.U.)	Temp. (°C)	Cond. (µS/cm)	DO (mg/L)	Turbidity (NTU)	ORP (mV)
MW0002	1/14/2022	6.50	25.10	1,015.2	0.06	7.42	19.5
	7/21/2022	6.08	27.53	1,276.9	0.04	11.94	-25.0
MW0013	1/14/2022	6.34	23.05	1,024.2	0.15	1.02	28.5
	7/21/2022	6.08	23.22	1,215.9	0.10	0.88	-17.5
MW0018	10/7/2021	7.04	28.30	1,170.0	0.15	1.95	-98.5
	1/14/2022	7.00	25.02	1,131.3	0.04	3.73	-45.6
	4/18/2022	6.79	27.09	1,466.6	0.04	0.77	21.3
	7/21/2022	6.64	29.92	1,377.1	0.04	17.51	-68.6
	10/26/2022	7.19	27.20	1,061.0	0.01	1.56	-121.1
MW0019	10/7/2021	6.99	22.80	718.0	0.14	6.80	-90.0
	1/14/2022	7.29	22.40	790.0	0.11	7.75	-123.5
	4/18/2022	6.70	22.92	1,089.2	0.10	6.06	19.6
	7/21/2022	6.56	22.91	972.2	0.14	16.46	-43.8
	10/28/2022	7.11	23.10	788.0	0.06	63.70	-159.0
MW0027	1/14/2022	7.96	23.80	259.0	0.13	6.58	-171.3
	7/21/2022	6.95	26.50	316.5	0.06	6.73	-84.7
MW0031	10/7/2021	6.90	26.40	904.0	0.03	0.67	-85.5
	1/14/2022	7.25	23.50	812.0	0.10	0.78	-102.1
	4/18/2022	6.71	25.90	1,151.8	0.13	5.87	51.3
	7/21/2022	6.46	27.72	1,091.5	0.11	1.44	-33.9
	10/27/2022	7.08	26.10	826.0	0.07	1.34	-103.2
MW0032	10/7/2021	6.86	24.80	2,914.0	0.02	13.20	-84.6
	1/14/2022	6.67	22.55	1,509.8	0.07	28.20	-12.4
	4/18/2022	6.61	24.11	2,137.0	0.04	26.31	58.2
	7/21/2022	6.46	26.90	1,953.9	0.08	15.72	-29.5
	10/28/2022	6.80	24.30	1,168.0	0.24	13.50	-79.2

Notes:

Field measurements displayed are final stabilized measurements collected before sampling.

SC = Specific conductance in microSiemens per centimeter (µS/cm).

DO = Dissolved oxygen in milligrams per liter (mg/L).

ORP = Oxidation/reduction potential in millivolts (mV).

NM = Not measured.

S.U. = Standard Units.

°C = Degree Celsius.

Values have been rounded from the source material field notes as follows: pH, temperature, turbidity and dissolved oxygen are shown to 2 decimals places, while conductivity and ORP is shown to one decimal place.

Table 4-4. Contaminants of Concern Performance Monitoring Analytical Results

Sample Location	Screened Interval (feet bls)	Sample Date	tDCE	VC
MW0002	30-35	6/14/2019	0.73 U	**28**
		1/14/2020	0.73 U	**22**
		7/17/2020	0.73 U	**1.8 I**
		1/19/2021	0.73 U	**3.1**
		7/26/2021	**0.73 I**	**7.4**
		1/14/2022	**1.1 I**	**6.6**
		7/21/2022	0.80 U	**2.0**
MW0003	5-15	06/14/2019	0.73 U	0.71 U
		1/13/2020	0.73 U	0.71 U
		7/17/2020	0.73 U	0.71 U
MW0012	25-30	6/14/2019	0.73 U	**2.6**
		1/13/2020	0.73 U	**1.4 I**
		7/17/2020	0.73 U	**1.7 I**
		1/19/2021	0.73 U	0.71 U
		7/26/2021	0.73 U	0.71 U
MW0013	25-30	6/14/2019	0.73 U	0.71 U
		1/14/2020	0.73 U	**1.4 I**
		7/20/2020	0.73 U	**4.6**
		1/19/2021	0.73 U	**2.1 I**
		7/26/2021	0.73 U	**1.4 I**
		1/14/2022	0.73 U	**1.1 I**
		7/21/2022	0.80 U	**2.0**
MW0015	25-30	6/14/2019	0.73 U	0.71 U
		1/13/2020	0.73 U	**0.77 I**
		7/17/2020	0.73 U	0.71 U
		1/19/2021	0.73 U	0.71 U
		7/26/2021	0.73 U	0.71 U

Table 4-4. Contaminants of Concern Performance Monitoring Analytical Results (continued).

Sample Location	Screened Interval (feet bls)	Sample Date	tDCE	VC
MW0018	53-63	6/17/2019	0.73 U	**140**
		10/15/2019	1.5 U	**130**
		1/14/2020	0.73 U	**100**
		4/9/2020	0.73 U	**84**
		7/22/2020	0.73 U	**110**
		10/15/2020	0.73 U	**81**
		1/19/2021	0.73 U	**97**
		4/14/2021	0.73 U	**63**
		7/26/2021	0.73 U	**55**
		10/7/2021	0.73 U	**42**
		1/14/2022	0.73 U	**34**
		4/18/2022	0.80 U	**33**
		7/21/2022	0.80 U	**31**
		10/26/2022	0.80 U	**26 M-03**
		10/26/2022	0.80 UH	**23 H**
MW0019	53-63	6/17/2019	**1.9 I**	**250**
		10/15/2019	1.5 U	**110**
		1/14/2020	0.73 U	**34**
		4/9/2020	0.73 U	**9.4**
		7/22/2020	0.73 U	**20**
		10/15/2020	0.73 U	**3.3**
		1/19/2021	0.73 U	**2.8**
		4/14/2021	0.73 U	**2.8**
		7/26/2021	0.73 U	**1.4 I**
		10/7/2021	0.73 U	**0.78 I**
		1/14/2022	0.73 U	0.71 U
		4/18/2022	0.80 U	**0.52 I**
		7/21/2022	0.80 U	**1.7**
		10/28/2022	0.80 U	**0.46 J**
MW0020	53-63	6/14/2019	0.73 U	0.71 U
		1/24/2020	0.73 U	0.71 U
		7/16/2020	0.73 U	0.71 U
MW0021	30-40	6/14/2019	0.73 U	0.71 U
		1/13/2020	0.73 U	0.71 U
		7/16/2020	0.73 U	0.71 U
MW0022	30-40	6/14/2019	0.73 U	0.71 U
		1/12/2020	0.73 U	0.71 U
		7/15/2020	0.73 U	0.71 U

Table 4.4 Contaminants of Concern Performance Monitoring Analytical Results (continued).

Sample Location	Screened Interval (feet bls)	Sample Date	tDCE	VC
MW0023	53-63	6/14/2019	0.73 U	0.71 U
		1/13/2020	0.73 U	0.71 U
		7/15/2020	0.73 U	0.71 U
MW0024	53-63	6/14/2019	0.73 U	0.71 U
		1/13/2020	0.73 U	0.71 U
		7/15/2020	0.73 U	0.71 U
MW0025	53-63	6/14/2019	0.73 U	0.71 U
		1/13/2020	0.73 U	0.71 U
		7/16/2020	0.73 U	0.71 U
MW0026	5-15	6/13/2019	0.73 U	0.71 U
		1/13/2020	0.73 U	0.71 U
		7/16/2020	0.73 U	0.71 U
MW0027	30-40	6/13/2019	0.73 U	0.71 U
		1/13/2020	0.73 U	0.71 U
		7/16/2020	0.73 U	0.71 U
		1/19/2021	0.73 U	**7**
		7/26/2021	0.73 U	0.71 U
		1/14/2022	0.73 U	0.71 U
		7/21/2022	0.80 U	0.80 U
MW0028	53-63	6/17/2019	0.73 U	**23**
		10/15/2019	0.73 U	**16**
		1/14/2020	0.73 U	**1.5 I**
		4/9/2020	0.73 U	**0.9 I**
		7/22/2020	0.73 U	**1.2 I**
		1/19/2021	0.73 U	0.71 U
		7/26/2021	0.73 U	0.71 U
MW0029	30-40	6/13/2019	0.73 U	0.71 U
		1/13/2020	0.73 U	0.71 U
		7/15/2020	0.73 U	0.71 U
		1/19/2021	0.73 U	0.71 U
		7/26/2021	0.73 U	0.71 U
MW0030	53-63	6/13/2019	**0.97 I**	**90**
		1/13/2020	0.73 U	**0.87 I**
		7/15/2020	0.73 U	0.71 U
		1/19/2021	0.73 U	0.71 U
		7/26/2021	0.73 U	0.71 U

Table 4.4 Contaminants of Concern Performance Monitoring Analytical Results (continued).

Sample Location	Screened Interval (feet bls)	Sample Date	tDCE	VC
MW0031	53-63	6/17/2019	**4.4 I**	**680**
		10/15/2019	3.6 U	**310**
		1/14/2020	0.73 U	**87**
		4/9/2020	0.73 U	**62**
		7/16/2020	0.73 U	**71**
		10/15/2020	0.73 U	**28**
		1/19/2021	0.73 U	**29**
		4/14/2021	0.73 U	**13**
		7/26/2021	0.73 U	**18**
		10/7/2021	0.73 U	**13**
		1/14/2022	0.73 U	**7.8**
		4/18/2022	0.80 U	**12**
		7/21/2022	0.80 U	**4.6**
		10/27/2022	0.80 U	**5.3**
MW0032	53-63	6/13/2019	0.73 U	0.71 U
		1/14/2020	0.73 U	**9.2**
		7/20/2020	0.73 U	**8.9**
		10/15/2020	0.73 U	**17**
		1/19/2021	0.73 U	0.71 U
		4/14/2021	0.73 U	**6**
		7/26/2021	0.73 U	**11**
		10/7/2021	0.73 U	**8.7**
		1/14/2022	0.73 U	**14**
		4/18/2022	0.80 U	**12**
		7/21/2022	0.80 U	**14**
		10/28/2022	0.80 U	**9.2**

Notes:

tDCE = trans-1,2-dichloroethene.

J = Estimated value.

VC = vinyl chloride.

U = Value was reported as below the method detection limit, therefore the detection limit is shown.

H = Out of holding time; extra vials with analytical method 8260D were prepared and sent to the lab with initial vials.

I = Value is between method detection limit and practical quantitation limit.

Bolding indicates a concentration is greater than the method detection limit.

Shading indicates State of Florida Groundwater Cleanup Target Level (GCTL) exceedance, tDCE = 100 µg/L, VC = 1 µg/L.

M-03 = Incorrect auto integration.

Table 4-5 Miscellaneous Parameter Performance Monitoring Analytical Results

Monitoring Well Screened Interval in feet bls	MW0018 (53-63)			
Sample Date	Oct-21	Jan-22	Apr-22	Jul-22
Dissolved Gases (µg/L)				
ETHANE	25.5 U	51 U	5.0 U	5.0 U
ETHENE	25.5 U	51 U	**2.6 I**	5.0 U
METHANE	**1140**	**1150**	**800**	**580 B**
PROPANE	--	--	7.5 U	7.5 U
Microbiological (Cells/mL)				
BAV1 VC R-DASE	0.50 <	0.50 <	--	0.50 <
DEHALOCOCCOIDES	**130**	**134**	--	**18.2**
TCE A REDUCTASE*	0.50 <	0.50 <	--	0.50 <
VINYL CHLORIDE REDUCTASE GENE	0.50 <	0.50 <	--	0.50 <
Monitoring Well Screened Interval in feet bls	MW0019 (53-63)			
Sample Date	Oct-21	Jan-22	Apr-22	Jul-22
Dissolved Gases (µg/L)				
ETHANE	5.1 U	5.1 U	5.0 U	5.0 U
ETHENE	5.1 U	5.1 U	5.0 U	5.0 U
METHANE	**425**	**346**	**260**	**520 B**
PROPANE	--	--	7.5 U	7.5 U
Microbiological (Cells/mL)				
BAV1 VC R-DASE	0.50 <	0.50 <	--	0.50 <
DEHALOCOCCOIDES	**108**	**168**	--	**21.1**
TCE A REDUCTASE*	0.50 <	0.50 <	--	0.50 <
VINYL CHLORIDE REDUCTASE GENE	0.50 <	0.50 <	--	0.50 <
Monitoring Well Screened Interval in feet bls	MW0031 (53-63)			
Sample Date	Oct-21	Jan-22	Apr-22	Jul-22
Dissolved Gases (µg/L)				
ETHANE	5.1 U	5.1 U	5.0 U	5.0 U
ETHENE	5.1 U	5.1 U	5.0 U	5.0 U
METHANE	**647**	**657**	**420**	**390 B**
PROPANE	--	--	7.5 U	15 U
Microbiological (Cells/mL)				
BAV1 VC R-DASE	0.50 <	0.50 <	--	0.50 <
DEHALOCOCCOIDES	**258**	**253**	--	**9.8**
TCE A REDUCTASE*	0.50 <	0.50 <	--	0.50 <
VINYL CHLORIDE REDUCTASE GENE	0.50 <	0.50 <	--	0.50 <

Notes:

U = Value was reported as below the method detection limit

B= Detected in the method blank.

I =Value is between method detection limit and practical quantitation limit.

< = The target gene was not detected at the limit of quantitation

Bolding indicates a concentration is greater than the method detection limit

* Not a contaminant of concern at CRCA, but part of the Microbial Insights laboratory analytical suite

"--"= Analysis was not collected.

Table 4-6. Vinyl Chloride Mass Reduction

Monitoring Well (CRCA-)	Baseline	Operation											
	June-19	October-19		January-20		April-20		July-20		October-20		January-21	
	VC (µg/L)	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction
Plume Centerline Wells													
MW0018	**140**	**130**	7.14%	**100**	28.57%	**84**	40.00%	**110**	21.43%	**81**	42.14%	**97**	30.71%
MW0019	**250**	**110**	56.00%	**34**	86.40%	**9.4**	96.24%	**20**	92.00%	**3.3**	98.68%	**2.8**	98.88%
MW0028	**23**	**16**	16.00%	**1.5 I**	93.48%	**0.9 I**	96.09%	**1.2 I**	94.78%	**-**	-	0.71 U	100%
MW0031	**680**	**310**	54.41%	**87**	87.21%	**62**	90.88%	**71**	89.56%	**28**	96%	**29**	96%
Plume Centerline Well Geo Mean	152.96	91.77	40.00%	25.81	83.13%	14.49	90.53%	20.81	86.40%	19.56	87.21%	8.65	94.35%
Plume Centerline Well Mass (lbs)*	4.79	2.88		0.81		0.45		0.65		0.61		0.27	
Sorbed Mass (lbs)	7.07E-05	4.24E-05		1.19E-05		6.69E-06		9.61E-06		9.04E-06		4.00E-06	
Plume Centerline Well Mass Removal (lbs)*		1.92		3.98		4.34		4.14		4.18		4.52	

Table 4-6. Vinyl Chloride Mass Reduction (continued)

Monitoring Well (CRCA-)	Operation													
	April-21		July-21		October-21		January-22		April-22		July-22		October-22	
	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction	VC (µg/L)	VC Reduction
Plume Centerline Wells														
MW0018	**63**	55.00%	**55**	60.71%	**42**	70.00%	**34**	75.71%	**33**	76.43%	**31**	77.86%	**26 +**	81.43%
MW0019	**2.8**	98.88%	**1.4 I**	99.44%	**0.78 I**	99.69%	0.71 U	100.00%	**0.52 I**	99.79%	**1.7**	99.32%	**0.46 J**	99.82%
MW0028	**-**	-	0.71 U	100%	**-**	-	-	-	**-**	-	-	-	-	-
MW0031	**13**	98%	**18**	97%	**13**	98%	**7.8**	99%	**12**	98%	**4.6**	99%	**5.3**	99%
Plume Centerline Well Geo Mean	13.19	91.38%	5.60	96.34%	7.52	95.08%	5.73	96.25%	5.91	96.14%	6.24	95.92%	3.99	97.39%
Plume Centerline Well Mass (lbs)*	0.41		0.18		0.24		0.18		0.19		0.20		0.12	
Sorbed Mass (lbs)	6.09E-06		2.59E-06		3.48E-06		2.65E-06		2.73E-06		2.88E-06		1.84E-06	
Plume Centerline Well Mas	4.38		4.62		4.56		4.61		4.61		4.60		4.67	

Notes:
VC = vinyl chloride.
lbs = pounds.
µg/L = micrograms per liter.
U= Value was reported as below the method detection limit, therefore the detection limit is shown.
J= Estimated value.
I = Value is between method detection limit and practical quantitation limit.
Shading indicates the State of Florida Groundwater Cleanup Target Level (GCTL) exceedance, VC = 1 µg/L.
* = rounded to the nearest hundredth of a pound
Bolding indicates a concentration is greater than the method detection limit.
+ = VC value of 26 ug/L at MW0018 from initial lab run in October 2022, and used as conservative measure for mass reduction.
- = No data from this sampling event.

Table 4-7. Sub-Slab Soil Gas Analytical Results

Analyte[1]	USEPA VISL (Commercial) in µg/m³	Sampling Location (CRCA-)													
		VMP01													
		2/1/2019	10/2/2019	1/15/2020	4/9/2020	7/17/2020	10/15/2020	1/20/2021	4/14/2021	7/26/2021	10/21/2021	1/14/2022	4/25/2022	7/22/2022	10/27/2022
1,2,4-Trichlorobenzene	290	2.6 U	1.5 U	12 U	NA	NA	NA	NA	NA	NA	NA	NA	2.29 U	2.29 U	2.29 U
1,2,4-Trimethylbenzene	8,800	0.64 U	**9.8**	1.4 U	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
1,3,5-Trimethylbenzene	8,800	0.64 U	**2.6**	1.1 U	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
1,3-Dichlorobenzene	37.2	0.52 U	**0.66 I**	3.8 U	4.2 U	5.5 U	0.38 U	0.38 U	0.36 U	0.41 U	2.4 U	2.3 U	2.40 U	**1.99 J**	**7.76**
1,4-Dichlorobenzene	NC	0.42 U	**0.23 I**	0.5 U	1.7 U	6.0 U	0.42 U	0.42 U	0.42 U	0.46 U	2.6 U	2.6 U	0.782 U	0.782 U	0.782 U
2-Butanone	730,000	**27**	**47**	22 U	NA	NA	NA	NA	NA	NA	NA	NA	0.560 U	**1.32 J**	0.734 U
2-Propanol	29,200	0.64 U	1.0 U	**18 I**	NA	NA	NA	NA	NA	NA	NA	NA	1.54 U	1.54 U	**51.6**
4-Ethyltoluene	NC	0.59 U	**8.8**	1.7 U	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
Acetone	4,510,000	**105**	**150**	42 U	46 U	**25**	**8.4**	**5.9**	**11**	**7.8**	**11**	**7.9 I**	2.85 U	**8.55**	**8.44**
2H,3H-Decafluoropentane	131,400	**76,200**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	52	0.15 U	**8.5**	**2.8 I**	NA	NA	NA	NA	NA	NA	NA	NA	**0.648 J**	**0.431 J**	0.479 U
Carbon Disulfide	10,200	0.29 U	**0.97 I**	3.5 U	NA	NA	NA	NA	NA	NA	NA	NA	0.778 U	**0.430 J**	0.778 U
Chloroform	18	0.39 U	**1.8**	**1.7 I**	1.9 U	6.0 U	0.51 U	0.51 U	0.49 U	0.56 U	2.6 U	2.5 U	**1.82**	0.730 U	**2.78**
Chloromethane	1,310	0.13 U	0.16 U	1.3 U	1.4 U	3.2 U	0.64 U	0.64 U	0.62 U	0.71 U	1.4 U	1.4 U	0.516 U	0.516 U	0.516 U
Dichlorodifluoromethane	14,600	0.33 U	0.30 U	**3.0 I**	2.4 U	8.8 U	0.74 U	0.74 U	0.72 U	0.81 U	3.8 U	3.7 U	1.48 U	1.48 U	1.28 U
Ethanol	NC	1.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.19 U	**4.03 B**	**29.4**
Ethylbenzene	54,400,000	**1.8 I**	**49**	**6.5**	NA	NA	NA	NA	NA	NA	NA	NA	0.867 U	0.867 U	0.867 U
Freon 113	730,000	**24**	**26**	**14**	**54**	**64**	**6.7**	**3.9**	**3.6**	**4.7**	**60**	**31**	1.53 U	**22.8**	**15.0**
N-Heptane	58,400	**9.4**	**4.5**	**12**	NA	NA	NA	NA	NA	NA	NA	NA	1.02 U	**1.48 J**	1.02 U
Hexachlorobutadiene	18.6	1.9 U	**0.93 I**	5.6 U	6.2 U	13 U	0.5 U	0.5 U	0.48 U	0.55 U	5.5 U	5.4 U	2.67 U	2.67 U	2.67 U
Hexane	102,000	**2.0 I**	1.7 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.76 U	1.76 U	1.76 U
Methylene Chloride	40,900	0.20 U	1.6 U	12 U	13 U	**2.4 I**	**1.2 I**	**0.75 I**	0.26 U	0.3 U	**1.1 I**	**1.0 I**	0.694 U	0.694 U	0.642 U
Propene	48,300	0.11 U	**2.2**	**3.4 I**	**4.1 I**	3.1 U	0.74 U	0.74 U	0.72 U	0.81 U	1.3 U	1.3 U	1.08 U	1.08 U	1.08 U
Styrene	14,600	0.32 U	**0.53**	1.6 U	NA	NA	NA	NA	NA	NA	NA	NA	0.851 U	0.851 U	0.851 U
Tertiary Butyl Alcohol	102,000	**1.9 I**	**2.2**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethylene	584	0.81 U	0.38 U	2.9 U	3.2 U	6.8 U	0.42 U	0.42 U	0.4 U	0.46 U	2.9 U	2.9 U	**1.24 J**	1.36 U	1.36 U
Tetrahydrofuran	292,000	**139**	**160**	**4.9**	NA	NA	NA	NA	NA	NA	NA	NA	0.442 U	0.442 U	0.442 U
Toluene	730,000	0.22 U	**31**	1.6 U	NA	NA	NA	NA	NA	NA	NA	NA	**0.335 J**	0.942 U	**0.746 J**
TLPH	NC	NA	**1,800**	11000 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	102,000	**95.2**	**1.1**	**2.6 I**	1.1 U	**5.5 I**	**4.2**	0.43 U	**0.69 I**	**0.5 U**	**6.0 I**	1.7 U	0.594 U	**0.951 J**	**1.07 J**
Trichloroethene	100	**0.86**	**55**	1.7 U	1.8 U	6.1 U	0.47 U	0.47 U	0.46 U	0.52 U	2.6 U	2.6 U	0.804 U	**17.1**	0.804 U
Trichlorofluoromethane	NC	0.62 U	0.27 U	2.1 U	2.3 U	6.2 U	0.46 U	0.46 U	0.44 U	0.5 U	2.7 U	2.6 U	0.983 U	**2.25**	**2.71**
Total Xylenes	14,600	**9.6**	**260**	4.8 U	NA	NA	NA	NA	NA	NA	NA	NA	**0.975 J**	**1.443 J**	**0.585 J**
Vinyl Acetate	29,200	0.49 U	0.14 U	1.0 U	NA	NA	NA	NA	NA	NA	NA	NA	0.880 U	0.880 U	0.880 U
Vinyl Chloride	93	0.23 U	0.18 U	1.4 U	1.5 U	4.6 U	0.75 U	0.75 U	0.73 U	0.83 U	2.0 U	2.0 U	0.511 U	0.511 U	0.511 U

Table 4-7. Sub-Slab Soil Gas Analytical Results (Continued)

Analyte[1]	USEPA VISL (Commercial) in µg/m³	Sampling Location (CRCA-)													
		VMP02													
		2/1/2019	10/2/2019	1/15/2020	4/9/2020	7/17/2020	10/15/2020	1/20/2021	4/14/2021	7/26/2021	10/21/2021	1/14/2022	4/25/2022	7/22/2022	10/27/2022
1,2,4-Trichlorobenzene	290	2.6 U	3.6 U	2.9 U	NA	NA	NA	NA	NA	NA	NA	NA	2.29 U	2.29 U	2.29 U
1,2,4-Trimethylbenzene	8,800	0.64 U	**7.1**	**0.79 I**	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
1,3,5-Trimethylbenzene	8,800	0.64 U	**2.1**	**0.32 I**	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
1,3-Dichlorobenzene	37.2	0.52 U	1.2 U	0.93 U	4.6 U	18 U	3.2 U	0.76 U	0.38 U	0.4 U	2.3 U	2.4 U	2.40 U	2.40 U	**4.60 J**
1,4-Dichlorobenzene	NC	0.42 U	0.46 U	0.37 U	1.8 U	20 U	3.5 U	0.84 U	0.42 U	0.45 U	2.6 U	2.6 U	0.782 U	0.782 U	**2.78**
2-Butanone	730,000	**18**	**62**	**7.4 I**	NA	NA	NA	NA	NA	NA	NA	NA	**1.68 J**	**0.888 J**	**1.85 J**
2-Propanol	29,200	**136**	2.4 U	160	NA	NA	NA	NA	NA	NA	NA	NA	1.54 U	1.54 U	**73.3**
4-Ethyltoluene	NC	0.59 U	**6.9**	**0.59 I**	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
Acetone	4,510,000	**80.3**	**210**	**13 I**	51 U	**11 I**	**7 I**	**3.5 I**	**4**	**4.3**	**6.6 I**	**3.6 I**	2.85 U	**6.18**	**11.4**
2H,3H-Decafluoropentane	131,400	**450**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	52	0.15 U	**3.3**	**1.6**	NA	NA	NA	NA	NA	NA	NA	NA	0.479 U	**0.326 J**	0.479 U
Carbon Disulfide	10,200	0.29 U	1.1 U	**1.8 I**	NA	NA	NA	NA	NA	NA	NA	NA	0.778 U	0.778 U	0.778 U
Chloroform	18	0.39 U	**1.5 I**	**0.93**	1.7 U	20 U	4.3 U	1 U	0.51 U	0.55 U	2.5 U	2.6 U	**0.808 J**	0.730 U	**0.823 J**
Chloromethane	1,310	0.13 U	0.38 U	**0.31 I**	1.5 U	10 U	5.5 U	1.3 U	0.65 U	0.69 U	1.4 U	1.4 U	0.516 U	0.516 U	0.516 U
Dichlorodifluoromethane	14,600	**3.0**	0.71 U	0.57 U	2.8 U	29 U	6.3 U	1.5 U	0.74 U	0.79 U	3.7 U	3.8 U	**1.43 J**	1.48 U	1.28 U
Ethanol	NC	**8.1**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.19 U	**2.07 BJ**	1.19 U
Ethylbenzene	54,400,000	**6.5**	**52**	0.39 U	NA	NA	NA	NA	NA	NA	NA	NA	0.867 U	0.867 U	0.867 U
Freon 113	730,000	**14**	**6.8**	**78**	**67**	**690**	**440**	**120**	**72**	**44**	**240**	**120**	**78.2**	**43.9**	**27.7**
N-Heptane	58,400	**12**	**5.7**	0.49 U	NA	NA	NA	NA	NA	NA	NA	NA	1.02 U	**1.60 J**	1.02 U
Hexachlorobutadiene	18.6	1.9 U	**1.9 I**	1.4 U	6.8 U	**42**	4.2 U	1 U	0.5 U	0.53 U	5.4 U	5.5 U	2.67 U	2.67 U	2.67 U
Hexane	102,000	**1.3**	**4.5 I**	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.76 U	1.76 U	1.76 U
Methylene Chloride	40,900	0.20 U	3.6 U	2.9 U	14 U	**7.6 I**	**2.7 1**	**0.97 I**	**0.76 I**	0.29 U	**1.1 I**	**1.0 I**	0.694 U	0.694 U	**0.670 J**
Propene	48,300	0.11 U	0.35 U	**1.1 I**	**1.9**	**10**	6.3 U	1.5 U	0.74 U	0.79 U	1.3 U	1.3 U	1.08 U	1.08 U	1.08 U
Styrene	14,600	0.32 U	0.47 U	**0.92 I**	NA	NA	NA	NA	NA	NA	NA	NA	0.851 U	0.851 U	0.851 U
Tertiary Butyl Alcohol	102,000	0.17 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethylene	584	**2.7**	0.90 U	0.72 U	3.6 U	**22**	3.5 U	0.84 U	0.42 U	0.45 U	2.9 U	2.9 U	1.36 U	1.36 U	**1.81 J**
Tetrahydrofuran	292,000	**91.4**	**230**	**4.7**	NA	NA	NA	NA	NA	NA	NA	NA	0.442 U	0.442 U	0.442 U
Toluene	730,000	**1.5 I**	**38**	**1.0 I**	NA	NA	NA	NA	NA	NA	NA	NA	0.942 U	0.942 U	**0.881 J**
TLPH	NC	NA	3200 U	2600 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	102,000	0.11 U	**3.9**	**24**	**3.2 I**	**15**	**8.8 I**	**5.5 I**	**1.8 I**	**6.2**	**11 I**	**3.3 I**	**3.54**	**7.09**	**7.25**
Trichloroethene	100	0.41 U	**76**	0.41 U	2.0 U	**20**	4 U	0.94 U	0.47 U	0.5 U	2.6 U	2.6 U	0.804 U	**19.4**	0.804 U
Trichlorofluoromethane	NC	0.62 U	**0.93 I**	**0.95 I**	2.5 U	**20**	3.9 U	0.92 U	0.46 U	0.49 U	2.6 U	2.7 U	**0.938 J**	**0.776 J**	**0.747 J**
Total Xylenes	14,600	**41**	**270**	**1.9**	NA	NA	NA	NA	NA	NA	NA	NA	**0.889 J**	**1.475 J**	**0.637 J**
Vinyl Acetate	29,200	0.49 U	0.32 U	0.26 U	NA	NA	NA	NA	NA	NA	NA	NA	0.880 U	0.880 U	0.880 U
Vinyl Chloride	93	0.23 U	0.43 U	0.34 U	1.7 U	**15**	6.4 U	**1.5** U	0.76 U	0.81 U	2.0 U	2.0 U	0.511 U	0.511 U	0.511 U

Table 4-7. Sub-Slab Soil Gas Analytical Results (Continued)

Analyte[1]	USEPA VISL (Commercial) in µg/m³	Sampling Location (CRCA-)													
		VMP03													
		2/1/2019	10/2/2019	1/15/2020	4/9/2020	7/17/2020	10/15/2020	1/20/2021	4/14/2021	7/26/2021	10/21/2021	1/14/2022	4/25/2022	7/22/2022	10/27/2022
1,2,4-Trichlorobenzene	290	2.6 U	**11**	14 U	NA	NA	NA	NA	NA	NA	NA	NA	2.29 U	2.29 U	2.29 U
1,2,4-Trimethylbenzene	8,800	0.64 U	**6.9**	**2.0 U**	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
1,3,5-Trimethylbenzene	8,800	0.64 U	**1.9**	1.4 U	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
1,3-Dichlorobenzene	37.2	0.52 U	0.50 U	4.6 U	5.2 U	8.8 U	9.7 U	0.45 U	0.36 U	0.41 U	2.1 U	2.5 U	2.40 U	2.40 U	**2.09 J**
1,4-Dichlorobenzene	NC	0.42 U	0.20 U	1.8 U	2.1 U	9.8 U	11 U	0.49 U	0.4 U	0.45 U	2.4 U	2.7 U	0.782 U	**0.542 J**	0.782 U
2-Butanone	730,000	**22**	**45**	27 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	**1.89 J**	0.982 U
2-Propanol	29,200	**39.6**	**22**	**1,200**	NA	NA	NA	NA	NA	NA	NA	NA	2.85 U	**622**	**460**
4-Ethyltoluene	NC	0.59 U	**6.4**	2.0 U	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
Acetone	4,510,000	**46.3**	**150**	51 U	58 U	**7.2 I**	**12 I**	**4.1**	**8.3**	**5.4**	**13**	**18**	0.479 U	2.85 U	**13.4**
2H,3H-Decafluoropentane	131,400	8.2 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	52	15 U	1.1	2.3 I	NA	NA	NA	NA	NA	NA	NA	NA	0.228 U	0.479 U	**0.232 J**
Carbon Disulfide	10,200	0.29 U	**0.61 U**	4.2 U	NA	NA	NA	NA	NA	NA	NA	NA	0.778 U	0.778 U	0.778 U
Chloroform	18	0.39 U	**9.7**	**4.6 I**	6.0	9.7 U	11 U	**1.9 I**	**2.4 I**	**2.5 I**	**5.4 I**	**5.5 I**	**18.2**	**18.1**	**8.52**
Chloromethane	1,310	0.13 U	0.16 U	1.5 U	1.7 U	5.2 U	5.7 U	0.76 U	0.62 U	0.7 U	1.3 U	1.5 U	0.516 U	0.516 U	0.516 U
Dichlorodifluoromethane	14,600	0.33 U	0.30 U	2.6 U	3.2 U	14 U	16 U	0.87 U	0.72 U	0.8 U	3.5 U	4.0 U	1.48 U	**1.51 J**	**2.40 J**
Ethanol	NC	1.6 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.19 U	**12.7**	1.19 U
Ethylbenzene	54,400,000	**2.1 I**	**43**	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	0.867 U	0.867 U	0.867 U
Freon 113	730,000	**71**	**94**	**87**	**18**	**1,100**	**270**	**8.1**	**2.7 I**	**5**	**27**	**45**	1.53 U	**11.0**	**18.9**
N-Heptane	58,400	**7.8**	**5.0**	2.4 U	NA	NA	NA	NA	NA	NA	NA	NA	1.02 U	**1.42 J**	1.02 U
Hexachlorobutadiene	18.6	1.9 U	**0.89 I**	6.8 U	7.8 U	21 U	23 U	0.59 U	0.48 U	0.54 U	5.0 U	5.8 U	2.67 U	2.67 U	2.67 U
Hexane	102,000	0.15 U	**1.7 I**	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.76 U	**0.924 J**	1.76 U
Methylene Chloride	40,900	0.20 U	1.6 U	14 U	17 U	**3.7 I**	**4.3 I**	**1.1 I**	0.26 U	0.29 U	**2.8 I**	1.0 U	0.694 U	0.694 U	**0.608 J**
Propene	48,300	0.11 U	0.15 U	**3.3 I**	**3.3 I**	5.0 U	5.5 U	0.87 U	0.72 U	0.8 U	1.2 U	1.4 U	1.08 U	1.08 U	1.08 U
Styrene	14,600	0.32 U	**0.42 I**	1.9 U	NA	NA	NA	NA	NA	NA	NA	NA	0.581 U	0.851 U	0.851 U
Tertiary Butyl Alcohol	102,000	0.17 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethylene	584	0.81 U	0.39 U	3.6 U	4.1 U	**11**	12 U	0.49 U	0.4 U	0.45 U	2.7 U	3.1 U	1.36 U	1.36 U	1.36 U
Tetrahydrofuran	292,000	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.216 U	0.885 U	0.442 U
Toluene	730,000	0.22 U	**30**	**8.5**	NA	NA	NA	NA	NA	NA	NA	NA	0.942 U	0.942 U	**0.727 J**
TLPH	NC	NA	**1,700**	13000 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	102,000	0.11 U	0.38 I	**4.3 I**	**3.1 I**	6.6 U	7.3 U	0.51 U	**0.52 I**	0.47 U	**18**	1.9 U	**3.37**	**2.01**	**2.66**
Trichloroethene	100	0.41 U	**56**	2.0 U	2.3 U	9.8 U	11 U	0.56 U	0.46 U	0.51 U	2.4 U	2.8 U	0.804 U	**13.7**	0.804 U
Trichlorofluoromethane	NC	0.62 U	**1.3**	2.5 U	2.8 U	10 U	12 U	0.54 U	0.44 U	0.5 U	2.4 U	2.8 U	0.983 U	**1.17 J**	**1.23 J**
Total Xylenes	14,600	**11**	**220**	5.8 U	NA	NA	NA	NA	NA	NA	NA	NA	**0.819 J**	**1.34 J**	1.30 U
Vinyl Acetate	29,200	0.49 U	0.14 U	1.3 U	NA	NA	NA	NA	NA	NA	NA	NA	0.880 U	0.880 U	0.880 U
Vinyl Chloride	93	0.23 U	**0.24 I**	1.7 U	1.9 U	7.5 U	8.2 U	0.89 U	0.73 U	0.82 U	1.8 U	2.1 U	0.511 U	0.511 U	0.511 U

Table 4-7. Sub-Slab Soil Gas Analytical Results (Continued)

Analyte[1]	USEPA VISL (Commercial) in µg/m³	Sampling Location (CRCA-)													
		VMP04													
		2/1/2019	10/2/2019	1/15/2020	4/9/2020	7/17/2020	10/15/2020	1/20/2021	4/14/2021	7/26/2021	10/21/2021	1/14/2022	4/25/2022	7/22/2022	10/27/2022
1,2,4-Trichlorobenzene	290	2.6 U	3.8 U	6.8 U	NA	NA	NA	NA	NA	NA	NA	NA	2.29 U	2.29 U	2.29 U
1,2,4-Trimethylbenzene	8,800	0.64 U	**3.3**	**0.97 I**	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
1,3,5-Trimethylbenzene	8,800	0.64 U	**1.0 I**	0.64 U	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
1,3-Dichlorobenzene	37.2	0.52 U	1.2 U	2.2 U	3.8 U	19 U	1.6 U	0.78 U	0.36 U	0.41 U	2.4 U	2.5 U	2.40 U	2.40 U	**1.21 J**
1,4-Dichlorobenzene	NC	0.42 U	0.49 U	0.87 U	1. 5U	21 U	1.8 U	0.87 U	0.4 U	0.46 U	2.7 U	2.8 U	0.782 U	0.782 U	0.782 U
2-Butanone	730,000	**24**	**45**	13 U	NA	NA	NA	NA	NA	NA	NA	NA	**1.80 J**	**1.75 J**	**2.80 J**
2-Propanol	29,200	**40.8**	**960**	**14 I**	NA	NA	NA	NA	NA	NA	NA	NA	1.54 U	**347**	**388**
4-Ethyltoluene	NC	0.59 U	**2.9**	0.97 U	NA	NA	NA	NA	NA	NA	NA	NA	0.982 U	0.982 U	0.982 U
Acetone	4,510,000	**31.4**	**190**	24 U	42 U	**42 I**	**15**	**31**	**18**	**42**	**13**	**8.8**	2.85 U	2.85 U	**16.3**
2H,3H-Decafluoropentane	131,400	**2.0**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Benzene	52	**2.0 I**	**2.4**	**1.9 I**	NA	NA	NA	NA	NA	NA	NA	NA	**0.840 J**	**0.247 J**	0.479 U
Carbon Disulfide	10,200	0.29 U	1.1 U	2.0 U	NA	NA	NA	NA	NA	NA	NA	NA	0.778 U	0.778 U	0.778 U
Chloroform	18	**12**	**6.3**	**17**	16	21 U	2.2 U	1.1 U	**1.4 I**	0.56 U	**13 I**	**6.5 I**	**9.44**	**11.6**	**13.3**
Chloromethane	1,310	0.13 U	0.4 U	0.72 U	1.2 U	11 U	2.8 U	1.3 U	0.62 U	0.71 U	1.4 U	1.5 U	0.516 U	0.516 U	0.516 U
Dichlorodifluoromethane	14,600	0.33 U	0.75 U	1.2 U	2.3 U	30 U	3.2	1.5 U	0.71 U	0.81 U	3.9 U	4.0 U	**1.64 J**	**1.18 J**	**1.81 J**
Ethanol	NC	**11**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.19 U	**33.0**	1.19 U
Freon 113	730,000	**78.2**	**56**	**63**	**54**	**980**	**130**	**34**	**21**	**350**	**350**	**130**	**117**	**41.0**	**210**
N-Heptane	58,400	**20**	**4.8**	1.2 U	NA	NA	NA	NA	NA	NA	NA	NA	**0.442 J**	**1.10 J**	**0.691 J**
Ethylbenzene	54,400,000	**13**	**22**	0.91 U	NA	NA	NA	NA	NA	NA	NA	NA	0.867 U	0.867 U	0.867 U
Hexachlorobutadiene	18.6	1.9 U	**1.8 I**	3.2 U	5.6 U	44 U	2.2 U	1 U	0.48 U	0.54 U	5.6 U	5.8 U	2.67 U	2.67 U	2.67 U
Hexane	102,000	**4.9**	**4.6 I**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	1.76 U	NA
Methylene Chloride	40,900	**2.9**	3.9 U	6.9 U	12 U	7.7 U	**1.8 I**	**1.1 I**	0.26 U	**1.3 I**	**2.5 I**	**2.1 I**	0.694 U	0.694 U	**0.688 J**
Propene	48,300	0.11 U	**3.7**	**4.6**	**4.7 I**	11 U	3.2 U	1.5 U	0.71 U	0.81 U	1.4 U	1.4 U	1.08 U	1.08 U	1.08 U
Styrene	14,600	0.32 U	0.50 U	0.89 U	NA	NA	NA	NA	NA	NA	NA	NA	0.851 U	0.581 U	0.851 U
Tertiary Butyl Alcohol	102,000	0.17 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NS	NA
Tetrachloroethylene	584	0.81 U	0.95 U	1.7 U	2.9 U	23 U	1.8 U	0.87 U	0.4 U	0.46 U	3.0 U	3.1 U	1.36 U	1.36 U	1.36 U
Tetrahydrofuran	292,000	**104**	**150**	**4.4**	NA	NA	NA	NA	NA	NA	NA	NA	**1.06**	0.442 U	0.442 U
Toluene	730,000	**2.7 I**	**22**	**1.5 I**	NA	NA	NA	NA	NA	NA	NA	NA	0.942 U	0.942 U	**1.22 J**
TLPH	NC	**2.7**	3400 U	6100 U	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
trans-1,2-Dichloroethene	102,000	0.11 U	**3.9**	**2.4 I**	0.99 U	14 U	**4.5 I**	0.9 U	**1 I**	**0.56 I**	**14**	1.9 U	**4.16**	**1.30**	**2.27**
Trichloroethene	100	0.41 U	**47**	0.95 U	1.6 U	21 U	2.1 U	0.98 U	0.45 U	0.51 U	2.7 U	2.8 U	0.804 U	**12.8**	**0.474 J**
Trichlorofluoromethane	NC	0.62 U	**1.1 I**	1.2 U	2.0 U	21 U	2 U	0.95 U	0.44 U	0.5 U	2.7 U	2.8 U	**0.983 J**	**0.877 J**	**1.03 J**
Total Xylenes	14,600	**33**	**110**	2.7 U	NA	NA	NA	NA	NA	NA	NA	NA	**0.902 J**	**0.611 J**	1.30 U
Vinyl Acetate	29,200	**2.3 I**	0.34 U	0.6 U	NA	NA	NA	NA	NA	NA	NA	NA	0.880 U	0.880 U	0.880 U
Vinyl Chloride	93	0.23 U	0.45 U	0.8 U	1.4 U	16 U	3.3 U	1.6 U	0.72 U	0.82 U	2.0 U	2.1 U	0.511 U	0.511 U	0.511 U

Table 4-7. Sub-Slab Soil Gas Analytical Results (Continued)

Notes:

1 - Analyte list presented is based on initial sub-slab soil gas sampling events. Additional analytes and results from subsequent sampling events can be found in supporting laboratory reports.

USEPA VISL = United States Environmental Protection Agency Vapor Intrusion Screening Level, May 2018 Region Screening Levels, 10^{-6} carcinogen risk, commercial

µg/m³ = micrograms per cubic meter.

Bolded concentrations indicate exceedance in laboratory method detection limit.

I = Analyte detected at a value greater than the laboratory method detection limit, but less than the practical quantitation limit.

J= Estimated value.

U = Analyte not detected at associated detection limit.

B = Same analyte found in the associated blank.

NA = Not analyzed.

NC = No screening criteria has been established or was calculated.

Table 4-8. Ambient Air Analytical Results

Analyte[1]	Permissible Exposure Limit	Threshold Limit Value	SAMPLE ID														
			SYS AIR AMB01														
			6/18/2019	8/12/2019	10/2/2019	1/15/2020	4/9/2020	7/16/2020	10/15/2020	1/20/2021	4/14/2021	7/26/2021	10/21/2021	1/14/2022	4/25/2022	7/22/2022	10/27/2022
Site Specific Compounds																	
trans-1,2-Dichloroethene	200,000	200,000	**5.8**	**20**	**0.43 I**	**22**	**0.44 I**	**49**	**210**	**0.96 I**	**7.2**	**3.6**	**36**	1.7 U	**26.8**	**101**	**9.39**
Vinyl Chloride	1,000	1,000	0.19 U	**4**	**1.3**	0.18 U	0.14 U	2.7 U	1.8 U	0.74 U	0.76 U	0.80 U	2.0 U	1.9 U	0.511 U	0.511 U	0.511 U
Other Compounds																	
1,2,4-Trichlorobenzene	NC	NC	**11**	1.6 U	1.7 U	1.5 U	NR	NR	NR	NR	NR	NR	NR	NR	2.29 U	2.29 U	2.29 U
1,2,4-Trimethylbenzene	NC	NC	**0.71 I**	**0.33 I**	**0.39 I**	**0.31 I**	NR	NR	NR	NR	NR	NR	NR	NR	0.982 U	**0.409 J**	0.982 U
1,3,5-Trimethylbenzene	NC	NC	**0.46 I**	0.15 U	0.16 U	0.15 U	NR	NR	NR	NR	NR	NR	NR	NR	0.982 U	0.982 U	0.982 U
1,4-Dichlorobenzene	75,000	10,000	**0.34 I**	0.20 U	0.22 U	0.20 U	0.15 U	3.5 U	2.4 U	0.41 U	0.42 U	0.44 U	2.6 U	2.5 U	0.782 U	0.782 U	0.782 U
2-Butanone	200,000	200,000	**5.2 I**	2.9 U	3.2 U	2.9 U	NR	NR	NR	NR	NR	NR	NR	NR	**0.923 J**	**0.767 J**	**1.03 J**
2-Propanol	NC	NC	**33**	**2.2 I**	**22**	**16**	NR	NR	NR	NR	NR	NR	NR	NR	**1.99 J**	**2.56 J**	**4.33**
4-Ethyltoluene	NC	NC	**0.88 I**	**0.28 I**	**0.24**	**0.29 I**	NR	NR	NR	NR	NR	NR	NR	NR	0.982 U	0.982 U	0.982 U
Acetone	2,400,000	250,000	**18**	**15**	11 U	**7.5 I**	**7.9**	**13**	11	**2.6 I**	**5.3 V**	**3.9**	**5.6 I**	**3.9 I**	**6.06**	**4.92 J**	**6.91**
Benzene	10,000	500	0.21 U	**0.24 I**	0.23 U	**0.26 I**	NR	NR	NR	NR	NR	NR	NR	NR	**0.235 J**	0.610 U	**0.706 J**
Carbon Disulfide	20,000	1,000	**0.51 I**	**2.4**	0.50 U	**0.65 I**	NR	NR	NR	NR	NR	NR	NR	NR	0.778 U	**2.52**	0.778 U
Carbon Tetrachloride	10,000	1,000	**0.49 I**	**0.48 I**	**0.38 I**	**0.60 I**	**0.53 I**	3.2 U	2.2 U	0.36 U	0.36 U	0.38 U	2.3 U	2.3 U	0.945 U	0.945 U	0.945 U
Chloromethane	NC	NC	**1.4**	**1.7**	**1.0**	**1.0**	**1.3**	1.9 U	1.3 I	0.66 U	0.66 U	0.80 U	1.4 U	1.3 U	**1.61**	0.516 U	**1.25**
Dichlorodifluoromethane	1,000,000	1,000,000	**2.2**	**2.2**	**1.9**	**1.7**	**1.6**	5.3 U	3.5 U	0.73 U	0.74 U	0.78 U	3.8 U	3.7 U	**2.44 J**	**1.46 J**	**2.16 J**
Ethyl Acetate	400,000	400,000	0.15 U	0.15 U	**0.29 I**	0.14 U	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
Freon 113	1,000,000	1,000,000	**2.5**	**0.75 I**	**0.51 I**	**4.0**	**2.2**	4.7 U	3.1 U	0.42 U	0.43 U	0.45 U	3.4 U	3.3 U	1.53 U	1.53 U	1.53 U
Hexachlorobutadiene	NC	NC	**0.96**	0.74 U	**0.96 I**	0.73 U	0.56 U	7.5 U	5.0 U	0.49 U	0.50 U	0.53 U	5.4 U	5.3 U	2.67 U	2.67 U	2.67 U
Methylene Chloride	100,000	50,000	1.6 U	1.6 U	1.7 U	1.6 U	**1.9 I**	**1.9 I**	2.1 IV	0.99 IV	0.27 U	**0.68 I**	**1.4 I**	**2.4 I**	**1.09 J**	0.694 U	**0.694 J**
n-Hexane	500,000	50,000	1.7 U	**5.2 I**	**1.9 I**	1.7 U	NR	NR	NR	NR	NR	NR	NR	NR	1.76 U	1.76 U	1.76 U
Propene	1,800,000	500,000	**0.34 I**	0.15 U	**0.34 I**	**0.38 I**	**0.60**	1.8 U	1.2 U	0.73 U	0.74 U	0.78 U	1.3 U	1.3 U	1.08 U	**0.222 J**	**0.837 BJ**
Tetrachloroethene	100,000	25,000	0.39 U	**0.69 I**	**0.60 I**	0.38 U	0.29 U	4 U	2.7 U	0.41 U	0.42 U	0.44 U	2.9 U	2.8 U	1.36 U	1.36 U	1.36 U
Tetrahydrofuran	200,000	50,000	**0.53 I**	0.18 U	0.19 U	0.18 U	NR	NR	NR	NR	NR	NR	NR	NR	0.442 U	0.442 U	0.442 U
Toluene	200,000	20,000	**0.60 I**	**0.61 I**	**0.51 I**	**0.62 I**	NR	NR	NR	NR	NR	NR	NR	NR	**0.976 J**	0.942 U	**1.33 J**
Trichlorofluoromethane	NC	NC	**1.3**	**1.2**	**1.2**	**1.2**	**1.1**	3.6 U	2.4 U	0.45 U	0.46 U	0.48 U	2.6 U	2.6 U	**1.20 J**	**1.18 J**	**1.13 J**
Xylenes (Total)	100,000	100,000	**1.2**	**2.1**	**1.0**	**0.62**	NR	NR	NR	NR	NR	NR	NR	NR	1.30 U	1.30 U	1.30 U

Table 4-8. Ambient Air Analytical Results (continued)

Analyte	Permissible Exposure Limit	Threshold Limit Value	SAMPLE ID SYS AIR AMB02														
			6/18/2019	8/12/2019	10/2/2019	1/15/2020	4/9/2020	7/16/2020	10/15/2020	1/20/2021	4/14/2021	7/26/2021	10/21/2021	1/14/2022	4/25/2022	7/22/2022	*10/27/2022
Site Specific Compounds																	
trans-1,2-Dichloroethene	200,000	200,000	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	1.8 U	**2.1 I**	0.594 U	**0.277 J**	**1.61**
Vinyl Chloride	1,000	1,000											2.0 U	1.9 U	0.511 U	0.511 U	0.511 U
Other Compounds																	
1,2,4-Trichlorobenzene	NC	NC	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	2.29 U	2.29 U	2.29 U
1,2,4-Trimethylbenzene	NC	NC											NR	NR	0.982 U	0.982 U	0.982 U
1,3,5-Trimethylbenzene	NC	NC											NR	NR	0.982 U	0.982 U	0.982 U
1,4-Dichlorobenzene	75,000	10,000											2.6 U	2.5 U	0.782 U	0.782 U	0.782 U
2-Butanone	200,000	200,000											NR	NR	**0.902 J**	**0.525 J**	**0.389 J**
2-Propanol	NC	NC											NR	NR	1.54 U	**1.54 J**	**440**
4-Ethyltoluene	NC	NC											NR	NR	0.982 U	0.982 U	0.982 U
Acetone	2,400,000	250,000											**6.7 I**	**11**	**6.15**	**4.87 J**	**6.46**
Benzene	10,000	500											NR	NR	0.479 U	0.479 U	0.479 U
Carbon Disulfide	20,000	1,000											NR	NR	0.778 U	0.778 U	0.778 U
Carbon Tetrachloride	10,000	1,000											2.4 U	2.3 U	**0.506 J**	0.945 U	**0.649 J**
Chloromethane	NC	NC											1.4 U	1.3 U	**1.32**	**1.12**	**2.29**
Dichlorodifluoromethane	1,000,000	1,000,000											3.8 U	3.7 U	**2.35 J**	**1.55 J**	**2.15 J**
Ethyl Acetate	400,000	400,000											NR	NR	NR	NR	NR
Freon 113	1,000,000	1,000,000											3.4 U	**5.8 I**	1.53 U	1.53 U	**1.07 J**
Hexachlorobutadiene	NC	NC											5.5 U	5.4 U	2.67 U	2.67 U	2.67 U
Methylene Chloride	100,000	50,000											**1.6 I**	**2.9 I**	0.694 U	0.694 U	**0.347 J**
n-Hexane	500,000	50,000											NR	NR	1.76 U	1.76 U	1.76 U
Propene	1,800,000	500,000											1.3 U	1.3 U	1.08 U	**0.210 J**	**0.424 BJ**
Tetrachloroethene	100,000	25,000											2.9 U	2.9 U	**1.05 J**	1.36 U	**10.5**
Tetrahydrofuran	200,000	50,000											NR	NR	0.442 U	0.442 U	0.442 U
Toluene	200,000	20,000											NR	NR	**0.441 J**	0.942 U	**0.368 J**
Trichlorofluoromethane	NC	NC											2.7 U	2.6 U	**1.17 J**	**1.10 J**	**1.13 J**
Xylenes (Total)	100,000	100,000											NR	NR	1.30 U	1.30 U	1.30 U

Notes:

1 - Analyte list presented is based on initial ambient air sampling events. Additional analytes and results from subsequent sampling events can be found in supporting laboratory reports.

Values are presented as 8-hour time weighted average.

Concentrations in micrograms per cubic meter.

U = Value was reported as below the method detection limit, therefore the detection limit is shown.

I = Value is between method detection limit and practical quantitation limit.

Shaded analytes indicated constitutes detected in the groundwater during monitoring sampling.

Bolded concentrations indicate exceedance in laboratory method detection limit.

NR= Not recorded.

PEL = Permissible exposure limit.

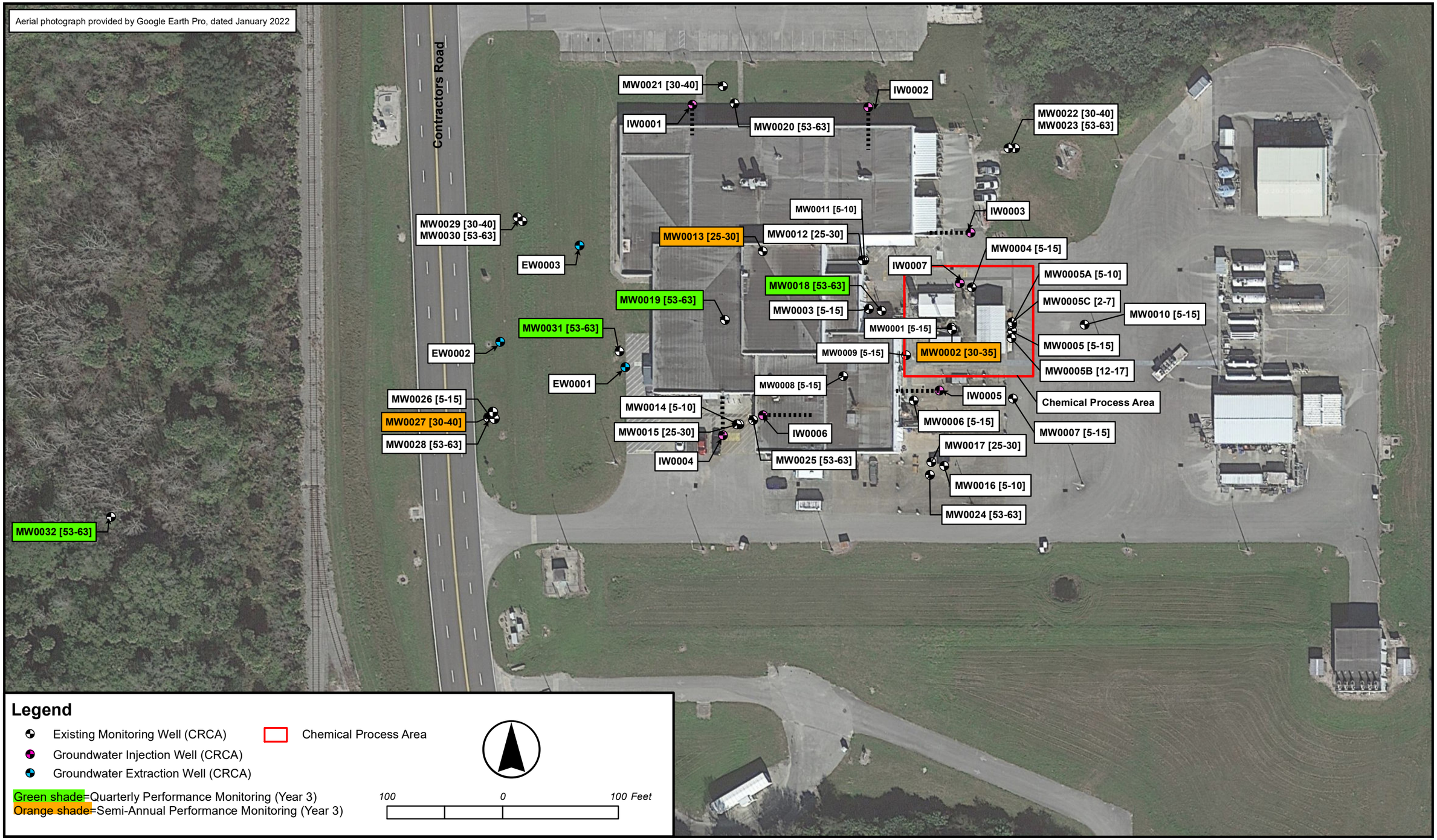
TLV = Threshold limit value.

V = analyte was detected in both the sample and the associated method blank.

B = Same analyte found in the associated blank.

J = Estimated result between the LOQ and the detection limit.

* = October 2022 had sampling done at AMB02; however, pressure was lost after four hours due to a valve malfunction, therefore, AMB02 was resampled but referenced as AMB03 in lab data (Analytical Package L1553021).



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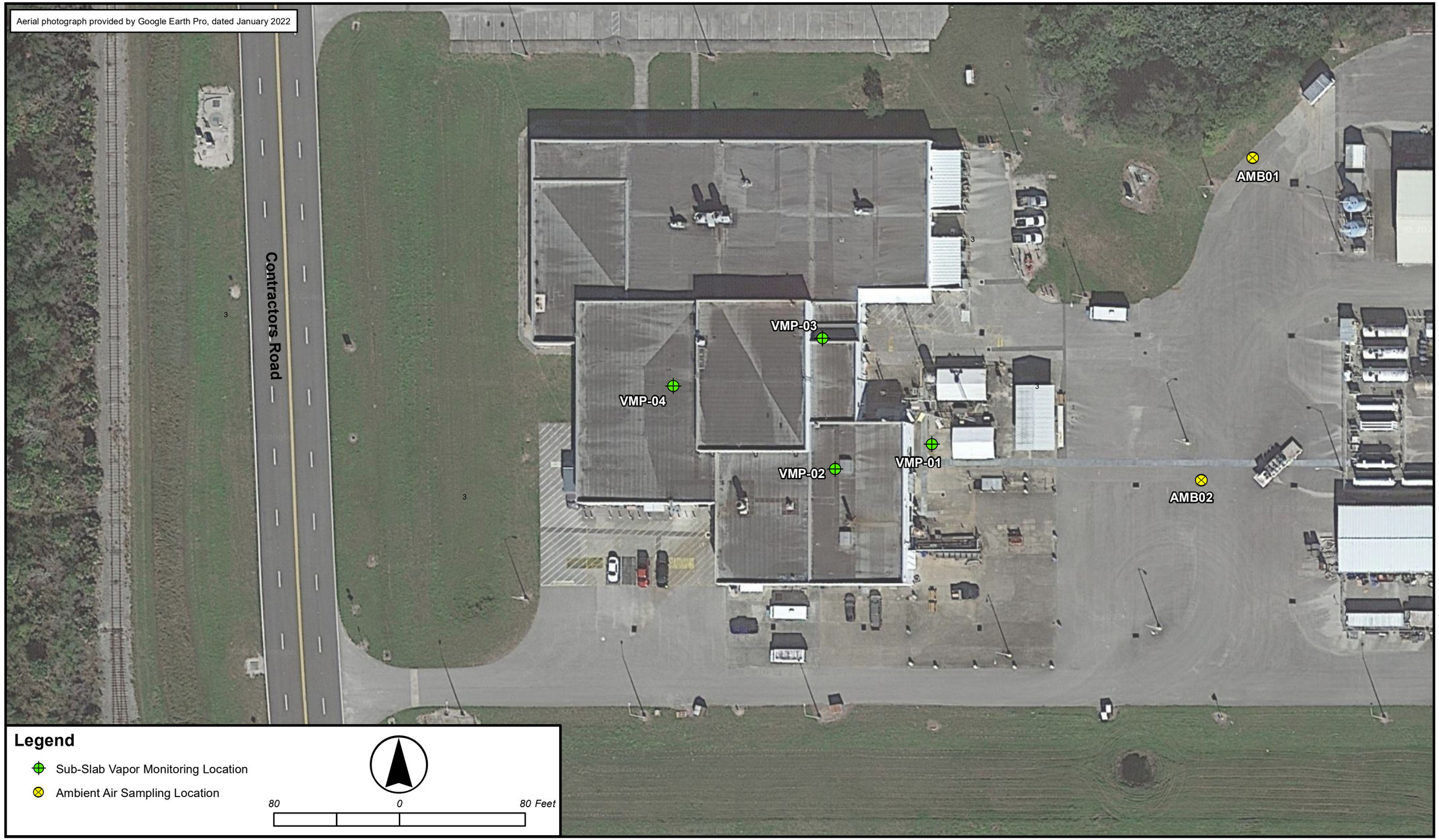

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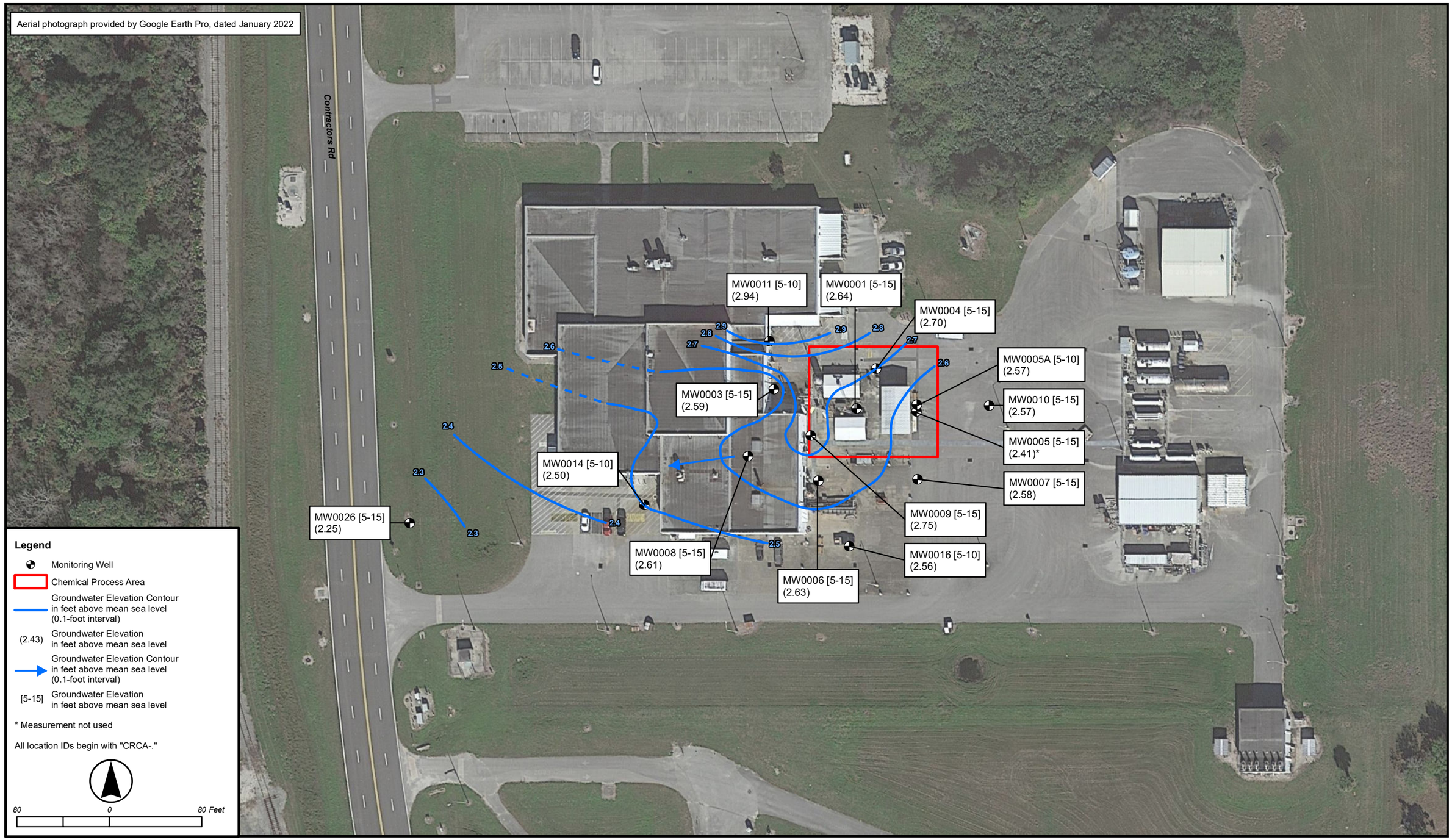

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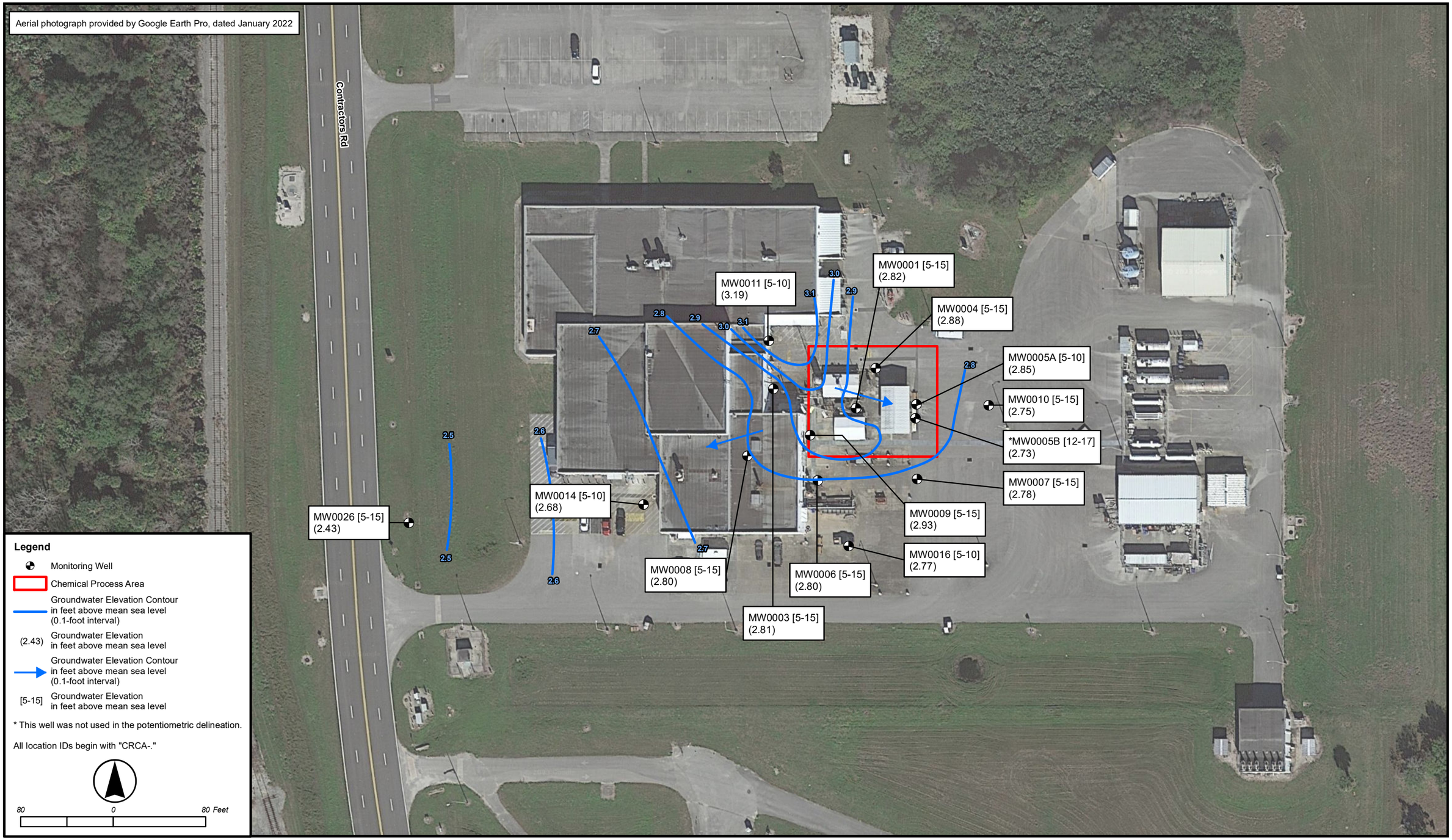
FIGURE 4-4 SHALLOW POTENTIOMETRIC SURFACE MAP - JANUARY 2022

SWMU 041, KENNEDY SPACE CENTER, FLORIDA



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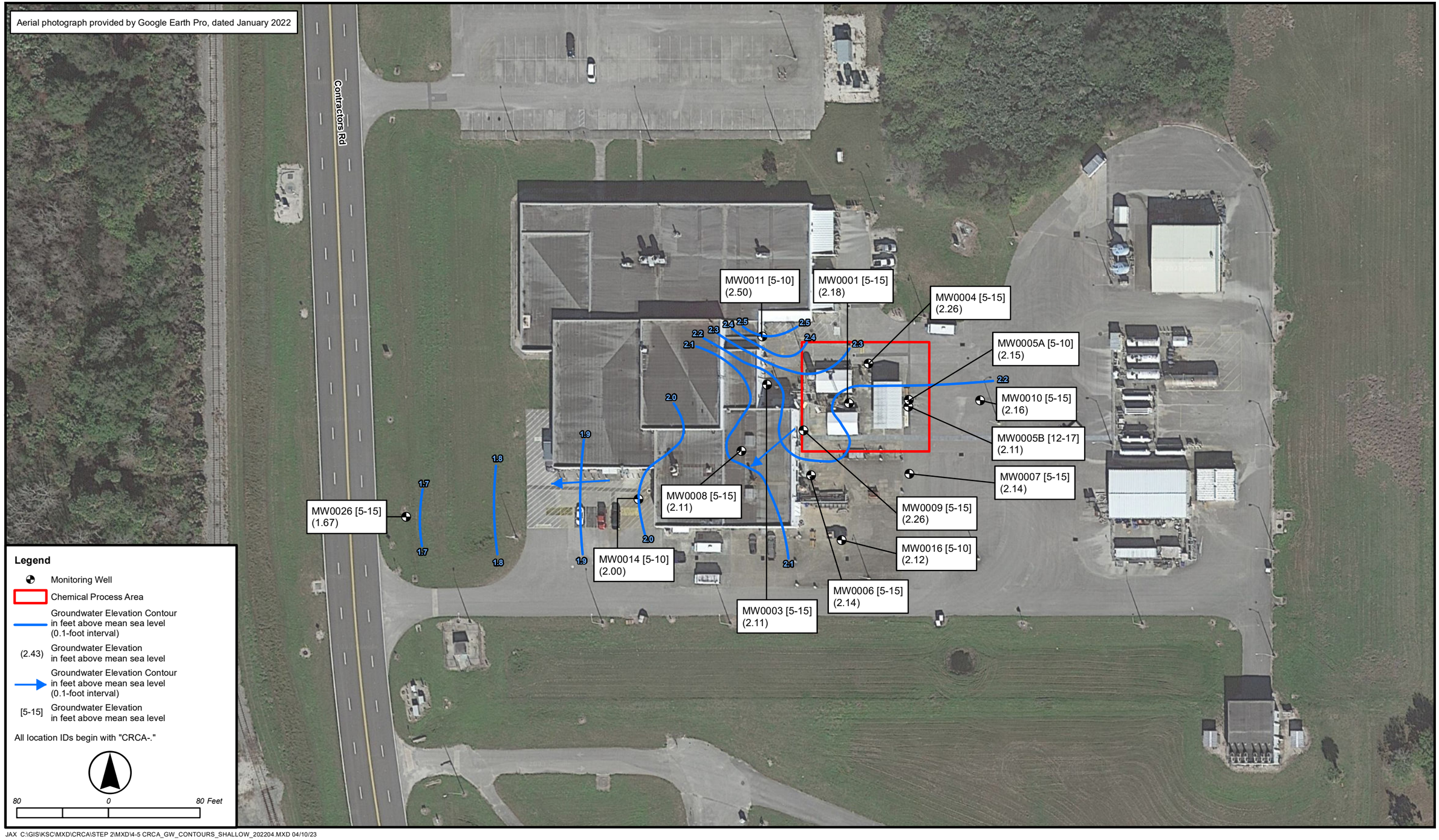

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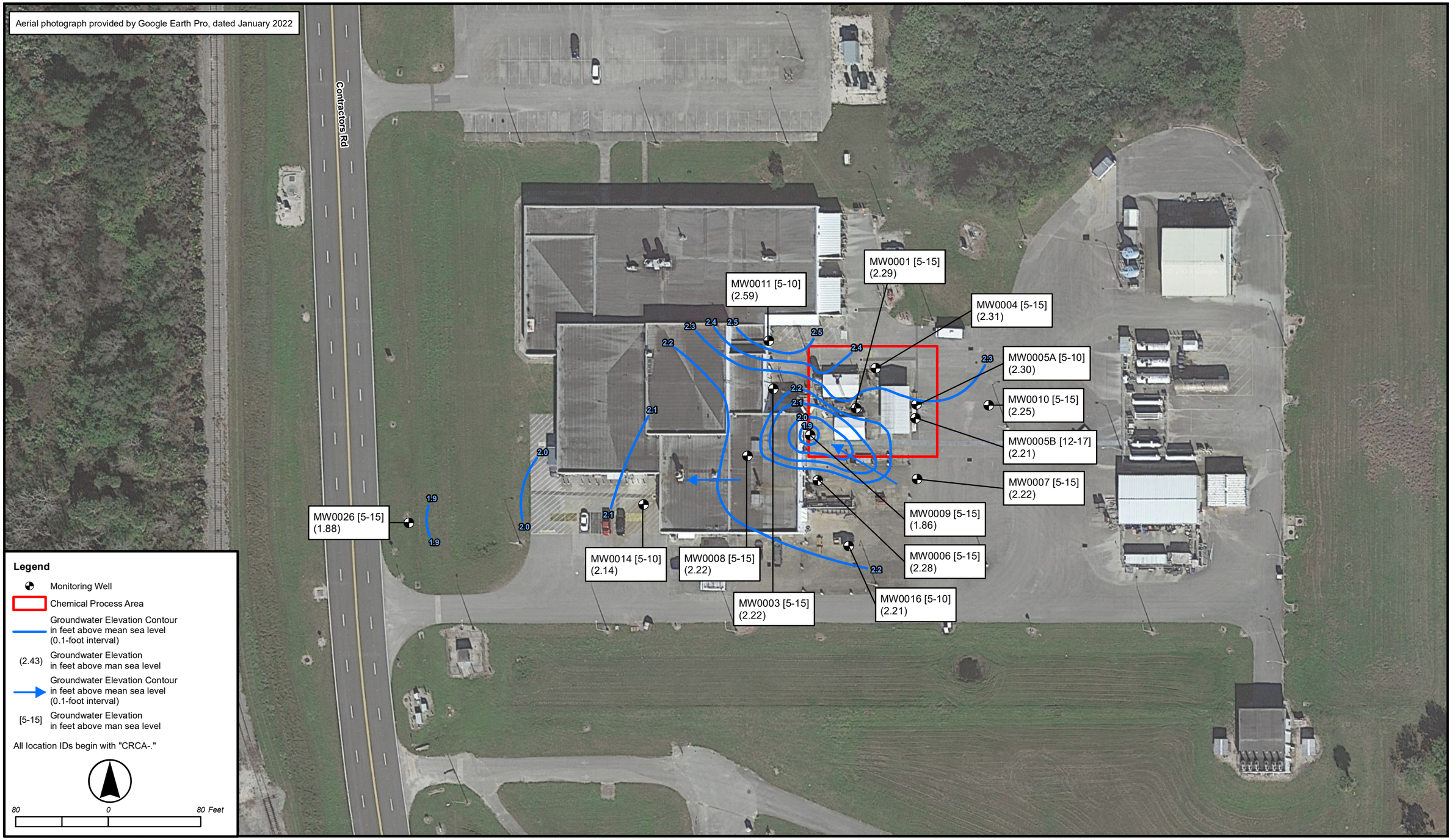

JAX C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\4-6 CRCA_GW_CONTOURS_SHALLOW_202207.MXD 04/10/23

FIGURE 4-7 SHALLOW POTENTIOMETRIC SURFACE MAP - OCTOBER 2022

SWMU 041, KENNEDY SPACE CENTER, FLORIDA

CRCA Year 3 PMR
Revision 0
May 2023

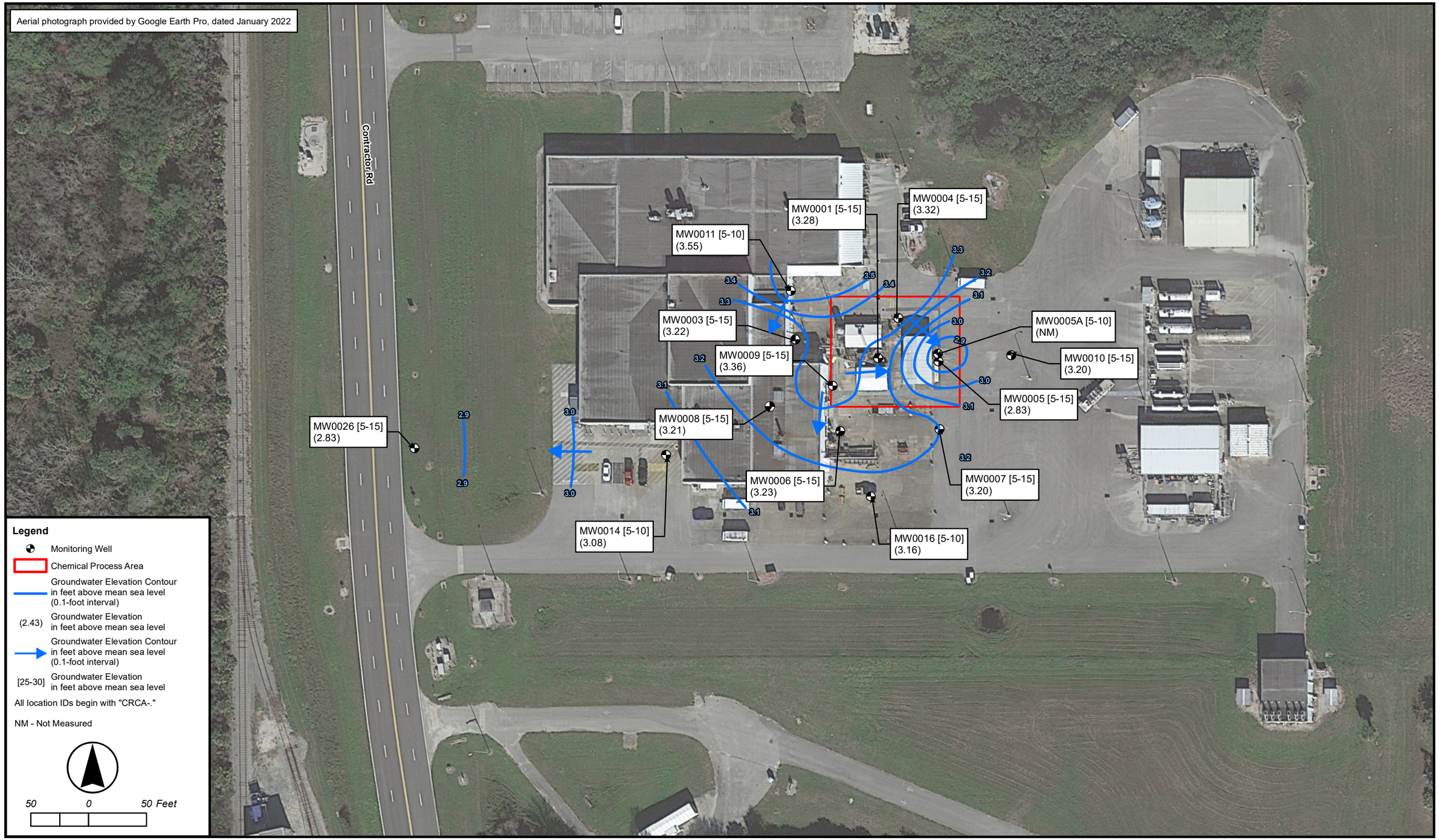

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FIGURE 4-8 INTERMEDIATE POTENTIOMETRIC SURFACE MAP - OCTOBER 2021

SWMU 041, KENNEDY SPACE CENTER, FLORIDA

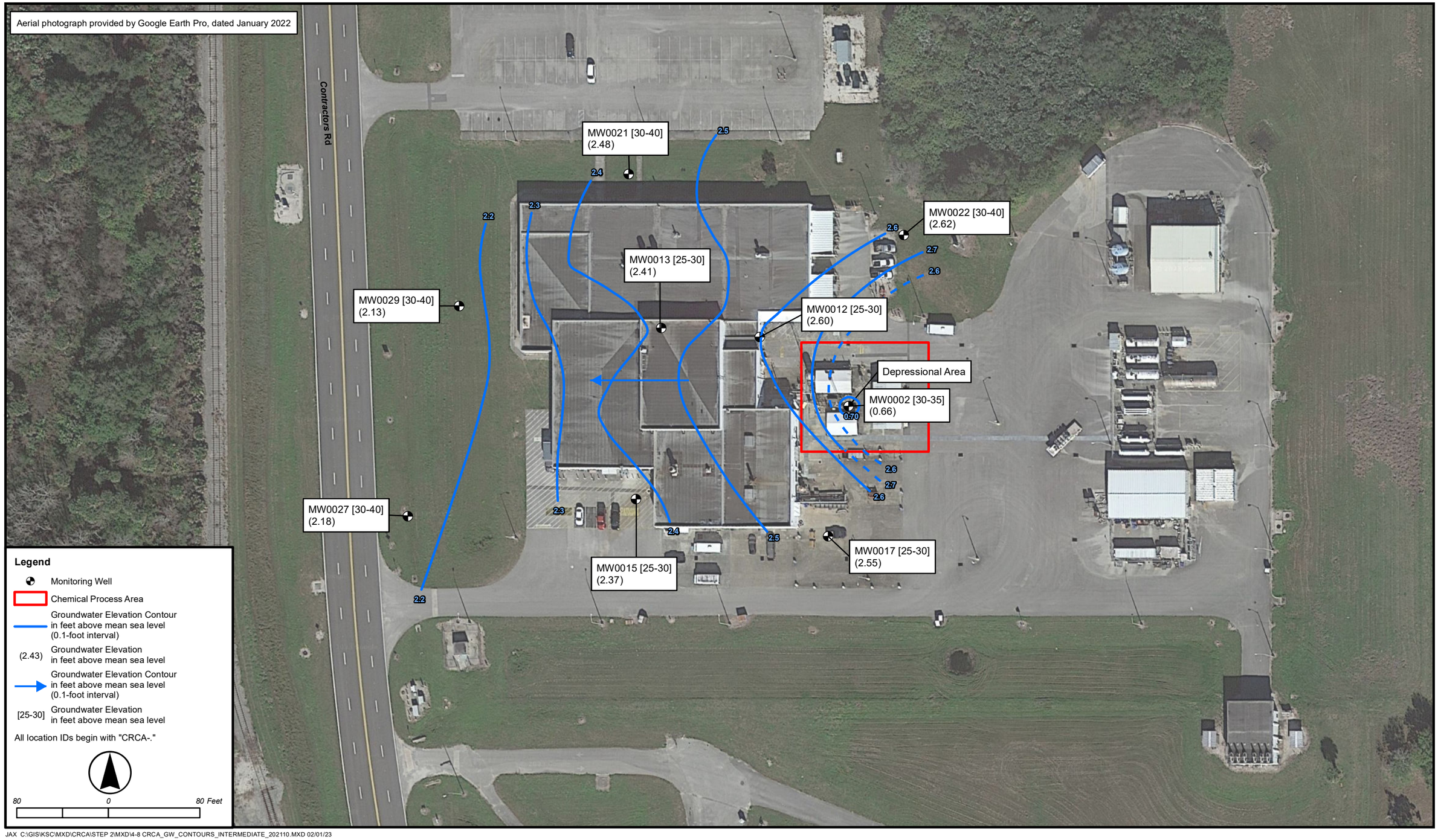

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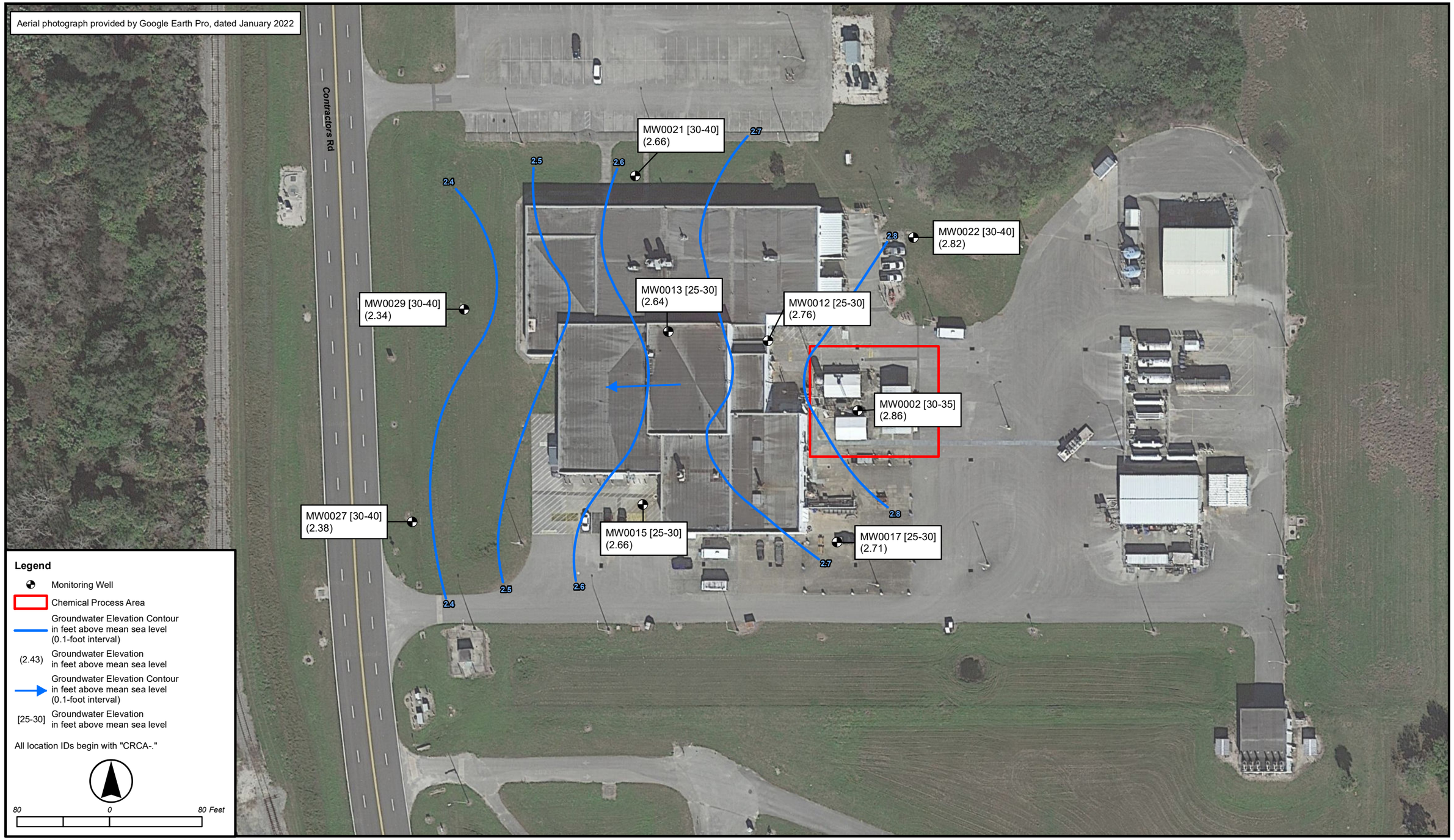
FIGURE 4-9 INTERMEDIATE POTENTIOMETRIC SURFACE MAP - JANUARY 2022

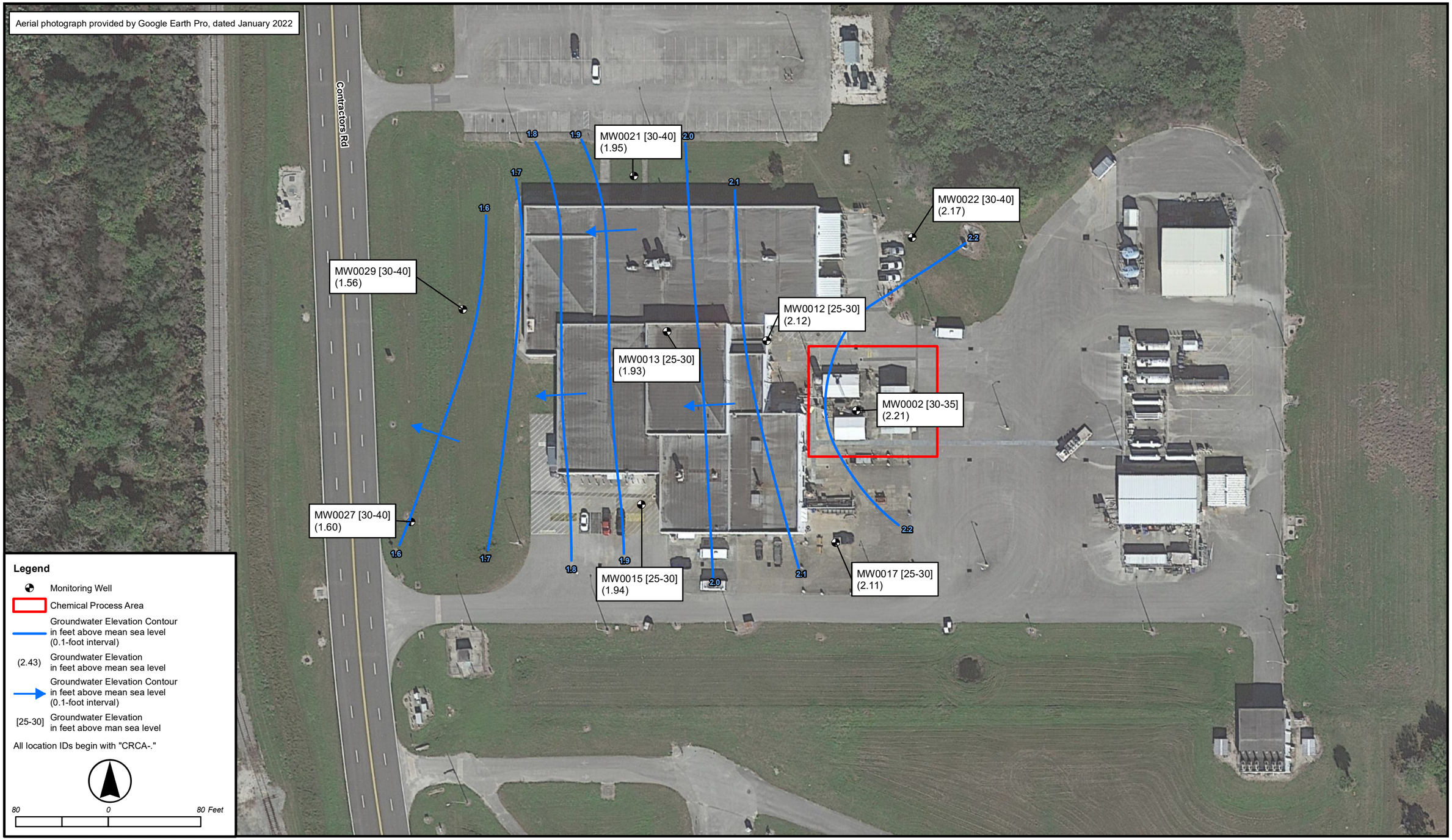
SWMU 041, KENNEDY SPACE CENTER, FLORIDA



PGH C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\4-9 CRCA_GW_CONTOURS_INTERMEDIATE_202201.MXD 02/01/23 JEE

FIGURE 4-10 INTERMEDIATE POTENTIOMETRIC SURFACE MAP - APRIL 2022

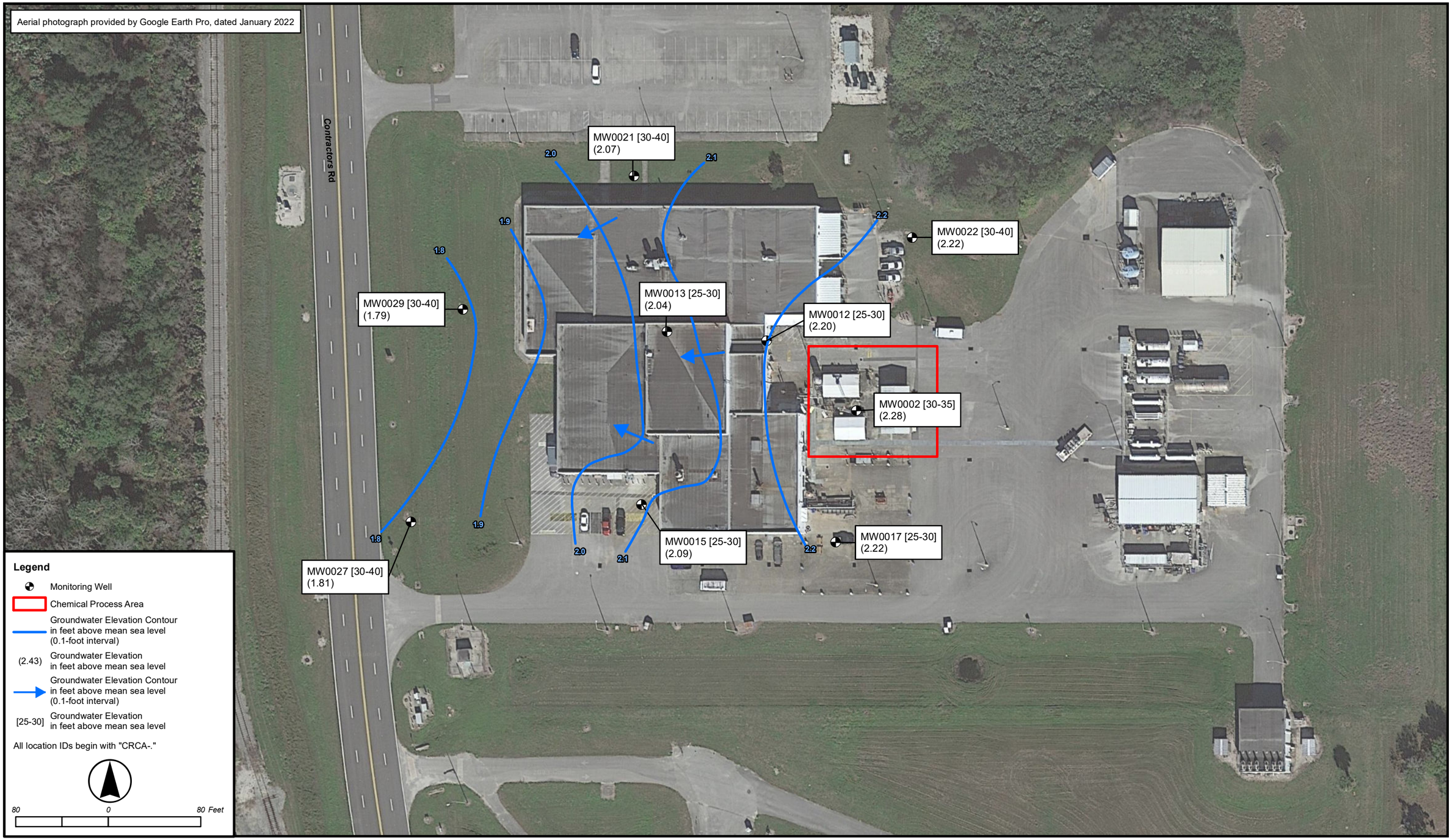
SWMU 041, KENNEDY SPACE CENTER, FLORIDA



PGH C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\4-10 CRCA_GW_CONTOURS_INTERMEDIATE_202204.MXD 04/10/23 JEE

FIGURE 4-11 INTERMEDIATE POTENTIOMETRIC SURFACE MAP - JULY 2022

SWMU 041, KENNEDY SPACE CENTER, FLORIDA



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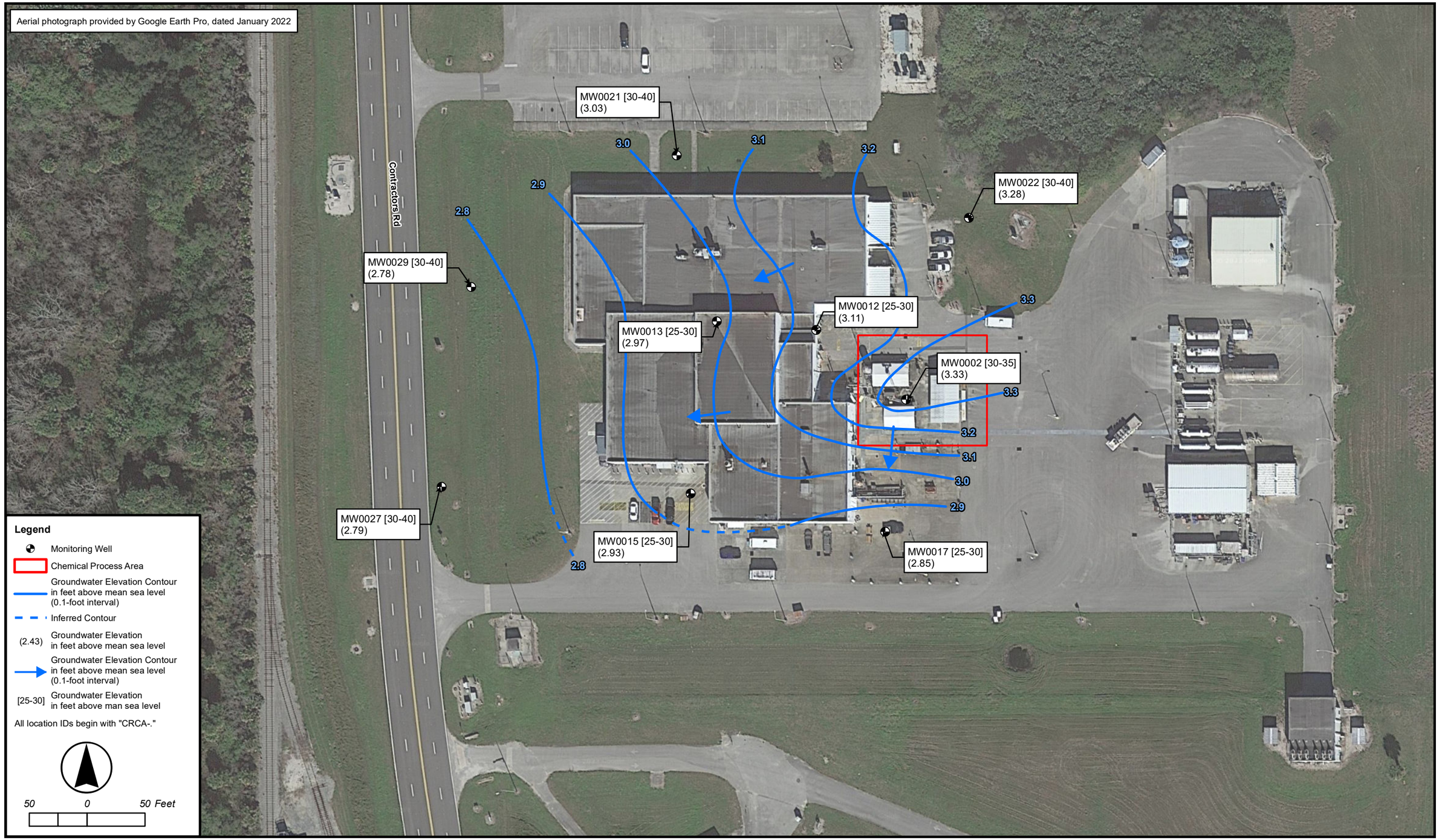

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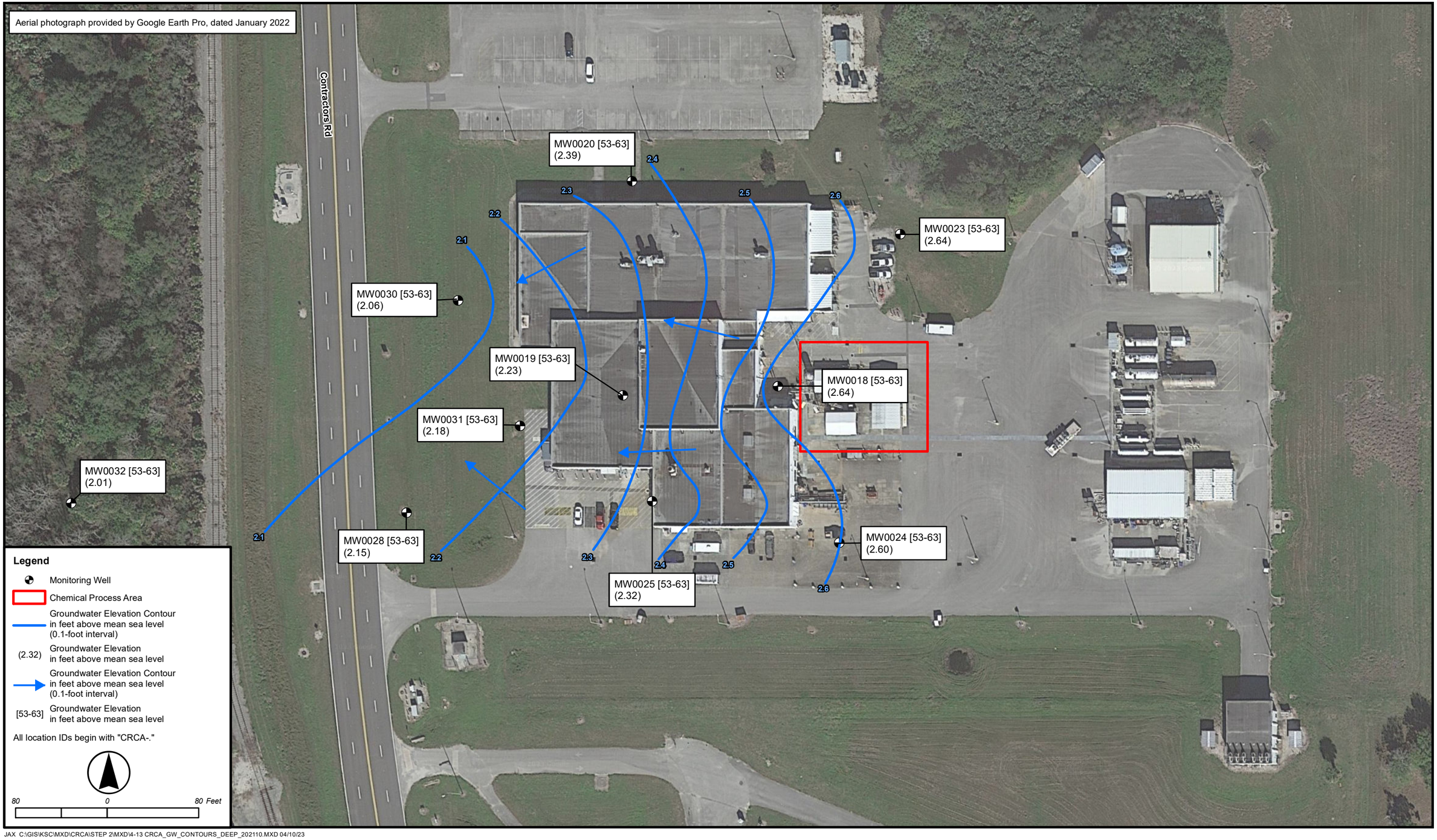
FIGURE 4-13 DEEP POTENTIOMETRIC SURFACE MAP - OCTOBER 2021
SWMU 041, KENNEDY SPACE CENTER, FLORIDA



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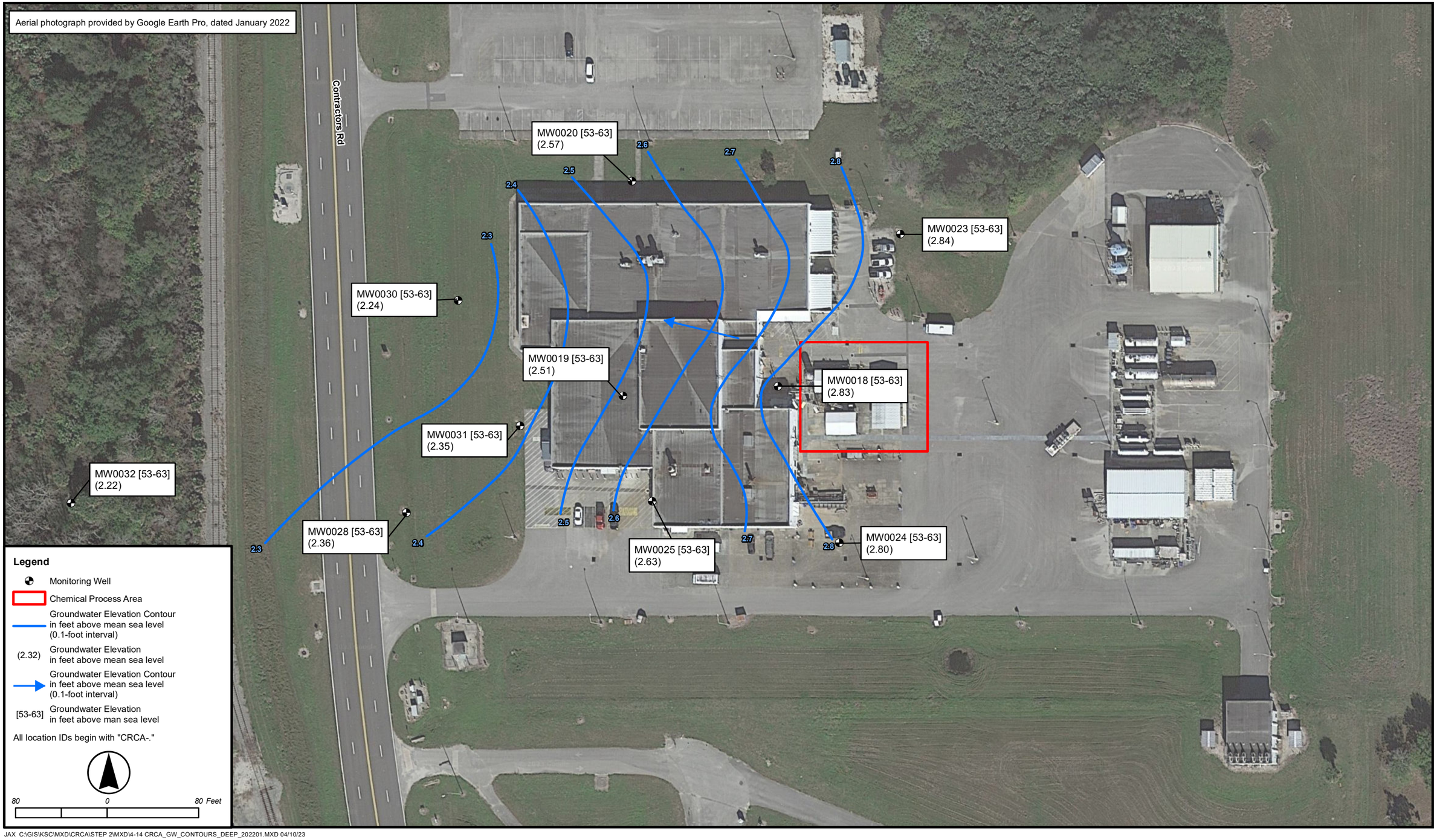

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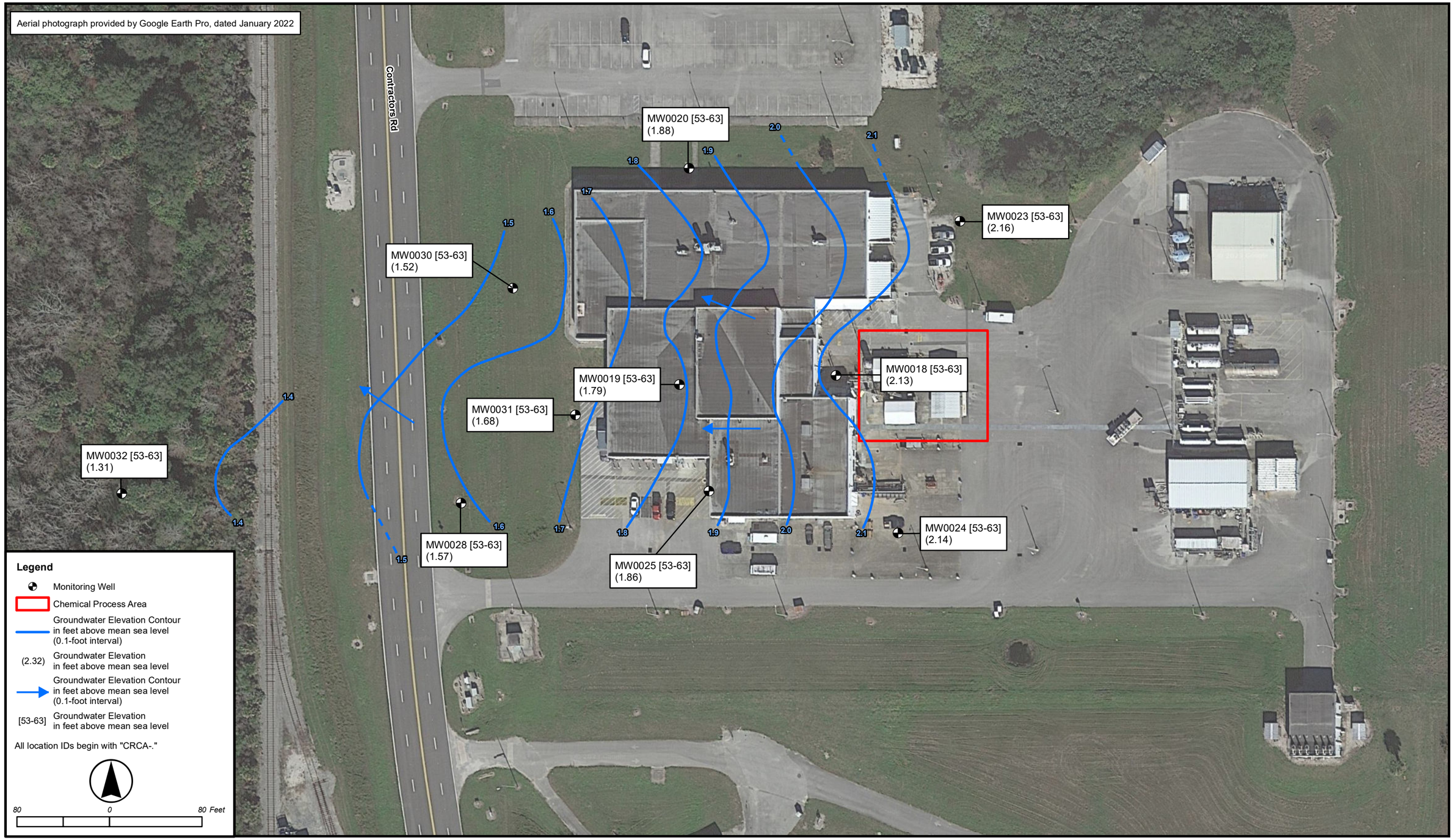
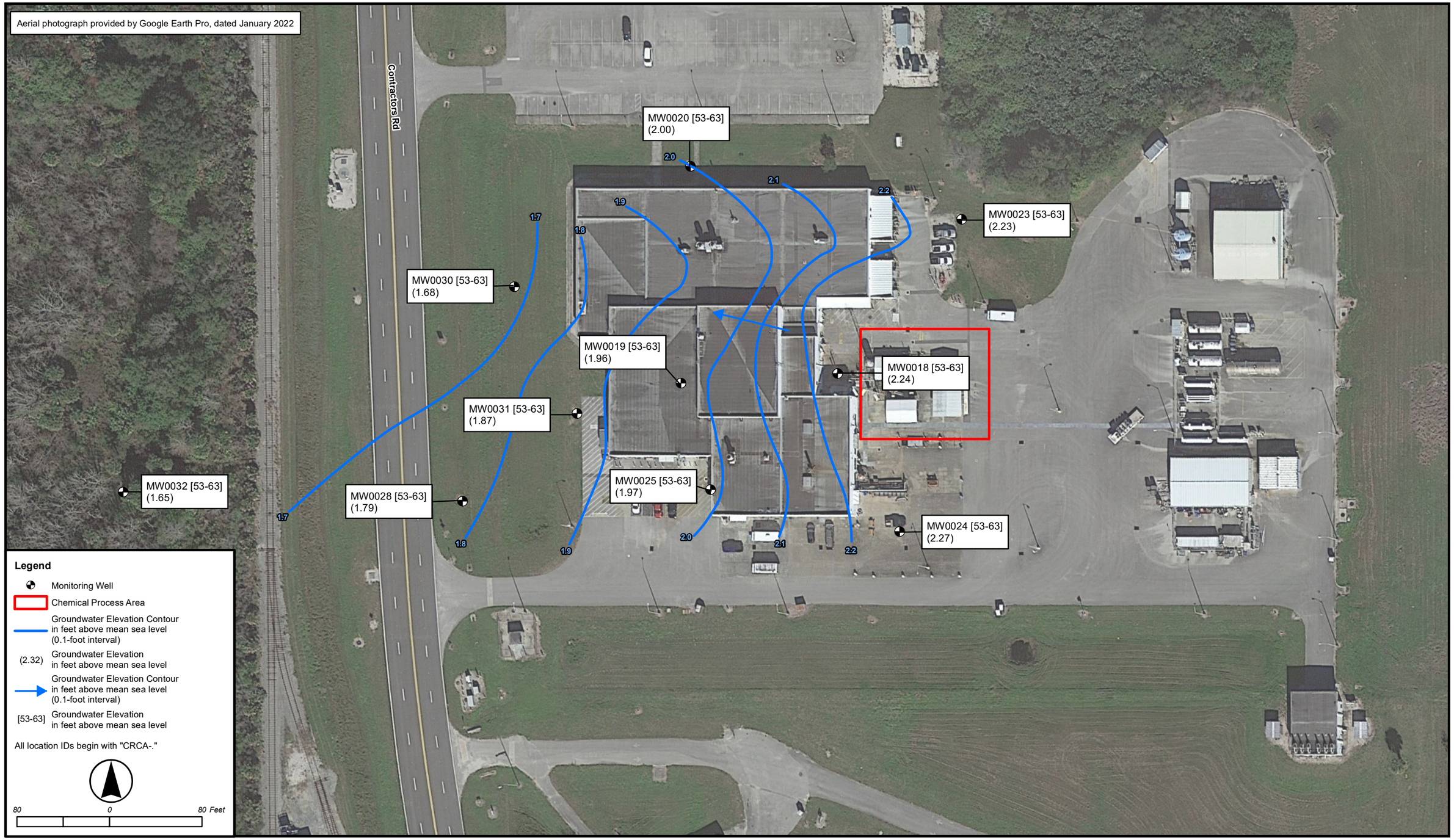


JAX C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\4-15 CRCA_GW_CONTOURS_DEEP_202204.MXD 04/10/23

FIGURE 4-16 DEEP POTENTIOMETRIC SURFACE MAP - JULY 2022
SWMU 041, KENNEDY SPACE CENTER, FLORIDA



JAX C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\4-16 CRCA_GW_CONTOURS_DEEP_202207.MXD 04/10/23

FIGURE 4-17 DEEP POTENTIOMETRIC SURFACE MAP - OCTOBER 2022

SWMU 041, KENNEDY SPACE CENTER, FLORIDA

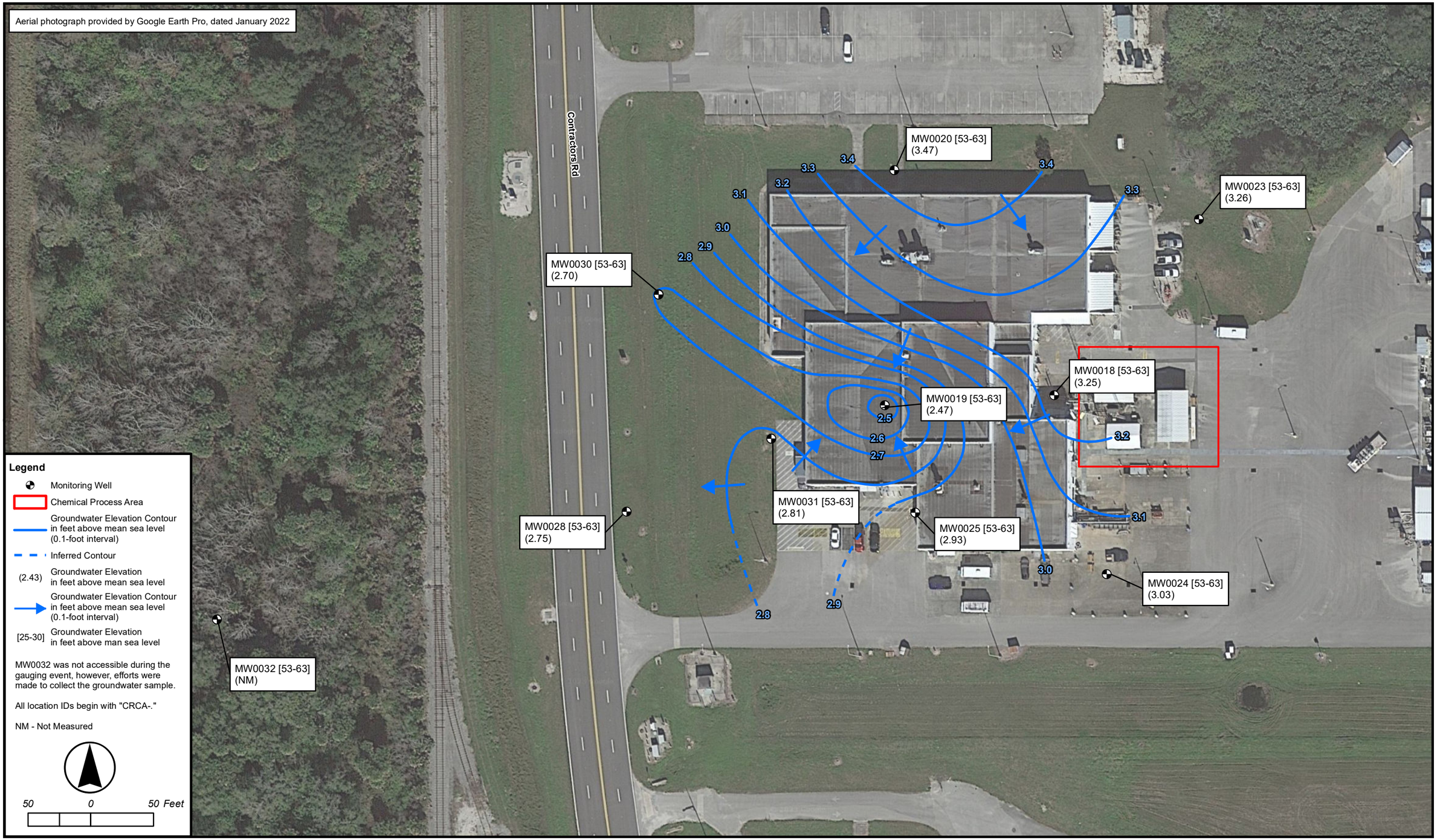


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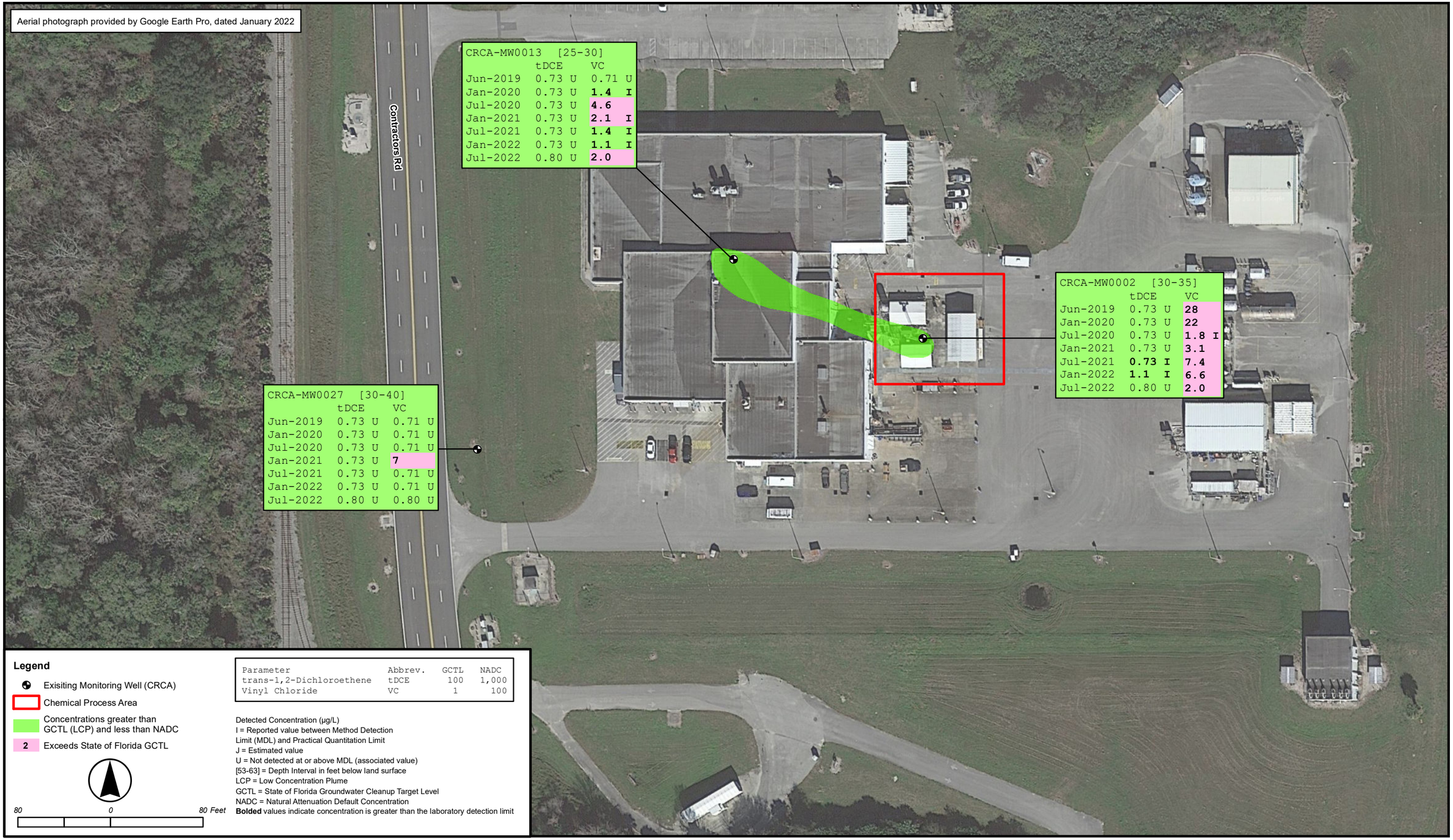
FIGURE 4-18 YEAR 3 CONTAMINANTS OF CONCERN INTERMEDIATE PLUME MAP: 24-40 FEET BLS

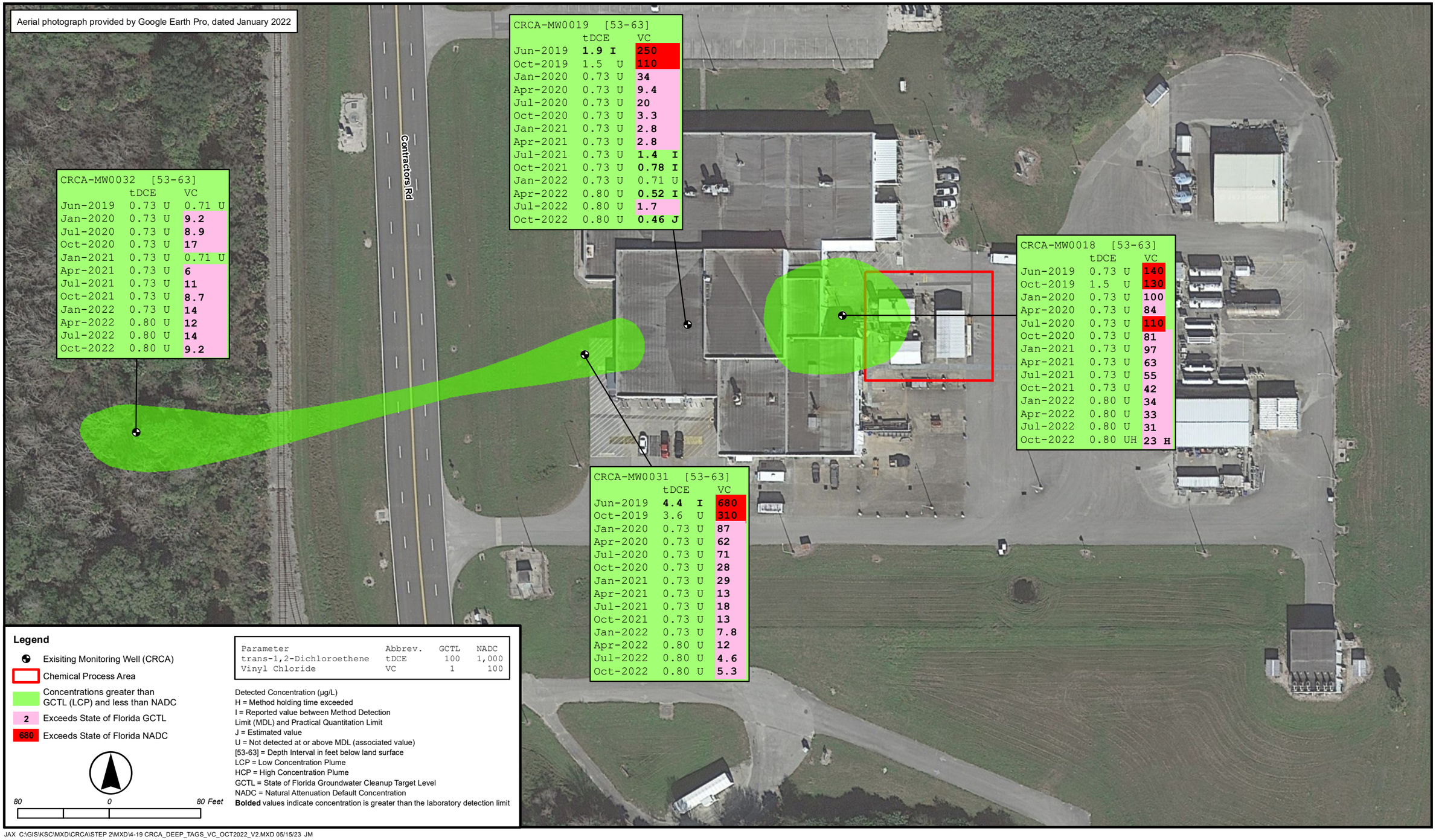
SWMU 041, KENNEDY SPACE CENTER, FLORIDA



JAX C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\4-18 CRCA_INTERMEDIATE_TAGS_VC_OCT2022_V2.MXD 05/15/23

FIGURE 4-19 YEAR 3 CONTAMINANTS OF CONCERN DEEP PLUME MAP: 53-63 FEET BLS

SWMU 041, KENNEDY SPACE CENTER, FLORIDA



CRCA-MW0032 [53-63]	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	**9.2**
Jul-2020	0.73 U	**8.9**
Oct-2020	0.73 U	**17**
Jan-2021	0.73 U	0.71 U
Apr-2021	0.73 U	**6**
Jul-2021	0.73 U	**11**
Oct-2021	0.73 U	**8.7**
Jan-2022	0.73 U	**14**
Apr-2022	0.80 U	**12**
Jul-2022	0.80 U	**14**
Oct-2022	0.80 U	**9.2**

CRCA-MW0019 [53-63]	tDCE	VC
Jun-2019	**1.9 I**	**250**
Oct-2019	1.5 U	**110**
Jan-2020	0.73 U	**34**
Apr-2020	0.73 U	**9.4**
Jul-2020	0.73 U	**20**
Oct-2020	0.73 U	**3.3**
Jan-2021	0.73 U	**2.8**
Apr-2021	0.73 U	**2.8**
Jul-2021	0.73 U	**1.4 I**
Oct-2021	0.73 U	**0.78 I**
Jan-2022	0.73 U	0.71 U
Apr-2022	0.80 U	**0.52 I**
Jul-2022	0.80 U	**1.7**
Oct-2022	0.80 U	**0.46 J**

CRCA-MW0018 [53-63]	tDCE	VC
Jun-2019	0.73 U	**140**
Oct-2019	1.5 U	**130**
Jan-2020	0.73 U	**100**
Apr-2020	0.73 U	**84**
Jul-2020	0.73 U	**110**
Oct-2020	0.73 U	**81**
Jan-2021	0.73 U	**97**
Apr-2021	0.73 U	**63**
Jul-2021	0.73 U	**55**
Oct-2021	0.73 U	**42**
Jan-2022	0.80 U	**34**
Apr-2022	0.80 U	**33**
Jul-2022	0.80 U	**31**
Oct-2022	0.80 UH	**23 H**

CRCA-MW0031 [53-63]	tDCE	VC
Jun-2019	**4.4 I**	**680**
Oct-2019	3.6 U	**310**
Jan-2020	0.73 U	**87**
Apr-2020	0.73 U	**62**
Jul-2020	0.73 U	**71**
Oct-2020	0.73 U	**28**
Jan-2021	0.73 U	**29**
Apr-2021	0.73 U	**13**
Jul-2021	0.73 U	**18**
Oct-2021	0.73 U	**13**
Jan-2022	0.73 U	**7.8**
Apr-2022	0.80 U	**12**
Jul-2022	0.80 U	**4.6**
Oct-2022	0.80 U	**5.3**

Parameter	Abbrev.	GCTL	NADC
trans-1,2-Dichloroethene	tDCE	100	1,000
Vinyl Chloride	VC	1	100

Detected Concentration (µg/L)
H = Method holding time exceeded
I = Reported value between Method Detection Limit (MDL) and Practical Quantitation Limit
J = Estimated value
U = Not detected at or above MDL (associated value)
[53-63] = Depth Interval in feet below land surface
LCP = Low Concentration Plume
HCP = High Concentration Plume
GCTL = State of Florida Groundwater Cleanup Target Level
NADC = Natural Attenuation Default Concentration
Bolded values indicate concentration is greater than the laboratory detection limit

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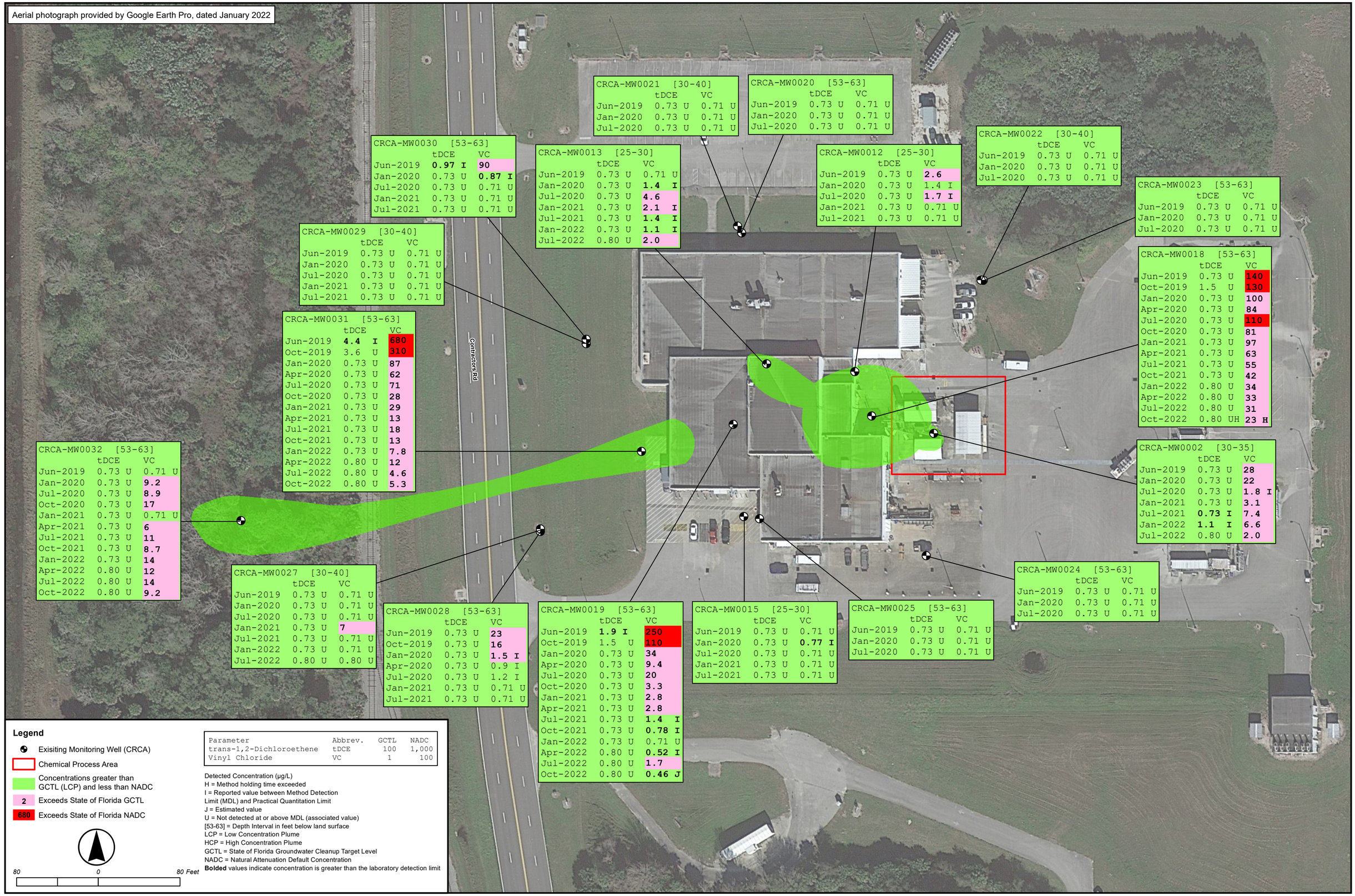
FIGURE 4-20 YEAR 3 VINYL CHLORIDE COMBINED INTERMEDIATE AND DEEP PLUMES
SWMU 041, KENNEDY SPACE CENTER, FLORIDA



CRCA-MW0021 [30-40]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	0.71 U
Jul-2020	0.73 U	0.71 U

CRCA-MW0020 [53-63]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	0.71 U
Jul-2020	0.73 U	0.71 U

CRCA-MW0030 [53-63]

	tDCE	VC
Jun-2019	**0.97 I**	90
Jan-2020	0.73 U	**0.87 I**
Jul-2020	0.73 U	0.71 U
Jan-2021	0.73 U	0.71 U
Jul-2021	0.73 U	0.71 U

CRCA-MW0013 [25-30]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	**1.4 I**
Jul-2020	0.73 U	4.6
Jan-2021	0.73 U	**2.1 I**
Jul-2021	0.73 U	**1.4 I**
Jan-2022	0.73 U	**1.1 I**
Jul-2022	0.80 U	2.0

CRCA-MW0012 [25-30]

	tDCE	VC
Jun-2019	0.73 U	2.6
Jan-2020	0.73 U	1.4 I
Jul-2020	0.73 U	**1.7 I**
Jan-2021	0.73 U	0.71 U
Jul-2021	0.73 U	0.71 U

CRCA-MW0022 [30-40]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	0.71 U
Jul-2020	0.73 U	0.71 U

CRCA-MW0023 [53-63]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	0.71 U
Jul-2020	0.73 U	0.71 U

CRCA-MW0029 [30-40]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	0.71 U
Jul-2020	0.73 U	0.71 U
Jan-2021	0.73 U	0.71 U
Jul-2021	0.73 U	0.71 U

CRCA-MW0031 [53-63]

	tDCE	VC
Jun-2019	**4.4 I**	680
Oct-2019	3.6 U	310
Jan-2020	0.73 U	87
Apr-2020	0.73 U	62
Jul-2020	0.73 U	71
Oct-2020	0.73 U	28
Jan-2021	0.73 U	29
Apr-2021	0.73 U	13
Jul-2021	0.73 U	18
Oct-2021	0.73 U	13
Jan-2022	0.73 U	7.8
Apr-2022	0.80 U	12
Jul-2022	0.80 U	4.6
Oct-2022	0.80 U	5.3

CRCA-MW0018 [53-63]

	tDCE	VC
Jun-2019	0.73 U	140
Oct-2019	1.5 U	130
Jan-2020	0.73 U	100
Apr-2020	0.73 U	84
Jul-2020	0.73 U	110
Oct-2020	0.73 U	81
Jan-2021	0.73 U	97
Apr-2021	0.73 U	63
Jul-2021	0.73 U	55
Oct-2021	0.73 U	42
Jan-2022	0.80 U	34
Apr-2022	0.80 U	33
Jul-2022	0.80 U	31
Oct-2022	0.80 UH	23 H

CRCA-MW0002 [30-35]

	tDCE	VC
Jun-2019	0.73 U	28
Jan-2020	0.73 U	22
Jul-2020	0.73 U	**1.8 I**
Jan-2021	0.73 U	3.1
Jul-2021	**0.73 I**	7.4
Jan-2022	**1.1 I**	6.6
Jul-2022	0.80 U	2.0

CRCA-MW0032 [53-63]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	9.2
Jul-2020	0.73 U	8.9
Oct-2020	0.73 U	17
Jan-2021	0.73 U	0.71 U
Apr-2021	0.73 U	6
Jul-2021	0.73 U	11
Oct-2021	0.73 U	8.7
Jan-2022	0.73 U	14
Apr-2022	0.80 U	12
Jul-2022	0.80 U	14
Oct-2022	0.80 U	9.2

CRCA-MW0027 [30-40]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	0.71 U
Jul-2020	0.73 U	0.71 U
Jan-2021	0.73 U	7
Jul-2021	0.73 U	0.71 U
Jan-2022	0.73 U	0.71 U
Jul-2022	0.80 U	0.80 U

CRCA-MW0028 [53-63]

	tDCE	VC
Jun-2019	0.73 U	23
Oct-2019	0.73 U	16
Jan-2020	0.73 U	**1.5 I**
Apr-2020	0.73 U	0.9 I
Jul-2020	0.73 U	1.2 I
Jan-2021	0.73 U	0.71 U
Jul-2021	0.73 U	0.71 U

CRCA-MW0019 [53-63]

	tDCE	VC
Jun-2019	**1.9 I**	250
Oct-2019	1.5 U	110
Jan-2020	0.73 U	34
Apr-2020	0.73 U	9.4
Jul-2020	0.73 U	20
Oct-2020	0.73 U	3.3
Jan-2021	0.73 U	2.8
Apr-2021	0.73 U	2.8
Jul-2021	0.73 U	**1.4 I**
Oct-2021	0.73 U	**0.78 I**
Jan-2022	0.73 U	0.71 U
Apr-2022	0.80 U	**0.52 I**
Jul-2022	0.80 U	1.7
Oct-2022	0.80 U	**0.46 J**

CRCA-MW0015 [25-30]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	**0.77 I**
Jul-2020	0.73 U	0.71 U
Jan-2021	0.73 U	0.71 U
Jul-2021	0.73 U	0.71 U

CRCA-MW0025 [53-63]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	0.71 U
Jul-2020	0.73 U	0.71 U

CRCA-MW0024 [53-63]

	tDCE	VC
Jun-2019	0.73 U	0.71 U
Jan-2020	0.73 U	0.71 U
Jul-2020	0.73 U	0.71 U

Legend

- Exisiting Monitoring Well (CRCA)
- Chemical Process Area
- Concentrations greater than GCTL (LCP) and less than NADC
- 2 — Exceeds State of Florida GCTL
- 680 — Exceeds State of Florida NADC

80 0 80 Feet

Parameter	Abbrev.	GCTL	NADC
trans-1,2-Dichloroethene	tDCE	100	1,000
Vinyl Chloride	VC	1	100

Detected Concentration (µg/L)
H = Method holding time exceeded
I = Reported value between Method Detection Limit (MDL) and Practical Quantitation Limit
J = Estimated value
U = Not detected at or above MDL (associated value)
[53-63] = Depth Interval in feet below land surface
LCP = Low Concentration Plume
HCP = High Concentration Plume
GCTL = State of Florida Groundwater Cleanup Target Level
NADC = Natural Attenuation Default Concentration
Bolded values indicate concentration is greater than the laboratory detection limit

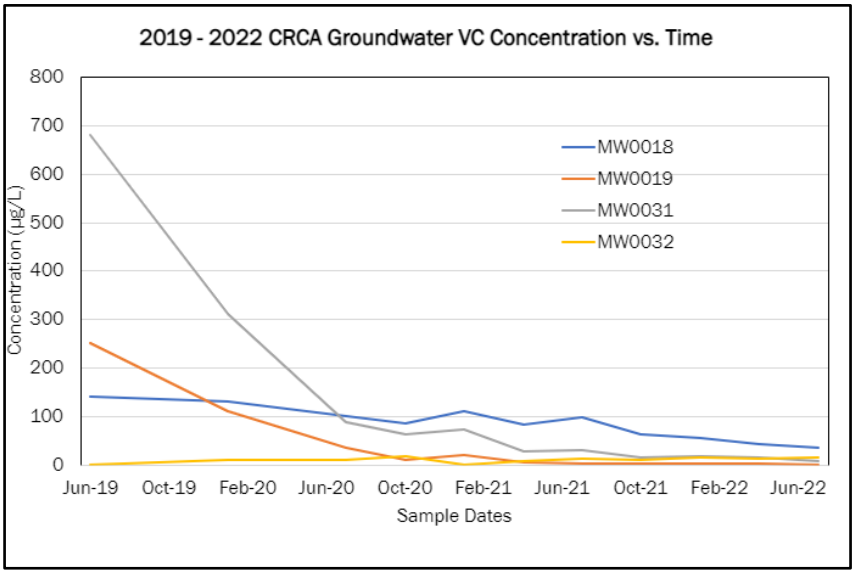
JAX C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\4-20 CRCA_COMBINED_TAGS.MXD 05/15/23 JM

FIGURE 4-21 VC TREND ANALYSIS

QUARTERLY AND SEMI-ANNUAL PERFORMANCE MONITORING WELLS

YEAR 1 THROUGH YEAR 3

QUARTERLY SAMPLED WELLS



SEMI-ANNUAL SAMPLED WELLS

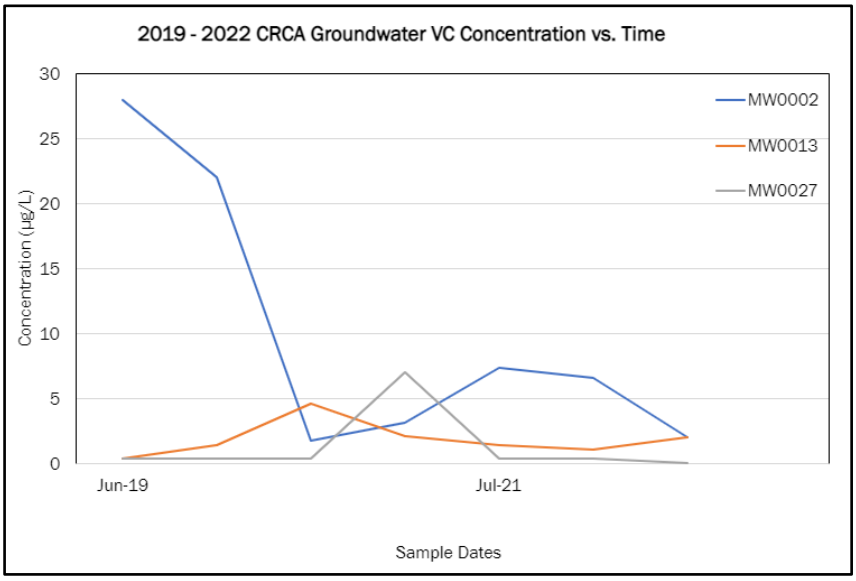
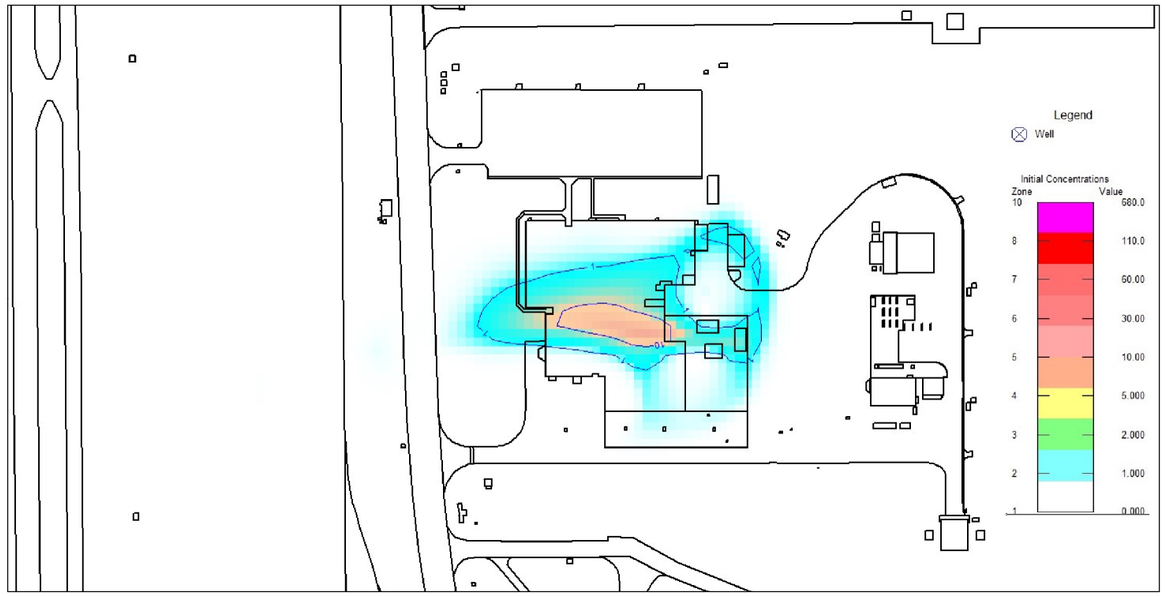
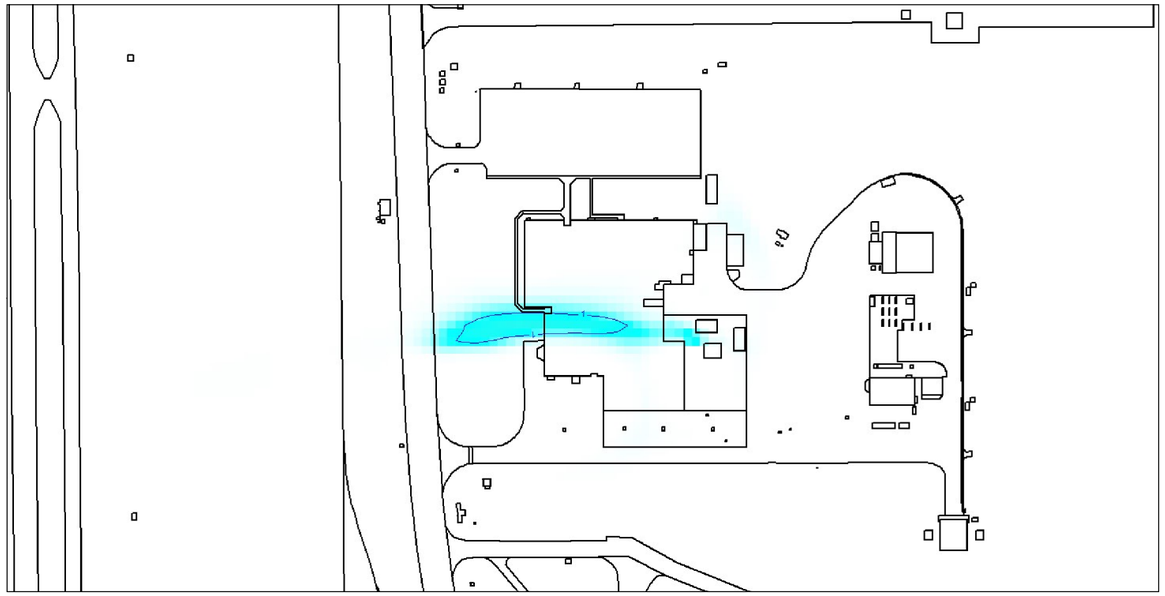


FIGURE 4-22 GROUNDWATER MODEL PROJECTIONS VS. ACTUAL YEAR 3 PLUME – INTERMEDIATE (20-40 FEET BLS)
SWMU 041, KENNEDY SPACE CENTER, FLORIDA

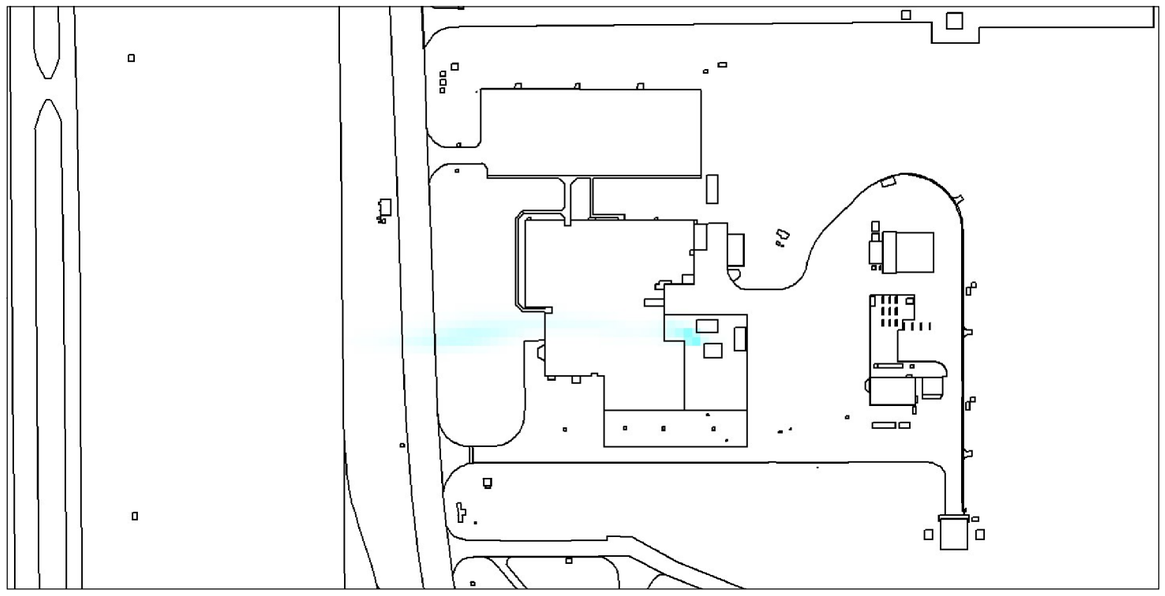
1 Year Future



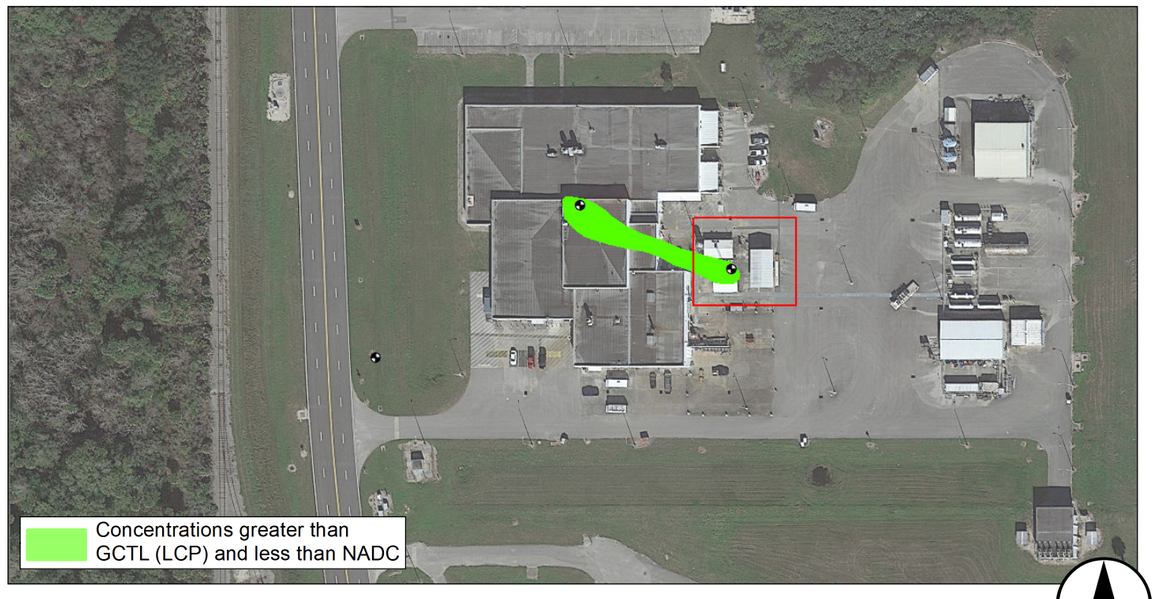
3 Year Future



5 Year Future



Year 3 Intermediate Plume (Actual, following July 2022 sampling event)



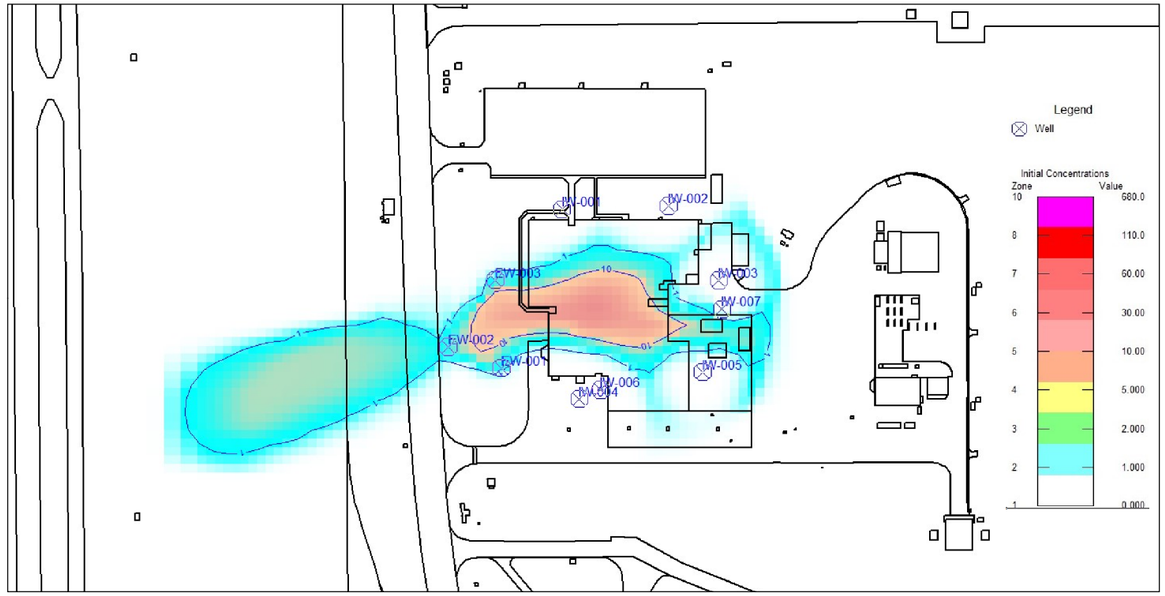
Note:
1) 1 Year, 3 Year, and 5 Year Future projections are based on the pumping scenario, as provided in February 2021 Year 1 Performance Monitoring Report.
2) Groundwater model projections and Year 3 plume based on vinyl chloride, which is the only remaining contaminant of concern above State of Florida GCTLs.
3) HCS startup completed in August 2019.

All concentrations in ug/L

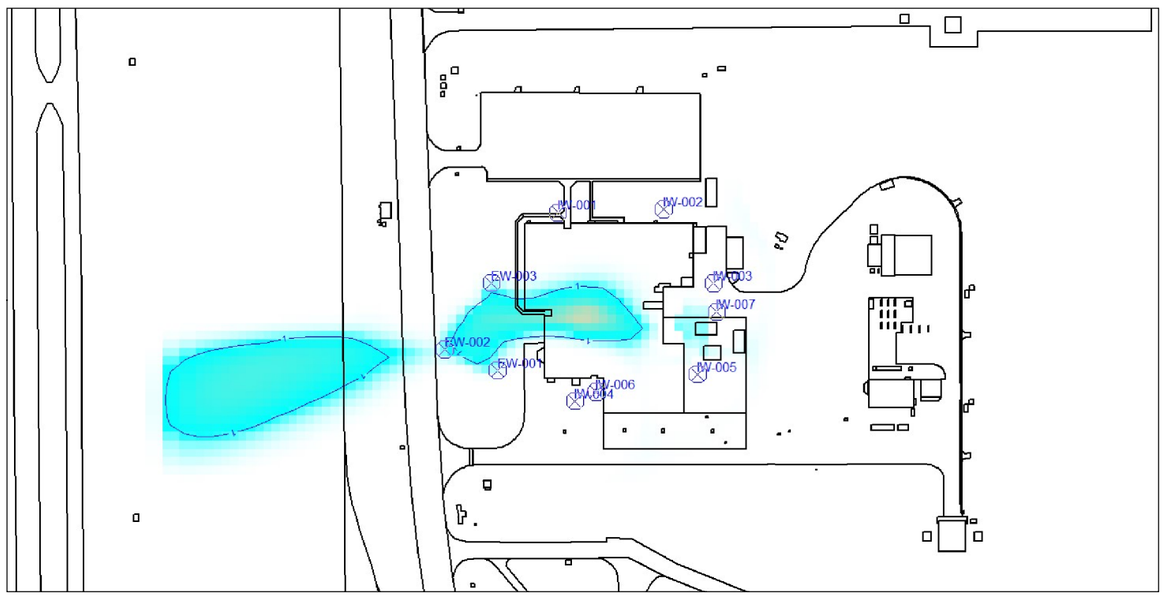
JAX C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\FIGURE_4-22_ONETHREEFIVE_JULY2020_INTERMEDIATE.MXD 05/19/23

FIGURE 4-23 GROUNDWATER MODEL PROJECTIONS VS. ACTUAL YEAR 3 PLUME MAP – DEEP (53-63 FEET BLS)
SWMU 041, KENNEDY SPACE CENTER, FLORIDA

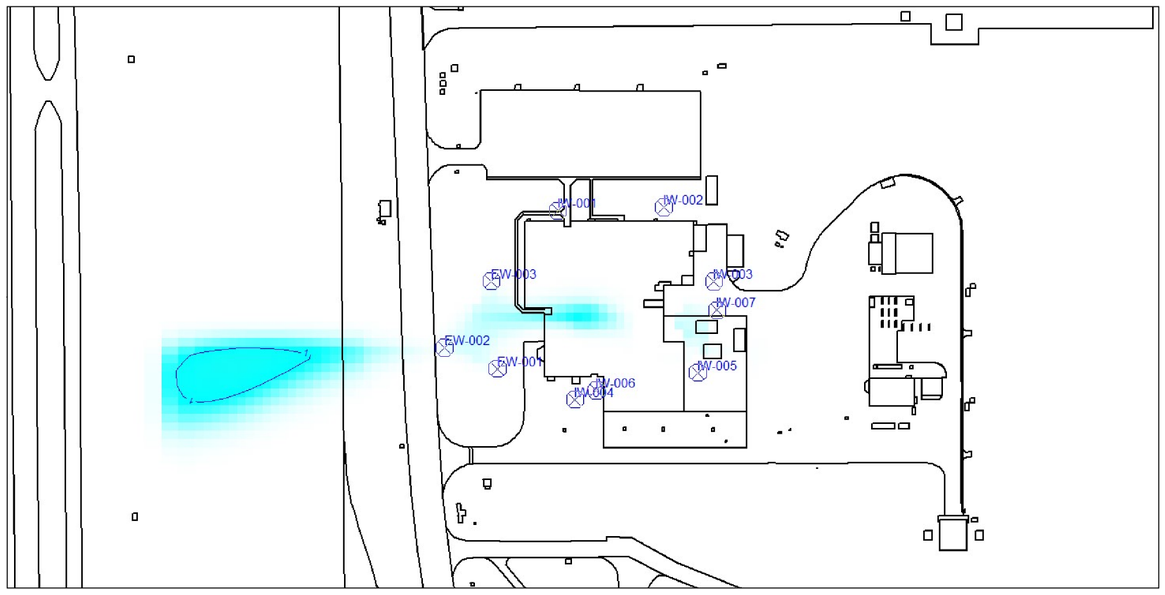
1 Year Future



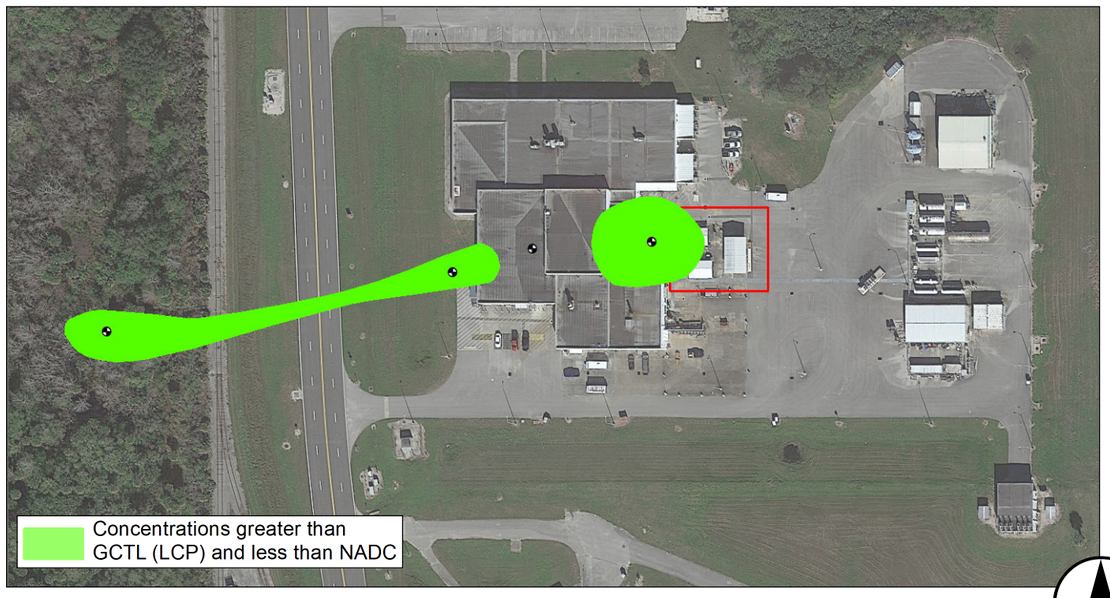
3 Year Future



5 Year Future



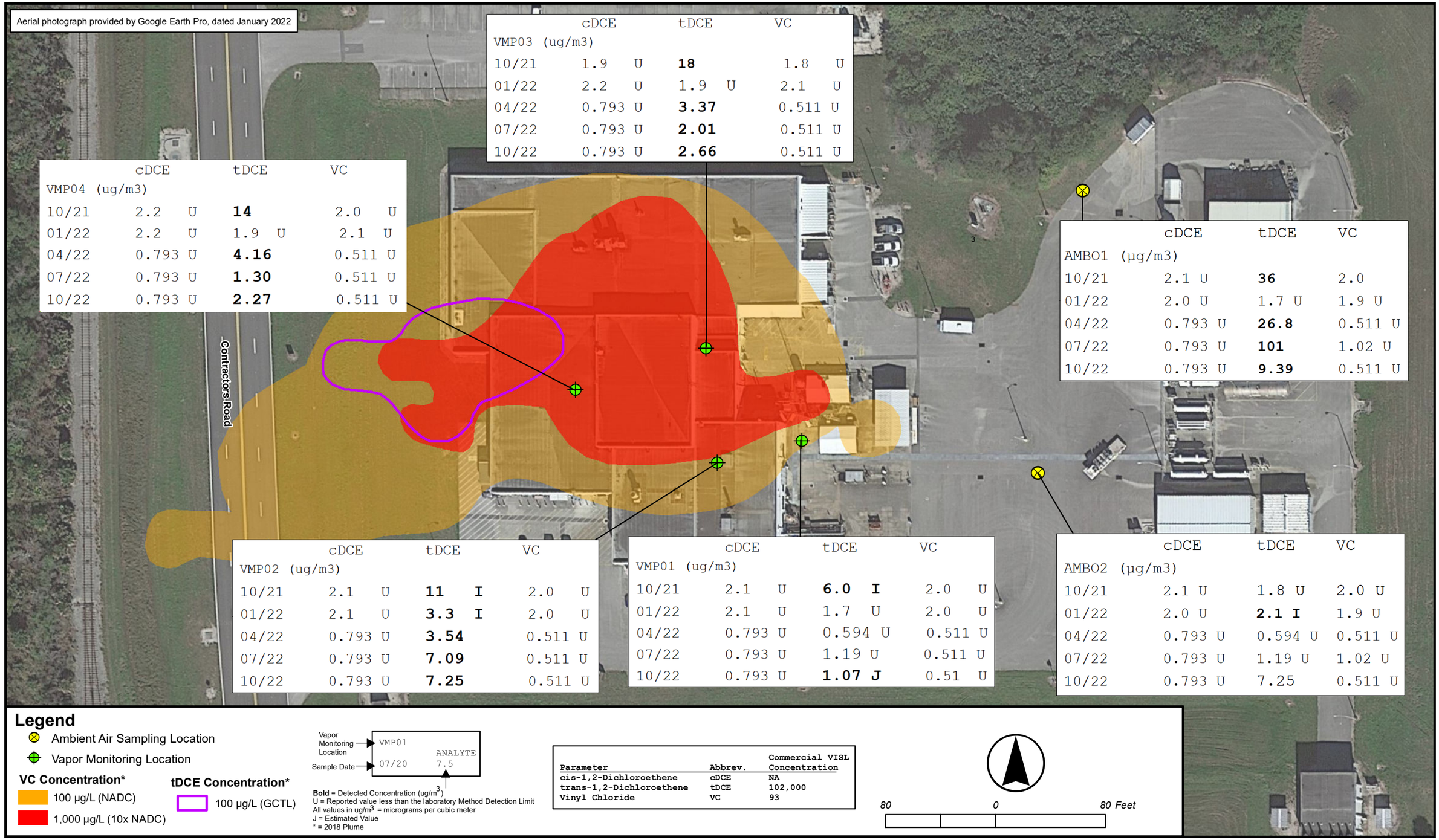
Year 3 Deep Plume (Actual, following October 2022 sampling event)



Note:
1) 1 Year, 3 Year, and 5 Year Future projections are based on the pumping scenario, as provided in February 2021 Year 1 Performance Monitoring Report.
2) Groundwater model projections and Year 3 plume based on vinyl chloride, which is the only remaining contaminant of concern above State of Florida GCTLs.
3) HCS startup completed in August 2019.

All concentrations in ug/L

JAX C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\FIGURE_4-23_ONETHREEFIVE_JULY2020_DEEP_.MXD 05/19/23



VMP03 (ug/m3)	cDCE	tDCE	VC
10/21	1.9 U	**18**	1.8 U
01/22	2.2 U	1.9 U	2.1 U
04/22	0.793 U	**3.37**	0.511 U
07/22	0.793 U	**2.01**	0.511 U
10/22	0.793 U	**2.66**	0.511 U

VMP04 (ug/m3)	cDCE	tDCE	VC
10/21	2.2 U	**14**	2.0 U
01/22	2.2 U	1.9 U	2.1 U
04/22	0.793 U	**4.16**	0.511 U
07/22	0.793 U	**1.30**	0.511 U
10/22	0.793 U	**2.27**	0.511 U

AMBO1 (µg/m3)	cDCE	tDCE	VC
10/21	2.1 U	**36**	2.0
01/22	2.0 U	1.7 U	1.9 U
04/22	0.793 U	**26.8**	0.511 U
07/22	0.793 U	**101**	1.02 U
10/22	0.793 U	**9.39**	0.511 U

VMP02 (ug/m3)	cDCE	tDCE	VC
10/21	2.1 U	**11 I**	2.0 U
01/22	2.1 U	**3.3 I**	2.0 U
04/22	0.793 U	**3.54**	0.511 U
07/22	0.793 U	**7.09**	0.511 U
10/22	0.793 U	**7.25**	0.511 U

VMP01 (ug/m3)	cDCE	tDCE	VC
10/21	2.1 U	**6.0 I**	2.0 U
01/22	2.1 U	1.7 U	2.0 U
04/22	0.793 U	0.594 U	0.511 U
07/22	0.793 U	1.19 U	0.511 U
10/22	0.793 U	**1.07 J**	0.51 U

AMBO2 (µg/m3)	cDCE	tDCE	VC
10/21	2.1 U	1.8 U	2.0 U
01/22	2.0 U	**2.1 I**	1.9 U
04/22	0.793 U	0.594 U	0.511 U
07/22	0.793 U	1.19 U	1.02 U
10/22	0.793 U	7.25	0.511 U

Legend

- Ambient Air Sampling Location
- Vapor Monitoring Location

VC Concentration*
- 100 µg/L (NADC)
- 1,000 µg/L (10x NADC)

tDCE Concentration*
- 100 µg/L (GCTL)

Vapor Monitoring Location → VMP01 ANALYTE
Sample Date → 07/20 7.5

Bold = Detected Concentration (ug/m^3)
U = Reported value less than the laboratory Method Detection Limit
All values in ug/m^3 = micrograms per cubic meter
J = Estimated Value
* = 2018 Plume

Parameter	Abbrev.	Commercial VISL Concentration
cis-1,2-Dichloroethene	cDCE	NA
trans-1,2-Dichloroethene	tDCE	102,000
Vinyl Chloride	VC	93

80 0 80 Feet

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SECTION V
CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

After three years of operation, the HCS is performing as designed to hydraulically control the CVOC plume and reduce concentrations of CVOCs to support transition to MNA. Current plume conditions suggest that the predicted course, based on Year 2 groundwater modeling predictions of transition to MNA in one to two years with continuous HCS operation, remains valid. The HCS has treated over 27 million gallons of groundwater since startup and has reduced concentrations of tDCE to below the MDL sitewide and reduced concentrations of VC by over 97%.

Ambient air sampling results for the treatment trailer area and within the paved driveway east of the Solvent Reclamation Area continue to be significantly below OSHA PELs and demonstrate breathing air safety for on-site personnel. In addition, sub-slab sampling results after three years of HCS operation do not show any exceedances of commercial EPA VISLs and indicate no effect from HCS operation in the CRCA building workspace.

Performance of the HCS has been operating as designed with only brief interruptions due to routine maintenance, Hurricane Ian, and repairs. The most noteworthy system repair during Year 3 HCS operation involved replacement of the blower motor for the air stripper. The operational runtime of the HCS from September 2021 to October 2022 (Year 3) was approximately 91%.

Overall plume conditions indicate some increasing VC concentrations in the most downgradient monitoring well (MW0032) from the HCS. This may be attributed to the general westward groundwater flow direction from the CRCA property and the location of MW0032, which is outside the radii of influence of the three EWs to the east. DPT sampling is on-going to further delineate the downgradient plume and confirm overall site-wide LCP boundaries.

5.2 RECOMMENDATIONS

The HCS performance detailed in this report and the PMR ADP were presented to the KSCRT in February 2023 (Meeting Minute 2302-M08, Decisions 2302-D13 through -D15). Team consensus was reached on several items including continued operation and evaluation of the HCS to maintain hydraulic control of the groundwater plume and further reduce VC concentrations, continued ambient air and vapor monitoring sampling, and continued performance monitoring with the following changes:

- Discontinue MW0027 from the sampling schedule due to non-detect results.
- Remove MEE and microbials from the analyte list for Year 4. Performance monitoring of four wells (quarterly) and two wells (semi-annually) will continue for VOCs only.

The proposed Year 4 Sampling Plan (2023-2024) is presented in Table 5-1 and on Figure 5-1. This includes replacement of monitoring well MW0019 and accompanying sub-slab sampling point VMP04, which is recommended to be installed during construction of the "non-clean room" area, as shown on the Relocation Schematic (Figure 5-2). The new location will be in a lab storage room located east of the current location. The relocation of MW0019 and VMP04 was discussed with the FDEP, and subsequent approval was received via email in October 2022. The purpose for relocation is that the room where MW0019 and VMP04 are currently located, will undergo construction from a storage room to a "clean room". The existing locations of MW0019 and VMP04 are recommended for proper abandonment as part of the relocation process.

Additionally, plans continue with ongoing DPT sampling to further delineate the downgradient plume edge and confirm overall site-wide LCP boundaries. Findings from the DPT groundwater investigation will be presented to the KSCRT along with recommendations for installation of new monitoring wells, as warranted.

In addition, select existing monitoring wells and DPT samples will be analyzed for PFAS to follow-up on the detection from a sample collected by others in 2021 as part of the on-going Center-wide PFAS sampling effort. Once available, these results, consisting of two separate

monitoring well events and two DPT sampling events will be presented to the KSCRT in a separate PFAS Site assessment ADP and a Site Assessment Report.

Table 5-1. Proposed Sampling Plan for Year Four (2023).

Monitoring Well	Screen Interval (ft bls)	Jan-23	Apr-23	Jul-23	Oct-23	Rationale
		Sample for VOCs via EPA Method 8260D				
MW0002	[30-35]	X	-	X	-	VC concentration above GCTL in January 2022 and July 2022. Continue semiannual performance monitoring. Within LCP.
MW0013	[25-30]	X	-	X	-	VC concentration at GCTL in January 2022 and above GCTL in July 2022. Continue semiannual performance monitoring sampling as is.
MW0018	[53-63]	X	X	X	X	VC concentration above GCTL in all Year 3 sampled quarters. Continue quarterly performance monitoring as is.
MW0019	[53-63]	X	X	X	X	VC concentration at GCTL in July 2022, and below GCTL at other Year 3 sampled quarters. Continue quarterly performance monitoring as is.
MW0031	[53-63]	X	X	X	X	VC concentration above GCTL in all sampled quarters. Continue quarterly performance monitoring as is.
MW0032	[53-63]	X	X	X	X	VC concentration above GCTL in all sampled quarters. Continue quarterly performance monitoring as is.

Notes:

VOCs = Volatile Organic Compounds.

ft bls = feet below land surface.

GCTL = State of Florida Groundwater Cleanup Target Level.

VC = vinyl chloride.

Aerial photograph provided by Google Earth Pro, dated January 2022

Contractors Road

MW0021 [30-40]
IW0002
IW0001
MW0020 [53-63]
MW0022 [30-40]
MW0023 [53-63]
MW0011 [5-10]
IW0003
MW0029 [30-40]
MW0030 [53-63]
MW0013 [25-30]
MW0012 [25-30]
MW0004 [5-15]
EW0003
IW0007
MW0005A [5-10]
MW0018 [53-63]
MW0019 [53-63]
MW0003 [5-15]
MW0005C [2-7]
MW0010 [5-15]
MW0031 [53-63]
MW0001 [5-15]
EW0002
MW0009 [5-15]
MW0002 [30-35]
MW0005 [5-15]
MW0005B [12-17]
EW0001
MW0008 [5-15]
IW0005
Chemical Process Area
MW0026 [5-15]
MW0014 [5-10]
MW0006 [5-15]
MW0027 [30-40]
IW0006
MW0007 [5-15]
MW0015 [25-30]
MW0017 [25-30]
MW0028 [53-63]
IW0004
MW0025 [53-63]
MW0016 [5-10]
MW0024 [53-63]
MW0032 [53-63]

Legend

- Existing Monitoring Well (CRCA)
- Groundwater Injection Well (CRCA)
- Groundwater Extraction Well (CRCA)
- MW0019 Relocation
- Chemical Process Area

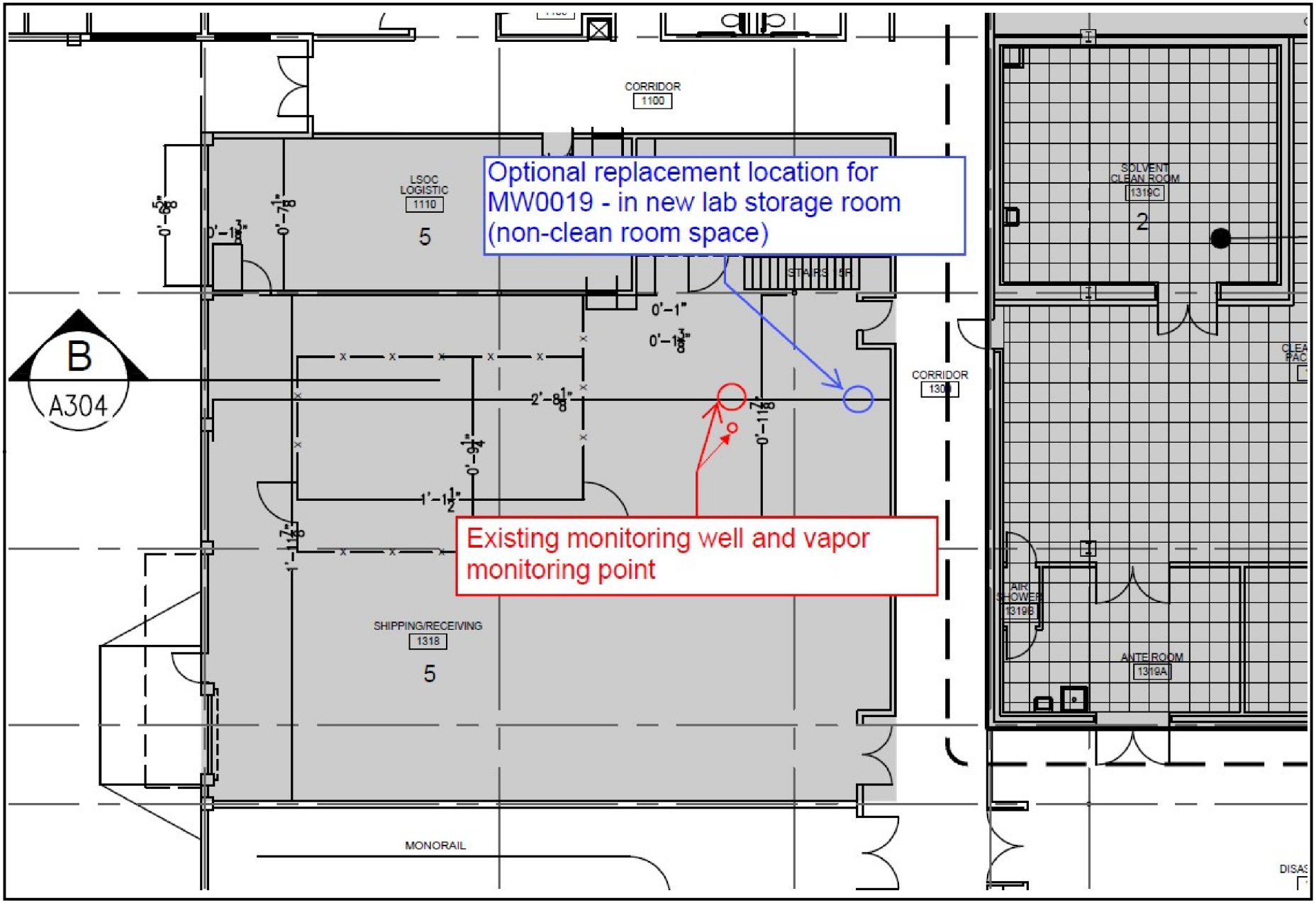
Green shade=Quarterly Performance Monitoring (Year 4)
Orange shade=Semi-Annual Performance Monitoring (Year 4)
Yellow box indicates Year 3 monitoring well removed from HCS performance schedule for Year 4.

100 0 100 Feet

JAX C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\5-2_CRCA_MW_PERFORMANCE_SAMPLING_YEAR4.MXD 03/16/23

FIGURE 5-2 MW0019 RELOCATION SCHEMATIC

SWMU 041, KENNEDY SPACE CENTER, FLORIDA



JAX:C:\GIS\KSC\MXD\CRCA\STEP 2\MXD\5-1_CRCA_MW19_RELO.MXD 2/1/2023 JM

SECTION VI
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APPENDIX A
KSCRT MEETING MINUTES

Revision 0 Meeting Minutes for February 7th and 8th, 2023

Attendees:

1. Evan Miller/FDEP
2. Jason French/FDEP
3. Ryan O'Meara/NASA
4. Deda Johansen/NASA
5. Anne Chrest/NASA
6. Natasha Darre/NASA
7. Chris Adkison/NASA
8. Michelle Moore/NEMCON
9. Mark Jonnet/Tetra Tech
10. Alex Murphy/Tetra Tech
11. Mark Speranza/Tetra Tech
12. Sarah Damphousse/Tetra Tech
13. Chris Neumann/Tetra Tech
14. Andrew Walters/Tetra Tech
15. Debbie Wilson/Tetra Tech
16. Chris Hook/Tetra Tech
17. Chris Pike/Tetra Tech
18. Jennifer Gootee/AECOM
19. Linnea King Clark/AECOM
20. Megan Garcia/AECOM
21. James Montague/AECOM
22. Randy Sillan/AECOM
23. Richard Smith/HGL
24. Jay Santa/HGL
25. Robert Lynch/HGL

2302-M08 Alex Murphy/Tetra Tech

Component Refurbishment and Chemical Analysis (CRCA) Facility (SWMU# 041) Performance Monitoring , February 2023

Objective: This advance data package (ADP) provides a summary of Year 3 of the hydraulic containment and treatment system operation and maintenance, performance groundwater sampling, sub-slab vapor monitoring, air monitoring results, and test consensus statements on a path forward.

Discussion: Over 27 million gallons of groundwater have been successfully treated at CRCA from startup in July 2019 through October 2022. Hydraulic capture is performing as designed and mitigating downgradient migration of vinyl chloride (VC).

During Year 3, influent and effluent samples were collected monthly for volatile organic compound (VOC) analysis. Groundwater VOC samples were collected from four monitoring wells quarterly and three additional wells semi-annually. Water levels were measured in all site monitoring wells quarterly. Sub-slab vapor samples from four vapor pins installed beneath the CRCA foundation were sampled quarterly for VOC analysis. Ambient air monitoring was conducted

using a direct reading instrument outside the water treatment building and at a background location.

Though VC concentrations remain above the Florida Groundwater Cleanup Target Level (GCTL) of 1 µg/L in select areas, they are decreasing over time in the monitoring wells. VC concentrations show a 97% reduction in the hydraulic containment system (HCS) system influent from startup through July 2022. Trans-1,2-dichloroethene (tDCE) is a major component of Vertrel™ MCA, the product which was released. Its concentrations remained undetected at all wells during the Year 3 HCS operational period, except one detection of 1.1 J µg/L in January 2022 in MW0002. The system is operating as designed with only brief interruptions due to routine maintenance and minor repairs. A runtime of 90% was achieved for Year 3. Ambient air sampling results for the treatment trailer area continue to be significantly below OSHA permissible exposure limit (PEL) levels. Similarly, sub-slab sampling results continue to show levels below commercial the Environmental Protection Agency (EPA) vapor intrusion screening levels (VISLs), with no impact to workers expected inside Building K6-1696.

Monitoring well MW0019 is under the building. Due to a remodeling project, that well will be abandoned and a replacement installed nearby, still beneath the building. The Department of Environmental Protection reviewed and approved of the proposed new location.

The Team reached consensus to continue operation and evaluation of the HCS to maintain hydraulic control of the groundwater plume and to further reduce VC concentrations **(2302-D13).**

The Team reached consensus to continue performance monitoring at the designated locations as outlined on Slide 42 (CRCA-MW0002, MW0013, MW0018, MW0019, MW0031 and MW0032). Monitoring well MW0027 will be removed from the sampling schedule as this well showed no detections during the Year 3 reporting period **(2302-D14).**

The Team reached consensus to continue ambient air and vapor monitoring sampling **(2302-D15).**

Results: Decision Items 2302-D13, D14, D15

Revision 1 Meeting Minutes for November 9 & 10, 2021

Attendees:

1. Bruce Moore/FDEP
2. Mike Deliz/NASA
3. Ryan O'Meara/NASA
4. Deda Johansen/NASA
5. Anne Chrest/NASA
6. Natasha D:lffe!NASA
7. Dinh Vo/NASA
8. Michelle Moore/NEMCON
9. Mark Speranza/Tetra Tech
10. Chris Neumann/Tetra Tech
11. Chris Pike/Tetra Tech
12. Jennifer Buel/Tetra Tech
13. Alex Mmphy/Tetra Tech
14. Scott Anderson/Tetra Tech
15. James Lloyd/Tetra Tech
16. Mark Jonnet/Tetra Tech
17. Debbie Wilson/Tetra Tech
18. Sarah Damphousse/Tetra Tech
19. Jermifer Joyal/AECOM
20. Linnea King Clark/AECOM
21. Chad Lee/AECOM
22. Richard Smith/HGL
23. Howard Fowler/HGL

2111-M04 Alex Mm·phy/Tetl'a Tech

Components Refm·bishment ancl Chemical Analysis Facilitv (SWMU #041) Yea!' 2 Pel'formance Monitol'ing, Novembel' 2021

Goal: The pmpose of the ADP is to smnmarize the Components Refurbishment and Chemical Analysis (CRCA) Year 2 Hydraulic Containment System (HCS) for Hot Spot 1 (HSl) Annual Pe1fonnance Monitoring Report (PMR).

Discussion: The advance data package (ADP) presented during the November 2021 Kennedy Space Center Remediation Team (KSCRT) meeting sununarized the investigation and site histo1y of CRCA: the HCS system operation pe1formance from September 2020 through August 2021 (Year 2 of system operation): Year 2 groundwater. sub-slab vapor. and ambient air analytical results: and updated grnundwater model based on Year 2 data collection.

The medium of concem at CRCA is groundwater. The contaminants of concem are vinyl chloride (VC) and trans-1.2-dichloroethene (tDCE). The primaiy Interim Measure (IM) objective is to attain hydraulic control of a dissolved-phase chlorinated volatile organic carbon (CVOC) plume. The seconda1y IM objective is to reduce concentrations of CVOCs in HS 1 and the high concentration plume (HCP) to support transition to monitored natural attenuation (MNA).

Cleaning operations at the site went from using trichloroethene to Freon 113 to Vertrel MCA. Vertrel MCA consists oftrans-1.2-dichloroethene and decafluoropentane. It was that product which was released. As of July 2021. VC (a breakdown product of trans-1.2-dichloroethene) was the only contaminant remaining above its groundwater cleanup target level (GCTL). Concentrations show a decreasing trend since start-up of the hydraulic containment and treatment system. The groundwater model update forecasts attainment of GCTLs in approximately 11 years under cun-ent pumping conditions. vVithout the hydraulic contaimnent system. contaminant migration to the west (downgradient) would resume.

Referencing Slide 12. FDEP pointed ont that the volume of water extracted and the volume of water injected for the year do not balance (volume injected is greater than vohune extracted) and inquired why. Tetra Tech replied that they have looked at that difference. and cannot fully explain it. The engineers speculate that it has to do with aerated water leaving the treatment system not registering coffectly in the flow meters.

FDEP initiated a discussion about contaminant migration. The down gradient well. MW0032, was positioned just beyond the leading edge of the VC plume based on direct push technology (DPT) groundwater sampling completed in 2018 in the wooded area between the railroad tracks and State Road 3/Kennedy Parkway. No contaminants were detected in the initial sample. but VC has been above its GCTL in most samples since 2020. FDEP inquired where the westem limit of groundwater capture was. Tetra Tech explained that the design radius of influence (ROI) was 75 feet. The pump test (step test with greater load on aquifer 2.5 times the design rate) and a constant rate test (24 hours) conducted before full system construction showed influence in a monitoring well located about 400 ft from the wells; a greater influence than the design was based on. The extraction wells are intended to effectively capture the plume under the building. Tetra Tech estimates the approximate actual capture is in the neighborhood of75 feet.

FDEP inquired what portion of the plume to the west is hydraulically cut off from the source area while pumping? Tetra Tech responded that no significant amomlt ofVC is expected to migrate to the westem area. NASA added that there was dissolved contamination ah·eady beyond the influence of the extraction wells at the time the containment system was installed. A DPT investigation is planned for late this year or early next to evaluate plume migration. Results will be briefed to the Team and new monitoring well locations proposed. Tetra Tech noted that the area between the railroad tracks and State Road *3* often has standing water, and there will therefore be some constraints to sampling. FDEP conctmed with this path forward.

NASA related that CRCA MW0003 had been sampled for per- and polyfluorinated substances (PFAS) as part of the Center-wide PFAS Confinnato1y Sampling. The perfluorooctanoic acid result was 204 palis per trillion (ppt). FDEP asked if the source of PFAS was known and if it was near that well. and what if the timing for further PFAS investigation.

NASA replied that initial PFAS sampling is planned to take place this fiscal year. PFAS precursor chemicals were identified in the CRC chemical invento1y, but a specific source has not been identified. FDEP inquired if operation of the HCS at this site would exacerbate the PFAS distribution. to which NASA responded that this system is. at a minimum, recirculating what is there. FDEP inquired if there was any purge or decontamination wastewater generated here from sampling operations? NASA responded that liquid investigative derived waste is routed tlu·ough the site's water treatment system.

The Team reached consensus to continue operation and evaluation of the hydraulic containment system to maintain hydraulic control of the chlorinated volatile organic compound grotmdwater plume and to further reduce vinyl chloride concentrations **(2111-D12).**

The Team reached consensus to continue perfonuance monitoring at designated locations outlined on slide 5l of the ADP, with the removal of monitoring wells MW0012, MW00l 5. MW0028, MW0029. and MW0030 from the sampling schedule. These wells showed no detections during the Year 2 reporting period. Wells MW0018. MW0019. MW0031 and MW0032 will be sampled quarterly and wells MW0002. MW0013 and MW0027 will be sampled semiannually **(2111-Dl3).**

The Team reached consensus to continue ambient air and vapor monitoring sampling. with the addition of a background ambient air sample to assist in distinguishing potential contributions from routine facility operations **(2111-D14).**

Full Meeting Record

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Meeting Code	Entry Date	Start Date	End Date	Type	Location
2010	2/1/2021	10/8/2020	10/8/2020	Full Partnering Team Meeting	Kennedy Space Center-FL

Description

October 2020 Full Partnering KSC Team Meeting

Attendees

: Eric Sager; Robert Simcik
AECOM: Jennifer Joyal; Randy Sillan
FDEP: Laura Barrett; Kirk Johnson
HGL: Carol Cady; Howard Fowler; Richard Smith
NASA: Anne Chrest; Mike Deliz; Deda Johansen; Ryan O'Meara; Dinh Vo
Tetra Tech: Sarah Damphousse; Mark Jonnet; James Lloyd; Mark Speranza; Andrew Walters; Deborah Wilson

Minute Id	Presenter	PRL SWMU
M2	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic

Components Refurbishment and Chemical Analysis (CRCA) Solid Waste Management Unit (SWMU) #041, Year 1 Operations Maintenance and Monitoring, October 2020

Discussion

Installation, startup, and commissioning of the HCS was previously presented in the June 2020 CRCA HCS Mid-Year Performance Monitoring ADP. CRCA is located east of Contractors Road, approximately 1 mile north of Schwartz Road. The site consists of Building K6-1696 and the surrounding support building and structures, including the Chemical Processing Area (CPA).

The groundwater contaminant plume at CRCA consists of a 6.54-acre Low Concentration Plume (LCP) where CVOC concentrations exceed Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs). Within the LCP is a 2.07-acre High Concentration Plume (HCP) where CVOC concentrations exceed FDEP Natural Attenuation Default Concentrations (NADCs), and within the HCP is a 0.8-acre Hot Spot (HS) where CVOC concentrations exceed 10 times (10X) NADCs. Approximately 88-percent of the CVOC plume mass is vinyl chloride (VC) based on pre-IM sampling. The primary IM objective is to attain hydraulic control of the dissolved-phase CVOC plume, and the secondary objective is to reduce concentrations of CVOCs via an IM to support transition to monitored natural attenuation (MNA).

Startup and prove-out activities were conducted from July 22 through August 16, 2019 and included a pre-commissioning check, functional performance tests, and system balancing of the extraction wells (EWs) and injection wells (IWs). The target design flow rate of each EW is 7 gallons per minute (gpm) and of each IW is 3 gpm.

Full-scale operation subsequently began after system balancing and continued through August 2020 (end of the reported operational period) and consisted of monthly air stripper cleaning, influent/effluent sampling for VOCs, and routine maintenance. The HCS performance flow rates and total gallons processed from August 2019 through August 2020, are listed on slide 10 of the ADP.

During this operational period, quarterly performance groundwater sampling was conducted in June 2019 (baseline sampling), October 2019, January 2020, April 2020, and July 2020. Additionally, sub-slab vapor monitoring and ambient air sampling were collected in October 2019, January 2020, April 2020, and July 2020 to determine if the HCS has potentially impacted indoor air for the workers present at the CRCA facility. No CVOC analytes were detected at concentrations exceeding their respective Commercial Vapor Intrusion Screening Levels (VISLs) in the sub-slab vapor samples, and all ambient air sample results were below the OSHA Personal Exposure Limit (PEL) for each constituent analyzed. No adjustments to the HCS system are currently needed based on these results.

Results of the groundwater performance monitoring were provided on slide 28. Data evaluation over the Year 1 operational period shows that all VOCs are less than NADCs with the exception of monitoring well (MW) MW0018 (110 g/L for VC). tDCE has been less than GCTL since before the

baseline groundwater sampling event in June 2019. VC is generally decreasing in all wells during the operation period with only slight rebound in 6 monitoring wells during the July 2020 sampling event (MW0012, MW0013, MW0018, MW0019, MW0028, and MW0031). Monitoring wells MW0003, MW0020 through MW0027, and MW0029 have shown no observed VC concentrations above laboratory method detection limits since baseline sampling. These wells are proposed to be removed from the performance sampling program.

Additionally, groundwater modeling was conducted based upon data collected during Year 1 operations to simulate site-specific surficial aquifer conditions, assess groundwater flow in 3-dimensions, and predict future groundwater remediation response to optimize and streamline long-term operations. Data inputs to the groundwater model consisted of twenty-one boring logs, seven synoptic groundwater level events, 3 to 5 slug tests at all well locations (except MW0013), pumping tests at EW0002, infiltration tests at three IWs, sieve analysis, HPT logging, and chemical analysis from baseline and quarterly groundwater sampling events.

Conclusions based on the groundwater modeling results forecast that, with continued system operation, VC reaches GCTL in approximately 4 to 5 years for all areas except for MW0018. Increasing the injection rate at IW0005 to increase flushing at MW0018 is recommended to expedite groundwater cleanup.

Over eight million gallons have successfully been treated through the HCS system during this operation period. VC concentrations in the groundwater remain above the GCTL of 1 g/L but are decreasing over time, with an 86% reduction in VC since startup.

The path forward for HCS is continued operation and evaluation to maintain hydraulic control of the groundwater plume and to further reduce VC concentrations, continue quarterly sampling of 3 monitoring wells and semiannual sampling of 7 monitoring wells, and to update the Groundwater Model and Transport Evaluation during Year 2 operation reporting.

FDEP inquired if any of the green or yellow shaded wells on Slide 11 are also sampled annually. Tetra Tech stated none of the wells are currently in an annual sampling event.

FDEP noted that there is only one point of compliance well, MW0018. How confident is the Team that there are no other concentrations within that area that are not monitored? Should there be an additional well in a downgradient location? Tetra Tech pointed out data on slide 32 for mid-plume monitoring wells that show decreasing VC results, indicating that the aquifer conditions promote VOC reduction. During each LTM event, data always supported the conclusion that this was a solid reducing environment, resulting in high confidence that the VC on the downgradient side will attenuate. If we need to consider further delineation in the wooded area, this is something that can be discussed; it is projected that the Team will continue to see concentration decreases in this area.

NASA stated their belief is that this VC plume had already passed the point of the extraction wells before the HCS was installed. Based on observations and water level measurements, NASAs suspicion is that the VC plume has not migrated into this area since HCS startup by was already in that area but acknowledged the VC concentration does merit close watching.

FDEP inquired if the June 2019 sample was the first because MW0032 had just been installed. Tetra Tech replied yes and brought up slide 6 to show the locations of 2016-2018 direct push technology (DPT) samples taken from the water table to about 55ft at every depth interval. Most performance monitoring wells were installed after that sampling event. FDEP asked if the system has been operating for one year? If so, would it make sense to keep in the quarterly sampling event to have more data? The HCS had been running for 1 year in August 2020. NASA stated that this well (MW0032) is in the semi-annual sampling event, but they can add it to the quarterly event if preferred. FDEP stated that they would want to know as early as possible if you are not seeing contaminant decreases in that well; quarterly sampling could bring it to our attention sooner. NASA took an action item to transition MW0032 to quarterly monitoring.

FDEP noted that, in terms of depth, it looks like the Team only evaluated to 63 below land surface (bls); and inquired if there is additional data where the Team has sampled deeper than that with DPT? Tetra Tech stated there are physical limitations with a tight confining layer at approximately 55-63 bls at the site. The Team did not want to punch through that confining layer and create preferential pathways for contaminant migration. This is a tough formation to drill through, with additional physical limitations such as wetlands, woods, train tracks, etc. It was determined the concentrations essentially stop around that confining layer. NASA added that this same confining layer is p 1,2-trans-DCE and decafluoropentane) is the COC for this site. NASA worked with FDEP to come up with a risk-based cleanup target level for decafluoropentane with assistance from University of Florida.

VC is lower in density than water in product form. FDEP was interested to know if this was a sinking plume based on the plumes cross-section. DCE is slightly denser than water. Tetra Tech pulled up a past presentation (March 2018 CRCA Step 1 presentation) to show how the plume is migrating away from the chemical processing area and how the plume looked to have been just in the shallow zone at the time of the evaluation. Over the course of the DPT sampling events, the plume started migrating and VC concentrations start increasing and expanding west as you get deeper. The deepest zone is under the occupied building. The geology and plume were shown on slide 31 of the March 2018 presentation.

NASA added that they identified the plume when it was in the shallow zone and over time the plume has migrated deeper. However, the retarding unit has made it spread out laterally at this point. For some history on how we came to use Vertrel, NASA stated in the beginning of the space program that TCE was historically used as a precision cleaner for flight hardware. NASA then migrated to using Freon 113, and eventually

Vertrel MCA because it was supposedly more environmentally friendly (greener chemical).

FDEP inquired why the Team opted out of having a point of compliance well in the deeper 30 ft zone at this site? Why is there not a sister well in the MW0032 location? FDEP pointed out on slide 23 of the 2020 ADP that there exists a distinct plume west of the railroad tracks, but no point of compliance well in that area. Why is that? Tetra Tech looked up the past information for DPT 232 (which is the single downgradient point with a 30-40 ft. interval exceedance) to check and see what the results were. The concentrations at DPT 232 was 12 ug/L at the 30-40 ft interval, 4 ug/L below that, and at the 62ft interval there was non-detect. FDEP inquired what the concentration was in the area of MW0032. Tetra Tech stated that MW0032 is located between DPT232 and DPT233. DPT 233 results were non-detect at the 30-40 ft interval, 10 g/L at the 40-50 ft interval. FDEP pointed out that a well currently exists in the 53-63 ft interval and asked why a shallower well was not also installed in this location. Tetra Tech stated that the logic for a monitoring well was not to monitor degradation of the plume in that area, but to monitor the potential migration from the treatment zone after the HCS was installed. MW0032 is screened to capture the interval that the HCS targets.

FDEP noted there are not high concentrations in this area but wants to make sure we are monitoring the downgradient leading edge of the plume. The plume is supposedly captured now with VC concentrations at MW0032 increasing since HCS start-up. NASA acknowledged that a portion of the plume had already moved through and downgradient of the capture zone prior to HCS start-up, and that low-level VC has increased in the downgradient well over the two most recent sampling events. NASA will transition MW0032 to a quarterly sampling basis in order to watch the trends there more carefully. FDEP agreed with this. NASA inquired if FDEP would like a basket item reported after the next two quarters of sampling events to provide trends of this monitoring? FDEP stated they would. NASA took the action to present a basket item after the next two rounds of quarterly groundwater data, which will take place in October 2020 and January 2021.

FDEP pointed out the recent increase in concentrations at MW0018. To increase flushing in the vicinity of MW0018, Tetra Tech proposes to increase the injection rate at nearby injection well IW0005. The increased injection rate will be achieved by reducing injection rates at other wells. FDEP asked what the increasing VC concentrations at MW0018 are attributed to? Tetra Tech responded with an explanation from one of their professional geologists: MW0018 is one of the quarterly upgradient centerline wells and, based on the data, the geologist believes it is likely the plume collapsing and moving in toward the centerline that is being created by the extraction and injection wells. That would explain increased concentrations. Tetra Tech noted that the wells are taking in more water than designed. This will make it possible to balance out IW0005 by lowering flow rates in other injection well (say to 3.5-4gpm). The adjustment will increase the flushing at this well, which will be more of a focused approach than the current extraction/injection regime.

A groundwater model was developed for CRCA using MODFLOW and MT3D, and details were presented to the Team. Under current pumping conditions, VC is predicted to reach its GCTL in 4-5 years in all locations except the vicinity of MW0018, which is forecast to attain GCTL in 12 years. If groundwater extraction and treatment stopped now, rebound would occur and VC is forecast to take 10 years to reach GCTL.

FDEP observed that the concentrations at MW0018 didnt go up that much from April 2020 to June 2020. Do we have a downgradient MW to monitor? Tetra Tech responded that MW0019, MW0028, and now MW0032 are positioned along a flow path downgradient of MW0018 and will be sampled quarterly to monitor contaminant trends. FDEP had no objection to the path forward. FDEP has the March 2020 IGM report for review, and inquired if they will be receiving another report after that? NASA confirmed a CAMP date of December 2020 for the next report, and explained that the intent of briefing the Team before submitting plans and reports is so that any questions that arise through Team members review of the ADP and its presentation can be addressed and incorporated prior to submitting the report or plan.

FDEP inquired if the wells proposed for elimination are in the shallow zone? Tetra Tech stated they are in the shallow zone and intermediate zone. These wells were installed based on location of the plume prior to HCS start-up. Tetra Tech is proposing to eliminate the MWs since we feel we have good understanding of the current plume. From initial baseline sampling to current, we have had no contaminant detections in these locations that we are proposing to eliminate. For performance sampling only, we are looking to eliminate these from the sampling program. FDEP asked if Tetra Tech could show where the wells are in the context of the plume. Tetra Tech pulled up slides 31 and 32 in the current ADP to provide a detailed explanation with the depths of the wells. FDEP stated that it doesnt look like there exists a shallow plume anymore. Tetra Tech concurred with that. FDEP stated that groundwater was flowing from the east to the west, and inquired if there was a southern component? Tetra Tech confirmed that the flow was from the east to the west and there is not a southern component. FDEP inquired if the Team is comfortable eliminating these wells. Tetra Tech stated that if FDEP recommends that MW0027 and MW0029 be retained in the intermediate zone, they will be. FDEP confirmed they would like MW0027 and MW0029 retained. NASA added that we will have changing plume morphology at this site over time due to groundwater recovery and treatment, and to keep that in mind. We need to consider what wells to retain or eliminate over time as a result of the changes in plume morphology. DPT is now used for performance monitoring at site LC34 as a result of similar conditions.

FDEP observed that the data used to populate the groundwater model will not have a large temporal difference if the model is updated after the second year of operation. Tetra Tech did not disagree but noted that updating the model is fairly simple now that the model has been developed and validated.

Geochemical indicators ha

Goal

The objective is to summarize the groundwater interim measures (IM) hydraulic containment system (HCS) Year 1 operation and maintenance

(O&M) for the treatment of chlorinated volatile organic compounds (CVOCs) at the Components Refurbishment and Chemical Analysis Facility (CRCA).

Decision Id	Decision
D2	The Team reached consensus to increase the groundwater reinjection rate at IW0005 to increase flushing in the vicinity of MW0018.
D3	The Team reached consensus to continue performance monitoring with the following changes: remove monitoring wells MW0003, and MW0020 through MW0026 from the performance sampling program, MW0027 and MW0029 will be sampled semi-annually, and MW0032 will transition to quarterly sampling; eliminate sulfate, sulfide, nitrate, nitrite, carbon dioxide, iron, dissolved iron, and RCRA metals analyses from groundwater sampling events (continue analysis of VOCs, MEE, DHC, and VC reductase in quarterly performance monitoring wells); transition MW0028 to semiannual sampling.
D4	The Team reached consensus to update the groundwater model and transport evaluation after completion of the Year 2 operational period.

Act. Item Id	PLR/SWMU	Status	Date Closed
A1	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)	Active	
Responsible Party			
Deda Johansen			
Action Item			
NASA took an action item to transition MW0032 to quarterly monitoring.n			
Comments			
NASA took an action item to transition MW0032 to quarterly monitoring.			

Act. Item Id	PLR/SWMU	Status	Date Closed
A2	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)	Active	
Responsible Party			
Deda Johansen			
Action Item			
NASA took the action to present a basket item after the next two rounds of quarterly groundwater data, which will take place in October 2020 and January 2021.			
Comments			
NASA inquired if FDEP would like a basket item reported after the next two quarters of sampling events to provide trends of this monitoring? FDEP stated they would. NASA took the action to present a basket item after the next two rounds of quarterly groundwater data, which will take place in October 2020 and January 2021.			

Minute Id	Presenter	PRL SWMU
M3	Neumann, Chris	KSC HEADQUARTERS BUILDING AREA (SWMU 104)
Topic		
KSC Headquarters Building Area (KHQA) (SWMU #104) Perimeter Soil IM Completion, October 2020		
Discussion		
A soil investigation was conducted from February 2020 to April 2020 to delineate PCB contamination suspected from deteriorating painted columns on the exterior of the former Headquarters Building. No areas with PCBs equal to or greater than 50 mg/kg were discovered during this investigation. The IM Work Plan (IMWP), approved by the Florida Department of Environmental Protection (FDEP) in June 2020, was developed using the KSC PCB Generic Work Plan. The IMWP addressed the soil contaminated by paint residue only. Two electrical equipment substations locations with PCB contamination as a result of dielectric fluid releases are being addressed separately (Location of Concern [LOC] 2D and LOC 2E).		

Full Meeting Record

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Meeting Code	Entry Date	Start Date	End Date	Type	Location
2006	9/28/2020	6/18/2020	6/18/2020	Full Partnering Team Meeting	Kennedy Space Center-FL

Description

June 2020 Team Meeting

Attendees

: Eric Sager; Robert Simcik
AECOM: Krista Sommerfeldt
FDEP: John Winters
HGL: Brad Mitchell; Richard Smith; Scott Starr
NASA: Mike Deliz; Alex Garcia; Ryan O'Meara; Dinh Vo
Tetra Tech: Sarah Damphousse; Chris Hook; Mark Jonnet; James Lloyd; Alex Murphy; Chris Neumann; Mark Speranza; Deborah Wilson

Minute Id	Presenter	PRL SWMU
M2	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic

Component Refurbishment and Chemical Analysis Facility Solid Waste Management Unit (SWMU) #41 Pump and Treat Operations, Maintenance, and Monitoring, June 2020

Discussion

concentrations exceed FDEP Groundwater Cleanup Target Levels (GCTLs). Within the LCP is a 2.07 acre High Concentration Plume (HCP) where CVOC concentrations exceed FDEP Natural Attenuation Default Concentrations (NADCs). Within the HCP is a 0.8 acre Hot Spot (HS) where CVOC concentrations exceed 10 times (10X) NADCs. Approximately 88 percent of the CVOC plume mass is vinyl chloride (VC). The primary IM objective is to attain hydraulic control of the dissolved-phase CVOC plume and the secondary objective is to reduce concentrations of CVOCs via an IM to support transition to monitored natural attenuation (MNA).

Initial startup activities were conducted from July 22-26, 2019 and included a pre-commissioning check and functional performance tests. During functional performance tests extraction well (EW), equalization (EQ) tank, and air stripper pumps were each set to approximately one half of their respective design flow rates, and steadily increased until they reached two to three times their design flow rate in order to stress-test the system. Additionally, air stripper influent and effluent samples for VOC analysis were collected in 8-hour intervals during Day 1, and then daily for the remainder of Week 1.

System prove-out was conducted during weeks two through four (July 29 August 16, 2019), which included system balancing of EWs and injection wells (IWs). The target design flow rate of each EW is 7 gallons per minute (gpm) and of each IW is 3 gpm. Based on system prove-out, each EW was able to achieve and maintain the design flow rate of 7 gpm and each IW was able to achieve the following flow rates: IW0001 achieved 8.2 gpm, IW0002 achieved 8.5 gpm, IW0003 achieved 8.1 gpm, IW0004 achieved 0.1 gpm, IW0005 achieved 7.6 gpm, IW0006 achieved 4.0 gpm, and IW0007 achieved 10.9 gpm.

O&M continued through May 2020 and consisted of monthly air stripper cleaning, influent/effluent sampling for VOCs, and routine maintenance. During this operational period, quarterly performance groundwater sampling was conducted in June 2019 (baseline sampling), October 2019, January 2020, and April 2020. Additionally, sub-slab vapor monitoring and ambient air sampling was collected in October 2019, January 2020, and April 2020 to determine if the HCS has impacted the workers present at the CRCA facility. No CVOC analytes were detected at concentrations exceeding their respective commercial Vapor Intrusion Screening Levels (VISLs) in the sub-slab vapor samples, and all ambient air sample results were below the OSHA Personal Exposure Limit (PEL) for each constituent analyzed. No adjustments to the HCS system are currently needed based on these results.

Additionally during this operational period, maintenance to the system was conducted including the following: cleaning out the flow totalizers which increased the flow in IW0004 from 0.1 gpm to 3.6 gpm; conducting biological activity reaction tests (BART) and Redux 390 inject pilot test

to reduce scaling on the effluent bag filters; and level sensor replacement on the EQ tank float stem.

In summary, over six million gallons have successfully been treated through the HCS system during this operation period. VC concentrations in the groundwater remain above the GCTL of 1 ug/L, but are decreasing over time with a 90% reduction in VC since startup in May 2020. tDCE concentrations have been non-detect during the last two quarterly sampling events. The system is operating as designed with only brief interruptions due to routine maintenance. Daily introduction of Redux 390 amendment has significantly reduced system scaling and helped to maintain system design parameters. The increase of reductive dechlorination indicators suggest a favorable environment for detoxification of these contaminants. Ambient air sampling results for the treatment trailer area are significantly below OSHA PEL levels and sub-slab sampling results show the levels below commercial Environmental Protection Agency (EPA) VISLs.

The path forward for HCS is continued operation and evaluation to maintain hydraulic control of the groundwater plume and to further reduce VC concentrations, continued quarterly sampling of 4 monitoring wells and semiannual sampling of 16 monitoring wells (next event in July 2020), and preparation and submittal of the Groundwater Model in conjunction with the Year 1 Performance Monitoring (PM) Report.

Goal

The purpose is to summarize the groundwater interim measures (IM) hydraulic containment system (HCS) startup and operation and maintenance (O&M) for the treatment of chlorinated volatile organic compounds (CVOCs) at the Components Refurbishment and Chemical Analysis Facility (CRCA).

Minute Id	Presenter	PRL SWMU
M3	Willson, Deborah	KSC HEADQUARTERS BUILDING AREA (SWMU 104)

Topic

KSC Headquarters Building (SWMU) #104, Perimeter Polychlorinated Biphenyl (PCB) Excavation / Interim Measure Work Plan

Discussion

A soil investigation was conducted from February to April 2020 to delineate PCB contamination suspected from deteriorating painted columns on the exterior of the former Headquarters Building. The proposed excavation areas will remove all soil with PCBs exceeding 0.5 mg/kg. No areas with PCBs greater than 50 mg/kg were discovered during this investigation. The proposed IM includes 25 areas around the perimeter of the former Headquarters Building to depths ranging from 0.5 to 4 feet (ft) below land surface. The IMWP was developed using the PCB Generic Work Plan.

The path forward for this site is to conduct the proposed IM prior to demolition of the former Headquarters Building. Following demolition of the building, the previously scoped and funded soil remediation for location of concern (LOC) 2D and LOC 2E will be conducted.

Due to the condensed timeline the Team is working with in this situation, NASA will send this report out ahead of FDEPs written approval. FDEP stated they will make it a priority to review this plan once it is received.

FDEP inquired on the disposition of the root bulbs from trees and vegetation being removed as a result of excavation activities. Tetra Tech responded that trees and vegetation will be cut down to grade level. The root bulbs will be removed with the excavator and disposed of in the KSC landfill along with the contaminated soils. NASAs Alex Garcia confirmed that this waste can be disposed of at the KSC landfill. FDEP agreed with this response and requested that the root bulb details be added to the IMWP.

The Draft IMWP was then reviewed by the Team, and NASA suggested the disposition of the root bulbs from the excavation be addressed in the waste handling and disposal section of the document.

Goal

The purpose is to present an Interim Measure Work Plan (IMWP) for polychlorinated biphenyl (PCB)-contaminated soil at the KSC Headquarters Building Area (KHQA).

Decision Id	Decision
D2	The Team reached consensus on the delineation of PCBs in soil to the residential soil cleanup target levels (R-SCTL) (0.5 mg/kg) at the KHQA site.
D3	The Team reached consensus on the boundaries of the 25 excavation areas proposed for the IM at KHQA.

Minute Id	Presenter	PRL SWMU
M5	Mitchell, Brad	COMPONENT CLEANING FACILITY (SWMU 030)

Meeting Minutes Summary Report

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
03/22/2018	196	5	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Component Refurbishment and Chemical Analysis (SWMU 041)

Discussion:

Based on results of the 2016 DPT investigation, the plume is migrating west of Building K6-1696, tDCE present in 30-55 ft BLS zone is greater than GCTL, VC present west of Building K6-1696 is greater than 10 times NADC. Methane results greater than 1 milligram per liter (mg/L), and presence of ethene suggesting reducing conditions. Groundwater flow is generally to the south-southeast in the 0 to 20 feet BLS zone, and northwest in the 20 to 60-foot zones. However, the current monitoring well network may not be adequate to properly determine the groundwater flow direction

tDCE and VC are COCs in groundwater. TCE and cDCE have no results exceeding the GCTL.

Team consensus reached on that the horizontal and vertical extents are adequately delineated (Hot Spot, HCP, and LCP for entire site are defined).

Proposed Treatment Areas for evaluation:
Hot Spot – VC greater than 1,000 µg/L; Total mass of 35.36 lbs
HCP – VC greater than 100 µg/L, total mass of 12.58 lbs.

Site Conditions and Considerations:
Building K6-1696 covers approximately 90% of the HS and 50% of the HCP plumes. Paved asphalt over majority of CRCA facility.
Electric power available. Numerous utilities within the Chemical Processing Area (CPA).
Area west of plumes is densely vegetated, with areas of seasonal standing water when the water table is elevated.
Average Site Elevations – approximately 7 feet above mean sea level (msl) NAVD88.
Relatively flat terrain.
Drainage swales located on both the east and west sides of Contractor Road.
Groundwater depth varies between 3 and 5 feet below land surface.
Groundwater flow is generally to the south-southeast in the 0 to 20 feet BLS zone, and northwest in the 20 to 60-foot zones. However, the current monitoring well network may not be adequate enough to properly determine the groundwater flow direction.

Data Gaps:
VC and tDCE not delineated per KSCRT EE Process within Building K6-1696, CPA, and wooded area due to limited access.
Vertical delineation of VC to GCTL not complete below 64 feet BLS, as a confining clay layer was identified and do not want to create a possible preferential pathway for further vertical migration.
Potentially inadequate monitoring well network to determine groundwater flow.
Fraction of organic carbon (foc) is a data gap. A few samples may be needed and should be collected prior to any implementation.

Is there a vertical contaminant gradient? Is there a water leak that may be pushing contamination down?

Team consensus reached on the retainment of the following technologies for evaluation:
Alternative 1. Barrier: Air Sparging Curtain of HCP (including Soil Vapor Extraction [SVE] to mitigate potential vapor issues), Source Treatment: In-Situ Chemical Oxidation of Hot Spot.
Alternative 2. Barrier: Air Sparging Curtain for HCP (including SVE to mitigate potential vapor issues), Source Treatment: Biostimulation of Hot Spot.
Alternative 3. Barrier: Hydraulic Control for HCP (including Air Stripping/Carbon Absorption), Source Treatment: In-situ Chemical Oxidation of Hot Spot.
Alternative 4. Barrier: Hydraulic Control of HCP (including Air Stripping/Carbon Absorption), Source Treatment: Biostimulation of Hot Spot.

If hydraulic control is done, consider adding electron donor to reinjected water.

Goal:

Present Site Characterization and obtain Team consensus on path forward.

Decision:23	Team consensus reached on that the horizontal and vertical extents are adequately delineated (Hot Spot, HCP, and LCP for entire site are defined).

Decision:24	Team consensus reached on the retainment of the following technologies for evaluation: Alternative 1. Barrier: Air Sparging Curtain of HCP (including Soil Vapor Extraction [SVE] to mitigate potential vapor issues), Source Treatment: In-Situ Chemical Oxidation of Hot Spot. Alternative 2. Barrier: Air Sparging Curtain for HCP (including SVE to mitigate potential vapor issues), Source Treatment: Biostimulation of Hot Spot. Alternative 3. Barrier: Hydraulic Control for HCP (including Air Stripping/Carbon Absorption), Source Treatment: In-situ Chemical Oxidation of Hot Spot. Alternative 4. Barrier: Hydraulic Control of HCP (including Air Stripping/Carbon Absorption), Source Treatment: Biostimulation of Hot Spot.

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
03/22/2018	196	6	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Component Refurbishment and Chemical Analysis (SWMU 041)

Discussion:

Operations began in 1998 with cleaning of spacecraft components using several organic and inorganic chemicals. The primary solvent of concern is Vertrel MCA which is a mixture of tDCE (35-41%) and decafluoropentane (59-65%). This was historical stored and used in the Chemical Processing Area (CPA). Bulk storage tanks of Vertrel were removed from CPA, and Vertrel is now stored in Building K6-1696A. tDCE and VC are the primary contaminants of concern at the site. Decafluoropentane has not been sampled in groundwater since 2006 (detected in groundwater sample DPT0103 in the 55 feet BLS zone at a concentration of 28.1 µg/L, less than the FDEP GCTL of 49 µg/L).

Based on VOC groundwater concentrations beneath Building K6-1696, an air monitoring plan will be developed to determine if vapor intrusion is occurring within the occupied Building K6-1696 with plume in its current state (absent of any IM implementation). Phase I will be an evaluation of the facility operations. Phase II will consist of groundwater sampling at select monitoring wells and soil gas sampling at select locations within Building K6-1696. Phase III is indoor ambient air sampling.

Phase I was completed in January 2018. There were no potential indoor vapor intrusion pathways found. The only VOC usage within Building K6-1696 is within the Extraction Laboratory at the northwest corner of the facility. Review of chemical inventory list found no chemicals in Building K6-1696 containing tDCE, VC, or decafluoropentane. Site reconnaissance of Building K6-1696A (location of stored Vertrel MCA) found this building to only be occupied for a maximum of 4 hours per day and is not a closed structure. Soil vapor extraction (SVE) system was abandoned approximately 5 years ago. The piping was pulled, and the vertical extraction wells are still on site.

Will evaluate Vapor Pins for use at this site. It was recommended to sample for oxygen to give insight into VC degradation in the vadose zone. Recommendation was made to check EPA Vapor Intrusion Screening Level (VISL) before you send to the lab to ensure that the laboratory detection limits are below the VISLs.

If indoor air sampling completed, need an outdoor sample with no operations in progress. Also make sure the Method TO15 is validated for decafluoropentane.

Team consensus reached to collect groundwater samples for VOCs (modified to include decafluoropentane) at the following monitoring well locations: MW0006, MW0008, MW0009, MW00011, MW0012, MW0013, MW0018, and MW0019.

Team consensus reached to collect soil gas sampling: one within the Calibration Warehouse (adjacent to MW0019), two within the Field Cleaning Room (one adjacent to MW0008 and one adjacent to MW0009), and one inside Building K6-1696 (adjacent to MW0011 and MW0012). Samples will be collected and be analyzed for VOCs via USEPA Method TO15 and be expanded to include decafluoropentane. Sampling locations will be confirmed based on review of the groundwater analysis. Soil gas sampling will be conducted when the doors to the facility are closed and preferably without the operation of the HVAC system.

An additional round of soil gas sampling may be warranted based on evaluation of the analytical results. Come back to Team with Phase II results before moving to Phase III.

Goal:

Present an air monitoring plan and obtain Team consensus on proposed plan.

Decision:25	Team consensus reached to collect groundwater samples for VOCs (modified to include decafluoropentane) at the following monitoring well locations: MW0006, MW0008, MW0009, MW00011, MW0012, MW0013, MW0018, and MW0019.

Decision:26	Team consensus reached to collect soil gas sampling: one within the Calibration Warehouse (adjacent to MW0019), two within the Field Cleaning Room (one adjacent to MW0008 and one adjacent to MW0009), and one inside Building K6-1696 (adjacent to MW0011 and MW0012). Samples will be collected and be analyzed for VOCs via USEPA Method TO15 and be expanded to include decafluoropentane. Sampling locations will be confirmed based on review of the groundwater analysis. Soil gas sampling will be conducted when the doors to the facility are closed and preferably without the operation of the HVAC system.

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
05/10/2018	197	8	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Component Refurbishment and Chemical Analysis (CRCA) Facility

Discussion:

IM objectives:
Primary Objective – Phase 1
• Mitigate plume migration
• Minimize risk to workers present within building K6-4696 by preventing vapor intrusion.
Secondary Objective – Phase 2
• Reduce concentrations within the VC hot spot and high concentration via an interim measure to support transition to monitored natural attenuation (MNA).

Data Gaps
Aquifer characteristics (hydraulic conductivity, groundwater velocity, hydraulic gradient) are not well define at the target treatment depth
Total Organic Carbon at target treatment depth
Proposed Year 1 Data Collection
Prior to implementation of Phase II:
• Aquifer tests will be conducted to better define the target treatment zone
• Total organic carbon (TOC) analysis and further lithologic characterization will be conducted in the target treatment zone
Results of the Year 1 data collection will be evaluated to adjust Phase II
The proposed Year 1 data collection will be outlined in the Interim Measure Work Plan

Alternative G1 – Phase I air sparge down gradient of high concentration plume and soil vapor extraction (SVE) in vadose zone. Phase II in situ chemical oxidation (ISCO) in Hot Spot. Estimated treatment time to less than NADCs is approximately 5 years and time to less than GCTLs via MNA is approximately 75 years. Estimated lifecycle cost is $3.97 million.

Advantages:
Effective technology at well-defined sites.
KSC level of air sparge experience
Large Hot Spot reduction from ISCO
Existing air sparge system onsite can reduce costs.

Disadvantages:
Energy intensive
Preferential pathways possible
Buffering capacity impacted
Potential vapor intrusion generator for occupied building K6-4696
High ISCO capital costs.

Alternative G2 – Phase I air sparge down gradient of high concentration plume and soil vapor extraction (SVE) in vadose zone design will be the same as Alternative G1. Phase II bioremediation injections in Hot Spot. Estimated treatment time to less than NADCs is approximately 5 years and time to less than GCTLs via MNA is approximately 75 years. Estimated lifecycle cost is $2.817 million.

Advantages:
Same as Alternative G1, but large Hot Spot reduction and continuing reduction during substrate recirculation.

Disadvantages:
Same as Alternative G1, but lower capital costs of bio compared to ISCO.

Alternative G3 – Phase I hydraulic control down gradient of high concentration plume. Phase II ISCO in Hot Spot; direct injection of ChemOx reagents into Hot Spot Plume will be the same as Alternative G1. Estimated treatment time to less than NADCs is approximately 5 years and time to less than GCTLs via MNA is approximately 75 years. Estimated

lifecycle cost is $4.02 million.

Advantages:
Effective technology for site COCs
Large Hot Spot reduction

Disadvantages:
Required adequate geochemical conditions to be successful
High ISCO capital costs

Alternative G4 – Phase I hydraulic control down gradient of high concentration plume; design will be the same as Alternative G3. Phase II bioremediation injections in Hot Spot; design will be the same as Alternative G2. Estimated treatment time to less than NADCs is approximately 5 years and time to less than GCTLs via MNA is approximately 75 years. Estimated lifecycle cost is $2.864 million.

Advantages:
Effective technology for site COCs
Large Hot Spot reduction and continuing reduction during substrate recirculation

Disadvantages:
Same as Alternative G3, but lower capital costs for injections

Team consensus reached on Alternative G4 Phase 1, Year 1 consisting of hydraulic containments with additional data collection (aquifer tests to better define the target treatment zone, TOC analysis, and further lithologic characterization in the target treatment zone).

Following Phase I, re-evaluate and adjust Phase II.

Consider not using double wall piping since within the footprint of the plume. Look at what was done at LC34 and do not pursue the double wall piping.

Consider reinject with a tracer that could be picked up at a recovery well at the end of the first year this will demonstrate the water movement from one side to the other.

Consider Hydraulic Profiling Tool (HPT) data evaluation prior to installing injection wells.

Goal:

Present remedial alternative evaluation and obtain team consensus on path forward.

Decision:22	Team consensus reached on Alternative G4 Phase 1, Year 1 consisting of hydraulic containments with additional data collection (aquifer tests to better define the target treatment zone, TOC analysis, and further lithologic characterization in the target treatment zone).

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
06/28/2018	200	2	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Components Refurbishment and Chemical Analysis (CRCA) Facility (SWMU 041)

Discussion:

Based on the Step 1B evaluation, the High Concentration Plume (HCP) and the Hot Spot will be the area of focus for the IMWP. Approximately 88% of the volatile organic compound (VOC) plume mass is within the HCP and Hot Spot. 100% of the trans-1,2-dichloroethene (tDCE) mass is from 50 to 60 50 feet (ft) below land surface (BLS). 47% of the vinyl chloride (VC) plume is from 40 to 50 ft BLS and 45% is from 50 to 60 ft BLS. The site characterization identified groundwater as the medium of concern.

The primary IM objective is to attain hydraulic control of the dissolved-phase chlorinated VOC (CVOC) plume with the caveat that prevention of vapor intrusion will be re-evaluated upon baseline air sampling or in the Year 1 performance monitoring evaluation. The secondary IM objective is to reduce concentrations of CVOCs in Hot Spot 1 and HCP via an IM to support transition to monitored natural attenuation (MNA).
Consensus was reached to retain pump and treat downgradient of the HCP, conduct aquifer testing and lithologic evaluations in target treatment zone during Year 1 pump and treat operation and evaluate path forward for treatment of Hot Spot 1 at the end of Year 1 (meeting minute 1805-M08, decision 1805-D22).

Site Conditions and Considerations:
• Average site elevations are approximately 7 feet above mean sea level (msl) relative to NAVD88.

• Relatively flat terrain.
• Drainage swales located on both the eastern and western sides of Contractors Road, and low-lying wooded area with approximately 2 feet of standing water approximately 250 west of building K6-1696.
• Groundwater elevations vary between 3 and 5 ft BLS.
• Groundwater flow is generally to the south-southeast in the 0- to 20 ft BLS zone, and northwest in the 20- to 60 ft BLS zones. However, the current monitoring well network may not be adequate to properly determine groundwater flow direction.
• Electric power available (VFI 713).
• Majority of groundwater contaminant mass is beneath building K6-1696. Access within building K6-1696 is limited. Additionally, there are numerous utilities throughout the Chemical Processing Area (CPA) just east of building K6-1696

Per team consensus at the May 2018 KSCRT Meeting, Alternative G4 has been modified as follows:
The pump and treat system will be installed as proposed in Alternative G4.
During the first year of operation, aquifer testing and lithologic, geochemical, and constituents of concern data collection will be conducted to evaluate the performance of the pump and treat system and the hydraulic state of the target treatment zone (43 to 63 ft BLS).
After approximately 1 year of operation, a performance evaluation will be conducted, and a path forward will be proposed to treat the HS located beneath the building.

Proposed Year 1 Aquifer Testing:
Install 11 monitoring wells at 7 locations:
• 1 Shallow well (5 to 15 ft BLS) will target the upper sand unit
• 4 Intermediate wells (30 to 40 ft BLS) will target the fine to very fine sand unit.
• 6 Deep wells (53 to 63 ft BLS across the site) will target the shell zone above the very fine sand layer.
• Hydraulic Profiling Tool (HPT) data collection will be conducted during the 6 deep monitoring well installations from surface to 63 feet BLS to produce a detailed log of relative formation permeability and estimate hydraulic conductivity.
Slug testing will be performed at newly installed monitoring wells and select existing monitoring wells:
• Using a solid slug rod capable of displacing approximately 3 feet of water (instantaneous head change)
• Data collected with a Solinst Levelogger or Van Essen Micro-Diver
• If slug testing does not generate a suitable head difference, then falling head tests will be conducted on the newly installed and existing monitoring wells
Monitoring well installation and aquifer tests on monitoring wells will be conducted prior to installation of the pump and treat system.
Installation of pump and treat system:
• Extraction well EW0002 and injection well IW0007 will be installed initially.
• A step-drawdown pumping test (step test) will be conducted at the central extraction well (EW0002) to observe the pumping performance under variable extraction conditions.
? Pumping rate in the extraction well will begin at 0.5 times the design flow rate and increase approximately every 30 minutes up to 1.25 times the design flow rate.
? Step test results will be used to evaluate transmissivity, well efficiency, and capture zone.
• A 24- or 48-hour constant-rate test will be performed at EW0002, with the test rate at the assumed extraction rate of 7 gallons per minute (gpm)
? Monitoring well water levels will be monitored with Solinst Leveloggers or Van Essen Micro-Divers.
? Transmissivity and storage will be estimated using AQTESOLV.
? Capture zone analysis will be performed to ensure adequate capture at targeted rate.
• A pressure transducer will be installed on injection well IW0007 to monitor water level changes before, during, and after the injection test.
• After completion of the extraction well EW0002 and injection well IW0007 tests, the remainder of the pump and treat system will be installed, modifying (if necessary) based on the test results.
• MODFLOW modeling estimating pump and injection system performance will be presented in the Year 1 Performance Monitoring Report, or when site-specific data supports its use.
• RT3D transport modeling will be conducted no sooner than after Year 1, or after site-specific data supports its use.

Pump and Treat Design Summary:
Extraction Wells
• Three installed to depths of 63 ft BLS (targeting shell zone)
• Construction: 6-inch diameter PVC riser with 20-foot 0.010-inch slotted screen set in 10-inch casings
• 75-foot capture zone spacing downgradient of HCP
• Flow rate of approximately 5 to 7 gpm per well
• Prior to installation of extraction wells, collect 1 soil sample from each extraction well location targeting the shell layer (approximately 43 to 63 ft BLS) to be analyzed at a fixed-based laboratory for:
? Total Organic Carbon
? Soil Grain Size to confirm filter pack size and screen slot size
Injection Wells
• Seven installed to depths of 61 ft BLS (targeting shell zone)
• 6 of 7 installed at angles to reach injection edge of HCP
• Construction: 6-inch diameter schedule 40 PVC with 20-foot 0.020 slotted screen set in 10-inch casings
From air stripper, extracted groundwater will be re-distributed to injection wells located on the northern, southern, and eastern sides of Building K6-1696 (upgradient of the HCP).
Emissions less than KSC Title V Operating Air Permit (based on mass present).
Injection and extraction well information (coordinates, depth, etc.) provided in IMWP Table 1.
Performance monitoring plan provided in IMWP Table 2.

O&M Frequency: Daily for the first week, weekly for the first month, bi-weekly thereafter.
Estimate treatment time to reach Natural Attenuation Default Concentrations (NADC):
• Based on preliminary pumping calculations of pump and treat system without the introduction of amendments: approximately 35 years of pump and treat operation.
• After Year 1 of pump and treat operation and treatment zone data collection, the estimated treatment time to reach NADCs and Year 2 (and onward) path forward will be re-evaluated.

Proposed Performance Monitoring:
• Baseline Sampling:
? 19 monitoring wells for VOCs
? 4 monitoring wells for select geochemical parameters (methane, ethane, and ethene (MEE), sulfate, sulfide, nitrate/nitrite, alkalinity, carbon dioxide, iron, dissolved iron, Resource Conservation and Recovery Act (RCRA) metals, total organic carbon, Dehalococcoides, and VC reductase).
• Year 1 Quarterly Monitoring of 4 monitoring wells for VOCs and select geochemical parameters (listed in Baseline Sampling).
• Year 1 Semi-Annual Sampling of 19 monitoring wells for VOCs.
• Water levels collected at all monitoring wells and injection and extraction wells during each quarterly O&M.
• Field parameter data collected from all monitoring wells sampled.

Total capital costs are approximately $895,000.
Total Year 1 Operation Costs approximately $103,000.

A flow chart exit strategy was provided in the advance data package presented at the Team meeting.

Team consensus reached on Hot Spot 1 Interim Measures Work Plan.

Tetra Tech expects one to two months for installation and pump test.
NASA indicated to FDEP that this site a NASA top priority project right now.

Goal:	
Obtain team consensus on Interim Measures Work Plan (IMWP).	
Decision:2	Team consensus reached on Hot Spot 1 Interim Measures Work Plan.

Meeting Minutes Summary Report

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
04/10/2019	204	16	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Component Refurbishment and Chemical Analysis (CRCA) Facility (SWMU 041)

Discussion:

Operations began in 1998 with cleaning of spacecraft components using several organic and inorganic chemicals. The primary solvent of concern is Vertrel MCA. Vertrel MCA is a mixture of trans-1,2-dichoroethene (tDCE, 35 to 41 percent) and decafluoropentane (DFP, 59 to 65 percent). Historically, it was stored and used in the Chemical Processing Area. Bulk storage tanks of Vertrel were removed from the Chemical Processing Area and it is now stored in Building K6-1696A. tDCE and vinyl chloride (VC) are the primary contaminants of concern at CRCA. DFP had not been sampled in groundwater since 2006, when it was detected in groundwater sample DPT0103 in the 55 feet below land surface zone at a concentration of 28.1 micrograms per liter (µg/L), less than the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Level (GCTL) of 1,800 µg/L that was derived from the 2006 University of Florida Clean-Up Criteria for DFP development.

The objective of air monitoring was based on volatile organic compounds (VOC) groundwater concentrations beneath Building K6-1696. The air monitoring plan was developed to determine if vapor intrusion is occurring within the occupied Building K6-1696.

Phase I: Evaluation of facility operations
Analysis of hazardous materials and interviews with CRCA Engineering Supervisor on facility operations to determine VOC usage locations within Building K6-1696.
Review of up-to-date chemical inventory list.
Evaluation of underground trenching and utility system in the CPA to determine if there are potential indoor pathways for vapor intrusion.

Phase I completed (January 2018) to determine Phase II and III approach. No potential indoor vapor intrusion pathways found. Only VOC usage within Building K6-1696 is within the Extraction Laboratory at the northwest corner of the facility. Review of chemical inventory list found no chemicals stored in Building K6-1696 containing tDCE, VC, or DFP. Site reconnaissance of Building K6-1696A (location of stored Vertrel MCA) found this building to only be occupied for a maximum of 4 hours per day and it is not a closed structure.

Phase II:
Groundwater sampled at 8 locations in August 2018 and analyzed for VOCs via Method 8260B and modified to include DFP. VC and DFP observed in groundwater samples. Benzene and toluene were observed below GCTLs and unassociated with source of spill.
Four vapor pins installed for sub-slab soil gas sampling. Samples were analyzed for VOCs via USEPA Method TO-15, modified to include DFP. Unable turn off the HVAC system during sub-slab sampling due to sensitive equipment calibrations within Building K6-1696. Sub-slab soil gas samples observed no detections of VC or tDCE. DFP detections were observed to be less than the calculated soil gas commercial screening level. There was an exceedance of the United States Environmental Protection Agency Residential Vapor Intrusion Screening Levels Sub-Slab for chloroform, assumed to be attributed to potable drinking water and/or sewer lines in the vicinity of VMP0004.

Based on Phase II results, ambient air sampling is not necessary at this time as the CVOC groundwater plume beneath Building K6-1696 is not presenting a vapor intrusion risk to the workers present.

An Implementation Work Plan for a Pump and Treat Interim Measure at CRCA to contain and remediate the CVOC plume beneath Building K6-1696 is in development. Within that work plan, VMP01 through VMP04 are proposed to be used for quarterly performance monitoring sub-slab sampling to ensure that Interim Measures do not generate sub-slab vapor. If contaminant concentrations are detected exceeding the appropriate RVISLs, then the system will be shut down until the problem is identified and corrective action is taken.

Team consensus reached that air monitoring evaluation is complete, ambient air samples within Building K6-1696 do not need to be collected at this time, Air Monitoring Report can be submitted to the FDEP documenting the results of Phase I and Phase II, and quarterly sampling of vapor monitoring pins will be part of performance monitoring program.

Provide memo with data to NASA Industrial Hygienist.

Goal:

Present air monitoring results.

Decision:40	Team consensus reached that air monitoring evaluation is complete, ambient air samples within Building K6-1696 do not need to be collected at this time, Air Monitoring Report can be submitted to the FDEP documenting the results of Phase I and Phase II, and quarterly sampling of vapor monitoring pins will be part of performance monitoring program.

Meeting Minutes Summary Report

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
06/06/2019	205	9	Neumann, Chris	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)
Topic:				
Components Refurbishment and Chemical Analysis (CRCA) Facility Solid Waste Management Unit (SWMU) #041 Hot Spot 1 Interim Measure (IM) hydraulic containment system (pump test and construction activiti				
Discussion:				

An extensive site history was presented.

The primary objective of Interim Measures (IM) is to attain hydraulic control of dissolved phase chlorinated volatile organic compounds (CVOC) plume. The secondary objective is to reduce concentrations of CVOC s in Hot Spot 1 and the High Concentration Plume via an IM to support transition to Monitored Natural Attenuation (MNA).

Hot Spot 1 Treatment Zone:
• Encompasses approximately 9.41 acres
? Low Concentration Plume area greater than Groundwater Cleanup Target Levels (GCTL) – 6.54 acres
? High Concentration Plume (HCP) area greater than Natural Attenuation Default Concentrations (NADC) – 2.07 acres
? Hot Spot area greater than ten times NADC – 0.8 acres
• Hot Spot 1 has a total VOC plume mass of 54.25 pounds.
• Approximately 88 percent of VOC plume mass is in Hot Spot and High Concentration Plume and approximately 99 percent of VOC plume mass is vinyl chloride.

Deviations from IM Work Plan:
Biggest change is location of power source. Existing electrical connection RLP1 was selected to provide power to the treatment system instead of VFI 713.
Injection wells were relocated, angles adjusted, and trenching re-routed based on site walk with dig police and facility manager.
Due to relocation, injection well IW0006 screen length was increased from 20 to 30 feet to allow more contact with the High Concentration Plume while maintaining the target treatment depth interval.
Some wells and piping moved to avoid GN2 lines.

Twelve monitoring wells were installed via DPT methods and constructed as outline in the Implementation Work Plan (1 shallow well screened 5 to 15 ft BLS, 4 intermediate wells screened 30 to 40 ft BLS, and 7 deep wells installed 53 to 63 ft BLS).

Hydraulic Profiling Tool (HPT) was conducted at deep monitoring well locations (from the water table to 63 ft BLS) to evaluate hydraulic behavior. Relatively low injection pressure indicates a relatively large grain size and an ability to easily transmit water. High hydraulic conductivity estimates ease with which water can move through pore spaces. The results were relatively uniform for all deep wells where HPT was conducted.

Following the installation of MW0021 through MW0032, slug testing was performed at 31 wells. Rapid recovery in falling and rising head tests were observed (full recovery within 30 seconds at most wells). Oscillary responses were common in many well locations (preliminary analysis confirm hydraulic conductivities (K) range from 50 to 100 plus feet per day).

Step pump test conducted on EW0002. Pumped well for 45 to 60 minutes at 5 different rates. There was rapid drawdown and recovery. Stabilization generally occurred within 15 to 20 minutes. Drawdown ranged from less than 1 ft at 3.5 gallons per minute (gpm) to 3.3 ft at 14 gpm.

Constant Rate Test Results
Data collected every 10 seconds with data transducer using water level probe. Monitored approximately 30 wells across the site in the shallow, intermediate, and deep zones at regular intervals for duration of test. Influence of pumping was observed across the site in all zones. Largest influences observed in the deep zone. Monitoring wells within 150 ft of well being pumped reached stabilization before ending test.

Injection Test
Prior to injection tests, extracted groundwater was stored in a 20,000-gallon frac tank, treated with a mobile air stripper, and “proved-out” with fixed-base laboratory analysis.
Performed injection testing at 3 injection wells that represent the range in lithologies encountered at the site for all injection wells. Generally, 3 to 5 injection rates were used at each location and ran for 4 or more hours in duration. Several long-term tests were run that were greater than 12 hours. Based on injection test results, anticipated capacities for IW0007 is 0.5 to 1.0 gpm, IW0001 up to 30 gpm, and IW002 up to 15 gpm.

Lessons Learned: A smaller sized sonic drilling rig was required to access certain areas. The smaller rig required more water than typical to advance to depth at the angles required. This generated more investigative derived water/soil spoils than anticipated.

Pump and treat system installed to completion. System commissioning, startup, and baseline sampling will be conducted in Summer 2019.

Goal:

Present Hot Spot 1 Interim Measure (IM) hydraulic containment system (pump test and construction activities).

Meeting Minutes Summary Report

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
06/18/2020	210	2	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Component Refurbishment and Chemical Analysis Facility Solid Waste Management Unit (SWMU) #41 Pump and Treat Operations, Maintenance, and Monitoring, June 2020

Discussion:

concentrations exceed FDEP Groundwater Cleanup Target Levels (GCTLs). Within the LCP is a 2.07 acre High Concentration Plume (HCP) where CVOC concentrations exceed FDEP Natural Attenuation Default Concentrations (NADCs). Within the HCP is a 0.8 acre Hot Spot (HS) where CVOC concentrations exceed 10 times (10X) NADCs. Approximately 88 percent of the CVOC plume mass is vinyl chloride (VC). The primary IM objective is to attain hydraulic control of the dissolved-phase CVOC plume and the secondary objective is to reduce concentrations of CVOCs via an IM to support transition to monitored natural attenuation (MNA).

Initial startup activities were conducted from July 22-26, 2019 and included a pre-commissioning check and functional performance tests. During functional performance tests extraction well (EW), equalization (EQ) tank, and air stripper pumps were each set to approximately one half of their respective design flow rates, and steadily increased until they reached two to three times their design flow rate in order to stress-test the system. Additionally, air stripper influent and effluent samples for VOC analysis were collected in 8-hour intervals during Day 1, and then daily for the remainder of Week 1.

System prove-out was conducted during weeks two through four (July 29 – August 16, 2019), which included system balancing of EWs and injection wells (IWs). The target design flow rate of each EW is 7 gallons per minute (gpm) and of each IW is 3 gpm. Based on system prove-out, each EW was able to achieve and maintain the design flow rate of 7 gpm and each IW was able to achieve the following flow rates: IW0001 achieved 8.2 gpm, IW0002 achieved 8.5 gpm, IW0003 achieved 8.1 gpm, IW0004 achieved 0.1 gpm, IW0005 achieved 7.6 gpm, IW0006 achieved 4.0 gpm, and IW0007 achieved 10.9 gpm.

O&M continued through May 2020 and consisted of monthly air stripper cleaning, influent/effluent sampling for VOCs, and routine maintenance. During this operational period, quarterly performance groundwater sampling was conducted in June 2019 (baseline sampling), October 2019, January 2020, and April 2020. Additionally, sub-slab vapor monitoring and ambient air sampling was collected in October 2019, January 2020, and April 2020 to determine if the HCS has impacted the workers present at the CRCA facility. No CVOC analytes were detected at concentrations exceeding their respective commercial Vapor Intrusion Screening Levels (VISLs) in the sub-slab vapor samples, and all ambient air sample results were below the OSHA Personal Exposure Limit (PEL) for each constituent analyzed. No adjustments to the HCS system are currently needed based on these results.

Additionally during this operational period, maintenance to the system was conducted including the following: cleaning out the flow totalizers which increased the flow in IW0004 from 0.1 gpm to 3.6 gpm; conducting biological activity reaction tests (BART) and Redux 390 inject pilot test to reduce scaling on the effluent bag filters; and level sensor replacement on the EQ tank float stem.

In summary, over six million gallons have successfully been treated through the HCS system during this operation period. VC concentrations in the groundwater remain above the GCTL of 1 ug/L, but are decreasing over time with a 90% reduction in VC since startup in May 2020. tDCE concentrations have been non-detect during the last two quarterly sampling events. The system is operating as designed with only brief interruptions due to routine maintenance. Daily introduction of Redux 390 amendment has significantly reduced system scaling and helped to maintain system design parameters. The increase of reductive dechlorination indicators suggest a favorable environment for detoxification of these contaminants. Ambient air sampling results for the treatment trailer area are significantly below OSHA PEL levels and sub-slab sampling results show the levels below commercial Environmental Protection Agency (EPA) VISLs.

The path forward for HCS is continued operation and evaluation to maintain hydraulic control of the groundwater plume and to further reduce VC concentrations, continued quarterly sampling of 4 monitoring wells and semiannual sampling of 16 monitoring wells (next event in July 2020), and preparation and submittal of the Groundwater Model in conjunction with the Year 1 Performance Monitoring (PM) Report.

Goal:

The purpose is to summarize the groundwater interim measures (IM) hydraulic containment system (HCS) startup and operation and maintenance (O&M) for the treatment of chlorinated volatile organic compounds (CVOCs) at the Components Refurbishment and Chemical Analysis Facility (CRCA).

Underground Injection Control (UIC) parameters was recommended for a subset of wells, and should be analyzed for the iron, manganese, and sodium. After one year, sampling frequency and locations should be assessed. This means that the Team would need one additional sampling round to meet that year timeframe. AECOM will take an action to update the presentation prior to uploading to RIS for the records.

AECOM's Jennifer Joyal confirmed this presentation was updated prior to uploading to RIS **(Closed Action Item 2008-A04).**

FDEP stated that the Department has been doing a pilot project regarding per- and polyfluoroalkyl substances (PFAS) occurrence beginning with listing out dry cleaner and other state-led cleanup sites. This PFAS tracking spreadsheet has minimal data so far and provides links to the reports associated with the sites. The State is really trying to identify the max concentrations by media type. It is interesting to see what is coming up. AECOM inquired if the state has a list issued for the hazardous waste sites? AECOM did locate the dry-cleaning list. FDEP stated there are links in the spreadsheet to all different facilities to include landfills and electroplaters. There is an updated version of a tracking sheet for site being investigated for PFAS, and FDEP will send out a copy to the Team.

Laura Barrett (FDEP) provided the latest version of the tracking sheet to the Team **(Closed Action Item 2008-A05).**

Result: Decision item 2010-D01

2010-M02 Alex Murphy /Tetra Tech

Components Refurbishment and Chemical Analysis (CRCA) Solid Waste Management Unit (SWMU) #041, Year 1 Operations Maintenance and Monitoring, October 2020

Goal: The objective is to summarize the groundwater interim measures (IM) hydraulic containment system (HCS) Year 1 operation and maintenance (O&M) for the treatment of chlorinated volatile organic compounds (CVOCs) at the Components Refurbishment and Chemical Analysis Facility (CRCA).

Discussion: Installation, startup, and commissioning of the HCS was previously presented in the June 2020 CRCA HCS – Mid-Year Performance Monitoring ADP. CRCA is located east of Contractors Road, approximately 1 mile north of Schwartz Road. The site consists of Building K6-1696 and the surrounding support building and structures, including the Chemical Processing Area (CPA).

The groundwater contaminant plume at CRCA consists of a 6.54-acre Low Concentration Plume (LCP) where CVOC concentrations exceed Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Levels (GCTLs). Within the LCP is a 2.07-acre High Concentration Plume (HCP) where CVOC concentrations exceed FDEP Natural Attenuation Default Concentrations (NADCs), and within the HCP is a 0.8-acre Hot Spot (HS) where CVOC concentrations exceed 10 times (10X) NADCs. Approximately 88-percent of the CVOC plume mass is vinyl chloride (VC) based on pre-IM sampling. The primary IM objective is to attain hydraulic control of the dissolved-phase CVOC plume, and the secondary objective is to reduce concentrations of CVOCs via an IM to support transition to monitored natural attenuation (MNA).

Startup and prove-out activities were conducted from July 22 through August 16, 2019 and included a pre-commissioning check, functional performance tests, and system balancing of the extraction wells (EWs) and injection wells (IWs). The target design flow rate of each EW is 7 gallons per minute (gpm) and of each IW is 3 gpm.

Full-scale operation subsequently began after system balancing and continued through August 2020 (end of the reported operational period) and consisted of monthly air stripper cleaning, influent/effluent sampling for VOCs, and routine maintenance. The HCS performance flow rates and total gallons processed from August 2019 through August 2020, are listed on slide 10 of the ADP.

During this operational period, quarterly performance groundwater sampling was conducted in June 2019 (baseline sampling), October 2019, January 2020, April 2020, and July 2020. Additionally, sub-slab vapor monitoring and ambient air sampling were collected in October 2019, January 2020, April 2020, and July 2020 to determine if the HCS has potentially impacted indoor air for the workers present at the CRCA facility. No CVOC analytes were detected at

concentrations exceeding their respective Commercial Vapor Intrusion Screening Levels (VISLs) in the sub-slab vapor samples, and all ambient air sample results were below the OSHA Personal Exposure Limit (PEL) for each constituent analyzed. No adjustments to the HCS system are currently needed based on these results.

Results of the groundwater performance monitoring were provided on slide 28. Data evaluation over the Year 1 operational period shows that all VOCs are less than NADCs with the exception of monitoring well (MW) MW0018 (110 µg/L for VC). tDCE has been less than GCTL since before the baseline groundwater sampling event in June 2019. VC is generally decreasing in all wells during the operation period with only slight rebound in 6 monitoring wells during the July 2020 sampling event (MW0012, MW0013, MW0018, MW0019, MW0028, and MW0031). Monitoring wells MW0003, MW0020 through MW0027, and MW0029 have shown no observed VC concentrations above laboratory method detection limits since baseline sampling. These wells are proposed to be removed from the performance sampling program.

Additionally, groundwater modeling was conducted based upon data collected during Year 1 operations to simulate site-specific surficial aquifer conditions, assess groundwater flow in 3-dimensions, and predict future groundwater remediation response to optimize and streamline long-term operations. Data inputs to the groundwater model consisted of twenty-one boring logs, seven synoptic groundwater level events, 3 to 5 slug tests at all well locations (except MW0013), pumping tests at EW0002, infiltration tests at three IWs, sieve analysis, HPT logging, and chemical analysis from baseline and quarterly groundwater sampling events.

Conclusions based on the groundwater modeling results forecast that, with continued system operation, VC reaches GCTL in approximately 4 to 5 years for all areas except for MW0018. Increasing the injection rate at IW0005 to increase flushing at MW0018 is recommended to expedite groundwater cleanup.

Over eight million gallons have successfully been treated through the HCS system during this operation period. VC concentrations in the groundwater remain above the GCTL of 1 µg/L but are decreasing over time, with an 86% reduction in VC since startup.

The path forward for HCS is continued operation and evaluation to maintain hydraulic control of the groundwater plume and to further reduce VC concentrations, continue quarterly sampling of 3 monitoring wells and semiannual sampling of 7 monitoring wells, and to update the Groundwater Model and Transport Evaluation during Year 2 operation reporting.

FDEP inquired if any of the green or yellow shaded wells on Slide 11 are also sampled annually. Tetra Tech stated none of the wells are currently in an annual sampling event.

FDEP noted that there is only one point of compliance well, MW0018. How confident is the Team that there are no other concentrations within that area that are not monitored? Should there be an additional well in a downgradient location? Tetra Tech pointed out data on slide 32 for mid-plume monitoring wells that show decreasing VC results, indicating that the aquifer conditions promote VOC reduction. During each LTM event, data always supported the conclusion that this was a solid reducing environment, resulting in high confidence that the VC on the downgradient side will attenuate. If we need to consider further delineation in the wooded area, this is something that can be discussed; it is projected that the Team will continue to see concentration decreases in this area.

NASA stated their belief is that this VC plume had already passed the point of the extraction wells before the HCS was installed. Based on observations and water level measurements, NASA's suspicion is that the VC plume has not migrated into this area since HCS startup by was already in that area but acknowledged the VC concentration does merit close watching.

FDEP inquired if the June 2019 sample was the first because MW0032 had just been installed. Tetra Tech replied yes and brought up slide 6 to show the locations of 2016-2018 direct push technology (DPT) samples taken from the water table to about 55ft at every depth interval. Most performance monitoring wells were installed after that sampling event. FDEP asked if the system has been operating for one year? If so, would it make sense to keep in the quarterly sampling event to have more data? The HCS had been running for 1 year in August 2020. NASA stated that this well

(MW0032) is in the semi-annual sampling event, but they can add it to the quarterly event if preferred. FDEP stated that they would want to know as early as possible if you are not seeing contaminant decreases in that well; quarterly sampling could bring it to our attention sooner. NASA took an action item to transition MW0032 to quarterly monitoring **(2010-A01).**

FDEP noted that, in terms of depth, it looks like the Team only evaluated to 63' below land surface (bls); and inquired if there is additional data where the Team has sampled deeper than that with DPT? Tetra Tech stated there are physical limitations with a tight confining layer at approximately 55'-63' bls at the site. The Team did not want to punch through that confining layer and create preferential pathways for contaminant migration. This is a tough formation to drill through, with additional physical limitations such as wetlands, woods, train tracks, etc. It was determined the concentrations essentially stop around that confining layer. NASA added that this same confining layer is present from the VAB area all the way down Contractors Road. Most of the groundwater contamination at sites in this area (with the exception of dense non-aqueous phase liquids [DNAPL] sites) remains above the confining layer.

FDEP inquired if Vertrel was the contaminant that impacted this area? NASA confirmed Vertrel MCA (a product containing 1,2-trans-DCE and decafluoropentane) is the COC for this site. NASA worked with FDEP to come up with a risk-based cleanup target level for decafluoropentane with assistance from University of Florida.

VC is lower in density than water in product form. FDEP was interested to know if this was a sinking plume based on the plume's cross-section. DCE is slightly denser than water. Tetra Tech pulled up a past presentation (March 2018 CRCA Step 1 presentation) to show how the plume is migrating away from the chemical processing area and how the plume looked to have been just in the shallow zone at the time of the evaluation. Over the course of the DPT sampling events, the plume started migrating and VC concentrations start increasing and expanding west as you get deeper. The deepest zone is under the occupied building. The geology and plume were shown on slide 31 of the March 2018 presentation.

NASA added that they identified the plume when it was in the shallow zone and over time the plume has migrated deeper. However, the retarding unit has made it spread out laterally at this point. For some history on how we came to use Vertrel, NASA stated in the beginning of the space program that TCE was historically used as a precision cleaner for flight hardware. NASA then migrated to using Freon 113, and eventually Vertrel MCA because it was supposedly more environmentally friendly (greener chemical).

FDEP inquired why the Team opted out of having a point of compliance well in the deeper 30 ft zone at this site? Why is there not a sister well in the MW0032 location? FDEP pointed out on slide 23 of the 2020 ADP that there exists a distinct plume west of the railroad tracks, but no point of compliance well in that area. Why is that? Tetra Tech looked up the past information for DPT 232 (which is the single downgradient point with a 30-40 ft. interval exceedance) to check and see what the results were. The concentrations at DPT 232 was 12 ug/L at the 30-40 ft interval, 4 ug/L below that, and at the 62ft interval there was non-detect. FDEP inquired what the concentration was in the area of MW0032. Tetra Tech stated that MW0032 is located between DPT232 and DPT233. DPT 233 results were non-detect at the 30-40 ft interval, 10 µg/L at the 40-50 ft interval. FDEP pointed out that a well currently exists in the 53-63 ft interval and asked why a shallower well was not also installed in this location. Tetra Tech stated that the logic for a monitoring well was not to monitor degradation of the plume in that area, but to monitor the potential migration from the treatment zone after the HCS was installed. MW0032 is screened to capture the interval that the HCS targets.

FDEP noted there are not high concentrations in this area but wants to make sure we are monitoring the downgradient leading edge of the plume. The plume is supposedly captured now with VC concentrations at MW0032 increasing since HCS start-up. NASA acknowledged that a portion of the plume had already moved through and downgradient of the capture zone prior to HCS start-up, and that low-level VC has increased in the downgradient well over the two most recent sampling events. NASA will transition MW0032 to a quarterly sampling basis in order to watch the trends there more carefully. FDEP agreed with this. NASA inquired if FDEP would like a basket item reported after the next two quarters

of sampling events to provide trends of this monitoring? FDEP stated they would. NASA took the action to present a basket item after the next two rounds of quarterly groundwater data, which will take place in October 2020 and January 2021 **(2010-A02).**

FDEP pointed out the recent increase in concentrations at MW0018. To increase flushing in the vicinity of MW0018, Tetra Tech proposes to increase the injection rate at nearby injection well IW0005. The increased injection rate will be achieved by reducing injection rates at other wells. FDEP asked what the increasing VC concentrations at MW0018 are attributed to? Tetra Tech responded with an explanation from one of their professional geologists: MW0018 is one of the quarterly upgradient centerline wells and, based on the data, the geologist believes it is likely the plume collapsing and moving in toward the centerline that is being created by the extraction and injection wells. That would explain increased concentrations. Tetra Tech noted that the wells are taking in more water than designed. This will make it possible to balance out IW0005 by lowering flow rates in other injection well (say to 3.5-4gpm). The adjustment will increase the flushing at this well, which will be more of a focused approach than the current extraction/injection regime.

A groundwater model was developed for CRCA using MODFLOW and MT3D, and details were presented to the Team. Under current pumping conditions, VC is predicted to reach its GCTL in 4-5 years in all locations except the vicinity of MW0018, which is forecast to attain GCTL in 12 years. If groundwater extraction and treatment stopped now, rebound would occur and VC is forecast to take 10 years to reach GCTL.

FDEP observed that the concentrations at MW0018 didn't go up that much from April 2020 to June 2020. Do we have a downgradient MW to monitor? Tetra Tech responded that MW0019, MW0028, and now MW0032 are positioned along a flow path downgradient of MW0018 and will be sampled quarterly to monitor contaminant trends. FDEP had no objection to the path forward. FDEP has the March 2020 IGM report for review, and inquired if they will be receiving another report after that? NASA confirmed a CAMP date of December 2020 for the next report, and explained that the intent of briefing the Team before submitting plans and reports is so that any questions that arise through Team members' review of the ADP

and its presentation can be addressed and incorporated prior to submitting the report or plan.

FDEP inquired if the wells proposed for elimination are in the shallow zone? Tetra Tech stated they are in the shallow zone and intermediate zone. These wells were installed based on location of the plume prior to HCS start-up. Tetra Tech is proposing to eliminate the MWs since we feel we have good understanding of the current plume. From initial baseline sampling to current, we have had no contaminant detections in these locations that we are proposing to eliminate. For performance sampling only, we are looking to eliminate these from the sampling program. FDEP asked if Tetra Tech could show where the wells are in the context of the plume. Tetra Tech pulled up slides 31 and 32 in the current ADP to provide a detailed explanation with the depths of the wells. FDEP stated that it doesn't look like there exists a shallow plume anymore. Tetra Tech concurred with that. FDEP stated that groundwater was flowing from the east to the west, and inquired if there was a southern component? Tetra Tech confirmed that the flow was from the east to the west and there is not a southern component. FDEP inquired if the Team is comfortable eliminating these wells. Tetra Tech stated that if FDEP recommends that MW0027 and MW0029 be retained in the intermediate zone, they will be. FDEP confirmed they would like MW0027 and MW0029 retained. NASA added that we will have changing plume morphology at this site over time due to groundwater recovery and treatment, and to keep that in mind. We need to consider what wells to retain or eliminate over time as a result of the changes in plume morphology. DPT is now used for performance monitoring at site LC34 as a result of similar conditions.

FDEP observed that the data used to populate the groundwater model will not have a large temporal difference if the model is updated after the second year of operation. Tetra Tech did not disagree but noted that updating the model is fairly simple now that the model has been developed and validated.

Geochemical indicators have been analyzed and *Dehaloccoides* (Dhc) census (including reductase genes) performed semi-annually to determine if conditions are favorable for biological reduction of chlorinated VOCs and if amendments might be needed. While the

reductase gene count fluctuates, conditions are favorable, and it does not appear necessary to add amendments.

The Team reached consensus to increase the groundwater reinjection rate at IW0005 to increase flushing in the vicinity of MW0018 **(2010-D02).**

The Team reached consensus to continue performance monitoring with the following changes: remove monitoring wells MW0003, and MW0020 through MW0026 from the performance sampling program, MW0027 and MW0029 will be sampled semi-annually, and MW0032 will transition to quarterly sampling; eliminate sulfate, sulfide, nitrate, nitrite, carbon dioxide, iron, dissolved iron, and RCRA metals analyses from groundwater sampling events (continue analysis of VOCs, MEE, DHC, and VC reductase in quarterly performance monitoring wells); transition MW0028 to semiannual sampling **(2010-D03).**

The Team reached consensus to update the groundwater model and transport evaluation after completion of the Year 2 operational period **(2010-D04).**

Result: Decision item 2010-D02 through D04
Action Item 2010-A01, A02

2010-M03 Chris Neumann /Tetra Tech

KSC Headquarters Building Area (KHQA) (SWMU #104)
Perimeter Soil IM Completion, October 2020

Goal: The purpose is to present the activities and results of the soil Interim Measure (IM) for polychlorinated biphenyl (PCB)-contaminated soil at the KSC Headquarters Building Area (KHQA).

Discussion:
A soil investigation was conducted from February 2020 to April 2020 to delineate PCB contamination suspected from deteriorating painted columns on the exterior of the former Headquarters Building. No areas with PCBs equal to or greater than 50 mg/kg were discovered during this investigation. The IM Work Plan (IMWP), approved by the Florida Department of Environmental Protection (FDEP) in June 2020, was developed using the KSC PCB Generic Work Plan. The IMWP addressed the soil contaminated by

Meeting Minutes Summary Report

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
04/10/2019	204	16	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Component Refurbishment and Chemical Analysis (CRCA) Facility (SWMU 041)

Discussion:

Operations began in 1998 with cleaning of spacecraft components using several organic and inorganic chemicals. The primary solvent of concern is Vertrel MCA. Vertrel MCA is a mixture of trans-1,2-dichoroethene (tDCE, 35 to 41 percent) and decafluoropentane (DFP, 59 to 65 percent). Historically, it was stored and used in the Chemical Processing Area. Bulk storage tanks of Vertrel were removed from the Chemical Processing Area and it is now stored in Building K6-1696A. tDCE and vinyl chloride (VC) are the primary contaminants of concern at CRCA. DFP had not been sampled in groundwater since 2006, when it was detected in groundwater sample DPT0103 in the 55 feet below land surface zone at a concentration of 28.1 micrograms per liter (µg/L), less than the Florida Department of Environmental Protection (FDEP) Groundwater Cleanup Target Level (GCTL) of 1,800 µg/L that was derived from the 2006 University of Florida Clean-Up Criteria for DFP development.

The objective of air monitoring was based on volatile organic compounds (VOC) groundwater concentrations beneath Building K6-1696. The air monitoring plan was developed to determine if vapor intrusion is occurring within the occupied Building K6-1696.

Phase I: Evaluation of facility operations
Analysis of hazardous materials and interviews with CRCA Engineering Supervisor on facility operations to determine VOC usage locations within Building K6-1696.
Review of up-to-date chemical inventory list.
Evaluation of underground trenching and utility system in the CPA to determine if there are potential indoor pathways for vapor intrusion.

Phase I completed (January 2018) to determine Phase II and III approach. No potential indoor vapor intrusion pathways found. Only VOC usage within Building K6-1696 is within the Extraction Laboratory at the northwest corner of the facility. Review of chemical inventory list found no chemicals stored in Building K6-1696 containing tDCE, VC, or DFP. Site reconnaissance of Building K6-1696A (location of stored Vertrel MCA) found this building to only be occupied for a maximum of 4 hours per day and it is not a closed structure.

Phase II:
Groundwater sampled at 8 locations in August 2018 and analyzed for VOCs via Method 8260B and modified to include DFP. VC and DFP observed in groundwater samples. Benzene and toluene were observed below GCTLs and unassociated with source of spill.
Four vapor pins installed for sub-slab soil gas sampling. Samples were analyzed for VOCs via USEPA Method TO-15, modified to include DFP. Unable turn off the HVAC system during sub-slab sampling due to sensitive equipment calibrations within Building K6-1696. Sub-slab soil gas samples observed no detections of VC or tDCE. DFP detections were observed to be less than the calculated soil gas commercial screening level. There was an exceedance of the United States Environmental Protection Agency Residential Vapor Intrusion Screening Levels Sub-Slab for chloroform, assumed to be attributed to potable drinking water and/or sewer lines in the vicinity of VMP0004.

Based on Phase II results, ambient air sampling is not necessary at this time as the CVOC groundwater plume beneath Building K6-1696 is not presenting a vapor intrusion risk to the workers present.

An Implementation Work Plan for a Pump and Treat Interim Measure at CRCA to contain and remediate the CVOC plume beneath Building K6-1696 is in development. Within that work plan, VMP01 through VMP04 are proposed to be used for quarterly performance monitoring sub-slab sampling to ensure that Interim Measures do not generate sub-slab vapor. If contaminant concentrations are detected exceeding the appropriate RVISLs, then the system will be shut down until the problem is identified and corrective action is taken.

Team consensus reached that air monitoring evaluation is complete, ambient air samples within Building K6-1696 do not need to be collected at this time, Air Monitoring Report can be submitted to the FDEP documenting the results of Phase I and Phase II, and quarterly sampling of vapor monitoring pins will be part of performance monitoring program.

Provide memo with data to NASA Industrial Hygienist.

Goal:

Present air monitoring results.

Decision:40	Team consensus reached that air monitoring evaluation is complete, ambient air samples within Building K6-1696 do not need to be collected at this time, Air Monitoring Report can be submitted to the FDEP documenting the results of Phase I and Phase II, and quarterly sampling of vapor monitoring pins will be part of performance monitoring program.

Full Meeting Record

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Meeting Code	Entry Date	Start Date	End Date	Type	Location
1806	10/26/2018	6/28/2018	6/28/2018	Full Partnering Team Meeting	Kennedy Space Center-FL

Description

June 2018 Team Meeting

Attendees

: Eric Sager; Robert Simcik
FDEP: John Armstrong
Geosyntec: Melissa Hensley; Jim Langenbach; Tom Peel; Kevin Warner
Jacobs Engineering: Guy Fazzio
NASA: Anne Chrest; Mike Deliz; Lindsay Morgan; Ryan O'Meara; Dinh Vo
Tetra Tech: Keith Henn; Mark Jonnet; Alex Murphy; Chris Neumann; Mark Speranza

Minute Id	Presenter	PRL SWMU
M2	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic

Components Refurbishment and Chemical Analysis (CRCA) Facility (SWMU 041)

Discussion

Based on the Step 1B evaluation, the High Concentration Plume (HCP) and the Hot Spot will be the area of focus for the IMWP. Approximately 88% of the volatile organic compound (VOC) plume mass is within the HCP and Hot Spot. 100% of the trans-1,2-dichloroethene (tDCE) mass is from 50 to 60 50 feet (ft) below land surface (BLS). 47% of the vinyl chloride (VC) plume is from 40 to 50 ft BLS and 45% is from 50 to 60 ft BLS. The site characterization identified groundwater as the medium of concern.

The primary IM objective is to attain hydraulic control of the dissolved-phase chlorinated VOC (CVOC) plume with the caveat that prevention of vapor intrusion will be re-evaluated upon baseline air sampling or in the Year 1 performance monitoring evaluation. The secondary IM objective is to reduce concentrations of CVOCs in Hot Spot 1 and HCP via an IM to support transition to monitored natural attenuation (MNA).
Consensus was reached to retain pump and treat downgradient of the HCP, conduct aquifer testing and lithologic evaluations in target treatment zone during Year 1 pump and treat operation and evaluate path forward for treatment of Hot Spot 1 at the end of Year 1 (meeting minute 1805-M08, decision 1805-D22).

Site Conditions and Considerations:
? Average site elevations are approximately 7 feet above mean sea level (msl) relative to NAVD88.
? Relatively flat terrain.
? Drainage swales located on both the eastern and western sides of Contractors Road, and low-lying wooded area with approximately 2 feet of standing water approximately 250 west of building K6-1696.
? Groundwater elevations vary between 3 and 5 ft BLS.
? Groundwater flow is generally to the south-southeast in the 0- to 20 ft BLS zone, and northwest in the 20- to 60 ft BLS zones. However, the current monitoring well network may not be adequate to properly determine groundwater flow direction.
? Electric power available (VFI 713).
? Majority of groundwater contaminant mass is beneath building K6-1696. Access within building K6-1696 is limited. Additionally, there are numerous utilities throughout the Chemical Processing Area (CPA) just east of building K6-1696

Per team consensus at the May 2018 KSCRT Meeting, Alternative G4 has been modified as follows:
The pump and treat system will be installed as proposed in Alternative G4.
During the first year of operation, aquifer testing and lithologic, geochemical, and constituents of concern data collection will be conducted to evaluate the performance of the pump and treat system and the hydraulic state of the target treatment zone (43 to 63 ft BLS).
After approximately 1 year of operation, a performance evaluation will be conducted, and a path forward will be proposed to treat the HS located

beneath the building.

Proposed Year 1 Aquifer Testing:
Install 11 monitoring wells at 7 locations:
? 1 Shallow well (5 to 15 ft BLS) will target the upper sand unit
? 4 Intermediate wells (30 to 40 ft BLS) will target the fine to very fine sand unit.
? 6 Deep wells (53 to 63 ft BLS across the site) will target the shell zone above the very fine sand layer.
? Hydraulic Profiling Tool (HPT) data collection will be conducted during the 6 deep monitoring well installations from surface to 63 feet BLS to produce a detailed log of relative formation permeability and estimate hydraulic conductivity.
Slug testing will be performed at newly installed monitoring wells and select existing monitoring wells:
? Using a solid slug rod capable of displacing approximately 3 feet of water (instantaneous head change)
? Data collected with a Solinst Levelogger or Van Essen Micro-Diver
? If slug testing does not generate a suitable head difference, then falling head tests will be conducted on the newly installed and existing monitoring wells
Monitoring well installation and aquifer tests on monitoring wells will be conducted prior to installation of the pump and treat system.
Installation of pump and treat system:
? Extraction well EW0002 and injection well IW0007 will be installed initially.
? A step-drawdown pumping test (step test) will be conducted at the central extraction well (EW0002) to observe the pumping performance under variable extraction conditions.
? Pumping rate in the extraction well will begin at 0.5 times the design flow rate and increase approximately every 30 minutes up to 1.25 times the design flow rate.
? Step test results will be used to evaluate transmissivity, well efficiency, and capture zone.
? A 24- or 48-hour constant-rate test will be performed at EW0002, with the test rate at the assumed extraction rate of 7 gallons per minute (gpm)
? Monitoring well water levels will be monitored with Solinst Leveloggers or Van Essen Micro-Divers.
? Transmissivity and storage will be estimated using AQTESOLV.
? Capture zone analysis will be performed to ensure adequate capture at targeted rate.
? A pressure transducer will be installed on injection well IW0007 to monitor water level changes before, during, and after the injection test.
? After completion of the extraction well EW0002 and injection well IW0007 tests, the remainder of the pump and treat system will be installed, modifying (if necessary) based on the test results.
? MODFLOW modeling estimating pump and injection system performance will be presented in the Year 1 Performance Monitoring Report, or when site-specific data supports its use.
? RT3D transport modeling will be conducted no sooner than after Year 1, or after site-specific data supports its use.

Pump and Treat Design Summary:
Extraction Wells
? Three installed to depths of 63 ft BLS (targeting shell zone)
? Construction: 6-inch diameter PVC riser with 20-foot 0.010-inch slotted screen set in 10-inch casings
? 75-foot capture zone spacing downgradient of HCP
? Flow rate of approximately 5 to 7 gpm per well
? Prior to installation of extraction wells, collect 1 soil sample from each extraction well location targeting the shell layer (approximately 43 to 63 ft BLS) to be analyzed at a fixed-based laboratory for:
? Total Organic Carbon
? Soil Grain Size to confirm filter pack size and screen slot size
Injection Wells
? Seven installed to depths of 61 ft BLS (targeting shell zone)
? 6 of 7 installed at angles to reach injection edge of HCP
? Construction: 6-inch diameter schedule 40 PVC with 20-foot 0.020 slotted screen set in 10-inch casings
From air stripper, extracted groundwater will be re-distributed to injection wells located on the northern, southern, and eastern sides of Building K6-1696 (upgradient of the HCP).
Emissions less than KSC Title V Operating Air Permit (based on mass present).
Injection and extraction well information (coordinates, depth, etc.) provided in IMWP Table 1.
Performance monitoring plan provided in IMWP Table 2.
O&M Frequency: Daily for the first week, weekly for the first month, bi-weekly thereafter.
Estimate treatment time to reach Natural Attenuation Default Concentrations (NADC):
? Based on preliminary pumping calculations of pump and treat system without the introduction of amendments: approximately 35 years of pump and treat operation.
? After Year 1 of pump and treat operation and treatment zone data collection, the estimated treatment time to reach NADCs and Year 2 (and onward) path forward will be re-evaluated.

Proposed Performance Monitoring:

? Baseline Sampling:
? 19 monitoring wells for VOCs
? 4 monitoring wells for select geochemical parameters (methane, ethane, and ethene (MEE), sulfate, sulfide, nitrate/nitrite, alkalinity, carbon dioxide, iron, dissolved iron, Resource Conservation and Recovery Act (RCRA) metals, total organic carbon, Dehalococcoides, and VC reductase).
? Year 1 Quarterly Monitoring of 4 monitoring wells for VOCs and select geochemical parameters (listed in Baseline Sampling).
? Year 1 Semi-Annual Sampling of 19 monitoring wells for VOCs.
? Water levels collected at all monitoring wells and injection and extraction wells during each quarterly O&M.
? Field parameter data collected from all monitoring wells sampled.

Total capital costs are approximately $895,000.
Total Year 1 Operation Costs approximately $103,000.

A flow chart exit strategy was provided in the advance data package presented at the Team meeting.

Team consensus reached on Hot Spot 1 Interim Measures Work Plan.

Tetra Tech expects one to two months for installation and pump test.
NASA indicated to FDEP that this site a NASA top priority project right now.

Goal

Obtain team consensus on Interim Measures Work Plan (IMWP).

Decision Id	Decision
D2	Team consensus reached on Hot Spot 1 Interim Measures Work Plan.

End of this Meeting Record

Decision:26	Team consensus reached to collect soil gas sampling: one within the Calibration Warehouse (adjacent to MW0019), two within the Field Cleaning Room (one adjacent to MW0008 and one adjacent to MW0009), and one inside Building K6-1696 (adjacent to MW0011 and MW0012). Samples will be collected and be analyzed for VOCs via USEPA Method TO15 and be expanded to include decafluoropentane. Sampling locations will be confirmed based on review of the groundwater analysis. Soil gas sampling will be conducted when the doors to the facility are closed and preferably without the operation of the HVAC system.

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
05/10/2018	197	8	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Component Refurbishment and Chemical Analysis (CRCA) Facility

Discussion:

IM objectives:
Primary Objective – Phase 1
• Mitigate plume migration
• Minimize risk to workers present within building K6-4696 by preventing vapor intrusion.
Secondary Objective – Phase 2
• Reduce concentrations within the VC hot spot and high concentration via an interim measure to support transition to monitored natural attenuation (MNA).

Data Gaps
Aquifer characteristics (hydraulic conductivity, groundwater velocity, hydraulic gradient) are not well define at the target treatment depth
Total Organic Carbon at target treatment depth
Proposed Year 1 Data Collection
Prior to implementation of Phase II:
• Aquifer tests will be conducted to better define the target treatment zone
• Total organic carbon (TOC) analysis and further lithologic characterization will be conducted in the target treatment zone
Results of the Year 1 data collection will be evaluated to adjust Phase II
The proposed Year 1 data collection will be outlined in the Interim Measure Work Plan

Alternative G1 – Phase I air sparge down gradient of high concentration plume and soil vapor extraction (SVE) in vadose zone. Phase II in situ chemical oxidation (ISCO) in Hot Spot. Estimated treatment time to less than NADCs is approximately 5 years and time to less than GCTLs via MNA is approximately 75 years. Estimated lifecycle cost is $3.97 million.

Advantages:
Effective technology at well-defined sites.
KSC level of air sparge experience
Large Hot Spot reduction from ISCO
Existing air sparge system onsite can reduce costs.

Disadvantages:
Energy intensive
Preferential pathways possible
Buffering capacity impacted
Potential vapor intrusion generator for occupied building K6-4696
High ISCO capital costs.

Alternative G2 – Phase I air sparge down gradient of high concentration plume and soil vapor extraction (SVE) in vadose zone design will be the same as Alternative G1. Phase II bioremediation injections in Hot Spot. Estimated treatment time to less than NADCs is approximately 5 years and time to less than GCTLs via MNA is approximately 75 years. Estimated lifecycle cost is $2.817 million.

Advantages:
Same as Alternative G1, but large Hot Spot reduction and continuing reduction during substrate recirculation.

Disadvantages:
Same as Alternative G1, but lower capital costs of bio compared to ISCO.

Alternative G3 – Phase I hydraulic control down gradient of high concentration plume. Phase II ISCO in Hot Spot; direct injection of ChemOx reagents into Hot Spot Plume will be the same as Alternative G1. Estimated treatment time to less than NADCs is approximately 5 years and time to less than GCTLs via MNA is approximately 75 years. Estimated

lifecycle cost is $4.02 million.

Advantages:
Effective technology for site COCs
Large Hot Spot reduction

Disadvantages:
Required adequate geochemical conditions to be successful
High ISCO capital costs

Alternative G4 – Phase I hydraulic control down gradient of high concentration plume; design will be the same as Alternative G3. Phase II bioremediation injections in Hot Spot; design will be the same as Alternative G2. Estimated treatment time to less than NADCs is approximately 5 years and time to less than GCTLs via MNA is approximately 75 years. Estimated lifecycle cost is $2.864 million.

Advantages:
Effective technology for site COCs
Large Hot Spot reduction and continuing reduction during substrate recirculation

Disadvantages:
Same as Alternative G3, but lower capital costs for injections

Team consensus reached on Alternative G4 Phase 1, Year 1 consisting of hydraulic containments with additional data collection (aquifer tests to better define the target treatment zone, TOC analysis, and further lithologic characterization in the target treatment zone).

Following Phase I, re-evaluate and adjust Phase II.

Consider not using double wall piping since within the footprint of the plume. Look at what was done at LC34 and do not pursue the double wall piping.

Consider reinject with a tracer that could be picked up at a recovery well at the end of the first year this will demonstrate the water movement from one side to the other.

Consider Hydraulic Profiling Tool (HPT) data evaluation prior to installing injection wells.

Goal:

Present remedial alternative evaluation and obtain team consensus on path forward.

Decision:22	Team consensus reached on Alternative G4 Phase 1, Year 1 consisting of hydraulic containments with additional data collection (aquifer tests to better define the target treatment zone, TOC analysis, and further lithologic characterization in the target treatment zone).

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
06/28/2018	200	2	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Components Refurbishment and Chemical Analysis (CRCA) Facility (SWMU 041)

Discussion:

Based on the Step 1B evaluation, the High Concentration Plume (HCP) and the Hot Spot will be the area of focus for the IMWP. Approximately 88% of the volatile organic compound (VOC) plume mass is within the HCP and Hot Spot. 100% of the trans-1,2-dichloroethene (tDCE) mass is from 50 to 60 50 feet (ft) below land surface (BLS). 47% of the vinyl chloride (VC) plume is from 40 to 50 ft BLS and 45% is from 50 to 60 ft BLS. The site characterization identified groundwater as the medium of concern.

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Consensus was reached to retain pump and treat downgradient of the HCP, conduct aquifer testing and lithologic evaluations in target treatment zone during Year 1 pump and treat operation and evaluate path forward for treatment of Hot Spot 1 at the end of Year 1 (meeting minute 1805-M08, decision 1805-D22).

Site Conditions and Considerations:
• Average site elevations are approximately 7 feet above mean sea level (msl) relative to NAVD88.

• Relatively flat terrain.
• Drainage swales located on both the eastern and western sides of Contractors Road, and low-lying wooded area with approximately 2 feet of standing water approximately 250 west of building K6-1696.
• Groundwater elevations vary between 3 and 5 ft BLS.
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• Electric power available (VFI 713).
• Majority of groundwater contaminant mass is beneath building K6-1696. Access within building K6-1696 is limited. Additionally, there are numerous utilities throughout the Chemical Processing Area (CPA) just east of building K6-1696

Per team consensus at the May 2018 KSCRT Meeting, Alternative G4 has been modified as follows:
The pump and treat system will be installed as proposed in Alternative G4.
During the first year of operation, aquifer testing and lithologic, geochemical, and constituents of concern data collection will be conducted to evaluate the performance of the pump and treat system and the hydraulic state of the target treatment zone (43 to 63 ft BLS).
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• MODFLOW modeling estimating pump and injection system performance will be presented in the Year 1 Performance Monitoring Report, or when site-specific data supports its use.
• RT3D transport modeling will be conducted no sooner than after Year 1, or after site-specific data supports its use.

Pump and Treat Design Summary:
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• 75-foot capture zone spacing downgradient of HCP
• Flow rate of approximately 5 to 7 gpm per well
• Prior to installation of extraction wells, collect 1 soil sample from each extraction well location targeting the shell layer (approximately 43 to 63 ft BLS) to be analyzed at a fixed-based laboratory for:
? Total Organic Carbon
? Soil Grain Size to confirm filter pack size and screen slot size
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• Seven installed to depths of 61 ft BLS (targeting shell zone)
• 6 of 7 installed at angles to reach injection edge of HCP
• Construction: 6-inch diameter schedule 40 PVC with 20-foot 0.020 slotted screen set in 10-inch casings
From air stripper, extracted groundwater will be re-distributed to injection wells located on the northern, southern, and eastern sides of Building K6-1696 (upgradient of the HCP).
Emissions less than KSC Title V Operating Air Permit (based on mass present).
Injection and extraction well information (coordinates, depth, etc.) provided in IMWP Table 1.
Performance monitoring plan provided in IMWP Table 2.

O&M Frequency: Daily for the first week, weekly for the first month, bi-weekly thereafter.
Estimate treatment time to reach Natural Attenuation Default Concentrations (NADC):
• Based on preliminary pumping calculations of pump and treat system without the introduction of amendments: approximately 35 years of pump and treat operation.
• After Year 1 of pump and treat operation and treatment zone data collection, the estimated treatment time to reach NADCs and Year 2 (and onward) path forward will be re-evaluated.

Proposed Performance Monitoring:
• Baseline Sampling:
? 19 monitoring wells for VOCs
? 4 monitoring wells for select geochemical parameters (methane, ethane, and ethene (MEE), sulfate, sulfide, nitrate/nitrite, alkalinity, carbon dioxide, iron, dissolved iron, Resource Conservation and Recovery Act (RCRA) metals, total organic carbon, Dehalococcoides, and VC reductase).
• Year 1 Quarterly Monitoring of 4 monitoring wells for VOCs and select geochemical parameters (listed in Baseline Sampling).
• Year 1 Semi-Annual Sampling of 19 monitoring wells for VOCs.
• Water levels collected at all monitoring wells and injection and extraction wells during each quarterly O&M.
• Field parameter data collected from all monitoring wells sampled.

Total capital costs are approximately $895,000.
Total Year 1 Operation Costs approximately $103,000.

A flow chart exit strategy was provided in the advance data package presented at the Team meeting.

Team consensus reached on Hot Spot 1 Interim Measures Work Plan.

Tetra Tech expects one to two months for installation and pump test.
NASA indicated to FDEP that this site a NASA top priority project right now.

Goal:	
Obtain team consensus on Interim Measures Work Plan (IMWP).	
Decision:2	Team consensus reached on Hot Spot 1 Interim Measures Work Plan.

Meeting Minutes Summary Report

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
03/22/2018	196	5	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Component Refurbishment and Chemical Analysis (SWMU 041)

Discussion:

Based on results of the 2016 DPT investigation, the plume is migrating west of Building K6-1696, tDCE present in 30-55 ft BLS zone is greater than GCTL, VC present west of Building K6-1696 is greater than 10 times NADC. Methane results greater than 1 milligram per liter (mg/L), and presence of ethene suggesting reducing conditions. Groundwater flow is generally to the south-southeast in the 0 to 20 feet BLS zone, and northwest in the 20 to 60-foot zones. However, the current monitoring well network may not be adequate to properly determine the groundwater flow direction

tDCE and VC are COCs in groundwater. TCE and cDCE have no results exceeding the GCTL.

Team consensus reached on that the horizontal and vertical extents are adequately delineated (Hot Spot, HCP, and LCP for entire site are defined).

Proposed Treatment Areas for evaluation:
Hot Spot – VC greater than 1,000 µg/L; Total mass of 35.36 lbs
HCP – VC greater than 100 µg/L, total mass of 12.58 lbs.

Site Conditions and Considerations:
Building K6-1696 covers approximately 90% of the HS and 50% of the HCP plumes. Paved asphalt over majority of CRCA facility.
Electric power available. Numerous utilities within the Chemical Processing Area (CPA).
Area west of plumes is densely vegetated, with areas of seasonal standing water when the water table is elevated.
Average Site Elevations – approximately 7 feet above mean sea level (msl) NAVD88.
Relatively flat terrain.
Drainage swales located on both the east and west sides of Contractor Road.
Groundwater depth varies between 3 and 5 feet below land surface.
Groundwater flow is generally to the south-southeast in the 0 to 20 feet BLS zone, and northwest in the 20 to 60-foot zones. However, the current monitoring well network may not be adequate enough to properly determine the groundwater flow direction.

Data Gaps:
VC and tDCE not delineated per KSCRT EE Process within Building K6-1696, CPA, and wooded area due to limited access.
Vertical delineation of VC to GCTL not complete below 64 feet BLS, as a confining clay layer was identified and do not want to create a possible preferential pathway for further vertical migration.
Potentially inadequate monitoring well network to determine groundwater flow.
Fraction of organic carbon (foc) is a data gap. A few samples may be needed and should be collected prior to any implementation.

Is there a vertical contaminant gradient? Is there a water leak that may be pushing contamination down?

Team consensus reached on the retainment of the following technologies for evaluation:
Alternative 1. Barrier: Air Sparging Curtain of HCP (including Soil Vapor Extraction [SVE] to mitigate potential vapor issues), Source Treatment: In-Situ Chemical Oxidation of Hot Spot.
Alternative 2. Barrier: Air Sparging Curtain for HCP (including SVE to mitigate potential vapor issues), Source Treatment: Biostimulation of Hot Spot.
Alternative 3. Barrier: Hydraulic Control for HCP (including Air Stripping/Carbon Absorption), Source Treatment: In-situ Chemical Oxidation of Hot Spot.
Alternative 4. Barrier: Hydraulic Control of HCP (including Air Stripping/Carbon Absorption), Source Treatment: Biostimulation of Hot Spot.

If hydraulic control is done, consider adding electron donor to reinjected water.

Goal:

Present Site Characterization and obtain Team consensus on path forward.

Decision:23	Team consensus reached on that the horizontal and vertical extents are adequately delineated (Hot Spot, HCP, and LCP for entire site are defined).

Decision:24	Team consensus reached on the retainment of the following technologies for evaluation: Alternative 1. Barrier: Air Sparging Curtain of HCP (including Soil Vapor Extraction [SVE] to mitigate potential vapor issues), Source Treatment: In-Situ Chemical Oxidation of Hot Spot. Alternative 2. Barrier: Air Sparging Curtain for HCP (including SVE to mitigate potential vapor issues), Source Treatment: Biostimulation of Hot Spot. Alternative 3. Barrier: Hydraulic Control for HCP (including Air Stripping/Carbon Absorption), Source Treatment: In-situ Chemical Oxidation of Hot Spot. Alternative 4. Barrier: Hydraulic Control of HCP (including Air Stripping/Carbon Absorption), Source Treatment: Biostimulation of Hot Spot.

Meeting Start Date:	Meeting ID:	Minute ID:	Presenter:	PRL / SWMU:
03/22/2018	196	6	Murphy, Alex	COMPONENTS REFURBISHMENT AND CHEMICAL ANALYSIS (SWMU 041)

Topic:

Component Refurbishment and Chemical Analysis (SWMU 041)

Discussion:

Operations began in 1998 with cleaning of spacecraft components using several organic and inorganic chemicals. The primary solvent of concern is Vertrel MCA which is a mixture of tDCE (35-41%) and decafluoropentane (59-65%). This was historical stored and used in the Chemical Processing Area (CPA). Bulk storage tanks of Vertrel were removed from CPA, and Vertrel is now stored in Building K6-1696A. tDCE and VC are the primary contaminants of concern at the site. Decafluoropentane has not been sampled in groundwater since 2006 (detected in groundwater sample DPT0103 in the 55 feet BLS zone at a concentration of 28.1 µg/L, less than the FDEP GCTL of 49 µg/L).

Based on VOC groundwater concentrations beneath Building K6-1696, an air monitoring plan will be developed to determine if vapor intrusion is occurring within the occupied Building K6-1696 with plume in its current state (absent of any IM implementation). Phase I will be an evaluation of the facility operations. Phase II will consist of groundwater sampling at select monitoring wells and soil gas sampling at select locations within Building K6-1696. Phase III is indoor ambient air sampling.

Phase I was completed in January 2018. There were no potential indoor vapor intrusion pathways found. The only VOC usage within Building K6-1696 is within the Extraction Laboratory at the northwest corner of the facility. Review of chemical inventory list found no chemicals in Building K6-1696 containing tDCE, VC, or decafluoropentane. Site reconnaissance of Building K6-1696A (location of stored Vertrel MCA) found this building to only be occupied for a maximum of 4 hours per day and is not a closed structure. Soil vapor extraction (SVE) system was abandoned approximately 5 years ago. The piping was pulled, and the vertical extraction wells are still on site.

Will evaluate Vapor Pins for use at this site. It was recommended to sample for oxygen to give insight into VC degradation in the vadose zone. Recommendation was made to check EPA Vapor Intrusion Screening Level (VISL) before you send to the lab to ensure that the laboratory detection limits are below the VISLs.

If indoor air sampling completed, need an outdoor sample with no operations in progress. Also make sure the Method TO15 is validated for decafluoropentane.

Team consensus reached to collect groundwater samples for VOCs (modified to include decafluoropentane) at the following monitoring well locations: MW0006, MW0008, MW0009, MW00011, MW0012, MW0013, MW0018, and MW0019.

Team consensus reached to collect soil gas sampling: one within the Calibration Warehouse (adjacent to MW0019), two within the Field Cleaning Room (one adjacent to MW0008 and one adjacent to MW0009), and one inside Building K6-1696 (adjacent to MW0011 and MW0012). Samples will be collected and be analyzed for VOCs via USEPA Method TO15 and be expanded to include decafluoropentane. Sampling locations will be confirmed based on review of the groundwater analysis. Soil gas sampling will be conducted when the doors to the facility are closed and preferably without the operation of the HVAC system.

An additional round of soil gas sampling may be warranted based on evaluation of the analytical results. Come back to Team with Phase II results before moving to Phase III.

Goal:

Present an air monitoring plan and obtain Team consensus on proposed plan.

Decision:25	Team consensus reached to collect groundwater samples for VOCs (modified to include decafluoropentane) at the following monitoring well locations: MW0006, MW0008, MW0009, MW00011, MW0012, MW0013, MW0018, and MW0019.

APPENDIX B
LABORATORY DATA PACKAGES

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive, Orlando, FL 32824
4810 Executive Park Court, Suite 211,Jacksonville, FL 32216
102-A Woodwinds Industrial Ct, Cary, NC 27511
www.encolabs.com

November 17, 2017

Tetra Tech, Inc.
661 Andersen Drive
Foster Plaza VII
5th Floor
Pittsburgh, PA 15220

Attention: Jennifer Buel

Please be advised that you may use data purchased from Environmental Conservation Laboratories, Inc. as you see fit. We hereby waive the requirement that our reports be reproduced only in full. You and your clients may reproduce the data in part or in full in reports and presentations or any other way you deem necessary. Please feel free to contact me at (407) 826-5314 should you need further clarification.

Thank you.
ENVIRONMENTAL CONSERVATION LABORATORIES, INC.

James W. Gregory
2017.11.17 15:11:07
-05'00'

James W Gregory
Senior Vice President

November 16, 2017

Jessica Buel
Tetra Tech

Laboratory Report Authorization

Microbial Insights authorizes NASA to publish laboratory reports containing data generated by Microbial Insights for any NASA projects.

In regards,

Anita Biernacki
Vice President of Operations

10515 Research Drive
Knoxville, TN 37932
Tel: 865.573.8188
Fax: 865.573.8133
Email: info@microbe.com

National Aeronautics and
Space Administration

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Felicia Grogan

Signature

5/13/2022

Date

Company Name: Pace Analytical Services
Company Representative Name: Felicia Grogan
Company Representative Title: Director Laboratory Operations
Company Address: 106 Vantage Point Dr. Cayce SC 29172
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ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Tuesday, February 28, 2023
Tetra Tech, Inc. (TE016)
Attn: Alex Murphy
1353 N Courtenay Pkwy, Suite S
Merritt Island, FL 32953

RE: Laboratory Results for
Project Number: 112G08970, Project Name/Desc: NASA KSC CRCA Airs
ENCO Workorder(s): AE07721

Dear Alex Murphy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Friday, October 22, 2021.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Kaitlin Dylnicki

Project Manager

Enclosure(s)

www.encolabs.com

Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Client PM: Alex Murphy
Project Number: 112G08970
ENCO Project ID: AE07721
SDG: AE07721-TE016

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

List of instruments used:

Analytical and Preparation Method	SOP Reference Instrument
TO-15	OVGCMS7

Analysis: TO-15

The calibration curve and the continuing calibration standards are in ppbv. Raw data is reported in pptv. Per request, results may be reported in a unit other than ppbv which is obtained through a conversion factor set up in the laboratories' database.

Manual integrations were performed on samples associated with TO-15. All data & explanations are included in the raw data section of the report.

Methylene chloride is common laboratory contaminant.

Affected Samples: 1J25034-BLK1, CRCA-AMB0001-20211021[AE07721-01], CRCA-AMB0002-20211021[AE07721-02], CRCA-VMP0001-20211021[AE07721-03], CRCA-VMP0002-20211021[AE07721-04], CRCA-VMP0003-20211021[AE07721-05], CRCA-VMP0004-20211021[AE07721-06RE1]
Result for methylene chloride may be biased high due to positive results in the associated method blank.

Affected Samples: CRCA-VMP0004-20211021[AE07721-06]
Sample was analyzed at a dilution due to suspected matrix interference. Initial analysis was over diluted. Sample was reanalyzed at a lower dilution.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Kaitlin Dylnicki
Project Manager

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: CRCA-AMB0001-20211021 **Lab ID: AE07721-01** **Sampled: 10/21/21 16:40** **Received: 10/22/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	11/20/21	10/25/21 11:41	10/25/21 22:30

Client ID: CRCA-AMB0002-20211021 **Lab ID: AE07721-02** **Sampled: 10/21/21 16:45** **Received: 10/22/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	11/20/21	10/25/21 11:41	10/25/21 23:15

Client ID: CRCA-VMP0001-20211021 **Lab ID: AE07721-03** **Sampled: 10/21/21 10:30** **Received: 10/22/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	11/20/21	10/25/21 11:41	10/26/21 00:00

Client ID: CRCA-VMP0002-20211021 **Lab ID: AE07721-04** **Sampled: 10/21/21 10:50** **Received: 10/22/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	11/20/21	10/25/21 11:41	10/26/21 00:46

Client ID: CRCA-VMP0003-20211021 **Lab ID: AE07721-05** **Sampled: 10/21/21 11:10** **Received: 10/22/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	11/20/21	10/25/21 11:41	10/26/21 01:31

Client ID: CRCA-VMP0004-20211021 **Lab ID: AE07721-06RE1** **Sampled: 10/21/21 11:35** **Received: 10/22/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	11/20/21	10/25/21 11:41	10/26/21 12:09

SAMPLE DETECTION SUMMARY

Client ID: CRCA-AMB0001-20211021 **Lab ID:** AE07721-01

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	5.6	I	1.1	8.2	ug/m³ Air	TO-15	
Methylene chloride	1.4	I	0.96	12	ug/m³ Air	TO-15	J-01, O-01
trans-1,2-Dichloroethene	36		1.8	14	ug/m³ Air	TO-15	

Client ID: CRCA-AMB0002-20211021 **Lab ID:** AE07721-02

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	6.7	I	1.2	8.3	ug/m³ Air	TO-15	
Methylene chloride	1.6	I	0.97	12	ug/m³ Air	TO-15	J-01, O-01

Client ID: CRCA-VMP0001-20211021 **Lab ID:** AE07721-03

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	11		1.2	8.3	ug/m³ Air	TO-15	
Freon 113	60		3.4	27	ug/m³ Air	TO-15	
Methylene chloride	1.1	I	0.97	12	ug/m³ Air	TO-15	J-01, O-01
trans-1,2-Dichloroethene	6.0	I	1.8	14	ug/m³ Air	TO-15	

Client ID: CRCA-VMP0002-20211021 **Lab ID:** AE07721-04

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	6.6	I	1.1	8.1	ug/m³ Air	TO-15	
Freon 113	240		3.4	26	ug/m³ Air	TO-15	
Methylene chloride	1.1	I	0.95	12	ug/m³ Air	TO-15	J-01, O-01
trans-1,2-Dichloroethene	11	I	1.7	14	ug/m³ Air	TO-15	

Client ID: CRCA-VMP0003-20211021 **Lab ID:** AE07721-05

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	13		1.1	7.5	ug/m³ Air	TO-15	
Chloroform	5.4	I	2.4	16	ug/m³ Air	TO-15	
Freon 113	27		3.1	24	ug/m³ Air	TO-15	
Methylene chloride	2.8	I	0.88	11	ug/m³ Air	TO-15	J-01, O-01
trans-1,2-Dichloroethene	18		1.6	13	ug/m³ Air	TO-15	

Client ID: CRCA-VMP0004-20211021 **Lab ID:** AE07721-06RE1

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	13		1.2	8.5	ug/m³ Air	TO-15	
Chloroform	13	I	2.7	17	ug/m³ Air	TO-15	
Freon 113	350		3.5	27	ug/m³ Air	TO-15	
Methylene chloride	2.5	I	0.99	12	ug/m³ Air	TO-15	J-01, O-01
trans-1,2-Dichloroethene	14		1.8	14	ug/m³ Air	TO-15	

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ANALYTICAL RESULTS

Description: CRCA-AMB0001-20211021 | **Lab Sample ID:** AE07721-01 | **Received:** 10/22/21 15:00

Matrix: Air | **Sampled:** 10/21/21 16:40 | **Work Order:** AE07721

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.6	U	ug/m³ Air	1.38	2.6	19	1J25034	TO-15	10/25/21 22:30	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.4	U	ug/m³ Air	1.38	3.4	24	1J25034	TO-15	10/25/21 22:30	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.6	U	ug/m³ Air	1.38	2.6	19	1J25034	TO-15	10/25/21 22:30	rgg	
1,1-Dichloroethane [75-34-3]^	2.0	U	ug/m³ Air	1.38	2.0	14	1J25034	TO-15	10/25/21 22:30	rgg	
1,1-Dichloroethene [75-35-4]^	2.1	U	ug/m³ Air	1.38	2.1	14	1J25034	TO-15	10/25/21 22:30	rgg	
1,2-Dibromoethane [106-93-4]^	3.8	U	ug/m³ Air	1.38	3.8	27	1J25034	TO-15	10/25/21 22:30	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.2	U	ug/m³ Air	1.38	2.2	21	1J25034	TO-15	10/25/21 22:30	rgg	
1,2-Dichloroethane [107-06-2]^	2.1	U	ug/m³ Air	1.38	2.1	14	1J25034	TO-15	10/25/21 22:30	rgg	
1,2-Dichloropropane [78-87-5]^	2.6	U	ug/m³ Air	1.38	2.6	16	1J25034	TO-15	10/25/21 22:30	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.3	U	ug/m³ Air	1.38	2.3	21	1J25034	TO-15	10/25/21 22:30	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.6	U	ug/m³ Air	1.38	2.6	21	1J25034	TO-15	10/25/21 22:30	rgg	
3-Chloropropene [107-05-1]^	1.7	U	ug/m³ Air	1.38	1.7	11	1J25034	TO-15	10/25/21 22:30	rgg	
Acetone [67-64-1]^	**5.6**	I	ug/m³ Air	1.38	1.1	8.2	1J25034	TO-15	10/25/21 22:30	rgg	
Bromodichloromethane [75-27-4]^	3.1	U	ug/m³ Air	1.38	3.1	23	1J25034	TO-15	10/25/21 22:30	rgg	
Bromoethene [593-60-2]^	2.0	U	ug/m³ Air	1.38	2.0	15	1J25034	TO-15	10/25/21 22:30	rgg	
Bromoform [75-25-2]^	5.4	U	ug/m³ Air	1.38	5.4	36	1J25034	TO-15	10/25/21 22:30	rgg	
Bromomethane [74-83-9]^	1.8	U	ug/m³ Air	1.38	1.8	13	1J25034	TO-15	10/25/21 22:30	rgg	
Carbon tetrachloride [56-23-5]^	2.3	U	ug/m³ Air	1.38	2.3	22	1J25034	TO-15	10/25/21 22:30	rgg	
Chlorobenzene [108-90-7]^	2.1	U	ug/m³ Air	1.38	2.1	16	1J25034	TO-15	10/25/21 22:30	rgg	
Chloroethane [75-00-3]^	1.2	U	ug/m³ Air	1.38	1.2	9.1	1J25034	TO-15	10/25/21 22:30	rgg	
Chloroform [67-66-3]^	2.6	U	ug/m³ Air	1.38	2.6	17	1J25034	TO-15	10/25/21 22:30	rgg	
Chloromethane [74-87-3]^	1.4	U	ug/m³ Air	1.38	1.4	7.1	1J25034	TO-15	10/25/21 22:30	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.1	U	ug/m³ Air	1.38	2.1	14	1J25034	TO-15	10/25/21 22:30	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.4	U	ug/m³ Air	1.38	2.4	16	1J25034	TO-15	10/25/21 22:30	rgg	
Dibromochloromethane [124-48-1]^	3.9	U	ug/m³ Air	1.38	3.9	29	1J25034	TO-15	10/25/21 22:30	rgg	
Dichlorodifluoromethane [75-71-8]^	3.8	U	ug/m³ Air	1.38	3.8	17	1J25034	TO-15	10/25/21 22:30	rgg	
Freon 113 [76-13-1]^	3.4	U	ug/m³ Air	1.38	3.4	26	1J25034	TO-15	10/25/21 22:30	rgg	
Freon 114 [76-14-2]^	5.0	U	ug/m³ Air	1.38	5.0	24	1J25034	TO-15	10/25/21 22:30	rgg	
Hexachlorobutadiene [87-68-3]^	5.4	U	ug/m³ Air	1.38	5.4	37	1J25034	TO-15	10/25/21 22:30	rgg	
Methylene chloride [75-09-2]^	**1.4**	I	ug/m³ Air	1.38	0.96	12	1J25034	TO-15	10/25/21 22:30	rgg	J-01, O-01
Propene [115-07-1]^	1.3	U	ug/m³ Air	1.38	1.3	5.9	1J25034	TO-15	10/25/21 22:30	rgg	
Tetrachloroethene [127-18-4]^	2.9	U	ug/m³ Air	1.38	2.9	23	1J25034	TO-15	10/25/21 22:30	rgg	
trans-1,2-Dichloroethene [156-60-5]^	**36**		ug/m³ Air	1.38	1.8	14	1J25034	TO-15	10/25/21 22:30	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.1	U	ug/m³ Air	1.38	2.1	16	1J25034	TO-15	10/25/21 22:30	rgg	
Trichloroethene [79-01-6]^	2.6	U	ug/m³ Air	1.38	2.6	19	1J25034	TO-15	10/25/21 22:30	rgg	
Trichlorofluoromethane [75-69-4]^	2.6	U	ug/m³ Air	1.38	2.6	19	1J25034	TO-15	10/25/21 22:30	rgg	
Vinyl chloride [75-01-4]^	2.0	U	ug/m³ Air	1.38	2.0	8.8	1J25034	TO-15	10/25/21 22:30	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*29*	*1*	*31.0*	*95 %*	*70-130*	*1J25034*	*TO-15*	*10/25/21 22:30*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-AMB0002-20211021 | **Lab Sample ID:** AE07721-02 | **Received:** 10/22/21 15:00

Matrix: Air | **Sampled:** 10/21/21 16:45 | **Work Order:** AE07721

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.6	U	ug/m³ Air	1.4	2.6	19	1J25034	TO-15	10/25/21 23:15	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.5	U	ug/m³ Air	1.4	3.5	24	1J25034	TO-15	10/25/21 23:15	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.7	U	ug/m³ Air	1.4	2.7	19	1J25034	TO-15	10/25/21 23:15	rgg	
1,1-Dichloroethane [75-34-3]^	2.0	U	ug/m³ Air	1.4	2.0	14	1J25034	TO-15	10/25/21 23:15	rgg	
1,1-Dichloroethene [75-35-4]^	2.1	U	ug/m³ Air	1.4	2.1	14	1J25034	TO-15	10/25/21 23:15	rgg	
1,2-Dibromoethane [106-93-4]^	3.9	U	ug/m³ Air	1.4	3.9	27	1J25034	TO-15	10/25/21 23:15	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.3	U	ug/m³ Air	1.4	2.3	21	1J25034	TO-15	10/25/21 23:15	rgg	
1,2-Dichloroethane [107-06-2]^	2.1	U	ug/m³ Air	1.4	2.1	14	1J25034	TO-15	10/25/21 23:15	rgg	
1,2-Dichloropropane [78-87-5]^	2.6	U	ug/m³ Air	1.4	2.6	16	1J25034	TO-15	10/25/21 23:15	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.4	U	ug/m³ Air	1.4	2.4	21	1J25034	TO-15	10/25/21 23:15	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.6	U	ug/m³ Air	1.4	2.6	21	1J25034	TO-15	10/25/21 23:15	rgg	
3-Chloropropene [107-05-1]^	1.7	U	ug/m³ Air	1.4	1.7	11	1J25034	TO-15	10/25/21 23:15	rgg	
Acetone [67-64-1]^	**6.7**	I	ug/m³ Air	1.4	1.2	8.3	1J25034	TO-15	10/25/21 23:15	rgg	
Bromodichloromethane [75-27-4]^	3.2	U	ug/m³ Air	1.4	3.2	23	1J25034	TO-15	10/25/21 23:15	rgg	
Bromoethene [593-60-2]^	2.0	U	ug/m³ Air	1.4	2.0	15	1J25034	TO-15	10/25/21 23:15	rgg	
Bromoform [75-25-2]^	5.5	U	ug/m³ Air	1.4	5.5	36	1J25034	TO-15	10/25/21 23:15	rgg	
Bromomethane [74-83-9]^	1.8	U	ug/m³ Air	1.4	1.8	14	1J25034	TO-15	10/25/21 23:15	rgg	
Carbon tetrachloride [56-23-5]^	2.4	U	ug/m³ Air	1.4	2.4	22	1J25034	TO-15	10/25/21 23:15	rgg	
Chlorobenzene [108-90-7]^	2.1	U	ug/m³ Air	1.4	2.1	16	1J25034	TO-15	10/25/21 23:15	rgg	
Chloroethane [75-00-3]^	1.2	U	ug/m³ Air	1.4	1.2	9.2	1J25034	TO-15	10/25/21 23:15	rgg	
Chloroform [67-66-3]^	2.6	U	ug/m³ Air	1.4	2.6	17	1J25034	TO-15	10/25/21 23:15	rgg	
Chloromethane [74-87-3]^	1.4	U	ug/m³ Air	1.4	1.4	7.2	1J25034	TO-15	10/25/21 23:15	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.1	U	ug/m³ Air	1.4	2.1	14	1J25034	TO-15	10/25/21 23:15	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.4	U	ug/m³ Air	1.4	2.4	16	1J25034	TO-15	10/25/21 23:15	rgg	
Dibromochloromethane [124-48-1]^	3.9	U	ug/m³ Air	1.4	3.9	30	1J25034	TO-15	10/25/21 23:15	rgg	
Dichlorodifluoromethane [75-71-8]^	3.8	U	ug/m³ Air	1.4	3.8	17	1J25034	TO-15	10/25/21 23:15	rgg	
Freon 113 [76-13-1]^	3.4	U	ug/m³ Air	1.4	3.4	27	1J25034	TO-15	10/25/21 23:15	rgg	
Freon 114 [76-14-2]^	5.1	U	ug/m³ Air	1.4	5.1	24	1J25034	TO-15	10/25/21 23:15	rgg	
Hexachlorobutadiene [87-68-3]^	5.5	U	ug/m³ Air	1.4	5.5	37	1J25034	TO-15	10/25/21 23:15	rgg	
Methylene chloride [75-09-2]^	**1.6**	I	ug/m³ Air	1.4	0.97	12	1J25034	TO-15	10/25/21 23:15	rgg	J-01, O-01
Propene [115-07-1]^	1.3	U	ug/m³ Air	1.4	1.3	6.0	1J25034	TO-15	10/25/21 23:15	rgg	
Tetrachloroethene [127-18-4]^	2.9	U	ug/m³ Air	1.4	2.9	24	1J25034	TO-15	10/25/21 23:15	rgg	
trans-1,2-Dichloroethene [156-60-5]^	1.8	U	ug/m³ Air	1.4	1.8	14	1J25034	TO-15	10/25/21 23:15	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.2	U	ug/m³ Air	1.4	2.2	16	1J25034	TO-15	10/25/21 23:15	rgg	
Trichloroethene [79-01-6]^	2.6	U	ug/m³ Air	1.4	2.6	19	1J25034	TO-15	10/25/21 23:15	rgg	
Trichlorofluoromethane [75-69-4]^	2.7	U	ug/m³ Air	1.4	2.7	20	1J25034	TO-15	10/25/21 23:15	rgg	
Vinyl chloride [75-01-4]^	2.0	U	ug/m³ Air	1.4	2.0	8.9	1J25034	TO-15	10/25/21 23:15	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*29*	*1*	*31.0*	*95 %*	*70-130*	*1J25034*	*TO-15*	*10/25/21 23:15*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0001-20211021 | **Lab Sample ID:** AE07721-03 | **Received:** 10/22/21 15:00

Matrix: Air | **Sampled:** 10/21/21 10:30 | **Work Order:** AE07721

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.6	U	ug/m³ Air	1.4	2.6	19	1J25034	TO-15	10/26/21 00:00	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.5	U	ug/m³ Air	1.4	3.5	24	1J25034	TO-15	10/26/21 00:00	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.7	U	ug/m³ Air	1.4	2.7	19	1J25034	TO-15	10/26/21 00:00	rgg	
1,1-Dichloroethane [75-34-3]^	2.0	U	ug/m³ Air	1.4	2.0	14	1J25034	TO-15	10/26/21 00:00	rgg	
1,1-Dichloroethene [75-35-4]^	2.1	U	ug/m³ Air	1.4	2.1	14	1J25034	TO-15	10/26/21 00:00	rgg	
1,2-Dibromoethane [106-93-4]^	3.9	U	ug/m³ Air	1.4	3.9	27	1J25034	TO-15	10/26/21 00:00	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.3	U	ug/m³ Air	1.4	2.3	21	1J25034	TO-15	10/26/21 00:00	rgg	
1,2-Dichloroethane [107-06-2]^	2.1	U	ug/m³ Air	1.4	2.1	14	1J25034	TO-15	10/26/21 00:00	rgg	
1,2-Dichloropropane [78-87-5]^	2.6	U	ug/m³ Air	1.4	2.6	16	1J25034	TO-15	10/26/21 00:00	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.4	U	ug/m³ Air	1.4	2.4	21	1J25034	TO-15	10/26/21 00:00	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.6	U	ug/m³ Air	1.4	2.6	21	1J25034	TO-15	10/26/21 00:00	rgg	
3-Chloropropene [107-05-1]^	1.7	U	ug/m³ Air	1.4	1.7	11	1J25034	TO-15	10/26/21 00:00	rgg	
Acetone [67-64-1]^	**11**		ug/m³ Air	1.4	1.2	8.3	1J25034	TO-15	10/26/21 00:00	rgg	
Bromodichloromethane [75-27-4]^	3.2	U	ug/m³ Air	1.4	3.2	23	1J25034	TO-15	10/26/21 00:00	rgg	
Bromoethene [593-60-2]^	2.0	U	ug/m³ Air	1.4	2.0	15	1J25034	TO-15	10/26/21 00:00	rgg	
Bromoform [75-25-2]^	5.5	U	ug/m³ Air	1.4	5.5	36	1J25034	TO-15	10/26/21 00:00	rgg	
Bromomethane [74-83-9]^	1.8	U	ug/m³ Air	1.4	1.8	14	1J25034	TO-15	10/26/21 00:00	rgg	
Carbon tetrachloride [56-23-5]^	2.4	U	ug/m³ Air	1.4	2.4	22	1J25034	TO-15	10/26/21 00:00	rgg	
Chlorobenzene [108-90-7]^	2.1	U	ug/m³ Air	1.4	2.1	16	1J25034	TO-15	10/26/21 00:00	rgg	
Chloroethane [75-00-3]^	1.2	U	ug/m³ Air	1.4	1.2	9.2	1J25034	TO-15	10/26/21 00:00	rgg	
Chloroform [67-66-3]^	2.6	U	ug/m³ Air	1.4	2.6	17	1J25034	TO-15	10/26/21 00:00	rgg	
Chloromethane [74-87-3]^	1.4	U	ug/m³ Air	1.4	1.4	7.2	1J25034	TO-15	10/26/21 00:00	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.1	U	ug/m³ Air	1.4	2.1	14	1J25034	TO-15	10/26/21 00:00	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.4	U	ug/m³ Air	1.4	2.4	16	1J25034	TO-15	10/26/21 00:00	rgg	
Dibromochloromethane [124-48-1]^	3.9	U	ug/m³ Air	1.4	3.9	30	1J25034	TO-15	10/26/21 00:00	rgg	
Dichlorodifluoromethane [75-71-8]^	3.8	U	ug/m³ Air	1.4	3.8	17	1J25034	TO-15	10/26/21 00:00	rgg	
Freon 113 [76-13-1]^	**60**		ug/m³ Air	1.4	3.4	27	1J25034	TO-15	10/26/21 00:00	rgg	
Freon 114 [76-14-2]^	5.1	U	ug/m³ Air	1.4	5.1	24	1J25034	TO-15	10/26/21 00:00	rgg	
Hexachlorobutadiene [87-68-3]^	5.5	U	ug/m³ Air	1.4	5.5	37	1J25034	TO-15	10/26/21 00:00	rgg	
Methylene chloride [75-09-2]^	**1.1**	I	ug/m³ Air	1.4	0.97	12	1J25034	TO-15	10/26/21 00:00	rgg	J-01, O-01
Propene [115-07-1]^	1.3	U	ug/m³ Air	1.4	1.3	6.0	1J25034	TO-15	10/26/21 00:00	rgg	
Tetrachloroethene [127-18-4]^	2.9	U	ug/m³ Air	1.4	2.9	24	1J25034	TO-15	10/26/21 00:00	rgg	
trans-1,2-Dichloroethene [156-60-5]^	**6.0**	I	ug/m³ Air	1.4	1.8	14	1J25034	TO-15	10/26/21 00:00	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.2	U	ug/m³ Air	1.4	2.2	16	1J25034	TO-15	10/26/21 00:00	rgg	
Trichloroethene [79-01-6]^	2.6	U	ug/m³ Air	1.4	2.6	19	1J25034	TO-15	10/26/21 00:00	rgg	
Trichlorofluoromethane [75-69-4]^	2.7	U	ug/m³ Air	1.4	2.7	20	1J25034	TO-15	10/26/21 00:00	rgg	
Vinyl chloride [75-01-4]^	2.0	U	ug/m³ Air	1.4	2.0	8.9	1J25034	TO-15	10/26/21 00:00	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*29*	*1*	*31.0*	*95 %*	*70-130*	*1J25034*	*TO-15*	*10/26/21 00:00*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0002-20211021 | **Lab Sample ID:** AE07721-04 | **Received:** 10/22/21 15:00

Matrix: Air | **Sampled:** 10/21/21 10:50 | **Work Order:** AE07721

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.5	U	ug/m³ Air	1.37	2.5	19	1J25034	TO-15	10/26/21 00:46	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.4	U	ug/m³ Air	1.37	3.4	24	1J25034	TO-15	10/26/21 00:46	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.6	U	ug/m³ Air	1.37	2.6	19	1J25034	TO-15	10/26/21 00:46	rgg	
1,1-Dichloroethane [75-34-3]^	2.0	U	ug/m³ Air	1.37	2.0	14	1J25034	TO-15	10/26/21 00:46	rgg	
1,1-Dichloroethene [75-35-4]^	2.1	U	ug/m³ Air	1.37	2.1	14	1J25034	TO-15	10/26/21 00:46	rgg	
1,2-Dibromoethane [106-93-4]^	3.8	U	ug/m³ Air	1.37	3.8	26	1J25034	TO-15	10/26/21 00:46	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.2	U	ug/m³ Air	1.37	2.2	21	1J25034	TO-15	10/26/21 00:46	rgg	
1,2-Dichloroethane [107-06-2]^	2.1	U	ug/m³ Air	1.37	2.1	14	1J25034	TO-15	10/26/21 00:46	rgg	
1,2-Dichloropropane [78-87-5]^	2.5	U	ug/m³ Air	1.37	2.5	16	1J25034	TO-15	10/26/21 00:46	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.3	U	ug/m³ Air	1.37	2.3	21	1J25034	TO-15	10/26/21 00:46	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.6	U	ug/m³ Air	1.37	2.6	21	1J25034	TO-15	10/26/21 00:46	rgg	
3-Chloropropene [107-05-1]^	1.7	U	ug/m³ Air	1.37	1.7	11	1J25034	TO-15	10/26/21 00:46	rgg	
Acetone [67-64-1]^	**6.6**	I	ug/m³ Air	1.37	1.1	8.1	1J25034	TO-15	10/26/21 00:46	rgg	
Bromodichloromethane [75-27-4]^	3.1	U	ug/m³ Air	1.37	3.1	23	1J25034	TO-15	10/26/21 00:46	rgg	
Bromoethene [593-60-2]^	2.0	U	ug/m³ Air	1.37	2.0	15	1J25034	TO-15	10/26/21 00:46	rgg	
Bromoform [75-25-2]^	5.4	U	ug/m³ Air	1.37	5.4	35	1J25034	TO-15	10/26/21 00:46	rgg	
Bromomethane [74-83-9]^	1.8	U	ug/m³ Air	1.37	1.8	13	1J25034	TO-15	10/26/21 00:46	rgg	
Carbon tetrachloride [56-23-5]^	2.3	U	ug/m³ Air	1.37	2.3	22	1J25034	TO-15	10/26/21 00:46	rgg	
Chlorobenzene [108-90-7]^	2.1	U	ug/m³ Air	1.37	2.1	16	1J25034	TO-15	10/26/21 00:46	rgg	
Chloroethane [75-00-3]^	1.2	U	ug/m³ Air	1.37	1.2	9.0	1J25034	TO-15	10/26/21 00:46	rgg	
Chloroform [67-66-3]^	2.5	U	ug/m³ Air	1.37	2.5	17	1J25034	TO-15	10/26/21 00:46	rgg	
Chloromethane [74-87-3]^	1.4	U	ug/m³ Air	1.37	1.4	7.1	1J25034	TO-15	10/26/21 00:46	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.1	U	ug/m³ Air	1.37	2.1	14	1J25034	TO-15	10/26/21 00:46	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.4	U	ug/m³ Air	1.37	2.4	16	1J25034	TO-15	10/26/21 00:46	rgg	
Dibromochloromethane [124-48-1]^	3.9	U	ug/m³ Air	1.37	3.9	29	1J25034	TO-15	10/26/21 00:46	rgg	
Dichlorodifluoromethane [75-71-8]^	3.7	U	ug/m³ Air	1.37	3.7	17	1J25034	TO-15	10/26/21 00:46	rgg	
Freon 113 [76-13-1]^	**240**		ug/m³ Air	1.37	3.4	26	1J25034	TO-15	10/26/21 00:46	rgg	
Freon 114 [76-14-2]^	5.0	U	ug/m³ Air	1.37	5.0	24	1J25034	TO-15	10/26/21 00:46	rgg	
Hexachlorobutadiene [87-68-3]^	5.4	U	ug/m³ Air	1.37	5.4	37	1J25034	TO-15	10/26/21 00:46	rgg	
Methylene chloride [75-09-2]^	**1.1**	I	ug/m³ Air	1.37	0.95	12	1J25034	TO-15	10/26/21 00:46	rgg	J-01, O-01
Propene [115-07-1]^	1.3	U	ug/m³ Air	1.37	1.3	5.9	1J25034	TO-15	10/26/21 00:46	rgg	
Tetrachloroethene [127-18-4]^	2.9	U	ug/m³ Air	1.37	2.9	23	1J25034	TO-15	10/26/21 00:46	rgg	
trans-1,2-Dichloroethene [156-60-5]^	**11**	I	ug/m³ Air	1.37	1.7	14	1J25034	TO-15	10/26/21 00:46	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.1	U	ug/m³ Air	1.37	2.1	16	1J25034	TO-15	10/26/21 00:46	rgg	
Trichloroethene [79-01-6]^	2.6	U	ug/m³ Air	1.37	2.6	18	1J25034	TO-15	10/26/21 00:46	rgg	
Trichlorofluoromethane [75-69-4]^	2.6	U	ug/m³ Air	1.37	2.6	19	1J25034	TO-15	10/26/21 00:46	rgg	
Vinyl chloride [75-01-4]^	2.0	U	ug/m³ Air	1.37	2.0	8.8	1J25034	TO-15	10/26/21 00:46	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*30*	*1*	*31.0*	*96 %*	*70-130*	*1J25034*	*TO-15*	*10/26/21 00:46*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0003-20211021 | **Lab Sample ID:** AE07721-05 | **Received:** 10/22/21 15:00

Matrix: Air | **Sampled:** 10/21/21 11:10 | **Work Order:** AE07721

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.4	U	ug/m³ Air	1.27	2.4	17	1J25034	TO-15	10/26/21 01:31	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.1	U	ug/m³ Air	1.27	3.1	22	1J25034	TO-15	10/26/21 01:31	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.4	U	ug/m³ Air	1.27	2.4	17	1J25034	TO-15	10/26/21 01:31	rgg	
1,1-Dichloroethane [75-34-3]^	1.9	U	ug/m³ Air	1.27	1.9	13	1J25034	TO-15	10/26/21 01:31	rgg	
1,1-Dichloroethene [75-35-4]^	1.9	U	ug/m³ Air	1.27	1.9	13	1J25034	TO-15	10/26/21 01:31	rgg	
1,2-Dibromoethane [106-93-4]^	3.5	U	ug/m³ Air	1.27	3.5	24	1J25034	TO-15	10/26/21 01:31	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.1	U	ug/m³ Air	1.27	2.1	19	1J25034	TO-15	10/26/21 01:31	rgg	
1,2-Dichloroethane [107-06-2]^	1.9	U	ug/m³ Air	1.27	1.9	13	1J25034	TO-15	10/26/21 01:31	rgg	
1,2-Dichloropropane [78-87-5]^	2.3	U	ug/m³ Air	1.27	2.3	15	1J25034	TO-15	10/26/21 01:31	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.1	U	ug/m³ Air	1.27	2.1	19	1J25034	TO-15	10/26/21 01:31	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.4	U	ug/m³ Air	1.27	2.4	19	1J25034	TO-15	10/26/21 01:31	rgg	
3-Chloropropene [107-05-1]^	1.6	U	ug/m³ Air	1.27	1.6	9.9	1J25034	TO-15	10/26/21 01:31	rgg	
Acetone [67-64-1]^	**13**		ug/m³ Air	1.27	1.1	7.5	1J25034	TO-15	10/26/21 01:31	rgg	
Bromodichloromethane [75-27-4]^	2.9	U	ug/m³ Air	1.27	2.9	21	1J25034	TO-15	10/26/21 01:31	rgg	
Bromoethene [593-60-2]^	1.8	U	ug/m³ Air	1.27	1.8	14	1J25034	TO-15	10/26/21 01:31	rgg	
Bromoform [75-25-2]^	5.0	U	ug/m³ Air	1.27	5.0	33	1J25034	TO-15	10/26/21 01:31	rgg	
Bromomethane [74-83-9]^	1.6	U	ug/m³ Air	1.27	1.6	12	1J25034	TO-15	10/26/21 01:31	rgg	
Carbon tetrachloride [56-23-5]^	2.2	U	ug/m³ Air	1.27	2.2	20	1J25034	TO-15	10/26/21 01:31	rgg	
Chlorobenzene [108-90-7]^	1.9	U	ug/m³ Air	1.27	1.9	15	1J25034	TO-15	10/26/21 01:31	rgg	
Chloroethane [75-00-3]^	1.1	U	ug/m³ Air	1.27	1.1	8.4	1J25034	TO-15	10/26/21 01:31	rgg	
Chloroform [67-66-3]^	**5.4**	I	ug/m³ Air	1.27	2.4	16	1J25034	TO-15	10/26/21 01:31	rgg	
Chloromethane [74-87-3]^	1.3	U	ug/m³ Air	1.27	1.3	6.6	1J25034	TO-15	10/26/21 01:31	rgg	
cis-1,2-Dichloroethene [156-59-2]^	1.9	U	ug/m³ Air	1.27	1.9	13	1J25034	TO-15	10/26/21 01:31	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.2	U	ug/m³ Air	1.27	2.2	14	1J25034	TO-15	10/26/21 01:31	rgg	
Dibromochloromethane [124-48-1]^	3.6	U	ug/m³ Air	1.27	3.6	27	1J25034	TO-15	10/26/21 01:31	rgg	
Dichlorodifluoromethane [75-71-8]^	3.5	U	ug/m³ Air	1.27	3.5	16	1J25034	TO-15	10/26/21 01:31	rgg	
Freon 113 [76-13-1]^	**27**		ug/m³ Air	1.27	3.1	24	1J25034	TO-15	10/26/21 01:31	rgg	
Freon 114 [76-14-2]^	4.6	U	ug/m³ Air	1.27	4.6	22	1J25034	TO-15	10/26/21 01:31	rgg	
Hexachlorobutadiene [87-68-3]^	5.0	U	ug/m³ Air	1.27	5.0	34	1J25034	TO-15	10/26/21 01:31	rgg	
Methylene chloride [75-09-2]^	**2.8**	I	ug/m³ Air	1.27	0.88	11	1J25034	TO-15	10/26/21 01:31	rgg	J-01, O-01
Propene [115-07-1]^	1.2	U	ug/m³ Air	1.27	1.2	5.5	1J25034	TO-15	10/26/21 01:31	rgg	
Tetrachloroethene [127-18-4]^	2.7	U	ug/m³ Air	1.27	2.7	22	1J25034	TO-15	10/26/21 01:31	rgg	
trans-1,2-Dichloroethene [156-60-5]^	**18**		ug/m³ Air	1.27	1.6	13	1J25034	TO-15	10/26/21 01:31	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.0	U	ug/m³ Air	1.27	2.0	14	1J25034	TO-15	10/26/21 01:31	rgg	
Trichloroethene [79-01-6]^	2.4	U	ug/m³ Air	1.27	2.4	17	1J25034	TO-15	10/26/21 01:31	rgg	
Trichlorofluoromethane [75-69-4]^	2.4	U	ug/m³ Air	1.27	2.4	18	1J25034	TO-15	10/26/21 01:31	rgg	
Vinyl chloride [75-01-4]^	1.8	U	ug/m³ Air	1.27	1.8	8.1	1J25034	TO-15	10/26/21 01:31	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*30*	*1*	*31.0*	*95 %*	*70-130*	*1J25034*	*TO-15*	*10/26/21 01:31*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0004-20211021 | **Lab Sample ID:** AE07721-06 | **Received:** 10/22/21 15:00

Matrix: Air | **Sampled:** 10/21/21 11:35 | **Work Order:** AE07721

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.7	U	ug/m³ Air	1.43	2.7	20	1J25034	TO-15	10/26/21 12:09	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.5	U	ug/m³ Air	1.43	3.5	25	1J25034	TO-15	10/26/21 12:09	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.7	U	ug/m³ Air	1.43	2.7	20	1J25034	TO-15	10/26/21 12:09	rgg	
1,1-Dichloroethane [75-34-3]^	2.1	U	ug/m³ Air	1.43	2.1	14	1J25034	TO-15	10/26/21 12:09	rgg	
1,1-Dichloroethene [75-35-4]^	2.2	U	ug/m³ Air	1.43	2.2	14	1J25034	TO-15	10/26/21 12:09	rgg	
1,2-Dibromoethane [106-93-4]^	4.0	U	ug/m³ Air	1.43	4.0	27	1J25034	TO-15	10/26/21 12:09	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.3	U	ug/m³ Air	1.43	2.3	21	1J25034	TO-15	10/26/21 12:09	rgg	
1,2-Dichloroethane [107-06-2]^	2.1	U	ug/m³ Air	1.43	2.1	14	1J25034	TO-15	10/26/21 12:09	rgg	
1,2-Dichloropropane [78-87-5]^	2.6	U	ug/m³ Air	1.43	2.6	17	1J25034	TO-15	10/26/21 12:09	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.4	U	ug/m³ Air	1.43	2.4	21	1J25034	TO-15	10/26/21 12:09	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.7	U	ug/m³ Air	1.43	2.7	21	1J25034	TO-15	10/26/21 12:09	rgg	
3-Chloropropene [107-05-1]^	1.7	U	ug/m³ Air	1.43	1.7	11	1J25034	TO-15	10/26/21 12:09	rgg	
Acetone [67-64-1]^	**13**		ug/m³ Air	1.43	1.2	8.5	1J25034	TO-15	10/26/21 12:09	rgg	
Bromodichloromethane [75-27-4]^	3.3	U	ug/m³ Air	1.43	3.3	24	1J25034	TO-15	10/26/21 12:09	rgg	
Bromoethene [593-60-2]^	2.1	U	ug/m³ Air	1.43	2.1	16	1J25034	TO-15	10/26/21 12:09	rgg	
Bromoform [75-25-2]^	5.6	U	ug/m³ Air	1.43	5.6	37	1J25034	TO-15	10/26/21 12:09	rgg	
Bromomethane [74-83-9]^	1.8	U	ug/m³ Air	1.43	1.8	14	1J25034	TO-15	10/26/21 12:09	rgg	
Carbon tetrachloride [56-23-5]^	2.4	U	ug/m³ Air	1.43	2.4	22	1J25034	TO-15	10/26/21 12:09	rgg	
Chlorobenzene [108-90-7]^	2.2	U	ug/m³ Air	1.43	2.2	16	1J25034	TO-15	10/26/21 12:09	rgg	
Chloroethane [75-00-3]^	1.2	U	ug/m³ Air	1.43	1.2	9.4	1J25034	TO-15	10/26/21 12:09	rgg	
Chloroform [67-66-3]^	**13**	I	ug/m³ Air	1.43	2.7	17	1J25034	TO-15	10/26/21 12:09	rgg	
Chloromethane [74-87-3]^	1.4	U	ug/m³ Air	1.43	1.4	7.4	1J25034	TO-15	10/26/21 12:09	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.2	U	ug/m³ Air	1.43	2.2	14	1J25034	TO-15	10/26/21 12:09	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.5	U	ug/m³ Air	1.43	2.5	16	1J25034	TO-15	10/26/21 12:09	rgg	
Dibromochloromethane [124-48-1]^	4.0	U	ug/m³ Air	1.43	4.0	30	1J25034	TO-15	10/26/21 12:09	rgg	
Dichlorodifluoromethane [75-71-8]^	3.9	U	ug/m³ Air	1.43	3.9	18	1J25034	TO-15	10/26/21 12:09	rgg	
Freon 113 [76-13-1]^	**350**		ug/m³ Air	1.43	3.5	27	1J25034	TO-15	10/26/21 12:09	rgg	
Freon 114 [76-14-2]^	5.2	U	ug/m³ Air	1.43	5.2	25	1J25034	TO-15	10/26/21 12:09	rgg	
Hexachlorobutadiene [87-68-3]^	5.6	U	ug/m³ Air	1.43	5.6	38	1J25034	TO-15	10/26/21 12:09	rgg	
Methylene chloride [75-09-2]^	**2.5**	I	ug/m³ Air	1.43	0.99	12	1J25034	TO-15	10/26/21 12:09	rgg	J-01, O-01
Propene [115-07-1]^	1.4	U	ug/m³ Air	1.43	1.4	6.2	1J25034	TO-15	10/26/21 12:09	rgg	
Tetrachloroethene [127-18-4]^	3.0	U	ug/m³ Air	1.43	3.0	24	1J25034	TO-15	10/26/21 12:09	rgg	
trans-1,2-Dichloroethene [156-60-5]^	**14**		ug/m³ Air	1.43	1.8	14	1J25034	TO-15	10/26/21 12:09	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.2	U	ug/m³ Air	1.43	2.2	16	1J25034	TO-15	10/26/21 12:09	rgg	
Trichloroethene [79-01-6]^	2.7	U	ug/m³ Air	1.43	2.7	19	1J25034	TO-15	10/26/21 12:09	rgg	
Trichlorofluoromethane [75-69-4]^	2.7	U	ug/m³ Air	1.43	2.7	20	1J25034	TO-15	10/26/21 12:09	rgg	
Vinyl chloride [75-01-4]^	2.0	U	ug/m³ Air	1.43	2.0	9.1	1J25034	TO-15	10/26/21 12:09	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*32*	*1*	*31.0*	*103 %*	*70-130*	*1J25034*	*TO-15*	*10/26/21 12:09*	*rgg*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J25034 - NO PREP 2

Blank (1J25034-BLK1) Prepared: 10/25/2021 11:41 Analyzed: 10/25/2021 21:45

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	1.9	U	14	ug/m³ Air							
1,1,2,2-Tetrachloroethane	2.5	U	17	ug/m³ Air							
1,1,2-Trichloroethane	1.9	U	14	ug/m³ Air							
1,1-Dichloroethane	1.5	U	10	ug/m³ Air							
1,1-Dichloroethene	1.5	U	9.9	ug/m³ Air							
1,2-Dibromoethane	2.8	U	19	ug/m³ Air							
1,2-Dichlorobenzene	1.6	U	15	ug/m³ Air							
1,2-Dichloroethane	1.5	U	10	ug/m³ Air							
1,2-Dichloropropane	1.8	U	12	ug/m³ Air							
1,3-Dichlorobenzene	1.7	U	15	ug/m³ Air							
1,4-Dichlorobenzene	1.9	U	15	ug/m³ Air							
3-Chloropropene	1.2	U	7.8	ug/m³ Air							
Acetone	0.83	U	5.9	ug/m³ Air							
Bromodichloromethane	2.3	U	17	ug/m³ Air							
Bromoethene	1.4	U	11	ug/m³ Air							
Bromoform	3.9	U	26	ug/m³ Air							
Bromomethane	1.3	U	9.7	ug/m³ Air							
Carbon tetrachloride	1.7	U	16	ug/m³ Air							
Chlorobenzene	1.5	U	12	ug/m³ Air							
Chloroethane	0.84	U	6.6	ug/m³ Air							
Chloroform	1.9	U	12	ug/m³ Air							
Chloromethane	0.99	U	5.2	ug/m³ Air							
cis-1,2-Dichloroethene	1.5	U	9.9	ug/m³ Air							
cis-1,3-Dichloropropene	1.7	U	11	ug/m³ Air							
Dibromochloromethane	2.8	U	21	ug/m³ Air							
Dichlorodifluoromethane	2.7	U	12	ug/m³ Air							
Freon 113	2.5	U	19	ug/m³ Air							
Freon 114	3.6	U	17	ug/m³ Air							
Hexachlorobutadiene	3.9	U	27	ug/m³ Air							
Methylene chloride	**0.69**	**I**	8.7	ug/m³ Air							J-01, O-01
Propene	0.95	U	4.3	ug/m³ Air							
Tetrachloroethene	2.1	U	17	ug/m³ Air							
trans-1,2-Dichloroethene	1.3	U	9.9	ug/m³ Air							
trans-1,3-Dichloropropene	1.5	U	11	ug/m³ Air							
Trichloroethene	1.9	U	13	ug/m³ Air							
Trichlorofluoromethane	1.9	U	14	ug/m³ Air							
Vinyl chloride	1.4	U	6.4	ug/m³ Air							
4-Bromofluorobenzene	*29*			*ppbv*	*31.0*		*94*	*70-130*			

LCS (1J25034-BS1) Prepared: 10/25/2021 11:41 Analyzed: 10/25/2021 19:40

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	46		14	ug/m³ Air	54.6		84	70-130			
1,1,2,2-Tetrachloroethane	71		17	ug/m³ Air	68.7		103	52-163			
1,1,2-Trichloroethane	53		14	ug/m³ Air	54.6		97	70-134			
1,1-Dichloroethane	40		10	ug/m³ Air	40.5		99	70-130			
1,1-Dichloroethene	39		9.9	ug/m³ Air	39.7		98	67-142			
1,2-Dibromoethane	74		19	ug/m³ Air	76.8		96	70-141			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J25034 - NO PREP 2 - Continued

LCS (1J25034-BS1) Continued Prepared: 10/25/2021 11:41 Analyzed: 10/25/2021 19:40

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dichlorobenzene	66		15	ug/m³ Air	60.1		110	37-180			
1,2-Dichloroethane	34		10	ug/m³ Air	40.5		85	70-130			
1,2-Dichloropropane	46		12	ug/m³ Air	46.2		99	70-130			
1,3-Dichlorobenzene	67		15	ug/m³ Air	60.1		112	47-178			
1,4-Dichlorobenzene	67		15	ug/m³ Air	60.1		112	45-180			
3-Chloropropene	29		7.8	ug/m³ Air	31.3		92	70-130			
Acetone	21		5.9	ug/m³ Air	23.8		89	65-130			
Bromodichloromethane	59		17	ug/m³ Air	67.0		88	70-130			
Bromoethene	36		11	ug/m³ Air	43.7		83	69-132			
Bromoform	98		26	ug/m³ Air	103		95	62-149			
Bromomethane	31		9.7	ug/m³ Air	38.8		81	69-130			
Carbon tetrachloride	53		16	ug/m³ Air	62.9		84	22-166			
Chlorobenzene	45		12	ug/m³ Air	46.0		97	70-134			
Chloroethane	22		6.6	ug/m³ Air	26.4		82	69-131			
Chloroform	44		12	ug/m³ Air	48.8		90	70-130			
Chloromethane	18		5.2	ug/m³ Air	20.7		89	55-142			
cis-1,2-Dichloroethene	41		9.9	ug/m³ Air	39.6		102	70-130			
cis-1,3-Dichloropropene	45		11	ug/m³ Air	45.4		99	70-137			
Dibromochloromethane	76		21	ug/m³ Air	85.2		89	70-130			
Dichlorodifluoromethane	39		12	ug/m³ Air	49.5		78	61-137			
Freon 113	79		19	ug/m³ Air	76.6		103	67-140			
Freon 114	63		17	ug/m³ Air	69.9		90	62-147			
Hexachlorobutadiene	110		27	ug/m³ Air	107		100	24-180			
Methylene chloride	35		8.7	ug/m³ Air	34.7		102	59-136			
Propene	14		4.3	ug/m³ Air	17.2		83	63-132			
Tetrachloroethene	66		17	ug/m³ Air	67.8		98	70-141			
trans-1,2-Dichloroethene	37		9.9	ug/m³ Air	39.6		92	70-130			
trans-1,3-Dichloropropene	41		11	ug/m³ Air	45.4		90	59-166			
Trichloroethene	53		13	ug/m³ Air	53.7		99	70-130			
Trichlorofluoromethane	51		14	ug/m³ Air	56.2		92	46-161			
Vinyl chloride	24		6.4	ug/m³ Air	25.6		95	53-148			
4-Bromofluorobenzene	*33*			*ppbv*	*31.0*		*105*	*70-130*			

LCS Dup (1J25034-BSD1) Prepared: 10/25/2021 11:41 Analyzed: 10/25/2021 20:20

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	46		14	ug/m³ Air	54.6		84	70-130	0.03	25	
1,1,2,2-Tetrachloroethane	70		17	ug/m³ Air	68.7		101	52-163	1	25	
1,1,2-Trichloroethane	53		14	ug/m³ Air	54.6		97	70-134	0.2	25	
1,1-Dichloroethane	40		10	ug/m³ Air	40.5		98	70-130	0.4	25	
1,1-Dichloroethene	39		9.9	ug/m³ Air	39.7		97	67-142	0.8	25	
1,2-Dibromoethane	74		19	ug/m³ Air	76.8		96	70-141	0.3	25	
1,2-Dichlorobenzene	66		15	ug/m³ Air	60.1		110	37-180	0.4	25	
1,2-Dichloroethane	34		10	ug/m³ Air	40.5		84	70-130	0.4	25	
1,2-Dichloropropane	46		12	ug/m³ Air	46.2		100	70-130	0.3	25	
1,3-Dichlorobenzene	68		15	ug/m³ Air	60.1		113	47-178	0.8	25	
1,4-Dichlorobenzene	66		15	ug/m³ Air	60.1		111	45-180	1	25	
3-Chloropropene	28		7.8	ug/m³ Air	31.3		91	70-130	1	25	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J25034 - NO PREP 2 - Continued

LCS Dup (1J25034-BSD1) Continued Prepared: 10/25/2021 11:41 Analyzed: 10/25/2021 20:20

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetone	21		5.9	ug/m³ Air	23.8		89	65-130	0.4	25	
Bromodichloromethane	59		17	ug/m³ Air	67.0		87	70-130	0.5	25	
Bromoethene	36		11	ug/m³ Air	43.7		83	69-132	0.4	25	
Bromoform	98		26	ug/m³ Air	103		95	62-149	0.07	25	
Bromomethane	31		9.7	ug/m³ Air	38.8		81	69-130	0.2	25	
Carbon tetrachloride	52		16	ug/m³ Air	62.9		82	22-166	2	25	
Chlorobenzene	45		12	ug/m³ Air	46.0		97	70-134	0.3	25	
Chloroethane	22		6.6	ug/m³ Air	26.4		82	69-131	0.5	25	
Chloroform	44		12	ug/m³ Air	48.8		89	70-130	0.2	25	
Chloromethane	18		5.2	ug/m³ Air	20.7		89	55-142	0.2	25	
cis-1,2-Dichloroethene	41		9.9	ug/m³ Air	39.6		103	70-130	1	25	
cis-1,3-Dichloropropene	45		11	ug/m³ Air	45.4		100	70-137	0.7	25	
Dibromochloromethane	75		21	ug/m³ Air	85.2		88	70-130	0.6	25	
Dichlorodifluoromethane	39		12	ug/m³ Air	49.5		78	61-137	0.6	25	
Freon 113	78		19	ug/m³ Air	76.6		102	67-140	1	25	
Freon 114	63		17	ug/m³ Air	69.9		90	62-147	0.01	25	
Hexachlorobutadiene	110		27	ug/m³ Air	107		103	24-180	3	25	
Methylene chloride	35		8.7	ug/m³ Air	34.7		101	59-136	0.7	25	
Propene	14		4.3	ug/m³ Air	17.2		83	63-132	0.9	25	
Tetrachloroethene	66		17	ug/m³ Air	67.8		98	70-141	0.2	25	
trans-1,2-Dichloroethene	36		9.9	ug/m³ Air	39.6		91	70-130	1	25	
trans-1,3-Dichloropropene	40		11	ug/m³ Air	45.4		89	59-166	0.8	25	
Trichloroethene	53		13	ug/m³ Air	53.7		100	70-130	0.8	25	
Trichlorofluoromethane	51		14	ug/m³ Air	56.2		91	46-161	0.7	25	
Vinyl chloride	24		6.4	ug/m³ Air	25.6		95	53-148	0.1	25	
4-Bromofluorobenzene	*33*			*ppbv*	*31.0*		*105*	*70-130*			

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*****	Not reported due to interference.
[CALC]	Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
J-01	Result may be biased high due to positive results in the associated method blank at a concentration above the MDL and/or greater than one-half the MRL.
O-01	This compound is a common laboratory contaminant.

B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported result is an estimated value.
U	The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a “tentative identification".
Q	One or more quality control criteria failed.

AE0772I

Tetra Tech, Inc. CHAIN OF CUSTODY | NUMBER No. 3216 | PAGE 1 OF 1

PROJECT NO: 112G08970	FACILITY: KSC-CRCA	PROJECT MANAGER: Alex Murphy	PHONE NUMBER: (321) 292-0842	LABORATORY NAME AND CONTACT: ENCO — Kaitlin Dykiewicz
SAMPLERS (SIGNATURE): Chuck Sorden		FIELD OPERATIONS LEADER: Chuck Sorden	PHONE NUMBER: (321) 591-7580	ADDRESS: 10775 Central Park Dr.
		CARRIER/WAYBILL NUMBER		CITY, STATE: Orlando, FL

STANDARD TAT ☒
RUSH TAT ☐ ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2021	TIME	SAMPLE ID	LOCATION ID	~~TOP DEPTH (FT)~~ START	~~BOTTOM DEPTH (FT)~~ STOP	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: TO15 (SUMMA)	None	Methanol	COMMENTS
10/21		CRCA-AMB0001-20211021	AMB1	0900 30"Hg	1640 2"	AIR	C	1			X			Can: JS-034 Reg: C449
		CRCA-AMB0002-20211021	AMB2	0910 30"Hg	1645 1.5"									Can: JS-001 Reg: CG82
		CRCA-VMP0001-20211021	VMP1	0930 29"Hg	1030 1.5"Hg									Can: JS-014 Reg: JAX-R-10
		CRCA-VMP0002-20211021	VMP2	0950 320"	1050 7"									Can: JS-018 Reg: JAX-R-51
		CRCA-VMP0003-20211021	VMP3	1010 22"	1110 0"									Can: JS-004 Reg: JAX-R-57
10/21		CRCA-VMP0004-20211021	VMP4	1035 28"	1135 4"	AIR	C	1			X			Can: JS-099 Reg: ~~JAX-R-62~~ JAX-R-62

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	10/22/21	1500	1. RECEIVED BY: James W Gregg	10/22/21	TIME 1500
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: bpp 26.1°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

AE0772)

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive, Orlando, FL 32824
4810 Executive Park Court, Suite 211,Jacksonville, FL 32216
102-A Woodwinds Industrial Ct, Cary, NC 27511

www.encolabs.com

COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	KSC-CRCA
SAMPLER ID:	CRCA-AMB0001-20211021
SAMPLING DATE:	10/21/21
OPERATOR:	Chuck Sordin
SHIPPING DATE:	10-13-21
CANISTER SERIAL NO.:	5S-034
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	6449

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	72°F	30 ~~mm Hg~~ inHg	0900	12.5mL/min
STOP	82	21 in Hg	1640	12.5mL/min

Signature/Title: Geologist

AE07721

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	KSC- CRCA
SAMPLER ID:	CRCA-AMB0002- 20211021
SAMPLING DATE:	10/21/21
OPERATOR:	Chuck Scrafin
SHIPPING DATE:	09/28/21
CANISTER SERIAL NO.:	JS-001
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	6682

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	71°F	29 ~~in hg~~ in hg	0910	12.5 mL/min
STOP	82°F	1.5" hg	1645	12.5 mL/min

Signature/Title: Geologist

AE07821

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4810 Executive Park Court, Suite 211,Jacksonville, FL 32216
102-A Woodwinds Industrial Ct, Cary, NC 27511

COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	KSC-CRCA
SAMPLER ID:	CRCA-~~AMB~~ VMP0001-20211021
SAMPLING DATE:	10/21/21
OPERATOR:	Chuck Sorden
SHIPPING DATE:	09/28/21
CANISTER SERIAL NO.:	JS-014
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAX-R-10

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	72°F	28" hg	0930	100 mL/min
STOP	79°F	1.5" hg	1030	100 mL/min

Signature/Title: Geologist

AC07721

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive, Orlando, FL 32824
4810 Executive Park Court, Suite 211,Jacksonville, FL 32216
102-A Woodwinds Industrial Ct, Cary, NC 27511

COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	KSC-CRCA
SAMPLER ID:	CRCA-VMP0002-20211021
SAMPLING DATE:	10/21/21
OPERATOR:	Chuck Sorden
SHIPPING DATE:	09/28/21
CANISTER SERIAL NO.:	JS-018
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAX-R-51

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	72°F	730" hg	0950	100 mL/min
STOP	79°F	7" hg	1050	100 mL/min

Signature/Title: Chuck Sorden Geologist

Regulator Bottom PSI Reading 5.5" HG O then disconnected

AE07721

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	KSC-CRCA
SAMPLER ID:	CRCA-VMP0003-20210921
SAMPLING DATE:	10/21/21
OPERATOR:	Chuck Sorden
SHIPPING DATE:	09/28/21
CANISTER SERIAL NO.:	JS-004
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAX-R-57

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	72°F	22" hg	1010	100mL/min
STOP	80°F	0" hg	1110	100mL/min

Signature/Title: Geologist

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	KSC - CRCA
SAMPLER ID:	CRCA-VMP0004-20211021
SAMPLING DATE:	10/21/21
OPERATOR:	Chuck Sorden
SHIPPING DATE:	09128121
CANISTER SERIAL NO.:	JS-099
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAX-R-62

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	73°F	28" hg	1035	100mL/min
STOP	80°F	4" hg	1135	100mL/min

Signature/Title: Chuck Sorden Geologist

ENCO Orlando

SDG: AE07721-TE016

CLASS: 06_VOA_AIR

METHOD: TO-15

ANALYSES DATA PACKAGE COVER PAGE

TO-15

Laboratory: ENCO Orlando

SDG: AE07721-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA Airs

Client Sample Id:	Lab Sample Id:
CRCA-AMB0001-20211021	AE07721-01
CRCA-AMB0002-20211021	AE07721-02
CRCA-VMP0001-20211021	AE07721-03
CRCA-VMP0002-20211021	AE07721-04
CRCA-VMP0003-20211021	AE07721-05
CRCA-VMP0004-20211021	AE07721-06
CRCA-VMP0004-20211021	AE07721-06RE1

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0001-20211021

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AE07721-01
File ID: 217JT008.D
Sampled: 10/21/21 16:40
Prepared: 10/25/21 11:41
Analyzed: 10/25/21 22:30
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 1J25034
Sequence: AA68966
Calibration: 2110016
Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.38	3.8	UD	3.8	17
115-07-1	Propene	1.38	1.3	UD	1.3	5.9
74-87-3	Chloromethane	1.38	1.4	UD	1.4	7.1
75-01-4	Vinyl chloride	1.38	2.0	UD	2.0	8.8
74-83-9	Bromomethane	1.38	1.8	UD	1.8	13
75-00-3	Chloroethane	1.38	1.2	UD	1.2	9.1
75-69-4	Trichlorofluoromethane	1.38	2.6	UD	2.6	19
593-60-2	Bromoethene	1.38	2.0	UD	2.0	15
75-34-3	1,1-Dichloroethane	1.38	2.0	UD	2.0	14
67-64-1	Acetone	1.38	5.6	JD	1.1	8.2
75-09-2	Methylene chloride	1.38	1.4	JBD	0.96	12
76-13-1	Freon 113	1.38	3.4	UD	3.4	26
107-05-1	3-Chloropropene	1.38	1.7	UD	1.7	11
156-60-5	trans-1,2-Dichloroethene	1.38	36	D	1.8	14
75-35-4	1,1-Dichloroethene	1.38	2.1	UD	2.1	14
156-59-2	cis-1,2-Dichloroethene	1.38	2.1	UD	2.1	14
67-66-3	Chloroform	1.38	2.6	UD	2.6	17
107-06-2	1,2-Dichloroethane	1.38	2.1	UD	2.1	14
71-55-6	1,1,1-Trichloroethane	1.38	2.6	UD	2.6	19
56-23-5	Carbon tetrachloride	1.38	2.3	UD	2.3	22
78-87-5	1,2-Dichloropropane	1.38	2.6	UD	2.6	16
79-01-6	Trichloroethene	1.38	2.6	UD	2.6	19
75-27-4	Bromodichloromethane	1.38	3.1	UD	3.1	23
10061-01-5	cis-1,3-Dichloropropene	1.38	2.4	UD	2.4	16
10061-02-6	trans-1,3-Dichloropropene	1.38	2.1	UD	2.1	16
79-00-5	1,1,2-Trichloroethane	1.38	2.6	UD	2.6	19
106-93-4	1,2-Dibromoethane	1.38	3.8	UD	3.8	27
127-18-4	Tetrachloroethene	1.38	2.9	UD	2.9	23
124-48-1	Dibromochloromethane	1.38	3.9	UD	3.9	29
108-90-7	Chlorobenzene	1.38	2.1	UD	2.1	16
75-25-2	Bromoform	1.38	5.4	UD	5.4	36
79-34-5	1,1,2,2-Tetrachloroethane	1.38	3.4	UD	3.4	24
541-73-1	1,3-Dichlorobenzene	1.38	2.3	UD	2.3	21
106-46-7	1,4-Dichlorobenzene	1.38	2.6	UD	2.6	21
95-50-1	1,2-Dichlorobenzene	1.38	2.2	UD	2.2	21
87-68-3	Hexachlorobutadiene	1.38	5.4	UD	5.4	37
76-14-2	Freon 114	1.38	5.0	UD	5.0	24

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	29	95	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0001-20211021

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AE07721-01
File ID: 217JT008.D
Sampled: 10/21/21 16:40
Prepared: 10/25/21 11:41
Analyzed: 10/25/21 22:30
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 1J25034
Sequence: AA68966
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	241696	10.89	226712	10.87	
1,4-Difluorobenzene	794533	12.4	736300	12.38	
Chlorobenzene-d5	600991	15.79	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0002-20211021

Laboratory: ENCO Orlando SDG: AE07721-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AE07721-02 File ID: 217JT009.D

Sampled: 10/21/21 16:45 Prepared: 10/25/21 11:41 Analyzed: 10/25/21 23:15

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 1J25034 Sequence: AA68966 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.4	3.8	UD	3.8	17
115-07-1	Propene	1.4	1.3	UD	1.3	6.0
74-87-3	Chloromethane	1.4	1.4	UD	1.4	7.2
75-01-4	Vinyl chloride	1.4	2.0	UD	2.0	8.9
74-83-9	Bromomethane	1.4	1.8	UD	1.8	14
75-00-3	Chloroethane	1.4	1.2	UD	1.2	9.2
75-69-4	Trichlorofluoromethane	1.4	2.7	UD	2.7	20
593-60-2	Bromoethene	1.4	2.0	UD	2.0	15
75-34-3	1,1-Dichloroethane	1.4	2.0	UD	2.0	14
67-64-1	Acetone	1.4	6.7	JD	1.2	8.3
75-09-2	Methylene chloride	1.4	1.6	JBD	0.97	12
76-13-1	Freon 113	1.4	3.4	UD	3.4	27
107-05-1	3-Chloropropene	1.4	1.7	UD	1.7	11
156-60-5	trans-1,2-Dichloroethene	1.4	1.8	UD	1.8	14
75-35-4	1,1-Dichloroethene	1.4	2.1	UD	2.1	14
156-59-2	cis-1,2-Dichloroethene	1.4	2.1	UD	2.1	14
67-66-3	Chloroform	1.4	2.6	UD	2.6	17
107-06-2	1,2-Dichloroethane	1.4	2.1	UD	2.1	14
71-55-6	1,1,1-Trichloroethane	1.4	2.6	UD	2.6	19
56-23-5	Carbon tetrachloride	1.4	2.4	UD	2.4	22
78-87-5	1,2-Dichloropropane	1.4	2.6	UD	2.6	16
79-01-6	Trichloroethene	1.4	2.6	UD	2.6	19
75-27-4	Bromodichloromethane	1.4	3.2	UD	3.2	23
10061-01-5	cis-1,3-Dichloropropene	1.4	2.4	UD	2.4	16
10061-02-6	trans-1,3-Dichloropropene	1.4	2.2	UD	2.2	16
79-00-5	1,1,2-Trichloroethane	1.4	2.7	UD	2.7	19
106-93-4	1,2-Dibromoethane	1.4	3.9	UD	3.9	27
127-18-4	Tetrachloroethene	1.4	2.9	UD	2.9	24
124-48-1	Dibromochloromethane	1.4	3.9	UD	3.9	30
108-90-7	Chlorobenzene	1.4	2.1	UD	2.1	16
75-25-2	Bromoform	1.4	5.5	UD	5.5	36
79-34-5	1,1,2,2-Tetrachloroethane	1.4	3.5	UD	3.5	24
541-73-1	1,3-Dichlorobenzene	1.4	2.4	UD	2.4	21
106-46-7	1,4-Dichlorobenzene	1.4	2.6	UD	2.6	21
95-50-1	1,2-Dichlorobenzene	1.4	2.3	UD	2.3	21
87-68-3	Hexachlorobutadiene	1.4	5.5	UD	5.5	37
76-14-2	Freon 114	1.4	5.1	UD	5.1	24

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	29	95	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0002-20211021

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AE07721-02
File ID: 217JT009.D
Sampled: 10/21/21 16:45
Prepared: 10/25/21 11:41
Analyzed: 10/25/21 23:15
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 1J25034
Sequence: AA68966
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	238562	10.89	226712	10.87	
1,4-Difluorobenzene	793794	12.39	736300	12.38	
Chlorobenzene-d5	598915	15.8	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0001-20211021

Laboratory: ENCO Orlando SDG: AE07721-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AE07721-03 File ID: 217JT010.D

Sampled: 10/21/21 10:30 Prepared: 10/25/21 11:41 Analyzed: 10/26/21 00:00

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 1J25034 Sequence: AA68966 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.4	3.8	UD	3.8	17
115-07-1	Propene	1.4	1.3	UD	1.3	6.0
74-87-3	Chloromethane	1.4	1.4	UD	1.4	7.2
75-01-4	Vinyl chloride	1.4	2.0	UD	2.0	8.9
74-83-9	Bromomethane	1.4	1.8	UD	1.8	14
75-00-3	Chloroethane	1.4	1.2	UD	1.2	9.2
75-69-4	Trichlorofluoromethane	1.4	2.7	UD	2.7	20
593-60-2	Bromoethene	1.4	2.0	UD	2.0	15
75-34-3	1,1-Dichloroethane	1.4	2.0	UD	2.0	14
67-64-1	Acetone	1.4	11	D	1.2	8.3
75-09-2	Methylene chloride	1.4	1.1	JBD	0.97	12
76-13-1	Freon 113	1.4	60	DE	3.4	27
107-05-1	3-Chloropropene	1.4	1.7	UD	1.7	11
156-60-5	trans-1,2-Dichloroethene	1.4	6.0	JD	1.8	14
75-35-4	1,1-Dichloroethene	1.4	2.1	UD	2.1	14
156-59-2	cis-1,2-Dichloroethene	1.4	2.1	UD	2.1	14
67-66-3	Chloroform	1.4	2.6	UD	2.6	17
107-06-2	1,2-Dichloroethane	1.4	2.1	UD	2.1	14
71-55-6	1,1,1-Trichloroethane	1.4	2.6	UD	2.6	19
56-23-5	Carbon tetrachloride	1.4	2.4	UD	2.4	22
78-87-5	1,2-Dichloropropane	1.4	2.6	UD	2.6	16
79-01-6	Trichloroethene	1.4	2.6	UD	2.6	19
75-27-4	Bromodichloromethane	1.4	3.2	UD	3.2	23
10061-01-5	cis-1,3-Dichloropropene	1.4	2.4	UD	2.4	16
10061-02-6	trans-1,3-Dichloropropene	1.4	2.2	UD	2.2	16
79-00-5	1,1,2-Trichloroethane	1.4	2.7	UD	2.7	19
106-93-4	1,2-Dibromoethane	1.4	3.9	UD	3.9	27
127-18-4	Tetrachloroethene	1.4	2.9	UD	2.9	24
124-48-1	Dibromochloromethane	1.4	3.9	UD	3.9	30
108-90-7	Chlorobenzene	1.4	2.1	UD	2.1	16
75-25-2	Bromoform	1.4	5.5	UD	5.5	36
79-34-5	1,1,2,2-Tetrachloroethane	1.4	3.5	UD	3.5	24
541-73-1	1,3-Dichlorobenzene	1.4	2.4	UD	2.4	21
106-46-7	1,4-Dichlorobenzene	1.4	2.6	UD	2.6	21
95-50-1	1,2-Dichlorobenzene	1.4	2.3	UD	2.3	21
87-68-3	Hexachlorobutadiene	1.4	5.5	UD	5.5	37
76-14-2	Freon 114	1.4	5.1	UD	5.1	24

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	29	95	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0001-20211021

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AE07721-03
File ID: 217JT010.D
Sampled: 10/21/21 10:30
Prepared: 10/25/21 11:41
Analyzed: 10/26/21 00:00
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 1J25034
Sequence: AA68966
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	244626	10.89	226712	10.87	
1,4-Difluorobenzene	803643	12.4	736300	12.38	
Chlorobenzene-d5	613808	15.79	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0002-20211021

Laboratory: ENCO Orlando SDG: AE07721-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AE07721-04 File ID: 217JT011.D

Sampled: 10/21/21 10:50 Prepared: 10/25/21 11:41 Analyzed: 10/26/21 00:46

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 1J25034 Sequence: AA68966 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.37	3.7	UD	3.7	17
115-07-1	Propene	1.37	1.3	UD	1.3	5.9
74-87-3	Chloromethane	1.37	1.4	UD	1.4	7.1
75-01-4	Vinyl chloride	1.37	2.0	UD	2.0	8.8
74-83-9	Bromomethane	1.37	1.8	UD	1.8	13
75-00-3	Chloroethane	1.37	1.2	UD	1.2	9.0
75-69-4	Trichlorofluoromethane	1.37	2.6	UD	2.6	19
593-60-2	Bromoethene	1.37	2.0	UD	2.0	15
75-34-3	1,1-Dichloroethane	1.37	2.0	UD	2.0	14
67-64-1	Acetone	1.37	6.6	JD	1.1	8.1
75-09-2	Methylene chloride	1.37	1.1	JBD	0.95	12
76-13-1	Freon 113	1.37	240	DE	3.4	26
107-05-1	3-Chloropropene	1.37	1.7	UD	1.7	11
156-60-5	trans-1,2-Dichloroethene	1.37	11	JD	1.7	14
75-35-4	1,1-Dichloroethene	1.37	2.1	UD	2.1	14
156-59-2	cis-1,2-Dichloroethene	1.37	2.1	UD	2.1	14
67-66-3	Chloroform	1.37	2.5	UD	2.5	17
107-06-2	1,2-Dichloroethane	1.37	2.1	UD	2.1	14
71-55-6	1,1,1-Trichloroethane	1.37	2.5	UD	2.5	19
56-23-5	Carbon tetrachloride	1.37	2.3	UD	2.3	22
78-87-5	1,2-Dichloropropane	1.37	2.5	UD	2.5	16
79-01-6	Trichloroethene	1.37	2.6	UD	2.6	18
75-27-4	Bromodichloromethane	1.37	3.1	UD	3.1	23
10061-01-5	cis-1,3-Dichloropropene	1.37	2.4	UD	2.4	16
10061-02-6	trans-1,3-Dichloropropene	1.37	2.1	UD	2.1	16
79-00-5	1,1,2-Trichloroethane	1.37	2.6	UD	2.6	19
106-93-4	1,2-Dibromoethane	1.37	3.8	UD	3.8	26
127-18-4	Tetrachloroethene	1.37	2.9	UD	2.9	23
124-48-1	Dibromochloromethane	1.37	3.9	UD	3.9	29
108-90-7	Chlorobenzene	1.37	2.1	UD	2.1	16
75-25-2	Bromoform	1.37	5.4	UD	5.4	35
79-34-5	1,1,2,2-Tetrachloroethane	1.37	3.4	UD	3.4	24
541-73-1	1,3-Dichlorobenzene	1.37	2.3	UD	2.3	21
106-46-7	1,4-Dichlorobenzene	1.37	2.6	UD	2.6	21
95-50-1	1,2-Dichlorobenzene	1.37	2.2	UD	2.2	21
87-68-3	Hexachlorobutadiene	1.37	5.4	UD	5.4	37
76-14-2	Freon 114	1.37	5.0	UD	5.0	24

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	30	96	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0002-20211021

Laboratory: ENCO Orlando SDG: AE07721-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AE07721-04 File ID: 217JT011.D

Sampled: 10/21/21 10:50 Prepared: 10/25/21 11:41 Analyzed: 10/26/21 00:46

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 1J25034 Sequence: AA68966 Calibration: 2110016 Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	301057	10.89	226712	10.87	
1,4-Difluorobenzene	983508	12.42	736300	12.38	
Chlorobenzene-d5	757286	15.8	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0003-20211021

Laboratory: ENCO Orlando SDG: AE07721-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AE07721-05 File ID: 217JT012.D

Sampled: 10/21/21 11:10 Prepared: 10/25/21 11:41 Analyzed: 10/26/21 01:31

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 1J25034 Sequence: AA68966 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.27	3.5	UD	3.5	16
115-07-1	Propene	1.27	1.2	UD	1.2	5.5
74-87-3	Chloromethane	1.27	1.3	UD	1.3	6.6
75-01-4	Vinyl chloride	1.27	1.8	UD	1.8	8.1
74-83-9	Bromomethane	1.27	1.6	UD	1.6	12
75-00-3	Chloroethane	1.27	1.1	UD	1.1	8.4
75-69-4	Trichlorofluoromethane	1.27	2.4	UD	2.4	18
593-60-2	Bromoethene	1.27	1.8	UD	1.8	14
75-34-3	1,1-Dichloroethane	1.27	1.9	UD	1.9	13
67-64-1	Acetone	1.27	13	D	1.1	7.5
75-09-2	Methylene chloride	1.27	2.8	JBD	0.88	11
76-13-1	Freon 113	1.27	27	D	3.1	24
107-05-1	3-Chloropropene	1.27	1.6	UD	1.6	9.9
156-60-5	trans-1,2-Dichloroethene	1.27	18	D	1.6	13
75-35-4	1,1-Dichloroethene	1.27	1.9	UD	1.9	13
156-59-2	cis-1,2-Dichloroethene	1.27	1.9	UD	1.9	13
67-66-3	Chloroform	1.27	5.4	JD	2.4	16
107-06-2	1,2-Dichloroethane	1.27	1.9	UD	1.9	13
71-55-6	1,1,1-Trichloroethane	1.27	2.4	UD	2.4	17
56-23-5	Carbon tetrachloride	1.27	2.2	UD	2.2	20
78-87-5	1,2-Dichloropropane	1.27	2.3	UD	2.3	15
79-01-6	Trichloroethene	1.27	2.4	UD	2.4	17
75-27-4	Bromodichloromethane	1.27	2.9	UD	2.9	21
10061-01-5	cis-1,3-Dichloropropene	1.27	2.2	UD	2.2	14
10061-02-6	trans-1,3-Dichloropropene	1.27	2.0	UD	2.0	14
79-00-5	1,1,2-Trichloroethane	1.27	2.4	UD	2.4	17
106-93-4	1,2-Dibromoethane	1.27	3.5	UD	3.5	24
127-18-4	Tetrachloroethene	1.27	2.7	UD	2.7	22
124-48-1	Dibromochloromethane	1.27	3.6	UD	3.6	27
108-90-7	Chlorobenzene	1.27	1.9	UD	1.9	15
75-25-2	Bromoform	1.27	5.0	UD	5.0	33
79-34-5	1,1,2,2-Tetrachloroethane	1.27	3.1	UD	3.1	22
541-73-1	1,3-Dichlorobenzene	1.27	2.1	UD	2.1	19
106-46-7	1,4-Dichlorobenzene	1.27	2.4	UD	2.4	19
95-50-1	1,2-Dichlorobenzene	1.27	2.1	UD	2.1	19
87-68-3	Hexachlorobutadiene	1.27	5.0	UD	5.0	34
76-14-2	Freon 114	1.27	4.6	UD	4.6	22

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	30	95	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0003-20211021

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AE07721-05
File ID: 217JT012.D
Sampled: 10/21/21 11:10
Prepared: 10/25/21 11:41
Analyzed: 10/26/21 01:31
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 1J25034
Sequence: AA68966
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	298675	10.89	226712	10.87	
1,4-Difluorobenzene	986684	12.42	736300	12.38	
Chlorobenzene-d5	761674	15.8	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0004-20211021

Laboratory: ENCO Orlando SDG: AE07721-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AE07721-06RE1 File ID: 217JT015.D

Sampled: 10/21/21 11:35 Prepared: 10/25/21 11:41 Analyzed: 10/26/21 12:09

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 1J25034 Sequence: AA68966 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.43	3.9	UD	3.9	18
115-07-1	Propene	1.43	1.4	UD	1.4	6.2
74-87-3	Chloromethane	1.43	1.4	UD	1.4	7.4
75-01-4	Vinyl chloride	1.43	2.0	UD	2.0	9.1
74-83-9	Bromomethane	1.43	1.8	UD	1.8	14
75-00-3	Chloroethane	1.43	1.2	UD	1.2	9.4
75-69-4	Trichlorofluoromethane	1.43	2.7	UD	2.7	20
593-60-2	Bromoethene	1.43	2.1	UD	2.1	16
75-34-3	1,1-Dichloroethane	1.43	2.1	UD	2.1	14
67-64-1	Acetone	1.43	13	D	1.2	8.5
75-09-2	Methylene chloride	1.43	2.5	JBD	0.99	12
76-13-1	Freon 113	1.43	350	DE	3.5	27
107-05-1	3-Chloropropene	1.43	1.7	UD	1.7	11
156-60-5	trans-1,2-Dichloroethene	1.43	14	D	1.8	14
75-35-4	1,1-Dichloroethene	1.43	2.2	UD	2.2	14
156-59-2	cis-1,2-Dichloroethene	1.43	2.2	UD	2.2	14
67-66-3	Chloroform	1.43	13	JD	2.7	17
107-06-2	1,2-Dichloroethane	1.43	2.1	UD	2.1	14
71-55-6	1,1,1-Trichloroethane	1.43	2.7	UD	2.7	20
56-23-5	Carbon tetrachloride	1.43	2.4	UD	2.4	22
78-87-5	1,2-Dichloropropane	1.43	2.6	UD	2.6	17
79-01-6	Trichloroethene	1.43	2.7	UD	2.7	19
75-27-4	Bromodichloromethane	1.43	3.3	UD	3.3	24
10061-01-5	cis-1,3-Dichloropropene	1.43	2.5	UD	2.5	16
10061-02-6	trans-1,3-Dichloropropene	1.43	2.2	UD	2.2	16
79-00-5	1,1,2-Trichloroethane	1.43	2.7	UD	2.7	20
106-93-4	1,2-Dibromoethane	1.43	4.0	UD	4.0	27
127-18-4	Tetrachloroethene	1.43	3.0	UD	3.0	24
124-48-1	Dibromochloromethane	1.43	4.0	UD	4.0	30
108-90-7	Chlorobenzene	1.43	2.2	UD	2.2	16
75-25-2	Bromoform	1.43	5.6	UD	5.6	37
79-34-5	1,1,2,2-Tetrachloroethane	1.43	3.5	UD	3.5	25
541-73-1	1,3-Dichlorobenzene	1.43	2.4	UD	2.4	21
106-46-7	1,4-Dichlorobenzene	1.43	2.7	UD	2.7	21
95-50-1	1,2-Dichlorobenzene	1.43	2.3	UD	2.3	21
87-68-3	Hexachlorobutadiene	1.43	5.6	UD	5.6	38
76-14-2	Freon 114	1.43	5.2	UD	5.2	25

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	32	103	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0004-20211021

Laboratory: ENCO Orlando SDG: AE07721-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AE07721-06RE1 File ID: 217JT015.D

Sampled: 10/21/21 11:35 Prepared: 10/25/21 11:41 Analyzed: 10/26/21 12:09

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 1J25034 Sequence: AA68966 Calibration: 2110016 Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	291919	10.89	226712	10.87	
1,4-Difluorobenzene	946752	12.39	736300	12.38	
Chlorobenzene-d5	692868	15.8	586400	15.77	

* Values outside of QC limits

HOLDING TIME SUMMARY

TO-15

Laboratory: ENCO Orlando

SDG: AE07721-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA Airs

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-AMB0001-20211021	10/21/21 16:40	10/22/21 15:00	10/25/21 11:41	3.79	NA	10/25/21 22:30	4.00	30.00	
CRCA-AMB0002-20211021	10/21/21 16:45	10/22/21 15:00	10/25/21 11:41	3.79	NA	10/25/21 23:15	4.00	30.00	
CRCA-VMP0001-20211021	10/21/21 10:30	10/22/21 15:00	10/25/21 11:41	4.05	NA	10/26/21 00:00	5.00	30.00	
CRCA-VMP0002-20211021	10/21/21 10:50	10/22/21 15:00	10/25/21 11:41	4.04	NA	10/26/21 00:46	5.00	30.00	
CRCA-VMP0003-20211021	10/21/21 11:10	10/22/21 15:00	10/25/21 11:41	4.02	NA	10/26/21 01:31	5.00	30.00	
CRCA-VMP0004-20211021	10/21/21 11:35	10/22/21 15:00	10/25/21 11:41	4.00	NA	10/26/21 12:09	5.00	30.00	

PREPARATION BATCH SUMMARY

TO-15

Laboratory: ENCO Orlando SDG: AE07721-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Batch: 1J25034 Batch Matrix: Air Preparation: NO PREP 2

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	1J25034-BLK1	217JT007.D	10/25/21 11:41	
LCS	1J25034-BS1	217JT004.D	10/25/21 11:41	
LCS Dup	1J25034-BSD1	217JT005.D	10/25/21 11:41	
CRCA-AMB0001-20211021	AE07721-01	217JT008.D	10/25/21 11:41	
CRCA-AMB0002-20211021	AE07721-02	217JT009.D	10/25/21 11:41	
CRCA-VMP0001-20211021	AE07721-03	217JT010.D	10/25/21 11:41	
CRCA-VMP0002-20211021	AE07721-04	217JT011.D	10/25/21 11:41	
CRCA-VMP0003-20211021	AE07721-05	217JT012.D	10/25/21 11:41	
CRCA-VMP0004-20211021	AE07721-06RE1	217JT015.D	10/25/21 11:41	

METHOD BLANK DATA SHEET
TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs

Matrix:	Air	Laboratory ID:	1J25034-BLK1	File ID:	217JT007.D
Prepared:	10/25/21 11:41	Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL
Analyzed:	10/25/21 21:45	Instrument:	OVGCMS7		
Batch:	1J25034	Sequence:	AA68966	Calibration:	2110016

CAS NO.	COMPOUND	CONC. (ug/m³ Air)	Q
75-71-8	Dichlorodifluoromethane	2.7	U
115-07-1	Propene	0.95	U
74-87-3	Chloromethane	0.99	U
75-01-4	Vinyl chloride	1.4	U
74-83-9	Bromomethane	1.3	U
75-00-3	Chloroethane	0.84	U
75-69-4	Trichlorofluoromethane	1.9	U
593-60-2	Bromoethene	1.4	U
75-34-3	1,1-Dichloroethane	1.5	U
67-64-1	Acetone	0.83	U
75-09-2	Methylene chloride	0.69	J
76-13-1	Freon 113	2.5	U
107-05-1	3-Chloropropene	1.2	U
156-60-5	trans-1,2-Dichloroethene	1.3	U
75-35-4	1,1-Dichloroethene	1.5	U
156-59-2	cis-1,2-Dichloroethene	1.5	U
67-66-3	Chloroform	1.9	U
107-06-2	1,2-Dichloroethane	1.5	U
71-55-6	1,1,1-Trichloroethane	1.9	U
56-23-5	Carbon tetrachloride	1.7	U
78-87-5	1,2-Dichloropropane	1.8	U
79-01-6	Trichloroethene	1.9	U
75-27-4	Bromodichloromethane	2.3	U
10061-01-5	cis-1,3-Dichloropropene	1.7	U
10061-02-6	trans-1,3-Dichloropropene	1.5	U
79-00-5	1,1,2-Trichloroethane	1.9	U
106-93-4	1,2-Dibromoethane	2.8	U
127-18-4	Tetrachloroethene	2.1	U
124-48-1	Dibromochloromethane	2.8	U
108-90-7	Chlorobenzene	1.5	U

METHOD BLANK DATA SHEET
TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs

Matrix:	Air	Laboratory ID:	1J25034-BLK1	File ID:	217JT007.D
Prepared:	10/25/21 11:41	Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL
Analyzed:	10/25/21 21:45	Instrument:	OVGCMS7		
Batch:	1J25034	Sequence:	AA68966	Calibration:	2110016

CAS NO.	COMPOUND	CONC. (ug/m³ Air)	Q
75-25-2	Bromoform	3.9	U
79-34-5	1,1,2,2-Tetrachloroethane	2.5	U
541-73-1	1,3-Dichlorobenzene	1.7	U
106-46-7	1,4-Dichlorobenzene	1.9	U
95-50-1	1,2-Dichlorobenzene	1.6	U
87-68-3	Hexachlorobutadiene	3.9	U
76-14-2	Freon 114	3.6	U

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	29	94	70 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	246395	10.89	226712	10.87	
1,4-Difluorobenzene	814319	12.39	736300	12.38	
Chlorobenzene-d5	613543	15.79	586400	15.77	

LCS / LCS DUPLICATE RECOVERY

TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Matrix:	Air		
Batch:	1J25034	Laboratory ID:	1J25034-BS1
Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL

COMPOUND	SPIKE ADDED (ug/m³ Air)	LCS CONCENTRATION (ug/m³ Air)	LCS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	49.5	39	78	61 - 137
Propene	17.2	14	83	63 - 132
Chloromethane	20.7	18	89	55 - 142
Vinyl chloride	25.6	24	95	53 - 148
Bromomethane	38.8	31	81	69 - 130
Chloroethane	26.4	22	82	69 - 131
Trichlorofluoromethane	56.2	51	92	46 - 161
Bromoethene	43.7	36	83	69 - 132
1,1-Dichloroethane	40.5	40	99	70 - 130
Acetone	23.8	21	89	65 - 130
Methylene chloride	34.7	35	102	59 - 136
Freon 113	76.6	79	103	67 - 140
3-Chloropropene	31.3	29	92	70 - 130
trans-1,2-Dichloroethene	39.6	37	92	70 - 130
1,1-Dichloroethene	39.7	39	98	67 - 142
cis-1,2-Dichloroethene	39.6	41	102	70 - 130
Chloroform	48.8	44	90	70 - 130
1,2-Dichloroethane	40.5	34	85	70 - 130
1,1,1-Trichloroethane	54.6	46	84	70 - 130
Carbon tetrachloride	62.9	53	84	22 - 166
1,2-Dichloropropane	46.2	46	99	70 - 130
Trichloroethene	53.7	53	99	70 - 130
Bromodichloromethane	67.0	59	88	70 - 130
cis-1,3-Dichloropropene	45.4	45	99	70 - 137
trans-1,3-Dichloropropene	45.4	41	90	59 - 166
1,1,2-Trichloroethane	54.6	53	97	70 - 134
1,2-Dibromoethane	76.8	74	96	70 - 141
Tetrachloroethene	67.8	66	98	70 - 141
Dibromochloromethane	85.2	76	89	70 - 130
Chlorobenzene	46.0	45	97	70 - 134

LCS / LCS DUPLICATE RECOVERY

TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Matrix:	Air		
Batch:	1J25034	Laboratory ID:	1J25034-BS1
Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL

COMPOUND	SPIKE ADDED (ug/m³ Air)	LCS CONCENTRATION (ug/m³ Air)	LCS % REC. #	QC LIMITS REC.
Bromoform	103	98	95	62 - 149
1,1,2,2-Tetrachloroethane	68.7	71	103	52 - 163
1,3-Dichlorobenzene	60.1	67	112	47 - 178
1,4-Dichlorobenzene	60.1	67	112	45 - 180
1,2-Dichlorobenzene	60.1	66	110	37 - 180
Hexachlorobutadiene	107	110	100	24 - 180
Freon 114	69.9	63	90	62 - 147

COMPOUND	SPIKE ADDED (ug/m³ Air)	LCSD CONCENTRATION (ug/m³ Air)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	49.5	39	78	0.6	25	61 - 137
Propene	17.2	14	83	0.9	25	63 - 132
Chloromethane	20.7	18	89	0.2	25	55 - 142
Vinyl chloride	25.6	24	95	0.1	25	53 - 148
Bromomethane	38.8	31	81	0.2	25	69 - 130
Chloroethane	26.4	22	82	0.5	25	69 - 131
Trichlorofluoromethane	56.2	51	91	0.7	25	46 - 161
Bromoethene	43.7	36	83	0.4	25	69 - 132
1,1-Dichloroethane	40.5	40	98	0.4	25	70 - 130
Acetone	23.8	21	89	0.4	25	65 - 130
Methylene chloride	34.7	35	101	0.7	25	59 - 136
Freon 113	76.6	78	102	1	25	67 - 140
3-Chloropropene	31.3	28	91	1	25	70 - 130
trans-1,2-Dichloroethene	39.6	36	91	1	25	70 - 130
1,1-Dichloroethene	39.7	39	97	0.8	25	67 - 142
cis-1,2-Dichloroethene	39.6	41	103	1	25	70 - 130
Chloroform	48.8	44	89	0.2	25	70 - 130
1,2-Dichloroethane	40.5	34	84	0.4	25	70 - 130
1,1,1-Trichloroethane	54.6	46	84	0.03	25	70 - 130
Carbon tetrachloride	62.9	52	82	2	25	22 - 166

LCS / LCS DUPLICATE RECOVERY

TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Matrix:	Air		
Batch:	1J25034	Laboratory ID:	1J25034-BSD1
Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL

COMPOUND	SPIKE ADDED (ug/m³ Air)	LCSD CONCENTRATION (ug/m³ Air)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,2-Dichloropropane	46.2	46	100	0.3	25	70 - 130
Trichloroethene	53.7	53	100	0.8	25	70 - 130
Bromodichloromethane	67.0	59	87	0.5	25	70 - 130
cis-1,3-Dichloropropene	45.4	45	100	0.7	25	70 - 137
trans-1,3-Dichloropropene	45.4	40	89	0.8	25	59 - 166
1,1,2-Trichloroethane	54.6	53	97	0.2	25	70 - 134
1,2-Dibromoethane	76.8	74	96	0.3	25	70 - 141
Tetrachloroethene	67.8	66	98	0.2	25	70 - 141
Dibromochloromethane	85.2	75	88	0.6	25	70 - 130
Chlorobenzene	46.0	45	97	0.3	25	70 - 134
Bromoform	103	98	95	0.07	25	62 - 149
1,1,2,2-Tetrachloroethane	68.7	70	101	1	25	52 - 163
1,3-Dichlorobenzene	60.1	68	113	0.8	25	47 - 178
1,4-Dichlorobenzene	60.1	66	111	1	25	45 - 180
1,2-Dichlorobenzene	60.1	66	110	0.4	25	37 - 180
Hexachlorobutadiene	107	110	103	3	25	24 - 180
Freon 114	69.9	63	90	0.01	25	62 - 147

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA68577
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Surrogate Compound	Spike Level ppbv	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA68577-SCV1)			Lab File ID: 217J4016.D		Analyzed: 10/05/21 09:33			
4-Bromofluorobenzene	31.0	100	0 - 200	17.21	17.20667	0.0033	+/-1.0	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA68966
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Surrogate Compound	Spike Level ppbv	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA68966-CCV1)			Lab File ID: 217JT003.D		Analyzed: 10/25/21 19:00			
4-Bromofluorobenzene	31.0	107	0 - 200	17.23	17.20667	0.0233	+/-1.0	
LCS (1J25034-BS1)			Lab File ID: 217JT004.D		Analyzed: 10/25/21 19:40			
4-Bromofluorobenzene	31.0	105	70 - 130	17.23	17.20667	0.0233	+/-1.0	
LCS Dup (1J25034-BSD1)			Lab File ID: 217JT005.D		Analyzed: 10/25/21 20:20			
4-Bromofluorobenzene	31.0	105	70 - 130	17.23	17.20667	0.0233	+/-1.0	
Blank (1J25034-BLK1)			Lab File ID: 217JT007.D		Analyzed: 10/25/21 21:45			
4-Bromofluorobenzene	31.0	94	70 - 130	17.23	17.20667	0.0233	+/-1.0	
CRCA-AMB0001-20211021 (AE07721-01)			Lab File ID: 217JT008.D		Analyzed: 10/25/21 22:30			
4-Bromofluorobenzene	31.0	95	70 - 130	17.23	17.20667	0.0233	+/-1.0	
CRCA-AMB0002-20211021 (AE07721-02)			Lab File ID: 217JT009.D		Analyzed: 10/25/21 23:15			
4-Bromofluorobenzene	31.0	95	70 - 130	17.23	17.20667	0.0233	+/-1.0	
CRCA-VMP0001-20211021 (AE07721-03)			Lab File ID: 217JT010.D		Analyzed: 10/26/21 00:00			
4-Bromofluorobenzene	31.0	95	70 - 130	17.23	17.20667	0.0233	+/-1.0	
CRCA-VMP0002-20211021 (AE07721-04)			Lab File ID: 217JT011.D		Analyzed: 10/26/21 00:46			
4-Bromofluorobenzene	31.0	96	70 - 130	17.23	17.20667	0.0233	+/-1.0	
CRCA-VMP0003-20211021 (AE07721-05)			Lab File ID: 217JT012.D		Analyzed: 10/26/21 01:31			
4-Bromofluorobenzene	31.0	95	70 - 130	17.23	17.20667	0.0233	+/-1.0	
CRCA-VMP0004-20211021 (AE07721-06RE1)			Lab File ID: 217JT015.D		Analyzed: 10/26/21 12:09			
4-Bromofluorobenzene	31.0	103	70 - 130	17.23	17.20667	0.0233	+/-1.0	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA68577
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA68577-CAL1)			Lab File ID: 217J4003.D			Analyzed: 10/04/21 14:37			
Bromochloromethane	224803	10.86	226712	10.87	99	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	729362	12.37	736300	12.38	99	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	558650	15.77	586400	15.77	95	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL2)			Lab File ID: 217J4004.D			Analyzed: 10/04/21 15:17			
Bromochloromethane	222081	10.86	226712	10.87	98	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	723311	12.37	736300	12.38	98	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	555062	15.77	586400	15.77	95	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL3)			Lab File ID: 217J4005.D			Analyzed: 10/04/21 15:56			
Bromochloromethane	220504	10.86	226712	10.87	97	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	719607	12.37	736300	12.38	98	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	552962	15.77	586400	15.77	94	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL4)			Lab File ID: 217J4006.D			Analyzed: 10/04/21 16:37			
Bromochloromethane	205114	10.86	226712	10.87	90	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	665960	12.37	736300	12.38	90	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	514034	15.77	586400	15.77	88	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL5)			Lab File ID: 217J4007.D			Analyzed: 10/04/21 17:19			
Bromochloromethane	213866	10.87	226712	10.87	94	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	691016	12.37	736300	12.38	94	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	541630	15.77	586400	15.77	92	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL6)			Lab File ID: 217J4008.D			Analyzed: 10/04/21 17:57			
Bromochloromethane	222080	10.86	226712	10.87	98	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	718415	12.37	736300	12.38	98	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	562665	15.77	586400	15.77	96	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL7)			Lab File ID: 217J4009.D			Analyzed: 10/04/21 18:37			
Bromochloromethane	226712	10.87	226712	10.87	100	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	736300	12.38	736300	12.38	100	60 - 140	0.0000	+/-0.50	
Chlorobenzene-d5	586400	15.77	586400	15.77	100	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL8)			Lab File ID: 217J4010.D			Analyzed: 10/04/21 19:18			
Bromochloromethane	229084	10.87	226712	10.87	101	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	753502	12.38	736300	12.38	102	60 - 140	0.0000	+/-0.50	
Chlorobenzene-d5	607276	15.77	586400	15.77	104	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL9)			Lab File ID: 217J4011.D			Analyzed: 10/04/21 20:03			
Bromochloromethane	246566	10.88	226712	10.87	109	60 - 140	0.0100	+/-0.50	
1,4-Difluorobenzene	782476	12.38	736300	12.38	106	60 - 140	0.0000	+/-0.50	
Chlorobenzene-d5	628282	15.78	586400	15.77	107	60 - 140	0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Sequence: AA68577
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA68577-SCV1)			Lab File ID: 217J4016.D			Analyzed: 10/05/21 09:33			
Bromochloromethane	226735	10.87	226712	10.87	100	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	735053	12.37	736300	12.38	100	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	580887	15.78	586400	15.77	99	60 - 140	0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Sequence: AA68966
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (AA68966-CCV1)			Lab File ID: 217JT003.D			Analyzed: 10/25/21 19:00			
Bromochloromethane	251028	10.9	226712	10.87	111	60 - 140	0.0300	+/-0.50	
1,4-Difluorobenzene	822170	12.4	736300	12.38	112	60 - 140	0.0200	+/-0.50	
Chlorobenzene-d5	660782	15.8	586400	15.77	113	60 - 140	0.0300	+/-0.50	
LCS (1J25034-BS1)			Lab File ID: 217JT004.D			Analyzed: 10/25/21 19:40			
Bromochloromethane	272289	10.9	226712	10.87	120	60 - 140	0.0300	+/-0.50	
1,4-Difluorobenzene	877688	12.4	736300	12.38	119	60 - 140	0.0200	+/-0.50	
Chlorobenzene-d5	685322	15.8	586400	15.77	117	60 - 140	0.0300	+/-0.50	
LCS Dup (1J25034-BSD1)			Lab File ID: 217JT005.D			Analyzed: 10/25/21 20:20			
Bromochloromethane	274586	10.9	226712	10.87	121	60 - 140	0.0300	+/-0.50	
1,4-Difluorobenzene	886974	12.4	736300	12.38	120	60 - 140	0.0200	+/-0.50	
Chlorobenzene-d5	691212	15.8	586400	15.77	118	60 - 140	0.0300	+/-0.50	
Blank (1J25034-BLK1)			Lab File ID: 217JT007.D			Analyzed: 10/25/21 21:45			
Bromochloromethane	246395	10.89	226712	10.87	109	60 - 140	0.0200	+/-0.50	
1,4-Difluorobenzene	814319	12.39	736300	12.38	111	60 - 140	0.0100	+/-0.50	
Chlorobenzene-d5	613543	15.79	586400	15.77	105	60 - 140	0.0200	+/-0.50	
CRCA-AMB0001-20211021 (AE07721-01)			Lab File ID: 217JT008.D			Analyzed: 10/25/21 22:30			
Bromochloromethane	241696	10.89	226712	10.87	107	60 - 140	0.0200	+/-0.50	
1,4-Difluorobenzene	794533	12.4	736300	12.38	108	60 - 140	0.0200	+/-0.50	
Chlorobenzene-d5	600991	15.79	586400	15.77	102	60 - 140	0.0200	+/-0.50	
CRCA-AMB0002-20211021 (AE07721-02)			Lab File ID: 217JT009.D			Analyzed: 10/25/21 23:15			
Bromochloromethane	238562	10.89	226712	10.87	105	60 - 140	0.0200	+/-0.50	
1,4-Difluorobenzene	793794	12.39	736300	12.38	108	60 - 140	0.0100	+/-0.50	
Chlorobenzene-d5	598915	15.8	586400	15.77	102	60 - 140	0.0300	+/-0.50	
CRCA-VMP0001-20211021 (AE07721-03)			Lab File ID: 217JT010.D			Analyzed: 10/26/21 00:00			
Bromochloromethane	244626	10.89	226712	10.87	108	60 - 140	0.0200	+/-0.50	
1,4-Difluorobenzene	803643	12.4	736300	12.38	109	60 - 140	0.0200	+/-0.50	
Chlorobenzene-d5	613808	15.79	586400	15.77	105	60 - 140	0.0200	+/-0.50	
CRCA-VMP0002-20211021 (AE07721-04)			Lab File ID: 217JT011.D			Analyzed: 10/26/21 00:46			
Bromochloromethane	301057	10.89	226712	10.87	133	60 - 140	0.0200	+/-0.50	
1,4-Difluorobenzene	983508	12.42	736300	12.38	134	60 - 140	0.0400	+/-0.50	
Chlorobenzene-d5	757286	15.8	586400	15.77	129	60 - 140	0.0300	+/-0.50	
CRCA-VMP0003-20211021 (AE07721-05)			Lab File ID: 217JT012.D			Analyzed: 10/26/21 01:31			
Bromochloromethane	298675	10.89	226712	10.87	132	60 - 140	0.0200	+/-0.50	
1,4-Difluorobenzene	986684	12.42	736300	12.38	134	60 - 140	0.0400	+/-0.50	
Chlorobenzene-d5	761674	15.8	586400	15.77	130	60 - 140	0.0300	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Sequence: AA68966
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
CRCA-VMP0004-20211021 (AE07721-06RE1)			Lab File ID: 217JT015.D			Analyzed: 10/26/21 12:09			
Bromochloromethane	291919	10.89	226712	10.87	129	60 - 140	0.0200	+/-0.50	
1,4-Difluorobenzene	946752	12.39	736300	12.38	129	60 - 140	0.0100	+/-0.50	
Chlorobenzene-d5	692868	15.8	586400	15.77	118	60 - 140	0.0300	+/-0.50	

ANALYSIS BATCH (SEQUENCE) SUMMARY

TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Sequence:	AA68577		
Calibration:	2110016	Instrument:	OVGCMS7

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA68577-TUN1	217J4002.D	10/04/21 13:43
Cal Standard	AA68577-CAL1	217J4003.D	10/04/21 14:37
Cal Standard	AA68577-CAL2	217J4004.D	10/04/21 15:17
Cal Standard	AA68577-CAL3	217J4005.D	10/04/21 15:56
Cal Standard	AA68577-CAL4	217J4006.D	10/04/21 16:37
Cal Standard	AA68577-CAL5	217J4007.D	10/04/21 17:19
Cal Standard	AA68577-CAL6	217J4008.D	10/04/21 17:57
Cal Standard	AA68577-CAL7	217J4009.D	10/04/21 18:37
Cal Standard	AA68577-CAL8	217J4010.D	10/04/21 19:18
Cal Standard	AA68577-CAL9	217J4011.D	10/04/21 20:03
Secondary Cal Check	AA68577-SCV1	217J4016.D	10/05/21 09:33

ANALYSIS BATCH (SEQUENCE) SUMMARY

TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Sequence:	AA68966		
Calibration:	2110016	Instrument:	OVGCMS7

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA68966-TUN1	217JT002.D	10/25/21 18:19
Calibration Check	AA68966-CCV1	217JT003.D	10/25/21 19:00
LCS	1J25034-BS1	217JT004.D	10/25/21 19:40
LCS Dup	1J25034-BSD1	217JT005.D	10/25/21 20:20
Blank	1J25034-BLK1	217JT007.D	10/25/21 21:45
CRCA-AMB0001-20211021	AE07721-01	217JT008.D	10/25/21 22:30
CRCA-AMB0002-20211021	AE07721-02	217JT009.D	10/25/21 23:15
CRCA-VMP0001-20211021	AE07721-03	217JT010.D	10/26/21 00:00
CRCA-VMP0002-20211021	AE07721-04	217JT011.D	10/26/21 00:46
CRCA-VMP0003-20211021	AE07721-05	217JT012.D	10/26/21 01:31
CRCA-VMP0004-20211021	AE07721-06RE1	217JT015.D	10/26/21 12:09

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Lab File ID:	217J4002.D	Injection Date:	10/04/21
Instrument ID:	OVGCMS7	Injection Time:	13:43
Sequence:	AA68577	Lab Sample ID:	AA68577-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8 - 40% of 95	28.9	PASS
75	30 - 66% of 95	49.1	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.99	PASS
173	Less than 2% of 174	0	PASS
174	50 - 120% of 95	82.6	PASS
175	4 - 9% of 174	8.25	PASS
176	95 - 101% of 174	96.7	PASS
177	5 - 9% of 176	6.5	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Lab File ID:	217JT002.D	Injection Date:	10/25/21
Instrument ID:	OVGCMS7	Injection Time:	18:19
Sequence:	AA68966	Lab Sample ID:	AA68966-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8 - 40% of 95	25.7	PASS
75	30 - 66% of 95	44.6	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.14	PASS
173	Less than 2% of 174	0	PASS
174	50 - 120% of 95	86.3	PASS
175	4 - 9% of 174	8.22	PASS
176	95 - 101% of 174	97.2	PASS
177	5 - 9% of 176	6.53	PASS

CONTINUING CALIBRATION CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Instrument ID:	OVGCMS7	Calibration:	2110016
Lab File ID:	217JT003.D	Calibration Date:	10/04/21 13:43
Sequence:	AA68966	Injection Date:	10/25/21
Lab Sample ID:	AA68966-CCV1	Injection Time:	19:00

		CONC. (ppbv)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Dichlorodifluoromethane	A	10.0	9.2	6.219378	5.706649		-8.2	30
Propene	A	10.0	9.3	3.23543	2.999156		-7.3	30
Chloromethane	A	10.0	9.5	3.106247	2.960787		-4.7	30
Vinyl chloride	A	10.0	10	2.673188	2.666666		-0.2	30
Bromomethane	A	10.0	8.8	2.341098	2.068852		-12	30
Chloroethane	A	10.0	9.0	1.188133	1.065528		-10	30
Trichlorofluoromethane	A	10.0	11	3.93271	4.241093		7.8	30
Bromoethene	A	10.0	9.0	2.006799	1.815644		-9.5	30
1,1-Dichloroethane	A	10.0	9.8	4.152167	4.070056		-2	30
Acetone	A	10.0	9.4	5.464891	5.149748		-5.8	30
Methylene chloride	A	10.0	9.7	1.998345	1.93232		-3.3	30
Freon 113	A	10.0	9.6	3.452188	3.312691		-4	30
3-Chloropropene	A	10.0	9.6	4.593315	4.421243		-3.7	30
trans-1,2-Dichloroethene	A	10.0	9.9	3.498948	3.459004		-1.1	30
1,1-Dichloroethene	A	10.0	9.8	3.889729	3.817057		-1.9	30
cis-1,2-Dichloroethene	A	10.0	9.8	2.254535	2.208003		-2.1	30
Chloroform	A	10.0	9.4	4.694174	4.413043		-6	30
1,2-Dichloroethane	A	10.0	9.2	3.295564	3.046874		-7.5	30
1,1,1-Trichloroethane	A	10.0	9.0	4.436574	3.987131		-10	30
Carbon tetrachloride	A	10.0	7.1	4.540764	3.221553		-29	30
1,2-Dichloropropane	A	10.0	9.8	0.7578331	0.7411427		-2.2	30
Trichloroethene	A	10.0	10	0.9819849	0.9999957		1.8	30
Bromodichloromethane	A	10.0	9.3	1.483156	1.378917		-7	30
cis-1,3-Dichloropropene	A	10.0	9.6	1.137442	1.093633		-3.9	30
trans-1,3-Dichloropropene	A	10.0	9.6	0.9942093	0.9528644		-4.2	30
1,1,2-Trichloroethane	A	10.0	9.7	0.7448029	0.7199072		-3.3	30
1,2-Dibromoethane	A	10.0	9.8	1.284507	1.259022		-2	30
Tetrachloroethene	A	10.0	10	1.009205	1.014527		0.50	30
Dibromochloromethane	A	10.0	9.5	1.288251	1.220635		-5.2	30

CONTINUING CALIBRATION CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AE07721-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Instrument ID:	OVGCMS7	Calibration:	2110016
Lab File ID:	217JT003.D	Calibration Date:	10/04/21 13:43
Sequence:	AA68966	Injection Date:	10/25/21
Lab Sample ID:	AA68966-CCV1	Injection Time:	19:00

		CONC. (ppbv)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Chlorobenzene	A	10.0	9.7	1.990599	1.93357		-2.9	30
Bromoform	A	10.0	9.9	1.555729	1.535846		-1.3	30
1,1,2,2-Tetrachloroethane	A	10.0	9.7	1.673199	1.630955		-2.5	30
1,3-Dichlorobenzene	A	10.0	12	1.36989	1.601568		17	30
1,4-Dichlorobenzene	A	10.0	12	1.285372	1.506975		17	30
1,2-Dichlorobenzene	A	10.0	12	1.274202	1.487614		17	30
Hexachlorobutadiene	A	10.0	12	0.531441	0.6365635		20	30
Freon 114	A	10.0	9.5	4.460102	4.243254		-4.9	30

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA68577
Instrument: OVGCMS7

Calibration: 2110016

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1J0413	Air- VIRTUAL TUN-100121	AA68577-TUN1	217J4002.D	10/04/21 13:43
A1J0443	Air- Virtual CAL 1-100421	AA68577-CAL1	217J4003.D	10/04/21 14:37
A1J0444	Air- Virtual CAL 2-100421	AA68577-CAL2	217J4004.D	10/04/21 15:17
A1J0445	Air- Virtual CAL 3-100421	AA68577-CAL3	217J4005.D	10/04/21 15:56
A1J0446	Air- Virtual CAL 4-100421	AA68577-CAL4	217J4006.D	10/04/21 16:37
A1J0447	Air- Virtual CAL 5-100421	AA68577-CAL5	217J4007.D	10/04/21 17:19
A1J0448	Air- Virtual CAL 6-100421	AA68577-CAL6	217J4008.D	10/04/21 17:57
A1J0450	Air- Virtual CAL 7-100421	AA68577-CAL7	217J4009.D	10/04/21 18:37
A1J0451	Air- Virtual CAL 8-100421	AA68577-CAL8	217J4010.D	10/04/21 19:18
A1J0452	Air- Virtual CAL 9-100421	AA68577-CAL9	217J4011.D	10/04/21 20:03
A1J0453	Air- Virtual SCV 100421	AA68577-SCV1	217J4016.D	10/05/21 09:33

INITIAL CALIBRATION DATA

TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
Dichlorodifluoromethane	0.125	7.486235	0.25	6.439506	0.5	5.958078	1.25	7.783356	2.5	6.671901	5	6.241793
Propene	0.125	~~5.253382~~	0.25	3.853765	0.5	3.20679	1.25	3.868705	2.5	3.311773	5	3.248104
Chloromethane	0.125	3.612941	0.25	3.012883	0.5	2.884564	1.25	3.565346	2.5	3.190826	5	3.202235
Vinyl chloride	0.125	2.830781	0.25	2.531581	0.5	2.310407	1.25	3.15861	2.5	2.908346	5	2.777856
Bromomethane	0.125	2.902488	0.25	2.230628	0.5	2.717266	1.25	2.781618	2.5	2.348431	5	2.233429
Chloroethane	0.125	1.495923	0.25	1.284216	0.5	1.135381	1.25	1.397096	2.5	1.215614	5	1.134582
Trichlorofluoromethane	0.125	4.448055	0.25	3.957619	0.5	3.830434	1.25	5.041758	2.5	4.321441	5	3.942059
Bromoethene	0.125	2.207479	0.25	2.055863	0.5	1.905516	1.25	2.477896	2.5	2.129034	5	1.992331
1,1-Dichloroethane	0.125	4.752534	0.25	4.063148	0.5	3.858551	1.25	5.260723	2.5	4.390785	5	4.152699
Acetone	0.125	~~9.262367~~	0.25	~~7.076589~~	0.5	6.262589	1.25	6.919465	2.5	5.772396	5	5.408975
Methylene chloride	0.125	~~7.328479~~	0.25	~~4.996159~~	0.5	~~4.048906~~	1.25	2.653092	2.5	2.209916	5	2.01553
Freon 113	0.125	4.109376	0.25	3.504235	0.5	3.145213	1.25	4.28064	2.5	3.633331	5	3.385963
3-Chloropropene	0.125	5.451956	0.25	4.600844	0.5	4.350887	1.25	5.721626	2.5	4.797284	5	4.535788
trans-1,2-Dichloroethene	0.125	3.897564	0.25	3.404289	0.5	3.299577	1.25	4.487393	2.5	3.775383	5	3.526892
1,1-Dichloroethene	0.125	4.266028	0.25	3.89955	0.5	3.677194	1.25	4.944548	2.5	4.160082	5	3.974862
cis-1,2-Dichloroethene	0.125	2.554984	0.25	2.177584	0.5	2.010676	1.25	2.849931	2.5	2.414355	5	2.259086
Chloroform	0.125	5.365907	0.25	4.74825	0.5	4.577795	1.25	6.039857	2.5	5.040337	5	4.739086
1,2-Dichloroethane	0.125	4.066351	0.25	3.378047	0.5	3.011093	1.25	4.152114	2.5	3.575815	5	3.333086
1,1,1-Trichloroethane	0.125	5.438717	0.25	4.684039	0.5	4.29409	1.25	5.625746	2.5	4.762496	5	4.479841
Carbon tetrachloride	0.125	5.645014	0.25	4.9688	0.5	4.608442	1.25	5.68886	2.5	4.8399	5	4.492124
1,2-Dichloropropane	0.125	0.864339	0.25	0.7716238	0.5	0.6943484	1.25	0.9242465	2.5	0.8128003	5	0.7534431
Trichloroethene	0.125	1.132277	0.25	0.9878019	0.5	0.8986294	1.25	1.19386	2.5	1.04748	5	0.9810881
Bromodichloromethane	0.125	1.666794	0.25	1.421872	0.5	1.366468	1.25	1.896234	2.5	1.651154	5	1.545704
cis-1,3-Dichloropropene	0.125	1.360773	0.25	1.144664	0.5	1.043892	1.25	1.367955	2.5	1.193943	5	1.133453
trans-1,3-Dichloropropene	0.125	1.259786	0.25	0.9716871	0.5	0.9117254	1.25	1.229275	2.5	1.074917	5	1.018431
1,1,2-Trichloroethane	0.125	0.8609387	0.25	0.7471088	0.5	0.6741874	1.25	0.9372431	2.5	0.7883777	5	0.7399456
1,2-Dibromoethane	0.125	1.390695	0.25	1.25181	0.5	1.125311	1.25	1.584093	2.5	1.383438	5	1.323194
Tetrachloroethene	0.125	1.188381	0.25	0.9977451	0.5	0.9338681	1.25	1.219816	2.5	1.045667	5	1.021045
Dibromochloromethane	0.125	1.407356	0.25	1.21718	0.5	1.149091	1.25	1.635669	2.5	1.426972	5	1.356731
Chlorobenzene	0.125	2.324403	0.25	1.987576	0.5	1.804963	1.25	2.447559	2.5	2.148703	5	2.038139
Bromoform	0.125	1.623442	0.25	1.342178	0.5	1.310611	1.25	1.960325	2.5	1.712689	5	1.671206

INITIAL CALIBRATION DATA

TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
1,1,2,2-Tetrachloroethane	0.125	1.79613	0.25	1.50794	0.5	1.374297	1.25	2.192629	2.5	1.825922	5	1.736086
1,3-Dichlorobenzene	0.125	1.370404	0.25	1.179991	0.5	1.071115	1.25	1.629407	2.5	1.436498	5	1.421747
1,4-Dichlorobenzene	0.125	1.286057	0.25	1.073206	0.5	1.005074	1.25	1.502568	2.5	1.308727	5	1.343997
1,2-Dichlorobenzene	0.125	1.277179	0.25	1.067621	0.5	1.029966	1.25	1.546376	2.5	1.340687	5	1.331237
Hexachlorobutadiene	0.125	0.4967547	0.25	0.4429992	0.5	0.3649618	1.25	0.6903497	2.5	0.597896	5	0.6013614
4-Bromofluorobenzene	31	0.4942558	31	0.4934656	31	0.4991211	31	0.4935354	31	0.5002068	31	0.5074938
Freon 114	0.125	5.092316	0.25	4.254664	0.5	4.121168	1.25	5.165206	2.5	4.75119	5	4.653853

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
Dichlorodifluoromethane	10	5.520976	25	5.268544	50	4.604009						
Propene	10	2.830422	25	2.842429	50	2.721449						
Chloromethane	10	2.913846	25	2.896384	50	2.6772						
Vinyl chloride	10	2.568625	25	2.568203	50	2.404282						
Bromomethane	10	2.023795	25	2.001346	50	1.830884						
Chloroethane	10	1.042445	25	1.026777	50	0.9611652						
Trichlorofluoromethane	10	3.456447	25	3.335606	50	3.060967						
Bromoethene	10	1.813438	25	1.806196	50	1.673439						
1,1-Dichloroethane	10	3.705446	25	3.63904	50	3.546577						
Acetone	10	4.804431	25	4.668777	50	4.417601						
Methylene chloride	10	1.754026	25	1.68124	50	1.676265						
Freon 113	10	3.023304	25	3.052973	50	2.934656						
3-Chloropropene	10	4.042749	25	3.997447	50	3.841254						
trans-1,2-Dichloroethene	10	3.131121	25	3.056686	50	2.911626						
1,1-Dichloroethene	10	3.496511	25	3.383423	50	3.205364						
cis-1,2-Dichloroethene	10	2.022414	25	2.000973	50	2.000814						
Chloroform	10	4.149856	25	3.97172	50	3.614759						
1,2-Dichloroethane	10	2.921462	25	2.777789	50	2.444316						
1,1,1-Trichloroethane	10	3.880469	25	3.620901	50	3.142863						
Carbon tetrachloride	10	3.940224	25	3.636079	50	3.047431						
1,2-Dichloropropane	10	0.6778866	25	0.6482476	50	0.6735625						
Trichloroethene	10	0.8767784	25	0.8658534	50	0.8540954						
Bromodichloromethane	10	1.354241	25	1.27364	50	1.172295						
cis-1,3-Dichloropropene	10	1.015443	25	0.9856666	50	0.9911882						
trans-1,3-Dichloropropene	10	0.8911732	25	0.8362712	50	0.7546182						
1,1,2-Trichloroethane	10	0.659391	25	0.6505745	50	0.6454592						
1,2-Dibromoethane	10	1.175406	25	1.177222	50	1.149393						
Tetrachloroethene	10	0.9184892	25	0.9219322	50	0.8359045						
Dibromochloromethane	10	1.198676	25	1.156192	50	1.046391						
Chlorobenzene	10	1.809022	25	1.779465	50	1.575558						
Bromoform	10	1.517187	25	1.509101	50	1.354819						

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
1,1,2,2-Tetrachloroethane	10	1.529573	25	1.554012	50	1.542206						
1,3-Dichlorobenzene	10	1.343578	25	1.438422	50	1.437849						
1,4-Dichlorobenzene	10	1.284555	25	1.381896	50	1.382264						
1,2-Dichlorobenzene	10	1.264593	25	1.307013	50	1.303146						
Hexachlorobutadiene	10	0.5457353	25	0.5318346	50	0.511076						
4-Bromofluorobenzene	31	0.5215194	31	0.5586126	31	0.5952391						
Freon 114	10	4.236219	25	4.135556	50	3.730745						

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	6.219378	16.45056	4.501111	0.281354			30	
Propene	3.23543	13.68767	4.38375	0.3209913			30	
Chloromethane	3.106247	10.22406	4.987778	0.397849			30	
Vinyl chloride	2.673188	10.00856	5.234444	0.2719751			30	
Bromomethane	2.341098	16.20217	6.046667	0.2607841			30	
Chloroethane	1.188133	14.962	6.365556	0.1585633			30	
Trichlorofluoromethane	3.93271	15.57423	6.687778	0.1241278			30	
Bromoethene	2.006799	12.19043	6.616667	0.1302457			30	
1,1-Dichloroethane	4.152167	13.65047	9.891111	5.899272E-02			30	
Acetone	5.464891	16.73202	8.832857	0.1063762			30	
Methylene chloride	1.998345	19.22182	8.726667	9.391202E-02			30	
Freon 113	3.452188	13.98067	7.823333	6.230389E-02			30	
3-Chloropropene	4.593315	14.06253	8.564445	8.362719E-02			30	
trans-1,2-Dichloroethene	3.498948	14.06555	8.988889	0.1038405			30	
1,1-Dichloroethene	3.889729	13.66188	7.722222	0.1074353			30	
cis-1,2-Dichloroethene	2.254535	13.29048	10.60667	6.613793E-02			30	
Chloroform	4.694174	15.76954	10.94111	5.649096E-02			30	
1,2-Dichloroethane	3.295564	17.39197	11.90778	0.055089			30	
1,1,1-Trichloroethane	4.436574	18.27041	11.23444	4.744527E-02			30	
Carbon tetrachloride	4.540764	19.42856	11.15444	0.0657239			30	
1,2-Dichloropropane	0.7578331	12.50097	12.97333	3.659988E-02			30	
Trichloroethene	0.9819849	12.45455	12.36	4.014823E-02			30	
Bromodichloromethane	1.483156	15.28258	13.01556	4.078041E-02			30	
cis-1,3-Dichloropropene	1.137442	12.9783	13.73667	0.040074			30	
trans-1,3-Dichloropropene	0.9942093	17.17145	14.46222	2.811502E-02			30	
1,1,2-Trichloroethane	0.7448029	13.71515	14.66	1.934242E-02			30	
1,2-Dibromoethane	1.284507	11.69037	15.20444	3.424017E-02			30	
Tetrachloroethene	1.009205	12.61264	14.48444	3.505998E-02			30	
Dibromochloromethane	1.288251	14.18627	14.88778	3.009113E-02			30	
Chlorobenzene	1.990599	14.11729	15.79444	0.030455			30	

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AE07721-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Bromoform	1.555729	13.55892	16.59556	0.0302815			30	
1,1,2,2-Tetrachloroethane	1.673199	14.65244	17.39	1.782912E-03			30	
1,3-Dichlorobenzene	1.36989	11.82179	18.50889	2.405671E-02			30	
1,4-Dichlorobenzene	1.285372	12.09772	18.61333	2.807933E-02			30	
1,2-Dichlorobenzene	1.274202	11.96971	19.15889	1.304716E-02			30	
Hexachlorobutadiene	0.531441	17.84082	21	0			30	
4-Bromofluorobenzene	0.5181611	6.882687	17.20667	3.456777E-02			30	
Freon 114	4.460102	10.82158	4.882222	0.223299			30	

SECOND-SOURCE CALIBRATION VERIFICATION

TO-15

Laboratory: ENCO Orlando **SDG:** AE07721-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA Airs

Calibration: 2110016 **Laboratory ID:** AA68577-SCV1

Sequence: AA68577 **Standard ID:** A1J0453

ANALYTE	EXPECTED (ppbv)	FOUND (ppbv)	% DRIFT	QC LIMIT
Dibromochloromethane	10.0	9.3	-6.7	30.00
Chloroform	10.0	9.3	-7.2	30.00
Acetone	10.0	9.4	-6.3	30.00
Bromoethene	10.0	9.3	-7.2	30.00
Carbon tetrachloride	10.0	9.7	-2.7	30.00
1,3-Dichlorobenzene	10.0	10	1.2	30.00
trans-1,2-Dichloroethene	10.0	9.1	-8.7	30.00
cis-1,3-Dichloropropene	10.0	9.8	-2.2	30.00
Tetrachloroethene	10.0	9.4	-5.5	30.00
Chloromethane	10.0	10	4.4	30.00
Propene	10.0	9.7	-3.3	30.00
Chlorobenzene	10.0	9.5	-4.5	30.00
1,2-Dichloroethane	10.0	9.3	-6.8	30.00
3-Chloropropene	10.0	9.1	-8.7	30.00
1,2-Dibromoethane	10.0	9.5	-4.8	30.00
1,4-Dichlorobenzene	10.0	10	1.2	30.00
trans-1,3-Dichloropropene	10.0	9.2	-8.0	30.00
cis-1,2-Dichloroethene	10.0	9.8	-2.3	30.00
1,1-Dichloroethene	10.0	10	2.2	30.00
Hexachlorobutadiene	10.0	9.2	-7.6	30.00
1,1,2,2-Tetrachloroethane	10.0	9.1	-9.4	30.00
Trichloroethene	10.0	9.6	-3.8	30.00
1,1,2-Trichloroethane	10.0	9.3	-7.1	30.00
1,2-Dichloropropane	10.0	9.4	-6.0	30.00
Freon 114	10.0	10	3.4	30.00
Freon 113	10.0	9.8	-2.1	30.00
1,1,1-Trichloroethane	10.0	9.2	-7.8	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

TO-15

Laboratory: ENCO Orlando **SDG:** AE07721-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA Airs

Calibration: 2110016 **Laboratory ID:** AA68577-SCV1

Sequence: AA68577 **Standard ID:** A1J0453

ANALYTE	EXPECTED (ppbv)	FOUND (ppbv)	% DRIFT	QC LIMIT
Trichlorofluoromethane	10.0	9.5	-5.1	30.00
Bromomethane	10.0	9.3	-6.8	30.00
1,1-Dichloroethane	10.0	9.6	-4.4	30.00
Bromodichloromethane	10.0	9.1	-8.8	30.00
Bromoform	10.0	9.6	-3.8	30.00
Methylene chloride	10.0	9.5	-4.9	30.00
Vinyl chloride	10.0	11	8.0	30.00
Chloroethane	10.0	9.6	-3.9	30.00
1,2-Dichlorobenzene	10.0	10	0.3	30.00
Dichlorodifluoromethane	10.0	9.5	-4.6	30.00

* Values outside of QC limits

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Client: Alex Murphy
Tetra Tech, Inc.
11 Riverside Dr.
Suite 204
Cocoa, FL 32922

Phone: 321-637-8530

Fax:

Identifier: 021SJ **Date Rec:** 10/08/2021 **Report Date:** 10/15/2021

Client Project #: 112G08970 **Client Project Name:** CRCA

Purchase Order #: 1165880

Test results provided for: CENSUS

Reviewed By:

Charles Slater

Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **Tetra Tech, Inc.**
Project: CRCA

MI Project Number: **021SJ**
Date Received: 10/08/2021

Sample Information

Client Sample ID:		**CRCA-MW0019-058.0-20211007**	**CRCA-MW0031-058.0-20211007**	**CRCA-MW0018-058.0-20211007**
Sample Date:		10/07/2021	10/07/2021	10/07/2021
Units:		cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		HT/CS	HT/CS	HT/CS
Dechlorinating Bacteria				
Dehalococcoides	*DHC*	**1.08E+02**	**2.58E+02**	**1.30E+02**
tceA Reductase	TCE	<5.00E-01	<5.00E-01	<5.00E-01
BAV1 Vinyl Chloride Reductase	BVC	<5.00E-01	<5.00E-01	<5.00E-01
Vinyl Chloride Reductase	VCR	<5.00E-01	<5.00E-01	<5.00E-01

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **10/8/2021**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	10/08/2021	10/15/2021	0 °C	108%	non-detect	non-detect
BVC	10/08/2021	10/15/2021	0 °C	105%	non-detect	non-detect
TCE	10/08/2021	10/15/2021	0 °C	102%	non-detect	non-detect
VCR	10/08/2021	10/15/2021	0 °C	100%	non-detect	non-detect

REPORT TO:
Name: Alex Murphy
Company: Tetra Tech, Inc.
Address: 11 Riverside Dr. STE 204
Cocoa FL 32922
email: alex.murphy@tetratech.com
Phone: (321) 636-6470
Fax: (321) 636-6473

INVOICE TO: (For Invoices paid by a third party it is imperative that all information be provided)
Name: Dean Orzik
Company: Tetra Tech Inc.
Address: 661 Anderson Drive
Foster Plaza 7
Pittsburgh, PA 15220
email: Dan.orzik@tetratech.com
Phone: (412) 921-7090
Fax: (412) 921-4040

microbialinsights
10515 Research Dr
Knoxville, TN 37932
865-573-8188
www.microbe.com

Project Manager: Alex Murphy
Project Name: CRCA
Project No.: 112G08970

Purchase Order No. 1165880
Subcontract No.
MI Quote No.

Please Check One:
☐ More samples to follow
☒ No Additional Samples

Report Type: ☒ Standard (default) ☐ Microbial Insights Level III raw data(15% surcharge) ☐ Microbial Insights Level IV (25% surcharge) ☐ Comprehensive Interpretive(15%) ☐ Historical Interpretive (35%)
EDD type: ☐ Microbial Insights Standard (default) ☐ All other available EDDs (5% surcharge) Specify EDD Type:

Please contact us with any questions about the analyses or filling out the COC at (865) 573-8188 (9:00 am to 5:00 pm EST, M-F). After hours email: customerservice@microbe.com

Sample Information						Analyses				CENSUS: Please select the target organism/gene																						
MI ID (Laboratory Use Only)	Sample Name	Date Sampled	Time Sampled	Matrix	Total Number of Containers	PLFA	NGS	QuantArray Chlor	QuantArray Petro	DHC (Dehalococcoides)	DHC Functional genes (bvc, tce, vcr)	DHBt (Dehalobacter)	DHG (Dehalogenimonas)	DSM (Desulfuromonas)	DSB (Desulfitobacterium)	EBAC (Total)	SRB (Sulfate Reducing Bacteria-APS)	MGN (Methanogens)	MOB (Methanotrophs)	SMMO	DNF (Dentrifiers-nirS and nirK)	AMO (ammonia oxidizing bacteria)	PM1 (MTBE aerobic)	RMO (Toluene Monooxygenase)	RDEG (Toluene Monooxygenase)	PHE (Phenol Hydroxylase)	NAH (Napthalene-aerobic)	BSSA (Toluene/Xylene-Anaerobic)	add. qPCR:	RNA (Expression Option)*	Other:	Other:	Other:
02155 1	CRCA-MW0019-0580-20211007	10/7/21	1330	GW	1					X	X																					
2	CRCA-MW0031-0580-20211007	10/7/21	1520	GW	1					X	X																					
3	CRC-MW0018-0580-20211007	10/7/21	1450	GW	1					X	X																					

Relinquished by: [signature] Date 10/07/2021 1745 Received by: [signature] Date 10/8/21 0940

It is vital that chain of custody is filled out correctly & that all relative information is provided.
Failure to provide sufficient and/or correct information regarding reporting, invoicing & analyses requested information may result in delays for which MI will not be liable.

* additional cost and sample preservation are associated with RNA samples.

**Saturday delivery: See sampling protocol for alternate shipping address.

TABLE OF CONTENTS

ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Monday, October 18, 2021
Tetra Tech, Inc. (TE016)
Attn: Alex Murphy
11 Riverside Drive, Suite 204
Cocoa, FL 32922

RE: Laboratory Results for
Project Number: 112G08970, Project Name/Desc: NASA KSC CRCA
ENCO Workorder(s): AE07722

Dear Alex Murphy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Friday, October 8, 2021.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Kaitlin Dylnicki

Project Manager

Enclosure(s)

www.encolabs.com

Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Client PM: Alex Murphy
Project Number: 112G08970
ENCO Project ID: AE07722
SDG: AE07722-TE016

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

List of instruments used:

Analytical and Preparation Method	SOP Reference Instrument
EPA 8260D / 5030B_MS	OVGCMS2
RSK-175	OVGCFID2

Analysis: EPA 8260D

Manual integrations were performed on samples associated with EPA 8260D. All data & explanations are included in the raw data section of the report.

Affected Samples: CRCA-MW0019-058.0-20211007[AE07722-01], 1J12028-MS1, 1J12028-MSD1
Precision between duplicate matrix spikes of the same sample was outside acceptance limits for multiple analytes.

Affected Samples: CRCA-MW0019-058.0-20211007[AE07722-01], 1J12028-MSD1
Matrix spike recovery was outside acceptance limits for carbon disulfide.

Affected Samples: AA68735-CCV1, CRCA-MW0019-058.0-20211007[AE07722-01], CRCA-MW0031-058.0-20211007[AE07722-02], CRCA-MW0032-058.0-20211007[AE07722-03], CRCA-MW0018-058-20211007[AE07722-04]
The associated calibration verification standard for bromomethane, carbon disulfide and tetrachloroethene exhibited high bias. Analyte(s) not detected in the sample.

Affected Samples: 1J12028-BS1, CRCA-MW0019-058.0-20211007[AE07722-01], CRCA-MW0031-058.0-20211007[AE07722-02], CRCA-MW0032-058.0-20211007[AE07722-03], CRCA-MW0018-058-20211007[AE07722-04]
The associated laboratory control sample for carbon disulfide and tetrachloroethene exhibited high bias. Analyte(s) not detected in the sample.

Affected Samples: AA68735-CCV1
Surrogate recovery for toluene-d8 was outside acceptance limits.

Affected Samples: AA68735-CCV1
The continuing calibration verification standard exhibited low bias for multiple analytes; the associated sample had ND (non-detect) results, but sensitivity was verified by analyzing a standard with a concentration equivalent to the reporting limit.

Analysis: RSK-175

Manual integrations were performed on samples associated with RSK-175. All data & explanations are included in the raw data section of the report.

Affected Samples: CCRCA-MW0031-058.0-20211007[AE07722-02]
Initial result for methane was above the calibration range of the instrument. Sample was reanalyzed at a dilution.

Affected Samples: CRCA-MW0018-058-20211007[AE07722-04]
Sample was analyzed at a dilution due to suspected matrix interference.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Kaitlin Dylnicki
Project Manager

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: CRCA-MW0019-058.0-20211007 **Lab ID: AE07722-01** **Sampled: 10/07/21 13:30** **Received: 10/08/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	10/21/21	10/12/21 00:00	10/12/21 23:16
RSK 175	Same	10/21/21	10/14/21 00:00	10/14/21 09:58

Client ID: CRCA-MW0031-058.0-20211007 **Lab ID: AE07722-02** **Sampled: 10/07/21 15:20** **Received: 10/08/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	10/21/21	10/12/21 00:00	10/12/21 23:45
RSK 175	Same	10/21/21	10/14/21 00:00	10/14/21 10:14

Client ID: CRCA-MW0031-058.0-20211007 **Lab ID: AE07722-02RE1** **Sampled: 10/07/21 15:20** **Received: 10/08/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
RSK 175	Same	10/21/21	10/15/21 07:23	10/15/21 12:22

Client ID: CRCA-MW0032-058.0-20211007 **Lab ID: AE07722-03** **Sampled: 10/07/21 17:35** **Received: 10/08/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	10/21/21	10/12/21 00:00	10/13/21 00:13

Client ID: CRCA-MW0018-058-20211007 **Lab ID: AE07722-04** **Sampled: 10/07/21 15:50** **Received: 10/08/21 15:00**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	10/21/21	10/12/21 00:00	10/13/21 00:42
RSK 175	Same	10/21/21	10/14/21 00:00	10/14/21 09:26

SAMPLE DETECTION SUMMARY

Client ID: CRCA-MW0019-058.0-20211007 **Lab ID:** AE07722-01

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Methane	0.425		0.00400	0.00500	mg/L	RSK 175	
Vinyl chloride	0.78	I	0.71	2.5	ug/L	EPA 8260D	

Client ID: CRCA-MW0031-058.0-20211007 **Lab ID:** AE07722-02

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Vinyl chloride	13		0.71	2.5	ug/L	EPA 8260D	

Client ID: CRCA-MW0031-058.0-20211007 **Lab ID:** AE07722-02RE1

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Methane	0.647		0.0200	0.0250	mg/L	RSK 175	

Client ID: CRCA-MW0032-058.0-20211007 **Lab ID:** AE07722-03

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Vinyl chloride	8.7		0.71	2.5	ug/L	EPA 8260D	

Client ID: CRCA-MW0018-058-20211007 **Lab ID:** AE07722-04

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Methane	1.14		0.0200	0.0250	mg/L	RSK 175	
Vinyl chloride	42		0.71	2.5	ug/L	EPA 8260D	

ANALYTICAL RESULTS

Description: CRCA-MW0019-058.0-20211007 **Lab Sample ID:** AE07722-01 **Received:** 10/08/21 15:00

Matrix: Ground Water **Sampled:** 10/07/21 13:30 **Work Order:** AE07722

Project: NASA KSC CRCA **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	QM-11
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	1J12028	EPA 8260D	10/12/21 23:16	kkw	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/12/21 23:16	kkw	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	1J12028	EPA 8260D	10/12/21 23:16	kkw	QM-11
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	QM-11
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/12/21 23:16	kkw	QL-02, QM-19, QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	QM-11
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	QL-02, QV-01
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	

ANALYTICAL RESULTS

Description: CRCA-MW0019-058.0-20211007 **Lab Sample ID:** AE07722-01 **Received:** 10/08/21 15:00

Matrix: Ground Water **Sampled:** 10/07/21 13:30 **Work Order:** AE07722

Project: NASA KSC CRCA **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Vinyl chloride [75-01-4]^	**0.78**	I	ug/L	1	0.71	2.5	1J12028	EPA 8260D	10/12/21 23:16	kkw	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	1J12028	EPA 8260D	10/12/21 23:16	kkw	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*49*	*1*	*50.0*	*97 %*	*41-142*	*1J12028*	*EPA 8260D*	*10/12/21 23:16*	*kkw*	
Dibromofluoromethane	*49*	*1*	*50.0*	*98 %*	*53-146*	*1J12028*	*EPA 8260D*	*10/12/21 23:16*	*kkw*	
Toluene-d8	*41*	*1*	*50.0*	*83 %*	*41-146*	*1J12028*	*EPA 8260D*	*10/12/21 23:16*	*kkw*	

Dissolved Gases by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Ethane [74-84-0]^	0.00510	U	mg/L	1	0.00510	0.00600	1J14005	RSK 175	10/14/21 09:58	JMW	
Ethene [74-85-1]^	0.00510	U	mg/L	1	0.00510	0.00600	1J14005	RSK 175	10/14/21 09:58	JMW	
Methane [74-82-8]^	**0.425**		mg/L	1	0.00400	0.00500	1J14005	RSK 175	10/14/21 09:58	JMW	

ANALYTICAL RESULTS

Description: CRCA-MW0031-058.0-20211007 **Lab Sample ID:** AE07722-02 **Received:** 10/08/21 15:00

Matrix: Ground Water **Sampled:** 10/07/21 15:20 **Work Order:** AE07722

Project: NASA KSC CRCA **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	1J12028	EPA 8260D	10/12/21 23:45	kkw	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/12/21 23:45	kkw	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/12/21 23:45	kkw	QL-02, QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	QL-02, QV-01
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	

ANALYTICAL RESULTS

Description: CRCA-MW0031-058.0-20211007 **Lab Sample ID:** AE07722-02 **Received:** 10/08/21 15:00

Matrix: Ground Water **Sampled:** 10/07/21 15:20 **Work Order:** AE07722

Project: NASA KSC CRCA **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Vinyl chloride [75-01-4]^	**13**		ug/L	1	0.71	2.5	1J12028	EPA 8260D	10/12/21 23:45	kkw	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	1J12028	EPA 8260D	10/12/21 23:45	kkw	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*46*	*1*	*50.0*	*93 %*	*41-142*	*1J12028*	*EPA 8260D*	*10/12/21 23:45*	*kkw*	
Dibromofluoromethane	*51*	*1*	*50.0*	*102 %*	*53-146*	*1J12028*	*EPA 8260D*	*10/12/21 23:45*	*kkw*	
Toluene-d8	*48*	*1*	*50.0*	*97 %*	*41-146*	*1J12028*	*EPA 8260D*	*10/12/21 23:45*	*kkw*	

Dissolved Gases by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Ethane [74-84-0]^	0.00510	U	mg/L	1	0.00510	0.00600	1J14005	RSK 175	10/14/21 10:14	JMW	
Ethene [74-85-1]^	0.00510	U	mg/L	1	0.00510	0.00600	1J14005	RSK 175	10/14/21 10:14	JMW	
Methane [74-82-8]^	**0.647**		mg/L	5	0.0200	0.0250	1J15005	RSK 175	10/15/21 12:22	JMW	

ANALYTICAL RESULTS

Description: CRCA-MW0032-058.0-20211007 **Lab Sample ID:** AE07722-03 **Received:** 10/08/21 15:00

Matrix: Ground Water **Sampled:** 10/07/21 17:35 **Work Order:** AE07722

Project: NASA KSC CRCA **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	1J12028	EPA 8260D	10/13/21 00:13	kkw	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/13/21 00:13	kkw	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/13/21 00:13	kkw	QL-02, QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	QL-02, QV-01
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	

ANALYTICAL RESULTS

Description: CRCA-MW0032-058.0-20211007 **Lab Sample ID:** AE07722-03 **Received:** 10/08/21 15:00

Matrix: Ground Water **Sampled:** 10/07/21 17:35 **Work Order:** AE07722

Project: NASA KSC CRCA **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Vinyl chloride [75-01-4]^	**8.7**		ug/L	1	0.71	2.5	1J12028	EPA 8260D	10/13/21 00:13	kkw	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	1J12028	EPA 8260D	10/13/21 00:13	kkw	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*48*	*1*	*50.0*	*97 %*	*41-142*	*1J12028*	*EPA 8260D*	*10/13/21 00:13*	*kkw*	
Dibromofluoromethane	*47*	*1*	*50.0*	*94 %*	*53-146*	*1J12028*	*EPA 8260D*	*10/13/21 00:13*	*kkw*	
Toluene-d8	*43*	*1*	*50.0*	*87 %*	*41-146*	*1J12028*	*EPA 8260D*	*10/13/21 00:13*	*kkw*	

ANALYTICAL RESULTS

Description: CRCA-MW0018-058-20211007 **Lab Sample ID:** AE07722-04 **Received:** 10/08/21 15:00

Matrix: Ground Water **Sampled:** 10/07/21 15:50 **Work Order:** AE07722

Project: NASA KSC CRCA **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	1J12028	EPA 8260D	10/13/21 00:42	kkw	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/13/21 00:42	kkw	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/13/21 00:42	kkw	QL-02, QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	QL-02, QV-01
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	

ANALYTICAL RESULTS

Description: CRCA-MW0018-058-20211007 **Lab Sample ID:** AE07722-04 **Received:** 10/08/21 15:00

Matrix: Ground Water **Sampled:** 10/07/21 15:50 **Work Order:** AE07722

Project: NASA KSC CRCA **Sampled By:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Vinyl chloride [75-01-4]^	**42**		ug/L	1	0.71	2.5	1J12028	EPA 8260D	10/13/21 00:42	kkw	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	1J12028	EPA 8260D	10/13/21 00:42	kkw	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*49*	*1*	*50.0*	*98 %*	*41-142*	*1J12028*	*EPA 8260D*	*10/13/21 00:42*	*kkw*	
Dibromofluoromethane	*50*	*1*	*50.0*	*100 %*	*53-146*	*1J12028*	*EPA 8260D*	*10/13/21 00:42*	*kkw*	
Toluene-d8	*48*	*1*	*50.0*	*96 %*	*41-146*	*1J12028*	*EPA 8260D*	*10/13/21 00:42*	*kkw*	

Dissolved Gases by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Ethane [74-84-0]^	0.0255	U	mg/L	5	0.0255	0.0300	1J14005	RSK 175	10/14/21 09:26	JMW	
Ethene [74-85-1]^	0.0255	U	mg/L	5	0.0255	0.0300	1J14005	RSK 175	10/14/21 09:26	JMW	
Methane [74-82-8]^	**1.14**		mg/L	5	0.0200	0.0250	1J14005	RSK 175	10/14/21 09:26	JMW	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J12028 - EPA 5030B_MS

Blank (1J12028-BLK1) Prepared: 10/12/2021 00:00 Analyzed: 10/12/2021 22:19

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.80	U	2.5	ug/L							
1,1,2,2-Tetrachloroethane	0.54	U	2.5	ug/L							
1,1,2-Trichloroethane	0.76	U	2.5	ug/L							
1,1-Dichloroethane	0.62	U	2.5	ug/L							
1,1-Dichloroethene	0.94	U	2.5	ug/L							
1,2,4-Trichlorobenzene	0.70	U	2.5	ug/L							
1,2-Dibromo-3-chloropropane	0.96	U	2.5	ug/L							
1,2-Dibromoethane	0.78	U	2.5	ug/L							
1,2-Dichlorobenzene	0.73	U	2.5	ug/L							
1,2-Dichloroethane	0.63	U	2.5	ug/L							
1,2-Dichloropropane	0.80	U	2.5	ug/L							
1,3-Dichlorobenzene	0.77	U	2.5	ug/L							
1,4-Dichlorobenzene	0.76	U	2.5	ug/L							
2-Butanone	4.5	U	12	ug/L							
2-Hexanone	2.5	U	12	ug/L							
4-Methyl-2-pentanone	2.5	U	12	ug/L							
Acetone	10	U	25	ug/L							
Benzene	0.71	U	2.5	ug/L							
Bromodichloromethane	0.52	U	2.5	ug/L							
Bromoform	0.75	U	2.5	ug/L							
Bromomethane	0.95	U	2.5	ug/L							
Carbon disulfide	2.5	U	12	ug/L							
Carbon Tetrachloride	0.94	U	2.5	ug/L							
Chlorobenzene	0.72	U	2.5	ug/L							
Chloroethane	0.98	U	2.5	ug/L							
Chloroform	0.80	U	2.5	ug/L							
Chloromethane	0.82	U	2.5	ug/L							
cis-1,2-Dichloroethene	0.53	U	2.5	ug/L							
cis-1,3-Dichloropropene	0.59	U	2.5	ug/L							
Cyclohexane	0.93	U	2.5	ug/L							
Dibromochloromethane	0.50	U	2.5	ug/L							
Dichlorodifluoromethane	0.74	U	2.5	ug/L							
Ethylbenzene	0.69	U	2.5	ug/L							
Freon 113	0.73	U	2.5	ug/L							
Isopropylbenzene	0.67	U	2.5	ug/L							
m,p-Xylenes	1.3	U	5.0	ug/L							
Methyl acetate	0.95	U	2.5	ug/L							
Methyl cyclohexane	0.64	U	2.5	ug/L							
Methylene Chloride	2.5	U	12	ug/L							
Methyl-tert-Butyl Ether	0.60	U	2.5	ug/L							
o-Xylene	0.53	U	2.5	ug/L							
Styrene	0.61	U	2.5	ug/L							
Tetrachloroethene	0.76	U	2.5	ug/L							
Toluene	0.72	U	2.5	ug/L							
trans-1,2-Dichloroethene	0.73	U	2.5	ug/L							
trans-1,3-Dichloropropene	0.73	U	2.5	ug/L							
Trichloroethene	0.89	U	2.5	ug/L							
Trichlorofluoromethane	0.94	U	2.5	ug/L							
Vinyl chloride	0.71	U	2.5	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J12028 - EPA 5030B_MS - Continued

Blank (1J12028-BLK1) Continued Prepared: 10/12/2021 00:00 Analyzed: 10/12/2021 22:19

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Xylenes (Total)	1.3	U	5.0	ug/L							
4-Bromofluorobenzene	*47*	*I*		*ug/L*	*50.0*		*94*	*41-142*			
Dibromofluoromethane	*50*			*ug/L*	*50.0*		*100*	*53-146*			
Toluene-d8	*48*	*I*		*ug/L*	*50.0*		*96*	*41-146*			

LCS (1J12028-BS1) Prepared: 10/12/2021 00:00 Analyzed: 10/12/2021 20:25

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	20		2.5	ug/L	20.0		101	57-148			
1,1,2,2-Tetrachloroethane	16		2.5	ug/L	20.0		82	60-139			
1,1,2-Trichloroethane	20		2.5	ug/L	20.0		100	57-141			
1,1-Dichloroethane	19		2.5	ug/L	20.0		95	57-142			
1,1-Dichloroethene	20		2.5	ug/L	20.0		99	47-139			
1,2,4-Trichlorobenzene	21		2.5	ug/L	20.0		104	52-159			
1,2-Dibromo-3-chloropropane	15		2.5	ug/L	20.0		76	48-150			
1,2-Dibromoethane	20		2.5	ug/L	20.0		98	57-140			
1,2-Dichlorobenzene	19		2.5	ug/L	20.0		97	63-131			
1,2-Dichloroethane	16		2.5	ug/L	20.0		81	50-156			
1,2-Dichloropropane	15		2.5	ug/L	20.0		76	61-133			
1,3-Dichlorobenzene	19		2.5	ug/L	20.0		94	66-129			
1,4-Dichlorobenzene	19		2.5	ug/L	20.0		93	65-133			
2-Butanone	130		12	ug/L	100		126	10-180			
2-Hexanone	74		12	ug/L	100		74	12-180			
4-Methyl-2-pentanone	86		12	ug/L	100		86	19-180			
Acetone	98		25	ug/L	100		98	10-180			
Benzene	19		2.5	ug/L	20.0		97	56-136			
Bromodichloromethane	17		2.5	ug/L	20.0		83	58-135			
Bromoform	22		2.5	ug/L	20.0		110	46-148			
Bromomethane	12		2.5	ug/L	20.0		58	10-173			
Carbon disulfide	33		12	ug/L	20.0		164	43-153			QL-02
Carbon Tetrachloride	21		2.5	ug/L	20.0		106	54-156			
Chlorobenzene	21		2.5	ug/L	20.0		107	51-139			
Chloroethane	23		2.5	ug/L	20.0		115	27-180			
Chloroform	20		2.5	ug/L	20.0		101	58-139			
Chloromethane	18		2.5	ug/L	20.0		91	33-154			
cis-1,2-Dichloroethene	19		2.5	ug/L	20.0		95	56-128			
cis-1,3-Dichloropropene	15		2.5	ug/L	20.0		76	64-128			
Cyclohexane	18		2.5	ug/L	20.0		91	70-130			
Dibromochloromethane	21		2.5	ug/L	20.0		103	50-140			
Dichlorodifluoromethane	20		2.5	ug/L	20.0		98	10-180			
Ethylbenzene	20		2.5	ug/L	20.0		100	63-133			
Freon 113	20		2.5	ug/L	20.0		98	47-173			
Isopropylbenzene	20		2.5	ug/L	20.0		100	60-132			
m,p-Xylenes	41		5.0	ug/L	40.0		101	64-133			
Methyl acetate	18		2.5	ug/L	20.0		92	70-130			
Methyl cyclohexane	16		2.5	ug/L	20.0		80	70-130			
Methylene Chloride	21		12	ug/L	20.0		105	43-142			
Methyl-tert-Butyl Ether	19		2.5	ug/L	20.0		94	51-145			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J12028 - EPA 5030B_MS - Continued

LCS (1J12028-BS1) Continued Prepared: 10/12/2021 00:00 Analyzed: 10/12/2021 20:25

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Xylene	20		2.5	ug/L	20.0		101	61-129			
Styrene	21		2.5	ug/L	20.0		106	59-136			
Tetrachloroethene	35		2.5	ug/L	20.0		176	60-147			QL-02
Toluene	19		2.5	ug/L	20.0		95	64-131			
trans-1,2-Dichloroethene	19		2.5	ug/L	20.0		95	54-134			
trans-1,3-Dichloropropene	17		2.5	ug/L	20.0		86	65-149			
Trichloroethene	22		2.5	ug/L	20.0		109	62-135			
Trichlorofluoromethane	22		2.5	ug/L	20.0		110	56-155			
Vinyl chloride	20		2.5	ug/L	20.0		99	20-167			
4-Bromofluorobenzene	*49*	*I*		*ug/L*	*50.0*		*99*	*41-142*			
Dibromofluoromethane	*48*	*I*		*ug/L*	*50.0*		*97*	*53-146*			
Toluene-d8	*45*	*I*		*ug/L*	*50.0*		*90*	*41-146*			

Matrix Spike (1J12028-MS1) Prepared: 10/12/2021 00:00 Analyzed: 10/12/2021 20:53

Source: AE07722-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	19		2.5	ug/L	20.0	0.80 U	95	57-148			
1,1,2,2-Tetrachloroethane	17		2.5	ug/L	20.0	0.54 U	84	60-139			
1,1,2-Trichloroethane	20		2.5	ug/L	20.0	0.76 U	99	57-141			
1,1-Dichloroethane	17		2.5	ug/L	20.0	0.62 U	87	57-142			
1,1-Dichloroethene	22		2.5	ug/L	20.0	0.94 U	108	47-139			
1,2,4-Trichlorobenzene	19		2.5	ug/L	20.0	0.70 U	97	52-159			
1,2-Dibromo-3-chloropropane	14		2.5	ug/L	20.0	0.96 U	72	48-150			
1,2-Dibromoethane	20		2.5	ug/L	20.0	0.78 U	100	57-140			
1,2-Dichlorobenzene	19		2.5	ug/L	20.0	0.73 U	97	63-131			
1,2-Dichloroethane	16		2.5	ug/L	20.0	0.63 U	79	50-156			QM-11
1,2-Dichloropropane	15		2.5	ug/L	20.0	0.80 U	77	61-133			
1,3-Dichlorobenzene	19		2.5	ug/L	20.0	0.77 U	95	66-129			
1,4-Dichlorobenzene	19		2.5	ug/L	20.0	0.76 U	95	65-133			
2-Butanone	110		12	ug/L	100	4.5 U	107	10-180			
2-Hexanone	73		12	ug/L	100	2.5 U	73	12-180			
4-Methyl-2-pentanone	89		12	ug/L	100	2.5 U	89	19-180			
Acetone	72		25	ug/L	100	10 U	72	10-180			QM-11
Benzene	18		2.5	ug/L	20.0	0.71 U	89	56-136			QM-11
Bromodichloromethane	17		2.5	ug/L	20.0	0.52 U	85	58-135			
Bromoform	22		2.5	ug/L	20.0	0.75 U	109	46-148			
Bromomethane	17		2.5	ug/L	20.0	0.95 U	84	10-173			
Carbon disulfide	30		12	ug/L	20.0	2.5 U	151	43-153			
Carbon Tetrachloride	20		2.5	ug/L	20.0	0.94 U	102	54-156			
Chlorobenzene	23		2.5	ug/L	20.0	0.72 U	114	51-139			QM-11
Chloroethane	27		2.5	ug/L	20.0	0.98 U	136	27-180			
Chloroform	18		2.5	ug/L	20.0	0.80 U	90	58-139			
Chloromethane	22		2.5	ug/L	20.0	0.82 U	109	33-154			
cis-1,2-Dichloroethene	19		2.5	ug/L	20.0	0.53 U	95	56-128			
cis-1,3-Dichloropropene	15		2.5	ug/L	20.0	0.59 U	74	64-128			
Cyclohexane	19		2.5	ug/L	20.0	0.93 U	94	70-130			
Dibromochloromethane	21		2.5	ug/L	20.0	0.50 U	105	50-140			
Dichlorodifluoromethane	25		2.5	ug/L	20.0	0.74 U	127	10-180			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J12028 - EPA 5030B_MS - Continued

Matrix Spike (1J12028-MS1) Continued Prepared: 10/12/2021 00:00 Analyzed: 10/12/2021 20:53

Source: AE07722-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethylbenzene	22		2.5	ug/L	20.0	0.69 U	110	63-133			
Freon 113	21		2.5	ug/L	20.0	0.73 U	107	47-173			
Isopropylbenzene	22		2.5	ug/L	20.0	0.67 U	110	60-132			
m,p-Xylenes	44		5.0	ug/L	40.0	1.3 U	110	64-133			
Methyl acetate	15		2.5	ug/L	20.0	0.95 U	75	70-130			
Methyl cyclohexane	19		2.5	ug/L	20.0	0.64 U	93	70-130			
Methylene Chloride	18		12	ug/L	20.0	2.5 U	91	43-142			
Methyl-tert-Butyl Ether	16		2.5	ug/L	20.0	0.60 U	79	51-145			
o-Xylene	22		2.5	ug/L	20.0	0.53 U	110	61-129			
Styrene	23		2.5	ug/L	20.0	0.61 U	113	59-136			
Tetrachloroethene	23		2.5	ug/L	20.0	0.76 U	117	60-147			
Toluene	20		2.5	ug/L	20.0	0.72 U	102	64-131			
trans-1,2-Dichloroethene	20		2.5	ug/L	20.0	0.73 U	99	54-134			
trans-1,3-Dichloropropene	17		2.5	ug/L	20.0	0.73 U	86	65-149			
Trichloroethene	23		2.5	ug/L	20.0	0.89 U	114	62-135			
Trichlorofluoromethane	27		2.5	ug/L	20.0	0.94 U	134	56-155			
Vinyl chloride	25		2.5	ug/L	20.0	0.78	121	20-167			
4-Bromofluorobenzene	*48*	*I*		*ug/L*	*50.0*		*96*	*41-142*			
Dibromofluoromethane	*45*	*I*		*ug/L*	*50.0*		*91*	*53-146*			
Toluene-d8	*44*	*I*		*ug/L*	*50.0*		*88*	*41-146*			

Matrix Spike Dup (1J12028-MSD1) Prepared: 10/12/2021 00:00 Analyzed: 10/12/2021 21:22

Source: AE07722-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	23		2.5	ug/L	20.0	0.80 U	113	57-148	17	25	
1,1,2,2-Tetrachloroethane	16		2.5	ug/L	20.0	0.54 U	82	60-139	3	17	
1,1,2-Trichloroethane	18		2.5	ug/L	20.0	0.76 U	90	57-141	10	16	
1,1-Dichloroethane	21		2.5	ug/L	20.0	0.62 U	103	57-142	16	24	
1,1-Dichloroethene	23		2.5	ug/L	20.0	0.94 U	113	47-139	4	16	
1,2,4-Trichlorobenzene	20		2.5	ug/L	20.0	0.70 U	98	52-159	0.6	24	
1,2-Dibromo-3-chloropropane	14		2.5	ug/L	20.0	0.96 U	69	48-150	4	21	
1,2-Dibromoethane	18		2.5	ug/L	20.0	0.78 U	91	57-140	10	16	
1,2-Dichlorobenzene	19		2.5	ug/L	20.0	0.73 U	95	63-131	1	25	
1,2-Dichloroethane	21		2.5	ug/L	20.0	0.63 U	103	50-156	26	18	QM-11
1,2-Dichloropropane	18		2.5	ug/L	20.0	0.80 U	89	61-133	14	26	
1,3-Dichlorobenzene	19		2.5	ug/L	20.0	0.77 U	95	66-129	0	23	
1,4-Dichlorobenzene	19		2.5	ug/L	20.0	0.76 U	94	65-133	1	23	
2-Butanone	120		12	ug/L	100	4.5 U	120	10-180	11	29	
2-Hexanone	97		12	ug/L	100	2.5 U	97	12-180	27	28	
4-Methyl-2-pentanone	91		12	ug/L	100	2.5 U	91	19-180	3	24	
Acetone	95		25	ug/L	100	10 U	95	10-180	27	19	QM-11
Benzene	21		2.5	ug/L	20.0	0.71 U	103	56-136	15	14	QM-11
Bromodichloromethane	20		2.5	ug/L	20.0	0.52 U	101	58-135	17	19	
Bromoform	20		2.5	ug/L	20.0	0.75 U	98	46-148	10	18	
Bromomethane	17		2.5	ug/L	20.0	0.95 U	86	10-173	2	29	
Carbon disulfide	33		12	ug/L	20.0	2.5 U	165	43-153	9	26	QM-19
Carbon Tetrachloride	23		2.5	ug/L	20.0	0.94 U	115	54-156	11	27	
Chlorobenzene	20		2.5	ug/L	20.0	0.72 U	98	51-139	16	13	QM-11

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J12028 - EPA 5030B_MS - Continued

Matrix Spike Dup (1J12028-MSD1) Continued Prepared: 10/12/2021 00:00 Analyzed: 10/12/2021 21:22

Source: AE07722-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloroethane	25		2.5	ug/L	20.0	0.98 U	126	27-180	8	22	
Chloroform	21		2.5	ug/L	20.0	0.80 U	106	58-139	16	17	
Chloromethane	20		2.5	ug/L	20.0	0.82 U	99	33-154	10	31	
cis-1,2-Dichloroethene	20		2.5	ug/L	20.0	0.53 U	101	56-128	6	17	
cis-1,3-Dichloropropene	17		2.5	ug/L	20.0	0.59 U	87	64-128	15	20	
Cyclohexane	22		2.5	ug/L	20.0	0.93 U	109	70-130	15	20	
Dibromochloromethane	18		2.5	ug/L	20.0	0.50 U	88	50-140	17	18	
Dichlorodifluoromethane	24		2.5	ug/L	20.0	0.74 U	121	10-180	5	26	
Ethylbenzene	20		2.5	ug/L	20.0	0.69 U	98	63-133	11	18	
Freon 113	23		2.5	ug/L	20.0	0.73 U	115	47-173	6	30	
Isopropylbenzene	20		2.5	ug/L	20.0	0.67 U	100	60-132	10	23	
m,p-Xylenes	38		5.0	ug/L	40.0	1.3 U	96	64-133	14	18	
Methyl acetate	17		2.5	ug/L	20.0	0.95 U	84	70-130	12	20	
Methyl cyclohexane	22		2.5	ug/L	20.0	0.64 U	110	70-130	17	20	
Methylene Chloride	21		12	ug/L	20.0	2.5 U	103	43-142	13	23	
Methyl-tert-Butyl Ether	18		2.5	ug/L	20.0	0.60 U	91	51-145	14	22	
o-Xylene	19		2.5	ug/L	20.0	0.53 U	97	61-129	13	16	
Styrene	20		2.5	ug/L	20.0	0.61 U	100	59-136	12	32	
Tetrachloroethene	19		2.5	ug/L	20.0	0.76 U	96	60-147	20	21	
Toluene	19		2.5	ug/L	20.0	0.72 U	95	64-131	7	16	
trans-1,2-Dichloroethene	21		2.5	ug/L	20.0	0.73 U	105	54-134	6	20	
trans-1,3-Dichloropropene	17		2.5	ug/L	20.0	0.73 U	83	65-149	3	17	
Trichloroethene	22		2.5	ug/L	20.0	0.89 U	109	62-135	4	20	
Trichlorofluoromethane	24		2.5	ug/L	20.0	0.94 U	122	56-155	9	22	
Vinyl chloride	22		2.5	ug/L	20.0	0.78	106	20-167	13	24	
4-Bromofluorobenzene	*48*	*I*		*ug/L*	*50.0*		*96*	*41-142*			
Dibromofluoromethane	*47*	*I*		*ug/L*	*50.0*		*95*	*53-146*			
Toluene-d8	*47*	*I*		*ug/L*	*50.0*		*95*	*41-146*			

Dissolved Gases by GC - Quality Control

Batch 1J14005 - Same

Blank (1J14005-BLK1) Prepared: 10/14/2021 00:00 Analyzed: 10/14/2021 08:38

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.00510	U	0.00600	mg/L							
Ethene	0.00510	U	0.00600	mg/L							
Methane	0.00400	U	0.00500	mg/L							

LCS (1J14005-BS1) Prepared: 10/14/2021 00:00 Analyzed: 10/14/2021 08:07

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.322		0.00600	mg/L	0.323		100	70-130			
Ethene	0.318		0.00600	mg/L	0.302		105	70-130			
Methane	0.170		0.00500	mg/L	0.174		98	70-130			

QUALITY CONTROL DATA

Dissolved Gases by GC - Quality Control

Batch 1J14005 - Same - Continued

LCS Dup (1J14005-BSD1) Prepared: 10/14/2021 00:00 Analyzed: 10/14/2021 08:23

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.349		0.00600	mg/L	0.323		108	70-130	8	30	
Ethene	0.348		0.00600	mg/L	0.302		115	70-130	9	30	
Methane	0.188		0.00500	mg/L	0.174		108	70-130	10	30	

Duplicate (1J14005-DUP1) Prepared: 10/14/2021 00:00 Analyzed: 10/14/2021 16:07

Source: AE07722-04

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.0255	U	0.0300	mg/L		0.0255 U				30	
Ethene	0.0255	U	0.0300	mg/L		0.0255 U				30	
Methane	1.10		0.0250	mg/L		1.14			3	30	

Batch 1J15005 - Same

Blank (1J15005-BLK1) Prepared: 10/15/2021 07:23 Analyzed: 10/15/2021 08:59

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.00510	U	0.00600	mg/L							
Ethene	0.00510	U	0.00600	mg/L							
Methane	0.00400	U	0.00500	mg/L							

LCS (1J15005-BS1) Prepared: 10/15/2021 07:23 Analyzed: 10/15/2021 08:28

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.357		0.00600	mg/L	0.323		111	70-130			
Ethene	0.357		0.00600	mg/L	0.302		118	70-130			
Methane	0.191		0.00500	mg/L	0.174		110	70-130			

LCS Dup (1J15005-BSD1) Prepared: 10/15/2021 07:23 Analyzed: 10/15/2021 08:43

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.353		0.00600	mg/L	0.323		109	70-130	1	30	
Ethene	0.352		0.00600	mg/L	0.302		116	70-130	2	30	
Methane	0.188		0.00500	mg/L	0.174		108	70-130	2	30	

Duplicate (1J15005-DUP1) Prepared: 10/15/2021 07:23 Analyzed: 10/15/2021 14:29

Source: AE08159-17

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.00510	U	0.00600	mg/L		0.00510 U				30	
Ethene	0.00510	U	0.00600	mg/L		0.00510 U				30	
Methane	0.00400	U	0.00500	mg/L		0.00400 U				30	

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*****	Not reported due to interference.
[CALC]	Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
QL-02	The associated laboratory control sample exhibited high bias; since the result is ND, there is no impact.
QM-11	Precision between duplicate matrix spikes of the same sample was outside acceptance limits.
QM-19	The spike recovery was outside acceptance limits for the MS and/or MSD.
QS-03	Surrogate recovery outside acceptance limits
QV-01	The associated continuing calibration verification standard exhibited high bias; since the result is ND, there is no impact.

B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported result is an estimated value.
U	The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a “tentative identification".
Q	One or more quality control criteria failed.

AE0722

Tetra Tech, Inc. CHAIN OF CUSTODY | NUMBER No. 3247 | PAGE 1 OF 1

PROJECT NO: 112G08970 FACILITY: KSC-CRCA	PROJECT MANAGER Alex Murphy	PHONE NUMBER (321) 292-0842	LABORATORY NAME AND CONTACT: ENCO - Kaitlin Rylnicki
SAMPLERS (SIGNATURE) Kyle Kercher	FIELD OPERATIONS LEADER Chuck Sorden	PHONE NUMBER (321) 591-7580	ADDRESS 10775 Central Port Dr
	CARRIER/WAYBILL NUMBER		CITY, STATE Orlando, FL

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2021	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: 8260DTCL SOM01	RSK175 MEE	CONTAINER TYPE PLASTIC (P) or GLASS (G): G	G	PRESERVATIVE USED: HCl	4°C	COMMENTS
10/07	1330	CRCA-MW0019-058.0-20211007		53	63	GW	G	6	X	X					
"	1520	CRCA-MW0021-058.0-20211007		53	63	GW	G	6	X	X					
"	1735	CRCA-MW0032-058.0-20211007		53	63	GW	G	3	X						
10/07	1550	CRCA-MW0018-058.0-20211007		53	63	GW	G	6	X	X					

1. RELINQUISHED BY Kyle Kercher	DATE 10/8/2021	TIME 1430	1. RECEIVED BY	DATE 10/08/21	TIME 1430
2. RELINQUISHED BY	DATE 10/08/21	TIME 1500	2. RECEIVED BY	DATE 10/8/21	TIME 1500
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS MB-3269 1.1°C, 1gBlue 0.23 gs

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

ENCO Orlando

SDG: AE07722-TE016

CLASS: 01_VOA_MS

METHOD: EPA 8260D

ANALYSES DATA PACKAGE COVER PAGE

EPA 8260D

Laboratory: ENCO Orlando

SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Client Sample Id:	Lab Sample Id:
CRCA-MW0019-058.0-20211007	AE07722-01
CRCA-MW0031-058.0-20211007	AE07722-02
CRCA-MW0032-058.0-20211007	AE07722-03
CRCA-MW0018-058-20211007	AE07722-04

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0019-058.0-20211007

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Ground Water
Laboratory ID: AE07722-01
File ID: 212JG034.D
Sampled: 10/07/21 13:30
Prepared: 10/12/21 00:00
Analyzed: 10/12/21 23:16
Solids:
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Batch: 1J12028
Sequence: AA68735
Calibration: 2107025
Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	0.78	J	0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0019-058.0-20211007

Laboratory: ENCO Orlando SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE07722-01 File ID: 212JG034.D

Sampled: 10/07/21 13:30 Prepared: 10/12/21 00:00 Analyzed: 10/12/21 23:16

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1J12028 Sequence: AA68735 Calibration: 2107025 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	49	98	53 - 146	
Toluene-d8	50.0	41	83	41 - 146	
4-Bromofluorobenzene	50.0	49	97	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	181068	11.49	193062	11.49	
1,4-Difluorobenzene	305759	12.04	330090	12.04	
Chlorobenzene-d5	115506	14.63	152465	14.63	
1,4-Dichlorobenzene-d4	114758	17	126714	17	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0031-058.0-20211007

Laboratory: ENCO Orlando SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE07722-02 File ID: 212JG035.D

Sampled: 10/07/21 15:20 Prepared: 10/12/21 00:00 Analyzed: 10/12/21 23:45

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1J12028 Sequence: AA68735 Calibration: 2107025 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	13		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0031-058.0-20211007

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Ground Water
Laboratory ID: AE07722-02
File ID: 212JG035.D
Sampled: 10/07/21 15:20
Prepared: 10/12/21 00:00
Analyzed: 10/12/21 23:45
Solids:
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Batch: 1J12028
Sequence: AA68735
Calibration: 2107025
Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	51	102	53 - 146	
Toluene-d8	50.0	48	97	41 - 146	
4-Bromofluorobenzene	50.0	46	93	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	173205	11.49	193062	11.49	
1,4-Difluorobenzene	291821	12.04	330090	12.04	
Chlorobenzene-d5	147493	14.64	152465	14.63	
1,4-Dichlorobenzene-d4	120010	17	126714	17	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0032-058.0-20211007

Laboratory: ENCO Orlando SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE07722-03 File ID: 212JG036.D

Sampled: 10/07/21 17:35 Prepared: 10/12/21 00:00 Analyzed: 10/13/21 00:13

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1J12028 Sequence: AA68735 Calibration: 2107025 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	8.7		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0032-058.0-20211007

Laboratory: ENCO Orlando SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE07722-03 File ID: 212JG036.D

Sampled: 10/07/21 17:35 Prepared: 10/12/21 00:00 Analyzed: 10/13/21 00:13

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1J12028 Sequence: AA68735 Calibration: 2107025 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	47	94	53 - 146	
Toluene-d8	50.0	43	87	41 - 146	
4-Bromofluorobenzene	50.0	48	97	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	156771	11.49	193062	11.49	
1,4-Difluorobenzene	264097	12.04	330090	12.04	
Chlorobenzene-d5	112618	14.63	152465	14.63	
1,4-Dichlorobenzene-d4	111851	17	126714	17	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0018-058-20211007

Laboratory: ENCO Orlando SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE07722-04 File ID: 212JG037.D

Sampled: 10/07/21 15:50 Prepared: 10/12/21 00:00 Analyzed: 10/13/21 00:42

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1J12028 Sequence: AA68735 Calibration: 2107025 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	42		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0018-058-20211007

Laboratory: ENCO Orlando SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE07722-04 File ID: 212JG037.D

Sampled: 10/07/21 15:50 Prepared: 10/12/21 00:00 Analyzed: 10/13/21 00:42

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1J12028 Sequence: AA68735 Calibration: 2107025 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	50	100	53 - 146	
Toluene-d8	50.0	48	96	41 - 146	
4-Bromofluorobenzene	50.0	49	98	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	177500	11.49	193062	11.49	
1,4-Difluorobenzene	301187	12.04	330090	12.04	
Chlorobenzene-d5	107763	14.63	152465	14.63	
1,4-Dichlorobenzene-d4	107448	17	126714	17	

* Values outside of QC limits

HOLDING TIME SUMMARY

EPA 8260D

Laboratory: ENCO Orlando

SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-MW0019-058.0-20211007	10/07/21 13:30	10/08/21 15:00	10/12/21 00:00	4.44	NA	10/12/21 23:16	5.00	14.00	
CRCA-MW0031-058.0-20211007	10/07/21 15:20	10/08/21 15:00	10/12/21 00:00	4.36	NA	10/12/21 23:45	5.00	14.00	
CRCA-MW0032-058.0-20211007	10/07/21 17:35	10/08/21 15:00	10/12/21 00:00	4.27	NA	10/13/21 00:13	5.00	14.00	
CRCA-MW0018-058-20211007	10/07/21 15:50	10/08/21 15:00	10/12/21 00:00	4.34	NA	10/13/21 00:42	5.00	14.00	

PREPARATION BATCH SUMMARY

EPA 8260D

Laboratory: ENCO Orlando SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Batch: 1J12028 Batch Matrix: Water Preparation: EPA 5030B_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	1J12028-BLK1	212JG032.D	10/12/21 00:00	
LCS	1J12028-BS1	212JG028.D	10/12/21 00:00	
CRCA-MW0019-058.0-20211007	1J12028-MS1	212JG029.D	10/12/21 00:00	
CRCA-MW0019-058.0-20211007	1J12028-MSD1	212JG030.D	10/12/21 00:00	
CRCA-MW0019-058.0-20211007	AE07722-01	212JG034.D	10/12/21 00:00	
CRCA-MW0031-058.0-20211007	AE07722-02	212JG035.D	10/12/21 00:00	
CRCA-MW0032-058.0-20211007	AE07722-03	212JG036.D	10/12/21 00:00	
CRCA-MW0018-058-20211007	AE07722-04	212JG037.D	10/12/21 00:00	

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	1J12028-BLK1	File ID:	212JG032.D
Prepared:	10/12/21 00:00	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	10/12/21 22:19	Instrument:	OVGCMS2		
Batch:	1J12028	Sequence:	AA68735	Calibration:	2107025

CAS NO.	COMPOUND	CONC. (ug/L)	Q
75-71-8	Dichlorodifluoromethane	0.74	U
74-87-3	Chloromethane	0.82	U
75-01-4	Vinyl chloride	0.71	U
74-83-9	Bromomethane	0.95	U
75-00-3	Chloroethane	0.98	U
75-69-4	Trichlorofluoromethane	0.94	U
76-13-1	Freon 113	0.73	U
67-64-1	Acetone	10	U
75-35-4	1,1-Dichloroethene	0.94	U
75-15-0	Carbon disulfide	2.5	U
75-09-2	Methylene Chloride	2.5	U
1634-04-4	Methyl-tert-Butyl Ether	0.60	U
156-60-5	trans-1,2-Dichloroethene	0.73	U
156-59-2	cis-1,2-Dichloroethene	0.53	U
75-34-3	1,1-Dichloroethane	0.62	U
78-93-3	2-Butanone	4.5	U
67-66-3	Chloroform	0.80	U
71-55-6	1,1,1-Trichloroethane	0.80	U
79-20-9	Methyl acetate	0.95	U
110-82-7	Cyclohexane	0.93	U
108-87-2	Methyl cyclohexane	0.64	U
56-23-5	Carbon Tetrachloride	0.94	U
107-06-2	1,2-Dichloroethane	0.63	U
71-43-2	Benzene	0.71	U
79-01-6	Trichloroethene	0.89	U
78-87-5	1,2-Dichloropropane	0.80	U
75-27-4	Bromodichloromethane	0.52	U
108-10-1	4-Methyl-2-pentanone	2.5	U
591-78-6	2-Hexanone	2.5	U
10061-01-5	cis-1,3-Dichloropropene	0.59	U

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	1J12028-BLK1	File ID:	212JG032.D
Prepared:	10/12/21 00:00	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	10/12/21 22:19	Instrument:	OVGCMS2		
Batch:	1J12028	Sequence:	AA68735	Calibration:	2107025

CAS NO.	COMPOUND	CONC. (ug/L)	Q
108-88-3	Toluene	0.72	U
10061-02-6	trans-1,3-Dichloropropene	0.73	U
79-00-5	1,1,2-Trichloroethane	0.76	U
127-18-4	Tetrachloroethene	0.76	U
124-48-1	Dibromochloromethane	0.50	U
106-93-4	1,2-Dibromoethane	0.78	U
108-90-7	Chlorobenzene	0.72	U
100-41-4	Ethylbenzene	0.69	U
108-38-3/106-42-3	m,p-Xylenes	1.3	U
95-47-6	o-Xylene	0.53	U
75-25-2	Bromoform	0.75	U
100-42-5	Styrene	0.61	U
98-82-8	Isopropylbenzene	0.67	U
79-34-5	1,1,2,2-Tetrachloroethane	0.54	U
120-82-1	1,2,4-Trichlorobenzene	0.70	U
541-73-1	1,3-Dichlorobenzene	0.77	U
106-46-7	1,4-Dichlorobenzene	0.76	U
95-50-1	1,2-Dichlorobenzene	0.73	U
96-12-8	1,2-Dibromo-3-chloropropane	0.96	U
1330-20-7	Xylenes (Total)	1.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	50	100	53 - 146	
Toluene-d8	50.0	48	96	41 - 146	
4-Bromofluorobenzene	50.0	47	94	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	176309	11.49	193062	11.49	
1,4-Difluorobenzene	298045	12.04	330090	12.04	
Chlorobenzene-d5	149250	14.63	152465	14.63	
1,4-Dichlorobenzene-d4	124670	17	126714	17	

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	1J12028	Laboratory ID:	1J12028-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	20	98	10 - 180
Chloromethane	20.0	18	91	33 - 154
Vinyl chloride	20.0	20	99	20 - 167
Bromomethane	20.0	12	58	10 - 173
Chloroethane	20.0	23	115	27 - 180
Trichlorofluoromethane	20.0	22	110	56 - 155
Freon 113	20.0	20	98	47 - 173
Acetone	100	98	98	10 - 180
1,1-Dichloroethene	20.0	20	99	47 - 139
Carbon disulfide	20.0	33	164 *	43 - 153
Methylene Chloride	20.0	21	105	43 - 142
Methyl-tert-Butyl Ether	20.0	19	94	51 - 145
trans-1,2-Dichloroethene	20.0	19	95	54 - 134
cis-1,2-Dichloroethene	20.0	19	95	56 - 128
1,1-Dichloroethane	20.0	19	95	57 - 142
2-Butanone	100	130	126	10 - 180
Chloroform	20.0	20	101	58 - 139
1,1,1-Trichloroethane	20.0	20	101	57 - 148
Methyl acetate	20.0	18	92	70 - 130
Cyclohexane	20.0	18	91	70 - 130
Methyl cyclohexane	20.0	16	80	70 - 130
Carbon Tetrachloride	20.0	21	106	54 - 156
1,2-Dichloroethane	20.0	16	81	50 - 156
Benzene	20.0	19	97	56 - 136
Trichloroethene	20.0	22	109	62 - 135
1,2-Dichloropropane	20.0	15	76	61 - 133
Bromodichloromethane	20.0	17	83	58 - 135
4-Methyl-2-pentanone	100	86	86	19 - 180
2-Hexanone	100	74	74	12 - 180
cis-1,3-Dichloropropene	20.0	15	76	64 - 128

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	1J12028	Laboratory ID:	1J12028-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Toluene	20.0	19	95	64 - 131
trans-1,3-Dichloropropene	20.0	17	86	65 - 149
1,1,2-Trichloroethane	20.0	20	100	57 - 141
Tetrachloroethene	20.0	35	176 *	60 - 147
Dibromochloromethane	20.0	21	103	50 - 140
1,2-Dibromoethane	20.0	20	98	57 - 140
Chlorobenzene	20.0	21	107	51 - 139
Ethylbenzene	20.0	20	100	63 - 133
m,p-Xylenes	40.0	41	101	64 - 133
o-Xylene	20.0	20	101	61 - 129
Bromoform	20.0	22	110	46 - 148
Styrene	20.0	21	106	59 - 136
Isopropylbenzene	20.0	20	100	60 - 132
1,1,2,2-Tetrachloroethane	20.0	16	82	60 - 139
1,2,4-Trichlorobenzene	20.0	21	104	52 - 159
1,3-Dichlorobenzene	20.0	19	94	66 - 129
1,4-Dichlorobenzene	20.0	19	93	65 - 133
1,2-Dichlorobenzene	20.0	19	97	63 - 131
1,2-Dibromo-3-chloropropane	20.0	15	76	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-MW0019-058.0-20211007

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1J12028
Laboratory ID: 1J12028-MS1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-MW0019-058.0-20211007

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	ND	25	127	10 - 180
Chloromethane	20.0	ND	22	109	33 - 154
Vinyl chloride	20.0	0.78	25	121	20 - 167
Bromomethane	20.0	ND	17	84	10 - 173
Chloroethane	20.0	ND	27	136	27 - 180
Trichlorofluoromethane	20.0	ND	27	134	56 - 155
Freon 113	20.0	ND	21	107	47 - 173
Acetone	100	ND	72	72	10 - 180
1,1-Dichloroethene	20.0	ND	22	108	47 - 139
Carbon disulfide	20.0	ND	30	151	43 - 153
Methylene Chloride	20.0	ND	18	91	43 - 142
Methyl-tert-Butyl Ether	20.0	ND	16	79	51 - 145
trans-1,2-Dichloroethene	20.0	ND	20	99	54 - 134
cis-1,2-Dichloroethene	20.0	ND	19	95	56 - 128
1,1-Dichloroethane	20.0	ND	17	87	57 - 142
2-Butanone	100	ND	110	107	10 - 180
Chloroform	20.0	ND	18	90	58 - 139
1,1,1-Trichloroethane	20.0	ND	19	95	57 - 148
Methyl acetate	20.0	ND	15	75	70 - 130
Cyclohexane	20.0	ND	19	94	70 - 130
Methyl cyclohexane	20.0	ND	19	93	70 - 130
Carbon Tetrachloride	20.0	ND	20	102	54 - 156
1,2-Dichloroethane	20.0	ND	16	79	50 - 156
Benzene	20.0	ND	18	89	56 - 136
Trichloroethene	20.0	ND	23	114	62 - 135
1,2-Dichloropropane	20.0	ND	15	77	61 - 133
Bromodichloromethane	20.0	ND	17	85	58 - 135
4-Methyl-2-pentanone	100	ND	89	89	19 - 180
2-Hexanone	100	ND	73	73	12 - 180
cis-1,3-Dichloropropene	20.0	ND	15	74	64 - 128
Toluene	20.0	ND	20	102	64 - 131

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-MW0019-058.0-20211007

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1J12028
Laboratory ID: 1J12028-MS1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-MW0019-058.0-20211007

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
trans-1,3-Dichloropropene	20.0	ND	17	86	65 - 149
1,1,2-Trichloroethane	20.0	ND	20	99	57 - 141
Tetrachloroethene	20.0	ND	23	117	60 - 147
Dibromochloromethane	20.0	ND	21	105	50 - 140
1,2-Dibromoethane	20.0	ND	20	100	57 - 140
Chlorobenzene	20.0	ND	23	114	51 - 139
Ethylbenzene	20.0	ND	22	110	63 - 133
m,p-Xylenes	40.0	ND	44	110	64 - 133
o-Xylene	20.0	ND	22	110	61 - 129
Bromoform	20.0	ND	22	109	46 - 148
Styrene	20.0	ND	23	113	59 - 136
Isopropylbenzene	20.0	ND	22	110	60 - 132
1,1,2,2-Tetrachloroethane	20.0	ND	17	84	60 - 139
1,2,4-Trichlorobenzene	20.0	ND	19	97	52 - 159
1,3-Dichlorobenzene	20.0	ND	19	95	66 - 129
1,4-Dichlorobenzene	20.0	ND	19	95	65 - 133
1,2-Dichlorobenzene	20.0	ND	19	97	63 - 131
1,2-Dibromo-3-chloropropane	20.0	ND	14	72	48 - 150

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-MW0019-058.0-20211007

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1J12028
Laboratory ID: 1J12028-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-MW0019-058.0-20211007

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	20.0	24	121	5	26	10 - 180
Chloromethane	20.0	20	99	10	31	33 - 154
Vinyl chloride	20.0	22	106	13	24	20 - 167
Bromomethane	20.0	17	86	2	29	10 - 173
Chloroethane	20.0	25	126	8	22	27 - 180
Trichlorofluoromethane	20.0	24	122	9	22	56 - 155
Freon 113	20.0	23	115	6	30	47 - 173
Acetone	100	95	95	27 *	19	10 - 180
1,1-Dichloroethene	20.0	23	113	4	16	47 - 139
Carbon disulfide	20.0	33	165 *	9	26	43 - 153
Methylene Chloride	20.0	21	103	13	23	43 - 142
Methyl-tert-Butyl Ether	20.0	18	91	14	22	51 - 145
trans-1,2-Dichloroethene	20.0	21	105	6	20	54 - 134
cis-1,2-Dichloroethene	20.0	20	101	6	17	56 - 128
1,1-Dichloroethane	20.0	21	103	16	24	57 - 142
2-Butanone	100	120	120	11	29	10 - 180
Chloroform	20.0	21	106	16	17	58 - 139
1,1,1-Trichloroethane	20.0	23	113	17	25	57 - 148
Methyl acetate	20.0	17	84	12	20	70 - 130
Cyclohexane	20.0	22	109	15	20	70 - 130
Methyl cyclohexane	20.0	22	110	17	20	70 - 130
Carbon Tetrachloride	20.0	23	115	11	27	54 - 156
1,2-Dichloroethane	20.0	21	103	26 *	18	50 - 156
Benzene	20.0	21	103	15 *	14	56 - 136
Trichloroethene	20.0	22	109	4	20	62 - 135
1,2-Dichloropropane	20.0	18	89	14	26	61 - 133
Bromodichloromethane	20.0	20	101	17	19	58 - 135
4-Methyl-2-pentanone	100	91	91	3	24	19 - 180
2-Hexanone	100	97	97	27	28	12 - 180
cis-1,3-Dichloropropene	20.0	17	87	15	20	64 - 128
Toluene	20.0	19	95	7	16	64 - 131
trans-1,3-Dichloropropene	20.0	17	83	3	17	65 - 149

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-MW0019-058.0-20211007

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1J12028
Laboratory ID: 1J12028-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-MW0019-058.0-20211007

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1,2-Trichloroethane	20.0	18	90	10	16	57 - 141
Tetrachloroethene	20.0	19	96	20	21	60 - 147
Dibromochloromethane	20.0	18	88	17	18	50 - 140
1,2-Dibromoethane	20.0	18	91	10	16	57 - 140
Chlorobenzene	20.0	20	98	16 *	13	51 - 139
Ethylbenzene	20.0	20	98	11	18	63 - 133
m,p-Xylenes	40.0	38	96	14	18	64 - 133
o-Xylene	20.0	19	97	13	16	61 - 129
Bromoform	20.0	20	98	10	18	46 - 148
Styrene	20.0	20	100	12	32	59 - 136
Isopropylbenzene	20.0	20	100	10	23	60 - 132
1,1,2,2-Tetrachloroethane	20.0	16	82	3	17	60 - 139
1,2,4-Trichlorobenzene	20.0	20	98	0.6	24	52 - 159
1,3-Dichlorobenzene	20.0	19	95	0	23	66 - 129
1,4-Dichlorobenzene	20.0	19	94	1	23	65 - 133
1,2-Dichlorobenzene	20.0	19	95	1	25	63 - 131
1,2-Dibromo-3-chloropropane	20.0	14	69	4	21	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA67203
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA67203-SCV1)			Lab File ID: 212GB012.D		Analyzed: 07/07/21 13:51			
Dibromofluoromethane	50.0	96	70 - 130	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	100	70 - 130	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	100	70 - 130	15.75	15.74857	0.0014	+/-0.5	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA68735
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA68735-CCV1)			Lab File ID: 212JG027.D		Analyzed: 10/12/21 19:56			
Dibromofluoromethane	50.0	94	80 - 120	11.11	11.09286	0.0171	+/-0.5	
Toluene-d8	50.0	77	80 - 120	13.26	13.25286	0.0071	+/-0.5	*
4-Bromofluorobenzene	50.0	99	80 - 120	15.75	15.74857	0.0014	+/-0.5	
LCS (1J12028-BS1)			Lab File ID: 212JG028.D		Analyzed: 10/12/21 20:25			
Dibromofluoromethane	50.0	97	53 - 146	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	90	41 - 146	13.25	13.25286	-0.0029	+/-0.5	
4-Bromofluorobenzene	50.0	99	41 - 142	15.75	15.74857	0.0014	+/-0.5	
Matrix Spike (1J12028-MS1)			Lab File ID: 212JG029.D		Analyzed: 10/12/21 20:53			
Dibromofluoromethane	50.0	91	53 - 146	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	88	41 - 146	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	96	41 - 142	15.76	15.74857	0.0114	+/-0.5	
Matrix Spike Dup (1J12028-MSD1)			Lab File ID: 212JG030.D		Analyzed: 10/12/21 21:22			
Dibromofluoromethane	50.0	95	53 - 146	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	95	41 - 146	13.25	13.25286	-0.0029	+/-0.5	
4-Bromofluorobenzene	50.0	96	41 - 142	15.75	15.74857	0.0014	+/-0.5	
Blank (1J12028-BLK1)			Lab File ID: 212JG032.D		Analyzed: 10/12/21 22:19			
Dibromofluoromethane	50.0	100	53 - 146	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	96	41 - 146	13.25	13.25286	-0.0029	+/-0.5	
4-Bromofluorobenzene	50.0	94	41 - 142	15.75	15.74857	0.0014	+/-0.5	
Instrument RL Check (AA68735-CRL1)			Lab File ID: 212JG033.D		Analyzed: 10/12/21 22:48			
Dibromofluoromethane	50.0	96	1 - 199	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	90	1 - 199	13.25	13.25286	-0.0029	+/-0.5	
4-Bromofluorobenzene	50.0	100	1 - 199	15.75	15.74857	0.0014	+/-0.5	
CRCA-MW0019-058.0-20211007 (AE07722-01)			Lab File ID: 212JG034.D		Analyzed: 10/12/21 23:16			
Dibromofluoromethane	50.0	98	53 - 146	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	83	41 - 146	13.25	13.25286	-0.0029	+/-0.5	
4-Bromofluorobenzene	50.0	97	41 - 142	15.75	15.74857	0.0014	+/-0.5	
CRCA-MW0031-058.0-20211007 (AE07722-02)			Lab File ID: 212JG035.D		Analyzed: 10/12/21 23:45			
Dibromofluoromethane	50.0	102	53 - 146	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	97	41 - 146	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	93	41 - 142	15.75	15.74857	0.0014	+/-0.5	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA68735
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
CRCA-MW0032-058.0-20211007 (AE07722-03)			Lab File ID: 212JG036.D		Analyzed: 10/13/21 00:13			
Dibromofluoromethane	50.0	94	53 - 146	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	87	41 - 146	13.25	13.25286	-0.0029	+/-0.5	
4-Bromofluorobenzene	50.0	97	41 - 142	15.75	15.74857	0.0014	+/-0.5	
CRCA-MW0018-058-20211007 (AE07722-04)			Lab File ID: 212JG037.D		Analyzed: 10/13/21 00:42			
Dibromofluoromethane	50.0	100	53 - 146	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	96	41 - 146	13.25	13.25286	-0.0029	+/-0.5	
4-Bromofluorobenzene	50.0	98	41 - 142	15.75	15.74857	0.0014	+/-0.5	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA67203
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA67203-CAL1)			Lab File ID: 212GB002.D			Analyzed: 07/07/21 08:38			
Pentafluorobenzene	215175	11.49	193062	11.49	111	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	353915	12.04	330090	12.04	107	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	163131	14.63	152465	14.63	107	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	128103	17	126714	17	101	50 - 200	0.0000	+/-0.50	
Cal Standard (AA67203-CAL2)			Lab File ID: 212GB003.D			Analyzed: 07/07/21 09:12			
Pentafluorobenzene	211652	11.48	193062	11.49	110	50 - 200	-0.0100	+/-0.50	
1,4-Difluorobenzene	347121	12.04	330090	12.04	105	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	158805	14.63	152465	14.63	104	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	127077	17	126714	17	100	50 - 200	0.0000	+/-0.50	
Cal Standard (AA67203-CAL3)			Lab File ID: 212GB004.D			Analyzed: 07/07/21 09:45			
Pentafluorobenzene	203927	11.49	193062	11.49	106	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	341315	12.04	330090	12.04	103	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	156499	14.63	152465	14.63	103	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	125355	17	126714	17	99	50 - 200	0.0000	+/-0.50	
Cal Standard (AA67203-CAL4)			Lab File ID: 212GB005.D			Analyzed: 07/07/21 10:20			
Pentafluorobenzene	201361	11.48	193062	11.49	104	50 - 200	-0.0100	+/-0.50	
1,4-Difluorobenzene	332358	12.03	330090	12.04	101	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	153847	14.63	152465	14.63	101	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	125049	16.99	126714	17	99	50 - 200	-0.0100	+/-0.50	
Cal Standard (AA67203-CAL5)			Lab File ID: 212GB006.D			Analyzed: 07/07/21 10:49			
Pentafluorobenzene	200029	11.49	193062	11.49	104	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	331857	12.03	330090	12.04	101	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	153677	14.63	152465	14.63	101	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	125353	16.99	126714	17	99	50 - 200	-0.0100	+/-0.50	
Cal Standard (AA67203-CAL6)			Lab File ID: 212GB007.D			Analyzed: 07/07/21 11:23			
Pentafluorobenzene	193062	11.49	193062	11.49	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	330090	12.04	330090	12.04	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	152465	14.63	152465	14.63	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	126714	17	126714	17	100	50 - 200	0.0000	+/-0.50	
Cal Standard (AA67203-CAL7)			Lab File ID: 212GB008.D			Analyzed: 07/07/21 11:52			
Pentafluorobenzene	193020	11.49	193062	11.49	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	331667	12.03	330090	12.04	100	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	154870	14.63	152465	14.63	102	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	128039	16.99	126714	17	101	50 - 200	-0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA67203
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA67203-CAL8)			Lab File ID: 212GB009.D			Analyzed: 07/07/21 12:20			
Pentafluorobenzene	186248	11.48	193062	11.49	96	50 - 200	-0.0100	+/-0.50	
1,4-Difluorobenzene	321571	12.03	330090	12.04	97	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	149062	14.63	152465	14.63	98	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	124574	16.99	126714	17	98	50 - 200	-0.0100	+/-0.50	
Secondary Cal Check (AA67203-SCV1)			Lab File ID: 212GB012.D			Analyzed: 07/07/21 13:51			
Pentafluorobenzene	194936	11.49	193062	11.49	101	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	323837	12.04	330090	12.04	98	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	148905	14.63	152465	14.63	98	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	124145	17	126714	17	98	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA68735
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (AA68735-CCV1)			Lab File ID: 212JG027.D			Analyzed: 10/12/21 19:56			
Pentafluorobenzene	172923	11.49	193062	11.49	90	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	296377	12.04	330090	12.04	90	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	115657	14.63	152465	14.63	76	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	123410	17	126714	17	97	50 - 200	0.0000	+/-0.50	
LCS (1J12028-BS1)			Lab File ID: 212JG028.D			Analyzed: 10/12/21 20:25			
Pentafluorobenzene	184376	11.49	193062	11.49	96	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	290649	12.04	330090	12.04	88	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	127469	14.63	152465	14.63	84	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	127290	17	126714	17	100	50 - 200	0.0000	+/-0.50	
Matrix Spike (1J12028-MS1)			Lab File ID: 212JG029.D			Analyzed: 10/12/21 20:53			
Pentafluorobenzene	163609	11.49	193062	11.49	85	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	276481	12.04	330090	12.04	84	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	119800	14.64	152465	14.63	79	50 - 200	0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	121483	17	126714	17	96	50 - 200	0.0000	+/-0.50	
Matrix Spike Dup (1J12028-MSD1)			Lab File ID: 212JG030.D			Analyzed: 10/12/21 21:22			
Pentafluorobenzene	179819	11.49	193062	11.49	93	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	302442	12.04	330090	12.04	92	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	154334	14.63	152465	14.63	101	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	121499	16.99	126714	17	96	50 - 200	-0.0100	+/-0.50	
Blank (1J12028-BLK1)			Lab File ID: 212JG032.D			Analyzed: 10/12/21 22:19			
Pentafluorobenzene	176309	11.49	193062	11.49	91	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	298045	12.04	330090	12.04	90	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	149250	14.63	152465	14.63	98	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	124670	17	126714	17	98	50 - 200	0.0000	+/-0.50	
Instrument RL Check (AA68735-CRL1)			Lab File ID: 212JG033.D			Analyzed: 10/12/21 22:48			
Pentafluorobenzene	157501	11.49	193062	11.49	82	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	266198	12.04	330090	12.04	81	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	114541	14.63	152465	14.63	75	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	112914	17	126714	17	89	50 - 200	0.0000	+/-0.50	
CRCA-MW0019-058.0-20211007 (AE07722-01)			Lab File ID: 212JG034.D			Analyzed: 10/12/21 23:16			
Pentafluorobenzene	181068	11.49	193062	11.49	94	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	305759	12.04	330090	12.04	93	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	115506	14.63	152465	14.63	76	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	114758	17	126714	17	91	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA68735
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
CRCA-MW0031-058.0-20211007 (AE07722-02)			Lab File ID: 212JG035.D			Analyzed: 10/12/21 23:45			
Pentafluorobenzene	173205	11.49	193062	11.49	90	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	291821	12.04	330090	12.04	88	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	147493	14.64	152465	14.63	97	50 - 200	0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	120010	17	126714	17	95	50 - 200	0.0000	+/-0.50	
CRCA-MW0032-058.0-20211007 (AE07722-03)			Lab File ID: 212JG036.D			Analyzed: 10/13/21 00:13			
Pentafluorobenzene	156771	11.49	193062	11.49	81	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	264097	12.04	330090	12.04	80	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	112618	14.63	152465	14.63	74	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	111851	17	126714	17	88	50 - 200	0.0000	+/-0.50	
CRCA-MW0018-058-20211007 (AE07722-04)			Lab File ID: 212JG037.D			Analyzed: 10/13/21 00:42			
Pentafluorobenzene	177500	11.49	193062	11.49	92	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	301187	12.04	330090	12.04	91	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	107763	14.63	152465	14.63	71	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	107448	17	126714	17	85	50 - 200	0.0000	+/-0.50	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA67203		
Calibration:	2107025	Instrument:	OVGCMS2

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA67203-TUN1	212GB001.D	07/07/21 07:58
Cal Standard	AA67203-CAL1	212GB002.D	07/07/21 08:38
Cal Standard	AA67203-CAL2	212GB003.D	07/07/21 09:12
Cal Standard	AA67203-CAL3	212GB004.D	07/07/21 09:45
Cal Standard	AA67203-CAL4	212GB005.D	07/07/21 10:20
Cal Standard	AA67203-CAL5	212GB006.D	07/07/21 10:49
Cal Standard	AA67203-CAL6	212GB007.D	07/07/21 11:23
Cal Standard	AA67203-CAL7	212GB008.D	07/07/21 11:52
Cal Standard	AA67203-CAL8	212GB009.D	07/07/21 12:20
Secondary Cal Check	AA67203-SCV1	212GB012.D	07/07/21 13:51

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA68735		
Calibration:	2107025	Instrument:	OVGCMS2

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	AA68735-CCV1	212JG027.D	10/12/21 19:56
LCS	1J12028-BS1	212JG028.D	10/12/21 20:25
CRCA-MW0019-058.0-20211007	1J12028-MS1	212JG029.D	10/12/21 20:53
CRCA-MW0019-058.0-20211007	1J12028-MSD1	212JG030.D	10/12/21 21:22
Blank	1J12028-BLK1	212JG032.D	10/12/21 22:19
Instrument RL Check	AA68735-CRL1	212JG033.D	10/12/21 22:48
CRCA-MW0019-058.0-20211007	AE07722-01	212JG034.D	10/12/21 23:16
CRCA-MW0031-058.0-20211007	AE07722-02	212JG035.D	10/12/21 23:45
CRCA-MW0032-058.0-20211007	AE07722-03	212JG036.D	10/13/21 00:13
CRCA-MW0018-058-20211007	AE07722-04	212JG037.D	10/13/21 00:42

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Lab File ID:	212GB001.D	Injection Date:	07/07/21
Instrument ID:	OVGCMS2	Injection Time:	07:58
Sequence:	AA67203	Lab Sample ID:	AA67203-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
95	50 - 200% of 174	133	PASS
96	5 - 9% of 95	6.97	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	75.2	PASS
175	5 - 9% of 174	7.67	PASS
176	95 - 105% of 174	97.7	PASS
177	5 - 10% of 176	6.56	PASS

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS2	Calibration:	2107025
Lab File ID:	212JG027.D	Calibration Date:	07/07/21 00:00
Sequence:	AA68735	Injection Date:	10/12/21
Lab Sample ID:	AA68735-CCV1	Injection Time:	19:56

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
Dichlorodifluoromethane	A	20.0	21	0.8144609	0.8504074		4.4	20	
Chloromethane	A	20.0	20	1.0402	1.01496		1.2	20	
Vinyl chloride	A	20.0	18	0.8035139	0.7220121		-7.8	20	
Bromomethane	A	20.0	41	0.4826353	0.6044453		110	20	*
Chloroethane	A	20.0	23	0.4157574	0.4078694		15	20	
Trichlorofluoromethane	A	20.0	21	0.7331526	0.7563048		3.2	20	
Freon 113	A	50.0	53	0.4738214	0.5036577		6.3	20	
Acetone	A	250	250	0.1680153	0.166503		-0.9	20	
1,1-Dichloroethene	A	50.0	51	0.4934686	0.4567409		2.0	20	
Carbon disulfide	A	250	370	1.083061	1.592465		47	20	*
Methylene Chloride	A	50.0	48	0.581384	0.5553454		-4.5	20	
Methyl-tert-Butyl Ether	A	50.0	47	1.438155	1.346501		-6.4	20	
trans-1,2-Dichloroethene	A	50.0	47	0.538907	0.5066764		-6	20	
cis-1,2-Dichloroethene	A	50.0	49	0.5813479	0.5752503		-1	20	
1,1-Dichloroethane	A	50.0	48	0.9793809	0.9345952		-4.6	20	
2-Butanone	A	250	230	5.934286E-02	5.389104E-02		-8.7	20	
Chloroform	A	50.0	52	0.9229288	0.954419		3.4	20	
1,1,1-Trichloroethane	A	50.0	54	0.7054439	0.7626863		8.1	20	
Methyl acetate	A	50.0	50	0.1087756	9.877229E-02		-0.2	20	
Cyclohexane	A	50.0	46	0.8359736	0.7713375		-7.7	20	
Methyl cyclohexane	A	50.0	48	0.3560741	0.3385958		-4.9	20	
Carbon Tetrachloride	A	50.0	53	0.432947	0.4616485		6.6	20	
1,2-Dichloroethane	A	50.0	51	0.4166106	0.4281945		2.8	20	
Benzene	A	50.0	46	1.145881	1.061628		-7.4	20	
Trichloroethene	A	50.0	54	0.3305369	0.3596872		8.8	20	
1,2-Dichloropropane	A	50.0	44	0.3604394	0.3187663		-12	20	
Bromodichloromethane	A	50.0	49	0.4205315	0.4158251		-1.1	20	
4-Methyl-2-pentanone	A	250	200	4.911296E-02	0.0390253		-21	20	*
2-Hexanone	A	250	160	0.2424491	0.1561788		-36	20	*

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS2	Calibration:	2107025
Lab File ID:	212JG027.D	Calibration Date:	07/07/21 00:00
Sequence:	AA68735	Injection Date:	10/12/21
Lab Sample ID:	AA68735-CCV1	Injection Time:	19:56

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
cis-1,3-Dichloropropene	A	50.0	38	0.5877535	0.4451796		-24	20	*
Toluene	A	50.0	47	1.523791	1.436316		-5.7	20	
trans-1,3-Dichloropropene	A	50.0	42	1.055085	0.8802061		-17	20	
1,1,2-Trichloroethane	A	50.0	48	0.600747	0.5749068		-4.3	20	
Tetrachloroethene	A	50.0	88	0.5170224	0.9054445		75	20	*
Dibromochloromethane	A	50.0	52	0.8177395	0.847774		3.7	20	
1,2-Dibromoethane	A	50.0	52	0.6978063	0.7259223		4.0	20	
Chlorobenzene	A	50.0	54	1.670897	1.800652		7.8	20	
Ethylbenzene	A	50.0	53	0.8355575	0.8893106		6.4	20	
m,p-Xylenes	A	100	110	1.035002	1.091953		5.5	20	
o-Xylene	A	50.0	53	1.031571	1.096535		6.3	20	
Bromoform	A	50.0	55	0.4537515	0.5016385		11	20	
Styrene	A	50.0	55	1.654601	1.818749		9.9	20	
Isopropylbenzene	A	50.0	52	2.485518	2.574794		3.6	20	
1,1,2,2-Tetrachloroethane	A	50.0	43	0.7928662	0.6791115		-14	20	
1,2,4-Trichlorobenzene	A	50.0	48	0.642641	0.6204765		-3.4	20	
1,3-Dichlorobenzene	A	50.0	45	1.445157	1.301224		-10	20	
1,4-Dichlorobenzene	A	50.0	46	1.478644	1.345507		-9	20	
1,2-Dichlorobenzene	A	50.0	46	1.368364	1.262078		-7.8	20	
1,2-Dibromo-3-chloropropane	A	50.0	36	0.1598436	9.002512E-02		-29	20	*

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA67203	Instrument:	OVGCMS2
Calibration:	2107025		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1B1157	MS Tune	AA67203-TUN1	212GB001.D	07/07/21 07:58
A1G0352	8260 1.0 PPB	AA67203-CAL1	212GB002.D	07/07/21 08:38
A1G0357	8260 2.0 PPB	AA67203-CAL2	212GB003.D	07/07/21 09:12
A1G0358	8260 5.0 PPB	AA67203-CAL3	212GB004.D	07/07/21 09:45
A1G0360	8260 10 PPB	AA67203-CAL4	212GB005.D	07/07/21 10:20
A1G0361	8260 20 PPB	AA67203-CAL5	212GB006.D	07/07/21 10:49
A1G0362	8260 50 PPB	AA67203-CAL6	212GB007.D	07/07/21 11:23
A1G0363	8260 80 PPB	AA67203-CAL7	212GB008.D	07/07/21 11:52
A1G0364	8260 100 PPB	AA67203-CAL8	212GB009.D	07/07/21 12:20
A1G0391	8260 SCV 50 PPB	AA67203-SCV1	212GB012.D	07/07/21 13:51

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	1	0.9812943	2	0.6771729	5	0.7139319	10	0.8475077	20	0.7782247	50	0.8516901
Chloromethane	1	1.632857	2	0.8451373	5	0.9041961	10	1.013131	20	0.9286653	50	0.9927743
Vinyl chloride	1	1.132799	2	0.7198137	5	0.7040264	10	0.8026877	20	0.7222578	50	0.7876589
Bromomethane	1	0.7807598	2	0.4813326	5	0.558239	10	0.453638	20	0.3645471	50	0.2572956
Chloroethane	1	0.7226676	2	0.3737267	5	0.3750852	10	0.4261997	20	0.3541736	50	0.3721343
Trichlorofluoromethane	1	0.8781225	2	0.6157513	5	0.6557739	10	0.7749763	20	0.7071725	50	0.7625789
Freon 113	1	0.4491693	2	0.53862	5	0.4598214	10	0.4946588	20	0.4333497	50	0.488874
Acetone	5	0.1904496	10	0.1566014	25	0.1740427	50	0.155184	100	0.1644012	250	0.167946
1,1-Dichloroethene	1	0.6122923	2	0.601459	5	0.4607041	10	0.5021826	20	0.4223263	50	0.4621262
Carbon disulfide	5	1.407366	10	0.9947461	25	1.0741	50	1.003581	100	1.021232	250	1.061266
Methylene Chloride	1	0.6355292	2	0.7094192	5	0.5932025	10	0.6016806	20	0.5045768	50	0.5487667
Methyl-tert-Butyl Ether	1	1.353782	2	1.7276	5	1.474989	10	1.5357	20	1.291025	50	1.41684
trans-1,2-Dichloroethene	1	0.5920762	2	0.6482339	5	0.5413212	10	0.5480207	20	0.472269	50	0.5169531
cis-1,2-Dichloroethene	1	0.6150807	2	0.6696133	5	0.6019311	10	0.6122337	20	0.5053017	50	0.5572096
1,1-Dichloroethane	1	0.875334	2	1.250992	5	1.022278	10	1.057975	20	0.8690615	50	0.9544447
2-Butanone	5	9.415592E-02	10	3.278967E-02	25	6.145336E-02	50	5.436505E-02	100	0.0558519	250	5.824968E-02
Chloroform	1	0.9385384	2	1.104643	5	0.9111103	10	0.979286	20	0.8197186	50	0.9003066
1,1,1-Trichloroethane	1	0.7047752	2	0.8291913	5	0.7066744	10	0.7288899	20	0.6247219	50	0.7017331
Methyl acetate	1	0.1022424	2	0.1449313	5	0.1169536	10	0.1131301	20	9.404886E-02	50	0.1039459
Cyclohexane	1	0.8390845	2	0.9293557	5	0.8019046	10	0.9001247	20	0.7678762	50	0.847707
Methyl cyclohexane	1	0.3101027	2	0.4061264	5	0.3478019	10	0.3890684	20	0.3432201	50	0.3658548
Carbon Tetrachloride	1	0.3971293	2	0.5158144	5	0.4378653	10	0.4646195	20	0.3894599	50	0.433294
1,2-Dichloroethane	1	0.4113982	2	0.542102	5	0.4261752	10	0.432335	20	0.3707094	50	0.39096
Benzene	1	1.210601	2	1.395983	5	1.169037	10	1.22511	20	1.039009	50	1.083726
Trichloroethene	1	0.3126457	2	0.3689636	5	0.3341195	10	0.3551742	20	0.303798	50	0.3294526
1,2-Dichloropropane	1	0.4501081	2	0.401301	5	0.3516986	10	0.3790491	20	0.3148269	50	0.3380442
Bromodichloromethane	1	0.3702867	2	0.5256092	5	0.4417327	10	0.455909	20	0.382695	50	0.407089
4-Methyl-2-pentanone	5	6.049475E-02	10	4.858536E-02	25	4.976049E-02	50	4.680495E-02	100	4.549701E-02	250	4.743918E-02
2-Hexanone	5	0.2707712	10	0.2100276	25	0.2401242	50	0.2309678	100	0.2423695	250	0.2487509
cis-1,3-Dichloropropene	1	0.5734428	2	0.6924819	5	0.6037238	10	0.62031	20	0.5289326	50	0.5774395
Toluene	1	1.419718	2	1.837159	5	1.574962	10	1.613064	20	1.372424	50	1.514846

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	1	1.047624	2	1.273575	5	1.09055	10	1.131774	20	0.9526312	50	1.0235
1,1,2-Trichloroethane	1	0.6384439	2	0.7416328	5	0.6188538	10	0.6294565	20	0.5387111	50	0.5585413
Tetrachloroethene	1	0.4563817	2	0.5665754	5	0.5555946	10	0.5796668	20	0.4706137	50	0.5469977
Dibromochloromethane	1	0.7821935	2	1.004376	5	0.8355964	10	0.8591328	20	0.7305745	50	0.8007674
1,2-Dibromoethane	1	0.6188278	2	0.8149932	5	0.7186627	10	0.7441809	20	0.6398648	50	0.7087594
Chlorobenzene	1	1.625074	2	1.965461	5	1.734196	10	1.764545	20	1.530841	50	1.63936
Ethylbenzene	1	0.7346856	2	1.010201	5	0.8528489	10	0.8858151	20	0.7655505	50	0.8378316
m,p-Xylenes	2	0.935751	4	1.247206	10	1.093553	20	1.11177	40	0.9548517	100	1.018709
o-Xylene	1	0.929621	2	1.19738	5	1.071764	10	1.110486	20	0.9416503	50	1.030715
Bromoform	1	0.3941617	2	0.5119486	5	0.4629423	10	0.4783974	20	0.4209153	50	0.465497
Styrene	1	1.340027	2	1.882497	5	1.657519	10	1.747028	20	1.537885	50	1.72862
Isopropylbenzene	1	2.312865	2	2.876169	5	2.512923	10	2.66973	20	2.29003	50	2.495412
1,1,2,2-Tetrachloroethane	1	0.8388963	2	0.9511665	5	0.7970019	10	0.8281604	20	0.7132818	50	0.7567179
1,2,4-Trichlorobenzene	1	0.6787507	2	0.6834439	5	0.5982211	10	0.6411087	20	0.5844695	50	0.6446091
1,3-Dichlorobenzene	1	1.390678	2	1.67851	5	1.468948	10	1.494334	20	1.307388	50	1.435256
1,4-Dichlorobenzene	1	1.390678	2	1.748546	5	1.538431	10	1.518125	20	1.353298	50	1.456327
1,2-Dichlorobenzene	1	1.312616	2	1.548077	5	1.374417	10	1.419244	20	1.24301	50	1.369044
1,2-Dibromo-3-chloropropane	1	0.2494087	2	0.2360773	5	0.1527661	10	0.1449032	20	0.1174882	50	0.128644
Dibromofluoromethane	50	0.4924364	55	0.4980345	60	0.5227647			65	0.5396218	50	0.5110327
Toluene-d8	50	0.892477	55	0.9256819	60	0.9338148			65	0.9694166	50	0.92991
4-Bromofluorobenzene	50	0.7597514	55	0.7846387	60	0.8128486			65	0.8214181	50	0.7924376

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	80	0.8228098	100	0.843056								
Chloromethane	80	0.9834862	100	1.021356								
Vinyl chloride	80	0.7609477	100	0.79792								
Bromomethane	80	~~0.1636424~~	100	~~0.1454888~~								
Chloroethane	80	0.3485649	100	0.3535072								
Trichlorofluoromethane	80	0.7211623	100	0.7496832								
Freon 113	80	0.4536706	100	0.4724078								
Acetone	400	0.1649725	500	0.1705253								
1,1-Dichloroethene	80	0.432235	100	0.4544237								
Carbon disulfide	400	1.035114	500	1.067085								
Methylene Chloride	80	0.5135446	100	0.5443522								
Methyl-tert-Butyl Ether	80	1.318111	100	1.387191								
trans-1,2-Dichloroethene	80	0.4823982	100	0.509984								
cis-1,2-Dichloroethene	80	0.5272996	100	0.5621134								
1,1-Dichloroethane	80	0.8818031	100	0.9231589								
2-Butanone	400	5.753031E-02	500	6.034696E-02								
Chloroform	80	0.8437241	100	0.8861035								
1,1,1-Trichloroethane	80	0.6580439	100	0.6895215								
Methyl acetate	80	9.438789E-02	100	0.1005648								
Cyclohexane	80	0.7821113	100	0.8196249								
Methyl cyclohexane	80	0.338847	100	0.3475718								
Carbon Tetrachloride	80	0.4026064	100	0.4227869								
1,2-Dichloroethane	80	0.3696008	100	0.3896045								
Benzene	80	0.9978966	100	1.045682								
Trichloroethene	80	0.310381	100	0.3297608								
1,2-Dichloropropane	80	0.3158722	100	0.3326155								
Bromodichloromethane	80	0.3778093	100	0.4031209								
4-Methyl-2-pentanone	400	4.614003E-02	500	4.818189E-02								
2-Hexanone	400	0.2446829	500	0.2518986								
cis-1,3-Dichloropropene	80	0.5394398	100	0.5662575								
Toluene	80	1.398302	100	1.459852								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	80	0.9421652	100	0.9788578								
1,1,2-Trichloroethane	80	0.5204082	100	0.5599281								
Tetrachloroethene	80	0.4750113	100	0.4853383								
Dibromochloromethane	80	0.7412104	100	0.7880647								
1,2-Dibromoethane	80	0.6501824	100	0.6869792								
Chlorobenzene	80	1.520917	100	1.586779								
Ethylbenzene	80	0.7773213	100	0.8202057								
m,p-Xylenes	160	0.9424174	200	0.9757618								
o-Xylene	80	0.9595064	100	1.011445								
Bromoform	80	0.4362368	100	0.4599127								
Styrene	80	1.625783	100	1.717446								
Isopropylbenzene	80	2.307645	100	2.419372								
1,1,2,2-Tetrachloroethane	80	0.7131183	100	0.7445861								
1,2,4-Trichlorobenzene	80	0.6369495	100	0.6735755								
1,3-Dichlorobenzene	80	1.367855	100	1.418286								
1,4-Dichlorobenzene	80	1.369959	100	1.453787								
1,2-Dichlorobenzene	80	1.311339	100	1.369166								
1,2-Dibromo-3-chloropropane	80	0.1201001	100	0.1293609								
Dibromofluoromethane	70	0.5086631	75	0.5111321								
Toluene-d8	70	0.9128024	75	0.9090268								
4-Bromofluorobenzene	70	0.7798707	75	0.7708157								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	0.8144609	11.50532	5.93125	5.921899E-02			20	
Chloromethane	1.0402	23.73763	6.405	8.366299E-02	0.9991419		0.99	
Vinyl chloride	0.8035139	17.22101	6.59625	0.1112571	0.9988763		0.99	
Bromomethane	0.4826353	37.08278	7.246667	0.1666723		0.9997793	0.99	
Chloroethane	0.4157574	30.39833	7.4675	0.3016741	0.9987283		0.99	
Trichlorofluoromethane	0.7331526	10.87444	7.73375	0.1183179			20	
Freon 113	0.4738214	7.003996	8.56	8.654411E-02			20	
Acetone	0.1680153	6.60922	9.2775	4.726807E-02			20	
1,1-Dichloroethene	0.4934686	14.97946	8.52	8.904635E-02	0.998482		0.99	
Carbon disulfide	1.083061	12.39843	8.6375	5.096163E-02			20	
Methylene Chloride	0.581384	11.77637	9.23625	5.579867E-02			20	
Methyl-tert-Butyl Ether	1.438155	9.864332	9.55375	5.658861E-02			20	
trans-1,2-Dichloroethene	0.538907	10.82464	9.4625	4.927588E-02			20	
cis-1,2-Dichloroethene	0.5813479	9.186062	10.6975	4.534096E-02			20	
1,1-Dichloroethane	0.9793809	13.26191	10.135	5.607816E-02			20	
2-Butanone	5.934286E-02	28.22575	11.2	6.659373E-02	0.9988031		0.99	
Chloroform	0.9229288	9.636793	10.9125	4.365542E-02			20	
1,1,1-Trichloroethane	0.7054439	8.453686	11.20875	3.111261E-02			20	
Methyl acetate	0.1087756	15.34546	9.42125	6.916466E-02	0.9973841		0.99	
Cyclohexane	0.8359736	6.698383	10.97875	2.728992E-02			20	
Methyl cyclohexane	0.3560741	8.495542	12.095	4.276631E-02			20	
Carbon Tetrachloride	0.432947	9.599993	11.1725	0.0388233			20	
1,2-Dichloroethane	0.4166106	13.40076	11.6925	6.403121E-02			20	
Benzene	1.145881	11.46316	11.54875	3.859392E-02			20	
Trichloroethene	0.3305369	6.803054	12.0625	3.234726E-02			20	
1,2-Dichloropropane	0.3604394	13.04483	12.51125	0.0517982			20	
Bromodichloromethane	0.4205315	12.39126	12.52625	4.514478E-02			20	
4-Methyl-2-pentanone	4.911296E-02	9.769496	13.5275	3.600818E-02			20	
2-Hexanone	0.2424491	7.185569	14.22875	2.675662E-02			20	
cis-1,3-Dichloropropene	0.5877535	8.82909	13.07	3.974212E-02			20	

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Toluene	1.523791	9.997262	13.3	3.685108E-02			20	
trans-1,3-Dichloropropene	1.055085	10.44344	13.59125	4.899325E-02			20	
1,1,2-Trichloroethane	0.600747	11.96595	13.745	4.039473E-02			20	
Tetrachloroethene	0.5170224	9.633677	13.675	3.762551E-02			20	
Dibromochloromethane	0.8177395	10.61589	13.9425	3.598978E-02			20	
1,2-Dibromoethane	0.6978063	9.130938	14.19875	3.004813E-02			20	
Chlorobenzene	1.670897	8.813982	14.64625	3.053514E-02			20	
Ethylbenzene	0.8355575	10.3185	14.60375	3.088365E-02			20	
m,p-Xylenes	1.035002	10.51912	14.72	3.436548E-02			20	
o-Xylene	1.031571	8.93094	15.13625	3.053246E-02			20	
Bromoform	0.4537515	7.985569	15.27	0.0337494			20	
Styrene	1.654601	9.780707	15.17875	1.787573E-02			20	
Isopropylbenzene	2.485518	8.209203	15.40625	3.299149E-02			20	
1,1,2,2-Tetrachloroethane	0.7928662	10.08678	15.845	3.729984E-02			20	
1,2,4-Trichlorobenzene	0.642641	5.67837	19.9825	3.576368E-02	0.9982458		0.99	
1,3-Dichlorobenzene	1.445157	7.677947	16.92125	3.887775E-02			20	
1,4-Dichlorobenzene	1.478644	8.644127	17.00375	0.1783969			20	
1,2-Dichlorobenzene	1.368364	6.594366	17.5875	4.126355E-02			20	
1,2-Dibromo-3-chloropropane	0.1598436	32.92043	18.7	4.153115E-02	0.9970013		0.99	
Dibromofluoromethane	0.511955	3.056775	11.09286	4.526921E-02			20	
Toluene-d8	0.9247328	2.625305	13.25286	3.685312E-02			20	
4-Bromofluorobenzene	0.7888258	2.796512	15.74857	2.347914E-02			20	

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AE07722-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2107025 **Laboratory ID:** AA67203-SCV1

Sequence: AA67203 **Standard ID:** A1G0391

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Cyclohexane	50.0	47	-6.6	30.00
Ethylbenzene	50.0	51	1.1	30.00
Carbon Tetrachloride	50.0	48	-3.1	30.00
1,3-Dichlorobenzene	50.0	51	1.3	30.00
4-Bromofluorobenzene	50.0	50	0.1	30.00
Toluene-d8	50.0	50	-0.3	30.00
Dibromofluoromethane	50.0	48	-3.9	30.00
Methyl-tert-Butyl Ether	50.0	48	-3.6	30.00
trans-1,2-Dichloroethene	50.0	45	-10.1	30.00
cis-1,2-Dichloroethene	50.0	46	-7.2	30.00
Tetrachloroethene	50.0	48	-4.7	30.00
Acetone	250	250	-0.7	30.00
1,2,4-Trichlorobenzene	50.0	51	1.5	30.00
Chloroform	50.0	47	-5.4	30.00
Chlorobenzene	50.0	50	0.2	30.00
Toluene	50.0	50	-0.3	30.00
Methyl cyclohexane	50.0	49	-2.6	30.00
m,p-Xylenes	100	96	-3.5	30.00
4-Methyl-2-pentanone	250	250	0.3	30.00
1,2-Dichloroethane	50.0	47	-5.7	30.00
1,2-Dibromoethane	50.0	50	-0.3	30.00
1,4-Dichlorobenzene	50.0	48	-3.7	30.00
trans-1,3-Dichloropropene	50.0	49	-1.7	30.00
cis-1,3-Dichloropropene	50.0	46	-7.8	30.00
Styrene	50.0	53	6.6	30.00
Dibromochloromethane	50.0	49	-1.2	30.00
1,1-Dichloroethene	50.0	45	-10.1	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AE07722-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2107025 **Laboratory ID:** AA67203-SCV1

Sequence: AA67203 **Standard ID:** A1G0391

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
1,2-Dibromo-3-chloropropane	50.0	52	4.2	30.00
1,2-Dichlorobenzene	50.0	51	1.3	30.00
o-Xylene	50.0	50	0.6	30.00
1,1,2,2-Tetrachloroethane	50.0	48	-3.4	30.00
Methyl acetate	50.0	54	7.2	30.00
Trichloroethene	50.0	49	-2.7	30.00
1,1,2-Trichloroethane	50.0	49	-2.8	30.00
2-Butanone	250	280	12.5	30.00
1,2-Dichloropropane	50.0	46	-7.7	30.00
Freon 113	50.0	45	-10.2	30.00
2-Hexanone	250	260	5.5	30.00
Trichlorofluoromethane	20.0	20	-2.0	30.00
Isopropylbenzene	50.0	50	0.9	30.00
1,1-Dichloroethane	50.0	49	-2.6	30.00
Bromodichloromethane	50.0	49	-1.0	30.00
Bromoform	50.0	54	8.3	30.00
Carbon disulfide	50.0	60	20.0	30.00
Methylene Chloride	50.0	45	-9.3	30.00
Vinyl chloride	20.0	19	-6.2	30.00
Chloroethane	20.0	20	-1.7	30.00
Chloromethane	20.0	19	-4.6	30.00
Bromomethane	20.0	12	-39.8 *	30.00
1,1,1-Trichloroethane	50.0	48	-3.6	30.00
Benzene	50.0	49	-2.0	30.00
Dichlorodifluoromethane	20.0	20	-2.3	30.00

* Values outside of QC limits

ENCO Orlando

SDG: AE07722-TE016

CLASS: 06_VOA_AIR_RSK

METHOD: RSK 175

ANALYSES DATA PACKAGE COVER PAGE

RSK 175

Laboratory: ENCO Orlando

SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Client Sample Id:	Lab Sample Id:
CRCA-MW0019-058.0-20211007	AE07722-01
CRCA-MW0031-058.0-20211007	AE07722-02
CRCA-MW0031-058.0-20211007	AE07722-02RE1
CRCA-MW0018-058-20211007	AE07722-04

ORGANIC ANALYSIS DATA SHEET

RSK 175

CRCA-MW0019-058.0-20211007

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Ground Water
Laboratory ID: AE07722-01
File ID: 21JI010.D
Sampled: 10/07/21 13:30
Prepared: 10/14/21 00:00
Analyzed: 10/14/21 09:58
Solids:
Preparation: Same
Initial/Final: 1 mL / 1 mL
Batch: 1J14005
Sequence: AA68769
Calibration: 2109039
Instrument: OVGCFID2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	MDL	MRL
74-82-8	Methane	1	0.425		0.00400	0.00500
74-85-1	Ethene	1	0.00510	U	0.00510	0.00600
74-84-0	Ethane	1	0.00510	U	0.00510	0.00600

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

RSK 175

CRCA-MW0031-058.0-20211007

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Ground Water
Laboratory ID: AE07722-02
File ID: 21JI011.D
Sampled: 10/07/21 15:20
Prepared: 10/14/21 00:00
Analyzed: 10/14/21 10:14
Solids:
Preparation: Same
Initial/Final: 1 mL / 1 mL
Batch: 1J14005
Sequence: AA68769
Calibration: 2109039
Instrument: OVGCFID2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	MDL	MRL
74-85-1	Ethene	1	0.00510	U	0.00510	0.00600
74-84-0	Ethane	1	0.00510	U	0.00510	0.00600

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

RSK 175

CRCA-MW0031-058.0-20211007

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Ground Water
Laboratory ID: AE07722-02RE1
File ID: 21JJ016.D
Sampled: 10/07/21 15:20
Prepared: 10/15/21 07:23
Analyzed: 10/15/21 12:22
Solids:
Preparation: Same
Initial/Final: 1 mL / 1 mL
Batch: 1J15005
Sequence: AA68799
Calibration: 2109039
Instrument: OVGCFID2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	MDL	MRL
74-82-8	Methane	5	0.647	D	0.0200	0.0250

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

RSK 175

CRCA-MW0018-058-20211007

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Ground Water	Laboratory ID:	AE07722-04	File ID:	21JI008.D
Sampled:	10/07/21 15:50	Prepared:	10/14/21 00:00	Analyzed:	10/14/21 09:26
Solids:		Preparation:	Same	Initial/Final:	1 mL / 1 mL

Batch:	1J14005	Sequence:	AA68769	Calibration:	2109039	Instrument:	OVGCFID2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	MDL	MRL
74-82-8	Methane	5	1.14	D	0.0200	0.0250
74-85-1	Ethene	5	0.0255	UD	0.0255	0.0300
74-84-0	Ethane	5	0.0255	UD	0.0255	0.0300

* Values outside of QC limits

HOLDING TIME SUMMARY

RSK 175

Laboratory: ENCO Orlando

SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-MW0019-058.0-20211007	10/07/21 13:30	10/08/21 15:00	10/14/21 00:00	6.44	NA	10/14/21 09:58	7.00	14.00	
CRCA-MW0031-058.0-20211007	10/07/21 15:20	10/08/21 15:00	10/14/21 00:00	6.36	NA	10/14/21 10:14	7.00	14.00	
CRCA-MW0031-058.0-20211007	10/07/21 15:20	10/08/21 15:00	10/15/21 07:23	7.67	NA	10/15/21 12:22	8.00	14.00	
CRCA-MW0018-058-20211007	10/07/21 15:50	10/08/21 15:00	10/14/21 00:00	6.34	NA	10/14/21 09:26	7.00	14.00	

PREPARATION BATCH SUMMARY

RSK 175

Laboratory: ENCO Orlando SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Batch: 1J14005 Batch Matrix: Water Preparation: Same

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	1J14005-BLK1	21JI005.D	10/14/21 00:00	
LCS	1J14005-BS1	21JI003.D	10/14/21 00:00	
LCS Dup	1J14005-BSD1	21JI004.D	10/14/21 00:00	
CRCA-MW0018-058-20211007	1J14005-DUP1	21JI030.D	10/14/21 00:00	
CRCA-MW0019-058.0-20211007	AE07722-01	21JI010.D	10/14/21 00:00	
CRCA-MW0031-058.0-20211007	AE07722-02	21JI011.D	10/14/21 00:00	
CRCA-MW0018-058-20211007	AE07722-04	21JI008.D	10/14/21 00:00	

PREPARATION BATCH SUMMARY

RSK 175

Laboratory: ENCO Orlando SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Batch: 1J15005 Batch Matrix: Water Preparation: Same

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	1J15005-BLK1	21JJ005.D	10/15/21 07:23	
LCS	1J15005-BS1	21JJ003.D	10/15/21 07:23	
LCS Dup	1J15005-BSD1	21JJ004.D	10/15/21 07:23	
CE15547-17 (MW-28DR)	1J15005-DUP1	21JJ024.D	10/15/21 07:23	
CRCA-MW0031-058.0-20211007	AE07722-02RE1	21JJ016.D	10/15/21 07:23	

METHOD BLANK DATA SHEET
RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	1J14005-BLK1	File ID:	21JI005.D
Prepared:	10/14/21 00:00	Preparation:	Same	Initial/Final:	1 mL / 1 mL
Analyzed:	10/14/21 08:38	Instrument:	OVGCFID2		
Batch:	1J14005	Sequence:	AA68769	Calibration:	2109039

CAS NO.	COMPOUND	CONC. (mg/L)	Q
74-82-8	Methane	0.00400	U
74-85-1	Ethene	0.00510	U
74-84-0	Ethane	0.00510	U

METHOD BLANK DATA SHEET
RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	1J15005-BLK1	File ID:	21JJ005.D
Prepared:	10/15/21 07:23	Preparation:	Same	Initial/Final:	1 mL / 1 mL
Analyzed:	10/15/21 08:59	Instrument:	OVGCFID2		
Batch:	1J15005	Sequence:	AA68799	Calibration:	2109039

CAS NO.	COMPOUND	CONC. (mg/L)	Q
74-82-8	Methane	0.00400	U
74-85-1	Ethene	0.00510	U
74-84-0	Ethane	0.00510	U

LCS / LCS DUPLICATE RECOVERY

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	1J14005	Laboratory ID:	1J14005-BS1
Preparation:	Same	Initial/Final:	1 mL / 1 mL

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC. #	QC LIMITS REC.
Methane	0.174	0.170	98	70 - 130
Ethene	0.302	0.318	105	70 - 130
Ethane	0.323	0.322	100	70 - 130

COMPOUND	SPIKE ADDED (mg/L)	LCSD CONCENTRATION (mg/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Methane	0.174	0.188	108	10	30	70 - 130
Ethene	0.302	0.348	115	9	30	70 - 130
Ethane	0.323	0.349	108	8	30	70 - 130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

LCS / LCS DUPLICATE RECOVERY

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	1J15005	Laboratory ID:	1J15005-BS1
Preparation:	Same	Initial/Final:	1 mL / 1 mL

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC. #	QC LIMITS REC.
Methane	0.174	0.191	110	70 - 130
Ethene	0.302	0.357	118	70 - 130
Ethane	0.323	0.357	111	70 - 130

COMPOUND	SPIKE ADDED (mg/L)	LCSD CONCENTRATION (mg/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Methane	0.174	0.188	108	2	30	70 - 130
Ethene	0.302	0.352	116	2	30	70 - 130
Ethane	0.323	0.353	109	1	30	70 - 130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

DUPLICATES

RSK 175

CRCA-MW0018-058-20211007

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Water
Laboratory ID: 1J14005-DUP1
Batch: 1J14005
Lab Source ID: AE07722-04
Preparation: Same
Initial/Final: 1 mL / 1 mL
Source Sample Name: CRCA-MW0018-058-20211007
% Solids:

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (mg/L)	C	DUPLICATE CONCENTRATION (mg/L)	C	RPD %	Q	METHOD
Methane	30	1.14		1.10		3		RSK 175
Ethene	30	0.00		ND				RSK 175
Ethane	30	0.00		ND				RSK 175

* Values outside of QC limits

DUPLICATES

RSK 175

CE15547-17 (MW-28DR)

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Water
Laboratory ID: 1J15005-DUP1
Batch: 1J15005
Lab Source ID: AE08159-17
Preparation: Same
Initial/Final: 1 mL / 1 mL
Source Sample Name: CE15547-17 (MW-28DR)
% Solids:

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (mg/L)	C	DUPLICATE CONCENTRATION (mg/L)	C	RPD %	Q	METHOD
Methane	30	0.00194		ND				RSK 175
Ethene	30	0.00		ND				RSK 175
Ethane	30	0.00		ND				RSK 175

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA68194		
Calibration:	2109039	Instrument:	OVGCFID2

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	AA68194-CAL1	21IE003.D	09/10/21 09:01
Cal Standard	AA68194-CAL3	21IE005.D	09/10/21 09:45
Cal Standard	AA68194-CAL4	21IE006.D	09/10/21 10:01
Cal Standard	AA68194-CAL5	21IE007.D	09/10/21 10:17
Cal Standard	AA68194-CAL6	21IE008.D	09/10/21 10:33
Cal Standard	AA68194-CAL7	21IE009.D	09/10/21 10:48
Cal Standard	AA68194-CAL2	21IE021.D	09/10/21 13:53
Secondary Cal Check	AA68194-SCV1	21IE023.D	09/10/21 14:25

ANALYSIS BATCH (SEQUENCE) SUMMARY

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA68769		
Calibration:	2109039	Instrument:	OVGCFID2

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	AA68769-CCV1	21JI001.D	10/14/21 07:35
LCS	1J14005-BS1	21JI003.D	10/14/21 08:07
LCS Dup	1J14005-BSD1	21JI004.D	10/14/21 08:23
Blank	1J14005-BLK1	21JI005.D	10/14/21 08:38
CRCA-MW0018-058-20211007	AE07722-04	21JI008.D	10/14/21 09:26
CRCA-MW0019-058.0-20211007	AE07722-01	21JI010.D	10/14/21 09:58
CRCA-MW0031-058.0-20211007	AE07722-02	21JI011.D	10/14/21 10:14
CRCA-MW0018-058-20211007	1J14005-DUP1	21JI030.D	10/14/21 16:07
Calibration Check	AA68769-CCV3	21JI031.D	10/14/21 16:23

ANALYSIS BATCH (SEQUENCE) SUMMARY

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA68799		
Calibration:	2109039	Instrument:	OVGCFID2

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	AA68799-CCV1	21JJ001.D	10/15/21 07:56
LCS	1J15005-BS1	21JJ003.D	10/15/21 08:28
LCS Dup	1J15005-BSD1	21JJ004.D	10/15/21 08:43
Blank	1J15005-BLK1	21JJ005.D	10/15/21 08:59
CRCA-MW0031-058.0-20211007	AE07722-02RE1	21JJ016.D	10/15/21 12:22
CE15547-17 (MW-28DR)	1J15005-DUP1	21JJ024.D	10/15/21 14:29
Calibration Check	AA68799-CCV3	21JJ026.D	10/15/21 15:31

CONTINUING CALIBRATION CHECK

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCFID2	Calibration:	2109039
Lab File ID:	21JI001.D	Calibration Date:	09/10/21 11:38
Sequence:	AA68769	Injection Date:	10/14/21
Lab Sample ID:	AA68769-CCV1	Injection Time:	07:35

		CONC. (mg/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Methane	A	0.174	0.184	1.475678E+08	1.560694E+08		5.8	20
Ethene	A	0.302	0.337	9.555433E+07	1.066339E+08		12	20
Ethane	A	0.323	0.343	1.392218E+08	1.477042E+08		6.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCFID2	Calibration:	2109039
Lab File ID:	21JI031.D	Calibration Date:	09/10/21 11:38
Sequence:	AA68769	Injection Date:	10/14/21
Lab Sample ID:	AA68769-CCV3	Injection Time:	16:23

		CONC. (mg/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Methane	A	0.174	0.180	1.475678E+08	1.524135E+08		3.3	20
Ethene	A	0.302	0.337	9.555433E+07	1.065465E+08		12	20
Ethane	A	0.323	0.335	1.392218E+08	1.44225E+08		3.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCFID2	Calibration:	2109039
Lab File ID:	21JJ001.D	Calibration Date:	09/10/21 11:38
Sequence:	AA68799	Injection Date:	10/15/21
Lab Sample ID:	AA68799-CCV1	Injection Time:	07:56

		CONC. (mg/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Methane	A	0.174	0.186	1.475678E+08	1.578499E+08		7.0	20
Ethene	A	0.302	0.342	9.555433E+07	1.083101E+08		13	20
Ethane	A	0.323	0.348	1.392218E+08	1.499734E+08		7.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCFID2	Calibration:	2109039
Lab File ID:	21JJ026.D	Calibration Date:	09/10/21 11:38
Sequence:	AA68799	Injection Date:	10/15/21
Lab Sample ID:	AA68799-CCV3	Injection Time:	15:31

		CONC. (mg/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Methane	A	0.174	0.179	1.475678E+08	1.515527E+08		2.7	20
Ethene	A	0.302	0.334	9.555433E+07	1.057387E+08		11	20
Ethane	A	0.323	0.336	1.392218E+08	1.449911E+08		4.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA68194	Instrument:	OVGCFID2
Calibration:	2109039		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1I0625	RSK175-Cal 1 09/10/2021	AA68194-CAL1	21IE003.D	09/10/21 09:01
A1I0627	RSK175-Cal 3 09/10/2021	AA68194-CAL3	21IE005.D	09/10/21 09:45
A1I0628	RSK175-Cal 4 09/10/2021	AA68194-CAL4	21IE006.D	09/10/21 10:01
A1I0629	RSK175-Cal 5 09/10/2021	AA68194-CAL5	21IE007.D	09/10/21 10:17
A1I0630	RSK175-Cal 6 09/10/2021	AA68194-CAL6	21IE008.D	09/10/21 10:33
A1I0631	RSK175-Cal 7 09/10/2021	AA68194-CAL7	21IE009.D	09/10/21 10:48
A1I0626	RSK175-Cal 2 09/10/2021	AA68194-CAL2	21IE021.D	09/10/21 13:53
A1A0933	RSK175- SCV/BS water CO2 and MEE	AA68194-SCV1	21IE023.D	09/10/21 14:25

INITIAL CALIBRATION DATA

RSK 175

Laboratory: ENCO Orlando

SDG: AE07722-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Calibration: 2109039

Instrument: OVGCFID2

Matrix: Water

Calibration Date: 09/10/21 11:38

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF
Methane	0.000869	1.794281E+08	0.00869	~~6.856743E+07~~	0.0348	1.460623E+08	0.0869	1.196339E+08	0.174	1.36344E+08	0.348	1.540102E+08
Ethene	0.00151	8.213444E+07	0.0151	~~4.337788E+07~~	0.0603	1.012845E+08	0.151	8.527974E+07	0.302	9.413798E+07	0.603	1.067702E+08
Ethane	0.00161	1.661503E+08	0.0161	~~5.479621E+07~~	0.0646	1.376196E+08	0.161	1.150807E+08	0.323	1.297924E+08	0.646	1.455248E+08

INITIAL CALIBRATION DATA (Continued)

RSK 175

Laboratory:	ENCO Orlando	SDG:	AE07722-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Calibration:	2109039	Instrument:	OVGCFID2
Matrix:	Water	Calibration Date:	09/10/21 11:38

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF
Methane	0.695	1.499281E+08										
Ethene	1.21	1.03719E+08										
Ethane	1.29	1.411628E+08										

INITIAL CALIBRATION DATA

RSK 175

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Calibration: 2109039
Instrument: OVGCFID2
Matrix: Water
Calibration Date: 09/10/21 11:38

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF
Methane												
Ethene												
Ethane												

INITIAL CALIBRATION DATA (Continued)

RSK 175

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Calibration: 2109039
Instrument: OVGCFID2
Matrix: Water
Calibration Date: 09/10/21 11:38

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Methane	1.475678E+08	13.45343	1.952167	9.419991E-02			20	
Ethene	9.555433E+07	10.60002	3.7055	0.2724778			20	
Ethane	1.392218E+08	12.20191	4.625167	0.2137797			20	

SECOND-SOURCE CALIBRATION VERIFICATION

RSK 175

Laboratory: ENCO Orlando
SDG: AE07722-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Calibration: 2109039
Laboratory ID: AA68194-SCV1
Sequence: AA68194
Standard ID: A1A0933

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Ethene	0.302	0.333	10.1	25.00
Ethane	0.323	0.328	1.6	25.00
Methane	0.172	0.180	4.4	25.00

* Values outside of QC limits

TETRA TECH ISG
TtEGS, Information Systems Group

Completion Ticket

On 11/5/2021 at 1:14 PM the following files were submitted to Tetra Tech by kdylnicki@encolabs.com with ENCO:

TE016AE07722A1.txt, TE016AE07722A3.txt

If you need to identify this session at a later date refer to Ticket Key:

2021115_4550114711_ledd_ENCO

You may print this page by clicking on the "Print This Page" button

Thank you for using the Data Checker, to upload more files click the "Upload/Check Files" link on navigation menu.

Print this Page Back To Upload

I Lovelie Metzgar, as the designated Quality Assurance Officer, hereby attest that all electronic deliverables have been thoroughly reviewed and are in agreement with the associated hardcopy data. The enclosed electronic files have been reviewed for accuracy (including significant figures), completeness and format. The laboratory will be responsible for any labor time necessary to correct enclosed electronic deliverables that have been found to be in error. I can be reached at (407) 826-5314 if there are any questions or problems with the enclosed electronic deliverables.

Signature:_____ Title: Quality Assurance Manager Date: 11/05/21

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ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Wednesday, October 13, 2021
Tetra Tech, Inc. (TE016)
Attn: Alex Murphy
11 Riverside Drive, Suite 204
Cocoa, FL 32922

RE: Laboratory Results for
Project Number: 112G08970, Project Name/Desc: NASA KSC CRCA
ENCO Workorder(s): AE08047

Dear Alex Murphy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Thursday, October 7, 2021.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Kaitlin Dylnicki

Project Manager

Enclosure(s)

www.encolabs.com

Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Client PM: Alex Murphy
Project Number: 112G08970
ENCO Project ID: AE08047
SDG: AE08047-TE016

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

List of instruments used:

Analytical Method / Preparation Method	SOP Reference Instrument
EPA 8260D / EPA 5030B_MS	OVGCMS2

Analysis:

Manual integrations were performed on samples associated with EPA 8260D. All data & explanations are included in the raw data section of the report

Affected Samples: AA68696-CCV1, CRCA-ASEFFLUENT-20211007[AE08047-01], CRCA-ASINFLUENT-20211007[AE08047-02]
The associated calibration verification standard for bromomethane, carbon disulfide and Freon 113 exhibited high bias. Analytes were not detected in the samples.

Affected Samples: 1J11008-BS1, CRCA-ASEFFLUENT-20211007[AE08047-01], CRCA-ASINFLUENT-20211007[AE08047-02]
The associated laboratory control sample for carbon disulfide exhibited high bias. Analyte was not detected in the sample.

Affected Samples: CRCA-ASEFFLUENT-20211007[AE08047-01], 1J11008-MS1, 1J11008-MSD1
Matrix spike recovery was outside acceptance limits for carbon disulfide.

Affected Samples: AA68696-CCV1
The continuing calibration verification standard exhibited low bias for 1,2-dibromo-3-chlorpropane; the associated sample had ND (non-detect) results, but sensitivity was verified by analyzing a standard with a concentration equivalent to the reporting limit.

Affected Samples: AA67203-SCV1
Recovery from bromomethane was outside acceptance limits. Analyte was not detected in the samples.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Kaitlin Dylnicki
Project Manager

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: CRCA-ASEFFLUENT-20211007	Lab ID: AE08047-01	Sampled: 10/07/21 07:45	Received: 10/07/21 15:15

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	10/21/21	10/11/21 08:25	10/11/21 11:51

Client ID: CRCA-ASINFLUENT-20211007	Lab ID: AE08047-02	Sampled: 10/07/21 08:00	Received: 10/07/21 15:15

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	10/21/21	10/11/21 08:25	10/11/21 12:19

SAMPLE DETECTION SUMMARY

Client ID: CRCA-ASINFLUENT-20211007 **Lab ID:** AE08047-02

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Vinyl chloride	11		0.71	2.5	ug/L	EPA 8260D	

ANALYTICAL RESULTS

Description: CRCA-ASEFFLUENT-20211007 **Lab Sample ID:** AE08047-01 **Received:** 10/07/21 15:15

Matrix: Ground Water **Sampled:** 10/07/21 07:45 **Work Order:** AE08047

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	1J11008	EPA 8260D	10/11/21 11:51	kkw	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	1J11008	EPA 8260D	10/11/21 11:51	kkw	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	1J11008	EPA 8260D	10/11/21 11:51	kkw	QL-02, QM-19, QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	QV-01
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	

ANALYTICAL RESULTS

Description: CRCA-ASEFFLUENT-20211007 **Lab Sample ID:** AE08047-01 **Received:** 10/07/21 15:15

Matrix: Ground Water **Sampled:** 10/07/21 07:45 **Work Order:** AE08047

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Vinyl chloride [75-01-4]^	0.71	U	ug/L	1	0.71	2.5	1J11008	EPA 8260D	10/11/21 11:51	kkw	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	1J11008	EPA 8260D	10/11/21 11:51	kkw	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*46*	*1*	*50.0*	*93 %*	*41-142*	*1J11008*	*EPA 8260D*	*10/11/21 11:51*	*kkw*	
Dibromofluoromethane	*53*	*1*	*50.0*	*107 %*	*53-146*	*1J11008*	*EPA 8260D*	*10/11/21 11:51*	*kkw*	
Toluene-d8	*51*	*1*	*50.0*	*103 %*	*41-146*	*1J11008*	*EPA 8260D*	*10/11/21 11:51*	*kkw*	

ANALYTICAL RESULTS

Description: CRCA-ASINFLUENT-20211007 **Lab Sample ID:** AE08047-02 **Received:** 10/07/21 15:15

Matrix: Ground Water **Sampled:** 10/07/21 08:00 **Work Order:** AE08047

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	1J11008	EPA 8260D	10/11/21 12:19	kkw	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	1J11008	EPA 8260D	10/11/21 12:19	kkw	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	1J11008	EPA 8260D	10/11/21 12:19	kkw	QL-02, QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	QV-01
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	

ANALYTICAL RESULTS

Description: CRCA-ASINFLUENT-20211007 **Lab Sample ID:** AE08047-02 **Received:** 10/07/21 15:15

Matrix: Ground Water **Sampled:** 10/07/21 08:00 **Work Order:** AE08047

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Vinyl chloride [75-01-4]^	**11**		ug/L	1	0.71	2.5	1J11008	EPA 8260D	10/11/21 12:19	kkw	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	1J11008	EPA 8260D	10/11/21 12:19	kkw	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*46*	*1*	*50.0*	*91 %*	*41-142*	*1J11008*	*EPA 8260D*	*10/11/21 12:19*	*kkw*	
Dibromofluoromethane	*52*	*1*	*50.0*	*104 %*	*53-146*	*1J11008*	*EPA 8260D*	*10/11/21 12:19*	*kkw*	
Toluene-d8	*48*	*1*	*50.0*	*96 %*	*41-146*	*1J11008*	*EPA 8260D*	*10/11/21 12:19*	*kkw*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J11008 - EPA 5030B_MS

Blank (1J11008-BLK1) Prepared: 10/11/2021 00:00 Analyzed: 10/11/2021 10:54

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.80	U	2.5	ug/L							
1,1,2,2-Tetrachloroethane	0.54	U	2.5	ug/L							
1,1,2-Trichloroethane	0.76	U	2.5	ug/L							
1,1-Dichloroethane	0.62	U	2.5	ug/L							
1,1-Dichloroethene	0.94	U	2.5	ug/L							
1,2,4-Trichlorobenzene	0.70	U	2.5	ug/L							
1,2-Dibromo-3-chloropropane	0.96	U	2.5	ug/L							
1,2-Dibromoethane	0.78	U	2.5	ug/L							
1,2-Dichlorobenzene	0.73	U	2.5	ug/L							
1,2-Dichloroethane	0.63	U	2.5	ug/L							
1,2-Dichloropropane	0.80	U	2.5	ug/L							
1,3-Dichlorobenzene	0.77	U	2.5	ug/L							
1,4-Dichlorobenzene	0.76	U	2.5	ug/L							
2-Butanone	4.5	U	12	ug/L							
2-Hexanone	2.5	U	12	ug/L							
4-Methyl-2-pentanone	2.5	U	12	ug/L							
Acetone	10	U	25	ug/L							
Benzene	0.71	U	2.5	ug/L							
Bromodichloromethane	0.52	U	2.5	ug/L							
Bromoform	0.75	U	2.5	ug/L							
Bromomethane	0.95	U	2.5	ug/L							
Carbon disulfide	2.5	U	12	ug/L							
Carbon Tetrachloride	0.94	U	2.5	ug/L							
Chlorobenzene	0.72	U	2.5	ug/L							
Chloroethane	0.98	U	2.5	ug/L							
Chloroform	0.80	U	2.5	ug/L							
Chloromethane	0.82	U	2.5	ug/L							
cis-1,2-Dichloroethene	0.53	U	2.5	ug/L							
cis-1,3-Dichloropropene	0.59	U	2.5	ug/L							
Cyclohexane	0.93	U	2.5	ug/L							
Dibromochloromethane	0.50	U	2.5	ug/L							
Dichlorodifluoromethane	0.74	U	2.5	ug/L							
Ethylbenzene	0.69	U	2.5	ug/L							
Freon 113	0.73	U	2.5	ug/L							
Isopropylbenzene	0.67	U	2.5	ug/L							
m,p-Xylenes	1.3	U	5.0	ug/L							
Methyl acetate	0.95	U	2.5	ug/L							
Methyl cyclohexane	0.64	U	2.5	ug/L							
Methylene Chloride	2.5	U	12	ug/L							
Methyl-tert-Butyl Ether	0.60	U	2.5	ug/L							
o-Xylene	0.53	U	2.5	ug/L							
Styrene	0.61	U	2.5	ug/L							
Tetrachloroethene	0.76	U	2.5	ug/L							
Toluene	0.72	U	2.5	ug/L							
trans-1,2-Dichloroethene	0.73	U	2.5	ug/L							
trans-1,3-Dichloropropene	0.73	U	2.5	ug/L							
Trichloroethene	0.89	U	2.5	ug/L							
Trichlorofluoromethane	0.94	U	2.5	ug/L							
Vinyl chloride	0.71	U	2.5	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J11008 - EPA 5030B_MS - Continued

Blank (1J11008-BLK1) Continued Prepared: 10/11/2021 00:00 Analyzed: 10/11/2021 10:54

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Xylenes (Total)	1.3	U	5.0	ug/L							
4-Bromofluorobenzene	*46*	*I*		*ug/L*	*50.0*		*93*	*41-142*			
Dibromofluoromethane	*53*			*ug/L*	*50.0*		*106*	*53-146*			
Toluene-d8	*49*	*I*		*ug/L*	*50.0*		*98*	*41-146*			

LCS (1J11008-BS1) Prepared: 10/11/2021 00:00 Analyzed: 10/11/2021 08:30

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	24		2.5	ug/L	20.0		119	57-148			
1,1,2,2-Tetrachloroethane	18		2.5	ug/L	20.0		88	60-139			
1,1,2-Trichloroethane	18		2.5	ug/L	20.0		90	57-141			
1,1-Dichloroethane	23		2.5	ug/L	20.0		115	57-142			
1,1-Dichloroethene	26		2.5	ug/L	20.0		128	47-139			
1,2,4-Trichlorobenzene	21		2.5	ug/L	20.0		104	52-159			
1,2-Dibromo-3-chloropropane	18		2.5	ug/L	20.0		88	48-150			
1,2-Dibromoethane	18		2.5	ug/L	20.0		89	57-140			
1,2-Dichlorobenzene	19		2.5	ug/L	20.0		93	63-131			
1,2-Dichloroethane	22		2.5	ug/L	20.0		110	50-156			
1,2-Dichloropropane	20		2.5	ug/L	20.0		100	61-133			
1,3-Dichlorobenzene	18		2.5	ug/L	20.0		91	66-129			
1,4-Dichlorobenzene	19		2.5	ug/L	20.0		93	65-133			
2-Butanone	150		12	ug/L	100		147	10-180			
2-Hexanone	100		12	ug/L	100		104	12-180			
4-Methyl-2-pentanone	98		12	ug/L	100		98	19-180			
Acetone	120		25	ug/L	100		116	10-180			
Benzene	22		2.5	ug/L	20.0		110	56-136			
Bromodichloromethane	22		2.5	ug/L	20.0		109	58-135			
Bromoform	19		2.5	ug/L	20.0		96	46-148			
Bromomethane	16		2.5	ug/L	20.0		81	10-173			
Carbon disulfide	43		12	ug/L	20.0		217	43-153			QL-02
Carbon Tetrachloride	23		2.5	ug/L	20.0		113	54-156			
Chlorobenzene	19		2.5	ug/L	20.0		94	51-139			
Chloroethane	24		2.5	ug/L	20.0		120	27-180			
Chloroform	23		2.5	ug/L	20.0		116	58-139			
Chloromethane	16		2.5	ug/L	20.0		80	33-154			
cis-1,2-Dichloroethene	22		2.5	ug/L	20.0		109	56-128			
cis-1,3-Dichloropropene	20		2.5	ug/L	20.0		99	64-128			
Cyclohexane	24		2.5	ug/L	20.0		118	70-130			
Dibromochloromethane	17		2.5	ug/L	20.0		85	50-140			
Dichlorodifluoromethane	13		2.5	ug/L	20.0		65	10-180			
Ethylbenzene	18		2.5	ug/L	20.0		92	63-133			
Freon 113	26		2.5	ug/L	20.0		128	47-173			
Isopropylbenzene	18		2.5	ug/L	20.0		92	60-132			
m,p-Xylenes	37		5.0	ug/L	40.0		92	64-133			
Methyl acetate	22		2.5	ug/L	20.0		110	70-130			
Methyl cyclohexane	23		2.5	ug/L	20.0		117	70-130			
Methylene Chloride	23		12	ug/L	20.0		115	43-142			
Methyl-tert-Butyl Ether	22		2.5	ug/L	20.0		111	51-145			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J11008 - EPA 5030B_MS - Continued

LCS (1J11008-BS1) Continued Prepared: 10/11/2021 00:00 Analyzed: 10/11/2021 08:30

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Xylene	18		2.5	ug/L	20.0		91	61-129			
Styrene	19		2.5	ug/L	20.0		95	59-136			
Tetrachloroethene	20		2.5	ug/L	20.0		98	60-147			
Toluene	18		2.5	ug/L	20.0		91	64-131			
trans-1,2-Dichloroethene	23		2.5	ug/L	20.0		115	54-134			
trans-1,3-Dichloropropene	18		2.5	ug/L	20.0		91	65-149			
Trichloroethene	22		2.5	ug/L	20.0		109	62-135			
Trichlorofluoromethane	22		2.5	ug/L	20.0		111	56-155			
Vinyl chloride	19		2.5	ug/L	20.0		93	20-167			
4-Bromofluorobenzene	*46*	*I*		*ug/L*	*50.0*		*93*	*41-142*			
Dibromofluoromethane	*54*			*ug/L*	*50.0*		*107*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*105*	*41-146*			

Matrix Spike (1J11008-MS1) Prepared: 10/11/2021 00:00 Analyzed: 10/11/2021 08:59

Source: AE08047-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	25		2.5	ug/L	20.0	0.80 U	127	57-148			
1,1,2,2-Tetrachloroethane	16		2.5	ug/L	20.0	0.54 U	82	60-139			
1,1,2-Trichloroethane	18		2.5	ug/L	20.0	0.76 U	91	57-141			
1,1-Dichloroethane	23		2.5	ug/L	20.0	0.62 U	116	57-142			
1,1-Dichloroethene	27		2.5	ug/L	20.0	0.94 U	133	47-139			
1,2,4-Trichlorobenzene	20		2.5	ug/L	20.0	0.70 U	101	52-159			
1,2-Dibromo-3-chloropropane	17		2.5	ug/L	20.0	0.96 U	85	48-150			
1,2-Dibromoethane	18		2.5	ug/L	20.0	0.78 U	88	57-140			
1,2-Dichlorobenzene	18		2.5	ug/L	20.0	0.73 U	92	63-131			
1,2-Dichloroethane	21		2.5	ug/L	20.0	0.63 U	106	50-156			
1,2-Dichloropropane	20		2.5	ug/L	20.0	0.80 U	99	61-133			
1,3-Dichlorobenzene	19		2.5	ug/L	20.0	0.77 U	94	66-129			
1,4-Dichlorobenzene	18		2.5	ug/L	20.0	0.76 U	92	65-133			
2-Butanone	140		12	ug/L	100	4.5 U	141	10-180			
2-Hexanone	110		12	ug/L	100	2.5 U	107	12-180			
4-Methyl-2-pentanone	100		12	ug/L	100	2.5 U	101	19-180			
Acetone	110		25	ug/L	100	10 U	109	10-180			
Benzene	23		2.5	ug/L	20.0	0.71 U	115	56-136			
Bromodichloromethane	22		2.5	ug/L	20.0	0.52 U	109	58-135			
Bromoform	19		2.5	ug/L	20.0	0.75 U	94	46-148			
Bromomethane	21		2.5	ug/L	20.0	0.95 U	103	10-173			
Carbon disulfide	40		12	ug/L	20.0	2.5 U	199	43-153			QM-19
Carbon Tetrachloride	24		2.5	ug/L	20.0	0.94 U	122	54-156			
Chlorobenzene	20		2.5	ug/L	20.0	0.72 U	98	51-139			
Chloroethane	28		2.5	ug/L	20.0	0.98 U	138	27-180			
Chloroform	24		2.5	ug/L	20.0	0.80 U	120	58-139			
Chloromethane	18		2.5	ug/L	20.0	0.82 U	92	33-154			
cis-1,2-Dichloroethene	23		2.5	ug/L	20.0	0.53 U	114	56-128			
cis-1,3-Dichloropropene	20		2.5	ug/L	20.0	0.59 U	98	64-128			
Cyclohexane	25		2.5	ug/L	20.0	0.93 U	126	70-130			
Dibromochloromethane	17		2.5	ug/L	20.0	0.50 U	86	50-140			
Dichlorodifluoromethane	16		2.5	ug/L	20.0	0.74 U	80	10-180			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J11008 - EPA 5030B_MS - Continued

Matrix Spike (1J11008-MS1) Continued Prepared: 10/11/2021 00:00 Analyzed: 10/11/2021 08:59

Source: AE08047-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethylbenzene	19		2.5	ug/L	20.0	0.69 U	96	63-133			
Freon 113	27		2.5	ug/L	20.0	0.73 U	135	47-173			
Isopropylbenzene	20		2.5	ug/L	20.0	0.67 U	101	60-132			
m,p-Xylenes	38		5.0	ug/L	40.0	1.3 U	96	64-133			
Methyl acetate	21		2.5	ug/L	20.0	0.95 U	105	70-130			
Methyl cyclohexane	24		2.5	ug/L	20.0	0.64 U	122	70-130			
Methylene Chloride	23		12	ug/L	20.0	2.5 U	113	43-142			
Methyl-tert-Butyl Ether	22		2.5	ug/L	20.0	0.60 U	108	51-145			
o-Xylene	19		2.5	ug/L	20.0	0.53 U	94	61-129			
Styrene	20		2.5	ug/L	20.0	0.61 U	98	59-136			
Tetrachloroethene	20		2.5	ug/L	20.0	0.76 U	98	60-147			
Toluene	20		2.5	ug/L	20.0	0.72 U	98	64-131			
trans-1,2-Dichloroethene	25		2.5	ug/L	20.0	0.73 U	123	54-134			
trans-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.73 U	90	65-149			
Trichloroethene	23		2.5	ug/L	20.0	0.89 U	114	62-135			
Trichlorofluoromethane	27		2.5	ug/L	20.0	0.94 U	134	56-155			
Vinyl chloride	21		2.5	ug/L	20.0	0.71 U	106	20-167			
4-Bromofluorobenzene	*46*	*I*		*ug/L*	*50.0*		*92*	*41-142*			
Dibromofluoromethane	*53*			*ug/L*	*50.0*		*106*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*103*	*41-146*			

Matrix Spike Dup (1J11008-MSD1) Prepared: 10/11/2021 00:00 Analyzed: 10/11/2021 09:28

Source: AE08047-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	25		2.5	ug/L	20.0	0.80 U	126	57-148	0.8	25	
1,1,2,2-Tetrachloroethane	16		2.5	ug/L	20.0	0.54 U	82	60-139	0	17	
1,1,2-Trichloroethane	18		2.5	ug/L	20.0	0.76 U	92	57-141	2	16	
1,1-Dichloroethane	23		2.5	ug/L	20.0	0.62 U	116	57-142	0	24	
1,1-Dichloroethene	26		2.5	ug/L	20.0	0.94 U	129	47-139	2	16	
1,2,4-Trichlorobenzene	20		2.5	ug/L	20.0	0.70 U	101	52-159	0	24	
1,2-Dibromo-3-chloropropane	17		2.5	ug/L	20.0	0.96 U	85	48-150	0	21	
1,2-Dibromoethane	18		2.5	ug/L	20.0	0.78 U	92	57-140	4	16	
1,2-Dichlorobenzene	19		2.5	ug/L	20.0	0.73 U	94	63-131	2	25	
1,2-Dichloroethane	21		2.5	ug/L	20.0	0.63 U	106	50-156	0	18	
1,2-Dichloropropane	20		2.5	ug/L	20.0	0.80 U	99	61-133	0	26	
1,3-Dichlorobenzene	19		2.5	ug/L	20.0	0.77 U	94	66-129	0	23	
1,4-Dichlorobenzene	18		2.5	ug/L	20.0	0.76 U	92	65-133	0	23	
2-Butanone	140		12	ug/L	100	4.5 U	141	10-180	0	29	
2-Hexanone	100		12	ug/L	100	2.5 U	102	12-180	4	28	
4-Methyl-2-pentanone	100		12	ug/L	100	2.5 U	101	19-180	0	24	
Acetone	110		25	ug/L	100	10 U	109	10-180	0	19	
Benzene	22		2.5	ug/L	20.0	0.71 U	112	56-136	2	14	
Bromodichloromethane	22		2.5	ug/L	20.0	0.52 U	109	58-135	0	19	
Bromoform	20		2.5	ug/L	20.0	0.75 U	100	46-148	6	18	
Bromomethane	21		2.5	ug/L	20.0	0.95 U	103	10-173	0	29	
Carbon disulfide	38		12	ug/L	20.0	2.5 U	190	43-153	5	26	QM-19
Carbon Tetrachloride	24		2.5	ug/L	20.0	0.94 U	120	54-156	2	27	
Chlorobenzene	20		2.5	ug/L	20.0	0.72 U	100	51-139	3	13	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1J11008 - EPA 5030B_MS - Continued

Matrix Spike Dup (1J11008-MSD1) Continued Prepared: 10/11/2021 00:00 Analyzed: 10/11/2021 09:28

Source: AE08047-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloroethane	27		2.5	ug/L	20.0	0.98 U	135	27-180	2	22	
Chloroform	24		2.5	ug/L	20.0	0.80 U	120	58-139	0	17	
Chloromethane	18		2.5	ug/L	20.0	0.82 U	89	33-154	3	31	
cis-1,2-Dichloroethene	23		2.5	ug/L	20.0	0.53 U	114	56-128	0	17	
cis-1,3-Dichloropropene	20		2.5	ug/L	20.0	0.59 U	98	64-128	0	20	
Cyclohexane	25		2.5	ug/L	20.0	0.93 U	126	70-130	0	20	
Dibromochloromethane	19		2.5	ug/L	20.0	0.50 U	93	50-140	8	18	
Dichlorodifluoromethane	16		2.5	ug/L	20.0	0.74 U	80	10-180	0	26	
Ethylbenzene	20		2.5	ug/L	20.0	0.69 U	100	63-133	3	18	
Freon 113	26		2.5	ug/L	20.0	0.73 U	131	47-173	3	30	
Isopropylbenzene	20		2.5	ug/L	20.0	0.67 U	101	60-132	0	23	
m,p-Xylenes	39		5.0	ug/L	40.0	1.3 U	98	64-133	2	18	
Methyl acetate	21		2.5	ug/L	20.0	0.95 U	103	70-130	2	20	
Methyl cyclohexane	24		2.5	ug/L	20.0	0.64 U	122	70-130	0	20	
Methylene Chloride	23		12	ug/L	20.0	2.5 U	113	43-142	0	23	
Methyl-tert-Butyl Ether	22		2.5	ug/L	20.0	0.60 U	108	51-145	0	22	
o-Xylene	20		2.5	ug/L	20.0	0.53 U	100	61-129	6	16	
Styrene	20		2.5	ug/L	20.0	0.61 U	99	59-136	1	32	
Tetrachloroethene	20		2.5	ug/L	20.0	0.76 U	101	60-147	3	21	
Toluene	20		2.5	ug/L	20.0	0.72 U	98	64-131	0	16	
trans-1,2-Dichloroethene	24		2.5	ug/L	20.0	0.73 U	119	54-134	3	20	
trans-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.73 U	91	65-149	1	17	
Trichloroethene	23		2.5	ug/L	20.0	0.89 U	114	62-135	0	20	
Trichlorofluoromethane	26		2.5	ug/L	20.0	0.94 U	129	56-155	4	22	
Vinyl chloride	21		2.5	ug/L	20.0	0.71 U	103	20-167	3	24	
4-Bromofluorobenzene	*46*	*I*		*ug/L*	*50.0*		*92*	*41-142*			
Dibromofluoromethane	*52*			*ug/L*	*50.0*		*104*	*53-146*			
Toluene-d8	*50*			*ug/L*	*50.0*		*101*	*41-146*			

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*****	Not reported due to interference.
[CALC]	Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
QL-02	The associated laboratory control sample exhibited high bias; since the result is ND, there is no impact.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QM-19	The spike recovery was outside acceptance limits for the MS and/or MSD.
QV-01	The associated continuing calibration verification standard exhibited high bias; since the result is ND, there is no impact.

B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported result is an estimated value.
U	The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a “tentative identification".
Q	One or more quality control criteria failed.

Tetra Tech, Inc. CHAIN OF CUSTODY | NUMBER No. 3205 AE08047 | PAGE 1 OF 1

PROJECT NO: 112G08970	FACILITY: CRCA	PROJECT MANAGER ALEX MURPHY	PHONE NUMBER 321-636-6470	LABORATORY NAME AND CONTACT: ENCO
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER DAN FORESTER	PHONE NUMBER 304 780 1426	ADDRESS
		CARRIER/WAYBILL NUMBER		CITY, STATE ORLANDO, FL

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☒ 72 hr ☐ 7 day ☐ 14 day

DATE YEAR 2021	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: 8260D TCL SOMO 1.2 CLP-LIKE CUSTOM LIST	COMMENTS
									G	HCL		COOLED ON ICE
7OCT	0745	CRCA-AS EFFLUENT-20211007	CRCA	/	/	GW	G	3			X	
7OCT	0800	CRCA-AS INFLUENT-20211007	CRCA	/	/	GW	G	3			X	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	10/07/21	1230	1. RECEIVED BY	10/07/21	1230
2. RELINQUISHED BY	10/07/21	1515	2. RECEIVED BY	10/7/21	1515
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS emailed OOC

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

ENCO Orlando

SDG: AE08047-TE016

CLASS: 01_VOA_MS

METHOD: EPA 8260D

ANALYSES DATA PACKAGE COVER PAGE

EPA 8260D

Laboratory: ENCO Orlando

SDG: AE08047-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Client Sample Id:	Lab Sample Id:
CRCA-ASEFFLUENT-20211007	AE08047-01
CRCA-ASINFLUENT-20211007	AE08047-02

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASEFFLUENT-20211007

Laboratory: ENCO Orlando SDG: AE08047-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE08047-01 File ID: 212JF010.D

Sampled: 10/07/21 07:45 Prepared: 10/11/21 08:25 Analyzed: 10/11/21 11:51

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1J11008 Sequence: AA68696 Calibration: 2107025 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	0.71	U	0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASEFFLUENT-20211007

Laboratory: ENCO Orlando | SDG: AE08047-TE016

Client: Tetra Tech, Inc. (TE016) | Project: NASA KSC CRCA

Matrix: Ground Water | Laboratory ID: AE08047-01 | File ID: 212JF010.D

Sampled: 10/07/21 07:45 | Prepared: 10/11/21 08:25 | Analyzed: 10/11/21 11:51

Solids: | Preparation: EPA 5030B_MS | Initial/Final: 5 mL / 5 mL

Batch: 1J11008 | Sequence: AA68696 | Calibration: 2107025 | Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	53	107	53 - 146	
Toluene-d8	50.0	51	103	41 - 146	
4-Bromofluorobenzene	50.0	46	93	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	153835	11.49	193062	11.49	
1,4-Difluorobenzene	266040	12.05	330090	12.04	
Chlorobenzene-d5	144628	14.64	152465	14.63	
1,4-Dichlorobenzene-d4	127261	17	126714	17	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASINFLUENT-20211007

Laboratory: ENCO Orlando SDG: AE08047-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE08047-02 File ID: 212JF011.D

Sampled: 10/07/21 08:00 Prepared: 10/11/21 08:25 Analyzed: 10/11/21 12:19

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1J11008 Sequence: AA68696 Calibration: 2107025 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	11		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASINFLUENT-20211007

Laboratory: ENCO Orlando SDG: AE08047-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE08047-02 File ID: 212JF011.D

Sampled: 10/07/21 08:00 Prepared: 10/11/21 08:25 Analyzed: 10/11/21 12:19

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1J11008 Sequence: AA68696 Calibration: 2107025 Instrument: OVGCMS2

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	52	104	53 - 146	
Toluene-d8	50.0	48	96	41 - 146	
4-Bromofluorobenzene	50.0	46	91	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	165112	11.5	193062	11.49	
1,4-Difluorobenzene	288101	12.04	330090	12.04	
Chlorobenzene-d5	147178	14.64	152465	14.63	
1,4-Dichlorobenzene-d4	127948	17	126714	17	

* Values outside of QC limits

HOLDING TIME SUMMARY

EPA 8260D

Laboratory: ENCO Orlando

SDG: AE08047-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-ASEFFLUENT-20211007	10/07/21 07:45	10/07/21 15:15	10/11/21 08:25	4.03	NA	10/11/21 11:51	4.00	14.00	
CRCA-ASINFLUENT-20211007	10/07/21 08:00	10/07/21 15:15	10/11/21 08:25	4.02	NA	10/11/21 12:19	4.00	14.00	

PREPARATION BATCH SUMMARY

EPA 8260D

Laboratory: ENCO Orlando SDG: AE08047-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Batch: 1J11008 Batch Matrix: Water Preparation: EPA 5030B_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	1J11008-BLK1	212JF008.D	10/11/21 00:00	
LCS	1J11008-BS1	212JF003.D	10/11/21 00:00	
CRCA-ASEFFLUENT-20211007	1J11008-MS1	212JF004.D	10/11/21 00:00	
CRCA-ASEFFLUENT-20211007	1J11008-MS1	212JF005.D	10/11/21 00:00	
CRCA-ASEFFLUENT-20211007	1J11008-MSD1	212JF005.D	10/11/21 00:00	
CRCA-ASEFFLUENT-20211007	AE08047-01	212JF010.D	10/11/21 08:25	
CRCA-ASINFLUENT-20211007	AE08047-02	212JF011.D	10/11/21 08:25	

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE08047-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	1J11008-BLK1	File ID:	212JF008.D
Prepared:	10/11/21 00:00	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	10/11/21 10:54	Instrument:	OVGCMS2		
Batch:	1J11008	Sequence:	AA68696	Calibration:	2107025

CAS NO.	COMPOUND	CONC. (ug/L)	Q
75-71-8	Dichlorodifluoromethane	0.74	U
74-87-3	Chloromethane	0.82	U
75-01-4	Vinyl chloride	0.71	U
74-83-9	Bromomethane	0.95	U
75-00-3	Chloroethane	0.98	U
75-69-4	Trichlorofluoromethane	0.94	U
76-13-1	Freon 113	0.73	U
67-64-1	Acetone	10	U
75-35-4	1,1-Dichloroethene	0.94	U
75-15-0	Carbon disulfide	2.5	U
75-09-2	Methylene Chloride	2.5	U
1634-04-4	Methyl-tert-Butyl Ether	0.60	U
156-60-5	trans-1,2-Dichloroethene	0.73	U
156-59-2	cis-1,2-Dichloroethene	0.53	U
75-34-3	1,1-Dichloroethane	0.62	U
78-93-3	2-Butanone	4.5	U
67-66-3	Chloroform	0.80	U
71-55-6	1,1,1-Trichloroethane	0.80	U
79-20-9	Methyl acetate	0.95	U
110-82-7	Cyclohexane	0.93	U
108-87-2	Methyl cyclohexane	0.64	U
56-23-5	Carbon Tetrachloride	0.94	U
107-06-2	1,2-Dichloroethane	0.63	U
71-43-2	Benzene	0.71	U
79-01-6	Trichloroethene	0.89	U
78-87-5	1,2-Dichloropropane	0.80	U
75-27-4	Bromodichloromethane	0.52	U
108-10-1	4-Methyl-2-pentanone	2.5	U
591-78-6	2-Hexanone	2.5	U
10061-01-5	cis-1,3-Dichloropropene	0.59	U

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE08047-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	1J11008-BLK1	File ID:	212JF008.D
Prepared:	10/11/21 00:00	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	10/11/21 10:54	Instrument:	OVGCMS2		
Batch:	1J11008	Sequence:	AA68696	Calibration:	2107025

CAS NO.	COMPOUND	CONC. (ug/L)	Q
108-88-3	Toluene	0.72	U
10061-02-6	trans-1,3-Dichloropropene	0.73	U
79-00-5	1,1,2-Trichloroethane	0.76	U
127-18-4	Tetrachloroethene	0.76	U
124-48-1	Dibromochloromethane	0.50	U
106-93-4	1,2-Dibromoethane	0.78	U
108-90-7	Chlorobenzene	0.72	U
100-41-4	Ethylbenzene	0.69	U
108-38-3/106-42-3	m,p-Xylenes	1.3	U
95-47-6	o-Xylene	0.53	U
75-25-2	Bromoform	0.75	U
100-42-5	Styrene	0.61	U
98-82-8	Isopropylbenzene	0.67	U
79-34-5	1,1,2,2-Tetrachloroethane	0.54	U
120-82-1	1,2,4-Trichlorobenzene	0.70	U
541-73-1	1,3-Dichlorobenzene	0.77	U
106-46-7	1,4-Dichlorobenzene	0.76	U
95-50-1	1,2-Dichlorobenzene	0.73	U
96-12-8	1,2-Dibromo-3-chloropropane	0.96	U
1330-20-7	Xylenes (Total)	1.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	53	106	53 - 146	
Toluene-d8	50.0	49	98	41 - 146	
4-Bromofluorobenzene	50.0	46	93	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	166274	11.49	193062	11.49	
1,4-Difluorobenzene	289840	12.04	330090	12.04	
Chlorobenzene-d5	148212	14.64	152465	14.63	
1,4-Dichlorobenzene-d4	129109	17	126714	17	

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE08047-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	1J11008	Laboratory ID:	1J11008-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	13	65	10 - 180
Chloromethane	20.0	16	80	33 - 154
Vinyl chloride	20.0	19	93	20 - 167
Bromomethane	20.0	16	81	10 - 173
Chloroethane	20.0	24	120	27 - 180
Trichlorofluoromethane	20.0	22	111	56 - 155
Freon 113	20.0	26	128	47 - 173
Acetone	100	120	116	10 - 180
1,1-Dichloroethene	20.0	26	128	47 - 139
Carbon disulfide	20.0	43	217 *	43 - 153
Methylene Chloride	20.0	23	115	43 - 142
Methyl-tert-Butyl Ether	20.0	22	111	51 - 145
trans-1,2-Dichloroethene	20.0	23	115	54 - 134
cis-1,2-Dichloroethene	20.0	22	109	56 - 128
1,1-Dichloroethane	20.0	23	115	57 - 142
2-Butanone	100	150	147	10 - 180
Chloroform	20.0	23	116	58 - 139
1,1,1-Trichloroethane	20.0	24	119	57 - 148
Methyl acetate	20.0	22	110	70 - 130
Cyclohexane	20.0	24	118	70 - 130
Methyl cyclohexane	20.0	23	117	70 - 130
Carbon Tetrachloride	20.0	23	113	54 - 156
1,2-Dichloroethane	20.0	22	110	50 - 156
Benzene	20.0	22	110	56 - 136
Trichloroethene	20.0	22	109	62 - 135
1,2-Dichloropropane	20.0	20	100	61 - 133
Bromodichloromethane	20.0	22	109	58 - 135
4-Methyl-2-pentanone	100	98	98	19 - 180
2-Hexanone	100	100	104	12 - 180
cis-1,3-Dichloropropene	20.0	20	99	64 - 128

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE08047-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	1J11008	Laboratory ID:	1J11008-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Toluene	20.0	18	91	64 - 131
trans-1,3-Dichloropropene	20.0	18	91	65 - 149
1,1,2-Trichloroethane	20.0	18	90	57 - 141
Tetrachloroethene	20.0	20	98	60 - 147
Dibromochloromethane	20.0	17	85	50 - 140
1,2-Dibromoethane	20.0	18	89	57 - 140
Chlorobenzene	20.0	19	94	51 - 139
Ethylbenzene	20.0	18	92	63 - 133
m,p-Xylenes	40.0	37	92	64 - 133
o-Xylene	20.0	18	91	61 - 129
Bromoform	20.0	19	96	46 - 148
Styrene	20.0	19	95	59 - 136
Isopropylbenzene	20.0	18	92	60 - 132
1,1,2,2-Tetrachloroethane	20.0	18	88	60 - 139
1,2,4-Trichlorobenzene	20.0	21	104	52 - 159
1,3-Dichlorobenzene	20.0	18	91	66 - 129
1,4-Dichlorobenzene	20.0	19	93	65 - 133
1,2-Dichlorobenzene	20.0	19	93	63 - 131
1,2-Dibromo-3-chloropropane	20.0	18	88	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-ASEFFLUENT-20211007

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1J11008
Laboratory ID: 1J11008-MS1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-ASEFFLUENT-20211007

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	ND	16	80	10 - 180
Chloromethane	20.0	ND	18	92	33 - 154
Vinyl chloride	20.0	ND	21	106	20 - 167
Bromomethane	20.0	ND	21	103	10 - 173
Chloroethane	20.0	ND	28	138	27 - 180
Trichlorofluoromethane	20.0	ND	27	134	56 - 155
Freon 113	20.0	ND	27	135	47 - 173
Acetone	100	ND	110	109	10 - 180
1,1-Dichloroethene	20.0	ND	27	133	47 - 139
Carbon disulfide	20.0	ND	40	199 *	43 - 153
Methylene Chloride	20.0	ND	23	113	43 - 142
Methyl-tert-Butyl Ether	20.0	ND	22	108	51 - 145
trans-1,2-Dichloroethene	20.0	ND	25	123	54 - 134
cis-1,2-Dichloroethene	20.0	ND	23	114	56 - 128
1,1-Dichloroethane	20.0	ND	23	116	57 - 142
2-Butanone	100	ND	140	141	10 - 180
Chloroform	20.0	ND	24	120	58 - 139
1,1,1-Trichloroethane	20.0	ND	25	127	57 - 148
Methyl acetate	20.0	ND	21	105	70 - 130
Cyclohexane	20.0	ND	25	126	70 - 130
Methyl cyclohexane	20.0	ND	24	122	70 - 130
Carbon Tetrachloride	20.0	ND	24	122	54 - 156
1,2-Dichloroethane	20.0	ND	21	106	50 - 156
Benzene	20.0	ND	23	115	56 - 136
Trichloroethene	20.0	ND	23	114	62 - 135
1,2-Dichloropropane	20.0	ND	20	99	61 - 133
Bromodichloromethane	20.0	ND	22	109	58 - 135
4-Methyl-2-pentanone	100	ND	100	101	19 - 180
2-Hexanone	100	ND	110	107	12 - 180
cis-1,3-Dichloropropene	20.0	ND	20	98	64 - 128
Toluene	20.0	ND	20	98	64 - 131

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-ASEFFLUENT-20211007

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1J11008
Laboratory ID: 1J11008-MS1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-ASEFFLUENT-20211007

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
trans-1,3-Dichloropropene	20.0	ND	18	90	65 - 149
1,1,2-Trichloroethane	20.0	ND	18	91	57 - 141
Tetrachloroethene	20.0	ND	20	98	60 - 147
Dibromochloromethane	20.0	ND	17	86	50 - 140
1,2-Dibromoethane	20.0	ND	18	88	57 - 140
Chlorobenzene	20.0	ND	20	98	51 - 139
Ethylbenzene	20.0	ND	19	96	63 - 133
m,p-Xylenes	40.0	ND	38	96	64 - 133
o-Xylene	20.0	ND	19	94	61 - 129
Bromoform	20.0	ND	19	94	46 - 148
Styrene	20.0	ND	20	98	59 - 136
Isopropylbenzene	20.0	ND	20	101	60 - 132
1,1,2,2-Tetrachloroethane	20.0	ND	16	82	60 - 139
1,2,4-Trichlorobenzene	20.0	ND	20	101	52 - 159
1,3-Dichlorobenzene	20.0	ND	19	94	66 - 129
1,4-Dichlorobenzene	20.0	ND	18	92	65 - 133
1,2-Dichlorobenzene	20.0	ND	18	92	63 - 131
1,2-Dibromo-3-chloropropane	20.0	ND	17	85	48 - 150

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-ASEFFLUENT-20211007

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1J11008
Laboratory ID: 1J11008-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-ASEFFLUENT-20211007

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	20.0	16	80	0	26	10 - 180
Chloromethane	20.0	18	89	3	31	33 - 154
Vinyl chloride	20.0	21	103	3	24	20 - 167
Bromomethane	20.0	21	103	0	29	10 - 173
Chloroethane	20.0	27	135	2	22	27 - 180
Trichlorofluoromethane	20.0	26	129	4	22	56 - 155
Freon 113	20.0	26	131	3	30	47 - 173
Acetone	100	110	109	0	19	10 - 180
1,1-Dichloroethene	20.0	26	129	2	16	47 - 139
Carbon disulfide	20.0	38	190 *	5	26	43 - 153
Methylene Chloride	20.0	23	113	0	23	43 - 142
Methyl-tert-Butyl Ether	20.0	22	108	0	22	51 - 145
trans-1,2-Dichloroethene	20.0	24	119	3	20	54 - 134
cis-1,2-Dichloroethene	20.0	23	114	0	17	56 - 128
1,1-Dichloroethane	20.0	23	116	0	24	57 - 142
2-Butanone	100	140	141	0	29	10 - 180
Chloroform	20.0	24	120	0	17	58 - 139
1,1,1-Trichloroethane	20.0	25	126	0.8	25	57 - 148
Methyl acetate	20.0	21	103	2	20	70 - 130
Cyclohexane	20.0	25	126	0	20	70 - 130
Methyl cyclohexane	20.0	24	122	0	20	70 - 130
Carbon Tetrachloride	20.0	24	120	2	27	54 - 156
1,2-Dichloroethane	20.0	21	106	0	18	50 - 156
Benzene	20.0	22	112	2	14	56 - 136
Trichloroethene	20.0	23	114	0	20	62 - 135
1,2-Dichloropropane	20.0	20	99	0	26	61 - 133
Bromodichloromethane	20.0	22	109	0	19	58 - 135
4-Methyl-2-pentanone	100	100	101	0	24	19 - 180
2-Hexanone	100	100	102	4	28	12 - 180
cis-1,3-Dichloropropene	20.0	20	98	0	20	64 - 128
Toluene	20.0	20	98	0	16	64 - 131
trans-1,3-Dichloropropene	20.0	18	91	1	17	65 - 149

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-ASEFFLUENT-20211007

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1J11008
Laboratory ID: 1J11008-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-ASEFFLUENT-20211007

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1,2-Trichloroethane	20.0	18	92	2	16	57 - 141
Tetrachloroethene	20.0	20	101	3	21	60 - 147
Dibromochloromethane	20.0	19	93	8	18	50 - 140
1,2-Dibromoethane	20.0	18	92	4	16	57 - 140
Chlorobenzene	20.0	20	100	3	13	51 - 139
Ethylbenzene	20.0	20	100	3	18	63 - 133
m,p-Xylenes	40.0	39	98	2	18	64 - 133
o-Xylene	20.0	20	100	6	16	61 - 129
Bromoform	20.0	20	100	6	18	46 - 148
Styrene	20.0	20	99	1	32	59 - 136
Isopropylbenzene	20.0	20	101	0	23	60 - 132
1,1,2,2-Tetrachloroethane	20.0	16	82	0	17	60 - 139
1,2,4-Trichlorobenzene	20.0	20	101	0	24	52 - 159
1,3-Dichlorobenzene	20.0	19	94	0	23	66 - 129
1,4-Dichlorobenzene	20.0	18	92	0	23	65 - 133
1,2-Dichlorobenzene	20.0	19	94	2	25	63 - 131
1,2-Dibromo-3-chloropropane	20.0	17	85	0	21	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA67203
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA67203-SCV1)			Lab File ID: 212GB012.D		Analyzed: 07/07/21 13:51			
Dibromofluoromethane	50.0	96	70 - 130	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	100	70 - 130	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	100	70 - 130	15.75	15.74857	0.0014	+/-0.5	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA68696
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA68696-CCV1)			Lab File ID: 212JF002.D		Analyzed: 10/11/21 07:52			
Dibromofluoromethane	50.0	104	80 - 120	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	101	80 - 120	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	100	80 - 120	15.75	15.74857	0.0014	+/-0.5	
LCS (1J11008-BS1)			Lab File ID: 212JF003.D		Analyzed: 10/11/21 08:30			
Dibromofluoromethane	50.0	107	53 - 146	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	105	41 - 146	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	93	41 - 142	15.76	15.74857	0.0114	+/-0.5	
Matrix Spike (1J11008-MS1)			Lab File ID: 212JF004.D		Analyzed: 10/11/21 08:59			
Dibromofluoromethane	50.0	106	53 - 146	11.11	11.09286	0.0171	+/-0.5	
Toluene-d8	50.0	103	41 - 146	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	92	41 - 142	15.75	15.74857	0.0014	+/-0.5	
Matrix Spike Dup (1J11008-MSD1)			Lab File ID: 212JF005.D		Analyzed: 10/11/21 09:28			
Dibromofluoromethane	50.0	104	53 - 146	11.11	11.09286	0.0171	+/-0.5	
Toluene-d8	50.0	101	41 - 146	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	92	41 - 142	15.75	15.74857	0.0014	+/-0.5	
Blank (1J11008-BLK1)			Lab File ID: 212JF008.D		Analyzed: 10/11/21 10:54			
Dibromofluoromethane	50.0	106	53 - 146	11.11	11.09286	0.0171	+/-0.5	
Toluene-d8	50.0	98	41 - 146	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	93	41 - 142	15.75	15.74857	0.0014	+/-0.5	
Instrument RL Check (AA68696-CRL1)			Lab File ID: 212JF009.D		Analyzed: 10/11/21 11:22			
Dibromofluoromethane	50.0	105	1 - 199	11.1	11.09286	0.0071	+/-0.5	
Toluene-d8	50.0	98	1 - 199	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	94	1 - 199	15.75	15.74857	0.0014	+/-0.5	
CRCA-ASEFFLUENT-20211007 (AE08047-01)			Lab File ID: 212JF010.D		Analyzed: 10/11/21 11:51			
Dibromofluoromethane	50.0	107	53 - 146	11.11	11.09286	0.0171	+/-0.5	
Toluene-d8	50.0	103	41 - 146	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	93	41 - 142	15.75	15.74857	0.0014	+/-0.5	
CRCA-ASINFLUENT-20211007 (AE08047-02)			Lab File ID: 212JF011.D		Analyzed: 10/11/21 12:19			
Dibromofluoromethane	50.0	104	53 - 146	11.11	11.09286	0.0171	+/-0.5	
Toluene-d8	50.0	96	41 - 146	13.26	13.25286	0.0071	+/-0.5	
4-Bromofluorobenzene	50.0	91	41 - 142	15.75	15.74857	0.0014	+/-0.5	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA67203
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA67203-CAL1)			Lab File ID: 212GB002.D			Analyzed: 07/07/21 08:38			
Pentafluorobenzene	215175	11.49	193062	11.49	111	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	353915	12.04	330090	12.04	107	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	163131	14.63	152465	14.63	107	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	128103	17	126714	17	101	50 - 200	0.0000	+/-0.50	
Cal Standard (AA67203-CAL2)			Lab File ID: 212GB003.D			Analyzed: 07/07/21 09:12			
Pentafluorobenzene	211652	11.48	193062	11.49	110	50 - 200	-0.0100	+/-0.50	
1,4-Difluorobenzene	347121	12.04	330090	12.04	105	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	158805	14.63	152465	14.63	104	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	127077	17	126714	17	100	50 - 200	0.0000	+/-0.50	
Cal Standard (AA67203-CAL3)			Lab File ID: 212GB004.D			Analyzed: 07/07/21 09:45			
Pentafluorobenzene	203927	11.49	193062	11.49	106	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	341315	12.04	330090	12.04	103	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	156499	14.63	152465	14.63	103	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	125355	17	126714	17	99	50 - 200	0.0000	+/-0.50	
Cal Standard (AA67203-CAL4)			Lab File ID: 212GB005.D			Analyzed: 07/07/21 10:20			
Pentafluorobenzene	201361	11.48	193062	11.49	104	50 - 200	-0.0100	+/-0.50	
1,4-Difluorobenzene	332358	12.03	330090	12.04	101	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	153847	14.63	152465	14.63	101	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	125049	16.99	126714	17	99	50 - 200	-0.0100	+/-0.50	
Cal Standard (AA67203-CAL5)			Lab File ID: 212GB006.D			Analyzed: 07/07/21 10:49			
Pentafluorobenzene	200029	11.49	193062	11.49	104	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	331857	12.03	330090	12.04	101	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	153677	14.63	152465	14.63	101	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	125353	16.99	126714	17	99	50 - 200	-0.0100	+/-0.50	
Cal Standard (AA67203-CAL6)			Lab File ID: 212GB007.D			Analyzed: 07/07/21 11:23			
Pentafluorobenzene	193062	11.49	193062	11.49	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	330090	12.04	330090	12.04	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	152465	14.63	152465	14.63	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	126714	17	126714	17	100	50 - 200	0.0000	+/-0.50	
Cal Standard (AA67203-CAL7)			Lab File ID: 212GB008.D			Analyzed: 07/07/21 11:52			
Pentafluorobenzene	193020	11.49	193062	11.49	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	331667	12.03	330090	12.04	100	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	154870	14.63	152465	14.63	102	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	128039	16.99	126714	17	101	50 - 200	-0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA67203
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA67203-CAL8)			Lab File ID: 212GB009.D			Analyzed: 07/07/21 12:20			
Pentafluorobenzene	186248	11.48	193062	11.49	96	50 - 200	-0.0100	+/-0.50	
1,4-Difluorobenzene	321571	12.03	330090	12.04	97	50 - 200	-0.0100	+/-0.50	
Chlorobenzene-d5	149062	14.63	152465	14.63	98	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	124574	16.99	126714	17	98	50 - 200	-0.0100	+/-0.50	
Secondary Cal Check (AA67203-SCV1)			Lab File ID: 212GB012.D			Analyzed: 07/07/21 13:51			
Pentafluorobenzene	194936	11.49	193062	11.49	101	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	323837	12.04	330090	12.04	98	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	148905	14.63	152465	14.63	98	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	124145	17	126714	17	98	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA68696
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (AA68696-CCV1)			Lab File ID: 212JF002.D			Analyzed: 10/11/21 07:52			
Pentafluorobenzene	156767	11.5	193062	11.49	81	50 - 200	0.0100	+/-0.50	
1,4-Difluorobenzene	278861	12.04	330090	12.04	84	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	146517	14.64	152465	14.63	96	50 - 200	0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	138627	17	126714	17	109	50 - 200	0.0000	+/-0.50	
LCS (1J11008-BS1)			Lab File ID: 212JF003.D			Analyzed: 10/11/21 08:30			
Pentafluorobenzene	160688	11.5	193062	11.49	83	50 - 200	0.0100	+/-0.50	
1,4-Difluorobenzene	281327	12.04	330090	12.04	85	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	155941	14.64	152465	14.63	102	50 - 200	0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	131834	17	126714	17	104	50 - 200	0.0000	+/-0.50	
Matrix Spike (1J11008-MS1)			Lab File ID: 212JF005.D			Analyzed: 10/11/21 08:59			
Pentafluorobenzene	156917	11.49	193062	11.49	81	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	276041	12.05	330090	12.04	84	50 - 200	0.0100	+/-0.50	
Chlorobenzene-d5	153582	14.64	152465	14.63	101	50 - 200	0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	130289	17	126714	17	103	50 - 200	0.0000	+/-0.50	
Matrix Spike Dup (1J11008-MSD1)			Lab File ID: 212JF005.D			Analyzed: 10/11/21 09:28			
Pentafluorobenzene	156917	11.49	193062	11.49	81	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	276041	12.05	330090	12.04	84	50 - 200	0.0100	+/-0.50	
Chlorobenzene-d5	149791	14.63	152465	14.63	98	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	133384	17	126714	17	105	50 - 200	0.0000	+/-0.50	
Blank (1J11008-BLK1)			Lab File ID: 212JF008.D			Analyzed: 10/11/21 10:54			
Pentafluorobenzene	166274	11.49	193062	11.49	86	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	289840	12.04	330090	12.04	88	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	148212	14.64	152465	14.63	97	50 - 200	0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	129109	17	126714	17	102	50 - 200	0.0000	+/-0.50	
Instrument RL Check (AA68696-CRL1)			Lab File ID: 212JF009.D			Analyzed: 10/11/21 11:22			
Pentafluorobenzene	164702	11.49	193062	11.49	85	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	284152	12.04	330090	12.04	86	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	146286	14.64	152465	14.63	96	50 - 200	0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	128747	17	126714	17	102	50 - 200	0.0000	+/-0.50	
CRCA-ASEFFLUENT-20211007 (AE08047-01)			Lab File ID: 212JF010.D			Analyzed: 10/11/21 11:51			
Pentafluorobenzene	153835	11.49	193062	11.49	80	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	266040	12.05	330090	12.04	81	50 - 200	0.0100	+/-0.50	
Chlorobenzene-d5	144628	14.64	152465	14.63	95	50 - 200	0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	127261	17	126714	17	100	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA68696
Instrument: OVGCMS2
Matrix: Water
Calibration: 2107025

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
CRCA-ASINFLUENT-20211007 (AE08047-02)			Lab File ID: 212JF011.D			Analyzed: 10/11/21 12:19			
Pentafluorobenzene	165112	11.5	193062	11.49	86	50 - 200	0.0100	+/-0.50	
1,4-Difluorobenzene	288101	12.04	330090	12.04	87	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	147178	14.64	152465	14.63	97	50 - 200	0.0100	+/-0.50	
1,4-Dichlorobenzene-d4	127948	17	126714	17	101	50 - 200	0.0000	+/-0.50	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE08047-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA67203		
Calibration:	2107025	Instrument:	OVGCMS2

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA67203-TUN1	212GB001.D	07/07/21 07:58
Cal Standard	AA67203-CAL1	212GB002.D	07/07/21 08:38
Cal Standard	AA67203-CAL2	212GB003.D	07/07/21 09:12
Cal Standard	AA67203-CAL3	212GB004.D	07/07/21 09:45
Cal Standard	AA67203-CAL4	212GB005.D	07/07/21 10:20
Cal Standard	AA67203-CAL5	212GB006.D	07/07/21 10:49
Cal Standard	AA67203-CAL6	212GB007.D	07/07/21 11:23
Cal Standard	AA67203-CAL7	212GB008.D	07/07/21 11:52
Cal Standard	AA67203-CAL8	212GB009.D	07/07/21 12:20
Secondary Cal Check	AA67203-SCV1	212GB012.D	07/07/21 13:51

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE08047-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA68696		
Calibration:	2107025	Instrument:	OVGCMS2

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	AA68696-CCV1	212JF002.D	10/11/21 07:52
LCS	1J11008-BS1	212JF003.D	10/11/21 08:30
CRCA-ASEFFLUENT-20211007	1J11008-MS1	212JF004.D	10/11/21 08:59
CRCA-ASEFFLUENT-20211007	1J11008-MS1	212JF005.D	10/11/21 08:59
CRCA-ASEFFLUENT-20211007	1J11008-MSD1	212JF005.D	10/11/21 09:28
Blank	1J11008-BLK1	212JF008.D	10/11/21 10:54
Instrument RL Check	AA68696-CRL1	212JF009.D	10/11/21 11:22
CRCA-ASEFFLUENT-20211007	AE08047-01	212JF010.D	10/11/21 11:51
CRCA-ASINFLUENT-20211007	AE08047-02	212JF011.D	10/11/21 12:19

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE08047-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Lab File ID:	212GB001.D	Injection Date:	07/07/21
Instrument ID:	OVGCMS2	Injection Time:	07:58
Sequence:	AA67203	Lab Sample ID:	AA67203-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
95	50 - 200% of 174	133	PASS
96	5 - 9% of 95	6.97	PASS
173	Less than 2% of 174	0	PASS
174	50 - 200% of 95	75.2	PASS
175	5 - 9% of 174	7.67	PASS
176	95 - 105% of 174	97.7	PASS
177	5 - 10% of 176	6.56	PASS

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE08047-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS2	Calibration:	2107025
Lab File ID:	212JF002.D	Calibration Date:	07/07/21 00:00
Sequence:	AA68696	Injection Date:	10/11/21
Lab Sample ID:	AA68696-CCV1	Injection Time:	07:52

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
Dichlorodifluoromethane	A	50.0	54	0.8144609	0.8840891		8.5	20	
Chloromethane	A	50.0	50	1.0402	0.9967978		-0.6	20	
Vinyl chloride	A	50.0	52	0.8035139	0.8184822		4.6	20	
Bromomethane	A	50.0	120	0.4826353	0.4326229		150	20	*
Chloroethane	A	50.0	60	0.4157574	0.4248152		20	20	
Trichlorofluoromethane	A	50.0	59	0.7331526	0.8661006		18	20	
Freon 113	A	50.0	64	0.4738214	0.6059694		28	20	*
Acetone	A	250	250	0.1680153	0.1660043		-1.2	20	
1,1-Dichloroethene	A	50.0	59	0.4934686	0.5251488		17	20	
Carbon disulfide	A	250	410	1.083061	1.754779		62	20	*
Methylene Chloride	A	50.0	52	0.581384	0.6095224		4.8	20	
Methyl-tert-Butyl Ether	A	50.0	54	1.438155	1.548591		7.7	20	
trans-1,2-Dichloroethene	A	50.0	54	0.538907	0.5853592		8.6	20	
cis-1,2-Dichloroethene	A	50.0	55	0.5813479	0.641621		10	20	
1,1-Dichloroethane	A	50.0	53	0.9793809	1.043995		6.6	20	
2-Butanone	A	250	230	5.934286E-02	5.421677E-02		-8.1	20	
Chloroform	A	50.0	57	0.9229288	1.055477		14	20	
1,1,1-Trichloroethane	A	50.0	60	0.7054439	0.8410954		19	20	
Methyl acetate	A	50.0	51	0.1087756	0.1004421		1.5	20	
Cyclohexane	A	50.0	55	0.8359736	0.9168384		9.7	20	
Methyl cyclohexane	A	50.0	55	0.3560741	0.391177		9.9	20	
Carbon Tetrachloride	A	50.0	58	0.432947	0.5040755		16	20	
1,2-Dichloroethane	A	50.0	54	0.4166106	0.4504574		8.1	20	
Benzene	A	50.0	50	1.145881	1.152255		0.60	20	
Trichloroethene	A	50.0	60	0.3305369	0.3941067		19	20	
1,2-Dichloropropane	A	50.0	49	0.3604394	0.3555571		-1.4	20	
Bromodichloromethane	A	50.0	53	0.4205315	0.4449636		5.8	20	
4-Methyl-2-pentanone	A	250	240	4.911296E-02	4.619793E-02		-5.9	20	
2-Hexanone	A	250	230	0.2424491	0.2247772		-7.3	20	

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE08047-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS2	Calibration:	2107025
Lab File ID:	212JF002.D	Calibration Date:	07/07/21 00:00
Sequence:	AA68696	Injection Date:	10/11/21
Lab Sample ID:	AA68696-CCV1	Injection Time:	07:52

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
cis-1,3-Dichloropropene	A	50.0	52	0.5877535	0.6128896		4.3	20	
Toluene	A	50.0	48	1.523791	1.477938		-3	20	
trans-1,3-Dichloropropene	A	50.0	46	1.055085	0.9736345		-7.7	20	
1,1,2-Trichloroethane	A	50.0	46	0.600747	0.5503252		-8.4	20	
Tetrachloroethene	A	50.0	51	0.5170224	0.5232157		1.2	20	
Dibromochloromethane	A	50.0	49	0.8177395	0.7969451		-2.5	20	
1,2-Dibromoethane	A	50.0	49	0.6978063	0.6894012		-1.2	20	
Chlorobenzene	A	50.0	51	1.670897	1.689961		1.1	20	
Ethylbenzene	A	50.0	51	0.8355575	0.8604735		3.0	20	
m,p-Xylenes	A	100	100	1.035002	1.041063		0.60	20	
o-Xylene	A	50.0	51	1.031571	1.059017		2.7	20	
Bromoform	A	50.0	53	0.4537515	0.4794188		5.7	20	
Styrene	A	50.0	53	1.654601	1.760499		6.4	20	
Isopropylbenzene	A	50.0	52	2.485518	2.602599		4.7	20	
1,1,2,2-Tetrachloroethane	A	50.0	45	0.7928662	0.7077677		-11	20	
1,2,4-Trichlorobenzene	A	50.0	48	0.642641	0.618285		-3.8	20	
1,3-Dichlorobenzene	A	50.0	47	1.445157	1.349571		-6.6	20	
1,4-Dichlorobenzene	A	50.0	46	1.478644	1.370599		-7.3	20	
1,2-Dichlorobenzene	A	50.0	47	1.368364	1.276476		-6.7	20	
1,2-Dibromo-3-chloropropane	A	50.0	39	0.1598436	9.815548E-02		-22	20	*

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE08047-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA67203	Instrument:	OVGCMS2
Calibration:	2107025		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1B1157	MS Tune	AA67203-TUN1	212GB001.D	07/07/21 07:58
A1G0352	8260 1.0 PPB	AA67203-CAL1	212GB002.D	07/07/21 08:38
A1G0357	8260 2.0 PPB	AA67203-CAL2	212GB003.D	07/07/21 09:12
A1G0358	8260 5.0 PPB	AA67203-CAL3	212GB004.D	07/07/21 09:45
A1G0360	8260 10 PPB	AA67203-CAL4	212GB005.D	07/07/21 10:20
A1G0361	8260 20 PPB	AA67203-CAL5	212GB006.D	07/07/21 10:49
A1G0362	8260 50 PPB	AA67203-CAL6	212GB007.D	07/07/21 11:23
A1G0363	8260 80 PPB	AA67203-CAL7	212GB008.D	07/07/21 11:52
A1G0364	8260 100 PPB	AA67203-CAL8	212GB009.D	07/07/21 12:20
A1G0391	8260 SCV 50 PPB	AA67203-SCV1	212GB012.D	07/07/21 13:51

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	1	0.9812943	2	0.6771729	5	0.7139319	10	0.8475077	20	0.7782247	50	0.8516901
Chloromethane	1	1.632857	2	0.8451373	5	0.9041961	10	1.013131	20	0.9286653	50	0.9927743
Vinyl chloride	1	1.132799	2	0.7198137	5	0.7040264	10	0.8026877	20	0.7222578	50	0.7876589
Bromomethane	1	0.7807598	2	0.4813326	5	0.558239	10	0.453638	20	0.3645471	50	0.2572956
Chloroethane	1	0.7226676	2	0.3737267	5	0.3750852	10	0.4261997	20	0.3541736	50	0.3721343
Trichlorofluoromethane	1	0.8781225	2	0.6157513	5	0.6557739	10	0.7749763	20	0.7071725	50	0.7625789
Freon 113	1	0.4491693	2	0.53862	5	0.4598214	10	0.4946588	20	0.4333497	50	0.488874
Acetone	5	0.1904496	10	0.1566014	25	0.1740427	50	0.155184	100	0.1644012	250	0.167946
1,1-Dichloroethene	1	0.6122923	2	0.601459	5	0.4607041	10	0.5021826	20	0.4223263	50	0.4621262
Carbon disulfide	5	1.407366	10	0.9947461	25	1.0741	50	1.003581	100	1.021232	250	1.061266
Methylene Chloride	1	0.6355292	2	0.7094192	5	0.5932025	10	0.6016806	20	0.5045768	50	0.5487667
Methyl-tert-Butyl Ether	1	1.353782	2	1.7276	5	1.474989	10	1.5357	20	1.291025	50	1.41684
trans-1,2-Dichloroethene	1	0.5920762	2	0.6482339	5	0.5413212	10	0.5480207	20	0.472269	50	0.5169531
cis-1,2-Dichloroethene	1	0.6150807	2	0.6696133	5	0.6019311	10	0.6122337	20	0.5053017	50	0.5572096
1,1-Dichloroethane	1	0.875334	2	1.250992	5	1.022278	10	1.057975	20	0.8690615	50	0.9544447
2-Butanone	5	9.415592E-02	10	3.278967E-02	25	6.145336E-02	50	5.436505E-02	100	0.0558519	250	5.824968E-02
Chloroform	1	0.9385384	2	1.104643	5	0.9111103	10	0.979286	20	0.8197186	50	0.9003066
1,1,1-Trichloroethane	1	0.7047752	2	0.8291913	5	0.7066744	10	0.7288899	20	0.6247219	50	0.7017331
Methyl acetate	1	0.1022424	2	0.1449313	5	0.1169536	10	0.1131301	20	9.404886E-02	50	0.1039459
Cyclohexane	1	0.8390845	2	0.9293557	5	0.8019046	10	0.9001247	20	0.7678762	50	0.847707
Methyl cyclohexane	1	0.3101027	2	0.4061264	5	0.3478019	10	0.3890684	20	0.3432201	50	0.3658548
Carbon Tetrachloride	1	0.3971293	2	0.5158144	5	0.4378653	10	0.4646195	20	0.3894599	50	0.433294
1,2-Dichloroethane	1	0.4113982	2	0.542102	5	0.4261752	10	0.432335	20	0.3707094	50	0.39096
Benzene	1	1.210601	2	1.395983	5	1.169037	10	1.22511	20	1.039009	50	1.083726
Trichloroethene	1	0.3126457	2	0.3689636	5	0.3341195	10	0.3551742	20	0.303798	50	0.3294526
1,2-Dichloropropane	1	0.4501081	2	0.401301	5	0.3516986	10	0.3790491	20	0.3148269	50	0.3380442
Bromodichloromethane	1	0.3702867	2	0.5256092	5	0.4417327	10	0.455909	20	0.382695	50	0.407089
4-Methyl-2-pentanone	5	6.049475E-02	10	4.858536E-02	25	4.976049E-02	50	4.680495E-02	100	4.549701E-02	250	4.743918E-02
2-Hexanone	5	0.2707712	10	0.2100276	25	0.2401242	50	0.2309678	100	0.2423695	250	0.2487509
cis-1,3-Dichloropropene	1	0.5734428	2	0.6924819	5	0.6037238	10	0.62031	20	0.5289326	50	0.5774395
Toluene	1	1.419718	2	1.837159	5	1.574962	10	1.613064	20	1.372424	50	1.514846

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	1	1.047624	2	1.273575	5	1.09055	10	1.131774	20	0.9526312	50	1.0235
1,1,2-Trichloroethane	1	0.6384439	2	0.7416328	5	0.6188538	10	0.6294565	20	0.5387111	50	0.5585413
Tetrachloroethene	1	0.4563817	2	0.5665754	5	0.5555946	10	0.5796668	20	0.4706137	50	0.5469977
Dibromochloromethane	1	0.7821935	2	1.004376	5	0.8355964	10	0.8591328	20	0.7305745	50	0.8007674
1,2-Dibromoethane	1	0.6188278	2	0.8149932	5	0.7186627	10	0.7441809	20	0.6398648	50	0.7087594
Chlorobenzene	1	1.625074	2	1.965461	5	1.734196	10	1.764545	20	1.530841	50	1.63936
Ethylbenzene	1	0.7346856	2	1.010201	5	0.8528489	10	0.8858151	20	0.7655505	50	0.8378316
m,p-Xylenes	2	0.935751	4	1.247206	10	1.093553	20	1.11177	40	0.9548517	100	1.018709
o-Xylene	1	0.929621	2	1.19738	5	1.071764	10	1.110486	20	0.9416503	50	1.030715
Bromoform	1	0.3941617	2	0.5119486	5	0.4629423	10	0.4783974	20	0.4209153	50	0.465497
Styrene	1	1.340027	2	1.882497	5	1.657519	10	1.747028	20	1.537885	50	1.72862
Isopropylbenzene	1	2.312865	2	2.876169	5	2.512923	10	2.66973	20	2.29003	50	2.495412
1,1,2,2-Tetrachloroethane	1	0.8388963	2	0.9511665	5	0.7970019	10	0.8281604	20	0.7132818	50	0.7567179
1,2,4-Trichlorobenzene	1	0.6787507	2	0.6834439	5	0.5982211	10	0.6411087	20	0.5844695	50	0.6446091
1,3-Dichlorobenzene	1	1.390678	2	1.67851	5	1.468948	10	1.494334	20	1.307388	50	1.435256
1,4-Dichlorobenzene	1	1.390678	2	1.748546	5	1.538431	10	1.518125	20	1.353298	50	1.456327
1,2-Dichlorobenzene	1	1.312616	2	1.548077	5	1.374417	10	1.419244	20	1.24301	50	1.369044
1,2-Dibromo-3-chloropropane	1	0.2494087	2	0.2360773	5	0.1527661	10	0.1449032	20	0.1174882	50	0.128644
Dibromofluoromethane	50	0.4924364	55	0.4980345	60	0.5227647			65	0.5396218	50	0.5110327
Toluene-d8	50	0.892477	55	0.9256819	60	0.9338148			65	0.9694166	50	0.92991
4-Bromofluorobenzene	50	0.7597514	55	0.7846387	60	0.8128486			65	0.8214181	50	0.7924376

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	80	0.8228098	100	0.843056								
Chloromethane	80	0.9834862	100	1.021356								
Vinyl chloride	80	0.7609477	100	0.79792								
Bromomethane	80	~~0.1636424~~	100	~~0.1454888~~								
Chloroethane	80	0.3485649	100	0.3535072								
Trichlorofluoromethane	80	0.7211623	100	0.7496832								
Freon 113	80	0.4536706	100	0.4724078								
Acetone	400	0.1649725	500	0.1705253								
1,1-Dichloroethene	80	0.432235	100	0.4544237								
Carbon disulfide	400	1.035114	500	1.067085								
Methylene Chloride	80	0.5135446	100	0.5443522								
Methyl-tert-Butyl Ether	80	1.318111	100	1.387191								
trans-1,2-Dichloroethene	80	0.4823982	100	0.509984								
cis-1,2-Dichloroethene	80	0.5272996	100	0.5621134								
1,1-Dichloroethane	80	0.8818031	100	0.9231589								
2-Butanone	400	5.753031E-02	500	6.034696E-02								
Chloroform	80	0.8437241	100	0.8861035								
1,1,1-Trichloroethane	80	0.6580439	100	0.6895215								
Methyl acetate	80	9.438789E-02	100	0.1005648								
Cyclohexane	80	0.7821113	100	0.8196249								
Methyl cyclohexane	80	0.338847	100	0.3475718								
Carbon Tetrachloride	80	0.4026064	100	0.4227869								
1,2-Dichloroethane	80	0.3696008	100	0.3896045								
Benzene	80	0.9978966	100	1.045682								
Trichloroethene	80	0.310381	100	0.3297608								
1,2-Dichloropropane	80	0.3158722	100	0.3326155								
Bromodichloromethane	80	0.3778093	100	0.4031209								
4-Methyl-2-pentanone	400	4.614003E-02	500	4.818189E-02								
2-Hexanone	400	0.2446829	500	0.2518986								
cis-1,3-Dichloropropene	80	0.5394398	100	0.5662575								
Toluene	80	1.398302	100	1.459852								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	80	0.9421652	100	0.9788578								
1,1,2-Trichloroethane	80	0.5204082	100	0.5599281								
Tetrachloroethene	80	0.4750113	100	0.4853383								
Dibromochloromethane	80	0.7412104	100	0.7880647								
1,2-Dibromoethane	80	0.6501824	100	0.6869792								
Chlorobenzene	80	1.520917	100	1.586779								
Ethylbenzene	80	0.7773213	100	0.8202057								
m,p-Xylenes	160	0.9424174	200	0.9757618								
o-Xylene	80	0.9595064	100	1.011445								
Bromoform	80	0.4362368	100	0.4599127								
Styrene	80	1.625783	100	1.717446								
Isopropylbenzene	80	2.307645	100	2.419372								
1,1,2,2-Tetrachloroethane	80	0.7131183	100	0.7445861								
1,2,4-Trichlorobenzene	80	0.6369495	100	0.6735755								
1,3-Dichlorobenzene	80	1.367855	100	1.418286								
1,4-Dichlorobenzene	80	1.369959	100	1.453787								
1,2-Dichlorobenzene	80	1.311339	100	1.369166								
1,2-Dibromo-3-chloropropane	80	0.1201001	100	0.1293609								
Dibromofluoromethane	70	0.5086631	75	0.5111321								
Toluene-d8	70	0.9128024	75	0.9090268								
4-Bromofluorobenzene	70	0.7798707	75	0.7708157								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	0.8144609	11.50532	5.93125	5.921899E-02			20	
Chloromethane	1.0402	23.73763	6.405	8.366299E-02	0.9991419		0.99	
Vinyl chloride	0.8035139	17.22101	6.59625	0.1112571	0.9988763		0.99	
Bromomethane	0.4826353	37.08278	7.246667	0.1666723		0.9997793	0.99	
Chloroethane	0.4157574	30.39833	7.4675	0.3016741	0.9987283		0.99	
Trichlorofluoromethane	0.7331526	10.87444	7.73375	0.1183179			20	
Freon 113	0.4738214	7.003996	8.56	8.654411E-02			20	
Acetone	0.1680153	6.60922	9.2775	4.726807E-02			20	
1,1-Dichloroethene	0.4934686	14.97946	8.52	8.904635E-02	0.998482		0.99	
Carbon disulfide	1.083061	12.39843	8.6375	5.096163E-02			20	
Methylene Chloride	0.581384	11.77637	9.23625	5.579867E-02			20	
Methyl-tert-Butyl Ether	1.438155	9.864332	9.55375	5.658861E-02			20	
trans-1,2-Dichloroethene	0.538907	10.82464	9.4625	4.927588E-02			20	
cis-1,2-Dichloroethene	0.5813479	9.186062	10.6975	4.534096E-02			20	
1,1-Dichloroethane	0.9793809	13.26191	10.135	5.607816E-02			20	
2-Butanone	5.934286E-02	28.22575	11.2	6.659373E-02	0.9988031		0.99	
Chloroform	0.9229288	9.636793	10.9125	4.365542E-02			20	
1,1,1-Trichloroethane	0.7054439	8.453686	11.20875	3.111261E-02			20	
Methyl acetate	0.1087756	15.34546	9.42125	6.916466E-02	0.9973841		0.99	
Cyclohexane	0.8359736	6.698383	10.97875	2.728992E-02			20	
Methyl cyclohexane	0.3560741	8.495542	12.095	4.276631E-02			20	
Carbon Tetrachloride	0.432947	9.599993	11.1725	0.0388233			20	
1,2-Dichloroethane	0.4166106	13.40076	11.6925	6.403121E-02			20	
Benzene	1.145881	11.46316	11.54875	3.859392E-02			20	
Trichloroethene	0.3305369	6.803054	12.0625	3.234726E-02			20	
1,2-Dichloropropane	0.3604394	13.04483	12.51125	0.0517982			20	
Bromodichloromethane	0.4205315	12.39126	12.52625	4.514478E-02			20	
4-Methyl-2-pentanone	4.911296E-02	9.769496	13.5275	3.600818E-02			20	
2-Hexanone	0.2424491	7.185569	14.22875	2.675662E-02			20	
cis-1,3-Dichloropropene	0.5877535	8.82909	13.07	3.974212E-02			20	

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE08047-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2107025
Instrument: OVGCMS2
Matrix: Water
Calibration Date: 07/07/21 00:00

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Toluene	1.523791	9.997262	13.3	3.685108E-02			20	
trans-1,3-Dichloropropene	1.055085	10.44344	13.59125	4.899325E-02			20	
1,1,2-Trichloroethane	0.600747	11.96595	13.745	4.039473E-02			20	
Tetrachloroethene	0.5170224	9.633677	13.675	3.762551E-02			20	
Dibromochloromethane	0.8177395	10.61589	13.9425	3.598978E-02			20	
1,2-Dibromoethane	0.6978063	9.130938	14.19875	3.004813E-02			20	
Chlorobenzene	1.670897	8.813982	14.64625	3.053514E-02			20	
Ethylbenzene	0.8355575	10.3185	14.60375	3.088365E-02			20	
m,p-Xylenes	1.035002	10.51912	14.72	3.436548E-02			20	
o-Xylene	1.031571	8.93094	15.13625	3.053246E-02			20	
Bromoform	0.4537515	7.985569	15.27	0.0337494			20	
Styrene	1.654601	9.780707	15.17875	1.787573E-02			20	
Isopropylbenzene	2.485518	8.209203	15.40625	3.299149E-02			20	
1,1,2,2-Tetrachloroethane	0.7928662	10.08678	15.845	3.729984E-02			20	
1,2,4-Trichlorobenzene	0.642641	5.67837	19.9825	3.576368E-02	0.9982458		0.99	
1,3-Dichlorobenzene	1.445157	7.677947	16.92125	3.887775E-02			20	
1,4-Dichlorobenzene	1.478644	8.644127	17.00375	0.1783969			20	
1,2-Dichlorobenzene	1.368364	6.594366	17.5875	4.126355E-02			20	
1,2-Dibromo-3-chloropropane	0.1598436	32.92043	18.7	4.153115E-02	0.9970013		0.99	
Dibromofluoromethane	0.511955	3.056775	11.09286	4.526921E-02			20	
Toluene-d8	0.9247328	2.625305	13.25286	3.685312E-02			20	
4-Bromofluorobenzene	0.7888258	2.796512	15.74857	2.347914E-02			20	

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AE08047-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2107025 **Laboratory ID:** AA67203-SCV1

Sequence: AA67203 **Standard ID:** A1G0391

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Cyclohexane	50.0	47	-6.6	30.00
Ethylbenzene	50.0	51	1.1	30.00
Carbon Tetrachloride	50.0	48	-3.1	30.00
1,3-Dichlorobenzene	50.0	51	1.3	30.00
4-Bromofluorobenzene	50.0	50	0.1	30.00
Toluene-d8	50.0	50	-0.3	30.00
Dibromofluoromethane	50.0	48	-3.9	30.00
Methyl-tert-Butyl Ether	50.0	48	-3.6	30.00
trans-1,2-Dichloroethene	50.0	45	-10.1	30.00
cis-1,2-Dichloroethene	50.0	46	-7.2	30.00
Tetrachloroethene	50.0	48	-4.7	30.00
Acetone	250	250	-0.7	30.00
1,2,4-Trichlorobenzene	50.0	51	1.5	30.00
Chloroform	50.0	47	-5.4	30.00
Chlorobenzene	50.0	50	0.2	30.00
Toluene	50.0	50	-0.3	30.00
Methyl cyclohexane	50.0	49	-2.6	30.00
m,p-Xylenes	100	96	-3.5	30.00
4-Methyl-2-pentanone	250	250	0.3	30.00
1,2-Dichloroethane	50.0	47	-5.7	30.00
1,2-Dibromoethane	50.0	50	-0.3	30.00
1,4-Dichlorobenzene	50.0	48	-3.7	30.00
trans-1,3-Dichloropropene	50.0	49	-1.7	30.00
cis-1,3-Dichloropropene	50.0	46	-7.8	30.00
Styrene	50.0	53	6.6	30.00
Dibromochloromethane	50.0	49	-1.2	30.00
1,1-Dichloroethene	50.0	45	-10.1	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AE08047-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2107025 **Laboratory ID:** AA67203-SCV1

Sequence: AA67203 **Standard ID:** A1G0391

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
1,2-Dibromo-3-chloropropane	50.0	52	4.2	30.00
1,2-Dichlorobenzene	50.0	51	1.3	30.00
o-Xylene	50.0	50	0.6	30.00
1,1,2,2-Tetrachloroethane	50.0	48	-3.4	30.00
Methyl acetate	50.0	54	7.2	30.00
Trichloroethene	50.0	49	-2.7	30.00
1,1,2-Trichloroethane	50.0	49	-2.8	30.00
2-Butanone	250	280	12.5	30.00
1,2-Dichloropropane	50.0	46	-7.7	30.00
Freon 113	50.0	45	-10.2	30.00
2-Hexanone	250	260	5.5	30.00
Trichlorofluoromethane	20.0	20	-2.0	30.00
Isopropylbenzene	50.0	50	0.9	30.00
1,1-Dichloroethane	50.0	49	-2.6	30.00
Bromodichloromethane	50.0	49	-1.0	30.00
Bromoform	50.0	54	8.3	30.00
Carbon disulfide	50.0	60	20.0	30.00
Methylene Chloride	50.0	45	-9.3	30.00
Vinyl chloride	20.0	19	-6.2	30.00
Chloroethane	20.0	20	-1.7	30.00
Chloromethane	20.0	19	-4.6	30.00
Bromomethane	20.0	12	-39.8 *	30.00
1,1,1-Trichloroethane	50.0	48	-3.6	30.00
Benzene	50.0	49	-2.0	30.00
Dichlorodifluoromethane	20.0	20	-2.3	30.00

* Values outside of QC limits

TETRA TECH ISG
TtEGS, Information Systems Group

Completion Ticket

On 11/4/2021 at 3:05 PM the following files were submitted to Tetra Tech by kdylnicki@encolabs.com with ENCO:

TE016AE08047A1.txt, TE016AE08047A3.txt

If you need to identify this session at a later date refer to Ticket Key:

2021114_69711207_ledd_ENCO

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I Lovelie Metzgar, as the designated Quality Assurance Officer, hereby attest that all electronic deliverables have been thoroughly reviewed and are in agreement with the associated hardcopy data. The enclosed electronic files have been reviewed for accuracy (including significant figures), completeness and format. The laboratory will be responsible for any labor time necessary to correct enclosed electronic deliverables that have been found to be in error. I can be reached at (407) 826-5314 if there are any questions or problems with the enclosed electronic deliverables.

Signature:_____ Title: Quality Assurance Manager Date:11/05/21

ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Thursday, November 18, 2021
Tetra Tech, Inc. (TE016)
Attn: Alex Murphy
11 Riverside Drive, Suite 204
Cocoa, FL 32922

RE: Laboratory Results for
Project Number: 112G08970, Project Name/Desc: NASA KSC CRCA
ENCO Workorder(s): AE09032

Dear Alex Murphy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Thursday, November 11, 2021.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Kaitlin Dylnicki

Project Manager

Enclosure(s)

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: CRCA-ASEFFLUENT-20211110 **Lab ID: AE09032-01** **Sampled: 11/10/21 09:30** **Received: 11/11/21 15:25**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	11/24/21	11/12/21 12:20	11/13/21 05:27

Client ID: CRCA-ASEFFLUENT-20211110 **Lab ID: AE09032-01RE1** **Sampled: 11/10/21 09:30** **Received: 11/11/21 15:25**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	11/24/21	11/16/21 11:14	11/16/21 16:22

Client ID: CRCA-ASINFLUENT-20211110 **Lab ID: AE09032-02** **Sampled: 11/10/21 09:40** **Received: 11/11/21 15:25**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	11/24/21	11/17/21 09:02	11/17/21 10:19

Client ID: CRCA-ASINFLUENT-20211110 **Lab ID: AE09032-02RE1** **Sampled: 11/10/21 09:40** **Received: 11/11/21 15:25**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	11/24/21	11/18/21 00:00	11/18/21 12:04

SAMPLE DETECTION SUMMARY

Client ID: CRCA-ASEFFLUENT-20211110 **Lab ID:** AE09032-01RE1

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	15	I	10	25	ug/L	EPA 8260D	
Bromomethane	1.3	I	0.95	2.5	ug/L	EPA 8260D	QR-02
Chloromethane	26		0.82	2.5	ug/L	EPA 8260D	

Client ID: CRCA-ASINFLUENT-20211110 **Lab ID:** AE09032-02

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	25		10	25	ug/L	EPA 8260D	
Methyl acetate	5.5		0.95	2.5	ug/L	EPA 8260D	
o-Xylene	16		0.53	2.5	ug/L	EPA 8260D	QM-07
Vinyl chloride	3.0		0.71	2.5	ug/L	EPA 8260D	
Xylenes (Total)	16		1.3	5.0	ug/L	EPA 8260D	

Client ID: CRCA-ASINFLUENT-20211110 **Lab ID:** AE09032-02RE1

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Chloromethane	48		0.82	2.5	ug/L	EPA 8260D	

ANALYTICAL RESULTS

Description: CRCA-ASEFFLUENT-20211110 **Lab Sample ID:** AE09032-01 **Received:** 11/11/21 15:25

Matrix: Ground Water **Sampled:** 11/10/21 09:30 **Work Order:** AE09032

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	QV-01
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	1K12031	EPA 8260D	11/13/21 05:27	nmc	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	1K12031	EPA 8260D	11/13/21 05:27	nmc	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Acetone [67-64-1]^	**15**	I	ug/L	1	10	25	1K16028	EPA 8260D	11/16/21 16:22	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Bromomethane [74-83-9]^	**1.3**	I	ug/L	1	0.95	2.5	1K16028	EPA 8260D	11/16/21 16:22	KKW	QR-02
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	1K12031	EPA 8260D	11/13/21 05:27	nmc	QL-02, QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	QV-01
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Chloromethane [74-87-3]^	**26**		ug/L	1	0.82	2.5	1K16028	EPA 8260D	11/16/21 16:22	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	QV-01
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	

ANALYTICAL RESULTS

Description: CRCA-ASEFFLUENT-20211110 **Lab Sample ID:** AE09032-01 **Received:** 11/11/21 15:25

Matrix: Ground Water **Sampled:** 11/10/21 09:30 **Work Order:** AE09032

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	QV-01, QL-02
Vinyl chloride [75-01-4]^	0.71	U	ug/L	1	0.71	2.5	1K12031	EPA 8260D	11/13/21 05:27	nmc	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	1K12031	EPA 8260D	11/13/21 05:27	nmc	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*42*	*1*	*50.0*	*84 %*	*41-142*	*1K12031*	*EPA 8260D*	*11/13/21 05:27*	*nmc*	
4-Bromofluorobenzene	*52*	*1*	*50.0*	*105 %*	*41-142*	*1K16028*	*EPA 8260D*	*11/16/21 16:22*	*KKW*	
Dibromofluoromethane	*45*	*1*	*50.0*	*90 %*	*53-146*	*1K12031*	*EPA 8260D*	*11/13/21 05:27*	*nmc*	
Dibromofluoromethane	*50*	*1*	*50.0*	*100 %*	*53-146*	*1K16028*	*EPA 8260D*	*11/16/21 16:22*	*KKW*	
Toluene-d8	*47*	*1*	*50.0*	*93 %*	*41-146*	*1K12031*	*EPA 8260D*	*11/13/21 05:27*	*nmc*	
Toluene-d8	*52*	*1*	*50.0*	*104 %*	*41-146*	*1K16028*	*EPA 8260D*	*11/16/21 16:22*	*KKW*	

ANALYTICAL RESULTS

Description: CRCA-ASINFLUENT-20211110 **Lab Sample ID:** AE09032-02 **Received:** 11/11/21 15:25

Matrix: Ground Water **Sampled:** 11/10/21 09:40 **Work Order:** AE09032

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	1K17014	EPA 8260D	11/17/21 10:19	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	1K17014	EPA 8260D	11/17/21 10:19	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Acetone [67-64-1]^	**25**		ug/L	1	10	25	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Chloromethane [74-87-3]^	**48**		ug/L	1	0.82	2.5	1K18005	EPA 8260D	11/18/21 12:04	nmc	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Methyl acetate [79-20-9]^	**5.5**		ug/L	1	0.95	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
o-Xylene [95-47-6]^	**16**		ug/L	1	0.53	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	QM-07
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	

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ANALYTICAL RESULTS

Description: CRCA-ASINFLUENT-20211110 **Lab Sample ID:** AE09032-02 **Received:** 11/11/21 15:25

Matrix: Ground Water **Sampled:** 11/10/21 09:40 **Work Order:** AE09032

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Vinyl chloride [75-01-4]^	**3.0**		ug/L	1	0.71	2.5	1K17014	EPA 8260D	11/17/21 10:19	KKW	
Xylenes (Total) [1330-20-7]	**16**		ug/L	1	1.3	5.0	1K17014	EPA 8260D	11/17/21 10:19	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*54*	*1*	*50.0*	*107 %*	*41-142*	*1K17014*	*EPA 8260D*	*11/17/21 10:19*	*KKW*	
4-Bromofluorobenzene	*40*	*1*	*50.0*	*81 %*	*41-142*	*1K18005*	*EPA 8260D*	*11/18/21 12:04*	*nmc*	
Dibromofluoromethane	*50*	*1*	*50.0*	*100 %*	*53-146*	*1K17014*	*EPA 8260D*	*11/17/21 10:19*	*KKW*	
Dibromofluoromethane	*43*	*1*	*50.0*	*86 %*	*53-146*	*1K18005*	*EPA 8260D*	*11/18/21 12:04*	*nmc*	
Toluene-d8	*52*	*1*	*50.0*	*105 %*	*41-146*	*1K17014*	*EPA 8260D*	*11/17/21 10:19*	*KKW*	
Toluene-d8	*44*	*1*	*50.0*	*87 %*	*41-146*	*1K18005*	*EPA 8260D*	*11/18/21 12:04*	*nmc*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K12031 - EPA 5030B_MS

Blank (1K12031-BLK1) Prepared: 11/12/2021 12:20 Analyzed: 11/12/2021 23:41

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.80	U	2.5	ug/L							
1,1,2,2-Tetrachloroethane	0.54	U	2.5	ug/L							
1,1,2-Trichloroethane	0.76	U	2.5	ug/L							
1,1-Dichloroethane	0.62	U	2.5	ug/L							
1,1-Dichloroethene	0.94	U	2.5	ug/L							
1,2,4-Trichlorobenzene	0.70	U	2.5	ug/L							
1,2-Dibromo-3-chloropropane	0.96	U	2.5	ug/L							
1,2-Dibromoethane	0.78	U	2.5	ug/L							
1,2-Dichlorobenzene	0.73	U	2.5	ug/L							
1,2-Dichloroethane	0.63	U	2.5	ug/L							
1,2-Dichloropropane	0.80	U	2.5	ug/L							
1,3-Dichlorobenzene	0.77	U	2.5	ug/L							
1,4-Dichlorobenzene	0.76	U	2.5	ug/L							
2-Butanone	4.5	U	12	ug/L							
2-Hexanone	2.5	U	12	ug/L							
4-Methyl-2-pentanone	2.5	U	12	ug/L							
Acetone	10	U	25	ug/L							
Benzene	0.71	U	2.5	ug/L							
Bromodichloromethane	0.52	U	2.5	ug/L							
Bromoform	0.75	U	2.5	ug/L							
Bromomethane	0.95	U	2.5	ug/L							
Carbon disulfide	2.5	U	12	ug/L							
Carbon Tetrachloride	0.94	U	2.5	ug/L							
Chlorobenzene	0.72	U	2.5	ug/L							
Chloroethane	0.98	U	2.5	ug/L							
Chloroform	0.80	U	2.5	ug/L							
Chloromethane	0.82	U	2.5	ug/L							
cis-1,2-Dichloroethene	0.53	U	2.5	ug/L							
cis-1,3-Dichloropropene	0.59	U	2.5	ug/L							
Cyclohexane	0.93	U	2.5	ug/L							
Dibromochloromethane	0.50	U	2.5	ug/L							
Dichlorodifluoromethane	0.74	U	2.5	ug/L							
Ethylbenzene	0.69	U	2.5	ug/L							
Freon 113	0.73	U	2.5	ug/L							
Isopropylbenzene	0.67	U	2.5	ug/L							
m,p-Xylenes	1.3	U	5.0	ug/L							
Methyl acetate	0.95	U	2.5	ug/L							
Methyl cyclohexane	0.64	U	2.5	ug/L							
Methylene Chloride	2.5	U	12	ug/L							
Methyl-tert-Butyl Ether	0.60	U	2.5	ug/L							
o-Xylene	0.53	U	2.5	ug/L							
Styrene	0.61	U	2.5	ug/L							
Tetrachloroethene	0.76	U	2.5	ug/L							
Toluene	0.72	U	2.5	ug/L							
trans-1,2-Dichloroethene	0.73	U	2.5	ug/L							
trans-1,3-Dichloropropene	0.73	U	2.5	ug/L							
Trichloroethene	0.89	U	2.5	ug/L							
Trichlorofluoromethane	0.94	U	2.5	ug/L							
Vinyl chloride	0.71	U	2.5	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K12031 - EPA 5030B_MS - Continued

Blank (1K12031-BLK1) Continued Prepared: 11/12/2021 12:20 Analyzed: 11/12/2021 23:41

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Xylenes (Total)	1.3	U	5.0	ug/L							
4-Bromofluorobenzene	*41*	*I*		*ug/L*	*50.0*		*82*	*41-142*			
Dibromofluoromethane	*45*	*I*		*ug/L*	*50.0*		*89*	*53-146*			
Toluene-d8	*45*	*I*		*ug/L*	*50.0*		*91*	*41-146*			

LCS (1K12031-BS1) Prepared: 11/12/2021 12:20 Analyzed: 11/12/2021 21:18

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	21		2.5	ug/L	20.0		106	57-148			
1,1,2,2-Tetrachloroethane	15		2.5	ug/L	20.0		74	60-139			
1,1,2-Trichloroethane	16		2.5	ug/L	20.0		79	57-141			
1,1-Dichloroethane	23		2.5	ug/L	20.0		116	57-142			
1,1-Dichloroethene	21		2.5	ug/L	20.0		106	47-139			
1,2,4-Trichlorobenzene	17		2.5	ug/L	20.0		87	52-159			
1,2-Dibromo-3-chloropropane	18		2.5	ug/L	20.0		89	48-150			
1,2-Dibromoethane	15		2.5	ug/L	20.0		76	57-140			
1,2-Dichlorobenzene	17		2.5	ug/L	20.0		86	63-131			
1,2-Dichloroethane	23		2.5	ug/L	20.0		117	50-156			
1,2-Dichloropropane	20		2.5	ug/L	20.0		102	61-133			
1,3-Dichlorobenzene	17		2.5	ug/L	20.0		85	66-129			
1,4-Dichlorobenzene	17		2.5	ug/L	20.0		86	65-133			
2-Butanone	130		12	ug/L	100		134	10-180			
2-Hexanone	110		12	ug/L	100		113	12-180			
4-Methyl-2-pentanone	86		12	ug/L	100		86	19-180			
Acetone	120		25	ug/L	100		119	10-180			
Benzene	21		2.5	ug/L	20.0		105	56-136			
Bromodichloromethane	21		2.5	ug/L	20.0		103	58-135			
Bromoform	14		2.5	ug/L	20.0		72	46-148			
Bromomethane	20		2.5	ug/L	20.0		99	10-173			
Carbon disulfide	39		12	ug/L	20.0		196	43-153			QL-02
Carbon Tetrachloride	19		2.5	ug/L	20.0		96	54-156			
Chlorobenzene	16		2.5	ug/L	20.0		81	51-139			
Chloroethane	36		2.5	ug/L	20.0		178	27-180			
Chloroform	22		2.5	ug/L	20.0		109	58-139			
Chloromethane	23		2.5	ug/L	20.0		114	33-154			
cis-1,2-Dichloroethene	19		2.5	ug/L	20.0		96	56-128			
cis-1,3-Dichloropropene	18		2.5	ug/L	20.0		92	64-128			
Cyclohexane	25		2.5	ug/L	20.0		124	70-130			
Dibromochloromethane	14		2.5	ug/L	20.0		69	50-140			
Dichlorodifluoromethane	27		2.5	ug/L	20.0		137	10-180			
Ethylbenzene	16		2.5	ug/L	20.0		79	63-133			
Freon 113	21		2.5	ug/L	20.0		106	47-173			
Isopropylbenzene	16		2.5	ug/L	20.0		81	60-132			
m,p-Xylenes	32		5.0	ug/L	40.0		80	64-133			
Methyl acetate	20		2.5	ug/L	20.0		102	70-130			
Methyl cyclohexane	25		2.5	ug/L	20.0		123	70-130			
Methylene Chloride	22		12	ug/L	20.0		110	43-142			
Methyl-tert-Butyl Ether	22		2.5	ug/L	20.0		109	51-145			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K12031 - EPA 5030B_MS - Continued

LCS (1K12031-BS1) Continued Prepared: 11/12/2021 12:20 Analyzed: 11/12/2021 21:18

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Xylene	16		2.5	ug/L	20.0		80	61-129			
Styrene	16		2.5	ug/L	20.0		79	59-136			
Tetrachloroethene	26		2.5	ug/L	20.0		131	60-147			
Toluene	17		2.5	ug/L	20.0		83	64-131			
trans-1,2-Dichloroethene	19		2.5	ug/L	20.0		97	54-134			
trans-1,3-Dichloropropene	16		2.5	ug/L	20.0		82	65-149			
Trichloroethene	20		2.5	ug/L	20.0		99	62-135			
Trichlorofluoromethane	33		2.5	ug/L	20.0		165	56-155			QL-02
Vinyl chloride	28		2.5	ug/L	20.0		140	20-167			
4-Bromofluorobenzene	*42*	*I*		*ug/L*	*50.0*		*84*	*41-142*			
Dibromofluoromethane	*44*	*I*		*ug/L*	*50.0*		*87*	*53-146*			
Toluene-d8	*45*	*I*		*ug/L*	*50.0*		*90*	*41-146*			

Matrix Spike (1K12031-MS1) Prepared: 11/12/2021 12:20 Analyzed: 11/12/2021 21:46

Source: AE07280-36

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	26		2.5	ug/L	20.0	0.80 U	129	57-148			
1,1,2,2-Tetrachloroethane	17		2.5	ug/L	20.0	0.54 U	84	60-139			
1,1,2-Trichloroethane	17		2.5	ug/L	20.0	0.76 U	87	57-141			
1,1-Dichloroethane	27		2.5	ug/L	20.0	0.62 U	135	57-142			
1,1-Dichloroethene	25		2.5	ug/L	20.0	0.94 U	126	47-139			
1,2,4-Trichlorobenzene	18		2.5	ug/L	20.0	0.70 U	90	52-159			
1,2-Dibromo-3-chloropropane	19		2.5	ug/L	20.0	0.96 U	95	48-150			
1,2-Dibromoethane	17		2.5	ug/L	20.0	0.78 U	84	57-140			
1,2-Dichlorobenzene	19		2.5	ug/L	20.0	0.73 U	95	63-131			
1,2-Dichloroethane	26		2.5	ug/L	20.0	0.63 U	131	50-156			
1,2-Dichloropropane	23		2.5	ug/L	20.0	0.80 U	116	61-133			
1,3-Dichlorobenzene	19		2.5	ug/L	20.0	0.77 U	95	66-129			
1,4-Dichlorobenzene	19		2.5	ug/L	20.0	0.76 U	97	65-133			
2-Butanone	150		12	ug/L	100	4.5 U	148	10-180			
2-Hexanone	130		12	ug/L	100	2.5 U	125	12-180			
4-Methyl-2-pentanone	95		12	ug/L	100	2.5 U	95	19-180			
Acetone	130		25	ug/L	100	10 U	128	10-180			
Benzene	24		2.5	ug/L	20.0	0.71 U	121	56-136			
Bromodichloromethane	24		2.5	ug/L	20.0	0.52 U	118	58-135			
Bromoform	16		2.5	ug/L	20.0	0.75 U	80	46-148			
Bromomethane	22		2.5	ug/L	20.0	0.95 U	108	10-173			
Carbon disulfide	41		12	ug/L	20.0	2.5 U	206	43-153			QM-19
Carbon Tetrachloride	23		2.5	ug/L	20.0	0.94 U	115	54-156			
Chlorobenzene	18		2.5	ug/L	20.0	0.72 U	92	51-139			
Chloroethane	31		2.5	ug/L	20.0	0.98 U	157	27-180			
Chloroform	25		2.5	ug/L	20.0	0.80 U	125	58-139			
Chloromethane	21		2.5	ug/L	20.0	0.82 U	105	33-154			
cis-1,2-Dichloroethene	22		2.5	ug/L	20.0	0.53 U	111	56-128			
cis-1,3-Dichloropropene	21		2.5	ug/L	20.0	0.59 U	105	64-128			
Cyclohexane	29		2.5	ug/L	20.0	0.93 U	146	70-130			QM-07
Dibromochloromethane	15		2.5	ug/L	20.0	0.50 U	77	50-140			
Dichlorodifluoromethane	24		2.5	ug/L	20.0	0.74 U	122	10-180			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K12031 - EPA 5030B_MS - Continued

Matrix Spike (1K12031-MS1) Continued Prepared: 11/12/2021 12:20 Analyzed: 11/12/2021 21:46

Source: AE07280-36

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethylbenzene	18		2.5	ug/L	20.0	0.69 U	92	63-133			
Freon 113	25		2.5	ug/L	20.0	0.73 U	125	47-173			
Isopropylbenzene	19		2.5	ug/L	20.0	0.67 U	94	60-132			
m,p-Xylenes	37		5.0	ug/L	40.0	1.3 U	92	64-133			
Methyl acetate	22		2.5	ug/L	20.0	0.95 U	109	70-130			
Methyl cyclohexane	29		2.5	ug/L	20.0	0.64 U	144	70-130			QM-07
Methylene Chloride	23		12	ug/L	20.0	2.5 U	116	43-142			
Methyl-tert-Butyl Ether	24		2.5	ug/L	20.0	0.60 U	122	51-145			
o-Xylene	18		2.5	ug/L	20.0	0.53 U	90	61-129			
Styrene	18		2.5	ug/L	20.0	0.61 U	89	59-136			
Tetrachloroethene	18		2.5	ug/L	20.0	0.76 U	88	60-147			
Toluene	19		2.5	ug/L	20.0	0.72 U	94	64-131			
trans-1,2-Dichloroethene	23		2.5	ug/L	20.0	0.73 U	117	54-134			
trans-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.73 U	89	65-149			
Trichloroethene	48		2.5	ug/L	20.0	23	125	62-135			
Trichlorofluoromethane	30		2.5	ug/L	20.0	0.94 U	148	56-155			
Vinyl chloride	25		2.5	ug/L	20.0	0.71 U	126	20-167			
4-Bromofluorobenzene	*40*	*I*		*ug/L*	*50.0*		*80*	*41-142*			
Dibromofluoromethane	*43*	*I*		*ug/L*	*50.0*		*86*	*53-146*			
Toluene-d8	*45*	*I*		*ug/L*	*50.0*		*89*	*41-146*			

Matrix Spike Dup (1K12031-MSD1) Prepared: 11/12/2021 12:20 Analyzed: 11/12/2021 22:15

Source: AE07280-36

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	26		2.5	ug/L	20.0	0.80 U	129	57-148	0.04	25	
1,1,2,2-Tetrachloroethane	17		2.5	ug/L	20.0	0.54 U	85	60-139	2	17	
1,1,2-Trichloroethane	18		2.5	ug/L	20.0	0.76 U	88	57-141	1	16	
1,1-Dichloroethane	27		2.5	ug/L	20.0	0.62 U	136	57-142	0.6	24	
1,1-Dichloroethene	26		2.5	ug/L	20.0	0.94 U	128	47-139	1	16	
1,2,4-Trichlorobenzene	18		2.5	ug/L	20.0	0.70 U	91	52-159	1	24	
1,2-Dibromo-3-chloropropane	19		2.5	ug/L	20.0	0.96 U	94	48-150	0.8	21	
1,2-Dibromoethane	17		2.5	ug/L	20.0	0.78 U	86	57-140	2	16	
1,2-Dichlorobenzene	19		2.5	ug/L	20.0	0.73 U	97	63-131	2	25	
1,2-Dichloroethane	26		2.5	ug/L	20.0	0.63 U	132	50-156	0.9	18	
1,2-Dichloropropane	24		2.5	ug/L	20.0	0.80 U	118	61-133	2	26	
1,3-Dichlorobenzene	20		2.5	ug/L	20.0	0.77 U	98	66-129	2	23	
1,4-Dichlorobenzene	20		2.5	ug/L	20.0	0.76 U	99	65-133	3	23	
2-Butanone	150		12	ug/L	100	4.5 U	149	10-180	0.7	29	
2-Hexanone	130		12	ug/L	100	2.5 U	128	12-180	2	28	
4-Methyl-2-pentanone	96		12	ug/L	100	2.5 U	96	19-180	0.9	24	
Acetone	130		25	ug/L	100	10 U	130	10-180	1	19	
Benzene	25		2.5	ug/L	20.0	0.71 U	123	56-136	1	14	
Bromodichloromethane	24		2.5	ug/L	20.0	0.52 U	119	58-135	1	19	
Bromoform	16		2.5	ug/L	20.0	0.75 U	81	46-148	2	18	
Bromomethane	24		2.5	ug/L	20.0	0.95 U	122	10-173	13	29	
Carbon disulfide	41		12	ug/L	20.0	2.5 U	204	43-153	1	26	QM-19
Carbon Tetrachloride	23		2.5	ug/L	20.0	0.94 U	116	54-156	2	27	
Chlorobenzene	19		2.5	ug/L	20.0	0.72 U	94	51-139	2	13	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K12031 - EPA 5030B_MS - Continued

Matrix Spike Dup (1K12031-MSD1) Continued Prepared: 11/12/2021 12:20 Analyzed: 11/12/2021 22:15

Source: AE07280-36

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloroethane	32		2.5	ug/L	20.0	0.98 U	162	27-180	3	22	
Chloroform	26		2.5	ug/L	20.0	0.80 U	129	58-139	3	17	
Chloromethane	21		2.5	ug/L	20.0	0.82 U	107	33-154	2	31	
cis-1,2-Dichloroethene	23		2.5	ug/L	20.0	0.53 U	113	56-128	2	17	
cis-1,3-Dichloropropene	21		2.5	ug/L	20.0	0.59 U	107	64-128	2	20	
Cyclohexane	30		2.5	ug/L	20.0	0.93 U	150	70-130	3	20	QM-07
Dibromochloromethane	16		2.5	ug/L	20.0	0.50 U	79	50-140	3	18	
Dichlorodifluoromethane	24		2.5	ug/L	20.0	0.74 U	121	10-180	0.8	26	
Ethylbenzene	19		2.5	ug/L	20.0	0.69 U	95	63-133	3	18	
Freon 113	25		2.5	ug/L	20.0	0.73 U	126	47-173	0.4	30	
Isopropylbenzene	19		2.5	ug/L	20.0	0.67 U	96	60-132	2	23	
m,p-Xylenes	38		5.0	ug/L	40.0	1.3 U	95	64-133	3	18	
Methyl acetate	22		2.5	ug/L	20.0	0.95 U	109	70-130	0.5	20	
Methyl cyclohexane	29		2.5	ug/L	20.0	0.64 U	147	70-130	2	20	QM-07
Methylene Chloride	24		12	ug/L	20.0	2.5 U	118	43-142	2	23	
Methyl-tert-Butyl Ether	25		2.5	ug/L	20.0	0.60 U	124	51-145	2	22	
o-Xylene	18		2.5	ug/L	20.0	0.53 U	92	61-129	2	16	
Styrene	18		2.5	ug/L	20.0	0.61 U	91	59-136	2	32	
Tetrachloroethene	18		2.5	ug/L	20.0	0.76 U	90	60-147	2	21	
Toluene	19		2.5	ug/L	20.0	0.72 U	97	64-131	3	16	
trans-1,2-Dichloroethene	23		2.5	ug/L	20.0	0.73 U	115	54-134	2	20	
trans-1,3-Dichloropropene	19		2.5	ug/L	20.0	0.73 U	94	65-149	5	17	
Trichloroethene	49		2.5	ug/L	20.0	23	130	62-135	2	20	
Trichlorofluoromethane	30		2.5	ug/L	20.0	0.94 U	149	56-155	0.9	22	
Vinyl chloride	26		2.5	ug/L	20.0	0.71 U	129	20-167	2	24	
4-Bromofluorobenzene	*41*	*I*		*ug/L*	*50.0*		*83*	*41-142*			
Dibromofluoromethane	*44*	*I*		*ug/L*	*50.0*		*88*	*53-146*			
Toluene-d8	*45*	*I*		*ug/L*	*50.0*		*90*	*41-146*			

Batch 1K16028 - EPA 5030B_MS

Blank (1K16028-BLK1) Prepared: 11/16/2021 00:00 Analyzed: 11/16/2021 14:31

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.80	U	2.5	ug/L							
1,1,2,2-Tetrachloroethane	0.54	U	2.5	ug/L							
1,1,2-Trichloroethane	0.76	U	2.5	ug/L							
1,1-Dichloroethane	0.62	U	2.5	ug/L							
1,1-Dichloroethene	0.94	U	2.5	ug/L							
1,2,4-Trichlorobenzene	0.70	U	2.5	ug/L							
1,2-Dibromo-3-chloropropane	0.96	U	2.5	ug/L							
1,2-Dibromoethane	0.78	U	2.5	ug/L							
1,2-Dichlorobenzene	0.73	U	2.5	ug/L							
1,2-Dichloroethane	0.63	U	2.5	ug/L							
1,2-Dichloropropane	0.80	U	2.5	ug/L							
1,3-Dichlorobenzene	0.77	U	2.5	ug/L							
1,4-Dichlorobenzene	0.76	U	2.5	ug/L							
2-Butanone	4.5	U	12	ug/L							
2-Hexanone	2.5	U	12	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K16028 - EPA 5030B_MS - Continued

Blank (1K16028-BLK1) Continued Prepared: 11/16/2021 00:00 Analyzed: 11/16/2021 14:31

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4-Methyl-2-pentanone	2.5	U	12	ug/L							
Acetone	10	U	25	ug/L							
Benzene	0.71	U	2.5	ug/L							
Bromodichloromethane	0.52	U	2.5	ug/L							
Bromoform	0.75	U	2.5	ug/L							
Bromomethane	0.95	U	2.5	ug/L							
Carbon disulfide	2.5	U	12	ug/L							
Carbon Tetrachloride	0.94	U	2.5	ug/L							
Chlorobenzene	0.72	U	2.5	ug/L							
Chloroethane	0.98	U	2.5	ug/L							
Chloroform	0.80	U	2.5	ug/L							
Chloromethane	0.82	U	2.5	ug/L							
cis-1,2-Dichloroethene	0.53	U	2.5	ug/L							
cis-1,3-Dichloropropene	0.59	U	2.5	ug/L							
Cyclohexane	0.93	U	2.5	ug/L							
Dibromochloromethane	0.50	U	2.5	ug/L							
Dichlorodifluoromethane	0.74	U	2.5	ug/L							
Ethylbenzene	0.69	U	2.5	ug/L							
Freon 113	0.73	U	2.5	ug/L							
Isopropylbenzene	0.67	U	2.5	ug/L							
m,p-Xylenes	1.3	U	5.0	ug/L							
Methyl acetate	0.95	U	2.5	ug/L							
Methyl cyclohexane	0.64	U	2.5	ug/L							
Methylene Chloride	2.5	U	12	ug/L							
Methyl-tert-Butyl Ether	0.60	U	2.5	ug/L							
o-Xylene	0.53	U	2.5	ug/L							
Styrene	0.61	U	2.5	ug/L							
Tetrachloroethene	0.76	U	2.5	ug/L							
Toluene	0.72	U	2.5	ug/L							
trans-1,2-Dichloroethene	0.73	U	2.5	ug/L							
trans-1,3-Dichloropropene	0.73	U	2.5	ug/L							
Trichloroethene	0.89	U	2.5	ug/L							
Trichlorofluoromethane	0.94	U	2.5	ug/L							
Vinyl chloride	0.71	U	2.5	ug/L							
Xylenes (Total)	1.3	U	5.0	ug/L							
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*104*	*41-142*			
Dibromofluoromethane	*49*	*I*		*ug/L*	*50.0*		*99*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*104*	*41-146*			

LCS (1K16028-BS1) Prepared: 11/16/2021 00:00 Analyzed: 11/16/2021 09:19

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	19		2.5	ug/L	20.0		97	57-148			
1,1,2,2-Tetrachloroethane	21		2.5	ug/L	20.0		103	60-139			
1,1,2-Trichloroethane	21		2.5	ug/L	20.0		105	57-141			
1,1-Dichloroethane	20		2.5	ug/L	20.0		98	57-142			
1,1-Dichloroethene	20		2.5	ug/L	20.0		101	47-139			
1,2,4-Trichlorobenzene	22		2.5	ug/L	20.0		112	52-159			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K16028 - EPA 5030B_MS - Continued

LCS (1K16028-BS1) Continued Prepared: 11/16/2021 00:00 Analyzed: 11/16/2021 09:19

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dibromo-3-chloropropane	18		2.5	ug/L	20.0		92	48-150			
1,2-Dibromoethane	20		2.5	ug/L	20.0		100	57-140			
1,2-Dichlorobenzene	20		2.5	ug/L	20.0		102	63-131			
1,2-Dichloroethane	19		2.5	ug/L	20.0		93	50-156			
1,2-Dichloropropane	20		2.5	ug/L	20.0		99	61-133			
1,3-Dichlorobenzene	21		2.5	ug/L	20.0		103	66-129			
1,4-Dichlorobenzene	19		2.5	ug/L	20.0		96	65-133			
2-Butanone	95		12	ug/L	100		95	10-180			
2-Hexanone	87		12	ug/L	100		87	12-180			
4-Methyl-2-pentanone	97		12	ug/L	100		97	19-180			
Acetone	84		25	ug/L	100		84	10-180			
Benzene	21		2.5	ug/L	20.0		103	56-136			
Bromodichloromethane	17		2.5	ug/L	20.0		86	58-135			
Bromoform	23		2.5	ug/L	20.0		117	46-148			
Bromomethane	10		2.5	ug/L	20.0		51	10-173			QR-02
Carbon disulfide	21		12	ug/L	20.0		106	43-153			
Carbon Tetrachloride	21		2.5	ug/L	20.0		107	54-156			
Chlorobenzene	22		2.5	ug/L	20.0		109	51-139			
Chloroethane	20		2.5	ug/L	20.0		101	27-180			
Chloroform	19		2.5	ug/L	20.0		95	58-139			
Chloromethane	17		2.5	ug/L	20.0		85	33-154			
cis-1,2-Dichloroethene	19		2.5	ug/L	20.0		97	56-128			
cis-1,3-Dichloropropene	17		2.5	ug/L	20.0		87	64-128			
Cyclohexane	22		2.5	ug/L	20.0		109	70-130			
Dibromochloromethane	18		2.5	ug/L	20.0		88	50-140			
Dichlorodifluoromethane	16		2.5	ug/L	20.0		79	10-180			
Ethylbenzene	22		2.5	ug/L	20.0		108	63-133			
Freon 113	21		2.5	ug/L	20.0		104	47-173			
Isopropylbenzene	22		2.5	ug/L	20.0		108	60-132			
m,p-Xylenes	43		5.0	ug/L	40.0		107	64-133			
Methyl acetate	20		2.5	ug/L	20.0		99	70-130			
Methyl cyclohexane	24		2.5	ug/L	20.0		118	70-130			
Methylene Chloride	21		12	ug/L	20.0		103	43-142			
Methyl-tert-Butyl Ether	20		2.5	ug/L	20.0		98	51-145			
o-Xylene	22		2.5	ug/L	20.0		112	61-129			
Styrene	19		2.5	ug/L	20.0		96	59-136			
Tetrachloroethene	20		2.5	ug/L	20.0		99	60-147			
Toluene	21		2.5	ug/L	20.0		104	64-131			
trans-1,2-Dichloroethene	21		2.5	ug/L	20.0		104	54-134			
trans-1,3-Dichloropropene	19		2.5	ug/L	20.0		94	65-149			
Trichloroethene	20		2.5	ug/L	20.0		102	62-135			
Trichlorofluoromethane	17		2.5	ug/L	20.0		87	56-155			
Vinyl chloride	18		2.5	ug/L	20.0		89	20-167			
4-Bromofluorobenzene	*54*			*ug/L*	*50.0*		*108*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*101*	*53-146*			
Toluene-d8	*54*			*ug/L*	*50.0*		*107*	*41-146*			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K16028 - EPA 5030B_MS - Continued

LCS Dup (1K16028-BSD1) Prepared: 11/16/2021 00:00 Analyzed: 11/16/2021 14:03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	20		2.5	ug/L	20.0		100	57-148	3	25	QM-10
1,1,2,2-Tetrachloroethane	20		2.5	ug/L	20.0		100	60-139	3	17	QM-10
1,1,2-Trichloroethane	22		2.5	ug/L	20.0		108	57-141	3	16	QM-10
1,1-Dichloroethane	20		2.5	ug/L	20.0		99	57-142	1	24	QM-10
1,1-Dichloroethene	20		2.5	ug/L	20.0		100	47-139	1	16	QM-10
1,2,4-Trichlorobenzene	21		2.5	ug/L	20.0		105	52-159	6	24	QM-10
1,2-Dibromo-3-chloropropane	20		2.5	ug/L	20.0		99	48-150	7	21	QM-10
1,2-Dibromoethane	21		2.5	ug/L	20.0		103	57-140	3	16	QM-10
1,2-Dichlorobenzene	21		2.5	ug/L	20.0		103	63-131	0.9	25	QM-10
1,2-Dichloroethane	18		2.5	ug/L	20.0		92	50-156	1	18	QM-10
1,2-Dichloropropane	20		2.5	ug/L	20.0		98	61-133	1	26	QM-10
1,3-Dichlorobenzene	21		2.5	ug/L	20.0		103	66-129	0.4	23	QM-10
1,4-Dichlorobenzene	19		2.5	ug/L	20.0		94	65-133	1	23	QM-10
2-Butanone	97		12	ug/L	100		97	10-180	2	29	QM-10
2-Hexanone	89		12	ug/L	100		89	12-180	2	28	QM-10
4-Methyl-2-pentanone	100		12	ug/L	100		100	19-180	3	24	QM-10
Acetone	86		25	ug/L	100		86	10-180	2	19	QM-10
Benzene	21		2.5	ug/L	20.0		104	56-136	1	14	QM-10
Bromodichloromethane	18		2.5	ug/L	20.0		88	58-135	2	19	QM-10
Bromoform	23		2.5	ug/L	20.0		114	46-148	2	18	QM-10
Bromomethane	17		2.5	ug/L	20.0		86	10-173	51	29	QR-02, QM-10
Carbon disulfide	21		12	ug/L	20.0		105	43-153	0.8	26	QM-10
Carbon Tetrachloride	22		2.5	ug/L	20.0		111	54-156	4	27	QM-10
Chlorobenzene	22		2.5	ug/L	20.0		108	51-139	1	13	QM-10
Chloroethane	20		2.5	ug/L	20.0		100	27-180	0.8	22	QM-10
Chloroform	19		2.5	ug/L	20.0		95	58-139	0.4	17	QM-10
Chloromethane	17		2.5	ug/L	20.0		85	33-154	0.9	31	QM-10
cis-1,2-Dichloroethene	21		2.5	ug/L	20.0		103	56-128	6	17	QM-10
cis-1,3-Dichloropropene	17		2.5	ug/L	20.0		84	64-128	5	20	QM-10
Cyclohexane	23		2.5	ug/L	20.0		114	70-130	5	20	QM-10
Dibromochloromethane	18		2.5	ug/L	20.0		88	50-140	0.3	18	QM-10
Dichlorodifluoromethane	16		2.5	ug/L	20.0		78	10-180	2	26	QM-10
Ethylbenzene	22		2.5	ug/L	20.0		109	63-133	1	18	QM-10
Freon 113	20		2.5	ug/L	20.0		100	47-173	4	30	QM-10
Isopropylbenzene	21		2.5	ug/L	20.0		107	60-132	1	23	QM-10
m,p-Xylenes	42		5.0	ug/L	40.0		105	64-133	1	18	QM-10
Methyl acetate	21		2.5	ug/L	20.0		103	70-130	3	20	QM-10
Methyl cyclohexane	23		2.5	ug/L	20.0		116	70-130	2	20	QM-10
Methylene Chloride	21		12	ug/L	20.0		105	43-142	2	23	QM-10
Methyl-tert-Butyl Ether	20		2.5	ug/L	20.0		101	51-145	3	22	QM-10
o-Xylene	22		2.5	ug/L	20.0		109	61-129	3	16	QM-10
Styrene	19		2.5	ug/L	20.0		95	59-136	2	32	QM-10
Tetrachloroethene	26		2.5	ug/L	20.0		130	60-147	27	21	QM-10
Toluene	21		2.5	ug/L	20.0		103	64-131	2	16	QM-10
trans-1,2-Dichloroethene	21		2.5	ug/L	20.0		105	54-134	1	20	QM-10
trans-1,3-Dichloropropene	19		2.5	ug/L	20.0		93	65-149	2	17	QM-10
Trichloroethene	19		2.5	ug/L	20.0		97	62-135	6	20	QM-10
Trichlorofluoromethane	17		2.5	ug/L	20.0		86	56-155	1	22	QM-10

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K16028 - EPA 5030B_MS - Continued

LCS Dup (1K16028-BSD1) Continued Prepared: 11/16/2021 00:00 Analyzed: 11/16/2021 14:03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Vinyl chloride	17		2.5	ug/L	20.0		86	20-167	3	24	QM-10
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*105*	*41-142*			*QM-10*
Dibromofluoromethane	*50*			*ug/L*	*50.0*		*101*	*53-146*			*QM-10*
Toluene-d8	*53*			*ug/L*	*50.0*		*106*	*41-146*			*QM-10*

Batch 1K17014 - EPA 5030B_MS

Blank (1K17014-BLK1) Prepared: 11/17/2021 00:00 Analyzed: 11/17/2021 09:51

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.80	U	2.5	ug/L							
1,1,2,2-Tetrachloroethane	0.54	U	2.5	ug/L							
1,1,2-Trichloroethane	0.76	U	2.5	ug/L							
1,1-Dichloroethane	0.62	U	2.5	ug/L							
1,1-Dichloroethene	0.94	U	2.5	ug/L							
1,2,4-Trichlorobenzene	0.70	U	2.5	ug/L							
1,2-Dibromo-3-chloropropane	0.96	U	2.5	ug/L							
1,2-Dibromoethane	0.78	U	2.5	ug/L							
1,2-Dichlorobenzene	0.73	U	2.5	ug/L							
1,2-Dichloroethane	0.63	U	2.5	ug/L							
1,2-Dichloropropane	0.80	U	2.5	ug/L							
1,3-Dichlorobenzene	0.77	U	2.5	ug/L							
1,4-Dichlorobenzene	0.76	U	2.5	ug/L							
2-Butanone	4.5	U	12	ug/L							
2-Hexanone	2.5	U	12	ug/L							
4-Methyl-2-pentanone	2.5	U	12	ug/L							
Acetone	10	U	25	ug/L							
Benzene	0.71	U	2.5	ug/L							
Bromodichloromethane	0.52	U	2.5	ug/L							
Bromoform	0.75	U	2.5	ug/L							
Bromomethane	0.95	U	2.5	ug/L							
Carbon disulfide	2.5	U	12	ug/L							
Carbon Tetrachloride	0.94	U	2.5	ug/L							
Chlorobenzene	0.72	U	2.5	ug/L							
Chloroethane	0.98	U	2.5	ug/L							
Chloroform	0.80	U	2.5	ug/L							
Chloromethane	0.82	U	2.5	ug/L							
cis-1,2-Dichloroethene	0.53	U	2.5	ug/L							
cis-1,3-Dichloropropene	0.59	U	2.5	ug/L							
Cyclohexane	0.93	U	2.5	ug/L							
Dibromochloromethane	0.50	U	2.5	ug/L							
Dichlorodifluoromethane	0.74	U	2.5	ug/L							
Ethylbenzene	0.69	U	2.5	ug/L							
Freon 113	0.73	U	2.5	ug/L							
Isopropylbenzene	0.67	U	2.5	ug/L							
m,p-Xylenes	1.3	U	5.0	ug/L							
Methyl acetate	0.95	U	2.5	ug/L							
Methyl cyclohexane	0.64	U	2.5	ug/L							
Methylene Chloride	2.5	U	12	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K17014 - EPA 5030B_MS - Continued

Blank (1K17014-BLK1) Continued Prepared: 11/17/2021 00:00 Analyzed: 11/17/2021 09:51

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Methyl-tert-Butyl Ether	0.60	U	2.5	ug/L							
o-Xylene	0.53	U	2.5	ug/L							
Styrene	0.61	U	2.5	ug/L							
Tetrachloroethene	0.76	U	2.5	ug/L							
Toluene	0.72	U	2.5	ug/L							
trans-1,2-Dichloroethene	0.73	U	2.5	ug/L							
trans-1,3-Dichloropropene	0.73	U	2.5	ug/L							
Trichloroethene	0.89	U	2.5	ug/L							
Trichlorofluoromethane	0.94	U	2.5	ug/L							
Vinyl chloride	0.71	U	2.5	ug/L							
Xylenes (Total)	1.3	U	5.0	ug/L							
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*104*	*41-142*			
Dibromofluoromethane	*49*	*I*		*ug/L*	*50.0*		*98*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*105*	*41-146*			

LCS (1K17014-BS1) Prepared: 11/17/2021 00:00 Analyzed: 11/17/2021 08:56

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	21		2.5	ug/L	20.0		104	57-148			
1,1,2,2-Tetrachloroethane	20		2.5	ug/L	20.0		102	60-139			
1,1,2-Trichloroethane	21		2.5	ug/L	20.0		105	57-141			
1,1-Dichloroethane	20		2.5	ug/L	20.0		101	57-142			
1,1-Dichloroethene	20		2.5	ug/L	20.0		100	47-139			
1,2,4-Trichlorobenzene	21		2.5	ug/L	20.0		104	52-159			
1,2-Dibromo-3-chloropropane	20		2.5	ug/L	20.0		99	48-150			
1,2-Dibromoethane	20		2.5	ug/L	20.0		102	57-140			
1,2-Dichlorobenzene	20		2.5	ug/L	20.0		101	63-131			
1,2-Dichloroethane	18		2.5	ug/L	20.0		89	50-156			
1,2-Dichloropropane	20		2.5	ug/L	20.0		101	61-133			
1,3-Dichlorobenzene	20		2.5	ug/L	20.0		101	66-129			
1,4-Dichlorobenzene	19		2.5	ug/L	20.0		96	65-133			
2-Butanone	96		12	ug/L	100		96	10-180			
2-Hexanone	86		12	ug/L	100		86	12-180			
4-Methyl-2-pentanone	100		12	ug/L	100		102	19-180			
Acetone	83		25	ug/L	100		83	10-180			
Benzene	21		2.5	ug/L	20.0		104	56-136			
Bromodichloromethane	17		2.5	ug/L	20.0		87	58-135			
Bromoform	23		2.5	ug/L	20.0		114	46-148			
Bromomethane	6.5		2.5	ug/L	20.0		32	10-173			
Carbon disulfide	22		12	ug/L	20.0		108	43-153			
Carbon Tetrachloride	21		2.5	ug/L	20.0		106	54-156			
Chlorobenzene	21		2.5	ug/L	20.0		107	51-139			
Chloroethane	21		2.5	ug/L	20.0		105	27-180			
Chloroform	19		2.5	ug/L	20.0		93	58-139			
Chloromethane	16		2.5	ug/L	20.0		82	33-154			
cis-1,2-Dichloroethene	20		2.5	ug/L	20.0		99	56-128			
cis-1,3-Dichloropropene	17		2.5	ug/L	20.0		86	64-128			
Cyclohexane	23		2.5	ug/L	20.0		113	70-130			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K17014 - EPA 5030B_MS - Continued

LCS (1K17014-BS1) Continued Prepared: 11/17/2021 00:00 Analyzed: 11/17/2021 08:56

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Dibromochloromethane	18		2.5	ug/L	20.0		90	50-140			
Dichlorodifluoromethane	15		2.5	ug/L	20.0		76	10-180			
Ethylbenzene	21		2.5	ug/L	20.0		106	63-133			
Freon 113	20		2.5	ug/L	20.0		102	47-173			
Isopropylbenzene	21		2.5	ug/L	20.0		107	60-132			
m,p-Xylenes	42		5.0	ug/L	40.0		105	64-133			
Methyl acetate	20		2.5	ug/L	20.0		102	70-130			
Methyl cyclohexane	24		2.5	ug/L	20.0		120	70-130			
Methylene Chloride	20		12	ug/L	20.0		102	43-142			
Methyl-tert-Butyl Ether	21		2.5	ug/L	20.0		103	51-145			
o-Xylene	22		2.5	ug/L	20.0		108	61-129			
Styrene	19		2.5	ug/L	20.0		96	59-136			
Tetrachloroethene	21		2.5	ug/L	20.0		106	60-147			
Toluene	20		2.5	ug/L	20.0		101	64-131			
trans-1,2-Dichloroethene	21		2.5	ug/L	20.0		106	54-134			
trans-1,3-Dichloropropene	19		2.5	ug/L	20.0		93	65-149			
Trichloroethene	20		2.5	ug/L	20.0		101	62-135			
Trichlorofluoromethane	18		2.5	ug/L	20.0		89	56-155			
Vinyl chloride	17		2.5	ug/L	20.0		85	20-167			
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*104*	*41-142*			
Dibromofluoromethane	*52*			*ug/L*	*50.0*		*104*	*53-146*			
Toluene-d8	*54*			*ug/L*	*50.0*		*107*	*41-146*			

Matrix Spike (1K17014-MS1) Prepared: 11/17/2021 00:00 Analyzed: 11/17/2021 19:05

Source: AE09032-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	22		2.5	ug/L	20.0	0.80 U	111	57-148			
1,1,2,2-Tetrachloroethane	21		2.5	ug/L	20.0	0.54 U	105	60-139			
1,1,2-Trichloroethane	22		2.5	ug/L	20.0	0.76 U	111	57-141			
1,1-Dichloroethane	21		2.5	ug/L	20.0	0.62 U	106	57-142			
1,1-Dichloroethene	22		2.5	ug/L	20.0	0.94 U	110	47-139			
1,2,4-Trichlorobenzene	22		2.5	ug/L	20.0	0.70 U	109	52-159			
1,2-Dibromo-3-chloropropane	20		2.5	ug/L	20.0	0.96 U	98	48-150			
1,2-Dibromoethane	20		2.5	ug/L	20.0	0.78 U	101	57-140			
1,2-Dichlorobenzene	21		2.5	ug/L	20.0	0.73 U	107	63-131			
1,2-Dichloroethane	19		2.5	ug/L	20.0	0.63 U	96	50-156			
1,2-Dichloropropane	21		2.5	ug/L	20.0	0.80 U	107	61-133			
1,3-Dichlorobenzene	22		2.5	ug/L	20.0	0.77 U	110	66-129			
1,4-Dichlorobenzene	20		2.5	ug/L	20.0	0.76 U	102	65-133			
2-Butanone	110		12	ug/L	100	4.5 U	107	10-180			
2-Hexanone	94		12	ug/L	100	2.5 U	94	12-180			
4-Methyl-2-pentanone	120		12	ug/L	100	2.5 U	116	19-180			
Acetone	100		25	ug/L	100	25	77	10-180			
Benzene	23		2.5	ug/L	20.0	0.71 U	116	56-136			
Bromodichloromethane	19		2.5	ug/L	20.0	0.52 U	93	58-135			
Bromoform	23		2.5	ug/L	20.0	0.75 U	113	46-148			
Bromomethane	13		2.5	ug/L	20.0	0.95 U	67	10-173			
Carbon disulfide	24		12	ug/L	20.0	2.5 U	120	43-153			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K17014 - EPA 5030B_MS - Continued

Matrix Spike (1K17014-MS1) Continued Prepared: 11/17/2021 00:00 Analyzed: 11/17/2021 19:05

Source: AE09032-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Carbon Tetrachloride	28		2.5	ug/L	20.0	0.94 U	142	54-156			
Chlorobenzene	23		2.5	ug/L	20.0	0.72 U	116	51-139			
Chloroethane	19		2.5	ug/L	20.0	0.98 U	97	27-180			
Chloroform	21		2.5	ug/L	20.0	0.80 U	104	58-139			
Chloromethane	78		2.5	ug/L	20.0	39	197	33-154			QM-07
cis-1,2-Dichloroethene	21		2.5	ug/L	20.0	0.53 U	107	56-128			
cis-1,3-Dichloropropene	17		2.5	ug/L	20.0	0.59 U	87	64-128			
Cyclohexane	24		2.5	ug/L	20.0	0.93 U	119	70-130			
Dibromochloromethane	18		2.5	ug/L	20.0	0.50 U	90	50-140			
Dichlorodifluoromethane	18		2.5	ug/L	20.0	0.74 U	90	10-180			
Ethylbenzene	23		2.5	ug/L	20.0	0.69 U	113	63-133			
Freon 113	23		2.5	ug/L	20.0	0.73 U	115	47-173			
Isopropylbenzene	23		2.5	ug/L	20.0	0.67 U	117	60-132			
m,p-Xylenes	47		5.0	ug/L	40.0	1.3 U	118	64-133			
Methyl acetate	21		2.5	ug/L	20.0	5.5	80	70-130			
Methyl cyclohexane	25		2.5	ug/L	20.0	0.64 U	125	70-130			
Methylene Chloride	21		12	ug/L	20.0	2.5 U	106	43-142			
Methyl-tert-Butyl Ether	20		2.5	ug/L	20.0	0.60 U	102	51-145			
o-Xylene	59		2.5	ug/L	20.0	16	213	61-129			QM-07
Styrene	20		2.5	ug/L	20.0	0.61 U	101	59-136			
Tetrachloroethene	22		2.5	ug/L	20.0	0.76 U	109	60-147			
Toluene	22		2.5	ug/L	20.0	0.72 U	110	64-131			
trans-1,2-Dichloroethene	24		2.5	ug/L	20.0	0.73 U	121	54-134			
trans-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.73 U	90	65-149			
Trichloroethene	21		2.5	ug/L	20.0	0.89 U	107	62-135			
Trichlorofluoromethane	20		2.5	ug/L	20.0	0.94 U	98	56-155			
Vinyl chloride	23		2.5	ug/L	20.0	3.0	103	20-167			
4-Bromofluorobenzene	*53*			*ug/L*	*50.0*		*106*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*102*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*107*	*41-146*			

Matrix Spike Dup (1K17014-MSD1) Prepared: 11/17/2021 00:00 Analyzed: 11/17/2021 19:33

Source: AE09032-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	22		2.5	ug/L	20.0	0.80 U	108	57-148	3	25	
1,1,2,2-Tetrachloroethane	21		2.5	ug/L	20.0	0.54 U	104	60-139	0.4	17	
1,1,2-Trichloroethane	22		2.5	ug/L	20.0	0.76 U	109	57-141	2	16	
1,1-Dichloroethane	21		2.5	ug/L	20.0	0.62 U	105	57-142	0.7	24	
1,1-Dichloroethene	22		2.5	ug/L	20.0	0.94 U	109	47-139	0.7	16	
1,2,4-Trichlorobenzene	22		2.5	ug/L	20.0	0.70 U	110	52-159	0.9	24	
1,2-Dibromo-3-chloropropane	20		2.5	ug/L	20.0	0.96 U	98	48-150	0.2	21	
1,2-Dibromoethane	21		2.5	ug/L	20.0	0.78 U	104	57-140	3	16	
1,2-Dichlorobenzene	21		2.5	ug/L	20.0	0.73 U	106	63-131	1	25	
1,2-Dichloroethane	19		2.5	ug/L	20.0	0.63 U	95	50-156	2	18	
1,2-Dichloropropane	21		2.5	ug/L	20.0	0.80 U	106	61-133	0.8	26	
1,3-Dichlorobenzene	22		2.5	ug/L	20.0	0.77 U	108	66-129	2	23	
1,4-Dichlorobenzene	20		2.5	ug/L	20.0	0.76 U	99	65-133	2	23	
2-Butanone	100		12	ug/L	100	4.5 U	102	10-180	5	29	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K17014 - EPA 5030B_MS - Continued

Matrix Spike Dup (1K17014-MSD1) Continued Prepared: 11/17/2021 00:00 Analyzed: 11/17/2021 19:33

Source: AE09032-02

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
2-Hexanone	95		12	ug/L	100	2.5 U	95	12-180	1	28	
4-Methyl-2-pentanone	110		12	ug/L	100	2.5 U	108	19-180	7	24	
Acetone	100		25	ug/L	100	25	75	10-180	1	19	
Benzene	23		2.5	ug/L	20.0	0.71 U	114	56-136	2	14	
Bromodichloromethane	18		2.5	ug/L	20.0	0.52 U	90	58-135	3	19	
Bromoform	22		2.5	ug/L	20.0	0.75 U	112	46-148	1	18	
Bromomethane	16		2.5	ug/L	20.0	0.95 U	80	10-173	18	29	
Carbon disulfide	23		12	ug/L	20.0	2.5 U	114	43-153	5	26	
Carbon Tetrachloride	29		2.5	ug/L	20.0	0.94 U	143	54-156	0.7	27	
Chlorobenzene	22		2.5	ug/L	20.0	0.72 U	112	51-139	3	13	
Chloroethane	22		2.5	ug/L	20.0	0.98 U	108	27-180	11	22	
Chloroform	20		2.5	ug/L	20.0	0.80 U	102	58-139	1	17	
Chloromethane	78		2.5	ug/L	20.0	39	194	33-154	0.8	31	QM-07
cis-1,2-Dichloroethene	21		2.5	ug/L	20.0	0.53 U	107	56-128	0.7	17	
cis-1,3-Dichloropropene	17		2.5	ug/L	20.0	0.59 U	85	64-128	2	20	
Cyclohexane	24		2.5	ug/L	20.0	0.93 U	121	70-130	2	20	
Dibromochloromethane	18		2.5	ug/L	20.0	0.50 U	91	50-140	1	18	
Dichlorodifluoromethane	18		2.5	ug/L	20.0	0.74 U	90	10-180	0.1	26	
Ethylbenzene	22		2.5	ug/L	20.0	0.69 U	111	63-133	2	18	
Freon 113	21		2.5	ug/L	20.0	0.73 U	104	47-173	10	30	
Isopropylbenzene	23		2.5	ug/L	20.0	0.67 U	114	60-132	3	23	
m,p-Xylenes	46		5.0	ug/L	40.0	1.3 U	116	64-133	2	18	
Methyl acetate	20		2.5	ug/L	20.0	5.5	75	70-130	5	20	
Methyl cyclohexane	25		2.5	ug/L	20.0	0.64 U	124	70-130	1	20	
Methylene Chloride	22		12	ug/L	20.0	2.5 U	108	43-142	1	23	
Methyl-tert-Butyl Ether	20		2.5	ug/L	20.0	0.60 U	101	51-145	0.8	22	
o-Xylene	58		2.5	ug/L	20.0	16	208	61-129	2	16	QM-07
Styrene	20		2.5	ug/L	20.0	0.61 U	99	59-136	2	32	
Tetrachloroethene	21		2.5	ug/L	20.0	0.76 U	105	60-147	4	21	
Toluene	22		2.5	ug/L	20.0	0.72 U	109	64-131	0.4	16	
trans-1,2-Dichloroethene	23		2.5	ug/L	20.0	0.73 U	117	54-134	3	20	
trans-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.73 U	92	65-149	2	17	
Trichloroethene	21		2.5	ug/L	20.0	0.89 U	105	62-135	1	20	
Trichlorofluoromethane	19		2.5	ug/L	20.0	0.94 U	96	56-155	2	22	
Vinyl chloride	22		2.5	ug/L	20.0	3.0	98	20-167	4	24	
4-Bromofluorobenzene	*53*			*ug/L*	*50.0*		*105*	*41-142*			
Dibromofluoromethane	*50*			*ug/L*	*50.0*		*100*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*106*	*41-146*			

Batch 1K18005 - EPA 5030B_MS

Blank (1K18005-BLK1) Prepared: 11/18/2021 00:00 Analyzed: 11/18/2021 10:38

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.80	U	2.5	ug/L							
1,1,2,2-Tetrachloroethane	0.54	U	2.5	ug/L							
1,1,2-Trichloroethane	0.76	U	2.5	ug/L							
1,1-Dichloroethane	0.62	U	2.5	ug/L							
1,1-Dichloroethene	0.94	U	2.5	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K18005 - EPA 5030B_MS - Continued

Blank (1K18005-BLK1) Continued Prepared: 11/18/2021 00:00 Analyzed: 11/18/2021 10:38

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2,4-Trichlorobenzene	0.70	U	2.5	ug/L							
1,2-Dibromo-3-chloropropane	0.96	U	2.5	ug/L							
1,2-Dibromoethane	0.78	U	2.5	ug/L							
1,2-Dichlorobenzene	0.73	U	2.5	ug/L							
1,2-Dichloroethane	0.63	U	2.5	ug/L							
1,2-Dichloropropane	0.80	U	2.5	ug/L							
1,3-Dichlorobenzene	0.77	U	2.5	ug/L							
1,4-Dichlorobenzene	0.76	U	2.5	ug/L							
2-Butanone	4.5	U	12	ug/L							
2-Hexanone	2.5	U	12	ug/L							
4-Methyl-2-pentanone	2.5	U	12	ug/L							
Acetone	10	U	25	ug/L							
Benzene	0.71	U	2.5	ug/L							
Bromodichloromethane	0.52	U	2.5	ug/L							
Bromoform	0.75	U	2.5	ug/L							
Bromomethane	0.95	U	2.5	ug/L							
Carbon disulfide	2.5	U	12	ug/L							
Carbon Tetrachloride	0.94	U	2.5	ug/L							
Chlorobenzene	0.72	U	2.5	ug/L							
Chloroethane	0.98	U	2.5	ug/L							
Chloroform	0.80	U	2.5	ug/L							
Chloromethane	0.82	U	2.5	ug/L							
cis-1,2-Dichloroethene	0.53	U	2.5	ug/L							
cis-1,3-Dichloropropene	0.59	U	2.5	ug/L							
Cyclohexane	0.93	U	2.5	ug/L							
Dibromochloromethane	0.50	U	2.5	ug/L							
Dichlorodifluoromethane	0.74	U	2.5	ug/L							
Ethylbenzene	0.69	U	2.5	ug/L							
Freon 113	0.73	U	2.5	ug/L							
Isopropylbenzene	0.67	U	2.5	ug/L							
m,p-Xylenes	1.3	U	5.0	ug/L							
Methyl acetate	0.95	U	2.5	ug/L							
Methyl cyclohexane	0.64	U	2.5	ug/L							
Methylene Chloride	2.5	U	12	ug/L							
Methyl-tert-Butyl Ether	0.60	U	2.5	ug/L							
o-Xylene	0.53	U	2.5	ug/L							
Styrene	0.61	U	2.5	ug/L							
Tetrachloroethene	0.76	U	2.5	ug/L							
Toluene	0.72	U	2.5	ug/L							
trans-1,2-Dichloroethene	0.73	U	2.5	ug/L							
trans-1,3-Dichloropropene	0.73	U	2.5	ug/L							
Trichloroethene	0.89	U	2.5	ug/L							
Trichlorofluoromethane	0.94	U	2.5	ug/L							
Vinyl chloride	0.71	U	2.5	ug/L							
Xylenes (Total)	1.3	U	5.0	ug/L							
4-Bromofluorobenzene	*40*	*I*		*ug/L*	*50.0*		*80*	*41-142*			
Dibromofluoromethane	*43*	*I*		*ug/L*	*50.0*		*87*	*53-146*			
Toluene-d8	*43*	*I*		*ug/L*	*50.0*		*86*	*41-146*			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K18005 - EPA 5030B_MS - Continued

LCS (1K18005-BS1) Prepared: 11/18/2021 00:00 Analyzed: 11/18/2021 08:13

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	24		2.5	ug/L	20.0		121	57-148			
1,1,2,2-Tetrachloroethane	17		2.5	ug/L	20.0		87	60-139			
1,1,2-Trichloroethane	17		2.5	ug/L	20.0		87	57-141			
1,1-Dichloroethane	26		2.5	ug/L	20.0		131	57-142			
1,1-Dichloroethene	24		2.5	ug/L	20.0		118	47-139			
1,2,4-Trichlorobenzene	20		2.5	ug/L	20.0		101	52-159			
1,2-Dibromo-3-chloropropane	21		2.5	ug/L	20.0		104	48-150			
1,2-Dibromoethane	17		2.5	ug/L	20.0		83	57-140			
1,2-Dichlorobenzene	19		2.5	ug/L	20.0		97	63-131			
1,2-Dichloroethane	26		2.5	ug/L	20.0		129	50-156			
1,2-Dichloropropane	23		2.5	ug/L	20.0		113	61-133			
1,3-Dichlorobenzene	19		2.5	ug/L	20.0		96	66-129			
1,4-Dichlorobenzene	19		2.5	ug/L	20.0		97	65-133			
2-Butanone	150		12	ug/L	100		154	10-180			
2-Hexanone	130		12	ug/L	100		129	12-180			
4-Methyl-2-pentanone	97		12	ug/L	100		97	19-180			
Acetone	130		25	ug/L	100		133	10-180			
Benzene	23		2.5	ug/L	20.0		117	56-136			
Bromodichloromethane	23		2.5	ug/L	20.0		115	58-135			
Bromoform	17		2.5	ug/L	20.0		85	46-148			
Bromomethane	8.9		2.5	ug/L	20.0		44	10-173			
Carbon disulfide	44		12	ug/L	20.0		218	43-153			QL-02
Carbon Tetrachloride	22		2.5	ug/L	20.0		108	54-156			
Chlorobenzene	18		2.5	ug/L	20.0		91	51-139			
Chloroethane	38		2.5	ug/L	20.0		191	27-180			QL-02
Chloroform	25		2.5	ug/L	20.0		123	58-139			
Chloromethane	22		2.5	ug/L	20.0		110	33-154			
cis-1,2-Dichloroethene	22		2.5	ug/L	20.0		109	56-128			
cis-1,3-Dichloropropene	21		2.5	ug/L	20.0		106	64-128			
Cyclohexane	27		2.5	ug/L	20.0		135	70-130			QL-02
Dibromochloromethane	16		2.5	ug/L	20.0		78	50-140			
Dichlorodifluoromethane	23		2.5	ug/L	20.0		113	10-180			
Ethylbenzene	18		2.5	ug/L	20.0		89	63-133			
Freon 113	24		2.5	ug/L	20.0		118	47-173			
Isopropylbenzene	18		2.5	ug/L	20.0		91	60-132			
m,p-Xylenes	36		5.0	ug/L	40.0		90	64-133			
Methyl acetate	24		2.5	ug/L	20.0		118	70-130			
Methyl cyclohexane	26		2.5	ug/L	20.0		132	70-130			QL-02
Methylene Chloride	22		12	ug/L	20.0		112	43-142			
Methyl-tert-Butyl Ether	25		2.5	ug/L	20.0		123	51-145			
o-Xylene	18		2.5	ug/L	20.0		88	61-129			
Styrene	18		2.5	ug/L	20.0		92	59-136			
Tetrachloroethene	18		2.5	ug/L	20.0		89	60-147			
Toluene	18		2.5	ug/L	20.0		91	64-131			
trans-1,2-Dichloroethene	22		2.5	ug/L	20.0		110	54-134			
trans-1,3-Dichloropropene	19		2.5	ug/L	20.0		94	65-149			
Trichloroethene	22		2.5	ug/L	20.0		108	62-135			
Trichlorofluoromethane	29		2.5	ug/L	20.0		144	56-155			
Vinyl chloride	25		2.5	ug/L	20.0		124	20-167			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K18005 - EPA 5030B_MS - Continued

LCS (1K18005-BS1) Continued Prepared: 11/18/2021 00:00 Analyzed: 11/18/2021 08:13

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
4-Bromofluorobenzene	*42*	*I*		*ug/L*	*50.0*		*84*	*41-142*			
Dibromofluoromethane	*44*	*I*		*ug/L*	*50.0*		*88*	*53-146*			
Toluene-d8	*44*	*I*		*ug/L*	*50.0*		*89*	*41-146*			

Matrix Spike (1K18005-MS1) Prepared: 11/18/2021 00:00 Analyzed: 11/18/2021 08:43

Source: AE07967-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	25		2.5	ug/L	20.0	0.80 U	123	57-148			
1,1,2,2-Tetrachloroethane	16		2.5	ug/L	20.0	0.54 U	81	60-139			
1,1,2-Trichloroethane	17		2.5	ug/L	20.0	0.76 U	85	57-141			
1,1-Dichloroethane	27		2.5	ug/L	20.0	1.5	128	57-142			
1,1-Dichloroethene	24		2.5	ug/L	20.0	0.94 U	120	47-139			
1,2,4-Trichlorobenzene	19		2.5	ug/L	20.0	0.70 U	97	52-159			
1,2-Dibromo-3-chloropropane	19		2.5	ug/L	20.0	0.96 U	97	48-150			
1,2-Dibromoethane	16		2.5	ug/L	20.0	0.78 U	82	57-140			
1,2-Dichlorobenzene	22		2.5	ug/L	20.0	3.6	92	63-131			
1,2-Dichloroethane	25		2.5	ug/L	20.0	0.63 U	124	50-156			
1,2-Dichloropropane	23		2.5	ug/L	20.0	0.80 U	113	61-133			
1,3-Dichlorobenzene	19		2.5	ug/L	20.0	0.77 U	94	66-129			
1,4-Dichlorobenzene	20		2.5	ug/L	20.0	0.97	94	65-133			
2-Butanone	140		12	ug/L	100	4.5 U	142	10-180			
2-Hexanone	120		12	ug/L	100	2.5 U	121	12-180			
4-Methyl-2-pentanone	93		12	ug/L	100	2.5 U	93	19-180			
Acetone	120		25	ug/L	100	10 U	119	10-180			
Benzene	24		2.5	ug/L	20.0	0.71 U	118	56-136			
Bromodichloromethane	23		2.5	ug/L	20.0	0.52 U	116	58-135			
Bromoform	16		2.5	ug/L	20.0	0.75 U	80	46-148			
Bromomethane	11		2.5	ug/L	20.0	0.95 U	56	10-173			
Carbon disulfide	40		12	ug/L	20.0	2.5 U	201	43-153			QM-19
Carbon Tetrachloride	22		2.5	ug/L	20.0	0.94 U	111	54-156			
Chlorobenzene	21		2.5	ug/L	20.0	3.5	88	51-139			
Chloroethane	35		2.5	ug/L	20.0	0.98 U	177	27-180			
Chloroform	24		2.5	ug/L	20.0	0.80 U	121	58-139			
Chloromethane	22		2.5	ug/L	20.0	0.82 U	112	33-154			
cis-1,2-Dichloroethene	24		2.5	ug/L	20.0	2.5	105	56-128			
cis-1,3-Dichloropropene	20		2.5	ug/L	20.0	0.59 U	102	64-128			
Cyclohexane	27		2.5	ug/L	20.0	0.93 U	135	70-130			QM-19
Dibromochloromethane	15		2.5	ug/L	20.0	0.50 U	77	50-140			
Dichlorodifluoromethane	21		2.5	ug/L	20.0	0.74 U	107	10-180			
Ethylbenzene	18		2.5	ug/L	20.0	0.69 U	89	63-133			
Freon 113	22		2.5	ug/L	20.0	0.73 U	111	47-173			
Isopropylbenzene	18		2.5	ug/L	20.0	0.67 U	92	60-132			
m,p-Xylenes	36		5.0	ug/L	40.0	1.3 U	91	64-133			
Methyl acetate	22		2.5	ug/L	20.0	0.95 U	112	70-130			
Methyl cyclohexane	26		2.5	ug/L	20.0	0.64 U	130	70-130			
Methylene Chloride	22		12	ug/L	20.0	2.5 U	109	43-142			
Methyl-tert-Butyl Ether	23		2.5	ug/L	20.0	0.60 U	114	51-145			
o-Xylene	18		2.5	ug/L	20.0	0.53 U	88	61-129			
Styrene	18		2.5	ug/L	20.0	0.61 U	91	59-136			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K18005 - EPA 5030B_MS - Continued

Matrix Spike (1K18005-MS1) Continued Prepared: 11/18/2021 00:00 Analyzed: 11/18/2021 08:43

Source: AE07967-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Tetrachloroethene	17		2.5	ug/L	20.0	0.76 U	86	60-147			
Toluene	18		2.5	ug/L	20.0	0.72 U	92	64-131			
trans-1,2-Dichloroethene	22		2.5	ug/L	20.0	0.73 U	112	54-134			
trans-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.73 U	92	65-149			
Trichloroethene	22		2.5	ug/L	20.0	0.89 U	108	62-135			
Trichlorofluoromethane	30		2.5	ug/L	20.0	0.94 U	150	56-155			
Vinyl chloride	29		2.5	ug/L	20.0	3.5	128	20-167			
4-Bromofluorobenzene	*42*	*I*		*ug/L*	*50.0*		*84*	*41-142*			
Dibromofluoromethane	*43*	*I*		*ug/L*	*50.0*		*87*	*53-146*			
Toluene-d8	*44*	*I*		*ug/L*	*50.0*		*88*	*41-146*			

Matrix Spike Dup (1K18005-MSD1) Prepared: 11/18/2021 00:00 Analyzed: 11/18/2021 09:12

Source: AE07967-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	24		2.5	ug/L	20.0	0.80 U	122	57-148	0.08	25	
1,1,2,2-Tetrachloroethane	16		2.5	ug/L	20.0	0.54 U	81	60-139	1	17	
1,1,2-Trichloroethane	17		2.5	ug/L	20.0	0.76 U	84	57-141	1	16	
1,1-Dichloroethane	28		2.5	ug/L	20.0	1.5	130	57-142	1	24	
1,1-Dichloroethene	24		2.5	ug/L	20.0	0.94 U	119	47-139	1	16	
1,2,4-Trichlorobenzene	18		2.5	ug/L	20.0	0.70 U	91	52-159	6	24	
1,2-Dibromo-3-chloropropane	18		2.5	ug/L	20.0	0.96 U	89	48-150	8	21	
1,2-Dibromoethane	17		2.5	ug/L	20.0	0.78 U	83	57-140	0.2	16	
1,2-Dichlorobenzene	22		2.5	ug/L	20.0	3.6	91	63-131	0.7	25	
1,2-Dichloroethane	25		2.5	ug/L	20.0	0.63 U	125	50-156	0.4	18	
1,2-Dichloropropane	22		2.5	ug/L	20.0	0.80 U	111	61-133	2	26	
1,3-Dichlorobenzene	19		2.5	ug/L	20.0	0.77 U	94	66-129	0.2	23	
1,4-Dichlorobenzene	20		2.5	ug/L	20.0	0.97	95	65-133	0.9	23	
2-Butanone	140		12	ug/L	100	4.5 U	139	10-180	3	29	
2-Hexanone	120		12	ug/L	100	2.5 U	117	12-180	4	28	
4-Methyl-2-pentanone	90		12	ug/L	100	2.5 U	90	19-180	4	24	
Acetone	120		25	ug/L	100	10 U	120	10-180	0.3	19	
Benzene	23		2.5	ug/L	20.0	0.71 U	116	56-136	2	14	
Bromodichloromethane	23		2.5	ug/L	20.0	0.52 U	114	58-135	2	19	
Bromoform	16		2.5	ug/L	20.0	0.75 U	81	46-148	2	18	
Bromomethane	14		2.5	ug/L	20.0	0.95 U	72	10-173	25	29	
Carbon disulfide	39		12	ug/L	20.0	2.5 U	194	43-153	4	26	QM-19
Carbon Tetrachloride	22		2.5	ug/L	20.0	0.94 U	111	54-156	0.05	27	
Chlorobenzene	21		2.5	ug/L	20.0	3.5	86	51-139	2	13	
Chloroethane	39		2.5	ug/L	20.0	0.98 U	193	27-180	9	22	QM-19
Chloroform	24		2.5	ug/L	20.0	0.80 U	122	58-139	0.7	17	
Chloromethane	24		2.5	ug/L	20.0	0.82 U	121	33-154	8	31	
cis-1,2-Dichloroethene	24		2.5	ug/L	20.0	2.5	106	56-128	1	17	
cis-1,3-Dichloropropene	21		2.5	ug/L	20.0	0.59 U	104	64-128	1	20	
Cyclohexane	27		2.5	ug/L	20.0	0.93 U	135	70-130	0.04	20	QM-19
Dibromochloromethane	15		2.5	ug/L	20.0	0.50 U	77	50-140	0.06	18	
Dichlorodifluoromethane	21		2.5	ug/L	20.0	0.74 U	106	10-180	0.7	26	
Ethylbenzene	17		2.5	ug/L	20.0	0.69 U	87	63-133	1	18	
Freon 113	23		2.5	ug/L	20.0	0.73 U	113	47-173	1	30	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1K18005 - EPA 5030B_MS - Continued

Matrix Spike Dup (1K18005-MSD1) Continued Prepared: 11/18/2021 00:00 Analyzed: 11/18/2021 09:12

Source: AE07967-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Isopropylbenzene	18		2.5	ug/L	20.0	0.67 U	89	60-132	3	23	
m,p-Xylenes	35		5.0	ug/L	40.0	1.3 U	88	64-133	4	18	
Methyl acetate	21		2.5	ug/L	20.0	0.95 U	107	70-130	5	20	
Methyl cyclohexane	25		2.5	ug/L	20.0	0.64 U	127	70-130	2	20	
Methylene Chloride	22		12	ug/L	20.0	2.5 U	111	43-142	2	23	
Methyl-tert-Butyl Ether	23		2.5	ug/L	20.0	0.60 U	115	51-145	1	22	
o-Xylene	17		2.5	ug/L	20.0	0.53 U	86	61-129	2	16	
Styrene	18		2.5	ug/L	20.0	0.61 U	89	59-136	2	32	
Tetrachloroethene	17		2.5	ug/L	20.0	0.76 U	86	60-147	0.2	21	
Toluene	18		2.5	ug/L	20.0	0.72 U	90	64-131	2	16	
trans-1,2-Dichloroethene	23		2.5	ug/L	20.0	0.73 U	113	54-134	1	20	
trans-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.73 U	92	65-149	0.4	17	
Trichloroethene	21		2.5	ug/L	20.0	0.89 U	106	62-135	2	20	
Trichlorofluoromethane	30		2.5	ug/L	20.0	0.94 U	151	56-155	1	22	
Vinyl chloride	29		2.5	ug/L	20.0	3.5	128	20-167	0.1	24	
4-Bromofluorobenzene	*41*	*I*		*ug/L*	*50.0*		*83*	*41-142*			
Dibromofluoromethane	*43*	*I*		*ug/L*	*50.0*		*87*	*53-146*			
Toluene-d8	*43*	*I*		*ug/L*	*50.0*		*87*	*41-146*			

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*****	Not reported due to interference.
[CALC]	Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
J-05	Result may be biased low. Associated calibration verification standard did not meet the minimum control limit.
QL-02	The associated laboratory control sample exhibited high bias; since the result is ND, there is no impact.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QM-10	LCS/LCSD were analyzed in place of MS/MSD.
QM-19	The spike recovery was outside acceptance limits for the MS and/or MSD.
QR-02	LCS/LCSD RPD exceeded QC control limits; however, recovery for spike and duplicate was acceptable. Sample results for the QC batch were accepted based on satisfactory recovery and completeness of QC data.
QV-01	The associated continuing calibration verification standard exhibited high bias; since the result is ND, there is no impact.

Tetra Tech, Inc.

CHAIN OF CUSTODY | NUMBER No. 3202 AC-097032 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G08	CRCA	ALEX MURPHY		ENCO
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: DAN FORESTER	PHONE NUMBER: 304-780-1426	ADDRESS
		CARRIER/WAYBILL NUMBER		CITY, STATE: ORLANDO, FL

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2021	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G): G	PRESERVATIVE USED: HCL	TYPE OF ANALYSIS: 8260D TCL Semi	COOLED ON ICE	COMMENTS
10NOV	0930	CRCA-AS-EFFLUENT-20211110	CRCA	/	/	GW	G	3			X		
10NOV	0940	CRCA-AS-INFLUENT-20211110	CRCA	/	/	GW	G	3			X		

		DATE	TIME		DATE	TIME
1. RELINQUISHED BY		11/11/21	1625	1. RECEIVED BY: James W. Gregory	11/11/21	1525
2. RELINQUISHED BY		DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY		DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: Cg Blue 4.3°C, MCd-383 2.5°C, C-2101 4.5°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

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ENCO Laboratories
Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Wednesday, December 22, 2021
Tetra Tech, Inc. (TE016)
Attn: Alex Murphy
11 Riverside Drive, Suite 204
Cocoa, FL 32922

RE: Laboratory Results for
Project Number: 112G08970, Project Name/Desc: NASA KSC CRCA
ENCO Workorder(s): AE09874

Dear Alex Murphy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Tuesday, December 14, 2021.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Kaitlin Dylnicki

Project Manager

Enclosure(s)

www.encolabs.com

Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Client PM: Alex Murphy
Project Number: 112G08970
ENCO Project ID: AE09874
SDG: AE09874-TE016

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

List of instruments used:

Analytical and Preparation Method	SOP Reference Instrument
EPA 8260D / 5030B_MS	OVGCMS5

Analysis: EPA 8260D

Manual integrations were performed on samples associated with EPA 8260D. All data & explanations are included in the raw data section of the report.

Affected Samples: AA69776-CCV1, CRCA-ASEFFLUENT-20211214[AE09874-01], CRCA-ASINFLUENT-20211214[AE09874-02]
The associated calibration verification standard for bromomethane exhibited high bias. Analyte(s) not detected in the sample.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Kaitlin Dylnicki
Project Manager

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: CRCA-ASEFFLUENT-20211214 **Lab ID: AE09874-01** **Sampled: 12/14/21 12:15** **Received: 12/14/21 14:45**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	12/28/21	12/16/21 11:44	12/17/21 01:36

Client ID: CRCA-ASINFLUENT-20211214 **Lab ID: AE09874-02** **Sampled: 12/14/21 12:20** **Received: 12/14/21 14:45**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	12/28/21	12/16/21 11:44	12/17/21 02:04

SAMPLE DETECTION SUMMARY

Client ID: CRCA-ASINFLUENT-20211214 **Lab ID:** AE09874-02

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Vinyl chloride	3.3		0.71	2.5	ug/L	EPA 8260D	

ANALYTICAL RESULTS

Description: CRCA-ASEFFLUENT-20211214 **Lab Sample ID:** AE09874-01 **Received:** 12/14/21 14:45

Matrix: Ground Water **Sampled:** 12/14/21 12:15 **Work Order:** AE09874

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	1L16024	EPA 8260D	12/17/21 01:36	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	1L16024	EPA 8260D	12/17/21 01:36	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	

ANALYTICAL RESULTS

Description: CRCA-ASEFFLUENT-20211214 **Lab Sample ID:** AE09874-01 **Received:** 12/14/21 14:45

Matrix: Ground Water **Sampled:** 12/14/21 12:15 **Work Order:** AE09874

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Vinyl chloride [75-01-4]^	0.71	U	ug/L	1	0.71	2.5	1L16024	EPA 8260D	12/17/21 01:36	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	1L16024	EPA 8260D	12/17/21 01:36	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*50*	*1*	*50.0*	*100 %*	*41-142*	*1L16024*	*EPA 8260D*	*12/17/21 01:36*	*KKW*	
Dibromofluoromethane	*51*	*1*	*50.0*	*101 %*	*53-146*	*1L16024*	*EPA 8260D*	*12/17/21 01:36*	*KKW*	
Toluene-d8	*51*	*1*	*50.0*	*102 %*	*41-146*	*1L16024*	*EPA 8260D*	*12/17/21 01:36*	*KKW*	

ANALYTICAL RESULTS

Description: CRCA-ASINFLUENT-20211214 **Lab Sample ID:** AE09874-02 **Received:** 12/14/21 14:45

Matrix: Ground Water **Sampled:** 12/14/21 12:20 **Work Order:** AE09874

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	1L16024	EPA 8260D	12/17/21 02:04	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	1L16024	EPA 8260D	12/17/21 02:04	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	

ANALYTICAL RESULTS

Description: CRCA-ASINFLUENT-20211214 **Lab Sample ID:** AE09874-02 **Received:** 12/14/21 14:45

Matrix: Ground Water **Sampled:** 12/14/21 12:20 **Work Order:** AE09874

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Vinyl chloride [75-01-4]^	**3.3**		ug/L	1	0.71	2.5	1L16024	EPA 8260D	12/17/21 02:04	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	1L16024	EPA 8260D	12/17/21 02:04	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*53*	*1*	*50.0*	*106 %*	*41-142*	*1L16024*	*EPA 8260D*	*12/17/21 02:04*	*KKW*	
Dibromofluoromethane	*49*	*1*	*50.0*	*97 %*	*53-146*	*1L16024*	*EPA 8260D*	*12/17/21 02:04*	*KKW*	
Toluene-d8	*52*	*1*	*50.0*	*104 %*	*41-146*	*1L16024*	*EPA 8260D*	*12/17/21 02:04*	*KKW*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1L16024 - EPA 5030B_MS

Blank (1L16024-BLK1) Prepared: 12/16/2021 11:44 Analyzed: 12/16/2021 22:22

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.80	U	2.5	ug/L							
1,1,2,2-Tetrachloroethane	0.54	U	2.5	ug/L							
1,1,2-Trichloroethane	0.76	U	2.5	ug/L							
1,1-Dichloroethane	0.62	U	2.5	ug/L							
1,1-Dichloroethene	0.94	U	2.5	ug/L							
1,2,4-Trichlorobenzene	0.70	U	2.5	ug/L							
1,2-Dibromo-3-chloropropane	0.96	U	2.5	ug/L							
1,2-Dibromoethane	0.78	U	2.5	ug/L							
1,2-Dichlorobenzene	0.73	U	2.5	ug/L							
1,2-Dichloroethane	0.63	U	2.5	ug/L							
1,2-Dichloropropane	0.80	U	2.5	ug/L							
1,3-Dichlorobenzene	0.77	U	2.5	ug/L							
1,4-Dichlorobenzene	0.76	U	2.5	ug/L							
2-Butanone	4.5	U	12	ug/L							
2-Hexanone	2.5	U	12	ug/L							
4-Methyl-2-pentanone	2.5	U	12	ug/L							
Acetone	10	U	25	ug/L							
Benzene	0.71	U	2.5	ug/L							
Bromodichloromethane	0.52	U	2.5	ug/L							
Bromoform	0.75	U	2.5	ug/L							
Bromomethane	0.95	U	2.5	ug/L							
Carbon disulfide	2.5	U	12	ug/L							
Carbon Tetrachloride	0.94	U	2.5	ug/L							
Chlorobenzene	0.72	U	2.5	ug/L							
Chloroethane	0.98	U	2.5	ug/L							
Chloroform	0.80	U	2.5	ug/L							
Chloromethane	0.82	U	2.5	ug/L							
cis-1,2-Dichloroethene	0.53	U	2.5	ug/L							
cis-1,3-Dichloropropene	0.59	U	2.5	ug/L							
Cyclohexane	0.93	U	2.5	ug/L							
Dibromochloromethane	0.50	U	2.5	ug/L							
Dichlorodifluoromethane	0.74	U	2.5	ug/L							
Ethylbenzene	0.69	U	2.5	ug/L							
Freon 113	0.73	U	2.5	ug/L							
Isopropylbenzene	0.67	U	2.5	ug/L							
m,p-Xylenes	1.3	U	5.0	ug/L							
Methyl acetate	0.95	U	2.5	ug/L							
Methyl cyclohexane	0.64	U	2.5	ug/L							
Methylene Chloride	2.5	U	12	ug/L							
Methyl-tert-Butyl Ether	0.60	U	2.5	ug/L							
o-Xylene	0.53	U	2.5	ug/L							
Styrene	0.61	U	2.5	ug/L							
Tetrachloroethene	0.76	U	2.5	ug/L							
Toluene	0.72	U	2.5	ug/L							
trans-1,2-Dichloroethene	0.73	U	2.5	ug/L							
trans-1,3-Dichloropropene	0.73	U	2.5	ug/L							
Trichloroethene	0.89	U	2.5	ug/L							
Trichlorofluoromethane	0.94	U	2.5	ug/L							
Vinyl chloride	0.71	U	2.5	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1L16024 - EPA 5030B_MS - Continued

Blank (1L16024-BLK1) Continued Prepared: 12/16/2021 11:44 Analyzed: 12/16/2021 22:22

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Xylenes (Total)	1.3	U	5.0	ug/L							
4-Bromofluorobenzene	*50*			*ug/L*	*50.0*		*101*	*41-142*			
Dibromofluoromethane	*51*			*ug/L*	*50.0*		*101*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*103*	*41-146*			

LCS (1L16024-BS1) Prepared: 12/16/2021 11:44 Analyzed: 12/16/2021 20:32

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	20		2.5	ug/L	20.0		102	57-148			
1,1,2,2-Tetrachloroethane	20		2.5	ug/L	20.0		102	60-139			
1,1,2-Trichloroethane	21		2.5	ug/L	20.0		104	57-141			
1,1-Dichloroethane	20		2.5	ug/L	20.0		98	57-142			
1,1-Dichloroethene	18		2.5	ug/L	20.0		91	47-139			
1,2,4-Trichlorobenzene	21		2.5	ug/L	20.0		106	52-159			
1,2-Dibromo-3-chloropropane	19		2.5	ug/L	20.0		96	48-150			
1,2-Dibromoethane	20		2.5	ug/L	20.0		98	57-140			
1,2-Dichlorobenzene	21		2.5	ug/L	20.0		107	63-131			
1,2-Dichloroethane	18		2.5	ug/L	20.0		89	50-156			
1,2-Dichloropropane	19		2.5	ug/L	20.0		97	61-133			
1,3-Dichlorobenzene	21		2.5	ug/L	20.0		107	66-129			
1,4-Dichlorobenzene	20		2.5	ug/L	20.0		98	65-133			
2-Butanone	96		12	ug/L	100		96	10-180			
2-Hexanone	82		12	ug/L	100		82	12-180			
4-Methyl-2-pentanone	91		12	ug/L	100		91	19-180			
Acetone	79		25	ug/L	100		79	10-180			
Benzene	20		2.5	ug/L	20.0		101	56-136			
Bromodichloromethane	17		2.5	ug/L	20.0		86	58-135			
Bromoform	23		2.5	ug/L	20.0		113	46-148			
Bromomethane	11		2.5	ug/L	20.0		53	10-173			
Carbon disulfide	21		12	ug/L	20.0		103	43-153			
Carbon Tetrachloride	26		2.5	ug/L	20.0		130	54-156			
Chlorobenzene	21		2.5	ug/L	20.0		105	51-139			
Chloroethane	22		2.5	ug/L	20.0		108	27-180			
Chloroform	19		2.5	ug/L	20.0		97	58-139			
Chloromethane	16		2.5	ug/L	20.0		82	33-154			
cis-1,2-Dichloroethene	20		2.5	ug/L	20.0		100	56-128			
cis-1,3-Dichloropropene	16		2.5	ug/L	20.0		80	64-128			
Cyclohexane	20		2.5	ug/L	20.0		101	70-130			
Dibromochloromethane	18		2.5	ug/L	20.0		91	50-140			
Dichlorodifluoromethane	17		2.5	ug/L	20.0		84	10-180			
Ethylbenzene	21		2.5	ug/L	20.0		103	63-133			
Freon 113	19		2.5	ug/L	20.0		97	47-173			
Isopropylbenzene	21		2.5	ug/L	20.0		106	60-132			
m,p-Xylenes	42		5.0	ug/L	40.0		105	64-133			
Methyl acetate	19		2.5	ug/L	20.0		96	70-130			
Methyl cyclohexane	22		2.5	ug/L	20.0		109	70-130			
Methylene Chloride	20		12	ug/L	20.0		99	43-142			
Methyl-tert-Butyl Ether	20		2.5	ug/L	20.0		99	51-145			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1L16024 - EPA 5030B_MS - Continued

LCS (1L16024-BS1) Continued Prepared: 12/16/2021 11:44 Analyzed: 12/16/2021 20:32

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Xylene	22		2.5	ug/L	20.0		109	61-129			
Styrene	19		2.5	ug/L	20.0		94	59-136			
Tetrachloroethene	18		2.5	ug/L	20.0		90	60-147			
Toluene	20		2.5	ug/L	20.0		100	64-131			
trans-1,2-Dichloroethene	21		2.5	ug/L	20.0		103	54-134			
trans-1,3-Dichloropropene	17		2.5	ug/L	20.0		87	65-149			
Trichloroethene	19		2.5	ug/L	20.0		96	62-135			
Trichlorofluoromethane	17		2.5	ug/L	20.0		86	56-155			
Vinyl chloride	18		2.5	ug/L	20.0		90	20-167			
4-Bromofluorobenzene	*53*			*ug/L*	*50.0*		*106*	*41-142*			
Dibromofluoromethane	*53*			*ug/L*	*50.0*		*106*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*106*	*41-146*			

Matrix Spike (1L16024-MS1) Prepared: 12/16/2021 11:44 Analyzed: 12/16/2021 20:59

Source: AE09238-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	22		2.5	ug/L	20.0	0.80 U	110	57-148			
1,1,2,2-Tetrachloroethane	21		2.5	ug/L	20.0	0.54 U	104	60-139			
1,1,2-Trichloroethane	22		2.5	ug/L	20.0	0.76 U	109	57-141			
1,1-Dichloroethane	22		2.5	ug/L	20.0	0.62 U	109	57-142			
1,1-Dichloroethene	22		2.5	ug/L	20.0	0.94 U	108	47-139			
1,2,4-Trichlorobenzene	23		2.5	ug/L	20.0	0.70 U	117	52-159			
1,2-Dibromo-3-chloropropane	21		2.5	ug/L	20.0	0.96 U	103	48-150			
1,2-Dibromoethane	20		2.5	ug/L	20.0	0.78 U	102	57-140			
1,2-Dichlorobenzene	22		2.5	ug/L	20.0	0.73 U	112	63-131			
1,2-Dichloroethane	19		2.5	ug/L	20.0	0.63 U	96	50-156			
1,2-Dichloropropane	21		2.5	ug/L	20.0	0.80 U	104	61-133			
1,3-Dichlorobenzene	23		2.5	ug/L	20.0	0.77 U	116	66-129			
1,4-Dichlorobenzene	21		2.5	ug/L	20.0	0.76 U	107	65-133			
2-Butanone	100		12	ug/L	100	4.5 U	102	10-180			
2-Hexanone	86		12	ug/L	100	2.5 U	86	12-180			
4-Methyl-2-pentanone	97		12	ug/L	100	2.5 U	97	19-180			
Acetone	84		25	ug/L	100	10 U	84	10-180			
Benzene	22		2.5	ug/L	20.0	0.71 U	108	56-136			
Bromodichloromethane	18		2.5	ug/L	20.0	0.52 U	90	58-135			
Bromoform	24		2.5	ug/L	20.0	0.75 U	119	46-148			
Bromomethane	15		2.5	ug/L	20.0	0.95 U	73	10-173			
Carbon disulfide	23		12	ug/L	20.0	2.5 U	116	43-153			
Carbon Tetrachloride	29		2.5	ug/L	20.0	0.94 U	146	54-156			
Chlorobenzene	23		2.5	ug/L	20.0	0.72 U	113	51-139			
Chloroethane	24		2.5	ug/L	20.0	0.98 U	122	27-180			
Chloroform	20		2.5	ug/L	20.0	0.80 U	102	58-139			
Chloromethane	18		2.5	ug/L	20.0	0.82 U	91	33-154			
cis-1,2-Dichloroethene	21		2.5	ug/L	20.0	0.53 U	103	56-128			
cis-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.59 U	88	64-128			
Cyclohexane	23		2.5	ug/L	20.0	0.93 U	116	70-130			
Dibromochloromethane	19		2.5	ug/L	20.0	0.50 U	95	50-140			
Dichlorodifluoromethane	19		2.5	ug/L	20.0	0.74 U	93	10-180			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1L16024 - EPA 5030B_MS - Continued

Matrix Spike (1L16024-MS1) Continued Prepared: 12/16/2021 11:44 Analyzed: 12/16/2021 20:59

Source: AE09238-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethylbenzene	22		2.5	ug/L	20.0	0.69 U	109	63-133			
Freon 113	22		2.5	ug/L	20.0	0.73 U	109	47-173			
Isopropylbenzene	23		2.5	ug/L	20.0	0.67 U	116	60-132			
m,p-Xylenes	46		5.0	ug/L	40.0	1.3 U	114	64-133			
Methyl acetate	22		2.5	ug/L	20.0	0.95 U	110	70-130			
Methyl cyclohexane	23		2.5	ug/L	20.0	0.64 U	117	70-130			
Methylene Chloride	22		12	ug/L	20.0	2.5 U	108	43-142			
Methyl-tert-Butyl Ether	21		2.5	ug/L	20.0	0.60 U	106	51-145			
o-Xylene	23		2.5	ug/L	20.0	0.53 U	116	61-129			
Styrene	20		2.5	ug/L	20.0	0.61 U	102	59-136			
Tetrachloroethene	21		2.5	ug/L	20.0	0.76 U	105	60-147			
Toluene	21		2.5	ug/L	20.0	0.72 U	105	64-131			
trans-1,2-Dichloroethene	23		2.5	ug/L	20.0	0.73 U	114	54-134			
trans-1,3-Dichloropropene	19		2.5	ug/L	20.0	0.73 U	95	65-149			
Trichloroethene	20		2.5	ug/L	20.0	0.89 U	102	62-135			
Trichlorofluoromethane	20		2.5	ug/L	20.0	0.94 U	99	56-155			
Vinyl chloride	20		2.5	ug/L	20.0	0.71 U	101	20-167			
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*104*	*41-142*			
Dibromofluoromethane	*53*			*ug/L*	*50.0*		*106*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*106*	*41-146*			

Matrix Spike Dup (1L16024-MSD1) Prepared: 12/16/2021 11:44 Analyzed: 12/16/2021 21:27

Source: AE09238-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	22		2.5	ug/L	20.0	0.80 U	111	57-148	0.5	25	
1,1,2,2-Tetrachloroethane	21		2.5	ug/L	20.0	0.54 U	107	60-139	3	17	
1,1,2-Trichloroethane	22		2.5	ug/L	20.0	0.76 U	108	57-141	2	16	
1,1-Dichloroethane	21		2.5	ug/L	20.0	0.62 U	104	57-142	4	24	
1,1-Dichloroethene	21		2.5	ug/L	20.0	0.94 U	103	47-139	5	16	
1,2,4-Trichlorobenzene	22		2.5	ug/L	20.0	0.70 U	108	52-159	8	24	
1,2-Dibromo-3-chloropropane	18		2.5	ug/L	20.0	0.96 U	91	48-150	12	21	
1,2-Dibromoethane	21		2.5	ug/L	20.0	0.78 U	103	57-140	0.8	16	
1,2-Dichlorobenzene	21		2.5	ug/L	20.0	0.73 U	107	63-131	5	25	
1,2-Dichloroethane	18		2.5	ug/L	20.0	0.63 U	90	50-156	5	18	
1,2-Dichloropropane	21		2.5	ug/L	20.0	0.80 U	104	61-133	0.2	26	
1,3-Dichlorobenzene	22		2.5	ug/L	20.0	0.77 U	108	66-129	7	23	
1,4-Dichlorobenzene	20		2.5	ug/L	20.0	0.76 U	98	65-133	9	23	
2-Butanone	97		12	ug/L	100	4.5 U	97	10-180	5	29	
2-Hexanone	87		12	ug/L	100	2.5 U	87	12-180	0.7	28	
4-Methyl-2-pentanone	95		12	ug/L	100	2.5 U	95	19-180	2	24	
Acetone	82		25	ug/L	100	10 U	82	10-180	2	19	
Benzene	21		2.5	ug/L	20.0	0.71 U	107	56-136	2	14	
Bromodichloromethane	18		2.5	ug/L	20.0	0.52 U	92	58-135	1	19	
Bromoform	25		2.5	ug/L	20.0	0.75 U	123	46-148	3	18	
Bromomethane	17		2.5	ug/L	20.0	0.95 U	83	10-173	13	29	
Carbon disulfide	21		12	ug/L	20.0	2.5 U	105	43-153	10	26	
Carbon Tetrachloride	28		2.5	ug/L	20.0	0.94 U	141	54-156	3	27	
Chlorobenzene	22		2.5	ug/L	20.0	0.72 U	111	51-139	2	13	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 1L16024 - EPA 5030B_MS - Continued

Matrix Spike Dup (1L16024-MSD1) Continued Prepared: 12/16/2021 11:44 Analyzed: 12/16/2021 21:27

Source: AE09238-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloroethane	21		2.5	ug/L	20.0	0.98 U	107	27-180	13	22	
Chloroform	20		2.5	ug/L	20.0	0.80 U	101	58-139	0.5	17	
Chloromethane	17		2.5	ug/L	20.0	0.82 U	87	33-154	4	31	
cis-1,2-Dichloroethene	21		2.5	ug/L	20.0	0.53 U	104	56-128	0.1	17	
cis-1,3-Dichloropropene	17		2.5	ug/L	20.0	0.59 U	84	64-128	5	20	
Cyclohexane	23		2.5	ug/L	20.0	0.93 U	114	70-130	2	20	
Dibromochloromethane	20		2.5	ug/L	20.0	0.50 U	98	50-140	3	18	
Dichlorodifluoromethane	18		2.5	ug/L	20.0	0.74 U	89	10-180	4	26	
Ethylbenzene	22		2.5	ug/L	20.0	0.69 U	108	63-133	1	18	
Freon 113	22		2.5	ug/L	20.0	0.73 U	108	47-173	0.5	30	
Isopropylbenzene	23		2.5	ug/L	20.0	0.67 U	113	60-132	3	23	
m,p-Xylenes	44		5.0	ug/L	40.0	1.3 U	110	64-133	3	18	
Methyl acetate	20		2.5	ug/L	20.0	0.95 U	102	70-130	7	20	
Methyl cyclohexane	24		2.5	ug/L	20.0	0.64 U	119	70-130	1	20	
Methylene Chloride	20		12	ug/L	20.0	2.5 U	102	43-142	6	23	
Methyl-tert-Butyl Ether	21		2.5	ug/L	20.0	0.60 U	104	51-145	2	22	
o-Xylene	23		2.5	ug/L	20.0	0.53 U	115	61-129	1	16	
Styrene	20		2.5	ug/L	20.0	0.61 U	99	59-136	4	32	
Tetrachloroethene	20		2.5	ug/L	20.0	0.76 U	100	60-147	4	21	
Toluene	22		2.5	ug/L	20.0	0.72 U	108	64-131	3	16	
trans-1,2-Dichloroethene	21		2.5	ug/L	20.0	0.73 U	106	54-134	8	20	
trans-1,3-Dichloropropene	19		2.5	ug/L	20.0	0.73 U	95	65-149	0.6	17	
Trichloroethene	19		2.5	ug/L	20.0	0.89 U	96	62-135	6	20	
Trichlorofluoromethane	19		2.5	ug/L	20.0	0.94 U	93	56-155	6	22	
Vinyl chloride	19		2.5	ug/L	20.0	0.71 U	93	20-167	8	24	
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*105*	*41-142*			
Dibromofluoromethane	*52*			*ug/L*	*50.0*		*103*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*106*	*41-146*			

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*****	Not reported due to interference.
[CALC]	Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
QV-01	The associated continuing calibration verification standard exhibited high bias; since the result is ND, there is no impact.

B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported result is an estimated value.
U	The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a “tentative identification".
Q	One or more quality control criteria failed.

AEO9874

Tetra Tech, Inc. | **CHAIN OF CUSTODY** | **NUMBER** No. 3189 | **PAGE** 1 **OF** 1

PROJECT NO: 112G08970	**FACILITY:** CRCA	**PROJECT MANAGER** ALEX MURPHY	**PHONE NUMBER** 321-292-0842	**LABORATORY NAME AND CONTACT:** ENCO ORLANDO
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER**	**PHONE NUMBER**	**ADDRESS**
		CARRIER/WAYBILL NUMBER		**CITY, STATE** ORLANDO, FC

STANDARD TAT ☒ 30
RUSH TAT ☐ ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2021	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS VOC 8260	COMMENTS
									G	HCL		
14 DEC	1215	CRCA-AS-EFFLUENT-20211214	CRCA	/	/	GW	G	3			X	
14 DEC	1220	CRCA-AS-INFLUENT-20211214	CRCA	/	/	GW	G	3			X	

1. RELINQUISHED BY		DATE 14 DEC 21	TIME 1445	1. RECEIVED BY		DATE 12/14/21	TIME 1445
2. RELINQUISHED BY		DATE	TIME	2. RECEIVED BY		DATE	TIME
3. RELINQUISHED BY		DATE	TIME	3. RECEIVED BY		DATE	TIME

COMMENTS: LG 983 5.4°C, C-273 2.6°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

12/14/2021

Environmental Conservation Labs, Inc.

Alex Murphy
Tetra Tech, Inc. (TE016)
11 Riverside Drive, Suite 204
Cocoa, FL 32922
Phone: (321) 636-6470
Fax: (321) 636-6473

Reference : **Sample Receipt Confirmation - *Please Review***
Project Name / Number : NASA KSC CRCA / 112G08970
Purchase Order # : 1165883

Lab Reference # : AE09874 Lab Receipt Date: 14-Dec-21 14:45
Anticipated ***(Estimated)*** Completion Date: 21-Dec-21 19:00

This is an automated notification from our laboratory information management system (LIMS), indicating the samples we have recently received and their associated analyses. Should any of the following information be in error, please contact us immediately.

Thank you for choosing Environmental Conservation Laboratories. Should any events occur that delay the processing of your samples or inhibit our ability to complete the project within the projected time frame you will be contacted.

Sincerely,

Kaitlin Dylnicki

Client: Tetra Tech, Inc. (TE016) **Project Name:** NASA KSC CRCA
Requested TAT: 5 **Project Number:** 112G08970

Analysis	TAT	Expires	Status
Sample ID: CRCA-ASEFFLUENT-20211214(Lab ID: AE09874-01), Matrix: Ground Water, Sampled: 14-Dec-21 12:15 (GMT-05:00) Eastern Time (US &			
8260D TCL SOM01.2 CLP-LIKE	5	28-Dec-21 23:59	Received
Sample ID: CRCA-ASINFLUENT-20211214(Lab ID: AE09874-02), Matrix: Ground Water, Sampled: 14-Dec-21 12:20 (GMT-05:00) Eastern Time (US &			
8260D TCL SOM01.2 CLP-LIKE	5	28-Dec-21 23:59	Received

Analysis Groups included in this work order

ENCO Orlando

SDG: AE09874-TE016

CLASS: 01_VOA_MS

METHOD: EPA 8260D

ANALYSES DATA PACKAGE COVER PAGE

EPA 8260D

Laboratory: ENCO Orlando

SDG: AE09874-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Client Sample Id:	Lab Sample Id:
CRCA-ASEFFLUENT-20211214	AE09874-01
CRCA-ASINFLUENT-20211214	AE09874-02

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASEFFLUENT-20211214

Laboratory: ENCO Orlando SDG: AE09874-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE09874-01 File ID: 215LK040.D

Sampled: 12/14/21 12:15 Prepared: 12/16/21 11:44 Analyzed: 12/17/21 01:36

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1L16024 Sequence: AA69776 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	0.71	U	0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASEFFLUENT-20211214

Laboratory: ENCO Orlando SDG: AE09874-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE09874-01 File ID: 215LK040.D

Sampled: 12/14/21 12:15 Prepared: 12/16/21 11:44 Analyzed: 12/17/21 01:36

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1L16024 Sequence: AA69776 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	51	101	53 - 146	
Toluene-d8	50.0	51	102	41 - 146	
4-Bromofluorobenzene	50.0	50	100	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1387849	9.845	1352333	9.845	
1,4-Difluorobenzene	2811650	10.438	2676972	10.438	
Chlorobenzene-d5	1521963	13.217	1499134	13.218	
1,4-Dichlorobenzene-d4	1101886	15.48	1293958	15.48	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASINFLUENT-20211214

Laboratory: ENCO Orlando SDG: AE09874-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE09874-02 File ID: 215LK041.D

Sampled: 12/14/21 12:20 Prepared: 12/16/21 11:44 Analyzed: 12/17/21 02:04

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1L16024 Sequence: AA69776 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	3.3		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASINFLUENT-20211214

Laboratory: ENCO Orlando SDG: AE09874-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AE09874-02 File ID: 215LK041.D

Sampled: 12/14/21 12:20 Prepared: 12/16/21 11:44 Analyzed: 12/17/21 02:04

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 1L16024 Sequence: AA69776 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	49	97	53 - 146	
Toluene-d8	50.0	52	104	41 - 146	
4-Bromofluorobenzene	50.0	53	106	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1238983	9.839	1352333	9.845	
1,4-Difluorobenzene	2482673	10.438	2676972	10.438	
Chlorobenzene-d5	1346208	13.218	1499134	13.218	
1,4-Dichlorobenzene-d4	1118574	15.474	1293958	15.48	

* Values outside of QC limits

HOLDING TIME SUMMARY

EPA 8260D

Laboratory: ENCO Orlando

SDG: AE09874-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-ASEFFLUENT-20211214	12/14/21 12:15	12/14/21 14:45	12/16/21 11:44	1.98	NA	12/17/21 01:36	3.00	14.00	
CRCA-ASINFLUENT-20211214	12/14/21 12:20	12/14/21 14:45	12/16/21 11:44	1.98	NA	12/17/21 02:04	3.00	14.00	

PREPARATION BATCH SUMMARY

EPA 8260D

Laboratory: ENCO Orlando SDG: AE09874-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Batch: 1L16024 Batch Matrix: Water Preparation: EPA 5030B_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	1L16024-BLK1	215LK033.D	12/16/21 11:44	
LCS	1L16024-BS1	215LK029.D	12/16/21 11:44	
Pond 1	1L16024-MS1	215LK030.D	12/16/21 11:44	
Pond 1	1L16024-MSD1	215LK031.D	12/16/21 11:44	
CRCA-ASEFFLUENT-20211214	AE09874-01	215LK040.D	12/16/21 11:44	
CRCA-ASINFLUENT-20211214	AE09874-02	215LK041.D	12/16/21 11:44	

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE09874-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	1L16024-BLK1	File ID:	215LK033.D
Prepared:	12/16/21 11:44	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	12/16/21 22:22	Instrument:	OVGCMS5		
Batch:	1L16024	Sequence:	AA69776	Calibration:	2111046

CAS NO.	COMPOUND	CONC. (ug/L)	Q
75-71-8	Dichlorodifluoromethane	0.74	U
74-87-3	Chloromethane	0.82	U
75-01-4	Vinyl chloride	0.71	U
74-83-9	Bromomethane	0.95	U
75-00-3	Chloroethane	0.98	U
75-69-4	Trichlorofluoromethane	0.94	U
76-13-1	Freon 113	0.73	U
67-64-1	Acetone	10	U
75-35-4	1,1-Dichloroethene	0.94	U
75-15-0	Carbon disulfide	2.5	U
75-09-2	Methylene Chloride	2.5	U
1634-04-4	Methyl-tert-Butyl Ether	0.60	U
156-60-5	trans-1,2-Dichloroethene	0.73	U
156-59-2	cis-1,2-Dichloroethene	0.53	U
75-34-3	1,1-Dichloroethane	0.62	U
78-93-3	2-Butanone	4.5	U
67-66-3	Chloroform	0.80	U
71-55-6	1,1,1-Trichloroethane	0.80	U
79-20-9	Methyl acetate	0.95	U
110-82-7	Cyclohexane	0.93	U
108-87-2	Methyl cyclohexane	0.64	U
56-23-5	Carbon Tetrachloride	0.94	U
107-06-2	1,2-Dichloroethane	0.63	U
71-43-2	Benzene	0.71	U
79-01-6	Trichloroethene	0.89	U
78-87-5	1,2-Dichloropropane	0.80	U
75-27-4	Bromodichloromethane	0.52	U
108-10-1	4-Methyl-2-pentanone	2.5	U
591-78-6	2-Hexanone	2.5	U
10061-01-5	cis-1,3-Dichloropropene	0.59	U

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE09874-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	1L16024-BLK1	File ID:	215LK033.D
Prepared:	12/16/21 11:44	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	12/16/21 22:22	Instrument:	OVGCMS5		
Batch:	1L16024	Sequence:	AA69776	Calibration:	2111046

CAS NO.	COMPOUND	CONC. (ug/L)	Q
108-88-3	Toluene	0.72	U
10061-02-6	trans-1,3-Dichloropropene	0.73	U
79-00-5	1,1,2-Trichloroethane	0.76	U
127-18-4	Tetrachloroethene	0.76	U
124-48-1	Dibromochloromethane	0.50	U
106-93-4	1,2-Dibromoethane	0.78	U
108-90-7	Chlorobenzene	0.72	U
100-41-4	Ethylbenzene	0.69	U
108-38-3/106-42-3	m,p-Xylenes	1.3	U
95-47-6	o-Xylene	0.53	U
75-25-2	Bromoform	0.75	U
100-42-5	Styrene	0.61	U
98-82-8	Isopropylbenzene	0.67	U
79-34-5	1,1,2,2-Tetrachloroethane	0.54	U
120-82-1	1,2,4-Trichlorobenzene	0.70	U
541-73-1	1,3-Dichlorobenzene	0.77	U
106-46-7	1,4-Dichlorobenzene	0.76	U
95-50-1	1,2-Dichlorobenzene	0.73	U
96-12-8	1,2-Dibromo-3-chloropropane	0.96	U
1330-20-7	Xylenes (Total)	1.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	51	101	53 - 146	
Toluene-d8	50.0	52	103	41 - 146	
4-Bromofluorobenzene	50.0	50	101	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1206992	9.845	1352333	9.845	
1,4-Difluorobenzene	2435348	10.438	2676972	10.438	
Chlorobenzene-d5	1334646	13.217	1499134	13.218	
1,4-Dichlorobenzene-d4	1061073	15.474	1293958	15.48	

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE09874-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	1L16024	Laboratory ID:	1L16024-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	17	84	10 - 180
Chloromethane	20.0	16	82	33 - 154
Vinyl chloride	20.0	18	90	20 - 167
Bromomethane	20.0	11	53	10 - 173
Chloroethane	20.0	22	108	27 - 180
Trichlorofluoromethane	20.0	17	86	56 - 155
Freon 113	20.0	19	97	47 - 173
Acetone	100	79	79	10 - 180
1,1-Dichloroethene	20.0	18	91	47 - 139
Carbon disulfide	20.0	21	103	43 - 153
Methylene Chloride	20.0	20	99	43 - 142
Methyl-tert-Butyl Ether	20.0	20	99	51 - 145
trans-1,2-Dichloroethene	20.0	21	103	54 - 134
cis-1,2-Dichloroethene	20.0	20	100	56 - 128
1,1-Dichloroethane	20.0	20	98	57 - 142
2-Butanone	100	96	96	10 - 180
Chloroform	20.0	19	97	58 - 139
1,1,1-Trichloroethane	20.0	20	102	57 - 148
Methyl acetate	20.0	19	96	70 - 130
Cyclohexane	20.0	20	101	70 - 130
Methyl cyclohexane	20.0	22	109	70 - 130
Carbon Tetrachloride	20.0	26	130	54 - 156
1,2-Dichloroethane	20.0	18	89	50 - 156
Benzene	20.0	20	101	56 - 136
Trichloroethene	20.0	19	96	62 - 135
1,2-Dichloropropane	20.0	19	97	61 - 133
Bromodichloromethane	20.0	17	86	58 - 135
4-Methyl-2-pentanone	100	91	91	19 - 180
2-Hexanone	100	82	82	12 - 180
cis-1,3-Dichloropropene	20.0	16	80	64 - 128

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE09874-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	1L16024	Laboratory ID:	1L16024-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Toluene	20.0	20	100	64 - 131
trans-1,3-Dichloropropene	20.0	17	87	65 - 149
1,1,2-Trichloroethane	20.0	21	104	57 - 141
Tetrachloroethene	20.0	18	90	60 - 147
Dibromochloromethane	20.0	18	91	50 - 140
1,2-Dibromoethane	20.0	20	98	57 - 140
Chlorobenzene	20.0	21	105	51 - 139
Ethylbenzene	20.0	21	103	63 - 133
m,p-Xylenes	40.0	42	105	64 - 133
o-Xylene	20.0	22	109	61 - 129
Bromoform	20.0	23	113	46 - 148
Styrene	20.0	19	94	59 - 136
Isopropylbenzene	20.0	21	106	60 - 132
1,1,2,2-Tetrachloroethane	20.0	20	102	60 - 139
1,2,4-Trichlorobenzene	20.0	21	106	52 - 159
1,3-Dichlorobenzene	20.0	21	107	66 - 129
1,4-Dichlorobenzene	20.0	20	98	65 - 133
1,2-Dichlorobenzene	20.0	21	107	63 - 131
1,2-Dibromo-3-chloropropane	20.0	19	96	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

Pond 1

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1L16024
Laboratory ID: 1L16024-MS1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: Pond 1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	ND	19	93	10 - 180
Chloromethane	20.0	ND	18	91	33 - 154
Vinyl chloride	20.0	ND	20	101	20 - 167
Bromomethane	20.0	ND	15	73	10 - 173
Chloroethane	20.0	ND	24	122	27 - 180
Trichlorofluoromethane	20.0	ND	20	99	56 - 155
Freon 113	20.0	ND	22	109	47 - 173
Acetone	100	ND	84	84	10 - 180
1,1-Dichloroethene	20.0	ND	22	108	47 - 139
Carbon disulfide	20.0	ND	23	116	43 - 153
Methylene Chloride	20.0	ND	22	108	43 - 142
Methyl-tert-Butyl Ether	20.0	ND	21	106	51 - 145
trans-1,2-Dichloroethene	20.0	ND	23	114	54 - 134
cis-1,2-Dichloroethene	20.0	ND	21	103	56 - 128
1,1-Dichloroethane	20.0	ND	22	109	57 - 142
2-Butanone	100	ND	100	102	10 - 180
Chloroform	20.0	ND	20	102	58 - 139
1,1,1-Trichloroethane	20.0	ND	22	110	57 - 148
Methyl acetate	20.0	ND	22	110	70 - 130
Cyclohexane	20.0	ND	23	116	70 - 130
Methyl cyclohexane	20.0	ND	23	117	70 - 130
Carbon Tetrachloride	20.0	ND	29	146	54 - 156
1,2-Dichloroethane	20.0	ND	19	96	50 - 156
Benzene	20.0	ND	22	108	56 - 136
Trichloroethene	20.0	ND	20	102	62 - 135
1,2-Dichloropropane	20.0	ND	21	104	61 - 133
Bromodichloromethane	20.0	ND	18	90	58 - 135
4-Methyl-2-pentanone	100	ND	97	97	19 - 180
2-Hexanone	100	ND	86	86	12 - 180
cis-1,3-Dichloropropene	20.0	ND	18	88	64 - 128
Toluene	20.0	ND	21	105	64 - 131

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

Pond 1

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1L16024
Laboratory ID: 1L16024-MS1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: Pond 1

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
trans-1,3-Dichloropropene	20.0	ND	19	95	65 - 149
1,1,2-Trichloroethane	20.0	ND	22	109	57 - 141
Tetrachloroethene	20.0	ND	21	105	60 - 147
Dibromochloromethane	20.0	ND	19	95	50 - 140
1,2-Dibromoethane	20.0	ND	20	102	57 - 140
Chlorobenzene	20.0	ND	23	113	51 - 139
Ethylbenzene	20.0	ND	22	109	63 - 133
m,p-Xylenes	40.0	ND	46	114	64 - 133
o-Xylene	20.0	ND	23	116	61 - 129
Bromoform	20.0	ND	24	119	46 - 148
Styrene	20.0	ND	20	102	59 - 136
Isopropylbenzene	20.0	ND	23	116	60 - 132
1,1,2,2-Tetrachloroethane	20.0	ND	21	104	60 - 139
1,2,4-Trichlorobenzene	20.0	ND	23	117	52 - 159
1,3-Dichlorobenzene	20.0	ND	23	116	66 - 129
1,4-Dichlorobenzene	20.0	ND	21	107	65 - 133
1,2-Dichlorobenzene	20.0	ND	22	112	63 - 131
1,2-Dibromo-3-chloropropane	20.0	ND	21	103	48 - 150

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

Pond 1

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1L16024
Laboratory ID: 1L16024-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: Pond 1

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	20.0	18	89	4	26	10 - 180
Chloromethane	20.0	17	87	4	31	33 - 154
Vinyl chloride	20.0	19	93	8	24	20 - 167
Bromomethane	20.0	17	83	13	29	10 - 173
Chloroethane	20.0	21	107	13	22	27 - 180
Trichlorofluoromethane	20.0	19	93	6	22	56 - 155
Freon 113	20.0	22	108	0.5	30	47 - 173
Acetone	100	82	82	2	19	10 - 180
1,1-Dichloroethene	20.0	21	103	5	16	47 - 139
Carbon disulfide	20.0	21	105	10	26	43 - 153
Methylene Chloride	20.0	20	102	6	23	43 - 142
Methyl-tert-Butyl Ether	20.0	21	104	2	22	51 - 145
trans-1,2-Dichloroethene	20.0	21	106	8	20	54 - 134
cis-1,2-Dichloroethene	20.0	21	104	0.1	17	56 - 128
1,1-Dichloroethane	20.0	21	104	4	24	57 - 142
2-Butanone	100	97	97	5	29	10 - 180
Chloroform	20.0	20	101	0.5	17	58 - 139
1,1,1-Trichloroethane	20.0	22	111	0.5	25	57 - 148
Methyl acetate	20.0	20	102	7	20	70 - 130
Cyclohexane	20.0	23	114	2	20	70 - 130
Methyl cyclohexane	20.0	24	119	1	20	70 - 130
Carbon Tetrachloride	20.0	28	141	3	27	54 - 156
1,2-Dichloroethane	20.0	18	90	5	18	50 - 156
Benzene	20.0	21	107	2	14	56 - 136
Trichloroethene	20.0	19	96	6	20	62 - 135
1,2-Dichloropropane	20.0	21	104	0.2	26	61 - 133
Bromodichloromethane	20.0	18	92	1	19	58 - 135
4-Methyl-2-pentanone	100	95	95	2	24	19 - 180
2-Hexanone	100	87	87	0.7	28	12 - 180
cis-1,3-Dichloropropene	20.0	17	84	5	20	64 - 128
Toluene	20.0	22	108	3	16	64 - 131
trans-1,3-Dichloropropene	20.0	19	95	0.6	17	65 - 149

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

Pond 1

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 1L16024
Laboratory ID: 1L16024-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: Pond 1

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1,2-Trichloroethane	20.0	22	108	2	16	57 - 141
Tetrachloroethene	20.0	20	100	4	21	60 - 147
Dibromochloromethane	20.0	20	98	3	18	50 - 140
1,2-Dibromoethane	20.0	21	103	0.8	16	57 - 140
Chlorobenzene	20.0	22	111	2	13	51 - 139
Ethylbenzene	20.0	22	108	1	18	63 - 133
m,p-Xylenes	40.0	44	110	3	18	64 - 133
o-Xylene	20.0	23	115	1	16	61 - 129
Bromoform	20.0	25	123	3	18	46 - 148
Styrene	20.0	20	99	4	32	59 - 136
Isopropylbenzene	20.0	23	113	3	23	60 - 132
1,1,2,2-Tetrachloroethane	20.0	21	107	3	17	60 - 139
1,2,4-Trichlorobenzene	20.0	22	108	8	24	52 - 159
1,3-Dichlorobenzene	20.0	22	108	7	23	66 - 129
1,4-Dichlorobenzene	20.0	20	98	9	23	65 - 133
1,2-Dichlorobenzene	20.0	21	107	5	25	63 - 131
1,2-Dibromo-3-chloropropane	20.0	18	91	12	21	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA69173
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA69173-SCV1)				Lab File ID: 215KC012.D		Analyzed: 11/08/21 12:44		
Dibromofluoromethane	50.0	109	70 - 130	9.422	9.41825	0.0038	+/-0.5	
Toluene-d8	50.0	107	70 - 130	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	105	70 - 130	14.322	14.322	0.0000	+/-0.5	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA69776
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA69776-CCV1)			Lab File ID: 215LK028.D		Analyzed: 12/16/21 20:04			
Dibromofluoromethane	50.0	106	80 - 120	9.416	9.41825	-0.0023	+/-0.5	
Toluene-d8	50.0	108	80 - 120	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	110	80 - 120	14.316	14.322	-0.0060	+/-0.5	
LCS (1L16024-BS1)			Lab File ID: 215LK029.D		Analyzed: 12/16/21 20:32			
Dibromofluoromethane	50.0	106	53 - 146	9.416	9.41825	-0.0023	+/-0.5	
Toluene-d8	50.0	106	41 - 146	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	106	41 - 142	14.322	14.322	0.0000	+/-0.5	
Matrix Spike (1L16024-MS1)			Lab File ID: 215LK030.D		Analyzed: 12/16/21 20:59			
Dibromofluoromethane	50.0	106	53 - 146	9.416	9.41825	-0.0023	+/-0.5	
Toluene-d8	50.0	106	41 - 146	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	104	41 - 142	14.322	14.322	0.0000	+/-0.5	
Matrix Spike Dup (1L16024-MSD1)			Lab File ID: 215LK031.D		Analyzed: 12/16/21 21:27			
Dibromofluoromethane	50.0	103	53 - 146	9.416	9.41825	-0.0023	+/-0.5	
Toluene-d8	50.0	106	41 - 146	11.766	11.772	-0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	105	41 - 142	14.316	14.322	-0.0060	+/-0.5	
Blank (1L16024-BLK1)			Lab File ID: 215LK033.D		Analyzed: 12/16/21 22:22			
Dibromofluoromethane	50.0	101	53 - 146	9.416	9.41825	-0.0023	+/-0.5	
Toluene-d8	50.0	103	41 - 146	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	101	41 - 142	14.316	14.322	-0.0060	+/-0.5	
Instrument RL Check (AA69776-CRL1)			Lab File ID: 215LK034.D		Analyzed: 12/16/21 22:50			
Dibromofluoromethane	50.0	101	1 - 199	9.416	9.41825	-0.0023	+/-0.5	
Toluene-d8	50.0	105	1 - 199	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	105	1 - 199	14.322	14.322	0.0000	+/-0.5	
CRCA-ASEFFLUENT-20211214 (AE09874-01)			Lab File ID: 215LK040.D		Analyzed: 12/17/21 01:36			
Dibromofluoromethane	50.0	101	53 - 146	9.416	9.41825	-0.0023	+/-0.5	
Toluene-d8	50.0	102	41 - 146	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	100	41 - 142	14.322	14.322	0.0000	+/-0.5	
CRCA-ASINFLUENT-20211214 (AE09874-02)			Lab File ID: 215LK041.D		Analyzed: 12/17/21 02:04			
Dibromofluoromethane	50.0	97	53 - 146	9.416	9.41825	-0.0023	+/-0.5	
Toluene-d8	50.0	104	41 - 146	11.766	11.772	-0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	106	41 - 142	14.316	14.322	-0.0060	+/-0.5	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA69173
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA69173-CAL1)			Lab File ID: 215KC003.D			Analyzed: 11/08/21 08:34			
Pentafluorobenzene	1341353	9.851	1352333	9.845	99	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2550205	10.438	2676972	10.438	95	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1343991	13.223	1499134	13.218	90	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1132020	15.48	1293958	15.48	87	50 - 200	0.0000	+/-0.50	
Cal Standard (AA69173-CAL2)			Lab File ID: 215KC004.D			Analyzed: 11/08/21 09:01			
Pentafluorobenzene	1351713	9.845	1352333	9.845	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2541770	10.438	2676972	10.438	95	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1399397	13.223	1499134	13.218	93	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1161047	15.479	1293958	15.48	90	50 - 200	-0.0010	+/-0.50	
Cal Standard (AA69173-CAL3)			Lab File ID: 215KC005.D			Analyzed: 11/08/21 09:29			
Pentafluorobenzene	1342561	9.845	1352333	9.845	99	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2530760	10.438	2676972	10.438	95	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1395960	13.217	1499134	13.218	93	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1163571	15.474	1293958	15.48	90	50 - 200	-0.0060	+/-0.50	
Cal Standard (AA69173-CAL4)			Lab File ID: 215KC006.D			Analyzed: 11/08/21 09:57			
Pentafluorobenzene	1329545	9.845	1352333	9.845	98	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2529195	10.438	2676972	10.438	94	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1407406	13.217	1499134	13.218	94	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1179463	15.479	1293958	15.48	91	50 - 200	-0.0010	+/-0.50	
Cal Standard (AA69173-CAL5)			Lab File ID: 215KC007.D			Analyzed: 11/08/21 10:25			
Pentafluorobenzene	1330054	9.845	1352333	9.845	98	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2593765	10.438	2676972	10.438	97	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1435594	13.217	1499134	13.218	96	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1235201	15.48	1293958	15.48	95	50 - 200	0.0000	+/-0.50	
Cal Standard (AA69173-CAL6)			Lab File ID: 215KC008.D			Analyzed: 11/08/21 10:52			
Pentafluorobenzene	1352333	9.845	1352333	9.845	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2676972	10.438	2676972	10.438	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1499134	13.218	1499134	13.218	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	1293958	15.48	1293958	15.48	100	50 - 200	0.0000	+/-0.50	
Cal Standard (AA69173-CAL7)			Lab File ID: 215KC009.D			Analyzed: 11/08/21 11:20			
Pentafluorobenzene	1375266	9.845	1352333	9.845	102	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2624988	10.438	2676972	10.438	98	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1544754	13.217	1499134	13.218	103	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1391219	15.48	1293958	15.48	108	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA69173
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA69173-CAL8)			Lab File ID: 215KC010.D			Analyzed: 11/08/21 11:48			
Pentafluorobenzene	1357376	9.845	1352333	9.845	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2634382	10.438	2676972	10.438	98	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1568019	13.217	1499134	13.218	105	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1379564	15.48	1293958	15.48	107	50 - 200	0.0000	+/-0.50	
Secondary Cal Check (AA69173-SCV1)			Lab File ID: 215KC012.D			Analyzed: 11/08/21 12:44			
Pentafluorobenzene	1304691	9.845	1352333	9.845	96	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2526000	10.438	2676972	10.438	94	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1492201	13.223	1499134	13.218	100	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1289303	15.479	1293958	15.48	100	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA69776
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (AA69776-CCV1)			Lab File ID: 215LK028.D			Analyzed: 12/16/21 20:04			
Pentafluorobenzene	1160697	9.845	1352333	9.845	86	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2325409	10.432	2676972	10.438	87	50 - 200	-0.0060	+/-0.50	
Chlorobenzene-d5	1335510	13.217	1499134	13.218	89	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1171720	15.479	1293958	15.48	91	50 - 200	-0.0010	+/-0.50	
LCS (1L16024-BS1)			Lab File ID: 215LK029.D			Analyzed: 12/16/21 20:32			
Pentafluorobenzene	1231453	9.845	1352333	9.845	91	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2449783	10.438	2676972	10.438	92	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1377517	13.217	1499134	13.218	92	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1120806	15.474	1293958	15.48	87	50 - 200	-0.0060	+/-0.50	
Matrix Spike (1L16024-MS1)			Lab File ID: 215LK030.D			Analyzed: 12/16/21 20:59			
Pentafluorobenzene	1203200	9.839	1352333	9.845	89	50 - 200	-0.0060	+/-0.50	
1,4-Difluorobenzene	2427181	10.438	2676972	10.438	91	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1384072	13.218	1499134	13.218	92	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	1118603	15.474	1293958	15.48	86	50 - 200	-0.0060	+/-0.50	
Matrix Spike Dup (1L16024-MSD1)			Lab File ID: 215LK031.D			Analyzed: 12/16/21 21:27			
Pentafluorobenzene	1250475	9.839	1352333	9.845	92	50 - 200	-0.0060	+/-0.50	
1,4-Difluorobenzene	2472619	10.438	2676972	10.438	92	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1390565	13.217	1499134	13.218	93	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1175821	15.474	1293958	15.48	91	50 - 200	-0.0060	+/-0.50	
Blank (1L16024-BLK1)			Lab File ID: 215LK033.D			Analyzed: 12/16/21 22:22			
Pentafluorobenzene	1206992	9.845	1352333	9.845	89	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2435348	10.438	2676972	10.438	91	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1334646	13.217	1499134	13.218	89	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1061073	15.474	1293958	15.48	82	50 - 200	-0.0060	+/-0.50	
Instrument RL Check (AA69776-CRL1)			Lab File ID: 215LK034.D			Analyzed: 12/16/21 22:50			
Pentafluorobenzene	1174728	9.845	1352333	9.845	87	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2383567	10.438	2676972	10.438	89	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1328613	13.217	1499134	13.218	89	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1125605	15.474	1293958	15.48	87	50 - 200	-0.0060	+/-0.50	
CRCA-ASEFFLUENT-20211214 (AE09874-01)			Lab File ID: 215LK040.D			Analyzed: 12/17/21 01:36			
Pentafluorobenzene	1387849	9.845	1352333	9.845	103	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2811650	10.438	2676972	10.438	105	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1521963	13.217	1499134	13.218	102	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1101886	15.48	1293958	15.48	85	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA69776
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
CRCA-ASINFLUENT-20211214 (AE09874-02)			Lab File ID: 215LK041.D			Analyzed: 12/17/21 02:04			
Pentafluorobenzene	1238983	9.839	1352333	9.845	92	50 - 200	-0.0060	+/-0.50	
1,4-Difluorobenzene	2482673	10.438	2676972	10.438	93	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1346208	13.218	1499134	13.218	90	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	1118574	15.474	1293958	15.48	86	50 - 200	-0.0060	+/-0.50	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE09874-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA69173		
Calibration:	2111046	Instrument:	OVGCMS5

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA69173-TUN1	215KC002.D	11/08/21 07:59
Cal Standard	AA69173-CAL1	215KC003.D	11/08/21 08:34
Cal Standard	AA69173-CAL2	215KC004.D	11/08/21 09:01
Cal Standard	AA69173-CAL3	215KC005.D	11/08/21 09:29
Cal Standard	AA69173-CAL4	215KC006.D	11/08/21 09:57
Cal Standard	AA69173-CAL5	215KC007.D	11/08/21 10:25
Cal Standard	AA69173-CAL6	215KC008.D	11/08/21 10:52
Cal Standard	AA69173-CAL7	215KC009.D	11/08/21 11:20
Cal Standard	AA69173-CAL8	215KC010.D	11/08/21 11:48
Secondary Cal Check	AA69173-SCV1	215KC012.D	11/08/21 12:44

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE09874-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA69776		
Calibration:	2111046	Instrument:	OVGCMS5

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	AA69776-CCV1	215LK028.D	12/16/21 20:04
LCS	1L16024-BS1	215LK029.D	12/16/21 20:32
Pond 1	1L16024-MS1	215LK030.D	12/16/21 20:59
Pond 1	1L16024-MSD1	215LK031.D	12/16/21 21:27
Blank	1L16024-BLK1	215LK033.D	12/16/21 22:22
Instrument RL Check	AA69776-CRL1	215LK034.D	12/16/21 22:50
CRCA-ASEFFLUENT-20211214	AE09874-01	215LK040.D	12/17/21 01:36
CRCA-ASINFLUENT-20211214	AE09874-02	215LK041.D	12/17/21 02:04

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE09874-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Lab File ID:	215KC002.D	Injection Date:	11/08/21
Instrument ID:	OVGCMS5	Injection Time:	07:59
Sequence:	AA69173	Lab Sample ID:	AA69173-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
95	50 - 200% of 174	153	PASS
96	5 - 9% of 95	7.14	PASS
173	Less than 2% of 174	0.158	PASS
174	50 - 200% of 95	65.3	PASS
175	5 - 9% of 174	7.48	PASS
176	95 - 105% of 174	97.9	PASS
177	5 - 10% of 176	6.79	PASS

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE09874-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS5	Calibration:	2111046
Lab File ID:	215LK028.D	Calibration Date:	11/08/21 08:47
Sequence:	AA69776	Injection Date:	12/16/21
Lab Sample ID:	AA69776-CCV1	Injection Time:	20:04

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
Dichlorodifluoromethane	A	20.0	18	0.6541938	0.5767698		-12	20	
Chloromethane	A	20.0	19	0.8265057	0.7244052		-5.6	20	
Vinyl chloride	A	20.0	18	0.5890365	0.5368886		-8.9	20	
Bromomethane	A	20.0	39	0.2183848	0.3581943		97	20	*
Chloroethane	A	20.0	17	0.3313991	0.2373251		-17	20	
Trichlorofluoromethane	A	20.0	18	0.7198355	0.6379809		-11	20	
Freon 113	A	50.0	50	0.291157	0.2888695		-0.8	20	
Acetone	A	250	210	0.1188119	9.858663E-02		-17	20	
1,1-Dichloroethene	A	50.0	46	0.4497824	0.4117336		-8.5	20	
Carbon disulfide	A	250	250	1.280426	1.30674		1.6	20	
Methylene Chloride	A	50.0	49	0.5095401	0.4952688		-2.8	20	
Methyl-tert-Butyl Ether	A	50.0	49	1.127138	1.105872		-1.9	20	
trans-1,2-Dichloroethene	A	50.0	48	0.4840347	0.4677664		-4.4	20	
cis-1,2-Dichloroethene	A	50.0	50	0.539181	0.5409517		0.30	20	
1,1-Dichloroethane	A	50.0	46	0.9186968	0.850302		-7.4	20	
2-Butanone	A	250	250	6.252422E-02	5.787712E-02		-1.4	20	
Chloroform	A	50.0	47	0.9110893	0.8520872		-6.5	20	
1,1,1-Trichloroethane	A	50.0	50	0.6829916	0.6787129		-0.6	20	
Methyl acetate	A	50.0	44	0.2758045	0.2570197		-12	20	
Cyclohexane	A	50.0	50	0.9169544	0.9122984		-0.5	20	
Methyl cyclohexane	A	50.0	49	0.6074144	0.4791837		-1.4	20	
Carbon Tetrachloride	A	50.0	56	0.2321685	0.3008215		13	20	
1,2-Dichloroethane	A	50.0	43	0.3583755	0.2845839		-15	20	
Benzene	A	50.0	47	1.081856	1.01955		-5.8	20	
Trichloroethene	A	50.0	45	0.2493154	0.2332308		-11	20	
1,2-Dichloropropane	A	50.0	47	0.2923637	0.2766236		-5.4	20	
Bromodichloromethane	A	50.0	42	0.2982542	0.2915629		-16	20	
4-Methyl-2-pentanone	A	250	240	3.462393E-02	3.388875E-02		-2.1	20	
2-Hexanone	A	250	210	0.2638736	0.2382699		-17	20	

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE09874-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS5	Calibration:	2111046
Lab File ID:	215LK028.D	Calibration Date:	11/08/21 08:47
Sequence:	AA69776	Injection Date:	12/16/21
Lab Sample ID:	AA69776-CCV1	Injection Time:	20:04

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
cis-1,3-Dichloropropene	A	50.0	43	0.4334937	0.4273119		-13	20
Toluene	A	50.0	47	1.251215	1.18208		-5.5	20
trans-1,3-Dichloropropene	A	50.0	44	0.5895958	0.5771054		-12	20
1,1,2-Trichloroethane	A	50.0	51	0.3797259	0.3851847		1.4	20
Tetrachloroethene	A	50.0	45	0.3511604	0.3083871		-9.6	20
Dibromochloromethane	A	50.0	46	0.3080625	0.3476537		-8.3	20
1,2-Dibromoethane	A	50.0	50	0.3790205	0.3771376		-0.5	20
Chlorobenzene	A	50.0	51	1.192695	1.212353		1.6	20
Ethylbenzene	A	50.0	50	0.6816257	0.6862023		0.70	20
m,p-Xylenes	A	100	100	0.8505266	0.852803		0.30	20
o-Xylene	A	50.0	52	0.806243	0.8397174		4.2	20
Bromoform	A	50.0	50	0.1441141	0.1715427		0.70	20
Styrene	A	50.0	47	1.300073	1.393377		-6.4	20
Isopropylbenzene	A	50.0	50	2.096851	2.108115		0.50	20
1,1,2,2-Tetrachloroethane	A	50.0	51	0.5108722	0.521591		2.1	20
1,2,4-Trichlorobenzene	A	50.0	49	0.4901185	0.479385		-2.2	20
1,3-Dichlorobenzene	A	50.0	51	1.038443	1.055459		1.6	20
1,4-Dichlorobenzene	A	50.0	47	1.106172	1.075197		-5.5	20
1,2-Dichlorobenzene	A	50.0	51	0.9941358	1.023476		3.0	20
1,2-Dibromo-3-chloropropane	A	50.0	46	8.937632E-02	0.0889052		-8.6	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AE09874-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA69173	Instrument:	OVGCMS5
Calibration:	2111046		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1J0534	MS Tune (lower conc.)	AA69173-TUN1	215KC002.D	11/08/21 07:59
A1K0853	8260 1.0 PPB ms5	AA69173-CAL1	215KC003.D	11/08/21 08:34
A1K0854	8260 2.0 PPB ms5	AA69173-CAL2	215KC004.D	11/08/21 09:01
A1K0855	8260 5.0 PPB ms5	AA69173-CAL3	215KC005.D	11/08/21 09:29
A1K0856	8260 10 PPB ms5	AA69173-CAL4	215KC006.D	11/08/21 09:57
A1K0857	8260 20 PPB ms5	AA69173-CAL5	215KC007.D	11/08/21 10:25
A1K0858	8260 50 PPB ms5	AA69173-CAL6	215KC008.D	11/08/21 10:52
A1K0859	8260 80 PPB ms5	AA69173-CAL7	215KC009.D	11/08/21 11:20
A1K0860	8260 100 PPB ms5	AA69173-CAL8	215KC010.D	11/08/21 11:48
A1K0784	8260 SCV 50 ppb/ 20 gases ms5	AA69173-SCV1	215KC012.D	11/08/21 12:44

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	1	0.7443231	2	0.5032873	5	0.6500859	10	0.6034847	20	0.6326341	50	0.6657524
Chloromethane	1	0.9591808	2	0.7599061	5	0.9088898	10	0.7190956	20	0.7791056	50	0.8066778
Vinyl chloride	1	0.6287681	2	0.4579005	5	0.5802045	10	0.5346829	20	0.5806418	50	0.6166854
Bromomethane	1	0.314235	2	0.235516	5	0.2580441	10	0.1796893	20	0.166356	50	0.1910639
Chloroethane	1	0.3698877	2	0.295144	5	0.379722	10	0.3367129	20	0.3305261	50	0.2764016
Trichlorofluoromethane	1	0.7454414	2	0.5730137	5	0.7765681	10	0.6678826	20	0.7148901	50	0.7343901
Freon 113	1	0.2760273	2	0.2282474	5	0.3206633	10	0.2676856	20	0.3005498	50	0.3003269
Acetone	5	0.1397022	10	8.872446E-02	25	0.1379081	50	0.1177967	100	0.1082328	250	0.1113408
1,1-Dichloroethene	1	0.5551111	2	0.3480399	5	0.4846037	10	0.4081321	20	0.4353695	50	0.4352264
Carbon disulfide	5	1.235916	10	0.8842114	25	1.568133	50	1.418763	100	1.30322	250	1.247655
Methylene Chloride	1	~~0.5688659~~	2	~~0.4191163~~	5	0.5510364	10	0.4493755	20	0.4900177	50	0.5027645
Methyl-tert-Butyl Ether	1	1.288251	2	0.7970072	5	1.193041	10	1.011797	20	1.096991	50	1.161448
trans-1,2-Dichloroethene	1	0.5479915	2	0.3272699	5	0.5606375	10	0.4492815	20	0.4566394	50	0.4883376
cis-1,2-Dichloroethene	1	0.6094965	2	0.3746727	5	0.5931276	10	0.4838911	20	0.5274786	50	0.5499629
1,1-Dichloroethane	1	1.054532	2	0.7395986	5	0.9544222	10	0.8435217	20	0.8932607	50	0.9154387
2-Butanone	5	8.161908E-02	10	5.101305E-02	25	7.316614E-02	50	6.082005E-02	100	5.464928E-02	250	5.645621E-02
Chloroform	1	1.008832	2	0.6488803	5	1.043737	10	0.8513928	20	0.9050911	50	0.9193416
1,1,1-Trichloroethane	1	0.6525874	2	0.4974059	5	0.7191703	10	0.626218	20	0.6737452	50	0.7301131
Methyl acetate	1	0.2125839	2	0.2323533	5	0.3277095	10	0.2601266	20	0.2600552	50	0.2882914
Cyclohexane	1	0.9208612	2	0.7618481	5	0.9736839	10	0.8180016	20	0.9073936	50	0.9393019
Methyl cyclohexane	1	1.10599	2	0.6321382	5	0.6583674	10	0.4843794	20	0.4711703	50	0.4740457
Carbon Tetrachloride	1	0.2053364	2	0.1465908	5	0.2168281	10	0.1977961	20	0.2350608	50	0.2539537
1,2-Dichloroethane	1	0.4661978	2	0.2877817	5	0.4136544	10	0.3339956	20	0.3204251	50	0.3268745
Benzene	1	1.215157	2	0.8544046	5	1.239201	10	1.009066	20	1.042526	50	1.057248
Trichloroethene	1	0.3084458	2	0.1615606	5	0.2723411	10	0.2305477	20	0.2427822	50	0.2505902
1,2-Dichloropropane	1	0.3357573	2	0.2346298	5	0.3112306	10	0.2661815	20	0.2825998	50	0.2862619
Bromodichloromethane	1	0.2856437	2	0.2181059	5	0.3196075	10	0.2524084	20	0.2956311	50	0.3136342
4-Methyl-2-pentanone	5	0.0335973	10	2.717004E-02	25	4.115365E-02	50	3.381432E-02	100	3.266988E-02	250	3.395979E-02
2-Hexanone	5	0.2346221	10	0.1586326	25	0.316373	50	0.2799597	100	0.2647496	250	0.2732542
cis-1,3-Dichloropropene	1	0.4707661	2	0.28729	5	0.4318782	10	0.3958572	20	0.4251657	50	0.4549383
Toluene	1	1.543165	2	1.001556	5	1.416301	10	1.152482	20	1.202103	50	1.216139

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	1	0.5940516	2	0.3215135	5	0.6704992	10	0.5470561	20	0.6094881	50	0.6418466
1,1,2-Trichloroethane	1	0.4122051	2	0.2976997	5	0.4105992	10	0.3571677	20	0.3736798	50	0.3862743
Tetrachloroethene	1	0.4542813	2	0.2595404	5	0.4254205	10	0.3121097	20	0.3421058	50	0.3321024
Dibromochloromethane	1	0.308819	2	0.1687334	5	0.3064271	10	0.252532	20	0.3058403	50	0.3498707
1,2-Dibromoethane	1	0.4291323	2	0.2621665	5	0.4130491	10	0.3437992	20	0.3784026	50	0.3889392
Chlorobenzene	1	1.322591	2	0.8904192	5	1.368592	10	1.135273	20	1.208827	50	1.188993
Ethylbenzene	1	0.7657045	2	0.5128638	5	0.7910542	10	0.609316	20	0.6539889	50	0.6912718
m,p-Xylenes	2	0.8998944	4	0.6399989	10	0.994939	20	0.8159444	40	0.8575135	100	0.8697585
o-Xylene	1	0.8046185	2	0.5955422	5	0.9099544	10	0.7294484	20	0.8172523	50	0.8316335
Bromoform	1	0.1198297	2	8.333947E-02	5	0.1226611	10	0.116228	20	0.134467	50	0.1642548
Styrene	1	1.206556	2	0.8642651	5	1.428193	10	1.171098	20	1.328166	50	1.395008
Isopropylbenzene	1	2.327434	2	1.456359	5	2.421774	10	1.940719	20	2.038027	50	2.134133
1,1,2,2-Tetrachloroethane	1	0.5692746	2	0.3549922	5	0.5724161	10	0.4600627	20	0.4842873	50	0.523719
1,2,4-Trichlorobenzene	1	0.4336496	2	0.3705061	5	0.5678038	10	0.4758098	20	0.4717754	50	0.5220548
1,3-Dichlorobenzene	1	1.136817	2	0.7925605	5	1.108209	10	0.969509	20	0.9961456	50	1.051553
1,4-Dichlorobenzene	1	1.3835	2	0.8003121	5	1.211005	10	1.033462	20	1.037534	50	1.095744
1,2-Dichlorobenzene	1	1.039646	2	0.6992396	5	1.151911	10	0.9495296	20	0.9366836	50	1.027779
1,2-Dibromo-3-chloropropane	1	8.219819E-02	2	7.109962E-02	5	9.102152E-02	10	7.738691E-02	20	8.275374E-02	50	9.518161E-02
Dibromofluoromethane	50	0.5213654	55	0.4883742	60	0.4863677	50	0.5418711	65	0.5249781	50	0.5633132
Toluene-d8	50	1.204121	55	1.159988	60	1.15519	50	1.228194	65	1.188561	50	1.231618
4-Bromofluorobenzene	50	0.8302065	55	0.7813489	60	0.7709933	50	0.8118453	65	0.8005242	50	0.8448371

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	80	0.7045673	100	0.7294154								
Chloromethane	80	0.8224336	100	0.8567567								
Vinyl chloride	80	0.6375817	100	0.6758271								
Bromomethane	80	0.1925555	100	0.2096188								
Chloroethane	80	~~0.1733356~~	100	~~0.1636503~~								
Trichlorofluoromethane	80	0.7532025	100	0.7932953								
Freon 113	80	0.3130817	100	0.322674								
Acetone	400	0.1256289	500	0.1211611								
1,1-Dichloroethene	80	0.4570052	100	0.4747715								
Carbon disulfide	400	1.300175	500	1.285334								
Methylene Chloride	80	0.525128	100	0.5389185								
Methyl-tert-Butyl Ether	80	1.22972	100	1.238846								
trans-1,2-Dichloroethene	80	0.5171304	100	0.5249894								
cis-1,2-Dichloroethene	80	0.5800023	100	0.594816								
1,1-Dichloroethane	80	0.9547403	100	0.9940602								
2-Butanone	400	6.240293E-02	500	0.060067								
Chloroform	80	0.9465719	100	0.9648675								
1,1,1-Trichloroethane	80	0.7633687	100	0.801324								
Methyl acetate	80	0.3157171	100	0.3095992								
Cyclohexane	80	0.9931829	100	1.021362								
Methyl cyclohexane	80	0.5119645	100	0.5212596								
Carbon Tetrachloride	80	0.2958359	100	0.3059458								
1,2-Dichloroethane	80	0.3598285	100	0.3582468								
Benzene	80	1.119785	100	1.117458								
Trichloroethene	80	0.2650181	100	0.2632378								
1,2-Dichloropropane	80	0.3078612	100	0.3143878								
Bromodichloromethane	80	0.3448549	100	0.3561479								
4-Methyl-2-pentanone	400	3.854751E-02	500	3.607894E-02								
2-Hexanone	400	0.3015983	500	0.2817997								
cis-1,3-Dichloropropene	80	0.5007618	100	0.5012925								
Toluene	80	1.250312	100	1.227658								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	80	0.6771467	100	0.6551643								
1,1,2-Trichloroethane	80	0.405516	100	0.3946655								
Tetrachloroethene	80	0.3395359	100	0.3441872								
Dibromochloromethane	80	0.3846628	100	0.3876149								
1,2-Dibromoethane	80	0.4140016	100	0.4026731								
Chlorobenzene	80	1.222218	100	1.204646								
Ethylbenzene	80	0.7172093	100	0.7115969								
m,p-Xylenes	160	0.8779626	200	0.8482018								
o-Xylene	80	0.8859882	100	0.8755063								
Bromoform	80	0.2051055	100	0.2070275								
Styrene	80	1.478863	100	1.528434								
Isopropylbenzene	80	2.23132	100	2.225046								
1,1,2,2-Tetrachloroethane	80	0.5696643	100	0.5525615								
1,2,4-Trichlorobenzene	80	0.5399316	100	0.5394168								
1,3-Dichlorobenzene	80	1.108494	100	1.144254								
1,4-Dichlorobenzene	80	1.127868	100	1.159947								
1,2-Dichlorobenzene	80	1.064045	100	1.084253								
1,2-Dibromo-3-chloropropane	80	0.1101637	100	0.1052053								
Dibromofluoromethane	70	0.5089758	75	0.5068323								
Toluene-d8	70	1.160035	75	1.156643								
4-Bromofluorobenzene	70	0.8034247	75	0.7953177								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	0.6541938	11.87968	3.97275	7.769159E-02			20	
Chloromethane	0.8265057	9.585286	4.41	7.394085E-02		0.9997979	0.99	
Vinyl chloride	0.5890365	11.57345	4.5715	5.797002E-02			20	
Bromomethane	0.2183848	22.39829	5.221	5.968524E-02		0.9986744	0.99	
Chloroethane	0.3313991	12.20852	5.449	0.1284504	0.993		0.99	
Trichlorofluoromethane	0.7198355	9.805754	5.6865	0.1673203			20	
Freon 113	0.291157	11.05666	6.546	4.707597E-02			20	
Acetone	0.1188119	13.965	7.3925	0.1723568			20	
1,1-Dichloroethene	0.4497824	13.41611	6.5235	6.360208E-02			20	
Carbon disulfide	1.280426	15.13496	6.61225	6.029833E-02	0.9994526		0.99	
Methylene Chloride	0.5095401	7.277248	7.33	1.997676E-02			20	
Methyl-tert-Butyl Ether	1.127138	14.13484	7.621	4.230198E-02			20	
trans-1,2-Dichloroethene	0.4840347	15.47666	7.53825	4.200009E-02		0.9997235	0.99	
cis-1,2-Dichloroethene	0.539181	14.53438	8.9415	6.731551E-02			20	
1,1-Dichloroethane	0.9186968	10.49641	8.30325	2.877628E-02			20	
2-Butanone	6.252422E-02	16.19997	9.543625	0.1411205		0.9983026	0.99	
Chloroform	0.9110893	13.36055	9.21225	5.204155E-02			20	
1,1,1-Trichloroethane	0.6829916	13.85342	9.475	6.037893E-02			20	
Methyl acetate	0.2758045	14.98942	7.5165	0.118789		0.9988158	0.99	
Cyclohexane	0.9169544	9.61271	9.181	3.295506E-02			20	
Methyl cyclohexane	0.6074144	35.18917	10.44175	4.150477E-02		0.9991179	0.99	
Carbon Tetrachloride	0.2321685	22.69836	9.4055	2.416228E-02		0.9989608	0.99	
1,2-Dichloroethane	0.3583755	15.88794	10.08	0.0321008		0.9991788	0.99	
Benzene	1.081856	11.28933	9.86825	3.218549E-02			20	
Trichloroethene	0.2493154	16.99313	10.44475	3.728466E-02	0.9990389		0.99	
1,2-Dichloropropane	0.2923637	10.90509	10.97675	4.349962E-02			20	
Bromodichloromethane	0.2982542	15.47263	11.01025	3.946928E-02	0.9954972		0.99	
4-Methyl-2-pentanone	3.462393E-02	12.04151	12.12837	6.686337E-02			20	
2-Hexanone	0.2638736	18.55431	12.87525	0.0479684	0.9972145		0.99	
cis-1,3-Dichloropropene	0.4334937	16.03798	11.60338	3.013039E-02	0.9969562		0.99	

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AE09874-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Toluene	1.251215	13.12437	11.8235	3.900333E-02			20	
trans-1,3-Dichloropropene	0.5895958	19.79333	12.1935	7.652679E-02	0.9987486		0.99	
1,1,2-Trichloroethane	0.3797259	10.05906	12.35687	3.745073E-02			20	
Tetrachloroethene	0.3511604	17.58625	12.20325	4.072693E-02	0.9994943		0.99	
Dibromochloromethane	0.3080625	23.42352	12.54563	3.416691E-02	0.9952751		0.99	
1,2-Dibromoethane	0.3790205	14.25926	12.80825	4.673264E-02			20	
Chlorobenzene	1.192695	12.01584	13.23725	3.749004E-02			20	
Ethylbenzene	0.6816257	13.09551	13.20363	2.617679E-02			20	
m,p-Xylenes	0.8505266	11.75631	13.32075	3.483174E-02			20	
o-Xylene	0.806243	12.6639	13.72875	3.077385E-02			20	
Bromoform	0.1441141	30.69529	13.87262	2.547564E-02		0.9962768	0.99	
Styrene	1.300073	16.59021	13.7765	5.839275E-02	0.9973928		0.99	
Isopropylbenzene	2.096851	14.33798	13.99	2.257002E-02			20	
1,1,2,2-Tetrachloroethane	0.5108722	14.82362	14.46525	0.0293586			20	
1,2,4-Trichlorobenzene	0.4901185	13.35787	18.13437	4.828563E-02			20	
1,3-Dichlorobenzene	1.038443	11.3836	15.40975	2.840209E-02			20	
1,4-Dichlorobenzene	1.106172	15.0854	15.49775	7.350592E-03	0.9988395		0.99	
1,2-Dichlorobenzene	0.9941358	13.88404	16.01775	2.737511E-02			20	
1,2-Dibromo-3-chloropropane	8.937632E-02	15.20203	17.07413	4.012998E-02		0.9968684	0.99	
Dibromofluoromethane	0.5177597	5.040217	9.41825	3.669852E-02			20	
Toluene-d8	1.185544	2.73446	11.772	1.988031E-02			20	
4-Bromofluorobenzene	0.8048122	3.007497	14.322	1.411585E-02			20	

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AE09874-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2111046 **Laboratory ID:** AA69173-SCV1

Sequence: AA69173 **Standard ID:** A1K0784

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Cyclohexane	50.0	58	16.0	30.00
Ethylbenzene	50.0	51	1.3	30.00
Carbon Tetrachloride	50.0	54	9.0	30.00
1,3-Dichlorobenzene	50.0	53	6.6	30.00
4-Bromofluorobenzene	50.0	53	5.4	30.00
Toluene-d8	50.0	54	7.3	30.00
Dibromofluoromethane	50.0	54	9.0	30.00
Methyl-tert-Butyl Ether	50.0	54	8.6	30.00
trans-1,2-Dichloroethene	50.0	51	2.7	30.00
cis-1,2-Dichloroethene	50.0	52	4.2	30.00
Tetrachloroethene	50.0	49	-1.1	30.00
Acetone	250	260	2.8	30.00
1,2,4-Trichlorobenzene	50.0	55	9.9	30.00
Chloroform	50.0	52	4.8	30.00
Chlorobenzene	50.0	51	2.0	30.00
Toluene	50.0	49	-1.8	30.00
Methyl cyclohexane	50.0	55	10.4	30.00
m,p-Xylenes	100	100	0.6	30.00
4-Methyl-2-pentanone	250	260	5.1	30.00
1,2-Dichloroethane	50.0	52	3.5	30.00
1,2-Dibromoethane	50.0	50	0.6	30.00
1,4-Dichlorobenzene	50.0	49	-1.7	30.00
trans-1,3-Dichloropropene	50.0	52	4.6	30.00
cis-1,3-Dichloropropene	50.0	46	-8.0	30.00
Styrene	50.0	48	-4.0	30.00
Dibromochloromethane	50.0	49	-2.6	30.00
1,1-Dichloroethene	50.0	50	-0.4	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AE09874-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2111046 **Laboratory ID:** AA69173-SCV1

Sequence: AA69173 **Standard ID:** A1K0784

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
1,2-Dibromo-3-chloropropane	50.0	51	2.5	30.00
1,2-Dichlorobenzene	50.0	54	8.0	30.00
o-Xylene	50.0	52	4.0	30.00
1,1,2,2-Tetrachloroethane	50.0	49	-1.5	30.00
Methyl acetate	50.0	52	3.8	30.00
Trichloroethene	50.0	49	-2.2	30.00
1,1,2-Trichloroethane	50.0	52	3.5	30.00
2-Butanone	250	260	3.0	30.00
1,2-Dichloropropane	50.0	50	0.02	30.00
Freon 113	50.0	52	4.7	30.00
2-Hexanone	250	240	-2.1	30.00
Trichlorofluoromethane	20.0	21	2.6	30.00
Isopropylbenzene	50.0	52	5.0	30.00
1,1-Dichloroethane	50.0	52	3.7	30.00
Bromodichloromethane	50.0	50	-0.3	30.00
Bromoform	50.0	53	7.0	30.00
Carbon disulfide	50.0	55	10.9	30.00
Methylene Chloride	50.0	52	4.3	30.00
Vinyl chloride	20.0	20	-0.7	30.00
Chloroethane	20.0	18	-12.2	30.00
Chloromethane	20.0	20	0.0	30.00
Bromomethane	20.0	23	13.6	30.00
1,1,1-Trichloroethane	50.0	57	14.3	30.00
Benzene	50.0	51	3.0	30.00
Dichlorodifluoromethane	20.0	19	-3.4	30.00

* Values outside of QC limits

TETRA TECH ISG
TtEGS, Information Systems Group

Completion Ticket

On 1/11/2022 at 3:28 PM the following files were submitted to Tetra Tech by kdylnicki@encolabs.com with ENCO:

TE016AE09874A1.txt, TE016AE09874A3.txt

If you need to identify this session at a later date refer to Ticket Key:

2022111_6469129532_ledd_ENCO

You may print this page by clicking on the "Print This Page" button

Thank you for using the Data Checker, to upload more files click the "Upload/Check Files" link on navigation menu.

Print this Page Back To Upload

I Lovelie Metzgar, as the designated Quality Assurance Officer, hereby attest that all electronic deliverables have been thoroughly reviewed and are in agreement with the associated hardcopy data. The enclosed electronic files have been reviewed for accuracy (including significant figures), completeness and format. The laboratory will be responsible for any labor time necessary to correct enclosed electronic deliverables that have been found to be in error. I can be reached at (407) 826-5314 if there are any questions or problems with the enclosed electronic deliverables.

Signature:_____ Title: Quality Assurance Manager Date: 01/12/22

TABLE OF CONTENTS

ENCO Laboratories
Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Thursday, February 3, 2022
Tetra Tech, Inc. (TE016)
Attn: Alex Murphy
1353 N Courtenay Pkwy, Suite S
Merritt Island, FL 32953

RE: Laboratory Results for
Project Number: 112G08970, Project Name/Desc: NASA KSC CRCA Airs
ENCO Workorder(s): AF00241

Dear Alex Murphy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Friday, January 14, 2022.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Ryya B Kumm For Kaitlin Dylnicki

Project Manager

Enclosure(s)

Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Client PM: Alex Murphy
Project Number: 112G08970
ENCO Project ID: AF00241
SDG: AF00241-TE016

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

List of instruments used:

Analytical and Preparation Method	SOP Reference Instrument
TO-15	OVGCMS7

Analysis: TO-15

The calibration curve and the continuing calibration standards are in ppbv. Raw data is reported in pptv. Per request, results may be reported in a unit other than ppbv which is obtained through a conversion factor set up in the laboratories' database.

Manual integrations were performed on samples associated with TO-15. All data & explanations are included in the raw data section of the report.

Affected Samples: CRCA-AMB0001-20220114[AF00241-01], CRCA-AMB0002-20220114 [AF00241-02], CRCA-VMP0001-20220114 [AF00241-03], CRCA-VMP0002-20220114 [AF00241-04], CRCA-VMP0003-20220114 [AF00241-05], CRCA-VMP0003-20220114 [AF00241-06]
The continuing calibration verification standard exhibited low bias for carbon tetrachloride; the associated sample had ND (non-detect) results, but sensitivity was verified by analyzing a standard with a concentration equivalent to the reporting limit.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Kaitlin Dylnicki
Project Manager

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: CRCA-AMB0001-20220114 **Lab ID: AF00241-01** **Sampled: 01/14/22 15:20** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 08:59

Client ID: CRCA-AMB0002-20220114 **Lab ID: AF00241-02** **Sampled: 01/14/22 15:25** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 09:45

Client ID: CRCA-VMP0001-20220114 **Lab ID: AF00241-03** **Sampled: 01/14/22 11:30** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 10:30

Client ID: CRCA-VMP0002-20220114 **Lab ID: AF00241-04** **Sampled: 01/14/22 11:45** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 11:16

Client ID: CRCA-VMP0003-20220114 **Lab ID: AF00241-05** **Sampled: 01/14/22 13:00** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 12:02

Client ID: CRCA-VMP0004-20220114 **Lab ID: AF00241-06** **Sampled: 01/14/22 13:40** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 12:50

SAMPLE DETECTION SUMMARY

Client ID: CRCA-AMB0001-20220114 **Lab ID:** AF00241-01

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	3.9	I	1.1	8.0	ug/m³ Air	TO-15	
Methylene chloride	2.4	I	0.94	12	ug/m³ Air	TO-15	

Client ID: CRCA-AMB0002-20220114 **Lab ID:** AF00241-02

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	11		1.1	8.1	ug/m³ Air	TO-15	
Freon 113	5.8	I	3.3	26	ug/m³ Air	TO-15	
Methylene chloride	2.9	I	0.94	12	ug/m³ Air	TO-15	
trans-1,2-Dichloroethene	2.1	I	1.7	13	ug/m³ Air	TO-15	

Client ID: CRCA-VMP0001-20220114 **Lab ID:** AF00241-03

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	7.9	I	1.1	8.1	ug/m³ Air	TO-15	
Freon 113	31		3.4	26	ug/m³ Air	TO-15	
Methylene chloride	1.0	I	0.95	12	ug/m³ Air	TO-15	

Client ID: CRCA-VMP0002-20220114 **Lab ID:** AF00241-04

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	3.6	I	1.2	8.3	ug/m³ Air	TO-15	
Freon 113	120		3.4	27	ug/m³ Air	TO-15	
Methylene chloride	1.0	I	0.97	12	ug/m³ Air	TO-15	
trans-1,2-Dichloroethene	3.3	I	1.8	14	ug/m³ Air	TO-15	

Client ID: CRCA-VMP0003-20220114 **Lab ID:** AF00241-05

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	18		1.2	8.7	ug/m³ Air	TO-15	
Chloroform	5.5	I	2.7	18	ug/m³ Air	TO-15	
Freon 113	45		3.6	28	ug/m³ Air	TO-15	

Client ID: CRCA-VMP0004-20220114 **Lab ID:** AF00241-06

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	8.8		1.2	8.8	ug/m³ Air	TO-15	
Chloroform	6.5	I	2.7	18	ug/m³ Air	TO-15	
Freon 113	130		3.6	28	ug/m³ Air	TO-15	
Methylene chloride	2.1	I	1.0	13	ug/m³ Air	TO-15	

ANALYTICAL RESULTS

Description: CRCA-AMB0001-20220114 | **Lab Sample ID:** AF00241-01 | **Received:** 01/14/22 15:40
Matrix: Air | **Sampled:** 01/14/22 15:20 | **Work Order:** AF00241
Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.5	U	ug/m³ Air	1.35	2.5	18	2A18022	TO-15	01/19/22 08:59	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.3	U	ug/m³ Air	1.35	3.3	23	2A18022	TO-15	01/19/22 08:59	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.6	U	ug/m³ Air	1.35	2.6	18	2A18022	TO-15	01/19/22 08:59	rgg	
1,1-Dichloroethane [75-34-3]^	2.0	U	ug/m³ Air	1.35	2.0	14	2A18022	TO-15	01/19/22 08:59	rgg	
1,1-Dichloroethene [75-35-4]^	2.0	U	ug/m³ Air	1.35	2.0	13	2A18022	TO-15	01/19/22 08:59	rgg	
1,2-Dibromoethane [106-93-4]^	3.7	U	ug/m³ Air	1.35	3.7	26	2A18022	TO-15	01/19/22 08:59	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.2	U	ug/m³ Air	1.35	2.2	20	2A18022	TO-15	01/19/22 08:59	rgg	
1,2-Dichloroethane [107-06-2]^	2.0	U	ug/m³ Air	1.35	2.0	14	2A18022	TO-15	01/19/22 08:59	rgg	
1,2-Dichloropropane [78-87-5]^	2.5	U	ug/m³ Air	1.35	2.5	16	2A18022	TO-15	01/19/22 08:59	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.3	U	ug/m³ Air	1.35	2.3	20	2A18022	TO-15	01/19/22 08:59	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.5	U	ug/m³ Air	1.35	2.5	20	2A18022	TO-15	01/19/22 08:59	rgg	
3-Chloropropene [107-05-1]^	1.6	U	ug/m³ Air	1.35	1.6	11	2A18022	TO-15	01/19/22 08:59	rgg	
Acetone [67-64-1]^	**3.9**	I	ug/m³ Air	1.35	1.1	8.0	2A18022	TO-15	01/19/22 08:59	rgg	
Bromodichloromethane [75-27-4]^	3.1	U	ug/m³ Air	1.35	3.1	23	2A18022	TO-15	01/19/22 08:59	rgg	
Bromoethene [593-60-2]^	1.9	U	ug/m³ Air	1.35	1.9	15	2A18022	TO-15	01/19/22 08:59	rgg	
Bromoform [75-25-2]^	5.3	U	ug/m³ Air	1.35	5.3	35	2A18022	TO-15	01/19/22 08:59	rgg	
Bromomethane [74-83-9]^	1.7	U	ug/m³ Air	1.35	1.7	13	2A18022	TO-15	01/19/22 08:59	rgg	
Carbon tetrachloride [56-23-5]^	2.3	U	ug/m³ Air	1.35	2.3	21	2A18022	TO-15	01/19/22 08:59	rgg	J-05
Chlorobenzene [108-90-7]^	2.1	U	ug/m³ Air	1.35	2.1	16	2A18022	TO-15	01/19/22 08:59	rgg	
Chloroethane [75-00-3]^	1.1	U	ug/m³ Air	1.35	1.1	8.9	2A18022	TO-15	01/19/22 08:59	rgg	
Chloroform [67-66-3]^	2.5	U	ug/m³ Air	1.35	2.5	16	2A18022	TO-15	01/19/22 08:59	rgg	
Chloromethane [74-87-3]^	1.3	U	ug/m³ Air	1.35	1.3	7.0	2A18022	TO-15	01/19/22 08:59	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.0	U	ug/m³ Air	1.35	2.0	13	2A18022	TO-15	01/19/22 08:59	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.3	U	ug/m³ Air	1.35	2.3	15	2A18022	TO-15	01/19/22 08:59	rgg	
Dibromochloromethane [124-48-1]^	3.8	U	ug/m³ Air	1.35	3.8	29	2A18022	TO-15	01/19/22 08:59	rgg	
Dichlorodifluoromethane [75-71-8]^	3.7	U	ug/m³ Air	1.35	3.7	17	2A18022	TO-15	01/19/22 08:59	rgg	
Freon 113 [76-13-1]^	3.3	U	ug/m³ Air	1.35	3.3	26	2A18022	TO-15	01/19/22 08:59	rgg	
Freon 114 [76-14-2]^	4.9	U	ug/m³ Air	1.35	4.9	24	2A18022	TO-15	01/19/22 08:59	rgg	
Hexachlorobutadiene [87-68-3]^	5.3	U	ug/m³ Air	1.35	5.3	36	2A18022	TO-15	01/19/22 08:59	rgg	
Methylene chloride [75-09-2]^	**2.4**	I	ug/m³ Air	1.35	0.94	12	2A18022	TO-15	01/19/22 08:59	rgg	
Propene [115-07-1]^	1.3	U	ug/m³ Air	1.35	1.3	5.8	2A18022	TO-15	01/19/22 08:59	rgg	
Tetrachloroethene [127-18-4]^	2.8	U	ug/m³ Air	1.35	2.8	23	2A18022	TO-15	01/19/22 08:59	rgg	
trans-1,2-Dichloroethene [156-60-5]^	1.7	U	ug/m³ Air	1.35	1.7	13	2A18022	TO-15	01/19/22 08:59	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.1	U	ug/m³ Air	1.35	2.1	15	2A18022	TO-15	01/19/22 08:59	rgg	
Trichloroethene [79-01-6]^	2.5	U	ug/m³ Air	1.35	2.5	18	2A18022	TO-15	01/19/22 08:59	rgg	
Trichlorofluoromethane [75-69-4]^	2.6	U	ug/m³ Air	1.35	2.6	19	2A18022	TO-15	01/19/22 08:59	rgg	
Vinyl chloride [75-01-4]^	1.9	U	ug/m³ Air	1.35	1.9	8.6	2A18022	TO-15	01/19/22 08:59	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*27*	*1*	*31.0*	*87 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 08:59*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-AMB0002-20220114 | **Lab Sample ID:** AF00241-02 | **Received:** 01/14/22 15:40

Matrix: Air | **Sampled:** 01/14/22 15:25 | **Work Order:** AF00241

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.5	U	ug/m³ Air	1.36	2.5	19	2A18022	TO-15	01/19/22 09:45	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.4	U	ug/m³ Air	1.36	3.4	23	2A18022	TO-15	01/19/22 09:45	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.6	U	ug/m³ Air	1.36	2.6	19	2A18022	TO-15	01/19/22 09:45	rgg	
1,1-Dichloroethane [75-34-3]^	2.0	U	ug/m³ Air	1.36	2.0	14	2A18022	TO-15	01/19/22 09:45	rgg	
1,1-Dichloroethene [75-35-4]^	2.0	U	ug/m³ Air	1.36	2.0	13	2A18022	TO-15	01/19/22 09:45	rgg	
1,2-Dibromoethane [106-93-4]^	3.8	U	ug/m³ Air	1.36	3.8	26	2A18022	TO-15	01/19/22 09:45	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.2	U	ug/m³ Air	1.36	2.2	20	2A18022	TO-15	01/19/22 09:45	rgg	
1,2-Dichloroethane [107-06-2]^	2.0	U	ug/m³ Air	1.36	2.0	14	2A18022	TO-15	01/19/22 09:45	rgg	
1,2-Dichloropropane [78-87-5]^	2.5	U	ug/m³ Air	1.36	2.5	16	2A18022	TO-15	01/19/22 09:45	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.3	U	ug/m³ Air	1.36	2.3	20	2A18022	TO-15	01/19/22 09:45	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.5	U	ug/m³ Air	1.36	2.5	20	2A18022	TO-15	01/19/22 09:45	rgg	
3-Chloropropene [107-05-1]^	1.7	U	ug/m³ Air	1.36	1.7	11	2A18022	TO-15	01/19/22 09:45	rgg	
Acetone [67-64-1]^	**11**		ug/m³ Air	1.36	1.1	8.1	2A18022	TO-15	01/19/22 09:45	rgg	
Bromodichloromethane [75-27-4]^	3.1	U	ug/m³ Air	1.36	3.1	23	2A18022	TO-15	01/19/22 09:45	rgg	
Bromoethene [593-60-2]^	2.0	U	ug/m³ Air	1.36	2.0	15	2A18022	TO-15	01/19/22 09:45	rgg	
Bromoform [75-25-2]^	5.3	U	ug/m³ Air	1.36	5.3	35	2A18022	TO-15	01/19/22 09:45	rgg	
Bromomethane [74-83-9]^	1.7	U	ug/m³ Air	1.36	1.7	13	2A18022	TO-15	01/19/22 09:45	rgg	
Carbon tetrachloride [56-23-5]^	2.3	U	ug/m³ Air	1.36	2.3	21	2A18022	TO-15	01/19/22 09:45	rgg	J-05
Chlorobenzene [108-90-7]^	2.1	U	ug/m³ Air	1.36	2.1	16	2A18022	TO-15	01/19/22 09:45	rgg	
Chloroethane [75-00-3]^	1.1	U	ug/m³ Air	1.36	1.1	9.0	2A18022	TO-15	01/19/22 09:45	rgg	
Chloroform [67-66-3]^	2.5	U	ug/m³ Air	1.36	2.5	17	2A18022	TO-15	01/19/22 09:45	rgg	
Chloromethane [74-87-3]^	1.3	U	ug/m³ Air	1.36	1.3	7.0	2A18022	TO-15	01/19/22 09:45	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.0	U	ug/m³ Air	1.36	2.0	13	2A18022	TO-15	01/19/22 09:45	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.3	U	ug/m³ Air	1.36	2.3	15	2A18022	TO-15	01/19/22 09:45	rgg	
Dibromochloromethane [124-48-1]^	3.8	U	ug/m³ Air	1.36	3.8	29	2A18022	TO-15	01/19/22 09:45	rgg	
Dichlorodifluoromethane [75-71-8]^	3.7	U	ug/m³ Air	1.36	3.7	17	2A18022	TO-15	01/19/22 09:45	rgg	
Freon 113 [76-13-1]^	**5.8**	I	ug/m³ Air	1.36	3.3	26	2A18022	TO-15	01/19/22 09:45	rgg	
Freon 114 [76-14-2]^	4.9	U	ug/m³ Air	1.36	4.9	24	2A18022	TO-15	01/19/22 09:45	rgg	
Hexachlorobutadiene [87-68-3]^	5.4	U	ug/m³ Air	1.36	5.4	36	2A18022	TO-15	01/19/22 09:45	rgg	
Methylene chloride [75-09-2]^	**2.9**	I	ug/m³ Air	1.36	0.94	12	2A18022	TO-15	01/19/22 09:45	rgg	
Propene [115-07-1]^	1.3	U	ug/m³ Air	1.36	1.3	5.9	2A18022	TO-15	01/19/22 09:45	rgg	
Tetrachloroethene [127-18-4]^	2.9	U	ug/m³ Air	1.36	2.9	23	2A18022	TO-15	01/19/22 09:45	rgg	
trans-1,2-Dichloroethene [156-60-5]^	**2.1**	I	ug/m³ Air	1.36	1.7	13	2A18022	TO-15	01/19/22 09:45	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.1	U	ug/m³ Air	1.36	2.1	15	2A18022	TO-15	01/19/22 09:45	rgg	
Trichloroethene [79-01-6]^	2.6	U	ug/m³ Air	1.36	2.6	18	2A18022	TO-15	01/19/22 09:45	rgg	
Trichlorofluoromethane [75-69-4]^	2.6	U	ug/m³ Air	1.36	2.6	19	2A18022	TO-15	01/19/22 09:45	rgg	
Vinyl chloride [75-01-4]^	1.9	U	ug/m³ Air	1.36	1.9	8.7	2A18022	TO-15	01/19/22 09:45	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*27*	*1*	*31.0*	*88 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 09:45*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0001-20220114 | **Lab Sample ID:** AF00241-03 | **Received:** 01/14/22 15:40

Matrix: Air | **Sampled:** 01/14/22 11:30 | **Work Order:** AF00241

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.5	U	ug/m³ Air	1.37	2.5	19	2A18022	TO-15	01/19/22 10:30	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.4	U	ug/m³ Air	1.37	3.4	24	2A18022	TO-15	01/19/22 10:30	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.6	U	ug/m³ Air	1.37	2.6	19	2A18022	TO-15	01/19/22 10:30	rgg	
1,1-Dichloroethane [75-34-3]^	2.0	U	ug/m³ Air	1.37	2.0	14	2A18022	TO-15	01/19/22 10:30	rgg	
1,1-Dichloroethene [75-35-4]^	2.1	U	ug/m³ Air	1.37	2.1	14	2A18022	TO-15	01/19/22 10:30	rgg	
1,2-Dibromoethane [106-93-4]^	3.8	U	ug/m³ Air	1.37	3.8	26	2A18022	TO-15	01/19/22 10:30	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.2	U	ug/m³ Air	1.37	2.2	21	2A18022	TO-15	01/19/22 10:30	rgg	
1,2-Dichloroethane [107-06-2]^	2.1	U	ug/m³ Air	1.37	2.1	14	2A18022	TO-15	01/19/22 10:30	rgg	
1,2-Dichloropropane [78-87-5]^	2.5	U	ug/m³ Air	1.37	2.5	16	2A18022	TO-15	01/19/22 10:30	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.3	U	ug/m³ Air	1.37	2.3	21	2A18022	TO-15	01/19/22 10:30	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.6	U	ug/m³ Air	1.37	2.6	21	2A18022	TO-15	01/19/22 10:30	rgg	
3-Chloropropene [107-05-1]^	1.7	U	ug/m³ Air	1.37	1.7	11	2A18022	TO-15	01/19/22 10:30	rgg	
Acetone [67-64-1]^	**7.9**	I	ug/m³ Air	1.37	1.1	8.1	2A18022	TO-15	01/19/22 10:30	rgg	
Bromodichloromethane [75-27-4]^	3.1	U	ug/m³ Air	1.37	3.1	23	2A18022	TO-15	01/19/22 10:30	rgg	
Bromoethene [593-60-2]^	2.0	U	ug/m³ Air	1.37	2.0	15	2A18022	TO-15	01/19/22 10:30	rgg	
Bromoform [75-25-2]^	5.4	U	ug/m³ Air	1.37	5.4	35	2A18022	TO-15	01/19/22 10:30	rgg	
Bromomethane [74-83-9]^	1.8	U	ug/m³ Air	1.37	1.8	13	2A18022	TO-15	01/19/22 10:30	rgg	
Carbon tetrachloride [56-23-5]^	2.3	U	ug/m³ Air	1.37	2.3	22	2A18022	TO-15	01/19/22 10:30	rgg	J-05
Chlorobenzene [108-90-7]^	2.1	U	ug/m³ Air	1.37	2.1	16	2A18022	TO-15	01/19/22 10:30	rgg	
Chloroethane [75-00-3]^	1.2	U	ug/m³ Air	1.37	1.2	9.0	2A18022	TO-15	01/19/22 10:30	rgg	
Chloroform [67-66-3]^	2.5	U	ug/m³ Air	1.37	2.5	17	2A18022	TO-15	01/19/22 10:30	rgg	
Chloromethane [74-87-3]^	1.4	U	ug/m³ Air	1.37	1.4	7.1	2A18022	TO-15	01/19/22 10:30	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.1	U	ug/m³ Air	1.37	2.1	14	2A18022	TO-15	01/19/22 10:30	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.4	U	ug/m³ Air	1.37	2.4	16	2A18022	TO-15	01/19/22 10:30	rgg	
Dibromochloromethane [124-48-1]^	3.9	U	ug/m³ Air	1.37	3.9	29	2A18022	TO-15	01/19/22 10:30	rgg	
Dichlorodifluoromethane [75-71-8]^	3.7	U	ug/m³ Air	1.37	3.7	17	2A18022	TO-15	01/19/22 10:30	rgg	
Freon 113 [76-13-1]^	**31**		ug/m³ Air	1.37	3.4	26	2A18022	TO-15	01/19/22 10:30	rgg	
Freon 114 [76-14-2]^	5.0	U	ug/m³ Air	1.37	5.0	24	2A18022	TO-15	01/19/22 10:30	rgg	
Hexachlorobutadiene [87-68-3]^	5.4	U	ug/m³ Air	1.37	5.4	37	2A18022	TO-15	01/19/22 10:30	rgg	
Methylene chloride [75-09-2]^	**1.0**	I	ug/m³ Air	1.37	0.95	12	2A18022	TO-15	01/19/22 10:30	rgg	
Propene [115-07-1]^	1.3	U	ug/m³ Air	1.37	1.3	5.9	2A18022	TO-15	01/19/22 10:30	rgg	
Tetrachloroethene [127-18-4]^	2.9	U	ug/m³ Air	1.37	2.9	23	2A18022	TO-15	01/19/22 10:30	rgg	
trans-1,2-Dichloroethene [156-60-5]^	1.7	U	ug/m³ Air	1.37	1.7	14	2A18022	TO-15	01/19/22 10:30	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.1	U	ug/m³ Air	1.37	2.1	16	2A18022	TO-15	01/19/22 10:30	rgg	
Trichloroethene [79-01-6]^	2.6	U	ug/m³ Air	1.37	2.6	18	2A18022	TO-15	01/19/22 10:30	rgg	
Trichlorofluoromethane [75-69-4]^	2.6	U	ug/m³ Air	1.37	2.6	19	2A18022	TO-15	01/19/22 10:30	rgg	
Vinyl chloride [75-01-4]^	2.0	U	ug/m³ Air	1.37	2.0	8.8	2A18022	TO-15	01/19/22 10:30	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*27*	*1*	*31.0*	*88 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 10:30*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0002-20220114 | **Lab Sample ID:** AF00241-04 | **Received:** 01/14/22 15:40

Matrix: Air | **Sampled:** 01/14/22 11:45 | **Work Order:** AF00241

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.6	U	ug/m³ Air	1.4	2.6	19	2A18022	TO-15	01/19/22 11:16	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.5	U	ug/m³ Air	1.4	3.5	24	2A18022	TO-15	01/19/22 11:16	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.7	U	ug/m³ Air	1.4	2.7	19	2A18022	TO-15	01/19/22 11:16	rgg	
1,1-Dichloroethane [75-34-3]^	2.0	U	ug/m³ Air	1.4	2.0	14	2A18022	TO-15	01/19/22 11:16	rgg	
1,1-Dichloroethene [75-35-4]^	2.1	U	ug/m³ Air	1.4	2.1	14	2A18022	TO-15	01/19/22 11:16	rgg	
1,2-Dibromoethane [106-93-4]^	3.9	U	ug/m³ Air	1.4	3.9	27	2A18022	TO-15	01/19/22 11:16	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.3	U	ug/m³ Air	1.4	2.3	21	2A18022	TO-15	01/19/22 11:16	rgg	
1,2-Dichloroethane [107-06-2]^	2.1	U	ug/m³ Air	1.4	2.1	14	2A18022	TO-15	01/19/22 11:16	rgg	
1,2-Dichloropropane [78-87-5]^	2.6	U	ug/m³ Air	1.4	2.6	16	2A18022	TO-15	01/19/22 11:16	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.4	U	ug/m³ Air	1.4	2.4	21	2A18022	TO-15	01/19/22 11:16	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.6	U	ug/m³ Air	1.4	2.6	21	2A18022	TO-15	01/19/22 11:16	rgg	
3-Chloropropene [107-05-1]^	1.7	U	ug/m³ Air	1.4	1.7	11	2A18022	TO-15	01/19/22 11:16	rgg	
Acetone [67-64-1]^	**3.6**	I	ug/m³ Air	1.4	1.2	8.3	2A18022	TO-15	01/19/22 11:16	rgg	
Bromodichloromethane [75-27-4]^	3.2	U	ug/m³ Air	1.4	3.2	23	2A18022	TO-15	01/19/22 11:16	rgg	
Bromoethene [593-60-2]^	2.0	U	ug/m³ Air	1.4	2.0	15	2A18022	TO-15	01/19/22 11:16	rgg	
Bromoform [75-25-2]^	5.5	U	ug/m³ Air	1.4	5.5	36	2A18022	TO-15	01/19/22 11:16	rgg	
Bromomethane [74-83-9]^	1.8	U	ug/m³ Air	1.4	1.8	14	2A18022	TO-15	01/19/22 11:16	rgg	
Carbon tetrachloride [56-23-5]^	2.4	U	ug/m³ Air	1.4	2.4	22	2A18022	TO-15	01/19/22 11:16	rgg	J-05
Chlorobenzene [108-90-7]^	2.1	U	ug/m³ Air	1.4	2.1	16	2A18022	TO-15	01/19/22 11:16	rgg	
Chloroethane [75-00-3]^	1.2	U	ug/m³ Air	1.4	1.2	9.2	2A18022	TO-15	01/19/22 11:16	rgg	
Chloroform [67-66-3]^	2.6	U	ug/m³ Air	1.4	2.6	17	2A18022	TO-15	01/19/22 11:16	rgg	
Chloromethane [74-87-3]^	1.4	U	ug/m³ Air	1.4	1.4	7.2	2A18022	TO-15	01/19/22 11:16	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.1	U	ug/m³ Air	1.4	2.1	14	2A18022	TO-15	01/19/22 11:16	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.4	U	ug/m³ Air	1.4	2.4	16	2A18022	TO-15	01/19/22 11:16	rgg	
Dibromochloromethane [124-48-1]^	3.9	U	ug/m³ Air	1.4	3.9	30	2A18022	TO-15	01/19/22 11:16	rgg	
Dichlorodifluoromethane [75-71-8]^	3.8	U	ug/m³ Air	1.4	3.8	17	2A18022	TO-15	01/19/22 11:16	rgg	
Freon 113 [76-13-1]^	**120**		ug/m³ Air	1.4	3.4	27	2A18022	TO-15	01/19/22 11:16	rgg	
Freon 114 [76-14-2]^	5.1	U	ug/m³ Air	1.4	5.1	24	2A18022	TO-15	01/19/22 11:16	rgg	
Hexachlorobutadiene [87-68-3]^	5.5	U	ug/m³ Air	1.4	5.5	37	2A18022	TO-15	01/19/22 11:16	rgg	
Methylene chloride [75-09-2]^	**1.0**	I	ug/m³ Air	1.4	0.97	12	2A18022	TO-15	01/19/22 11:16	rgg	
Propene [115-07-1]^	1.3	U	ug/m³ Air	1.4	1.3	6.0	2A18022	TO-15	01/19/22 11:16	rgg	
Tetrachloroethene [127-18-4]^	2.9	U	ug/m³ Air	1.4	2.9	24	2A18022	TO-15	01/19/22 11:16	rgg	
trans-1,2-Dichloroethene [156-60-5]^	**3.3**	I	ug/m³ Air	1.4	1.8	14	2A18022	TO-15	01/19/22 11:16	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.2	U	ug/m³ Air	1.4	2.2	16	2A18022	TO-15	01/19/22 11:16	rgg	
Trichloroethene [79-01-6]^	2.6	U	ug/m³ Air	1.4	2.6	19	2A18022	TO-15	01/19/22 11:16	rgg	
Trichlorofluoromethane [75-69-4]^	2.7	U	ug/m³ Air	1.4	2.7	20	2A18022	TO-15	01/19/22 11:16	rgg	
Vinyl chloride [75-01-4]^	2.0	U	ug/m³ Air	1.4	2.0	8.9	2A18022	TO-15	01/19/22 11:16	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*27*	*1*	*31.0*	*88 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 11:16*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0003-20220114 | **Lab Sample ID:** AF00241-05 | **Received:** 01/14/22 15:40

Matrix: Air | **Sampled:** 01/14/22 13:00 | **Work Order:** AF00241

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.7	U	ug/m³ Air	1.47	2.7	20	2A18022	TO-15	01/19/22 12:02	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.6	U	ug/m³ Air	1.47	3.6	25	2A18022	TO-15	01/19/22 12:02	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.8	U	ug/m³ Air	1.47	2.8	20	2A18022	TO-15	01/19/22 12:02	rgg	
1,1-Dichloroethane [75-34-3]^	2.1	U	ug/m³ Air	1.47	2.1	15	2A18022	TO-15	01/19/22 12:02	rgg	
1,1-Dichloroethene [75-35-4]^	2.2	U	ug/m³ Air	1.47	2.2	15	2A18022	TO-15	01/19/22 12:02	rgg	
1,2-Dibromoethane [106-93-4]^	4.1	U	ug/m³ Air	1.47	4.1	28	2A18022	TO-15	01/19/22 12:02	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.4	U	ug/m³ Air	1.47	2.4	22	2A18022	TO-15	01/19/22 12:02	rgg	
1,2-Dichloroethane [107-06-2]^	2.2	U	ug/m³ Air	1.47	2.2	15	2A18022	TO-15	01/19/22 12:02	rgg	
1,2-Dichloropropane [78-87-5]^	2.7	U	ug/m³ Air	1.47	2.7	17	2A18022	TO-15	01/19/22 12:02	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.5	U	ug/m³ Air	1.47	2.5	22	2A18022	TO-15	01/19/22 12:02	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.7	U	ug/m³ Air	1.47	2.7	22	2A18022	TO-15	01/19/22 12:02	rgg	
3-Chloropropene [107-05-1]^	1.8	U	ug/m³ Air	1.47	1.8	12	2A18022	TO-15	01/19/22 12:02	rgg	
Acetone [67-64-1]^	**18**		ug/m³ Air	1.47	1.2	8.7	2A18022	TO-15	01/19/22 12:02	rgg	
Bromodichloromethane [75-27-4]^	3.3	U	ug/m³ Air	1.47	3.3	25	2A18022	TO-15	01/19/22 12:02	rgg	
Bromoethene [593-60-2]^	2.1	U	ug/m³ Air	1.47	2.1	16	2A18022	TO-15	01/19/22 12:02	rgg	
Bromoform [75-25-2]^	5.8	U	ug/m³ Air	1.47	5.8	38	2A18022	TO-15	01/19/22 12:02	rgg	
Bromomethane [74-83-9]^	1.9	U	ug/m³ Air	1.47	1.9	14	2A18022	TO-15	01/19/22 12:02	rgg	
Carbon tetrachloride [56-23-5]^	2.5	U	ug/m³ Air	1.47	2.5	23	2A18022	TO-15	01/19/22 12:02	rgg	J-05
Chlorobenzene [108-90-7]^	2.2	U	ug/m³ Air	1.47	2.2	17	2A18022	TO-15	01/19/22 12:02	rgg	
Chloroethane [75-00-3]^	1.2	U	ug/m³ Air	1.47	1.2	9.7	2A18022	TO-15	01/19/22 12:02	rgg	
Chloroform [67-66-3]^	**5.5**	I	ug/m³ Air	1.47	2.7	18	2A18022	TO-15	01/19/22 12:02	rgg	
Chloromethane [74-87-3]^	1.5	U	ug/m³ Air	1.47	1.5	7.6	2A18022	TO-15	01/19/22 12:02	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.2	U	ug/m³ Air	1.47	2.2	15	2A18022	TO-15	01/19/22 12:02	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.5	U	ug/m³ Air	1.47	2.5	17	2A18022	TO-15	01/19/22 12:02	rgg	
Dibromochloromethane [124-48-1]^	4.1	U	ug/m³ Air	1.47	4.1	31	2A18022	TO-15	01/19/22 12:02	rgg	
Dichlorodifluoromethane [75-71-8]^	4.0	U	ug/m³ Air	1.47	4.0	18	2A18022	TO-15	01/19/22 12:02	rgg	
Freon 113 [76-13-1]^	**45**		ug/m³ Air	1.47	3.6	28	2A18022	TO-15	01/19/22 12:02	rgg	
Freon 114 [76-14-2]^	5.3	U	ug/m³ Air	1.47	5.3	26	2A18022	TO-15	01/19/22 12:02	rgg	
Hexachlorobutadiene [87-68-3]^	5.8	U	ug/m³ Air	1.47	5.8	39	2A18022	TO-15	01/19/22 12:02	rgg	
Methylene chloride [75-09-2]^	1.0	U	ug/m³ Air	1.47	1.0	13	2A18022	TO-15	01/19/22 12:02	rgg	
Propene [115-07-1]^	1.4	U	ug/m³ Air	1.47	1.4	6.3	2A18022	TO-15	01/19/22 12:02	rgg	
Tetrachloroethene [127-18-4]^	3.1	U	ug/m³ Air	1.47	3.1	25	2A18022	TO-15	01/19/22 12:02	rgg	
trans-1,2-Dichloroethene [156-60-5]^	1.9	U	ug/m³ Air	1.47	1.9	15	2A18022	TO-15	01/19/22 12:02	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.3	U	ug/m³ Air	1.47	2.3	17	2A18022	TO-15	01/19/22 12:02	rgg	
Trichloroethene [79-01-6]^	2.8	U	ug/m³ Air	1.47	2.8	20	2A18022	TO-15	01/19/22 12:02	rgg	
Trichlorofluoromethane [75-69-4]^	2.8	U	ug/m³ Air	1.47	2.8	21	2A18022	TO-15	01/19/22 12:02	rgg	
Vinyl chloride [75-01-4]^	2.1	U	ug/m³ Air	1.47	2.1	9.4	2A18022	TO-15	01/19/22 12:02	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*27*	*1*	*31.0*	*89 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 12:02*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0004-20220114 | **Lab Sample ID:** AF00241-06 | **Received:** 01/14/22 15:40

Matrix: Air | **Sampled:** 01/14/22 13:40 | **Work Order:** AF00241

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	2.7	U	ug/m³ Air	1.48	2.7	20	2A18022	TO-15	01/19/22 12:50	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	3.7	U	ug/m³ Air	1.48	3.7	25	2A18022	TO-15	01/19/22 12:50	rgg	
1,1,2-Trichloroethane [79-00-5]^	2.8	U	ug/m³ Air	1.48	2.8	20	2A18022	TO-15	01/19/22 12:50	rgg	
1,1-Dichloroethane [75-34-3]^	2.2	U	ug/m³ Air	1.48	2.2	15	2A18022	TO-15	01/19/22 12:50	rgg	
1,1-Dichloroethene [75-35-4]^	2.2	U	ug/m³ Air	1.48	2.2	15	2A18022	TO-15	01/19/22 12:50	rgg	
1,2-Dibromoethane [106-93-4]^	4.1	U	ug/m³ Air	1.48	4.1	28	2A18022	TO-15	01/19/22 12:50	rgg	
1,2-Dichlorobenzene [95-50-1]^	2.4	U	ug/m³ Air	1.48	2.4	22	2A18022	TO-15	01/19/22 12:50	rgg	
1,2-Dichloroethane [107-06-2]^	2.2	U	ug/m³ Air	1.48	2.2	15	2A18022	TO-15	01/19/22 12:50	rgg	
1,2-Dichloropropane [78-87-5]^	2.7	U	ug/m³ Air	1.48	2.7	17	2A18022	TO-15	01/19/22 12:50	rgg	
1,3-Dichlorobenzene [541-73-1]^	2.5	U	ug/m³ Air	1.48	2.5	22	2A18022	TO-15	01/19/22 12:50	rgg	
1,4-Dichlorobenzene [106-46-7]^	2.8	U	ug/m³ Air	1.48	2.8	22	2A18022	TO-15	01/19/22 12:50	rgg	
3-Chloropropene [107-05-1]^	1.8	U	ug/m³ Air	1.48	1.8	12	2A18022	TO-15	01/19/22 12:50	rgg	
Acetone [67-64-1]^	**8.8**		ug/m³ Air	1.48	1.2	8.8	2A18022	TO-15	01/19/22 12:50	rgg	
Bromodichloromethane [75-27-4]^	3.4	U	ug/m³ Air	1.48	3.4	25	2A18022	TO-15	01/19/22 12:50	rgg	
Bromoethene [593-60-2]^	2.1	U	ug/m³ Air	1.48	2.1	16	2A18022	TO-15	01/19/22 12:50	rgg	
Bromoform [75-25-2]^	5.8	U	ug/m³ Air	1.48	5.8	38	2A18022	TO-15	01/19/22 12:50	rgg	
Bromomethane [74-83-9]^	1.9	U	ug/m³ Air	1.48	1.9	14	2A18022	TO-15	01/19/22 12:50	rgg	
Carbon tetrachloride [56-23-5]^	2.5	U	ug/m³ Air	1.48	2.5	23	2A18022	TO-15	01/19/22 12:50	rgg	J-05
Chlorobenzene [108-90-7]^	2.2	U	ug/m³ Air	1.48	2.2	17	2A18022	TO-15	01/19/22 12:50	rgg	
Chloroethane [75-00-3]^	1.2	U	ug/m³ Air	1.48	1.2	9.8	2A18022	TO-15	01/19/22 12:50	rgg	
Chloroform [67-66-3]^	**6.5**	I	ug/m³ Air	1.48	2.7	18	2A18022	TO-15	01/19/22 12:50	rgg	
Chloromethane [74-87-3]^	1.5	U	ug/m³ Air	1.48	1.5	7.6	2A18022	TO-15	01/19/22 12:50	rgg	
cis-1,2-Dichloroethene [156-59-2]^	2.2	U	ug/m³ Air	1.48	2.2	15	2A18022	TO-15	01/19/22 12:50	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	2.6	U	ug/m³ Air	1.48	2.6	17	2A18022	TO-15	01/19/22 12:50	rgg	
Dibromochloromethane [124-48-1]^	4.2	U	ug/m³ Air	1.48	4.2	32	2A18022	TO-15	01/19/22 12:50	rgg	
Dichlorodifluoromethane [75-71-8]^	4.0	U	ug/m³ Air	1.48	4.0	18	2A18022	TO-15	01/19/22 12:50	rgg	
Freon 113 [76-13-1]^	**130**		ug/m³ Air	1.48	3.6	28	2A18022	TO-15	01/19/22 12:50	rgg	
Freon 114 [76-14-2]^	5.4	U	ug/m³ Air	1.48	5.4	26	2A18022	TO-15	01/19/22 12:50	rgg	
Hexachlorobutadiene [87-68-3]^	5.8	U	ug/m³ Air	1.48	5.8	39	2A18022	TO-15	01/19/22 12:50	rgg	
Methylene chloride [75-09-2]^	**2.1**	I	ug/m³ Air	1.48	1.0	13	2A18022	TO-15	01/19/22 12:50	rgg	
Propene [115-07-1]^	1.4	U	ug/m³ Air	1.48	1.4	6.4	2A18022	TO-15	01/19/22 12:50	rgg	
Tetrachloroethene [127-18-4]^	3.1	U	ug/m³ Air	1.48	3.1	25	2A18022	TO-15	01/19/22 12:50	rgg	
trans-1,2-Dichloroethene [156-60-5]^	1.9	U	ug/m³ Air	1.48	1.9	15	2A18022	TO-15	01/19/22 12:50	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	2.3	U	ug/m³ Air	1.48	2.3	17	2A18022	TO-15	01/19/22 12:50	rgg	
Trichloroethene [79-01-6]^	2.8	U	ug/m³ Air	1.48	2.8	20	2A18022	TO-15	01/19/22 12:50	rgg	
Trichlorofluoromethane [75-69-4]^	2.8	U	ug/m³ Air	1.48	2.8	21	2A18022	TO-15	01/19/22 12:50	rgg	
Vinyl chloride [75-01-4]^	2.1	U	ug/m³ Air	1.48	2.1	9.5	2A18022	TO-15	01/19/22 12:50	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*28*	*1*	*31.0*	*89 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 12:50*	*rgg*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A18022 - NO PREP 2

Blank (2A18022-BLK1) Prepared: 01/18/2022 11:01 Analyzed: 01/18/2022 21:17

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	1.9	U	14	ug/m³ Air							
1,1,2,2-Tetrachloroethane	2.5	U	17	ug/m³ Air							
1,1,2-Trichloroethane	1.9	U	14	ug/m³ Air							
1,1-Dichloroethane	1.5	U	10	ug/m³ Air							
1,1-Dichloroethene	1.5	U	9.9	ug/m³ Air							
1,2-Dibromoethane	2.8	U	19	ug/m³ Air							
1,2-Dichlorobenzene	1.6	U	15	ug/m³ Air							
1,2-Dichloroethane	1.5	U	10	ug/m³ Air							
1,2-Dichloropropane	1.8	U	12	ug/m³ Air							
1,3-Dichlorobenzene	1.7	U	15	ug/m³ Air							
1,4-Dichlorobenzene	1.9	U	15	ug/m³ Air							
3-Chloropropene	1.2	U	7.8	ug/m³ Air							
Acetone	0.83	U	5.9	ug/m³ Air							
Bromodichloromethane	2.3	U	17	ug/m³ Air							
Bromoethene	1.4	U	11	ug/m³ Air							
Bromoform	3.9	U	26	ug/m³ Air							
Bromomethane	1.3	U	9.7	ug/m³ Air							
Carbon tetrachloride	1.7	U	16	ug/m³ Air							
Chlorobenzene	1.5	U	12	ug/m³ Air							
Chloroethane	0.84	U	6.6	ug/m³ Air							
Chloroform	1.9	U	12	ug/m³ Air							
Chloromethane	0.99	U	5.2	ug/m³ Air							
cis-1,2-Dichloroethene	1.5	U	9.9	ug/m³ Air							
cis-1,3-Dichloropropene	1.7	U	11	ug/m³ Air							
Dibromochloromethane	2.8	U	21	ug/m³ Air							
Dichlorodifluoromethane	2.7	U	12	ug/m³ Air							
Freon 113	2.5	U	19	ug/m³ Air							
Freon 114	3.6	U	17	ug/m³ Air							
Hexachlorobutadiene	3.9	U	27	ug/m³ Air							
Methylene chloride	0.69	U	8.7	ug/m³ Air							
Propene	0.95	U	4.3	ug/m³ Air							
Tetrachloroethene	2.1	U	17	ug/m³ Air							
trans-1,2-Dichloroethene	1.3	U	9.9	ug/m³ Air							
trans-1,3-Dichloropropene	1.5	U	11	ug/m³ Air							
Trichloroethene	1.9	U	13	ug/m³ Air							
Trichlorofluoromethane	1.9	U	14	ug/m³ Air							
Vinyl chloride	1.4	U	6.4	ug/m³ Air							
4-Bromofluorobenzene	*27*			*ppbv*	*31.0*		*87*	*70-130*			

LCS (2A18022-BS1) Prepared: 01/18/2022 11:01 Analyzed: 01/18/2022 19:11

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	50		14	ug/m³ Air	54.6		91	70-130			
1,1,2,2-Tetrachloroethane	68		17	ug/m³ Air	68.7		99	52-163			
1,1,2-Trichloroethane	53		14	ug/m³ Air	54.6		97	70-134			
1,1-Dichloroethane	42		10	ug/m³ Air	40.5		103	70-130			
1,1-Dichloroethene	41		9.9	ug/m³ Air	39.7		104	67-142			
1,2-Dibromoethane	72		19	ug/m³ Air	76.8		94	70-141			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A18022 - NO PREP 2 - Continued

LCS (2A18022-BS1) Continued Prepared: 01/18/2022 11:01 Analyzed: 01/18/2022 19:11

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dichlorobenzene	60		15	ug/m³ Air	60.1		99	37-180			
1,2-Dichloroethane	37		10	ug/m³ Air	40.5		92	70-130			
1,2-Dichloropropane	47		12	ug/m³ Air	46.2		102	70-130			
1,3-Dichlorobenzene	61		15	ug/m³ Air	60.1		101	47-178			
1,4-Dichlorobenzene	60		15	ug/m³ Air	60.1		99	45-180			
3-Chloropropene	30		7.8	ug/m³ Air	31.3		97	70-130			
Acetone	23		5.9	ug/m³ Air	23.8		95	65-130			
Bromodichloromethane	57		17	ug/m³ Air	67.0		85	70-130			
Bromoethene	38		11	ug/m³ Air	43.7		88	69-132			
Bromoform	79		26	ug/m³ Air	103		77	62-149			
Bromomethane	32		9.7	ug/m³ Air	38.8		83	69-130			
Carbon tetrachloride	20		16	ug/m³ Air	62.9		32	22-166			
Chlorobenzene	46		12	ug/m³ Air	46.0		99	70-134			
Chloroethane	24		6.6	ug/m³ Air	26.4		91	69-131			
Chloroform	47		12	ug/m³ Air	48.8		96	70-130			
Chloromethane	20		5.2	ug/m³ Air	20.7		96	55-142			
cis-1,2-Dichloroethene	42		9.9	ug/m³ Air	39.6		105	70-130			
cis-1,3-Dichloropropene	46		11	ug/m³ Air	45.4		101	70-137			
Dibromochloromethane	66		21	ug/m³ Air	85.2		78	70-130			
Dichlorodifluoromethane	41		12	ug/m³ Air	49.5		83	61-137			
Freon 113	79		19	ug/m³ Air	76.6		103	67-140			
Freon 114	63		17	ug/m³ Air	69.9		91	62-147			
Hexachlorobutadiene	100		27	ug/m³ Air	107		95	24-180			
Methylene chloride	36		8.7	ug/m³ Air	34.7		103	59-136			
Propene	16		4.3	ug/m³ Air	17.2		93	63-132			
Tetrachloroethene	66		17	ug/m³ Air	67.8		97	70-141			
trans-1,2-Dichloroethene	39		9.9	ug/m³ Air	39.6		98	70-130			
trans-1,3-Dichloropropene	42		11	ug/m³ Air	45.4		92	59-166			
Trichloroethene	53		13	ug/m³ Air	53.7		98	70-130			
Trichlorofluoromethane	48		14	ug/m³ Air	56.2		85	46-161			
Vinyl chloride	26		6.4	ug/m³ Air	25.6		102	53-148			
4-Bromofluorobenzene	*29*			*ppbv*	*31.0*		*95*	*70-130*			

LCS Dup (2A18022-BSD1) Prepared: 01/18/2022 11:01 Analyzed: 01/18/2022 19:51

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	49		14	ug/m³ Air	54.6		90	70-130	2	25	
1,1,2,2-Tetrachloroethane	69		17	ug/m³ Air	68.7		100	52-163	1	25	
1,1,2-Trichloroethane	53		14	ug/m³ Air	54.6		98	70-134	1	25	
1,1-Dichloroethane	42		10	ug/m³ Air	40.5		103	70-130	0.2	25	
1,1-Dichloroethene	42		9.9	ug/m³ Air	39.7		105	67-142	0.9	25	
1,2-Dibromoethane	73		19	ug/m³ Air	76.8		95	70-141	0.7	25	
1,2-Dichlorobenzene	61		15	ug/m³ Air	60.1		101	37-180	2	25	
1,2-Dichloroethane	37		10	ug/m³ Air	40.5		91	70-130	1	25	
1,2-Dichloropropane	47		12	ug/m³ Air	46.2		103	70-130	1	25	
1,3-Dichlorobenzene	61		15	ug/m³ Air	60.1		102	47-178	0.4	25	
1,4-Dichlorobenzene	60		15	ug/m³ Air	60.1		101	45-180	2	25	
3-Chloropropene	30		7.8	ug/m³ Air	31.3		96	70-130	1	25	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A18022 - NO PREP 2 - Continued

LCS Dup (2A18022-BSD1) Continued Prepared: 01/18/2022 11:01 Analyzed: 01/18/2022 19:51

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetone	22		5.9	ug/m³ Air	23.8		94	65-130	1	25	
Bromodichloromethane	57		17	ug/m³ Air	67.0		85	70-130	0.4	25	
Bromoethene	38		11	ug/m³ Air	43.7		87	69-132	0.9	25	
Bromoform	80		26	ug/m³ Air	103		78	62-149	1	25	
Bromomethane	32		9.7	ug/m³ Air	38.8		84	69-130	0.4	25	
Carbon tetrachloride	20		16	ug/m³ Air	62.9		31	22-166	2	25	
Chlorobenzene	46		12	ug/m³ Air	46.0		100	70-134	1	25	
Chloroethane	24		6.6	ug/m³ Air	26.4		90	69-131	1	25	
Chloroform	47		12	ug/m³ Air	48.8		96	70-130	0.6	25	
Chloromethane	20		5.2	ug/m³ Air	20.7		95	55-142	1	25	
cis-1,2-Dichloroethene	42		9.9	ug/m³ Air	39.6		106	70-130	0.3	25	
cis-1,3-Dichloropropene	46		11	ug/m³ Air	45.4		102	70-137	0.8	25	
Dibromochloromethane	67		21	ug/m³ Air	85.2		79	70-130	1	25	
Dichlorodifluoromethane	41		12	ug/m³ Air	49.5		82	61-137	1	25	
Freon 113	79		19	ug/m³ Air	76.6		103	67-140	0.6	25	
Freon 114	62		17	ug/m³ Air	69.9		89	62-147	1	25	
Hexachlorobutadiene	100		27	ug/m³ Air	107		95	24-180	0.4	25	
Methylene chloride	36		8.7	ug/m³ Air	34.7		103	59-136	0.8	25	
Propene	15		4.3	ug/m³ Air	17.2		90	63-132	3	25	
Tetrachloroethene	66		17	ug/m³ Air	67.8		98	70-141	0.7	25	
trans-1,2-Dichloroethene	39		9.9	ug/m³ Air	39.6		98	70-130	0.2	25	
trans-1,3-Dichloropropene	42		11	ug/m³ Air	45.4		93	59-166	0.9	25	
Trichloroethene	53		13	ug/m³ Air	53.7		99	70-130	0.5	25	
Trichlorofluoromethane	47		14	ug/m³ Air	56.2		84	46-161	0.8	25	
Vinyl chloride	26		6.4	ug/m³ Air	25.6		102	53-148	0.3	25	
4-Bromofluorobenzene	*30*			*ppbv*	*31.0*		*96*	*70-130*			

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*****	Not reported due to interference.
[CALC]	Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
J-05	Result may be biased low. Associated calibration verification standard did not meet the minimum control limit.

B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported result is an estimated value.
U	The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a “tentative identification".
Q	One or more quality control criteria failed.

AF80241

Tetra Tech, Inc. CHAIN OF CUSTODY NUMBER No. 2559 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G-08970	KSC-CRCA	Alex Murphy	(321) 292-0842	ENCO — Kaitlin Orlowski
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		Chuck Sorden	(321) 591-7580	10775 Central Port Dr
		CARRIER/WAYBILL NUMBER		CITY, STATE
				Orlando, FL

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2022	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT) START	BOTTOM DEPTH (FT) STOP	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS TO-15 Air VOCs	COMMENTS
									Metal	None		
01/14		CRCA-AMB0001-20220114	AMB1	0725 / 30"	1520 / 5"	Air	C	1			X	Can: JS-060 Reg: GG48
		CRCA-AMB0002-20220114	AMB2	0730 / 30"	1525 / 0"							Can: JS-016 Reg: GG93
		CRCA-VMP0001-20220114	VMP1	1039 / 30"	1139 / 60"							Can: JS-063 Reg: JAX-R-15
		CRCA-VMP0002-20220114	VMP2	1045 / 30"	1145 / 4"							Can: JS-032 Reg: JAX-R-2
		CRCA-VMP0003-20220114	VMP3	1200 / 23"	1300 / 1"							Can: JS-026 Reg: JAX-R-14
01/14		CRCA-VMP0004-20220114	VMP4	1240 / 29"	1340 / 5"	AIR	C	1			X	Can: JS-071 Reg: JAX-R-13

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	01/14/2022	1540	1. RECEIVED BY	1/14/22	1540
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS Box 1 19.7°C, Box 2 19.8°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

AF00241

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive, Orlando, FL 32824
4810 Executive Park Court, Suite 211,Jacksonville, FL 32216
102-A Woodwinds Industrial Ct, Cary, NC 27511

www.encolabs.com

COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-AMB0001-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Serden
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-060
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	6448

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	51°F	730"	0725	12.5mL/min
STOP	65°F	7"	1520	12.5mL/mn

Signature/Title: [signature] - Geologist

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-AM00002-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Sorden
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-016
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	6693

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	51°F	29"	0730	12.5mL/min
STOP	65°F	6"	1525	12.5mL/min

Signature/Title: [signature] - Geologist

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-UMP0001-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Serden
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-063
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAX-R-15

Reg off Canister = 7"

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	57°F	7.30"	1030	100mL/min
STOP	59°F	10"	1130	100mL/min

Signature/Title: _____ - Geologist

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-VMP0002-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Sorden
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-032
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAX-R-02

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	58°F	29"	1045	100mL/min
STOP	60°F	4"	1145	100mL/min

Signature/Title: _____ – Geologist

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-VMP0003-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Sorden
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-026
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAX-R-14

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	61°F	27"	1200	100mL/min
STOP	63°F	1"	1300	100mL/min

Signature/Title: — Geologist

AF0024)

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-UMP0004-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Scrader
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-071
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAx-R-13.

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	62°F	29"	1240	100mL/min
STOP	62°F		1340	100mL/m

Signature/Title: Geologist

ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Friday, January 21, 2022
Tetra Tech, Inc. (TE016)
Attn: Alex Murphy
1353 N Courtenay Pkwy, Suite S
Merritt Island, FL 32953

RE: Laboratory Results for
Project Number: 112G08970, Project Name/Desc: NASA KSC CRCA Airs
ENCO Workorder(s): AF00241

Dear Alex Murphy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Friday, January 14, 2022.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Kaitlin Dylnicki

Project Manager

Enclosure(s)

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: CRCA-AMB0001-20220114 **Lab ID: AF00241-01** **Sampled: 01/14/22 15:20** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 08:59

Client ID: CRCA-AMB0002-20220114 **Lab ID: AF00241-02** **Sampled: 01/14/22 15:25** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 09:45

Client ID: CRCA-VMP0001-20220114 **Lab ID: AF00241-03** **Sampled: 01/14/22 11:30** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 10:30

Client ID: CRCA-VMP0002-20220114 **Lab ID: AF00241-04** **Sampled: 01/14/22 11:45** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 11:16

Client ID: CRCA-VMP0003-20220114 **Lab ID: AF00241-05** **Sampled: 01/14/22 13:00** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 12:02

Client ID: CRCA-VMP0004-20220114 **Lab ID: AF00241-06** **Sampled: 01/14/22 13:40** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
TO-15	NO PREP 2	02/13/22	01/18/22 11:01	01/19/22 12:50

SAMPLE DETECTION SUMMARY

Client ID: CRCA-AMB0001-20220114 **Lab ID:** AF00241-01

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	1.6	I	0.47	3.4	ppbv	TO-15	
Methylene chloride	0.68	I	0.27	3.4	ppbv	TO-15	

Client ID: CRCA-AMB0002-20220114 **Lab ID:** AF00241-02

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	4.5		0.48	3.4	ppbv	TO-15	
Freon 113	0.76	I	0.44	3.4	ppbv	TO-15	
Methylene chloride	0.84	I	0.27	3.4	ppbv	TO-15	
trans-1,2-Dichloroethene	0.53	I	0.44	3.4	ppbv	TO-15	

Client ID: CRCA-VMP0001-20220114 **Lab ID:** AF00241-03

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	3.3	I	0.48	3.4	ppbv	TO-15	
Freon 113	4.0		0.44	3.4	ppbv	TO-15	
Methylene chloride	0.29	I	0.27	3.4	ppbv	TO-15	

Client ID: CRCA-VMP0002-20220114 **Lab ID:** AF00241-04

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	1.5	I	0.49	3.5	ppbv	TO-15	
Freon 113	15		0.45	3.5	ppbv	TO-15	
Methylene chloride	0.29	I	0.28	3.5	ppbv	TO-15	
trans-1,2-Dichloroethene	0.83	I	0.45	3.5	ppbv	TO-15	

Client ID: CRCA-VMP0003-20220114 **Lab ID:** AF00241-05

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	7.4		0.51	3.7	ppbv	TO-15	
Chloroform	1.1	I	0.56	3.7	ppbv	TO-15	
Freon 113	5.8		0.47	3.7	ppbv	TO-15	

Client ID: CRCA-VMP0004-20220114 **Lab ID:** AF00241-06

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Acetone	3.7		0.52	3.7	ppbv	TO-15	
Chloroform	1.3	I	0.56	3.7	ppbv	TO-15	
Freon 113	17		0.47	3.7	ppbv	TO-15	
Methylene chloride	0.60	I	0.30	3.7	ppbv	TO-15	

ANALYTICAL RESULTS

Description: CRCA-AMB0001-20220114 | **Lab Sample ID:** AF00241-01 | **Received:** 01/14/22 15:40

Matrix: Air | **Sampled:** 01/14/22 15:20 | **Work Order:** AF00241

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.46	U	ppbv	1.35	0.46	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.49	U	ppbv	1.35	0.49	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
1,1,2-Trichloroethane [79-00-5]^	0.47	U	ppbv	1.35	0.47	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
1,1-Dichloroethane [75-34-3]^	0.49	U	ppbv	1.35	0.49	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
1,1-Dichloroethene [75-35-4]^	0.51	U	ppbv	1.35	0.51	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
1,2-Dibromoethane [106-93-4]^	0.49	U	ppbv	1.35	0.49	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
1,2-Dichlorobenzene [95-50-1]^	0.36	U	ppbv	1.35	0.36	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
1,2-Dichloroethane [107-06-2]^	0.50	U	ppbv	1.35	0.50	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
1,2-Dichloropropane [78-87-5]^	0.54	U	ppbv	1.35	0.54	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
1,3-Dichlorobenzene [541-73-1]^	0.38	U	ppbv	1.35	0.38	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
1,4-Dichlorobenzene [106-46-7]^	0.42	U	ppbv	1.35	0.42	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
3-Chloropropene [107-05-1]^	0.53	U	ppbv	1.35	0.53	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Acetone [67-64-1]^	**1.6**	I	ppbv	1.35	0.47	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Bromodichloromethane [75-27-4]^	0.46	U	ppbv	1.35	0.46	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Bromoethene [593-60-2]^	0.45	U	ppbv	1.35	0.45	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Bromoform [75-25-2]^	0.51	U	ppbv	1.35	0.51	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Bromomethane [74-83-9]^	0.45	U	ppbv	1.35	0.45	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Carbon tetrachloride [56-23-5]^	0.36	U	ppbv	1.35	0.36	3.4	2A18022	TO-15	01/19/22 08:59	rgg	J-05
Chlorobenzene [108-90-7]^	0.45	U	ppbv	1.35	0.45	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Chloroethane [75-00-3]^	0.43	U	ppbv	1.35	0.43	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Chloroform [67-66-3]^	0.51	U	ppbv	1.35	0.51	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Chloromethane [74-87-3]^	0.65	U	ppbv	1.35	0.65	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
cis-1,2-Dichloroethene [156-59-2]^	0.51	U	ppbv	1.35	0.51	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	0.51	U	ppbv	1.35	0.51	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Dibromochloromethane [124-48-1]^	0.45	U	ppbv	1.35	0.45	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ppbv	1.35	0.74	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Freon 113 [76-13-1]^	0.43	U	ppbv	1.35	0.43	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Freon 114 [76-14-2]^	0.70	U	ppbv	1.35	0.70	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Hexachlorobutadiene [87-68-3]^	0.50	U	ppbv	1.35	0.50	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Methylene chloride [75-09-2]^	**0.68**	I	ppbv	1.35	0.27	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Propene [115-07-1]^	0.74	U	ppbv	1.35	0.74	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Tetrachloroethene [127-18-4]^	0.42	U	ppbv	1.35	0.42	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
trans-1,2-Dichloroethene [156-60-5]^	0.43	U	ppbv	1.35	0.43	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	0.46	U	ppbv	1.35	0.46	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Trichloroethene [79-01-6]^	0.47	U	ppbv	1.35	0.47	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Trichlorofluoromethane [75-69-4]^	0.46	U	ppbv	1.35	0.46	3.4	2A18022	TO-15	01/19/22 08:59	rgg	
Vinyl chloride [75-01-4]^	0.76	U	ppbv	1.35	0.76	3.4	2A18022	TO-15	01/19/22 08:59	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*27*	*1*	*31.0*	*87 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 08:59*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-AMB0002-20220114 | **Lab Sample ID:** AF00241-02 | **Received:** 01/14/22 15:40

Matrix: Air | **Sampled:** 01/14/22 15:25 | **Work Order:** AF00241

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.46	U	ppbv	1.36	0.46	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.49	U	ppbv	1.36	0.49	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
1,1,2-Trichloroethane [79-00-5]^	0.48	U	ppbv	1.36	0.48	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
1,1-Dichloroethane [75-34-3]^	0.49	U	ppbv	1.36	0.49	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
1,1-Dichloroethene [75-35-4]^	0.52	U	ppbv	1.36	0.52	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
1,2-Dibromoethane [106-93-4]^	0.49	U	ppbv	1.36	0.49	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
1,2-Dichlorobenzene [95-50-1]^	0.37	U	ppbv	1.36	0.37	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
1,2-Dichloroethane [107-06-2]^	0.50	U	ppbv	1.36	0.50	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
1,2-Dichloropropane [78-87-5]^	0.54	U	ppbv	1.36	0.54	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
1,3-Dichlorobenzene [541-73-1]^	0.38	U	ppbv	1.36	0.38	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
1,4-Dichlorobenzene [106-46-7]^	0.42	U	ppbv	1.36	0.42	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
3-Chloropropene [107-05-1]^	0.53	U	ppbv	1.36	0.53	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Acetone [67-64-1]^	**4.5**		ppbv	1.36	0.48	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Bromodichloromethane [75-27-4]^	0.46	U	ppbv	1.36	0.46	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Bromoethene [593-60-2]^	0.45	U	ppbv	1.36	0.45	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Bromoform [75-25-2]^	0.52	U	ppbv	1.36	0.52	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Bromomethane [74-83-9]^	0.45	U	ppbv	1.36	0.45	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Carbon tetrachloride [56-23-5]^	0.37	U	ppbv	1.36	0.37	3.4	2A18022	TO-15	01/19/22 09:45	rgg	J-05
Chlorobenzene [108-90-7]^	0.45	U	ppbv	1.36	0.45	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Chloroethane [75-00-3]^	0.44	U	ppbv	1.36	0.44	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Chloroform [67-66-3]^	0.52	U	ppbv	1.36	0.52	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Chloromethane [74-87-3]^	0.65	U	ppbv	1.36	0.65	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
cis-1,2-Dichloroethene [156-59-2]^	0.52	U	ppbv	1.36	0.52	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	0.52	U	ppbv	1.36	0.52	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Dibromochloromethane [124-48-1]^	0.45	U	ppbv	1.36	0.45	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Dichlorodifluoromethane [75-71-8]^	0.75	U	ppbv	1.36	0.75	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Freon 113 [76-13-1]^	**0.76**	I	ppbv	1.36	0.44	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Freon 114 [76-14-2]^	0.71	U	ppbv	1.36	0.71	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Hexachlorobutadiene [87-68-3]^	0.50	U	ppbv	1.36	0.50	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Methylene chloride [75-09-2]^	**0.84**	I	ppbv	1.36	0.27	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Propene [115-07-1]^	0.75	U	ppbv	1.36	0.75	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Tetrachloroethene [127-18-4]^	0.42	U	ppbv	1.36	0.42	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
trans-1,2-Dichloroethene [156-60-5]^	**0.53**	I	ppbv	1.36	0.44	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	0.46	U	ppbv	1.36	0.46	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Trichloroethene [79-01-6]^	0.48	U	ppbv	1.36	0.48	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Trichlorofluoromethane [75-69-4]^	0.46	U	ppbv	1.36	0.46	3.4	2A18022	TO-15	01/19/22 09:45	rgg	
Vinyl chloride [75-01-4]^	0.76	U	ppbv	1.36	0.76	3.4	2A18022	TO-15	01/19/22 09:45	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*27*	*1*	*31.0*	*88 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 09:45*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0001-20220114 | **Lab Sample ID:** AF00241-03 | **Received:** 01/14/22 15:40

Matrix: Air | **Sampled:** 01/14/22 11:30 | **Work Order:** AF00241

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.47	U	ppbv	1.37	0.47	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.49	U	ppbv	1.37	0.49	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
1,1,2-Trichloroethane [79-00-5]^	0.48	U	ppbv	1.37	0.48	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
1,1-Dichloroethane [75-34-3]^	0.49	U	ppbv	1.37	0.49	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
1,1-Dichloroethene [75-35-4]^	0.52	U	ppbv	1.37	0.52	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
1,2-Dibromoethane [106-93-4]^	0.49	U	ppbv	1.37	0.49	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
1,2-Dichlorobenzene [95-50-1]^	0.37	U	ppbv	1.37	0.37	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
1,2-Dichloroethane [107-06-2]^	0.51	U	ppbv	1.37	0.51	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
1,2-Dichloropropane [78-87-5]^	0.55	U	ppbv	1.37	0.55	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
1,3-Dichlorobenzene [541-73-1]^	0.38	U	ppbv	1.37	0.38	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
1,4-Dichlorobenzene [106-46-7]^	0.42	U	ppbv	1.37	0.42	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
3-Chloropropene [107-05-1]^	0.53	U	ppbv	1.37	0.53	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Acetone [67-64-1]^	**3.3**	I	ppbv	1.37	0.48	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Bromodichloromethane [75-27-4]^	0.47	U	ppbv	1.37	0.47	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Bromoethene [593-60-2]^	0.45	U	ppbv	1.37	0.45	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Bromoform [75-25-2]^	0.52	U	ppbv	1.37	0.52	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Bromomethane [74-83-9]^	0.45	U	ppbv	1.37	0.45	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Carbon tetrachloride [56-23-5]^	0.37	U	ppbv	1.37	0.37	3.4	2A18022	TO-15	01/19/22 10:30	rgg	J-05
Chlorobenzene [108-90-7]^	0.45	U	ppbv	1.37	0.45	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Chloroethane [75-00-3]^	0.44	U	ppbv	1.37	0.44	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Chloroform [67-66-3]^	0.52	U	ppbv	1.37	0.52	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Chloromethane [74-87-3]^	0.66	U	ppbv	1.37	0.66	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
cis-1,2-Dichloroethene [156-59-2]^	0.52	U	ppbv	1.37	0.52	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	0.52	U	ppbv	1.37	0.52	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Dibromochloromethane [124-48-1]^	0.45	U	ppbv	1.37	0.45	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Dichlorodifluoromethane [75-71-8]^	0.75	U	ppbv	1.37	0.75	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Freon 113 [76-13-1]^	**4.0**		ppbv	1.37	0.44	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Freon 114 [76-14-2]^	0.71	U	ppbv	1.37	0.71	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Hexachlorobutadiene [87-68-3]^	0.51	U	ppbv	1.37	0.51	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Methylene chloride [75-09-2]^	**0.29**	I	ppbv	1.37	0.27	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Propene [115-07-1]^	0.75	U	ppbv	1.37	0.75	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Tetrachloroethene [127-18-4]^	0.42	U	ppbv	1.37	0.42	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
trans-1,2-Dichloroethene [156-60-5]^	0.44	U	ppbv	1.37	0.44	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	0.47	U	ppbv	1.37	0.47	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Trichloroethene [79-01-6]^	0.48	U	ppbv	1.37	0.48	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Trichlorofluoromethane [75-69-4]^	0.47	U	ppbv	1.37	0.47	3.4	2A18022	TO-15	01/19/22 10:30	rgg	
Vinyl chloride [75-01-4]^	0.77	U	ppbv	1.37	0.77	3.4	2A18022	TO-15	01/19/22 10:30	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*27*	*1*	*31.0*	*88 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 10:30*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0002-20220114 | **Lab Sample ID:** AF00241-04 | **Received:** 01/14/22 15:40

Matrix: Air | **Sampled:** 01/14/22 11:45 | **Work Order:** AF00241

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.48	U	ppbv	1.4	0.48	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.50	U	ppbv	1.4	0.50	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
1,1,2-Trichloroethane [79-00-5]^	0.49	U	ppbv	1.4	0.49	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
1,1-Dichloroethane [75-34-3]^	0.50	U	ppbv	1.4	0.50	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
1,1-Dichloroethene [75-35-4]^	0.53	U	ppbv	1.4	0.53	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
1,2-Dibromoethane [106-93-4]^	0.50	U	ppbv	1.4	0.50	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
1,2-Dichlorobenzene [95-50-1]^	0.38	U	ppbv	1.4	0.38	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
1,2-Dichloroethane [107-06-2]^	0.52	U	ppbv	1.4	0.52	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
1,2-Dichloropropane [78-87-5]^	0.56	U	ppbv	1.4	0.56	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
1,3-Dichlorobenzene [541-73-1]^	0.39	U	ppbv	1.4	0.39	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
1,4-Dichlorobenzene [106-46-7]^	0.43	U	ppbv	1.4	0.43	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
3-Chloropropene [107-05-1]^	0.55	U	ppbv	1.4	0.55	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Acetone [67-64-1]^	**1.5**	I	ppbv	1.4	0.49	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Bromodichloromethane [75-27-4]^	0.48	U	ppbv	1.4	0.48	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Bromoethene [593-60-2]^	0.46	U	ppbv	1.4	0.46	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Bromoform [75-25-2]^	0.53	U	ppbv	1.4	0.53	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Bromomethane [74-83-9]^	0.46	U	ppbv	1.4	0.46	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Carbon tetrachloride [56-23-5]^	0.38	U	ppbv	1.4	0.38	3.5	2A18022	TO-15	01/19/22 11:16	rgg	J-05
Chlorobenzene [108-90-7]^	0.46	U	ppbv	1.4	0.46	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Chloroethane [75-00-3]^	0.45	U	ppbv	1.4	0.45	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Chloroform [67-66-3]^	0.53	U	ppbv	1.4	0.53	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Chloromethane [74-87-3]^	0.67	U	ppbv	1.4	0.67	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ppbv	1.4	0.53	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	0.53	U	ppbv	1.4	0.53	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Dibromochloromethane [124-48-1]^	0.46	U	ppbv	1.4	0.46	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Dichlorodifluoromethane [75-71-8]^	0.77	U	ppbv	1.4	0.77	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Freon 113 [76-13-1]^	**15**		ppbv	1.4	0.45	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Freon 114 [76-14-2]^	0.73	U	ppbv	1.4	0.73	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Hexachlorobutadiene [87-68-3]^	0.52	U	ppbv	1.4	0.52	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Methylene chloride [75-09-2]^	**0.29**	I	ppbv	1.4	0.28	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Propene [115-07-1]^	0.77	U	ppbv	1.4	0.77	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Tetrachloroethene [127-18-4]^	0.43	U	ppbv	1.4	0.43	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
trans-1,2-Dichloroethene [156-60-5]^	**0.83**	I	ppbv	1.4	0.45	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	0.48	U	ppbv	1.4	0.48	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Trichloroethene [79-01-6]^	0.49	U	ppbv	1.4	0.49	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Trichlorofluoromethane [75-69-4]^	0.48	U	ppbv	1.4	0.48	3.5	2A18022	TO-15	01/19/22 11:16	rgg	
Vinyl chloride [75-01-4]^	0.78	U	ppbv	1.4	0.78	3.5	2A18022	TO-15	01/19/22 11:16	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*27*	*1*	*31.0*	*88 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 11:16*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0003-20220114 | **Lab Sample ID:** AF00241-05 | **Received:** 01/14/22 15:40

Matrix: Air | **Sampled:** 01/14/22 13:00 | **Work Order:** AF00241

Project: NASA KSC CRCA Airs | **Sampled By:** Chuck Sorden | **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.50	U	ppbv	1.47	0.50	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.53	U	ppbv	1.47	0.53	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
1,1,2-Trichloroethane [79-00-5]^	0.51	U	ppbv	1.47	0.51	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
1,1-Dichloroethane [75-34-3]^	0.53	U	ppbv	1.47	0.53	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
1,1-Dichloroethene [75-35-4]^	0.56	U	ppbv	1.47	0.56	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
1,2-Dibromoethane [106-93-4]^	0.53	U	ppbv	1.47	0.53	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
1,2-Dichlorobenzene [95-50-1]^	0.40	U	ppbv	1.47	0.40	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
1,2-Dichloroethane [107-06-2]^	0.54	U	ppbv	1.47	0.54	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
1,2-Dichloropropane [78-87-5]^	0.59	U	ppbv	1.47	0.59	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
1,3-Dichlorobenzene [541-73-1]^	0.41	U	ppbv	1.47	0.41	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
1,4-Dichlorobenzene [106-46-7]^	0.46	U	ppbv	1.47	0.46	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
3-Chloropropene [107-05-1]^	0.57	U	ppbv	1.47	0.57	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Acetone [67-64-1]^	**7.4**		ppbv	1.47	0.51	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Bromodichloromethane [75-27-4]^	0.50	U	ppbv	1.47	0.50	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Bromoethene [593-60-2]^	0.49	U	ppbv	1.47	0.49	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Bromoform [75-25-2]^	0.56	U	ppbv	1.47	0.56	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Bromomethane [74-83-9]^	0.49	U	ppbv	1.47	0.49	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Carbon tetrachloride [56-23-5]^	0.40	U	ppbv	1.47	0.40	3.7	2A18022	TO-15	01/19/22 12:02	rgg	J-05
Chlorobenzene [108-90-7]^	0.49	U	ppbv	1.47	0.49	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Chloroethane [75-00-3]^	0.47	U	ppbv	1.47	0.47	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Chloroform [67-66-3]^	**1.1**	I	ppbv	1.47	0.56	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Chloromethane [74-87-3]^	0.71	U	ppbv	1.47	0.71	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
cis-1,2-Dichloroethene [156-59-2]^	0.56	U	ppbv	1.47	0.56	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	0.56	U	ppbv	1.47	0.56	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Dibromochloromethane [124-48-1]^	0.49	U	ppbv	1.47	0.49	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Dichlorodifluoromethane [75-71-8]^	0.81	U	ppbv	1.47	0.81	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Freon 113 [76-13-1]^	**5.8**		ppbv	1.47	0.47	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Freon 114 [76-14-2]^	0.76	U	ppbv	1.47	0.76	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Hexachlorobutadiene [87-68-3]^	0.54	U	ppbv	1.47	0.54	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Methylene chloride [75-09-2]^	0.29	U	ppbv	1.47	0.29	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Propene [115-07-1]^	0.81	U	ppbv	1.47	0.81	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Tetrachloroethene [127-18-4]^	0.46	U	ppbv	1.47	0.46	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
trans-1,2-Dichloroethene [156-60-5]^	0.47	U	ppbv	1.47	0.47	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	0.50	U	ppbv	1.47	0.50	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Trichloroethene [79-01-6]^	0.51	U	ppbv	1.47	0.51	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Trichlorofluoromethane [75-69-4]^	0.50	U	ppbv	1.47	0.50	3.7	2A18022	TO-15	01/19/22 12:02	rgg	
Vinyl chloride [75-01-4]^	0.82	U	ppbv	1.47	0.82	3.7	2A18022	TO-15	01/19/22 12:02	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*27*	*1*	*31.0*	*89 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 12:02*	*rgg*	

ANALYTICAL RESULTS

Description: CRCA-VMP0004-20220114 **Lab Sample ID:** AF00241-06 **Received:** 01/14/22 15:40

Matrix: Air **Sampled:** 01/14/22 13:40 **Work Order:** AF00241

Project: NASA KSC CRCA Airs **Sampled By:** Chuck Sorden **% Solids:**

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.50	U	ppbv	1.48	0.50	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.53	U	ppbv	1.48	0.53	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
1,1,2-Trichloroethane [79-00-5]^	0.52	U	ppbv	1.48	0.52	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
1,1-Dichloroethane [75-34-3]^	0.53	U	ppbv	1.48	0.53	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
1,1-Dichloroethene [75-35-4]^	0.56	U	ppbv	1.48	0.56	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
1,2-Dibromoethane [106-93-4]^	0.53	U	ppbv	1.48	0.53	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
1,2-Dichlorobenzene [95-50-1]^	0.40	U	ppbv	1.48	0.40	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
1,2-Dichloroethane [107-06-2]^	0.55	U	ppbv	1.48	0.55	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
1,2-Dichloropropane [78-87-5]^	0.59	U	ppbv	1.48	0.59	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
1,3-Dichlorobenzene [541-73-1]^	0.41	U	ppbv	1.48	0.41	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
1,4-Dichlorobenzene [106-46-7]^	0.46	U	ppbv	1.48	0.46	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
3-Chloropropene [107-05-1]^	0.58	U	ppbv	1.48	0.58	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Acetone [67-64-1]^	**3.7**		ppbv	1.48	0.52	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Bromodichloromethane [75-27-4]^	0.50	U	ppbv	1.48	0.50	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Bromoethene [593-60-2]^	0.49	U	ppbv	1.48	0.49	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Bromoform [75-25-2]^	0.56	U	ppbv	1.48	0.56	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Bromomethane [74-83-9]^	0.49	U	ppbv	1.48	0.49	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Carbon tetrachloride [56-23-5]^	0.40	U	ppbv	1.48	0.40	3.7	2A18022	TO-15	01/19/22 12:50	rgg	J-05
Chlorobenzene [108-90-7]^	0.49	U	ppbv	1.48	0.49	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Chloroethane [75-00-3]^	0.47	U	ppbv	1.48	0.47	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Chloroform [67-66-3]^	**1.3**	I	ppbv	1.48	0.56	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Chloromethane [74-87-3]^	0.71	U	ppbv	1.48	0.71	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
cis-1,2-Dichloroethene [156-59-2]^	0.56	U	ppbv	1.48	0.56	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
cis-1,3-Dichloropropene [10061-01-5]^	0.56	U	ppbv	1.48	0.56	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Dibromochloromethane [124-48-1]^	0.49	U	ppbv	1.48	0.49	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Dichlorodifluoromethane [75-71-8]^	0.81	U	ppbv	1.48	0.81	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Freon 113 [76-13-1]^	**17**		ppbv	1.48	0.47	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Freon 114 [76-14-2]^	0.77	U	ppbv	1.48	0.77	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Hexachlorobutadiene [87-68-3]^	0.55	U	ppbv	1.48	0.55	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Methylene chloride [75-09-2]^	**0.60**	I	ppbv	1.48	0.30	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Propene [115-07-1]^	0.81	U	ppbv	1.48	0.81	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Tetrachloroethene [127-18-4]^	0.46	U	ppbv	1.48	0.46	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
trans-1,2-Dichloroethene [156-60-5]^	0.47	U	ppbv	1.48	0.47	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
trans-1,3-Dichloropropene [10061-02-6]^	0.50	U	ppbv	1.48	0.50	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Trichloroethene [79-01-6]^	0.52	U	ppbv	1.48	0.52	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Trichlorofluoromethane [75-69-4]^	0.50	U	ppbv	1.48	0.50	3.7	2A18022	TO-15	01/19/22 12:50	rgg	
Vinyl chloride [75-01-4]^	0.83	U	ppbv	1.48	0.83	3.7	2A18022	TO-15	01/19/22 12:50	rgg	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*28*	*1*	*31.0*	*89 %*	*70-130*	*2A18022*	*TO-15*	*01/19/22 12:50*	*rgg*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A18022 - NO PREP 2

Blank (2A18022-BLK1) Prepared: 01/18/2022 11:01 Analyzed: 01/18/2022 21:17

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.34	U	2.5	ppbv							
1,1,2,2-Tetrachloroethane	0.36	U	2.5	ppbv							
1,1,2-Trichloroethane	0.35	U	2.5	ppbv							
1,1-Dichloroethane	0.36	U	2.5	ppbv							
1,1-Dichloroethene	0.38	U	2.5	ppbv							
1,2-Dibromoethane	0.36	U	2.5	ppbv							
1,2-Dichlorobenzene	0.27	U	2.5	ppbv							
1,2-Dichloroethane	0.37	U	2.5	ppbv							
1,2-Dichloropropane	0.40	U	2.5	ppbv							
1,3-Dichlorobenzene	0.28	U	2.5	ppbv							
1,4-Dichlorobenzene	0.31	U	2.5	ppbv							
3-Chloropropene	0.39	U	2.5	ppbv							
Acetone	0.35	U	2.5	ppbv							
Bromodichloromethane	0.34	U	2.5	ppbv							
Bromoethene	0.33	U	2.5	ppbv							
Bromoform	0.38	U	2.5	ppbv							
Bromomethane	0.33	U	2.5	ppbv							
Carbon tetrachloride	0.27	U	2.5	ppbv							
Chlorobenzene	0.33	U	2.5	ppbv							
Chloroethane	0.32	U	2.5	ppbv							
Chloroform	0.38	U	2.5	ppbv							
Chloromethane	0.48	U	2.5	ppbv							
cis-1,2-Dichloroethene	0.38	U	2.5	ppbv							
cis-1,3-Dichloropropene	0.38	U	2.5	ppbv							
Dibromochloromethane	0.33	U	2.5	ppbv							
Dichlorodifluoromethane	0.55	U	2.5	ppbv							
Freon 113	0.32	U	2.5	ppbv							
Freon 114	0.52	U	2.5	ppbv							
Hexachlorobutadiene	0.37	U	2.5	ppbv							
Methylene chloride	0.20	U	2.5	ppbv							
Propene	0.55	U	2.5	ppbv							
Tetrachloroethene	0.31	U	2.5	ppbv							
trans-1,2-Dichloroethene	0.32	U	2.5	ppbv							
trans-1,3-Dichloropropene	0.34	U	2.5	ppbv							
Trichloroethene	0.35	U	2.5	ppbv							
Trichlorofluoromethane	0.34	U	2.5	ppbv							
Vinyl chloride	0.56	U	2.5	ppbv							
4-Bromofluorobenzene	*27*			*ppbv*	*31.0*		*87*	*70-130*			

LCS (2A18022-BS1) Prepared: 01/18/2022 11:01 Analyzed: 01/18/2022 19:11

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	9.1		2.5	ppbv	10.0		91	70-130			
1,1,2,2-Tetrachloroethane	9.9		2.5	ppbv	10.0		99	52-163			
1,1,2-Trichloroethane	9.7		2.5	ppbv	10.0		97	70-134			
1,1-Dichloroethane	10		2.5	ppbv	10.0		103	70-130			
1,1-Dichloroethene	10		2.5	ppbv	10.0		104	67-142			
1,2-Dibromoethane	9.4		2.5	ppbv	10.0		94	70-141			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A18022 - NO PREP 2 - Continued

LCS (2A18022-BS1) Continued Prepared: 01/18/2022 11:01 Analyzed: 01/18/2022 19:11

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,2-Dichlorobenzene	9.9		2.5	ppbv	10.0		99	37-180			
1,2-Dichloroethane	9.2		2.5	ppbv	10.0		92	70-130			
1,2-Dichloropropane	10		2.5	ppbv	10.0		102	70-130			
1,3-Dichlorobenzene	10		2.5	ppbv	10.0		101	47-178			
1,4-Dichlorobenzene	9.9		2.5	ppbv	10.0		99	45-180			
3-Chloropropene	9.7		2.5	ppbv	10.0		97	70-130			
Acetone	9.5		2.5	ppbv	10.0		95	65-130			
Bromodichloromethane	8.5		2.5	ppbv	10.0		85	70-130			
Bromoethene	8.8		2.5	ppbv	10.0		88	69-132			
Bromoform	7.7		2.5	ppbv	10.0		77	62-149			
Bromomethane	8.3		2.5	ppbv	10.0		83	69-130			
Carbon tetrachloride	3.2		2.5	ppbv	10.0		32	22-166			
Chlorobenzene	9.9		2.5	ppbv	10.0		99	70-134			
Chloroethane	9.1		2.5	ppbv	10.0		91	69-131			
Chloroform	9.6		2.5	ppbv	10.0		96	70-130			
Chloromethane	9.6		2.5	ppbv	10.0		96	55-142			
cis-1,2-Dichloroethene	11		2.5	ppbv	10.0		105	70-130			
cis-1,3-Dichloropropene	10		2.5	ppbv	10.0		101	70-137			
Dibromochloromethane	7.8		2.5	ppbv	10.0		78	70-130			
Dichlorodifluoromethane	8.3		2.5	ppbv	10.0		83	61-137			
Freon 113	10		2.5	ppbv	10.0		103	67-140			
Freon 114	9.1		2.5	ppbv	10.0		91	62-147			
Hexachlorobutadiene	9.5		2.5	ppbv	10.0		95	24-180			
Methylene chloride	10		2.5	ppbv	10.0		103	59-136			
Propene	9.3		2.5	ppbv	10.0		93	63-132			
Tetrachloroethene	9.7		2.5	ppbv	10.0		97	70-141			
trans-1,2-Dichloroethene	9.8		2.5	ppbv	10.0		98	70-130			
trans-1,3-Dichloropropene	9.2		2.5	ppbv	10.0		92	59-166			
Trichloroethene	9.8		2.5	ppbv	10.0		98	70-130			
Trichlorofluoromethane	8.5		2.5	ppbv	10.0		85	46-161			
Vinyl chloride	10		2.5	ppbv	10.0		102	53-148			
4-Bromofluorobenzene	*29*			*ppbv*	*31.0*		*95*	*70-130*			

LCS Dup (2A18022-BSD1) Prepared: 01/18/2022 11:01 Analyzed: 01/18/2022 19:51

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	9.0		2.5	ppbv	10.0		90	70-130	2	25	
1,1,2,2-Tetrachloroethane	10		2.5	ppbv	10.0		100	52-163	1	25	
1,1,2-Trichloroethane	9.8		2.5	ppbv	10.0		98	70-134	1	25	
1,1-Dichloroethane	10		2.5	ppbv	10.0		103	70-130	0.2	25	
1,1-Dichloroethene	11		2.5	ppbv	10.0		105	67-142	0.9	25	
1,2-Dibromoethane	9.5		2.5	ppbv	10.0		95	70-141	0.7	25	
1,2-Dichlorobenzene	10		2.5	ppbv	10.0		101	37-180	2	25	
1,2-Dichloroethane	9.1		2.5	ppbv	10.0		91	70-130	1	25	
1,2-Dichloropropane	10		2.5	ppbv	10.0		103	70-130	1	25	
1,3-Dichlorobenzene	10		2.5	ppbv	10.0		102	47-178	0.4	25	
1,4-Dichlorobenzene	10		2.5	ppbv	10.0		101	45-180	2	25	
3-Chloropropene	9.6		2.5	ppbv	10.0		96	70-130	1	25	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A18022 - NO PREP 2 - Continued

LCS Dup (2A18022-BSD1) Continued Prepared: 01/18/2022 11:01 Analyzed: 01/18/2022 19:51

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Acetone	9.4		2.5	ppbv	10.0		94	65-130	1	25	
Bromodichloromethane	8.5		2.5	ppbv	10.0		85	70-130	0.4	25	
Bromoethene	8.7		2.5	ppbv	10.0		87	69-132	0.9	25	
Bromoform	7.8		2.5	ppbv	10.0		78	62-149	1	25	
Bromomethane	8.4		2.5	ppbv	10.0		84	69-130	0.4	25	
Carbon tetrachloride	3.1		2.5	ppbv	10.0		31	22-166	2	25	
Chlorobenzene	10		2.5	ppbv	10.0		100	70-134	1	25	
Chloroethane	9.0		2.5	ppbv	10.0		90	69-131	1	25	
Chloroform	9.6		2.5	ppbv	10.0		96	70-130	0.6	25	
Chloromethane	9.5		2.5	ppbv	10.0		95	55-142	1	25	
cis-1,2-Dichloroethene	11		2.5	ppbv	10.0		106	70-130	0.3	25	
cis-1,3-Dichloropropene	10		2.5	ppbv	10.0		102	70-137	0.8	25	
Dibromochloromethane	7.9		2.5	ppbv	10.0		79	70-130	1	25	
Dichlorodifluoromethane	8.2		2.5	ppbv	10.0		82	61-137	1	25	
Freon 113	10		2.5	ppbv	10.0		103	67-140	0.6	25	
Freon 114	8.9		2.5	ppbv	10.0		89	62-147	1	25	
Hexachlorobutadiene	9.5		2.5	ppbv	10.0		95	24-180	0.4	25	
Methylene chloride	10		2.5	ppbv	10.0		103	59-136	0.8	25	
Propene	9.0		2.5	ppbv	10.0		90	63-132	3	25	
Tetrachloroethene	9.8		2.5	ppbv	10.0		98	70-141	0.7	25	
trans-1,2-Dichloroethene	9.8		2.5	ppbv	10.0		98	70-130	0.2	25	
trans-1,3-Dichloropropene	9.3		2.5	ppbv	10.0		93	59-166	0.9	25	
Trichloroethene	9.9		2.5	ppbv	10.0		99	70-130	0.5	25	
Trichlorofluoromethane	8.4		2.5	ppbv	10.0		84	46-161	0.8	25	
Vinyl chloride	10		2.5	ppbv	10.0		102	53-148	0.3	25	
4-Bromofluorobenzene	*30*			*ppbv*	*31.0*		*96*	*70-130*			

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*****	Not reported due to interference.
[CALC]	Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
J-05	Result may be biased low. Associated calibration verification standard did not meet the minimum control limit.

AF80241

Tetra Tech, Inc. CHAIN OF CUSTODY NUMBER No. 2559 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G-08970	KSC-CRCA	Alex Murphy	(321) 292-0842	ENCO — Kaitlin Orlowski
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
		Chuck Sorden	(321) 591-7580	10775 Central Port Dr
		CARRIER/WAYBILL NUMBER		CITY, STATE
				Orlando, FL

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2022	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT) START	BOTTOM DEPTH (FT) STOP	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS TO-15 Air VOCs	COMMENTS
									Metal	None		
01/14		CRCA-AMB0001-20220114	AMB1	0725 / 30"	1520 / 5"	Air	C	1			X	Can: JS-060 Reg: GG48
		CRCA-AMB0002-20220114	AMB2	0730 / 29"	1525 / 0"							Can: JS-016 Reg: GG93
		CRCA-VMP0001-20220114	VMP1	1039 / 30"	1139 / 6"							Can: JS-063 Reg: JAX-R-15
		CRCA-VMP0002-20220114	VMP2	1045 / 30"	1145 / 4"							Can: JS-032 Reg: JAX-R-2
		CRCA-VMP0003-20220114	VMP3	1200 / 23"	1300 / 1"							Can: JS-026 Reg: JAX-R-14
01/14		CRCA-VMP0004-20220114	VMP4	1240 / 29"	1340 / 5"	AIR	C	1			X	Can: JS-071 Reg: JAX-R-13

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	01/14/2022	1540	1. RECEIVED BY	1/14/22	1540
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS Box 1 19.7°C, Box 2 19.8°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

AF00241

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive, Orlando, FL 32824
4810 Executive Park Court, Suite 211,Jacksonville, FL 32216
102-A Woodwinds Industrial Ct, Cary, NC 27511

www.encolabs.com

COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-AMB0001-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Serden
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-060
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	6448

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	51°F	730"	0725	12.5mL/min
STOP	65°F	7"	1520	12.5mL/mn

Signature/Title: [signature] - Geologist

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-AM00002-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Sorden
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-016
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	6693

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	51°F	29"	0730	12.5mL/min
STOP	65°F	6"	1525	12.5mL/min

Signature/Title: [signature] - Geologist

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-VMP0001-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Serden
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-063
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAX-R-15

Reg off Canister = 7"

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	57°F	7.30"	1030	100mL/min
STOP	59°F	10"	1130	100mL/min

Signature/Title: _____ - Geologist

AF000241

Environmental Conservation Laboratories, Inc.
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102-A Woodwinds Industrial Ct, Cary, NC 27511
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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-VMP0002-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Sorden
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-032
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAX-R-02

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	58°F	29"	1045	100mL/min
STOP	60°F	4"	1145	100mL/min

Signature/Title: _____ – Geologist

AF00241

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102-A Woodwinds Industrial Ct, Cary, NC 27511

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COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-VMP0003-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Sorden
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-026
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAX-R-14

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	61°F	27"	1200	100mL/min
STOP	63°F	1"	1300	100mL/min

Signature/Title: — Geologist

AF0024)

Environmental Conservation Laboratories, Inc.
10775 Central Port Drive, Orlando, FL 32824
4810 Executive Park Court, Suite 211,Jacksonville, FL 32216
102-A Woodwinds Industrial Ct, Cary, NC 27511

COMPENDIUM METHOD TO-14A/COMPENDIUM METHOD TO-15 CANISTER SAMPLING FIELD TEST DATA SHEET

General Sampling Information should be recorded for each SUMMA canister used to collect samples.

General Information

SITE LOCATION:	Kennedy Space Center, FL
SITE ADDRESS:	CRCA
SAMPLER ID:	CRCA-UMP0004-20220114
SAMPLING DATE:	01/14/22
OPERATOR:	Chuck Scrader
SHIPPING DATE:	01-12-22
CANISTER SERIAL NO.:	JS-071
CANISTER LEAK CHECK DATE:	Laboratory information on file.
REGULATOR SERIAL NO.:	JAx-R-13.

Sampling Information

	Temperature	Canister Pressure	Local Time	Regulator Flow Rate
START	62°F	29"	1240	100mL/min
STOP	62°F		1340	100mL/m

Signature/Title: Geologist

ENCO Orlando

SDG: AF00241-TE016

CLASS: 06_VOA_AIR

METHOD: TO-15

ANALYSES DATA PACKAGE COVER PAGE

TO-15

Laboratory: ENCO Orlando

SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA Airs

Client Sample Id:	Lab Sample Id:
CRCA-AMB0001-20220114	AF00241-01
CRCA-AMB0002-20220114	AF00241-02
CRCA-VMP0001-20220114	AF00241-03
CRCA-VMP0002-20220114	AF00241-04
CRCA-VMP0003-20220114	AF00241-05
CRCA-VMP0004-20220114	AF00241-06

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0001-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-01
File ID: 227AM013.D
Sampled: 01/14/22 15:20
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 08:59
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.35	3.7	UD	3.7	17
115-07-1	Propene	1.35	1.3	UD	1.3	5.8
74-87-3	Chloromethane	1.35	1.3	UD	1.3	7.0
75-01-4	Vinyl chloride	1.35	1.9	UD	1.9	8.6
74-83-9	Bromomethane	1.35	1.7	UD	1.7	13
75-00-3	Chloroethane	1.35	1.1	UD	1.1	8.9
75-69-4	Trichlorofluoromethane	1.35	2.6	UD	2.6	19
593-60-2	Bromoethene	1.35	1.9	UD	1.9	15
75-34-3	1,1-Dichloroethane	1.35	2.0	UD	2.0	14
67-64-1	Acetone	1.35	3.9	JD	1.1	8.0
75-09-2	Methylene chloride	1.35	2.4	JD	0.94	12
76-13-1	Freon 113	1.35	3.3	UD	3.3	26
107-05-1	3-Chloropropene	1.35	1.6	UD	1.6	11
156-60-5	trans-1,2-Dichloroethene	1.35	1.7	UD	1.7	13
75-35-4	1,1-Dichloroethene	1.35	2.0	UD	2.0	13
156-59-2	cis-1,2-Dichloroethene	1.35	2.0	UD	2.0	13
67-66-3	Chloroform	1.35	2.5	UD	2.5	16
107-06-2	1,2-Dichloroethane	1.35	2.0	UD	2.0	14
71-55-6	1,1,1-Trichloroethane	1.35	2.5	UD	2.5	18
56-23-5	Carbon tetrachloride	1.35	2.3	UD	2.3	21
78-87-5	1,2-Dichloropropane	1.35	2.5	UD	2.5	16
79-01-6	Trichloroethene	1.35	2.5	UD	2.5	18
75-27-4	Bromodichloromethane	1.35	3.1	UD	3.1	23
10061-01-5	cis-1,3-Dichloropropene	1.35	2.3	UD	2.3	15
10061-02-6	trans-1,3-Dichloropropene	1.35	2.1	UD	2.1	15
79-00-5	1,1,2-Trichloroethane	1.35	2.6	UD	2.6	18
106-93-4	1,2-Dibromoethane	1.35	3.7	UD	3.7	26
127-18-4	Tetrachloroethene	1.35	2.8	UD	2.8	23
124-48-1	Dibromochloromethane	1.35	3.8	UD	3.8	29
108-90-7	Chlorobenzene	1.35	2.1	UD	2.1	16
75-25-2	Bromoform	1.35	5.3	UD	5.3	35
79-34-5	1,1,2,2-Tetrachloroethane	1.35	3.3	UD	3.3	23
541-73-1	1,3-Dichlorobenzene	1.35	2.3	UD	2.3	20
106-46-7	1,4-Dichlorobenzene	1.35	2.5	UD	2.5	20
95-50-1	1,2-Dichlorobenzene	1.35	2.2	UD	2.2	20
87-68-3	Hexachlorobutadiene	1.35	5.3	UD	5.3	36
76-14-2	Freon 114	1.35	4.9	UD	4.9	24

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	87	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0001-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-01
File ID: 227AM013.D
Sampled: 01/14/22 15:20
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 08:59
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	299748	10.84	226712	10.87	
1,4-Difluorobenzene	1029447	12.36	736300	12.38	
Chlorobenzene-d5	768403	15.76	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0002-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-02
File ID: 227AM014.D
Sampled: 01/14/22 15:25
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 09:45
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.36	3.7	UD	3.7	17
115-07-1	Propene	1.36	1.3	UD	1.3	5.9
74-87-3	Chloromethane	1.36	1.3	UD	1.3	7.0
75-01-4	Vinyl chloride	1.36	1.9	UD	1.9	8.7
74-83-9	Bromomethane	1.36	1.7	UD	1.7	13
75-00-3	Chloroethane	1.36	1.1	UD	1.1	9.0
75-69-4	Trichlorofluoromethane	1.36	2.6	UD	2.6	19
593-60-2	Bromoethene	1.36	2.0	UD	2.0	15
75-34-3	1,1-Dichloroethane	1.36	2.0	UD	2.0	14
67-64-1	Acetone	1.36	11	D	1.1	8.1
75-09-2	Methylene chloride	1.36	2.9	JD	0.94	12
76-13-1	Freon 113	1.36	5.8	JD	3.3	26
107-05-1	3-Chloropropene	1.36	1.7	UD	1.7	11
156-60-5	trans-1,2-Dichloroethene	1.36	2.1	JD	1.7	13
75-35-4	1,1-Dichloroethene	1.36	2.0	UD	2.0	13
156-59-2	cis-1,2-Dichloroethene	1.36	2.0	UD	2.0	13
67-66-3	Chloroform	1.36	2.5	UD	2.5	17
107-06-2	1,2-Dichloroethane	1.36	2.0	UD	2.0	14
71-55-6	1,1,1-Trichloroethane	1.36	2.5	UD	2.5	19
56-23-5	Carbon tetrachloride	1.36	2.3	UD	2.3	21
78-87-5	1,2-Dichloropropane	1.36	2.5	UD	2.5	16
79-01-6	Trichloroethene	1.36	2.6	UD	2.6	18
75-27-4	Bromodichloromethane	1.36	3.1	UD	3.1	23
10061-01-5	cis-1,3-Dichloropropene	1.36	2.3	UD	2.3	15
10061-02-6	trans-1,3-Dichloropropene	1.36	2.1	UD	2.1	15
79-00-5	1,1,2-Trichloroethane	1.36	2.6	UD	2.6	19
106-93-4	1,2-Dibromoethane	1.36	3.8	UD	3.8	26
127-18-4	Tetrachloroethene	1.36	2.9	UD	2.9	23
124-48-1	Dibromochloromethane	1.36	3.8	UD	3.8	29
108-90-7	Chlorobenzene	1.36	2.1	UD	2.1	16
75-25-2	Bromoform	1.36	5.3	UD	5.3	35
79-34-5	1,1,2,2-Tetrachloroethane	1.36	3.4	UD	3.4	23
541-73-1	1,3-Dichlorobenzene	1.36	2.3	UD	2.3	20
106-46-7	1,4-Dichlorobenzene	1.36	2.5	UD	2.5	20
95-50-1	1,2-Dichlorobenzene	1.36	2.2	UD	2.2	20
87-68-3	Hexachlorobutadiene	1.36	5.4	UD	5.4	36
76-14-2	Freon 114	1.36	4.9	UD	4.9	24

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	88	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0002-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-02
File ID: 227AM014.D
Sampled: 01/14/22 15:25
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 09:45
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	297581	10.85	226712	10.87	
1,4-Difluorobenzene	1000997	12.36	736300	12.38	
Chlorobenzene-d5	745658	15.76	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0001-20220114

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AF00241-03 File ID: 227AM015.D

Sampled: 01/14/22 11:30 Prepared: 01/18/22 11:01 Analyzed: 01/19/22 10:30

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 2A18022 Sequence: AA70198 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.37	3.7	UD	3.7	17
115-07-1	Propene	1.37	1.3	UD	1.3	5.9
74-87-3	Chloromethane	1.37	1.4	UD	1.4	7.1
75-01-4	Vinyl chloride	1.37	2.0	UD	2.0	8.8
74-83-9	Bromomethane	1.37	1.8	UD	1.8	13
75-00-3	Chloroethane	1.37	1.2	UD	1.2	9.0
75-69-4	Trichlorofluoromethane	1.37	2.6	UD	2.6	19
593-60-2	Bromoethene	1.37	2.0	UD	2.0	15
75-34-3	1,1-Dichloroethane	1.37	2.0	UD	2.0	14
67-64-1	Acetone	1.37	7.9	JD	1.1	8.1
75-09-2	Methylene chloride	1.37	1.0	JD	0.95	12
76-13-1	Freon 113	1.37	31	D	3.4	26
107-05-1	3-Chloropropene	1.37	1.7	UD	1.7	11
156-60-5	trans-1,2-Dichloroethene	1.37	1.7	UD	1.7	14
75-35-4	1,1-Dichloroethene	1.37	2.1	UD	2.1	14
156-59-2	cis-1,2-Dichloroethene	1.37	2.1	UD	2.1	14
67-66-3	Chloroform	1.37	2.5	UD	2.5	17
107-06-2	1,2-Dichloroethane	1.37	2.1	UD	2.1	14
71-55-6	1,1,1-Trichloroethane	1.37	2.5	UD	2.5	19
56-23-5	Carbon tetrachloride	1.37	2.3	UD	2.3	22
78-87-5	1,2-Dichloropropane	1.37	2.5	UD	2.5	16
79-01-6	Trichloroethene	1.37	2.6	UD	2.6	18
75-27-4	Bromodichloromethane	1.37	3.1	UD	3.1	23
10061-01-5	cis-1,3-Dichloropropene	1.37	2.4	UD	2.4	16
10061-02-6	trans-1,3-Dichloropropene	1.37	2.1	UD	2.1	16
79-00-5	1,1,2-Trichloroethane	1.37	2.6	UD	2.6	19
106-93-4	1,2-Dibromoethane	1.37	3.8	UD	3.8	26
127-18-4	Tetrachloroethene	1.37	2.9	UD	2.9	23
124-48-1	Dibromochloromethane	1.37	3.9	UD	3.9	29
108-90-7	Chlorobenzene	1.37	2.1	UD	2.1	16
75-25-2	Bromoform	1.37	5.4	UD	5.4	35
79-34-5	1,1,2,2-Tetrachloroethane	1.37	3.4	UD	3.4	24
541-73-1	1,3-Dichlorobenzene	1.37	2.3	UD	2.3	21
106-46-7	1,4-Dichlorobenzene	1.37	2.6	UD	2.6	21
95-50-1	1,2-Dichlorobenzene	1.37	2.2	UD	2.2	21
87-68-3	Hexachlorobutadiene	1.37	5.4	UD	5.4	37
76-14-2	Freon 114	1.37	5.0	UD	5.0	24

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	88	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0001-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-03
File ID: 227AM015.D
Sampled: 01/14/22 11:30
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 10:30
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	287991	10.85	226712	10.87	
1,4-Difluorobenzene	988228	12.36	736300	12.38	
Chlorobenzene-d5	747485	15.77	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0002-20220114

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AF00241-04 File ID: 227AM016.D

Sampled: 01/14/22 11:45 Prepared: 01/18/22 11:01 Analyzed: 01/19/22 11:16

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 2A18022 Sequence: AA70198 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.4	3.8	UD	3.8	17
115-07-1	Propene	1.4	1.3	UD	1.3	6.0
74-87-3	Chloromethane	1.4	1.4	UD	1.4	7.2
75-01-4	Vinyl chloride	1.4	2.0	UD	2.0	8.9
74-83-9	Bromomethane	1.4	1.8	UD	1.8	14
75-00-3	Chloroethane	1.4	1.2	UD	1.2	9.2
75-69-4	Trichlorofluoromethane	1.4	2.7	UD	2.7	20
593-60-2	Bromoethene	1.4	2.0	UD	2.0	15
75-34-3	1,1-Dichloroethane	1.4	2.0	UD	2.0	14
67-64-1	Acetone	1.4	3.6	JD	1.2	8.3
75-09-2	Methylene chloride	1.4	1.0	JD	0.97	12
76-13-1	Freon 113	1.4	120	DE	3.4	27
107-05-1	3-Chloropropene	1.4	1.7	UD	1.7	11
156-60-5	trans-1,2-Dichloroethene	1.4	3.3	JD	1.8	14
75-35-4	1,1-Dichloroethene	1.4	2.1	UD	2.1	14
156-59-2	cis-1,2-Dichloroethene	1.4	2.1	UD	2.1	14
67-66-3	Chloroform	1.4	2.6	UD	2.6	17
107-06-2	1,2-Dichloroethane	1.4	2.1	UD	2.1	14
71-55-6	1,1,1-Trichloroethane	1.4	2.6	UD	2.6	19
56-23-5	Carbon tetrachloride	1.4	2.4	UD	2.4	22
78-87-5	1,2-Dichloropropane	1.4	2.6	UD	2.6	16
79-01-6	Trichloroethene	1.4	2.6	UD	2.6	19
75-27-4	Bromodichloromethane	1.4	3.2	UD	3.2	23
10061-01-5	cis-1,3-Dichloropropene	1.4	2.4	UD	2.4	16
10061-02-6	trans-1,3-Dichloropropene	1.4	2.2	UD	2.2	16
79-00-5	1,1,2-Trichloroethane	1.4	2.7	UD	2.7	19
106-93-4	1,2-Dibromoethane	1.4	3.9	UD	3.9	27
127-18-4	Tetrachloroethene	1.4	2.9	UD	2.9	24
124-48-1	Dibromochloromethane	1.4	3.9	UD	3.9	30
108-90-7	Chlorobenzene	1.4	2.1	UD	2.1	16
75-25-2	Bromoform	1.4	5.5	UD	5.5	36
79-34-5	1,1,2,2-Tetrachloroethane	1.4	3.5	UD	3.5	24
541-73-1	1,3-Dichlorobenzene	1.4	2.4	UD	2.4	21
106-46-7	1,4-Dichlorobenzene	1.4	2.6	UD	2.6	21
95-50-1	1,2-Dichlorobenzene	1.4	2.3	UD	2.3	21
87-68-3	Hexachlorobutadiene	1.4	5.5	UD	5.5	37
76-14-2	Freon 114	1.4	5.1	UD	5.1	24

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	88	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0002-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-04
File ID: 227AM016.D
Sampled: 01/14/22 11:45
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 11:16
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	304516	10.85	226712	10.87	
1,4-Difluorobenzene	1022834	12.37	736300	12.38	
Chlorobenzene-d5	760183	15.77	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0003-20220114

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AF00241-05 File ID: 227AM017.D

Sampled: 01/14/22 13:00 Prepared: 01/18/22 11:01 Analyzed: 01/19/22 12:02

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 2A18022 Sequence: AA70198 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.47	4.0	UD	4.0	18
115-07-1	Propene	1.47	1.4	UD	1.4	6.3
74-87-3	Chloromethane	1.47	1.5	UD	1.5	7.6
75-01-4	Vinyl chloride	1.47	2.1	UD	2.1	9.4
74-83-9	Bromomethane	1.47	1.9	UD	1.9	14
75-00-3	Chloroethane	1.47	1.2	UD	1.2	9.7
75-69-4	Trichlorofluoromethane	1.47	2.8	UD	2.8	21
593-60-2	Bromoethene	1.47	2.1	UD	2.1	16
75-34-3	1,1-Dichloroethane	1.47	2.1	UD	2.1	15
67-64-1	Acetone	1.47	18	D	1.2	8.7
75-09-2	Methylene chloride	1.47	1.0	UD	1.0	13
76-13-1	Freon 113	1.47	45	D	3.6	28
107-05-1	3-Chloropropene	1.47	1.8	UD	1.8	12
156-60-5	trans-1,2-Dichloroethene	1.47	1.9	UD	1.9	15
75-35-4	1,1-Dichloroethene	1.47	2.2	UD	2.2	15
156-59-2	cis-1,2-Dichloroethene	1.47	2.2	UD	2.2	15
67-66-3	Chloroform	1.47	5.5	JD	2.7	18
107-06-2	1,2-Dichloroethane	1.47	2.2	UD	2.2	15
71-55-6	1,1,1-Trichloroethane	1.47	2.7	UD	2.7	20
56-23-5	Carbon tetrachloride	1.47	2.5	UD	2.5	23
78-87-5	1,2-Dichloropropane	1.47	2.7	UD	2.7	17
79-01-6	Trichloroethene	1.47	2.8	UD	2.8	20
75-27-4	Bromodichloromethane	1.47	3.3	UD	3.3	25
10061-01-5	cis-1,3-Dichloropropene	1.47	2.5	UD	2.5	17
10061-02-6	trans-1,3-Dichloropropene	1.47	2.3	UD	2.3	17
79-00-5	1,1,2-Trichloroethane	1.47	2.8	UD	2.8	20
106-93-4	1,2-Dibromoethane	1.47	4.1	UD	4.1	28
127-18-4	Tetrachloroethene	1.47	3.1	UD	3.1	25
124-48-1	Dibromochloromethane	1.47	4.1	UD	4.1	31
108-90-7	Chlorobenzene	1.47	2.2	UD	2.2	17
75-25-2	Bromoform	1.47	5.8	UD	5.8	38
79-34-5	1,1,2,2-Tetrachloroethane	1.47	3.6	UD	3.6	25
541-73-1	1,3-Dichlorobenzene	1.47	2.5	UD	2.5	22
106-46-7	1,4-Dichlorobenzene	1.47	2.7	UD	2.7	22
95-50-1	1,2-Dichlorobenzene	1.47	2.4	UD	2.4	22
87-68-3	Hexachlorobutadiene	1.47	5.8	UD	5.8	39
76-14-2	Freon 114	1.47	5.3	UD	5.3	26

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	89	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0003-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-05
File ID: 227AM017.D
Sampled: 01/14/22 13:00
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 12:02
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	296867	10.85	226712	10.87	
1,4-Difluorobenzene	997410	12.37	736300	12.38	
Chlorobenzene-d5	735662	15.77	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0004-20220114

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AF00241-06 File ID: 227AM018.D

Sampled: 01/14/22 13:40 Prepared: 01/18/22 11:01 Analyzed: 01/19/22 12:50

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 2A18022 Sequence: AA70198 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ug/m³ Air)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.48	4.0	UD	4.0	18
115-07-1	Propene	1.48	1.4	UD	1.4	6.4
74-87-3	Chloromethane	1.48	1.5	UD	1.5	7.6
75-01-4	Vinyl chloride	1.48	2.1	UD	2.1	9.5
74-83-9	Bromomethane	1.48	1.9	UD	1.9	14
75-00-3	Chloroethane	1.48	1.2	UD	1.2	9.8
75-69-4	Trichlorofluoromethane	1.48	2.8	UD	2.8	21
593-60-2	Bromoethene	1.48	2.1	UD	2.1	16
75-34-3	1,1-Dichloroethane	1.48	2.2	UD	2.2	15
67-64-1	Acetone	1.48	8.8	D	1.2	8.8
75-09-2	Methylene chloride	1.48	2.1	JD	1.0	13
76-13-1	Freon 113	1.48	130	DE	3.6	28
107-05-1	3-Chloropropene	1.48	1.8	UD	1.8	12
156-60-5	trans-1,2-Dichloroethene	1.48	1.9	UD	1.9	15
75-35-4	1,1-Dichloroethene	1.48	2.2	UD	2.2	15
156-59-2	cis-1,2-Dichloroethene	1.48	2.2	UD	2.2	15
67-66-3	Chloroform	1.48	6.5	JD	2.7	18
107-06-2	1,2-Dichloroethane	1.48	2.2	UD	2.2	15
71-55-6	1,1,1-Trichloroethane	1.48	2.7	UD	2.7	20
56-23-5	Carbon tetrachloride	1.48	2.5	UD	2.5	23
78-87-5	1,2-Dichloropropane	1.48	2.7	UD	2.7	17
79-01-6	Trichloroethene	1.48	2.8	UD	2.8	20
75-27-4	Bromodichloromethane	1.48	3.4	UD	3.4	25
10061-01-5	cis-1,3-Dichloropropene	1.48	2.6	UD	2.6	17
10061-02-6	trans-1,3-Dichloropropene	1.48	2.3	UD	2.3	17
79-00-5	1,1,2-Trichloroethane	1.48	2.8	UD	2.8	20
106-93-4	1,2-Dibromoethane	1.48	4.1	UD	4.1	28
127-18-4	Tetrachloroethene	1.48	3.1	UD	3.1	25
124-48-1	Dibromochloromethane	1.48	4.2	UD	4.2	32
108-90-7	Chlorobenzene	1.48	2.2	UD	2.2	17
75-25-2	Bromoform	1.48	5.8	UD	5.8	38
79-34-5	1,1,2,2-Tetrachloroethane	1.48	3.7	UD	3.7	25
541-73-1	1,3-Dichlorobenzene	1.48	2.5	UD	2.5	22
106-46-7	1,4-Dichlorobenzene	1.48	2.8	UD	2.8	22
95-50-1	1,2-Dichlorobenzene	1.48	2.4	UD	2.4	22
87-68-3	Hexachlorobutadiene	1.48	5.8	UD	5.8	39
76-14-2	Freon 114	1.48	5.4	UD	5.4	26

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	28	89	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0004-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-06
File ID: 227AM018.D
Sampled: 01/14/22 13:40
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 12:50
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	268832	10.86	226712	10.87	
1,4-Difluorobenzene	879755	12.37	736300	12.38	
Chlorobenzene-d5	654239	15.77	586400	15.77	

* Values outside of QC limits

HOLDING TIME SUMMARY

TO-15

Laboratory: ENCO Orlando

SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA Airs

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-AMB0001-20220114	01/14/22 15:20	01/14/22 15:40	01/18/22 11:01	3.82	NA	01/19/22 08:59	5.00	30.00	
CRCA-AMB0002-20220114	01/14/22 15:25	01/14/22 15:40	01/18/22 11:01	3.82	NA	01/19/22 09:45	5.00	30.00	
CRCA-VMP0001-20220114	01/14/22 11:30	01/14/22 15:40	01/18/22 11:01	3.98	NA	01/19/22 10:30	5.00	30.00	
CRCA-VMP0002-20220114	01/14/22 11:45	01/14/22 15:40	01/18/22 11:01	3.97	NA	01/19/22 11:16	5.00	30.00	
CRCA-VMP0003-20220114	01/14/22 13:00	01/14/22 15:40	01/18/22 11:01	3.92	NA	01/19/22 12:02	5.00	30.00	
CRCA-VMP0004-20220114	01/14/22 13:40	01/14/22 15:40	01/18/22 11:01	3.89	NA	01/19/22 12:50	5.00	30.00	

PREPARATION BATCH SUMMARY

TO-15

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Batch: 2A18022 Batch Matrix: Air Preparation: NO PREP 2

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	2A18022-BLK1	227AM006.D	01/18/22 11:01	
LCS	2A18022-BS1	227AM003.D	01/18/22 11:01	
LCS Dup	2A18022-BSD1	227AM004.D	01/18/22 11:01	
CRCA-AMB0001-20220114	AF00241-01	227AM013.D	01/18/22 11:01	
CRCA-AMB0002-20220114	AF00241-02	227AM014.D	01/18/22 11:01	
CRCA-VMP0001-20220114	AF00241-03	227AM015.D	01/18/22 11:01	
CRCA-VMP0002-20220114	AF00241-04	227AM016.D	01/18/22 11:01	
CRCA-VMP0003-20220114	AF00241-05	227AM017.D	01/18/22 11:01	
CRCA-VMP0004-20220114	AF00241-06	227AM018.D	01/18/22 11:01	

METHOD BLANK DATA SHEET
TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs

Matrix:	Air	Laboratory ID:	2A18022-BLK1	File ID:	227AM006.D
Prepared:	01/18/22 11:01	Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL
Analyzed:	01/18/22 21:17	Instrument:	OVGCMS7		
Batch:	2A18022	Sequence:	AA70198	Calibration:	2110016

CAS NO.	COMPOUND	CONC. (ug/m³ Air)	Q
75-71-8	Dichlorodifluoromethane	2.7	U
115-07-1	Propene	0.95	U
74-87-3	Chloromethane	0.99	U
75-01-4	Vinyl chloride	1.4	U
74-83-9	Bromomethane	1.3	U
75-00-3	Chloroethane	0.84	U
75-69-4	Trichlorofluoromethane	1.9	U
593-60-2	Bromoethene	1.4	U
75-34-3	1,1-Dichloroethane	1.5	U
67-64-1	Acetone	0.83	U
75-09-2	Methylene chloride	0.69	U
76-13-1	Freon 113	2.5	U
107-05-1	3-Chloropropene	1.2	U
156-60-5	trans-1,2-Dichloroethene	1.3	U
75-35-4	1,1-Dichloroethene	1.5	U
156-59-2	cis-1,2-Dichloroethene	1.5	U
67-66-3	Chloroform	1.9	U
107-06-2	1,2-Dichloroethane	1.5	U
71-55-6	1,1,1-Trichloroethane	1.9	U
56-23-5	Carbon tetrachloride	1.7	U
78-87-5	1,2-Dichloropropane	1.8	U
79-01-6	Trichloroethene	1.9	U
75-27-4	Bromodichloromethane	2.3	U
10061-01-5	cis-1,3-Dichloropropene	1.7	U
10061-02-6	trans-1,3-Dichloropropene	1.5	U
79-00-5	1,1,2-Trichloroethane	1.9	U
106-93-4	1,2-Dibromoethane	2.8	U
127-18-4	Tetrachloroethene	2.1	U
124-48-1	Dibromochloromethane	2.8	U
108-90-7	Chlorobenzene	1.5	U

METHOD BLANK DATA SHEET
TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs

Matrix:	Air	Laboratory ID:	2A18022-BLK1	File ID:	227AM006.D
Prepared:	01/18/22 11:01	Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL
Analyzed:	01/18/22 21:17	Instrument:	OVGCMS7		
Batch:	2A18022	Sequence:	AA70198	Calibration:	2110016

CAS NO.	COMPOUND	CONC. (ug/m³ Air)	Q
75-25-2	Bromoform	3.9	U
79-34-5	1,1,2,2-Tetrachloroethane	2.5	U
541-73-1	1,3-Dichlorobenzene	1.7	U
106-46-7	1,4-Dichlorobenzene	1.9	U
95-50-1	1,2-Dichlorobenzene	1.6	U
87-68-3	Hexachlorobutadiene	3.9	U
76-14-2	Freon 114	3.6	U

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	87	70 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	288827	10.86	226712	10.87	
1,4-Difluorobenzene	954661	12.36	736300	12.38	
Chlorobenzene-d5	708555	15.77	586400	15.77	

LCS / LCS DUPLICATE RECOVERY

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Matrix:	Air		
Batch:	2A18022	Laboratory ID:	2A18022-BS1
Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL

COMPOUND	SPIKE ADDED (ug/m³ Air)	LCS CONCENTRATION (ug/m³ Air)	LCS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	49.5	41	83	61 - 137
Propene	17.2	16	93	63 - 132
Chloromethane	20.7	20	96	55 - 142
Vinyl chloride	25.6	26	102	53 - 148
Bromomethane	38.8	32	83	69 - 130
Chloroethane	26.4	24	91	69 - 131
Trichlorofluoromethane	56.2	48	85	46 - 161
Bromoethene	43.7	38	88	69 - 132
1,1-Dichloroethane	40.5	42	103	70 - 130
Acetone	23.8	23	95	65 - 130
Methylene chloride	34.7	36	103	59 - 136
Freon 113	76.6	79	103	67 - 140
3-Chloropropene	31.3	30	97	70 - 130
trans-1,2-Dichloroethene	39.6	39	98	70 - 130
1,1-Dichloroethene	39.7	41	104	67 - 142
cis-1,2-Dichloroethene	39.6	42	105	70 - 130
Chloroform	48.8	47	96	70 - 130
1,2-Dichloroethane	40.5	37	92	70 - 130
1,1,1-Trichloroethane	54.6	50	91	70 - 130
Carbon tetrachloride	62.9	20	32	22 - 166
1,2-Dichloropropane	46.2	47	102	70 - 130
Trichloroethene	53.7	53	98	70 - 130
Bromodichloromethane	67.0	57	85	70 - 130
cis-1,3-Dichloropropene	45.4	46	101	70 - 137
trans-1,3-Dichloropropene	45.4	42	92	59 - 166
1,1,2-Trichloroethane	54.6	53	97	70 - 134
1,2-Dibromoethane	76.8	72	94	70 - 141
Tetrachloroethene	67.8	66	97	70 - 141
Dibromochloromethane	85.2	66	78	70 - 130
Chlorobenzene	46.0	46	99	70 - 134

LCS / LCS DUPLICATE RECOVERY

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Matrix:	Air		
Batch:	2A18022	Laboratory ID:	2A18022-BS1
Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL

COMPOUND	SPIKE ADDED (ug/m³ Air)	LCS CONCENTRATION (ug/m³ Air)	LCS % REC. #	QC LIMITS REC.
Bromoform	103	79	77	62 - 149
1,1,2,2-Tetrachloroethane	68.7	68	99	52 - 163
1,3-Dichlorobenzene	60.1	61	101	47 - 178
1,4-Dichlorobenzene	60.1	60	99	45 - 180
1,2-Dichlorobenzene	60.1	60	99	37 - 180
Hexachlorobutadiene	107	100	95	24 - 180
Freon 114	69.9	63	91	62 - 147

COMPOUND	SPIKE ADDED (ug/m³ Air)	LCSD CONCENTRATION (ug/m³ Air)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	49.5	41	82	1	25	61 - 137
Propene	17.2	15	90	3	25	63 - 132
Chloromethane	20.7	20	95	1	25	55 - 142
Vinyl chloride	25.6	26	102	0.3	25	53 - 148
Bromomethane	38.8	32	84	0.4	25	69 - 130
Chloroethane	26.4	24	90	1	25	69 - 131
Trichlorofluoromethane	56.2	47	84	0.8	25	46 - 161
Bromoethene	43.7	38	87	0.9	25	69 - 132
1,1-Dichloroethane	40.5	42	103	0.2	25	70 - 130
Acetone	23.8	22	94	1	25	65 - 130
Methylene chloride	34.7	36	103	0.8	25	59 - 136
Freon 113	76.6	79	103	0.6	25	67 - 140
3-Chloropropene	31.3	30	96	1	25	70 - 130
trans-1,2-Dichloroethene	39.6	39	98	0.2	25	70 - 130
1,1-Dichloroethene	39.7	42	105	0.9	25	67 - 142
cis-1,2-Dichloroethene	39.6	42	106	0.3	25	70 - 130
Chloroform	48.8	47	96	0.6	25	70 - 130
1,2-Dichloroethane	40.5	37	91	1	25	70 - 130
1,1,1-Trichloroethane	54.6	49	90	2	25	70 - 130
Carbon tetrachloride	62.9	20	31	2	25	22 - 166

LCS / LCS DUPLICATE RECOVERY

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Matrix:	Air		
Batch:	2A18022	Laboratory ID:	2A18022-BSD1
Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL

COMPOUND	SPIKE ADDED (ug/m³ Air)	LCSD CONCENTRATION (ug/m³ Air)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,2-Dichloropropane	46.2	47	103	1	25	70 - 130
Trichloroethene	53.7	53	99	0.5	25	70 - 130
Bromodichloromethane	67.0	57	85	0.4	25	70 - 130
cis-1,3-Dichloropropene	45.4	46	102	0.8	25	70 - 137
trans-1,3-Dichloropropene	45.4	42	93	0.9	25	59 - 166
1,1,2-Trichloroethane	54.6	53	98	1	25	70 - 134
1,2-Dibromoethane	76.8	73	95	0.7	25	70 - 141
Tetrachloroethene	67.8	66	98	0.7	25	70 - 141
Dibromochloromethane	85.2	67	79	1	25	70 - 130
Chlorobenzene	46.0	46	100	1	25	70 - 134
Bromoform	103	80	78	1	25	62 - 149
1,1,2,2-Tetrachloroethane	68.7	69	100	1	25	52 - 163
1,3-Dichlorobenzene	60.1	61	102	0.4	25	47 - 178
1,4-Dichlorobenzene	60.1	60	101	2	25	45 - 180
1,2-Dichlorobenzene	60.1	61	101	2	25	37 - 180
Hexachlorobutadiene	107	100	95	0.4	25	24 - 180
Freon 114	69.9	62	89	1	25	62 - 147

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA68577
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Surrogate Compound	Spike Level ppbv	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA68577-SCV1)			Lab File ID: 217J4016.D		Analyzed: 10/05/21 09:33			
4-Bromofluorobenzene	31.0	100	0 - 200	17.21	17.20667	0.0033	+/-1.0	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA70198
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Surrogate Compound	Spike Level ppbv	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA70198-CCV1)			Lab File ID: 227AM002.D		Analyzed: 01/18/22 18:31			
4-Bromofluorobenzene	31.0	97	0 - 200	17.2	17.20667	-0.0067	+/-1.0	
LCS (2A18022-BS1)			Lab File ID: 227AM003.D		Analyzed: 01/18/22 19:11			
4-Bromofluorobenzene	31.0	95	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
LCS Dup (2A18022-BSD1)			Lab File ID: 227AM004.D		Analyzed: 01/18/22 19:51			
4-Bromofluorobenzene	31.0	96	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
Blank (2A18022-BLK1)			Lab File ID: 227AM006.D		Analyzed: 01/18/22 21:17			
4-Bromofluorobenzene	31.0	87	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
Instrument RL Check (AA70198-CRL1)			Lab File ID: 227AM007.D		Analyzed: 01/18/22 21:58			
4-Bromofluorobenzene	31.0	91	0 - 200	17.2	17.20667	-0.0067	+/-1.0	
CRCA-AMB0001-20220114 (AF00241-01)			Lab File ID: 227AM013.D		Analyzed: 01/19/22 08:59			
4-Bromofluorobenzene	31.0	87	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
CRCA-AMB0002-20220114 (AF00241-02)			Lab File ID: 227AM014.D		Analyzed: 01/19/22 09:45			
4-Bromofluorobenzene	31.0	88	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
CRCA-VMP0001-20220114 (AF00241-03)			Lab File ID: 227AM015.D		Analyzed: 01/19/22 10:30			
4-Bromofluorobenzene	31.0	88	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
CRCA-VMP0002-20220114 (AF00241-04)			Lab File ID: 227AM016.D		Analyzed: 01/19/22 11:16			
4-Bromofluorobenzene	31.0	88	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
CRCA-VMP0003-20220114 (AF00241-05)			Lab File ID: 227AM017.D		Analyzed: 01/19/22 12:02			
4-Bromofluorobenzene	31.0	89	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
CRCA-VMP0004-20220114 (AF00241-06)			Lab File ID: 227AM018.D		Analyzed: 01/19/22 12:50			
4-Bromofluorobenzene	31.0	89	70 - 130	17.2	17.20667	-0.0067	+/-1.0	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA68577
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA68577-CAL1)			Lab File ID: 217J4003.D			Analyzed: 10/04/21 14:37			
Bromochloromethane	224803	10.86	226712	10.87	99	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	729362	12.37	736300	12.38	99	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	558650	15.77	586400	15.77	95	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL2)			Lab File ID: 217J4004.D			Analyzed: 10/04/21 15:17			
Bromochloromethane	222081	10.86	226712	10.87	98	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	723311	12.37	736300	12.38	98	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	555062	15.77	586400	15.77	95	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL3)			Lab File ID: 217J4005.D			Analyzed: 10/04/21 15:56			
Bromochloromethane	220504	10.86	226712	10.87	97	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	719607	12.37	736300	12.38	98	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	552962	15.77	586400	15.77	94	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL4)			Lab File ID: 217J4006.D			Analyzed: 10/04/21 16:37			
Bromochloromethane	205114	10.86	226712	10.87	90	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	665960	12.37	736300	12.38	90	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	514034	15.77	586400	15.77	88	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL5)			Lab File ID: 217J4007.D			Analyzed: 10/04/21 17:19			
Bromochloromethane	213866	10.87	226712	10.87	94	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	691016	12.37	736300	12.38	94	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	541630	15.77	586400	15.77	92	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL6)			Lab File ID: 217J4008.D			Analyzed: 10/04/21 17:57			
Bromochloromethane	222080	10.86	226712	10.87	98	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	718415	12.37	736300	12.38	98	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	562665	15.77	586400	15.77	96	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL7)			Lab File ID: 217J4009.D			Analyzed: 10/04/21 18:37			
Bromochloromethane	226712	10.87	226712	10.87	100	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	736300	12.38	736300	12.38	100	60 - 140	0.0000	+/-0.50	
Chlorobenzene-d5	586400	15.77	586400	15.77	100	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL8)			Lab File ID: 217J4010.D			Analyzed: 10/04/21 19:18			
Bromochloromethane	229084	10.87	226712	10.87	101	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	753502	12.38	736300	12.38	102	60 - 140	0.0000	+/-0.50	
Chlorobenzene-d5	607276	15.77	586400	15.77	104	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL9)			Lab File ID: 217J4011.D			Analyzed: 10/04/21 20:03			
Bromochloromethane	246566	10.88	226712	10.87	109	60 - 140	0.0100	+/-0.50	
1,4-Difluorobenzene	782476	12.38	736300	12.38	106	60 - 140	0.0000	+/-0.50	
Chlorobenzene-d5	628282	15.78	586400	15.77	107	60 - 140	0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Sequence: AA68577
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA68577-SCV1)			Lab File ID: 217J4016.D			Analyzed: 10/05/21 09:33			
Bromochloromethane	226735	10.87	226712	10.87	100	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	735053	12.37	736300	12.38	100	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	580887	15.78	586400	15.77	99	60 - 140	0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Sequence: AA70198
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (AA70198-CCV1)			Lab File ID: 227AM002.D			Analyzed: 01/18/22 18:31			
Bromochloromethane	279836	10.87	226712	10.87	123	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	923570	12.37	736300	12.38	125	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	712153	15.77	586400	15.77	121	60 - 140	0.0000	+/-0.50	
LCS (2A18022-BS1)			Lab File ID: 227AM003.D			Analyzed: 01/18/22 19:11			
Bromochloromethane	285630	10.86	226712	10.87	126	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	954437	12.37	736300	12.38	130	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	738735	15.77	586400	15.77	126	60 - 140	0.0000	+/-0.50	
LCS Dup (2A18022-BSD1)			Lab File ID: 227AM004.D			Analyzed: 01/18/22 19:51			
Bromochloromethane	286055	10.87	226712	10.87	126	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	953821	12.37	736300	12.38	130	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	731911	15.77	586400	15.77	125	60 - 140	0.0000	+/-0.50	
Blank (2A18022-BLK1)			Lab File ID: 227AM006.D			Analyzed: 01/18/22 21:17			
Bromochloromethane	288827	10.86	226712	10.87	127	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	954661	12.36	736300	12.38	130	60 - 140	-0.0200	+/-0.50	
Chlorobenzene-d5	708555	15.77	586400	15.77	121	60 - 140	0.0000	+/-0.50	
Instrument RL Check (AA70198-CRL1)			Lab File ID: 227AM007.D			Analyzed: 01/18/22 21:58			
Bromochloromethane	270298	10.86	226712	10.87	119	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	893326	12.37	736300	12.38	121	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	668634	15.77	586400	15.77	114	60 - 140	0.0000	+/-0.50	
CRCA-AMB0001-20220114 (AF00241-01)			Lab File ID: 227AM013.D			Analyzed: 01/19/22 08:59			
Bromochloromethane	299748	10.84	226712	10.87	132	60 - 140	-0.0300	+/-0.50	
1,4-Difluorobenzene	1029447	12.36	736300	12.38	140	60 - 140	-0.0200	+/-0.50	
Chlorobenzene-d5	768403	15.76	586400	15.77	131	60 - 140	-0.0100	+/-0.50	
CRCA-AMB0002-20220114 (AF00241-02)			Lab File ID: 227AM014.D			Analyzed: 01/19/22 09:45			
Bromochloromethane	297581	10.85	226712	10.87	131	60 - 140	-0.0200	+/-0.50	
1,4-Difluorobenzene	1000997	12.36	736300	12.38	136	60 - 140	-0.0200	+/-0.50	
Chlorobenzene-d5	745658	15.76	586400	15.77	127	60 - 140	-0.0100	+/-0.50	
CRCA-VMP0001-20220114 (AF00241-03)			Lab File ID: 227AM015.D			Analyzed: 01/19/22 10:30			
Bromochloromethane	287991	10.85	226712	10.87	127	60 - 140	-0.0200	+/-0.50	
1,4-Difluorobenzene	988228	12.36	736300	12.38	134	60 - 140	-0.0200	+/-0.50	
Chlorobenzene-d5	747485	15.77	586400	15.77	127	60 - 140	0.0000	+/-0.50	
CRCA-VMP0002-20220114 (AF00241-04)			Lab File ID: 227AM016.D			Analyzed: 01/19/22 11:16			
Bromochloromethane	304516	10.85	226712	10.87	134	60 - 140	-0.0200	+/-0.50	
1,4-Difluorobenzene	1022834	12.37	736300	12.38	139	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	760183	15.77	586400	15.77	130	60 - 140	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Sequence: AA70198
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
CRCA-VMP0003-20220114 (AF00241-05)			Lab File ID: 227AM017.D			Analyzed: 01/19/22 12:02			
Bromochloromethane	296867	10.85	226712	10.87	131	60 - 140	-0.0200	+/-0.50	
1,4-Difluorobenzene	997410	12.37	736300	12.38	135	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	735662	15.77	586400	15.77	125	60 - 140	0.0000	+/-0.50	
CRCA-VMP0004-20220114 (AF00241-06)			Lab File ID: 227AM018.D			Analyzed: 01/19/22 12:50			
Bromochloromethane	268832	10.86	226712	10.87	119	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	879755	12.37	736300	12.38	119	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	654239	15.77	586400	15.77	112	60 - 140	0.0000	+/-0.50	

ANALYSIS BATCH (SEQUENCE) SUMMARY

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Sequence:	AA68577		
Calibration:	2110016	Instrument:	OVGCMS7

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA68577-TUN1	217J4002.D	10/04/21 13:43
Cal Standard	AA68577-CAL1	217J4003.D	10/04/21 14:37
Cal Standard	AA68577-CAL2	217J4004.D	10/04/21 15:17
Cal Standard	AA68577-CAL3	217J4005.D	10/04/21 15:56
Cal Standard	AA68577-CAL4	217J4006.D	10/04/21 16:37
Cal Standard	AA68577-CAL5	217J4007.D	10/04/21 17:19
Cal Standard	AA68577-CAL6	217J4008.D	10/04/21 17:57
Cal Standard	AA68577-CAL7	217J4009.D	10/04/21 18:37
Cal Standard	AA68577-CAL8	217J4010.D	10/04/21 19:18
Cal Standard	AA68577-CAL9	217J4011.D	10/04/21 20:03
Secondary Cal Check	AA68577-SCV1	217J4016.D	10/05/21 09:33

ANALYSIS BATCH (SEQUENCE) SUMMARY

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Sequence:	AA70198		
Calibration:	2110016	Instrument:	OVGCMS7

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA70198-TUN1	227AM001.D	01/18/22 17:38
Calibration Check	AA70198-CCV1	227AM002.D	01/18/22 18:31
LCS	2A18022-BS1	227AM003.D	01/18/22 19:11
LCS Dup	2A18022-BSD1	227AM004.D	01/18/22 19:51
Blank	2A18022-BLK1	227AM006.D	01/18/22 21:17
Instrument RL Check	AA70198-CRL1	227AM007.D	01/18/22 21:58
CRCA-AMB0001-20220114	AF00241-01	227AM013.D	01/19/22 08:59
CRCA-AMB0002-20220114	AF00241-02	227AM014.D	01/19/22 09:45
CRCA-VMP0001-20220114	AF00241-03	227AM015.D	01/19/22 10:30
CRCA-VMP0002-20220114	AF00241-04	227AM016.D	01/19/22 11:16
CRCA-VMP0003-20220114	AF00241-05	227AM017.D	01/19/22 12:02
CRCA-VMP0004-20220114	AF00241-06	227AM018.D	01/19/22 12:50

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Lab File ID:	217J4002.D	Injection Date:	10/04/21
Instrument ID:	OVGCMS7	Injection Time:	13:43
Sequence:	AA68577	Lab Sample ID:	AA68577-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8 - 40% of 95	28.9	PASS
75	30 - 66% of 95	49.1	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.99	PASS
173	Less than 2% of 174	0	PASS
174	50 - 120% of 95	82.6	PASS
175	4 - 9% of 174	8.25	PASS
176	95 - 101% of 174	96.7	PASS
177	5 - 9% of 176	6.5	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Lab File ID:	227AM001.D	Injection Date:	01/18/22
Instrument ID:	OVGCMS7	Injection Time:	17:38
Sequence:	AA70198	Lab Sample ID:	AA70198-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8 - 40% of 95	27.5	PASS
75	30 - 66% of 95	46.7	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.31	PASS
173	Less than 2% of 174	0	PASS
174	50 - 120% of 95	81.3	PASS
175	4 - 9% of 174	8.15	PASS
176	95 - 101% of 174	96.2	PASS
177	5 - 9% of 176	6.73	PASS

CONTINUING CALIBRATION CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Instrument ID:	OVGCMS7	Calibration:	2110016
Lab File ID:	227AM002.D	Calibration Date:	10/04/21 13:43
Sequence:	AA70198	Injection Date:	01/18/22
Lab Sample ID:	AA70198-CCV1	Injection Time:	18:31

		CONC. (ppbv)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
Dichlorodifluoromethane	A	10.0	9.1	6.219378	5.680169		-8.7	30	
Propene	A	10.0	9.5	3.23543	3.074366		-5	30	
Chloromethane	A	10.0	9.4	3.106247	2.911022		-6.3	30	
Vinyl chloride	A	10.0	9.7	2.673188	2.592299		-3	30	
Bromomethane	A	10.0	8.4	2.341098	1.964037		-16	30	
Chloroethane	A	10.0	8.8	1.188133	1.045024		-12	30	
Trichlorofluoromethane	A	10.0	8.6	3.93271	3.375408		-14	30	
Bromoethene	A	10.0	8.8	2.006799	1.765731		-12	30	
1,1-Dichloroethane	A	10.0	10	4.152167	4.132174		-0.5	30	
Acetone	A	10.0	9.6	5.464891	5.256549		-3.8	30	
Methylene chloride	A	10.0	9.4	1.998345	1.883589		-5.7	30	
Freon 113	A	10.0	9.3	3.452188	3.210713		-7	30	
3-Chloropropene	A	10.0	9.8	4.593315	4.486479		-2.3	30	
trans-1,2-Dichloroethene	A	10.0	10	3.498948	3.532582		1.0	30	
1,1-Dichloroethene	A	10.0	10	3.889729	3.912333		0.60	30	
cis-1,2-Dichloroethene	A	10.0	9.7	2.254535	2.183557		-3.1	30	
Chloroform	A	10.0	9.4	4.694174	4.409299		-6.1	30	
1,2-Dichloroethane	A	10.0	9.4	3.295564	3.110535		-5.6	30	
1,1,1-Trichloroethane	A	10.0	9.0	4.436574	3.982267		-10	30	
Carbon tetrachloride	A	10.0	5.4	4.540764	2.461048		-46	30	*
1,2-Dichloropropane	A	10.0	9.7	0.7578331	0.734693		-3.1	30	
Trichloroethene	A	10.0	9.2	0.9819849	0.9041446		-7.9	30	
Bromodichloromethane	A	10.0	9.0	1.483156	1.340102		-9.6	30	
cis-1,3-Dichloropropene	A	10.0	9.3	1.137442	1.063379		-6.5	30	
trans-1,3-Dichloropropene	A	10.0	9.1	0.9942093	0.9053529		-8.9	30	
1,1,2-Trichloroethane	A	10.0	9.2	0.7448029	0.6869059		-7.8	30	
1,2-Dibromoethane	A	10.0	9.2	1.284507	1.184379		-7.8	30	
Tetrachloroethene	A	10.0	9.5	1.009205	0.9574095		-5.1	30	
Dibromochloromethane	A	10.0	8.5	1.288251	1.100855		-15	30	

CONTINUING CALIBRATION CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Instrument ID:	OVGCMS7	Calibration:	2110016
Lab File ID:	227AM002.D	Calibration Date:	10/04/21 13:43
Sequence:	AA70198	Injection Date:	01/18/22
Lab Sample ID:	AA70198-CCV1	Injection Time:	18:31

		CONC. (ppbv)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Chlorobenzene	A	10.0	9.6	1.990599	1.914718		-3.8	30
Bromoform	A	10.0	8.6	1.555729	1.334751		-14	30
1,1,2,2-Tetrachloroethane	A	10.0	10	1.673199	1.667285		-0.4	30
1,3-Dichlorobenzene	A	10.0	10	1.36989	1.395101		1.8	30
1,4-Dichlorobenzene	A	10.0	10	1.285372	1.293545		0.60	30
1,2-Dichlorobenzene	A	10.0	10	1.274202	1.32416		3.9	30
Hexachlorobutadiene	A	10.0	11	0.531441	0.5957512		12	30
Freon 114	A	10.0	8.8	4.460102	3.923555		-12	30

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA68577
Instrument: OVGCMS7

Calibration: 2110016

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1J0413	Air- VIRTUAL TUN-100121	AA68577-TUN1	217J4002.D	10/04/21 13:43
A1J0443	Air- Virtual CAL 1-100421	AA68577-CAL1	217J4003.D	10/04/21 14:37
A1J0444	Air- Virtual CAL 2-100421	AA68577-CAL2	217J4004.D	10/04/21 15:17
A1J0445	Air- Virtual CAL 3-100421	AA68577-CAL3	217J4005.D	10/04/21 15:56
A1J0446	Air- Virtual CAL 4-100421	AA68577-CAL4	217J4006.D	10/04/21 16:37
A1J0447	Air- Virtual CAL 5-100421	AA68577-CAL5	217J4007.D	10/04/21 17:19
A1J0448	Air- Virtual CAL 6-100421	AA68577-CAL6	217J4008.D	10/04/21 17:57
A1J0450	Air- Virtual CAL 7-100421	AA68577-CAL7	217J4009.D	10/04/21 18:37
A1J0451	Air- Virtual CAL 8-100421	AA68577-CAL8	217J4010.D	10/04/21 19:18
A1J0452	Air- Virtual CAL 9-100421	AA68577-CAL9	217J4011.D	10/04/21 20:03
A1J0453	Air- Virtual SCV 100421	AA68577-SCV1	217J4016.D	10/05/21 09:33

INITIAL CALIBRATION DATA

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
Dichlorodifluoromethane	0.125	7.486235	0.25	6.439506	0.5	5.958078	1.25	7.783356	2.5	6.671901	5	6.241793
Propene	0.125	~~5.253382~~	0.25	3.853765	0.5	3.20679	1.25	3.868705	2.5	3.311773	5	3.248104
Chloromethane	0.125	3.612941	0.25	3.012883	0.5	2.884564	1.25	3.565346	2.5	3.190826	5	3.202235
Vinyl chloride	0.125	2.830781	0.25	2.531581	0.5	2.310407	1.25	3.15861	2.5	2.908346	5	2.777856
Bromomethane	0.125	2.902488	0.25	2.230628	0.5	2.717266	1.25	2.781618	2.5	2.348431	5	2.233429
Chloroethane	0.125	1.495923	0.25	1.284216	0.5	1.135381	1.25	1.397096	2.5	1.215614	5	1.134582
Trichlorofluoromethane	0.125	4.448055	0.25	3.957619	0.5	3.830434	1.25	5.041758	2.5	4.321441	5	3.942059
Bromoethene	0.125	2.207479	0.25	2.055863	0.5	1.905516	1.25	2.477896	2.5	2.129034	5	1.992331
1,1-Dichloroethane	0.125	4.752534	0.25	4.063148	0.5	3.858551	1.25	5.260723	2.5	4.390785	5	4.152699
Acetone	0.125	~~9.262367~~	0.25	~~7.076589~~	0.5	6.262589	1.25	6.919465	2.5	5.772396	5	5.408975
Methylene chloride	0.125	~~7.328479~~	0.25	~~4.996159~~	0.5	~~4.048906~~	1.25	2.653092	2.5	2.209916	5	2.01553
Freon 113	0.125	4.109376	0.25	3.504235	0.5	3.145213	1.25	4.28064	2.5	3.633331	5	3.385963
3-Chloropropene	0.125	5.451956	0.25	4.600844	0.5	4.350887	1.25	5.721626	2.5	4.797284	5	4.535788
trans-1,2-Dichloroethene	0.125	3.897564	0.25	3.404289	0.5	3.299577	1.25	4.487393	2.5	3.775383	5	3.526892
1,1-Dichloroethene	0.125	4.266028	0.25	3.89955	0.5	3.677194	1.25	4.944548	2.5	4.160082	5	3.974862
cis-1,2-Dichloroethene	0.125	2.554984	0.25	2.177584	0.5	2.010676	1.25	2.849931	2.5	2.414355	5	2.259086
Chloroform	0.125	5.365907	0.25	4.74825	0.5	4.577795	1.25	6.039857	2.5	5.040337	5	4.739086
1,2-Dichloroethane	0.125	4.066351	0.25	3.378047	0.5	3.011093	1.25	4.152114	2.5	3.575815	5	3.333086
1,1,1-Trichloroethane	0.125	5.438717	0.25	4.684039	0.5	4.29409	1.25	5.625746	2.5	4.762496	5	4.479841
Carbon tetrachloride	0.125	5.645014	0.25	4.9688	0.5	4.608442	1.25	5.68886	2.5	4.8399	5	4.492124
1,2-Dichloropropane	0.125	0.864339	0.25	0.7716238	0.5	0.6943484	1.25	0.9242465	2.5	0.8128003	5	0.7534431
Trichloroethene	0.125	1.132277	0.25	0.9878019	0.5	0.8986294	1.25	1.19386	2.5	1.04748	5	0.9810881
Bromodichloromethane	0.125	1.666794	0.25	1.421872	0.5	1.366468	1.25	1.896234	2.5	1.651154	5	1.545704
cis-1,3-Dichloropropene	0.125	1.360773	0.25	1.144664	0.5	1.043892	1.25	1.367955	2.5	1.193943	5	1.133453
trans-1,3-Dichloropropene	0.125	1.259786	0.25	0.9716871	0.5	0.9117254	1.25	1.229275	2.5	1.074917	5	1.018431
1,1,2-Trichloroethane	0.125	0.8609387	0.25	0.7471088	0.5	0.6741874	1.25	0.9372431	2.5	0.7883777	5	0.7399456
1,2-Dibromoethane	0.125	1.390695	0.25	1.25181	0.5	1.125311	1.25	1.584093	2.5	1.383438	5	1.323194
Tetrachloroethene	0.125	1.188381	0.25	0.9977451	0.5	0.9338681	1.25	1.219816	2.5	1.045667	5	1.021045
Dibromochloromethane	0.125	1.407356	0.25	1.21718	0.5	1.149091	1.25	1.635669	2.5	1.426972	5	1.356731
Chlorobenzene	0.125	2.324403	0.25	1.987576	0.5	1.804963	1.25	2.447559	2.5	2.148703	5	2.038139
Bromoform	0.125	1.623442	0.25	1.342178	0.5	1.310611	1.25	1.960325	2.5	1.712689	5	1.671206

INITIAL CALIBRATION DATA

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
1,1,2,2-Tetrachloroethane	0.125	1.79613	0.25	1.50794	0.5	1.374297	1.25	2.192629	2.5	1.825922	5	1.736086
1,3-Dichlorobenzene	0.125	1.370404	0.25	1.179991	0.5	1.071115	1.25	1.629407	2.5	1.436498	5	1.421747
1,4-Dichlorobenzene	0.125	1.286057	0.25	1.073206	0.5	1.005074	1.25	1.502568	2.5	1.308727	5	1.343997
1,2-Dichlorobenzene	0.125	1.277179	0.25	1.067621	0.5	1.029966	1.25	1.546376	2.5	1.340687	5	1.331237
Hexachlorobutadiene	0.125	0.4967547	0.25	0.4429992	0.5	0.3649618	1.25	0.6903497	2.5	0.597896	5	0.6013614
4-Bromofluorobenzene	31	0.4942558	31	0.4934656	31	0.4991211	31	0.4935354	31	0.5002068	31	0.5074938
Freon 114	0.125	5.092316	0.25	4.254664	0.5	4.121168	1.25	5.165206	2.5	4.75119	5	4.653853

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
Dichlorodifluoromethane	10	5.520976	25	5.268544	50	4.604009						
Propene	10	2.830422	25	2.842429	50	2.721449						
Chloromethane	10	2.913846	25	2.896384	50	2.6772						
Vinyl chloride	10	2.568625	25	2.568203	50	2.404282						
Bromomethane	10	2.023795	25	2.001346	50	1.830884						
Chloroethane	10	1.042445	25	1.026777	50	0.9611652						
Trichlorofluoromethane	10	3.456447	25	3.335606	50	3.060967						
Bromoethene	10	1.813438	25	1.806196	50	1.673439						
1,1-Dichloroethane	10	3.705446	25	3.63904	50	3.546577						
Acetone	10	4.804431	25	4.668777	50	4.417601						
Methylene chloride	10	1.754026	25	1.68124	50	1.676265						
Freon 113	10	3.023304	25	3.052973	50	2.934656						
3-Chloropropene	10	4.042749	25	3.997447	50	3.841254						
trans-1,2-Dichloroethene	10	3.131121	25	3.056686	50	2.911626						
1,1-Dichloroethene	10	3.496511	25	3.383423	50	3.205364						
cis-1,2-Dichloroethene	10	2.022414	25	2.000973	50	2.000814						
Chloroform	10	4.149856	25	3.97172	50	3.614759						
1,2-Dichloroethane	10	2.921462	25	2.777789	50	2.444316						
1,1,1-Trichloroethane	10	3.880469	25	3.620901	50	3.142863						
Carbon tetrachloride	10	3.940224	25	3.636079	50	3.047431						
1,2-Dichloropropane	10	0.6778866	25	0.6482476	50	0.6735625						
Trichloroethene	10	0.8767784	25	0.8658534	50	0.8540954						
Bromodichloromethane	10	1.354241	25	1.27364	50	1.172295						
cis-1,3-Dichloropropene	10	1.015443	25	0.9856666	50	0.9911882						
trans-1,3-Dichloropropene	10	0.8911732	25	0.8362712	50	0.7546182						
1,1,2-Trichloroethane	10	0.659391	25	0.6505745	50	0.6454592						
1,2-Dibromoethane	10	1.175406	25	1.177222	50	1.149393						
Tetrachloroethene	10	0.9184892	25	0.9219322	50	0.8359045						
Dibromochloromethane	10	1.198676	25	1.156192	50	1.046391						
Chlorobenzene	10	1.809022	25	1.779465	50	1.575558						
Bromoform	10	1.517187	25	1.509101	50	1.354819						

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
1,1,2,2-Tetrachloroethane	10	1.529573	25	1.554012	50	1.542206						
1,3-Dichlorobenzene	10	1.343578	25	1.438422	50	1.437849						
1,4-Dichlorobenzene	10	1.284555	25	1.381896	50	1.382264						
1,2-Dichlorobenzene	10	1.264593	25	1.307013	50	1.303146						
Hexachlorobutadiene	10	0.5457353	25	0.5318346	50	0.511076						
4-Bromofluorobenzene	31	0.5215194	31	0.5586126	31	0.5952391						
Freon 114	10	4.236219	25	4.135556	50	3.730745						

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	6.219378	16.45056	4.501111	0.281354			30	
Propene	3.23543	13.68767	4.38375	0.3209913			30	
Chloromethane	3.106247	10.22406	4.987778	0.397849			30	
Vinyl chloride	2.673188	10.00856	5.234444	0.2719751			30	
Bromomethane	2.341098	16.20217	6.046667	0.2607841			30	
Chloroethane	1.188133	14.962	6.365556	0.1585633			30	
Trichlorofluoromethane	3.93271	15.57423	6.687778	0.1241278			30	
Bromoethene	2.006799	12.19043	6.616667	0.1302457			30	
1,1-Dichloroethane	4.152167	13.65047	9.891111	5.899272E-02			30	
Acetone	5.464891	16.73202	8.832857	0.1063762			30	
Methylene chloride	1.998345	19.22182	8.726667	9.391202E-02			30	
Freon 113	3.452188	13.98067	7.823333	6.230389E-02			30	
3-Chloropropene	4.593315	14.06253	8.564445	8.362719E-02			30	
trans-1,2-Dichloroethene	3.498948	14.06555	8.988889	0.1038405			30	
1,1-Dichloroethene	3.889729	13.66188	7.722222	0.1074353			30	
cis-1,2-Dichloroethene	2.254535	13.29048	10.60667	6.613793E-02			30	
Chloroform	4.694174	15.76954	10.94111	5.649096E-02			30	
1,2-Dichloroethane	3.295564	17.39197	11.90778	0.055089			30	
1,1,1-Trichloroethane	4.436574	18.27041	11.23444	4.744527E-02			30	
Carbon tetrachloride	4.540764	19.42856	11.15444	0.0657239			30	
1,2-Dichloropropane	0.7578331	12.50097	12.97333	3.659988E-02			30	
Trichloroethene	0.9819849	12.45455	12.36	4.014823E-02			30	
Bromodichloromethane	1.483156	15.28258	13.01556	4.078041E-02			30	
cis-1,3-Dichloropropene	1.137442	12.9783	13.73667	0.040074			30	
trans-1,3-Dichloropropene	0.9942093	17.17145	14.46222	2.811502E-02			30	
1,1,2-Trichloroethane	0.7448029	13.71515	14.66	1.934242E-02			30	
1,2-Dibromoethane	1.284507	11.69037	15.20444	3.424017E-02			30	
Tetrachloroethene	1.009205	12.61264	14.48444	3.505998E-02			30	
Dibromochloromethane	1.288251	14.18627	14.88778	3.009113E-02			30	
Chlorobenzene	1.990599	14.11729	15.79444	0.030455			30	

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Bromoform	1.555729	13.55892	16.59556	0.0302815			30	
1,1,2,2-Tetrachloroethane	1.673199	14.65244	17.39	1.782912E-03			30	
1,3-Dichlorobenzene	1.36989	11.82179	18.50889	2.405671E-02			30	
1,4-Dichlorobenzene	1.285372	12.09772	18.61333	2.807933E-02			30	
1,2-Dichlorobenzene	1.274202	11.96971	19.15889	1.304716E-02			30	
Hexachlorobutadiene	0.531441	17.84082	21	0			30	
4-Bromofluorobenzene	0.5181611	6.882687	17.20667	3.456777E-02			30	
Freon 114	4.460102	10.82158	4.882222	0.223299			30	

SECOND-SOURCE CALIBRATION VERIFICATION

TO-15

Laboratory: ENCO Orlando **SDG:** AF00241-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA Airs

Calibration: 2110016 **Laboratory ID:** AA68577-SCV1

Sequence: AA68577 **Standard ID:** A1J0453

ANALYTE	EXPECTED (ppbv)	FOUND (ppbv)	% DRIFT	QC LIMIT
Dibromochloromethane	10.0	9.3	-6.7	30.00
Chloroform	10.0	9.3	-7.2	30.00
Acetone	10.0	9.4	-6.3	30.00
Bromoethene	10.0	9.3	-7.2	30.00
Carbon tetrachloride	10.0	9.7	-2.7	30.00
1,3-Dichlorobenzene	10.0	10	1.2	30.00
trans-1,2-Dichloroethene	10.0	9.1	-8.7	30.00
cis-1,3-Dichloropropene	10.0	9.8	-2.2	30.00
Tetrachloroethene	10.0	9.4	-5.5	30.00
Chloromethane	10.0	10	4.4	30.00
Propene	10.0	9.7	-3.3	30.00
Chlorobenzene	10.0	9.5	-4.5	30.00
1,2-Dichloroethane	10.0	9.3	-6.8	30.00
3-Chloropropene	10.0	9.1	-8.7	30.00
1,2-Dibromoethane	10.0	9.5	-4.8	30.00
1,4-Dichlorobenzene	10.0	10	1.2	30.00
trans-1,3-Dichloropropene	10.0	9.2	-8.0	30.00
cis-1,2-Dichloroethene	10.0	9.8	-2.3	30.00
1,1-Dichloroethene	10.0	10	2.2	30.00
Hexachlorobutadiene	10.0	9.2	-7.6	30.00
1,1,2,2-Tetrachloroethane	10.0	9.1	-9.4	30.00
Trichloroethene	10.0	9.6	-3.8	30.00
1,1,2-Trichloroethane	10.0	9.3	-7.1	30.00
1,2-Dichloropropane	10.0	9.4	-6.0	30.00
Freon 114	10.0	10	3.4	30.00
Freon 113	10.0	9.8	-2.1	30.00
1,1,1-Trichloroethane	10.0	9.2	-7.8	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

TO-15

Laboratory: ENCO Orlando **SDG:** AF00241-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA Airs

Calibration: 2110016 **Laboratory ID:** AA68577-SCV1

Sequence: AA68577 **Standard ID:** A1J0453

ANALYTE	EXPECTED (ppbv)	FOUND (ppbv)	% DRIFT	QC LIMIT
Trichlorofluoromethane	10.0	9.5	-5.1	30.00
Bromomethane	10.0	9.3	-6.8	30.00
1,1-Dichloroethane	10.0	9.6	-4.4	30.00
Bromodichloromethane	10.0	9.1	-8.8	30.00
Bromoform	10.0	9.6	-3.8	30.00
Methylene chloride	10.0	9.5	-4.9	30.00
Vinyl chloride	10.0	11	8.0	30.00
Chloroethane	10.0	9.6	-3.9	30.00
1,2-Dichlorobenzene	10.0	10	0.3	30.00
Dichlorodifluoromethane	10.0	9.5	-4.6	30.00

* Values outside of QC limits

ENCO Orlando

SDG: AF00241-TE016

CLASS: 06_VOA_AIR

METHOD: TO-15

ANALYSES DATA PACKAGE COVER PAGE

TO-15

Laboratory: ENCO Orlando

SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA Airs

Client Sample Id:	Lab Sample Id:
CRCA-AMB0001-20220114	AF00241-01
CRCA-AMB0002-20220114	AF00241-02
CRCA-VMP0001-20220114	AF00241-03
CRCA-VMP0002-20220114	AF00241-04
CRCA-VMP0003-20220114	AF00241-05
CRCA-VMP0004-20220114	AF00241-06

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0001-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-01
File ID: 227AM013.D
Sampled: 01/14/22 15:20
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 08:59
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ppbv)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.35	0.74	UD	0.74	3.4
115-07-1	Propene	1.35	0.74	UD	0.74	3.4
74-87-3	Chloromethane	1.35	0.65	UD	0.65	3.4
75-01-4	Vinyl chloride	1.35	0.76	UD	0.76	3.4
74-83-9	Bromomethane	1.35	0.45	UD	0.45	3.4
75-00-3	Chloroethane	1.35	0.43	UD	0.43	3.4
75-69-4	Trichlorofluoromethane	1.35	0.46	UD	0.46	3.4
593-60-2	Bromoethene	1.35	0.45	UD	0.45	3.4
75-34-3	1,1-Dichloroethane	1.35	0.49	UD	0.49	3.4
67-64-1	Acetone	1.35	1.6	JD	0.47	3.4
75-09-2	Methylene chloride	1.35	0.68	JD	0.27	3.4
76-13-1	Freon 113	1.35	0.43	UD	0.43	3.4
107-05-1	3-Chloropropene	1.35	0.53	UD	0.53	3.4
156-60-5	trans-1,2-Dichloroethene	1.35	0.43	UD	0.43	3.4
75-35-4	1,1-Dichloroethene	1.35	0.51	UD	0.51	3.4
156-59-2	cis-1,2-Dichloroethene	1.35	0.51	UD	0.51	3.4
67-66-3	Chloroform	1.35	0.51	UD	0.51	3.4
107-06-2	1,2-Dichloroethane	1.35	0.50	UD	0.50	3.4
71-55-6	1,1,1-Trichloroethane	1.35	0.46	UD	0.46	3.4
56-23-5	Carbon tetrachloride	1.35	0.36	UD	0.36	3.4
78-87-5	1,2-Dichloropropane	1.35	0.54	UD	0.54	3.4
79-01-6	Trichloroethene	1.35	0.47	UD	0.47	3.4
75-27-4	Bromodichloromethane	1.35	0.46	UD	0.46	3.4
10061-01-5	cis-1,3-Dichloropropene	1.35	0.51	UD	0.51	3.4
10061-02-6	trans-1,3-Dichloropropene	1.35	0.46	UD	0.46	3.4
79-00-5	1,1,2-Trichloroethane	1.35	0.47	UD	0.47	3.4
106-93-4	1,2-Dibromoethane	1.35	0.49	UD	0.49	3.4
127-18-4	Tetrachloroethene	1.35	0.42	UD	0.42	3.4
124-48-1	Dibromochloromethane	1.35	0.45	UD	0.45	3.4
108-90-7	Chlorobenzene	1.35	0.45	UD	0.45	3.4
75-25-2	Bromoform	1.35	0.51	UD	0.51	3.4
79-34-5	1,1,2,2-Tetrachloroethane	1.35	0.49	UD	0.49	3.4
541-73-1	1,3-Dichlorobenzene	1.35	0.38	UD	0.38	3.4
106-46-7	1,4-Dichlorobenzene	1.35	0.42	UD	0.42	3.4
95-50-1	1,2-Dichlorobenzene	1.35	0.36	UD	0.36	3.4
87-68-3	Hexachlorobutadiene	1.35	0.50	UD	0.50	3.4
76-14-2	Freon 114	1.35	0.70	UD	0.70	3.4

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	87	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0001-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-01
File ID: 227AM013.D
Sampled: 01/14/22 15:20
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 08:59
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	299748	10.84	226712	10.87	
1,4-Difluorobenzene	1029447	12.36	736300	12.38	
Chlorobenzene-d5	768403	15.76	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0002-20220114

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AF00241-02 File ID: 227AM014.D

Sampled: 01/14/22 15:25 Prepared: 01/18/22 11:01 Analyzed: 01/19/22 09:45

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 2A18022 Sequence: AA70198 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ppbv)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.36	0.75	UD	0.75	3.4
115-07-1	Propene	1.36	0.75	UD	0.75	3.4
74-87-3	Chloromethane	1.36	0.65	UD	0.65	3.4
75-01-4	Vinyl chloride	1.36	0.76	UD	0.76	3.4
74-83-9	Bromomethane	1.36	0.45	UD	0.45	3.4
75-00-3	Chloroethane	1.36	0.44	UD	0.44	3.4
75-69-4	Trichlorofluoromethane	1.36	0.46	UD	0.46	3.4
593-60-2	Bromoethene	1.36	0.45	UD	0.45	3.4
75-34-3	1,1-Dichloroethane	1.36	0.49	UD	0.49	3.4
67-64-1	Acetone	1.36	4.5	D	0.48	3.4
75-09-2	Methylene chloride	1.36	0.84	JD	0.27	3.4
76-13-1	Freon 113	1.36	0.76	JD	0.44	3.4
107-05-1	3-Chloropropene	1.36	0.53	UD	0.53	3.4
156-60-5	trans-1,2-Dichloroethene	1.36	0.53	JD	0.44	3.4
75-35-4	1,1-Dichloroethene	1.36	0.52	UD	0.52	3.4
156-59-2	cis-1,2-Dichloroethene	1.36	0.52	UD	0.52	3.4
67-66-3	Chloroform	1.36	0.52	UD	0.52	3.4
107-06-2	1,2-Dichloroethane	1.36	0.50	UD	0.50	3.4
71-55-6	1,1,1-Trichloroethane	1.36	0.46	UD	0.46	3.4
56-23-5	Carbon tetrachloride	1.36	0.37	UD	0.37	3.4
78-87-5	1,2-Dichloropropane	1.36	0.54	UD	0.54	3.4
79-01-6	Trichloroethene	1.36	0.48	UD	0.48	3.4
75-27-4	Bromodichloromethane	1.36	0.46	UD	0.46	3.4
10061-01-5	cis-1,3-Dichloropropene	1.36	0.52	UD	0.52	3.4
10061-02-6	trans-1,3-Dichloropropene	1.36	0.46	UD	0.46	3.4
79-00-5	1,1,2-Trichloroethane	1.36	0.48	UD	0.48	3.4
106-93-4	1,2-Dibromoethane	1.36	0.49	UD	0.49	3.4
127-18-4	Tetrachloroethene	1.36	0.42	UD	0.42	3.4
124-48-1	Dibromochloromethane	1.36	0.45	UD	0.45	3.4
108-90-7	Chlorobenzene	1.36	0.45	UD	0.45	3.4
75-25-2	Bromoform	1.36	0.52	UD	0.52	3.4
79-34-5	1,1,2,2-Tetrachloroethane	1.36	0.49	UD	0.49	3.4
541-73-1	1,3-Dichlorobenzene	1.36	0.38	UD	0.38	3.4
106-46-7	1,4-Dichlorobenzene	1.36	0.42	UD	0.42	3.4
95-50-1	1,2-Dichlorobenzene	1.36	0.37	UD	0.37	3.4
87-68-3	Hexachlorobutadiene	1.36	0.50	UD	0.50	3.4
76-14-2	Freon 114	1.36	0.71	UD	0.71	3.4

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	88	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-AMB0002-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-02
File ID: 227AM014.D
Sampled: 01/14/22 15:25
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 09:45
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	297581	10.85	226712	10.87	
1,4-Difluorobenzene	1000997	12.36	736300	12.38	
Chlorobenzene-d5	745658	15.76	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0001-20220114

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AF00241-03 File ID: 227AM015.D

Sampled: 01/14/22 11:30 Prepared: 01/18/22 11:01 Analyzed: 01/19/22 10:30

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 2A18022 Sequence: AA70198 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ppbv)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.37	0.75	UD	0.75	3.4
115-07-1	Propene	1.37	0.75	UD	0.75	3.4
74-87-3	Chloromethane	1.37	0.66	UD	0.66	3.4
75-01-4	Vinyl chloride	1.37	0.77	UD	0.77	3.4
74-83-9	Bromomethane	1.37	0.45	UD	0.45	3.4
75-00-3	Chloroethane	1.37	0.44	UD	0.44	3.4
75-69-4	Trichlorofluoromethane	1.37	0.47	UD	0.47	3.4
593-60-2	Bromoethene	1.37	0.45	UD	0.45	3.4
75-34-3	1,1-Dichloroethane	1.37	0.49	UD	0.49	3.4
67-64-1	Acetone	1.37	3.3	JD	0.48	3.4
75-09-2	Methylene chloride	1.37	0.29	JD	0.27	3.4
76-13-1	Freon 113	1.37	4.0	D	0.44	3.4
107-05-1	3-Chloropropene	1.37	0.53	UD	0.53	3.4
156-60-5	trans-1,2-Dichloroethene	1.37	0.44	UD	0.44	3.4
75-35-4	1,1-Dichloroethene	1.37	0.52	UD	0.52	3.4
156-59-2	cis-1,2-Dichloroethene	1.37	0.52	UD	0.52	3.4
67-66-3	Chloroform	1.37	0.52	UD	0.52	3.4
107-06-2	1,2-Dichloroethane	1.37	0.51	UD	0.51	3.4
71-55-6	1,1,1-Trichloroethane	1.37	0.47	UD	0.47	3.4
56-23-5	Carbon tetrachloride	1.37	0.37	UD	0.37	3.4
78-87-5	1,2-Dichloropropane	1.37	0.55	UD	0.55	3.4
79-01-6	Trichloroethene	1.37	0.48	UD	0.48	3.4
75-27-4	Bromodichloromethane	1.37	0.47	UD	0.47	3.4
10061-01-5	cis-1,3-Dichloropropene	1.37	0.52	UD	0.52	3.4
10061-02-6	trans-1,3-Dichloropropene	1.37	0.47	UD	0.47	3.4
79-00-5	1,1,2-Trichloroethane	1.37	0.48	UD	0.48	3.4
106-93-4	1,2-Dibromoethane	1.37	0.49	UD	0.49	3.4
127-18-4	Tetrachloroethene	1.37	0.42	UD	0.42	3.4
124-48-1	Dibromochloromethane	1.37	0.45	UD	0.45	3.4
108-90-7	Chlorobenzene	1.37	0.45	UD	0.45	3.4
75-25-2	Bromoform	1.37	0.52	UD	0.52	3.4
79-34-5	1,1,2,2-Tetrachloroethane	1.37	0.49	UD	0.49	3.4
541-73-1	1,3-Dichlorobenzene	1.37	0.38	UD	0.38	3.4
106-46-7	1,4-Dichlorobenzene	1.37	0.42	UD	0.42	3.4
95-50-1	1,2-Dichlorobenzene	1.37	0.37	UD	0.37	3.4
87-68-3	Hexachlorobutadiene	1.37	0.51	UD	0.51	3.4
76-14-2	Freon 114	1.37	0.71	UD	0.71	3.4

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	88	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0001-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-03
File ID: 227AM015.D
Sampled: 01/14/22 11:30
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 10:30
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	287991	10.85	226712	10.87	
1,4-Difluorobenzene	988228	12.36	736300	12.38	
Chlorobenzene-d5	747485	15.77	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0002-20220114

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AF00241-04 File ID: 227AM016.D

Sampled: 01/14/22 11:45 Prepared: 01/18/22 11:01 Analyzed: 01/19/22 11:16

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 2A18022 Sequence: AA70198 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ppbv)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.4	0.77	UD	0.77	3.5
115-07-1	Propene	1.4	0.77	UD	0.77	3.5
74-87-3	Chloromethane	1.4	0.67	UD	0.67	3.5
75-01-4	Vinyl chloride	1.4	0.78	UD	0.78	3.5
74-83-9	Bromomethane	1.4	0.46	UD	0.46	3.5
75-00-3	Chloroethane	1.4	0.45	UD	0.45	3.5
75-69-4	Trichlorofluoromethane	1.4	0.48	UD	0.48	3.5
593-60-2	Bromoethene	1.4	0.46	UD	0.46	3.5
75-34-3	1,1-Dichloroethane	1.4	0.50	UD	0.50	3.5
67-64-1	Acetone	1.4	1.5	JD	0.49	3.5
75-09-2	Methylene chloride	1.4	0.29	JD	0.28	3.5
76-13-1	Freon 113	1.4	15	D	0.45	3.5
107-05-1	3-Chloropropene	1.4	0.55	UD	0.55	3.5
156-60-5	trans-1,2-Dichloroethene	1.4	0.83	JD	0.45	3.5
75-35-4	1,1-Dichloroethene	1.4	0.53	UD	0.53	3.5
156-59-2	cis-1,2-Dichloroethene	1.4	0.53	UD	0.53	3.5
67-66-3	Chloroform	1.4	0.53	UD	0.53	3.5
107-06-2	1,2-Dichloroethane	1.4	0.52	UD	0.52	3.5
71-55-6	1,1,1-Trichloroethane	1.4	0.48	UD	0.48	3.5
56-23-5	Carbon tetrachloride	1.4	0.38	UD	0.38	3.5
78-87-5	1,2-Dichloropropane	1.4	0.56	UD	0.56	3.5
79-01-6	Trichloroethene	1.4	0.49	UD	0.49	3.5
75-27-4	Bromodichloromethane	1.4	0.48	UD	0.48	3.5
10061-01-5	cis-1,3-Dichloropropene	1.4	0.53	UD	0.53	3.5
10061-02-6	trans-1,3-Dichloropropene	1.4	0.48	UD	0.48	3.5
79-00-5	1,1,2-Trichloroethane	1.4	0.49	UD	0.49	3.5
106-93-4	1,2-Dibromoethane	1.4	0.50	UD	0.50	3.5
127-18-4	Tetrachloroethene	1.4	0.43	UD	0.43	3.5
124-48-1	Dibromochloromethane	1.4	0.46	UD	0.46	3.5
108-90-7	Chlorobenzene	1.4	0.46	UD	0.46	3.5
75-25-2	Bromoform	1.4	0.53	UD	0.53	3.5
79-34-5	1,1,2,2-Tetrachloroethane	1.4	0.50	UD	0.50	3.5
541-73-1	1,3-Dichlorobenzene	1.4	0.39	UD	0.39	3.5
106-46-7	1,4-Dichlorobenzene	1.4	0.43	UD	0.43	3.5
95-50-1	1,2-Dichlorobenzene	1.4	0.38	UD	0.38	3.5
87-68-3	Hexachlorobutadiene	1.4	0.52	UD	0.52	3.5
76-14-2	Freon 114	1.4	0.73	UD	0.73	3.5

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	88	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0002-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-04
File ID: 227AM016.D
Sampled: 01/14/22 11:45
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 11:16
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	304516	10.85	226712	10.87	
1,4-Difluorobenzene	1022834	12.37	736300	12.38	
Chlorobenzene-d5	760183	15.77	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0003-20220114

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AF00241-05 File ID: 227AM017.D

Sampled: 01/14/22 13:00 Prepared: 01/18/22 11:01 Analyzed: 01/19/22 12:02

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 2A18022 Sequence: AA70198 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ppbv)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.47	0.81	UD	0.81	3.7
115-07-1	Propene	1.47	0.81	UD	0.81	3.7
74-87-3	Chloromethane	1.47	0.71	UD	0.71	3.7
75-01-4	Vinyl chloride	1.47	0.82	UD	0.82	3.7
74-83-9	Bromomethane	1.47	0.49	UD	0.49	3.7
75-00-3	Chloroethane	1.47	0.47	UD	0.47	3.7
75-69-4	Trichlorofluoromethane	1.47	0.50	UD	0.50	3.7
593-60-2	Bromoethene	1.47	0.49	UD	0.49	3.7
75-34-3	1,1-Dichloroethane	1.47	0.53	UD	0.53	3.7
67-64-1	Acetone	1.47	7.4	D	0.51	3.7
75-09-2	Methylene chloride	1.47	0.29	UD	0.29	3.7
76-13-1	Freon 113	1.47	5.8	D	0.47	3.7
107-05-1	3-Chloropropene	1.47	0.57	UD	0.57	3.7
156-60-5	trans-1,2-Dichloroethene	1.47	0.47	UD	0.47	3.7
75-35-4	1,1-Dichloroethene	1.47	0.56	UD	0.56	3.7
156-59-2	cis-1,2-Dichloroethene	1.47	0.56	UD	0.56	3.7
67-66-3	Chloroform	1.47	1.1	JD	0.56	3.7
107-06-2	1,2-Dichloroethane	1.47	0.54	UD	0.54	3.7
71-55-6	1,1,1-Trichloroethane	1.47	0.50	UD	0.50	3.7
56-23-5	Carbon tetrachloride	1.47	0.40	UD	0.40	3.7
78-87-5	1,2-Dichloropropane	1.47	0.59	UD	0.59	3.7
79-01-6	Trichloroethene	1.47	0.51	UD	0.51	3.7
75-27-4	Bromodichloromethane	1.47	0.50	UD	0.50	3.7
10061-01-5	cis-1,3-Dichloropropene	1.47	0.56	UD	0.56	3.7
10061-02-6	trans-1,3-Dichloropropene	1.47	0.50	UD	0.50	3.7
79-00-5	1,1,2-Trichloroethane	1.47	0.51	UD	0.51	3.7
106-93-4	1,2-Dibromoethane	1.47	0.53	UD	0.53	3.7
127-18-4	Tetrachloroethene	1.47	0.46	UD	0.46	3.7
124-48-1	Dibromochloromethane	1.47	0.49	UD	0.49	3.7
108-90-7	Chlorobenzene	1.47	0.49	UD	0.49	3.7
75-25-2	Bromoform	1.47	0.56	UD	0.56	3.7
79-34-5	1,1,2,2-Tetrachloroethane	1.47	0.53	UD	0.53	3.7
541-73-1	1,3-Dichlorobenzene	1.47	0.41	UD	0.41	3.7
106-46-7	1,4-Dichlorobenzene	1.47	0.46	UD	0.46	3.7
95-50-1	1,2-Dichlorobenzene	1.47	0.40	UD	0.40	3.7
87-68-3	Hexachlorobutadiene	1.47	0.54	UD	0.54	3.7
76-14-2	Freon 114	1.47	0.76	UD	0.76	3.7

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	89	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0003-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-05
File ID: 227AM017.D
Sampled: 01/14/22 13:00
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 12:02
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	296867	10.85	226712	10.87	
1,4-Difluorobenzene	997410	12.37	736300	12.38	
Chlorobenzene-d5	735662	15.77	586400	15.77	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0004-20220114

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Matrix: Air Laboratory ID: AF00241-06 File ID: 227AM018.D

Sampled: 01/14/22 13:40 Prepared: 01/18/22 11:01 Analyzed: 01/19/22 12:50

Solids: Preparation: NO PREP 2 Initial/Final: 400 mL / 400 mL

Batch: 2A18022 Sequence: AA70198 Calibration: 2110016 Instrument: OVGCMS7

CAS NO.	COMPOUND	DILUTION	CONC. (ppbv)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1.48	0.81	UD	0.81	3.7
115-07-1	Propene	1.48	0.81	UD	0.81	3.7
74-87-3	Chloromethane	1.48	0.71	UD	0.71	3.7
75-01-4	Vinyl chloride	1.48	0.83	UD	0.83	3.7
74-83-9	Bromomethane	1.48	0.49	UD	0.49	3.7
75-00-3	Chloroethane	1.48	0.47	UD	0.47	3.7
75-69-4	Trichlorofluoromethane	1.48	0.50	UD	0.50	3.7
593-60-2	Bromoethene	1.48	0.49	UD	0.49	3.7
75-34-3	1,1-Dichloroethane	1.48	0.53	UD	0.53	3.7
67-64-1	Acetone	1.48	3.7	D	0.52	3.7
75-09-2	Methylene chloride	1.48	0.60	JD	0.30	3.7
76-13-1	Freon 113	1.48	17	D	0.47	3.7
107-05-1	3-Chloropropene	1.48	0.58	UD	0.58	3.7
156-60-5	trans-1,2-Dichloroethene	1.48	0.47	UD	0.47	3.7
75-35-4	1,1-Dichloroethene	1.48	0.56	UD	0.56	3.7
156-59-2	cis-1,2-Dichloroethene	1.48	0.56	UD	0.56	3.7
67-66-3	Chloroform	1.48	1.3	JD	0.56	3.7
107-06-2	1,2-Dichloroethane	1.48	0.55	UD	0.55	3.7
71-55-6	1,1,1-Trichloroethane	1.48	0.50	UD	0.50	3.7
56-23-5	Carbon tetrachloride	1.48	0.40	UD	0.40	3.7
78-87-5	1,2-Dichloropropane	1.48	0.59	UD	0.59	3.7
79-01-6	Trichloroethene	1.48	0.52	UD	0.52	3.7
75-27-4	Bromodichloromethane	1.48	0.50	UD	0.50	3.7
10061-01-5	cis-1,3-Dichloropropene	1.48	0.56	UD	0.56	3.7
10061-02-6	trans-1,3-Dichloropropene	1.48	0.50	UD	0.50	3.7
79-00-5	1,1,2-Trichloroethane	1.48	0.52	UD	0.52	3.7
106-93-4	1,2-Dibromoethane	1.48	0.53	UD	0.53	3.7
127-18-4	Tetrachloroethene	1.48	0.46	UD	0.46	3.7
124-48-1	Dibromochloromethane	1.48	0.49	UD	0.49	3.7
108-90-7	Chlorobenzene	1.48	0.49	UD	0.49	3.7
75-25-2	Bromoform	1.48	0.56	UD	0.56	3.7
79-34-5	1,1,2,2-Tetrachloroethane	1.48	0.53	UD	0.53	3.7
541-73-1	1,3-Dichlorobenzene	1.48	0.41	UD	0.41	3.7
106-46-7	1,4-Dichlorobenzene	1.48	0.46	UD	0.46	3.7
95-50-1	1,2-Dichlorobenzene	1.48	0.40	UD	0.40	3.7
87-68-3	Hexachlorobutadiene	1.48	0.55	UD	0.55	3.7
76-14-2	Freon 114	1.48	0.77	UD	0.77	3.7

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	28	89	70 - 130	

ORGANIC ANALYSIS DATA SHEET

TO-15

CRCA-VMP0004-20220114

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Matrix: Air
Laboratory ID: AF00241-06
File ID: 227AM018.D
Sampled: 01/14/22 13:40
Prepared: 01/18/22 11:01
Analyzed: 01/19/22 12:50
Solids:
Preparation: NO PREP 2
Initial/Final: 400 mL / 400 mL
Batch: 2A18022
Sequence: AA70198
Calibration: 2110016
Instrument: OVGCMS7

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	268832	10.86	226712	10.87	
1,4-Difluorobenzene	879755	12.37	736300	12.38	
Chlorobenzene-d5	654239	15.77	586400	15.77	

* Values outside of QC limits

HOLDING TIME SUMMARY

TO-15

Laboratory: ENCO Orlando

SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA Airs

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-AMB0001-20220114	01/14/22 15:20	01/14/22 15:40	01/18/22 11:01	3.82	NA	01/19/22 08:59	5.00	30.00	
CRCA-AMB0002-20220114	01/14/22 15:25	01/14/22 15:40	01/18/22 11:01	3.82	NA	01/19/22 09:45	5.00	30.00	
CRCA-VMP0001-20220114	01/14/22 11:30	01/14/22 15:40	01/18/22 11:01	3.98	NA	01/19/22 10:30	5.00	30.00	
CRCA-VMP0002-20220114	01/14/22 11:45	01/14/22 15:40	01/18/22 11:01	3.97	NA	01/19/22 11:16	5.00	30.00	
CRCA-VMP0003-20220114	01/14/22 13:00	01/14/22 15:40	01/18/22 11:01	3.92	NA	01/19/22 12:02	5.00	30.00	
CRCA-VMP0004-20220114	01/14/22 13:40	01/14/22 15:40	01/18/22 11:01	3.89	NA	01/19/22 12:50	5.00	30.00	

PREPARATION BATCH SUMMARY

TO-15

Laboratory: ENCO Orlando SDG: AF00241-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA Airs

Batch: 2A18022 Batch Matrix: Air Preparation: NO PREP 2

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	2A18022-BLK1	227AM006.D	01/18/22 11:01	
LCS	2A18022-BS1	227AM003.D	01/18/22 11:01	
LCS Dup	2A18022-BSD1	227AM004.D	01/18/22 11:01	
CRCA-AMB0001-20220114	AF00241-01	227AM013.D	01/18/22 11:01	
CRCA-AMB0002-20220114	AF00241-02	227AM014.D	01/18/22 11:01	
CRCA-VMP0001-20220114	AF00241-03	227AM015.D	01/18/22 11:01	
CRCA-VMP0002-20220114	AF00241-04	227AM016.D	01/18/22 11:01	
CRCA-VMP0003-20220114	AF00241-05	227AM017.D	01/18/22 11:01	
CRCA-VMP0004-20220114	AF00241-06	227AM018.D	01/18/22 11:01	

METHOD BLANK DATA SHEET
TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs

Matrix:	Air	Laboratory ID:	2A18022-BLK1	File ID:	227AM006.D
Prepared:	01/18/22 11:01	Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL
Analyzed:	01/18/22 21:17	Instrument:	OVGCMS7		
Batch:	2A18022	Sequence:	AA70198	Calibration:	2110016

CAS NO.	COMPOUND	CONC. (ppbv)	Q
75-71-8	Dichlorodifluoromethane	0.55	U
115-07-1	Propene	0.55	U
74-87-3	Chloromethane	0.48	U
75-01-4	Vinyl chloride	0.56	U
74-83-9	Bromomethane	0.33	U
75-00-3	Chloroethane	0.32	U
75-69-4	Trichlorofluoromethane	0.34	U
593-60-2	Bromoethene	0.33	U
75-34-3	1,1-Dichloroethane	0.36	U
67-64-1	Acetone	0.35	U
75-09-2	Methylene chloride	0.20	U
76-13-1	Freon 113	0.32	U
107-05-1	3-Chloropropene	0.39	U
156-60-5	trans-1,2-Dichloroethene	0.32	U
75-35-4	1,1-Dichloroethene	0.38	U
156-59-2	cis-1,2-Dichloroethene	0.38	U
67-66-3	Chloroform	0.38	U
107-06-2	1,2-Dichloroethane	0.37	U
71-55-6	1,1,1-Trichloroethane	0.34	U
56-23-5	Carbon tetrachloride	0.27	U
78-87-5	1,2-Dichloropropane	0.40	U
79-01-6	Trichloroethene	0.35	U
75-27-4	Bromodichloromethane	0.34	U
10061-01-5	cis-1,3-Dichloropropene	0.38	U
10061-02-6	trans-1,3-Dichloropropene	0.34	U
79-00-5	1,1,2-Trichloroethane	0.35	U
106-93-4	1,2-Dibromoethane	0.36	U
127-18-4	Tetrachloroethene	0.31	U
124-48-1	Dibromochloromethane	0.33	U
108-90-7	Chlorobenzene	0.33	U

METHOD BLANK DATA SHEET
TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs

Matrix:	Air	Laboratory ID:	2A18022-BLK1	File ID:	227AM006.D
Prepared:	01/18/22 11:01	Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL
Analyzed:	01/18/22 21:17	Instrument:	OVGCMS7		
Batch:	2A18022	Sequence:	AA70198	Calibration:	2110016

CAS NO.	COMPOUND	CONC. (ppbv)	Q
75-25-2	Bromoform	0.38	U
79-34-5	1,1,2,2-Tetrachloroethane	0.36	U
541-73-1	1,3-Dichlorobenzene	0.28	U
106-46-7	1,4-Dichlorobenzene	0.31	U
95-50-1	1,2-Dichlorobenzene	0.27	U
87-68-3	Hexachlorobutadiene	0.37	U
76-14-2	Freon 114	0.52	U

SYSTEM MONITORING COMPOUND	ADDED (ppbv)	CONC (ppbv)	% REC	QC LIMITS	Q
4-Bromofluorobenzene	31.0	27	87	70 - 130	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Bromochloromethane	288827	10.86	226712	10.87	
1,4-Difluorobenzene	954661	12.36	736300	12.38	
Chlorobenzene-d5	708555	15.77	586400	15.77	

LCS / LCS DUPLICATE RECOVERY

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Matrix:	Air		
Batch:	2A18022	Laboratory ID:	2A18022-BS1
Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL

COMPOUND	SPIKE ADDED (ppbv)	LCS CONCENTRATION (ppbv)	LCS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	10.0	8.3	83	61 - 137
Propene	10.0	9.3	93	63 - 132
Chloromethane	10.0	9.6	96	55 - 142
Vinyl chloride	10.0	10	102	53 - 148
Bromomethane	10.0	8.3	83	69 - 130
Chloroethane	10.0	9.1	91	69 - 131
Trichlorofluoromethane	10.0	8.5	85	46 - 161
Bromoethene	10.0	8.8	88	69 - 132
1,1-Dichloroethane	10.0	10	103	70 - 130
Acetone	10.0	9.5	95	65 - 130
Methylene chloride	10.0	10	103	59 - 136
Freon 113	10.0	10	103	67 - 140
3-Chloropropene	10.0	9.7	97	70 - 130
trans-1,2-Dichloroethene	10.0	9.8	98	70 - 130
1,1-Dichloroethene	10.0	10	104	67 - 142
cis-1,2-Dichloroethene	10.0	11	105	70 - 130
Chloroform	10.0	9.6	96	70 - 130
1,2-Dichloroethane	10.0	9.2	92	70 - 130
1,1,1-Trichloroethane	10.0	9.1	91	70 - 130
Carbon tetrachloride	10.0	3.2	32	22 - 166
1,2-Dichloropropane	10.0	10	102	70 - 130
Trichloroethene	10.0	9.8	98	70 - 130
Bromodichloromethane	10.0	8.5	85	70 - 130
cis-1,3-Dichloropropene	10.0	10	101	70 - 137
trans-1,3-Dichloropropene	10.0	9.2	92	59 - 166
1,1,2-Trichloroethane	10.0	9.7	97	70 - 134
1,2-Dibromoethane	10.0	9.4	94	70 - 141
Tetrachloroethene	10.0	9.7	97	70 - 141
Dibromochloromethane	10.0	7.8	78	70 - 130
Chlorobenzene	10.0	9.9	99	70 - 134

LCS / LCS DUPLICATE RECOVERY

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Matrix:	Air		
Batch:	2A18022	Laboratory ID:	2A18022-BS1
Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL

COMPOUND	SPIKE ADDED (ppbv)	LCS CONCENTRATION (ppbv)	LCS % REC. #	QC LIMITS REC.
Bromoform	10.0	7.7	77	62 - 149
1,1,2,2-Tetrachloroethane	10.0	9.9	99	52 - 163
1,3-Dichlorobenzene	10.0	10	101	47 - 178
1,4-Dichlorobenzene	10.0	9.9	99	45 - 180
1,2-Dichlorobenzene	10.0	9.9	99	37 - 180
Hexachlorobutadiene	10.0	9.5	95	24 - 180
Freon 114	10.0	9.1	91	62 - 147

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	10.0	8.2	82	1	25	61 - 137
Propene	10.0	9.0	90	3	25	63 - 132
Chloromethane	10.0	9.5	95	1	25	55 - 142
Vinyl chloride	10.0	10	102	0.3	25	53 - 148
Bromomethane	10.0	8.4	84	0.4	25	69 - 130
Chloroethane	10.0	9.0	90	1	25	69 - 131
Trichlorofluoromethane	10.0	8.4	84	0.8	25	46 - 161
Bromoethene	10.0	8.7	87	0.9	25	69 - 132
1,1-Dichloroethane	10.0	10	103	0.2	25	70 - 130
Acetone	10.0	9.4	94	1	25	65 - 130
Methylene chloride	10.0	10	103	0.8	25	59 - 136
Freon 113	10.0	10	103	0.6	25	67 - 140
3-Chloropropene	10.0	9.6	96	1	25	70 - 130
trans-1,2-Dichloroethene	10.0	9.8	98	0.2	25	70 - 130
1,1-Dichloroethene	10.0	11	105	0.9	25	67 - 142
cis-1,2-Dichloroethene	10.0	11	106	0.3	25	70 - 130
Chloroform	10.0	9.6	96	0.6	25	70 - 130
1,2-Dichloroethane	10.0	9.1	91	1	25	70 - 130
1,1,1-Trichloroethane	10.0	9.0	90	2	25	70 - 130
Carbon tetrachloride	10.0	3.1	31	2	25	22 - 166

LCS / LCS DUPLICATE RECOVERY

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Matrix:	Air		
Batch:	2A18022	Laboratory ID:	2A18022-BSD1
Preparation:	NO PREP 2	Initial/Final:	400 mL / 400 mL

COMPOUND	SPIKE ADDED (ppbv)	LCSD CONCENTRATION (ppbv)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,2-Dichloropropane	10.0	10	103	1	25	70 - 130
Trichloroethene	10.0	9.9	99	0.5	25	70 - 130
Bromodichloromethane	10.0	8.5	85	0.4	25	70 - 130
cis-1,3-Dichloropropene	10.0	10	102	0.8	25	70 - 137
trans-1,3-Dichloropropene	10.0	9.3	93	0.9	25	59 - 166
1,1,2-Trichloroethane	10.0	9.8	98	1	25	70 - 134
1,2-Dibromoethane	10.0	9.5	95	0.7	25	70 - 141
Tetrachloroethene	10.0	9.8	98	0.7	25	70 - 141
Dibromochloromethane	10.0	7.9	79	1	25	70 - 130
Chlorobenzene	10.0	10	100	1	25	70 - 134
Bromoform	10.0	7.8	78	1	25	62 - 149
1,1,2,2-Tetrachloroethane	10.0	10	100	1	25	52 - 163
1,3-Dichlorobenzene	10.0	10	102	0.4	25	47 - 178
1,4-Dichlorobenzene	10.0	10	101	2	25	45 - 180
1,2-Dichlorobenzene	10.0	10	101	2	25	37 - 180
Hexachlorobutadiene	10.0	9.5	95	0.4	25	24 - 180
Freon 114	10.0	8.9	89	1	25	62 - 147

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA68577
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Surrogate Compound	Spike Level ppbv	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA68577-SCV1)			Lab File ID: 217J4016.D		Analyzed: 10/05/21 09:33			
4-Bromofluorobenzene	31.0	100	0 - 200	17.21	17.20667	0.0033	+/-1.0	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA70198
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Surrogate Compound	Spike Level ppbv	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA70198-CCV1)			Lab File ID: 227AM002.D		Analyzed: 01/18/22 18:31			
4-Bromofluorobenzene	31.0	97	0 - 200	17.2	17.20667	-0.0067	+/-1.0	
LCS (2A18022-BS1)			Lab File ID: 227AM003.D		Analyzed: 01/18/22 19:11			
4-Bromofluorobenzene	31.0	95	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
LCS Dup (2A18022-BSD1)			Lab File ID: 227AM004.D		Analyzed: 01/18/22 19:51			
4-Bromofluorobenzene	31.0	96	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
Blank (2A18022-BLK1)			Lab File ID: 227AM006.D		Analyzed: 01/18/22 21:17			
4-Bromofluorobenzene	31.0	87	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
Instrument RL Check (AA70198-CRL1)			Lab File ID: 227AM007.D		Analyzed: 01/18/22 21:58			
4-Bromofluorobenzene	31.0	91	0 - 200	17.2	17.20667	-0.0067	+/-1.0	
CRCA-AMB0001-20220114 (AF00241-01)			Lab File ID: 227AM013.D		Analyzed: 01/19/22 08:59			
4-Bromofluorobenzene	31.0	87	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
CRCA-AMB0002-20220114 (AF00241-02)			Lab File ID: 227AM014.D		Analyzed: 01/19/22 09:45			
4-Bromofluorobenzene	31.0	88	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
CRCA-VMP0001-20220114 (AF00241-03)			Lab File ID: 227AM015.D		Analyzed: 01/19/22 10:30			
4-Bromofluorobenzene	31.0	88	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
CRCA-VMP0002-20220114 (AF00241-04)			Lab File ID: 227AM016.D		Analyzed: 01/19/22 11:16			
4-Bromofluorobenzene	31.0	88	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
CRCA-VMP0003-20220114 (AF00241-05)			Lab File ID: 227AM017.D		Analyzed: 01/19/22 12:02			
4-Bromofluorobenzene	31.0	89	70 - 130	17.2	17.20667	-0.0067	+/-1.0	
CRCA-VMP0004-20220114 (AF00241-06)			Lab File ID: 227AM018.D		Analyzed: 01/19/22 12:50			
4-Bromofluorobenzene	31.0	89	70 - 130	17.2	17.20667	-0.0067	+/-1.0	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA68577
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA68577-CAL1)			Lab File ID: 217J4003.D			Analyzed: 10/04/21 14:37			
Bromochloromethane	224803	10.86	226712	10.87	99	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	729362	12.37	736300	12.38	99	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	558650	15.77	586400	15.77	95	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL2)			Lab File ID: 217J4004.D			Analyzed: 10/04/21 15:17			
Bromochloromethane	222081	10.86	226712	10.87	98	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	723311	12.37	736300	12.38	98	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	555062	15.77	586400	15.77	95	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL3)			Lab File ID: 217J4005.D			Analyzed: 10/04/21 15:56			
Bromochloromethane	220504	10.86	226712	10.87	97	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	719607	12.37	736300	12.38	98	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	552962	15.77	586400	15.77	94	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL4)			Lab File ID: 217J4006.D			Analyzed: 10/04/21 16:37			
Bromochloromethane	205114	10.86	226712	10.87	90	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	665960	12.37	736300	12.38	90	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	514034	15.77	586400	15.77	88	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL5)			Lab File ID: 217J4007.D			Analyzed: 10/04/21 17:19			
Bromochloromethane	213866	10.87	226712	10.87	94	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	691016	12.37	736300	12.38	94	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	541630	15.77	586400	15.77	92	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL6)			Lab File ID: 217J4008.D			Analyzed: 10/04/21 17:57			
Bromochloromethane	222080	10.86	226712	10.87	98	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	718415	12.37	736300	12.38	98	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	562665	15.77	586400	15.77	96	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL7)			Lab File ID: 217J4009.D			Analyzed: 10/04/21 18:37			
Bromochloromethane	226712	10.87	226712	10.87	100	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	736300	12.38	736300	12.38	100	60 - 140	0.0000	+/-0.50	
Chlorobenzene-d5	586400	15.77	586400	15.77	100	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL8)			Lab File ID: 217J4010.D			Analyzed: 10/04/21 19:18			
Bromochloromethane	229084	10.87	226712	10.87	101	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	753502	12.38	736300	12.38	102	60 - 140	0.0000	+/-0.50	
Chlorobenzene-d5	607276	15.77	586400	15.77	104	60 - 140	0.0000	+/-0.50	
Cal Standard (AA68577-CAL9)			Lab File ID: 217J4011.D			Analyzed: 10/04/21 20:03			
Bromochloromethane	246566	10.88	226712	10.87	109	60 - 140	0.0100	+/-0.50	
1,4-Difluorobenzene	782476	12.38	736300	12.38	106	60 - 140	0.0000	+/-0.50	
Chlorobenzene-d5	628282	15.78	586400	15.77	107	60 - 140	0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Sequence: AA68577
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA68577-SCV1)			Lab File ID: 217J4016.D			Analyzed: 10/05/21 09:33			
Bromochloromethane	226735	10.87	226712	10.87	100	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	735053	12.37	736300	12.38	100	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	580887	15.78	586400	15.77	99	60 - 140	0.0100	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Sequence: AA70198
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (AA70198-CCV1)			Lab File ID: 227AM002.D			Analyzed: 01/18/22 18:31			
Bromochloromethane	279836	10.87	226712	10.87	123	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	923570	12.37	736300	12.38	125	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	712153	15.77	586400	15.77	121	60 - 140	0.0000	+/-0.50	
LCS (2A18022-BS1)			Lab File ID: 227AM003.D			Analyzed: 01/18/22 19:11			
Bromochloromethane	285630	10.86	226712	10.87	126	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	954437	12.37	736300	12.38	130	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	738735	15.77	586400	15.77	126	60 - 140	0.0000	+/-0.50	
LCS Dup (2A18022-BSD1)			Lab File ID: 227AM004.D			Analyzed: 01/18/22 19:51			
Bromochloromethane	286055	10.87	226712	10.87	126	60 - 140	0.0000	+/-0.50	
1,4-Difluorobenzene	953821	12.37	736300	12.38	130	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	731911	15.77	586400	15.77	125	60 - 140	0.0000	+/-0.50	
Blank (2A18022-BLK1)			Lab File ID: 227AM006.D			Analyzed: 01/18/22 21:17			
Bromochloromethane	288827	10.86	226712	10.87	127	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	954661	12.36	736300	12.38	130	60 - 140	-0.0200	+/-0.50	
Chlorobenzene-d5	708555	15.77	586400	15.77	121	60 - 140	0.0000	+/-0.50	
Instrument RL Check (AA70198-CRL1)			Lab File ID: 227AM007.D			Analyzed: 01/18/22 21:58			
Bromochloromethane	270298	10.86	226712	10.87	119	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	893326	12.37	736300	12.38	121	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	668634	15.77	586400	15.77	114	60 - 140	0.0000	+/-0.50	
CRCA-AMB0001-20220114 (AF00241-01)			Lab File ID: 227AM013.D			Analyzed: 01/19/22 08:59			
Bromochloromethane	299748	10.84	226712	10.87	132	60 - 140	-0.0300	+/-0.50	
1,4-Difluorobenzene	1029447	12.36	736300	12.38	140	60 - 140	-0.0200	+/-0.50	
Chlorobenzene-d5	768403	15.76	586400	15.77	131	60 - 140	-0.0100	+/-0.50	
CRCA-AMB0002-20220114 (AF00241-02)			Lab File ID: 227AM014.D			Analyzed: 01/19/22 09:45			
Bromochloromethane	297581	10.85	226712	10.87	131	60 - 140	-0.0200	+/-0.50	
1,4-Difluorobenzene	1000997	12.36	736300	12.38	136	60 - 140	-0.0200	+/-0.50	
Chlorobenzene-d5	745658	15.76	586400	15.77	127	60 - 140	-0.0100	+/-0.50	
CRCA-VMP0001-20220114 (AF00241-03)			Lab File ID: 227AM015.D			Analyzed: 01/19/22 10:30			
Bromochloromethane	287991	10.85	226712	10.87	127	60 - 140	-0.0200	+/-0.50	
1,4-Difluorobenzene	988228	12.36	736300	12.38	134	60 - 140	-0.0200	+/-0.50	
Chlorobenzene-d5	747485	15.77	586400	15.77	127	60 - 140	0.0000	+/-0.50	
CRCA-VMP0002-20220114 (AF00241-04)			Lab File ID: 227AM016.D			Analyzed: 01/19/22 11:16			
Bromochloromethane	304516	10.85	226712	10.87	134	60 - 140	-0.0200	+/-0.50	
1,4-Difluorobenzene	1022834	12.37	736300	12.38	139	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	760183	15.77	586400	15.77	130	60 - 140	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Sequence: AA70198
Instrument: OVGCMS7
Matrix: Air
Calibration: 2110016

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
CRCA-VMP0003-20220114 (AF00241-05)			Lab File ID: 227AM017.D			Analyzed: 01/19/22 12:02			
Bromochloromethane	296867	10.85	226712	10.87	131	60 - 140	-0.0200	+/-0.50	
1,4-Difluorobenzene	997410	12.37	736300	12.38	135	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	735662	15.77	586400	15.77	125	60 - 140	0.0000	+/-0.50	
CRCA-VMP0004-20220114 (AF00241-06)			Lab File ID: 227AM018.D			Analyzed: 01/19/22 12:50			
Bromochloromethane	268832	10.86	226712	10.87	119	60 - 140	-0.0100	+/-0.50	
1,4-Difluorobenzene	879755	12.37	736300	12.38	119	60 - 140	-0.0100	+/-0.50	
Chlorobenzene-d5	654239	15.77	586400	15.77	112	60 - 140	0.0000	+/-0.50	

ANALYSIS BATCH (SEQUENCE) SUMMARY

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Sequence:	AA68577		
Calibration:	2110016	Instrument:	OVGCMS7

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA68577-TUN1	217J4002.D	10/04/21 13:43
Cal Standard	AA68577-CAL1	217J4003.D	10/04/21 14:37
Cal Standard	AA68577-CAL2	217J4004.D	10/04/21 15:17
Cal Standard	AA68577-CAL3	217J4005.D	10/04/21 15:56
Cal Standard	AA68577-CAL4	217J4006.D	10/04/21 16:37
Cal Standard	AA68577-CAL5	217J4007.D	10/04/21 17:19
Cal Standard	AA68577-CAL6	217J4008.D	10/04/21 17:57
Cal Standard	AA68577-CAL7	217J4009.D	10/04/21 18:37
Cal Standard	AA68577-CAL8	217J4010.D	10/04/21 19:18
Cal Standard	AA68577-CAL9	217J4011.D	10/04/21 20:03
Secondary Cal Check	AA68577-SCV1	217J4016.D	10/05/21 09:33

ANALYSIS BATCH (SEQUENCE) SUMMARY

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Sequence:	AA70198		
Calibration:	2110016	Instrument:	OVGCMS7

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA70198-TUN1	227AM001.D	01/18/22 17:38
Calibration Check	AA70198-CCV1	227AM002.D	01/18/22 18:31
LCS	2A18022-BS1	227AM003.D	01/18/22 19:11
LCS Dup	2A18022-BSD1	227AM004.D	01/18/22 19:51
Blank	2A18022-BLK1	227AM006.D	01/18/22 21:17
Instrument RL Check	AA70198-CRL1	227AM007.D	01/18/22 21:58
CRCA-AMB0001-20220114	AF00241-01	227AM013.D	01/19/22 08:59
CRCA-AMB0002-20220114	AF00241-02	227AM014.D	01/19/22 09:45
CRCA-VMP0001-20220114	AF00241-03	227AM015.D	01/19/22 10:30
CRCA-VMP0002-20220114	AF00241-04	227AM016.D	01/19/22 11:16
CRCA-VMP0003-20220114	AF00241-05	227AM017.D	01/19/22 12:02
CRCA-VMP0004-20220114	AF00241-06	227AM018.D	01/19/22 12:50

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Lab File ID:	217J4002.D	Injection Date:	10/04/21
Instrument ID:	OVGCMS7	Injection Time:	13:43
Sequence:	AA68577	Lab Sample ID:	AA68577-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8 - 40% of 95	28.9	PASS
75	30 - 66% of 95	49.1	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	6.99	PASS
173	Less than 2% of 174	0	PASS
174	50 - 120% of 95	82.6	PASS
175	4 - 9% of 174	8.25	PASS
176	95 - 101% of 174	96.7	PASS
177	5 - 9% of 176	6.5	PASS

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Lab File ID:	227AM001.D	Injection Date:	01/18/22
Instrument ID:	OVGCMS7	Injection Time:	17:38
Sequence:	AA70198	Lab Sample ID:	AA70198-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
50	8 - 40% of 95	27.5	PASS
75	30 - 66% of 95	46.7	PASS
95	Base peak, 100% relative abundance	100	PASS
96	5 - 9% of 95	7.31	PASS
173	Less than 2% of 174	0	PASS
174	50 - 120% of 95	81.3	PASS
175	4 - 9% of 174	8.15	PASS
176	95 - 101% of 174	96.2	PASS
177	5 - 9% of 176	6.73	PASS

CONTINUING CALIBRATION CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Instrument ID:	OVGCMS7	Calibration:	2110016
Lab File ID:	227AM002.D	Calibration Date:	10/04/21 13:43
Sequence:	AA70198	Injection Date:	01/18/22
Lab Sample ID:	AA70198-CCV1	Injection Time:	18:31

		CONC. (ppbv)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
Dichlorodifluoromethane	A	10.0	9.1	6.219378	5.680169		-8.7	30	
Propene	A	10.0	9.5	3.23543	3.074366		-5	30	
Chloromethane	A	10.0	9.4	3.106247	2.911022		-6.3	30	
Vinyl chloride	A	10.0	9.7	2.673188	2.592299		-3	30	
Bromomethane	A	10.0	8.4	2.341098	1.964037		-16	30	
Chloroethane	A	10.0	8.8	1.188133	1.045024		-12	30	
Trichlorofluoromethane	A	10.0	8.6	3.93271	3.375408		-14	30	
Bromoethene	A	10.0	8.8	2.006799	1.765731		-12	30	
1,1-Dichloroethane	A	10.0	10	4.152167	4.132174		-0.5	30	
Acetone	A	10.0	9.6	5.464891	5.256549		-3.8	30	
Methylene chloride	A	10.0	9.4	1.998345	1.883589		-5.7	30	
Freon 113	A	10.0	9.3	3.452188	3.210713		-7	30	
3-Chloropropene	A	10.0	9.8	4.593315	4.486479		-2.3	30	
trans-1,2-Dichloroethene	A	10.0	10	3.498948	3.532582		1.0	30	
1,1-Dichloroethene	A	10.0	10	3.889729	3.912333		0.60	30	
cis-1,2-Dichloroethene	A	10.0	9.7	2.254535	2.183557		-3.1	30	
Chloroform	A	10.0	9.4	4.694174	4.409299		-6.1	30	
1,2-Dichloroethane	A	10.0	9.4	3.295564	3.110535		-5.6	30	
1,1,1-Trichloroethane	A	10.0	9.0	4.436574	3.982267		-10	30	
Carbon tetrachloride	A	10.0	5.4	4.540764	2.461048		-46	30	*
1,2-Dichloropropane	A	10.0	9.7	0.7578331	0.734693		-3.1	30	
Trichloroethene	A	10.0	9.2	0.9819849	0.9041446		-7.9	30	
Bromodichloromethane	A	10.0	9.0	1.483156	1.340102		-9.6	30	
cis-1,3-Dichloropropene	A	10.0	9.3	1.137442	1.063379		-6.5	30	
trans-1,3-Dichloropropene	A	10.0	9.1	0.9942093	0.9053529		-8.9	30	
1,1,2-Trichloroethane	A	10.0	9.2	0.7448029	0.6869059		-7.8	30	
1,2-Dibromoethane	A	10.0	9.2	1.284507	1.184379		-7.8	30	
Tetrachloroethene	A	10.0	9.5	1.009205	0.9574095		-5.1	30	
Dibromochloromethane	A	10.0	8.5	1.288251	1.100855		-15	30	

CONTINUING CALIBRATION CHECK

TO-15

Laboratory:	ENCO Orlando	SDG:	AF00241-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA Airs
Instrument ID:	OVGCMS7	Calibration:	2110016
Lab File ID:	227AM002.D	Calibration Date:	10/04/21 13:43
Sequence:	AA70198	Injection Date:	01/18/22
Lab Sample ID:	AA70198-CCV1	Injection Time:	18:31

		CONC. (ppbv)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Chlorobenzene	A	10.0	9.6	1.990599	1.914718		-3.8	30
Bromoform	A	10.0	8.6	1.555729	1.334751		-14	30
1,1,2,2-Tetrachloroethane	A	10.0	10	1.673199	1.667285		-0.4	30
1,3-Dichlorobenzene	A	10.0	10	1.36989	1.395101		1.8	30
1,4-Dichlorobenzene	A	10.0	10	1.285372	1.293545		0.60	30
1,2-Dichlorobenzene	A	10.0	10	1.274202	1.32416		3.9	30
Hexachlorobutadiene	A	10.0	11	0.531441	0.5957512		12	30
Freon 114	A	10.0	8.8	4.460102	3.923555		-12	30

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Sequence: AA68577
Instrument: OVGCMS7

Calibration: 2110016

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1J0413	Air- VIRTUAL TUN-100121	AA68577-TUN1	217J4002.D	10/04/21 13:43
A1J0443	Air- Virtual CAL 1-100421	AA68577-CAL1	217J4003.D	10/04/21 14:37
A1J0444	Air- Virtual CAL 2-100421	AA68577-CAL2	217J4004.D	10/04/21 15:17
A1J0445	Air- Virtual CAL 3-100421	AA68577-CAL3	217J4005.D	10/04/21 15:56
A1J0446	Air- Virtual CAL 4-100421	AA68577-CAL4	217J4006.D	10/04/21 16:37
A1J0447	Air- Virtual CAL 5-100421	AA68577-CAL5	217J4007.D	10/04/21 17:19
A1J0448	Air- Virtual CAL 6-100421	AA68577-CAL6	217J4008.D	10/04/21 17:57
A1J0450	Air- Virtual CAL 7-100421	AA68577-CAL7	217J4009.D	10/04/21 18:37
A1J0451	Air- Virtual CAL 8-100421	AA68577-CAL8	217J4010.D	10/04/21 19:18
A1J0452	Air- Virtual CAL 9-100421	AA68577-CAL9	217J4011.D	10/04/21 20:03
A1J0453	Air- Virtual SCV 100421	AA68577-SCV1	217J4016.D	10/05/21 09:33

INITIAL CALIBRATION DATA

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
Dichlorodifluoromethane	0.125	7.486235	0.25	6.439506	0.5	5.958078	1.25	7.783356	2.5	6.671901	5	6.241793
Propene	0.125	~~5.253382~~	0.25	3.853765	0.5	3.20679	1.25	3.868705	2.5	3.311773	5	3.248104
Chloromethane	0.125	3.612941	0.25	3.012883	0.5	2.884564	1.25	3.565346	2.5	3.190826	5	3.202235
Vinyl chloride	0.125	2.830781	0.25	2.531581	0.5	2.310407	1.25	3.15861	2.5	2.908346	5	2.777856
Bromomethane	0.125	2.902488	0.25	2.230628	0.5	2.717266	1.25	2.781618	2.5	2.348431	5	2.233429
Chloroethane	0.125	1.495923	0.25	1.284216	0.5	1.135381	1.25	1.397096	2.5	1.215614	5	1.134582
Trichlorofluoromethane	0.125	4.448055	0.25	3.957619	0.5	3.830434	1.25	5.041758	2.5	4.321441	5	3.942059
Bromoethene	0.125	2.207479	0.25	2.055863	0.5	1.905516	1.25	2.477896	2.5	2.129034	5	1.992331
1,1-Dichloroethane	0.125	4.752534	0.25	4.063148	0.5	3.858551	1.25	5.260723	2.5	4.390785	5	4.152699
Acetone	0.125	~~9.262367~~	0.25	~~7.076589~~	0.5	6.262589	1.25	6.919465	2.5	5.772396	5	5.408975
Methylene chloride	0.125	~~7.328479~~	0.25	~~4.996159~~	0.5	~~4.048906~~	1.25	2.653092	2.5	2.209916	5	2.01553
Freon 113	0.125	4.109376	0.25	3.504235	0.5	3.145213	1.25	4.28064	2.5	3.633331	5	3.385963
3-Chloropropene	0.125	5.451956	0.25	4.600844	0.5	4.350887	1.25	5.721626	2.5	4.797284	5	4.535788
trans-1,2-Dichloroethene	0.125	3.897564	0.25	3.404289	0.5	3.299577	1.25	4.487393	2.5	3.775383	5	3.526892
1,1-Dichloroethene	0.125	4.266028	0.25	3.89955	0.5	3.677194	1.25	4.944548	2.5	4.160082	5	3.974862
cis-1,2-Dichloroethene	0.125	2.554984	0.25	2.177584	0.5	2.010676	1.25	2.849931	2.5	2.414355	5	2.259086
Chloroform	0.125	5.365907	0.25	4.74825	0.5	4.577795	1.25	6.039857	2.5	5.040337	5	4.739086
1,2-Dichloroethane	0.125	4.066351	0.25	3.378047	0.5	3.011093	1.25	4.152114	2.5	3.575815	5	3.333086
1,1,1-Trichloroethane	0.125	5.438717	0.25	4.684039	0.5	4.29409	1.25	5.625746	2.5	4.762496	5	4.479841
Carbon tetrachloride	0.125	5.645014	0.25	4.9688	0.5	4.608442	1.25	5.68886	2.5	4.8399	5	4.492124
1,2-Dichloropropane	0.125	0.864339	0.25	0.7716238	0.5	0.6943484	1.25	0.9242465	2.5	0.8128003	5	0.7534431
Trichloroethene	0.125	1.132277	0.25	0.9878019	0.5	0.8986294	1.25	1.19386	2.5	1.04748	5	0.9810881
Bromodichloromethane	0.125	1.666794	0.25	1.421872	0.5	1.366468	1.25	1.896234	2.5	1.651154	5	1.545704
cis-1,3-Dichloropropene	0.125	1.360773	0.25	1.144664	0.5	1.043892	1.25	1.367955	2.5	1.193943	5	1.133453
trans-1,3-Dichloropropene	0.125	1.259786	0.25	0.9716871	0.5	0.9117254	1.25	1.229275	2.5	1.074917	5	1.018431
1,1,2-Trichloroethane	0.125	0.8609387	0.25	0.7471088	0.5	0.6741874	1.25	0.9372431	2.5	0.7883777	5	0.7399456
1,2-Dibromoethane	0.125	1.390695	0.25	1.25181	0.5	1.125311	1.25	1.584093	2.5	1.383438	5	1.323194
Tetrachloroethene	0.125	1.188381	0.25	0.9977451	0.5	0.9338681	1.25	1.219816	2.5	1.045667	5	1.021045
Dibromochloromethane	0.125	1.407356	0.25	1.21718	0.5	1.149091	1.25	1.635669	2.5	1.426972	5	1.356731
Chlorobenzene	0.125	2.324403	0.25	1.987576	0.5	1.804963	1.25	2.447559	2.5	2.148703	5	2.038139
Bromoform	0.125	1.623442	0.25	1.342178	0.5	1.310611	1.25	1.960325	2.5	1.712689	5	1.671206

INITIAL CALIBRATION DATA

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
1,1,2,2-Tetrachloroethane	0.125	1.79613	0.25	1.50794	0.5	1.374297	1.25	2.192629	2.5	1.825922	5	1.736086
1,3-Dichlorobenzene	0.125	1.370404	0.25	1.179991	0.5	1.071115	1.25	1.629407	2.5	1.436498	5	1.421747
1,4-Dichlorobenzene	0.125	1.286057	0.25	1.073206	0.5	1.005074	1.25	1.502568	2.5	1.308727	5	1.343997
1,2-Dichlorobenzene	0.125	1.277179	0.25	1.067621	0.5	1.029966	1.25	1.546376	2.5	1.340687	5	1.331237
Hexachlorobutadiene	0.125	0.4967547	0.25	0.4429992	0.5	0.3649618	1.25	0.6903497	2.5	0.597896	5	0.6013614
4-Bromofluorobenzene	31	0.4942558	31	0.4934656	31	0.4991211	31	0.4935354	31	0.5002068	31	0.5074938
Freon 114	0.125	5.092316	0.25	4.254664	0.5	4.121168	1.25	5.165206	2.5	4.75119	5	4.653853

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
Dichlorodifluoromethane	10	5.520976	25	5.268544	50	4.604009						
Propene	10	2.830422	25	2.842429	50	2.721449						
Chloromethane	10	2.913846	25	2.896384	50	2.6772						
Vinyl chloride	10	2.568625	25	2.568203	50	2.404282						
Bromomethane	10	2.023795	25	2.001346	50	1.830884						
Chloroethane	10	1.042445	25	1.026777	50	0.9611652						
Trichlorofluoromethane	10	3.456447	25	3.335606	50	3.060967						
Bromoethene	10	1.813438	25	1.806196	50	1.673439						
1,1-Dichloroethane	10	3.705446	25	3.63904	50	3.546577						
Acetone	10	4.804431	25	4.668777	50	4.417601						
Methylene chloride	10	1.754026	25	1.68124	50	1.676265						
Freon 113	10	3.023304	25	3.052973	50	2.934656						
3-Chloropropene	10	4.042749	25	3.997447	50	3.841254						
trans-1,2-Dichloroethene	10	3.131121	25	3.056686	50	2.911626						
1,1-Dichloroethene	10	3.496511	25	3.383423	50	3.205364						
cis-1,2-Dichloroethene	10	2.022414	25	2.000973	50	2.000814						
Chloroform	10	4.149856	25	3.97172	50	3.614759						
1,2-Dichloroethane	10	2.921462	25	2.777789	50	2.444316						
1,1,1-Trichloroethane	10	3.880469	25	3.620901	50	3.142863						
Carbon tetrachloride	10	3.940224	25	3.636079	50	3.047431						
1,2-Dichloropropane	10	0.6778866	25	0.6482476	50	0.6735625						
Trichloroethene	10	0.8767784	25	0.8658534	50	0.8540954						
Bromodichloromethane	10	1.354241	25	1.27364	50	1.172295						
cis-1,3-Dichloropropene	10	1.015443	25	0.9856666	50	0.9911882						
trans-1,3-Dichloropropene	10	0.8911732	25	0.8362712	50	0.7546182						
1,1,2-Trichloroethane	10	0.659391	25	0.6505745	50	0.6454592						
1,2-Dibromoethane	10	1.175406	25	1.177222	50	1.149393						
Tetrachloroethene	10	0.9184892	25	0.9219322	50	0.8359045						
Dibromochloromethane	10	1.198676	25	1.156192	50	1.046391						
Chlorobenzene	10	1.809022	25	1.779465	50	1.575558						
Bromoform	10	1.517187	25	1.509101	50	1.354819						

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF	ppbv	RF
1,1,2,2-Tetrachloroethane	10	1.529573	25	1.554012	50	1.542206						
1,3-Dichlorobenzene	10	1.343578	25	1.438422	50	1.437849						
1,4-Dichlorobenzene	10	1.284555	25	1.381896	50	1.382264						
1,2-Dichlorobenzene	10	1.264593	25	1.307013	50	1.303146						
Hexachlorobutadiene	10	0.5457353	25	0.5318346	50	0.511076						
4-Bromofluorobenzene	31	0.5215194	31	0.5586126	31	0.5952391						
Freon 114	10	4.236219	25	4.135556	50	3.730745						

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs

Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	6.219378	16.45056	4.501111	0.281354			30	
Propene	3.23543	13.68767	4.38375	0.3209913			30	
Chloromethane	3.106247	10.22406	4.987778	0.397849			30	
Vinyl chloride	2.673188	10.00856	5.234444	0.2719751			30	
Bromomethane	2.341098	16.20217	6.046667	0.2607841			30	
Chloroethane	1.188133	14.962	6.365556	0.1585633			30	
Trichlorofluoromethane	3.93271	15.57423	6.687778	0.1241278			30	
Bromoethene	2.006799	12.19043	6.616667	0.1302457			30	
1,1-Dichloroethane	4.152167	13.65047	9.891111	5.899272E-02			30	
Acetone	5.464891	16.73202	8.832857	0.1063762			30	
Methylene chloride	1.998345	19.22182	8.726667	9.391202E-02			30	
Freon 113	3.452188	13.98067	7.823333	6.230389E-02			30	
3-Chloropropene	4.593315	14.06253	8.564445	8.362719E-02			30	
trans-1,2-Dichloroethene	3.498948	14.06555	8.988889	0.1038405			30	
1,1-Dichloroethene	3.889729	13.66188	7.722222	0.1074353			30	
cis-1,2-Dichloroethene	2.254535	13.29048	10.60667	6.613793E-02			30	
Chloroform	4.694174	15.76954	10.94111	5.649096E-02			30	
1,2-Dichloroethane	3.295564	17.39197	11.90778	0.055089			30	
1,1,1-Trichloroethane	4.436574	18.27041	11.23444	4.744527E-02			30	
Carbon tetrachloride	4.540764	19.42856	11.15444	0.0657239			30	
1,2-Dichloropropane	0.7578331	12.50097	12.97333	3.659988E-02			30	
Trichloroethene	0.9819849	12.45455	12.36	4.014823E-02			30	
Bromodichloromethane	1.483156	15.28258	13.01556	4.078041E-02			30	
cis-1,3-Dichloropropene	1.137442	12.9783	13.73667	0.040074			30	
trans-1,3-Dichloropropene	0.9942093	17.17145	14.46222	2.811502E-02			30	
1,1,2-Trichloroethane	0.7448029	13.71515	14.66	1.934242E-02			30	
1,2-Dibromoethane	1.284507	11.69037	15.20444	3.424017E-02			30	
Tetrachloroethene	1.009205	12.61264	14.48444	3.505998E-02			30	
Dibromochloromethane	1.288251	14.18627	14.88778	3.009113E-02			30	
Chlorobenzene	1.990599	14.11729	15.79444	0.030455			30	

INITIAL CALIBRATION DATA (Continued)

TO-15

Laboratory: ENCO Orlando
SDG: AF00241-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA Airs
Calibration: 2110016
Instrument: OVGCMS7
Matrix: Air
Calibration Date: 10/04/21 13:43

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Bromoform	1.555729	13.55892	16.59556	0.0302815			30	
1,1,2,2-Tetrachloroethane	1.673199	14.65244	17.39	1.782912E-03			30	
1,3-Dichlorobenzene	1.36989	11.82179	18.50889	2.405671E-02			30	
1,4-Dichlorobenzene	1.285372	12.09772	18.61333	2.807933E-02			30	
1,2-Dichlorobenzene	1.274202	11.96971	19.15889	1.304716E-02			30	
Hexachlorobutadiene	0.531441	17.84082	21	0			30	
4-Bromofluorobenzene	0.5181611	6.882687	17.20667	3.456777E-02			30	
Freon 114	4.460102	10.82158	4.882222	0.223299			30	

SECOND-SOURCE CALIBRATION VERIFICATION

TO-15

Laboratory: ENCO Orlando **SDG:** AF00241-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA Airs

Calibration: 2110016 **Laboratory ID:** AA68577-SCV1

Sequence: AA68577 **Standard ID:** A1J0453

ANALYTE	EXPECTED (ppbv)	FOUND (ppbv)	% DRIFT	QC LIMIT
Dibromochloromethane	10.0	9.3	-6.7	30.00
Chloroform	10.0	9.3	-7.2	30.00
Acetone	10.0	9.4	-6.3	30.00
Bromoethene	10.0	9.3	-7.2	30.00
Carbon tetrachloride	10.0	9.7	-2.7	30.00
1,3-Dichlorobenzene	10.0	10	1.2	30.00
trans-1,2-Dichloroethene	10.0	9.1	-8.7	30.00
cis-1,3-Dichloropropene	10.0	9.8	-2.2	30.00
Tetrachloroethene	10.0	9.4	-5.5	30.00
Chloromethane	10.0	10	4.4	30.00
Propene	10.0	9.7	-3.3	30.00
Chlorobenzene	10.0	9.5	-4.5	30.00
1,2-Dichloroethane	10.0	9.3	-6.8	30.00
3-Chloropropene	10.0	9.1	-8.7	30.00
1,2-Dibromoethane	10.0	9.5	-4.8	30.00
1,4-Dichlorobenzene	10.0	10	1.2	30.00
trans-1,3-Dichloropropene	10.0	9.2	-8.0	30.00
cis-1,2-Dichloroethene	10.0	9.8	-2.3	30.00
1,1-Dichloroethene	10.0	10	2.2	30.00
Hexachlorobutadiene	10.0	9.2	-7.6	30.00
1,1,2,2-Tetrachloroethane	10.0	9.1	-9.4	30.00
Trichloroethene	10.0	9.6	-3.8	30.00
1,1,2-Trichloroethane	10.0	9.3	-7.1	30.00
1,2-Dichloropropane	10.0	9.4	-6.0	30.00
Freon 114	10.0	10	3.4	30.00
Freon 113	10.0	9.8	-2.1	30.00
1,1,1-Trichloroethane	10.0	9.2	-7.8	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

TO-15

Laboratory: ENCO Orlando **SDG:** AF00241-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA Airs

Calibration: 2110016 **Laboratory ID:** AA68577-SCV1

Sequence: AA68577 **Standard ID:** A1J0453

ANALYTE	EXPECTED (ppbv)	FOUND (ppbv)	% DRIFT	QC LIMIT
Trichlorofluoromethane	10.0	9.5	-5.1	30.00
Bromomethane	10.0	9.3	-6.8	30.00
1,1-Dichloroethane	10.0	9.6	-4.4	30.00
Bromodichloromethane	10.0	9.1	-8.8	30.00
Bromoform	10.0	9.6	-3.8	30.00
Methylene chloride	10.0	9.5	-4.9	30.00
Vinyl chloride	10.0	11	8.0	30.00
Chloroethane	10.0	9.6	-3.9	30.00
1,2-Dichlorobenzene	10.0	10	0.3	30.00
Dichlorodifluoromethane	10.0	9.5	-4.6	30.00

* Values outside of QC limits

TETRA TECH ISG
TtEGS, Information Systems Group

Completion Ticket

On 2/3/2022 at 4:17 PM the following files were submitted to Tetra Tech by kdylnicki@encolabs.com with ENCO:

TE016AF00241A1.txt, TE016AF00241A3.txt

If you need to identify this session at a later date refer to Ticket Key:

202223_3007250943_ledd_ENCO

You may print this page by clicking on the "Print This Page" button

Thank you for using the Data Checker, to upload more files click the "Upload/Check Files" link on navigation menu.

Print this Page Back To Upload

I Lovelie Metzgar, as the designated Quality Assurance Officer, hereby attest that all electronic deliverables have been thoroughly reviewed and are in agreement with the associated hardcopy data. The enclosed electronic files have been reviewed for accuracy (including significant figures), completeness and format. The laboratory will be responsible for any labor time necessary to correct enclosed electronic deliverables that have been found to be in error. I can be reached at (407) 826-5314 if there are any questions or problems with the enclosed electronic deliverables.

Signature:_____ Title: Quality Assurance Manager Date: 02/04/2022

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

Client:	Alex Murphy Tetra Tech, Inc. 11 Riverside Dr. Suite 204 Cocoa, FL 32922	**Phone:**	321-637-8530 **Fax:**

Identifier: 030TA **Date Rec:** 01/15/2022 **Report Date:** 01/20/2022

Client Project #: 112G08970 **Client Project Name:** CRCA

Purchase Order #: 1165880

Test results provided for: CENSUS

Reviewed By:

Charles Slater

Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **Tetra Tech, Inc.**
Project: CRCA

MI Project Number: **030TA**
Date Received: 01/15/2022

Sample Information

Client Sample ID:		**CRCA-MW0031-058.0-20220114**	**CRCA-MW0018-058.0-20220114**	**CRCA-MW0019-058.0-20220114**
Sample Date:		01/14/2022	01/14/2022	01/14/2022
Units:		cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		BB/CS	BB/CS	BB/CS
Dechlorinating Bacteria				
Dehalococcoides	*DHC*	**2.53E+02**	**1.34E+02**	**1.68E+02**
tceA Reductase	TCE	<5.00E-01	<5.00E-01	<5.00E-01
BAV1 Vinyl Chloride Reductase	BVC	<5.00E-01	<5.00E-01	<5.00E-01
Vinyl Chloride Reductase	VCR	<5.00E-01	<5.00E-01	<5.00E-01

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **1/15/2022**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	01/15/2022	01/20/2022	0 °C	112%	non-detect	non-detect
BVC	01/15/2022	01/20/2022	0 °C	110%	non-detect	non-detect
TCE	01/15/2022	01/20/2022	0 °C	111%	non-detect	non-detect
VCR	01/15/2022	01/20/2022	0 °C	107%	non-detect	non-detect

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ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Monday, February 7, 2022
Tetra Tech, Inc. (TE016)
Attn: Alex Murphy
1353 N Courtenay Pkwy, Suite S
Merritt Island, FL 32953

RE: Laboratory Results for
Project Number: 112G08970, Project Name/Desc: NASA KSC CRCA
ENCO Workorder(s): AF00374

Dear Alex Murphy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Friday, January 14, 2022.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Kaitlin Dylnicki

Project Manager

Enclosure(s)

Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Client PM: Alex Murphy
Project Number: 112G08970
ENCO Project ID: AF00374
SDG: AF00374-TE016

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

This package includes an amendment to the Level II report dated 01/21/22 for this work order to update the sampling dates to match dates listed on the chain of custody.

List of instruments used:

Analytical and Preparation Method	SOP Reference Instrument
EPA 8260D / 5030B_MS	OVGCMS5
RSK-175	OVGCFID2

Analysis: EPA 8260D

Manual integrations were performed on samples associated with EPA 8260D. All data & explanations are included in the raw data section of the report.

Affected Samples: AA70175-CCV1, CRCA-MW0027-035.0-20220114[AF00374-01], CRCA-MW0002-032.5-20220114 [AF00374-02], CRCA-MW0031-058.0-20220114 [AF00374-03], CRCA-MW0018-058.0-20220114 [AF00374-04], CRCA-MW0013-027.5-20220114 [AF00374-05], CRCA-MW0019-058.0-20220114 [AF00374-06], CRCA-MW0032-058.0-20220114 [AF00374-07]
The associated calibration verification standard for multiple analytes exhibited high bias. Analyte(s) not detected in the sample.

Analysis: RSK-175

Manual integrations were performed on samples associated with RSK-175. All data & explanations are included in the raw data section of the report.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Kaitlin Dylnicki
Project Manager

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: CRCA-MW0027-035.0-20220114 **Lab ID: AF00374-01** **Sampled: 01/14/22 10:55** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	01/28/22	01/17/22 11:51	01/17/22 13:34

Client ID: CRCA-MW0002-032.5-20220114 **Lab ID: AF00374-02** **Sampled: 01/14/22 11:25** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	01/28/22	01/17/22 11:51	01/17/22 14:02

Client ID: CRCA-MW0031-058.0-20220114 **Lab ID: AF00374-03** **Sampled: 01/14/22 11:45** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	01/28/22	01/17/22 11:51	01/17/22 14:29
RSK 175	Same	01/28/22	01/19/22 08:05	01/19/22 13:10

Client ID: CRCA-MW0018-058.0-20220114 **Lab ID: AF00374-04** **Sampled: 01/14/22 12:10** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	01/28/22	01/17/22 11:51	01/17/22 14:57
RSK 175	Same	01/28/22	01/19/22 08:05	01/19/22 13:26

Client ID: CRCA-MW0013-027.5-20220114 **Lab ID: AF00374-05** **Sampled: 01/14/22 13:00** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	01/28/22	01/17/22 11:51	01/17/22 15:25

Client ID: CRCA-MW0019-058.0-20220114 **Lab ID: AF00374-06** **Sampled: 01/14/22 13:05** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	01/28/22	01/17/22 11:51	01/17/22 15:53
RSK 175	Same	01/28/22	01/19/22 08:05	01/19/22 13:42

Client ID: CRCA-MW0032-058.0-20220114 **Lab ID: AF00374-07** **Sampled: 01/14/22 15:00** **Received: 01/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	01/28/22	01/17/22 11:51	01/17/22 16:21

SAMPLE DETECTION SUMMARY

Client ID: CRCA-MW0002-032.5-20220114 **Lab ID:** AF00374-02

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
trans-1,2-Dichloroethene	1.1	I	0.73	2.5	ug/L	EPA 8260D	
Vinyl chloride	6.6		0.71	2.5	ug/L	EPA 8260D	

Client ID: CRCA-MW0031-058.0-20220114 **Lab ID:** AF00374-03

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Methane	0.657		0.00400	0.00500	mg/L	RSK 175	
Vinyl chloride	7.8		0.71	2.5	ug/L	EPA 8260D	

Client ID: CRCA-MW0018-058.0-20220114 **Lab ID:** AF00374-04

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Methane	1.15		0.0400	0.0500	mg/L	RSK 175	
Vinyl chloride	34		0.71	2.5	ug/L	EPA 8260D	

Client ID: CRCA-MW0013-027.5-20220114 **Lab ID:** AF00374-05

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Vinyl chloride	1.1	I	0.71	2.5	ug/L	EPA 8260D	

Client ID: CRCA-MW0019-058.0-20220114 **Lab ID:** AF00374-06

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Methane	0.346		0.00400	0.00500	mg/L	RSK 175	

Client ID: CRCA-MW0032-058.0-20220114 **Lab ID:** AF00374-07

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Vinyl chloride	14		0.71	2.5	ug/L	EPA 8260D	

ANALYTICAL RESULTS

Description: CRCA-MW0027-035.0-20220114 **Lab Sample ID:** AF00374-01 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 10:55 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2A17028	EPA 8260D	01/17/22 13:34	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 13:34	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 13:34	KKW	QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	QV-01
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	QV-01
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	

ANALYTICAL RESULTS

Description: CRCA-MW0027-035.0-20220114 **Lab Sample ID:** AF00374-01 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 10:55 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Vinyl chloride [75-01-4]^	0.71	U	ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 13:34	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 13:34	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*52*	*1*	*50.0*	*104 %*	*41-142*	*2A17028*	*EPA 8260D*	*01/17/22 13:34*	*KKW*	
Dibromofluoromethane	*55*	*1*	*50.0*	*110 %*	*53-146*	*2A17028*	*EPA 8260D*	*01/17/22 13:34*	*KKW*	
Toluene-d8	*53*	*1*	*50.0*	*105 %*	*41-146*	*2A17028*	*EPA 8260D*	*01/17/22 13:34*	*KKW*	

ANALYTICAL RESULTS

Description: CRCA-MW0002-032.5-20220114 **Lab Sample ID:** AF00374-02 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 11:25 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2A17028	EPA 8260D	01/17/22 14:02	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:02	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:02	KKW	QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	QV-01
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	QV-01
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
trans-1,2-Dichloroethene [156-60-5]^	**1.1**	I	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	

ANALYTICAL RESULTS

Description: CRCA-MW0002-032.5-20220114 **Lab Sample ID:** AF00374-02 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 11:25 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Vinyl chloride [75-01-4]^	**6.6**		ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 14:02	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 14:02	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*54*	*1*	*50.0*	*108 %*	*41-142*	*2A17028*	*EPA 8260D*	*01/17/22 14:02*	*KKW*	
Dibromofluoromethane	*53*	*1*	*50.0*	*106 %*	*53-146*	*2A17028*	*EPA 8260D*	*01/17/22 14:02*	*KKW*	
Toluene-d8	*53*	*1*	*50.0*	*105 %*	*41-146*	*2A17028*	*EPA 8260D*	*01/17/22 14:02*	*KKW*	

ANALYTICAL RESULTS

Description: CRCA-MW0031-058.0-20220114 **Lab Sample ID:** AF00374-03 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 11:45 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2A17028	EPA 8260D	01/17/22 14:29	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:29	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:29	KKW	QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	QV-01
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	QV-01
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	

ANALYTICAL RESULTS

Description: CRCA-MW0031-058.0-20220114 **Lab Sample ID:** AF00374-03 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 11:45 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Vinyl chloride [75-01-4]^	**7.8**		ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 14:29	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 14:29	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*54*	*1*	*50.0*	*107 %*	*41-142*	*2A17028*	*EPA 8260D*	*01/17/22 14:29*	*KKW*	
Dibromofluoromethane	*54*	*1*	*50.0*	*108 %*	*53-146*	*2A17028*	*EPA 8260D*	*01/17/22 14:29*	*KKW*	
Toluene-d8	*51*	*1*	*50.0*	*103 %*	*41-146*	*2A17028*	*EPA 8260D*	*01/17/22 14:29*	*KKW*	

Dissolved Gases by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Ethane [74-84-0]^	0.00510	U	mg/L	1	0.00510	0.00600	2A19013	RSK 175	01/19/22 13:10	RGG	
Ethene [74-85-1]^	0.00510	U	mg/L	1	0.00510	0.00600	2A19013	RSK 175	01/19/22 13:10	RGG	
Methane [74-82-8]^	**0.657**		mg/L	1	0.00400	0.00500	2A19013	RSK 175	01/19/22 13:10	RGG	

ANALYTICAL RESULTS

Description: CRCA-MW0018-058.0-20220114 **Lab Sample ID:** AF00374-04 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 12:10 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2A17028	EPA 8260D	01/17/22 14:57	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:57	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:57	KKW	QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	QV-01
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	QV-01
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	

ANALYTICAL RESULTS

Description: CRCA-MW0018-058.0-20220114 **Lab Sample ID:** AF00374-04 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 12:10 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Vinyl chloride [75-01-4]^	**34**		ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 14:57	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 14:57	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*54*	*1*	*50.0*	*107 %*	*41-142*	*2A17028*	*EPA 8260D*	*01/17/22 14:57*	*KKW*	
Dibromofluoromethane	*53*	*1*	*50.0*	*106 %*	*53-146*	*2A17028*	*EPA 8260D*	*01/17/22 14:57*	*KKW*	
Toluene-d8	*52*	*1*	*50.0*	*105 %*	*41-146*	*2A17028*	*EPA 8260D*	*01/17/22 14:57*	*KKW*	

Dissolved Gases by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Ethane [74-84-0]^	0.0510	U	mg/L	10	0.0510	0.0600	2A19013	RSK 175	01/19/22 13:26	RGG	
Ethene [74-85-1]^	0.0510	U	mg/L	10	0.0510	0.0600	2A19013	RSK 175	01/19/22 13:26	RGG	
Methane [74-82-8]^	**1.15**		mg/L	10	0.0400	0.0500	2A19013	RSK 175	01/19/22 13:26	RGG	

ANALYTICAL RESULTS

Description: CRCA-MW0013-027.5-20220114 **Lab Sample ID:** AF00374-05 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 13:00 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2A17028	EPA 8260D	01/17/22 15:25	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 15:25	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 15:25	KKW	QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	QV-01
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	QV-01
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	

ANALYTICAL RESULTS

Description: CRCA-MW0013-027.5-20220114 **Lab Sample ID:** AF00374-05 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 13:00 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Vinyl chloride [75-01-4]^	**1.1**	I	ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 15:25	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 15:25	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*52*	*1*	*50.0*	*104 %*	*41-142*	*2A17028*	*EPA 8260D*	*01/17/22 15:25*	*KKW*	
Dibromofluoromethane	*54*	*1*	*50.0*	*108 %*	*53-146*	*2A17028*	*EPA 8260D*	*01/17/22 15:25*	*KKW*	
Toluene-d8	*51*	*1*	*50.0*	*102 %*	*41-146*	*2A17028*	*EPA 8260D*	*01/17/22 15:25*	*KKW*	

ANALYTICAL RESULTS

Description: CRCA-MW0019-058.0-20220114 **Lab Sample ID:** AF00374-06 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 13:05 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2A17028	EPA 8260D	01/17/22 15:53	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 15:53	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 15:53	KKW	QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	QV-01
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	QV-01
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	

ANALYTICAL RESULTS

Description: CRCA-MW0019-058.0-20220114 **Lab Sample ID:** AF00374-06 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 13:05 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Vinyl chloride [75-01-4]^	0.71	U	ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 15:53	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 15:53	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*53*	*1*	*50.0*	*107 %*	*41-142*	*2A17028*	*EPA 8260D*	*01/17/22 15:53*	*KKW*	
Dibromofluoromethane	*54*	*1*	*50.0*	*108 %*	*53-146*	*2A17028*	*EPA 8260D*	*01/17/22 15:53*	*KKW*	
Toluene-d8	*53*	*1*	*50.0*	*106 %*	*41-146*	*2A17028*	*EPA 8260D*	*01/17/22 15:53*	*KKW*	

Dissolved Gases by GC

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Ethane [74-84-0]^	0.00510	U	mg/L	1	0.00510	0.00600	2A19013	RSK 175	01/19/22 13:42	RGG	
Ethene [74-85-1]^	0.00510	U	mg/L	1	0.00510	0.00600	2A19013	RSK 175	01/19/22 13:42	RGG	
Methane [74-82-8]^	**0.346**		mg/L	1	0.00400	0.00500	2A19013	RSK 175	01/19/22 13:42	RGG	

ANALYTICAL RESULTS

Description: CRCA-MW0032-058.0-20220114 **Lab Sample ID:** AF00374-07 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 15:00 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2A17028	EPA 8260D	01/17/22 16:21	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 16:21	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 16:21	KKW	QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	QV-01
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	QV-01
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	

ANALYTICAL RESULTS

Description: CRCA-MW0032-058.0-20220114 **Lab Sample ID:** AF00374-07 **Received:** 01/14/22 15:40

Matrix: Ground Water **Sampled:** 01/14/22 15:00 **Work Order:** AF00374

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden/R. Siegel

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Vinyl chloride [75-01-4]^	**14**		ug/L	1	0.71	2.5	2A17028	EPA 8260D	01/17/22 16:21	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2A17028	EPA 8260D	01/17/22 16:21	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*52*	*1*	*50.0*	*104 %*	*41-142*	*2A17028*	*EPA 8260D*	*01/17/22 16:21*	*KKW*	
Dibromofluoromethane	*55*	*1*	*50.0*	*109 %*	*53-146*	*2A17028*	*EPA 8260D*	*01/17/22 16:21*	*KKW*	
Toluene-d8	*52*	*1*	*50.0*	*104 %*	*41-146*	*2A17028*	*EPA 8260D*	*01/17/22 16:21*	*KKW*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A17028 - EPA 5030B_MS

Blank (2A17028-BLK1) Prepared: 01/17/2022 00:00 Analyzed: 01/17/2022 12:38

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.80	U	2.5	ug/L							
1,1,2,2-Tetrachloroethane	0.54	U	2.5	ug/L							
1,1,2-Trichloroethane	0.76	U	2.5	ug/L							
1,1-Dichloroethane	0.62	U	2.5	ug/L							
1,1-Dichloroethene	0.94	U	2.5	ug/L							
1,2,4-Trichlorobenzene	0.70	U	2.5	ug/L							
1,2-Dibromo-3-chloropropane	0.96	U	2.5	ug/L							
1,2-Dibromoethane	0.78	U	2.5	ug/L							
1,2-Dichlorobenzene	0.73	U	2.5	ug/L							
1,2-Dichloroethane	0.63	U	2.5	ug/L							
1,2-Dichloropropane	0.80	U	2.5	ug/L							
1,3-Dichlorobenzene	0.77	U	2.5	ug/L							
1,4-Dichlorobenzene	0.76	U	2.5	ug/L							
2-Butanone	4.5	U	12	ug/L							
2-Hexanone	2.5	U	12	ug/L							
4-Methyl-2-pentanone	2.5	U	12	ug/L							
Acetone	10	U	25	ug/L							
Benzene	0.71	U	2.5	ug/L							
Bromodichloromethane	0.52	U	2.5	ug/L							
Bromoform	0.75	U	2.5	ug/L							
Bromomethane	0.95	U	2.5	ug/L							
Carbon disulfide	2.5	U	12	ug/L							
Carbon Tetrachloride	0.94	U	2.5	ug/L							
Chlorobenzene	0.72	U	2.5	ug/L							
Chloroethane	0.98	U	2.5	ug/L							
Chloroform	0.80	U	2.5	ug/L							
Chloromethane	0.82	U	2.5	ug/L							
cis-1,2-Dichloroethene	0.53	U	2.5	ug/L							
cis-1,3-Dichloropropene	0.59	U	2.5	ug/L							
Cyclohexane	0.93	U	2.5	ug/L							
Dibromochloromethane	0.50	U	2.5	ug/L							
Dichlorodifluoromethane	0.74	U	2.5	ug/L							
Ethylbenzene	0.69	U	2.5	ug/L							
Freon 113	0.73	U	2.5	ug/L							
Isopropylbenzene	0.67	U	2.5	ug/L							
m,p-Xylenes	1.3	U	5.0	ug/L							
Methyl acetate	0.95	U	2.5	ug/L							
Methyl cyclohexane	0.64	U	2.5	ug/L							
Methylene Chloride	2.5	U	12	ug/L							
Methyl-tert-Butyl Ether	0.60	U	2.5	ug/L							
o-Xylene	0.53	U	2.5	ug/L							
Styrene	0.61	U	2.5	ug/L							
Tetrachloroethene	0.76	U	2.5	ug/L							
Toluene	0.72	U	2.5	ug/L							
trans-1,2-Dichloroethene	0.73	U	2.5	ug/L							
trans-1,3-Dichloropropene	0.73	U	2.5	ug/L							
Trichloroethene	0.89	U	2.5	ug/L							
Trichlorofluoromethane	0.94	U	2.5	ug/L							
Vinyl chloride	0.71	U	2.5	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A17028 - EPA 5030B_MS - Continued

Blank (2A17028-BLK1) Continued Prepared: 01/17/2022 00:00 Analyzed: 01/17/2022 12:38

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Xylenes (Total)	1.3	U	5.0	ug/L							
4-Bromofluorobenzene	*53*			*ug/L*	*50.0*		*106*	*41-142*			
Dibromofluoromethane	*56*			*ug/L*	*50.0*		*112*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*105*	*41-146*			

LCS (2A17028-BS1) Prepared: 01/17/2022 00:00 Analyzed: 01/17/2022 11:43

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	22		2.5	ug/L	20.0		112	57-148			
1,1,2,2-Tetrachloroethane	20		2.5	ug/L	20.0		98	60-139			
1,1,2-Trichloroethane	20		2.5	ug/L	20.0		102	57-141			
1,1-Dichloroethane	20		2.5	ug/L	20.0		102	57-142			
1,1-Dichloroethene	19		2.5	ug/L	20.0		93	47-139			
1,2,4-Trichlorobenzene	21		2.5	ug/L	20.0		104	52-159			
1,2-Dibromo-3-chloropropane	19		2.5	ug/L	20.0		96	48-150			
1,2-Dibromoethane	19		2.5	ug/L	20.0		97	57-140			
1,2-Dichlorobenzene	21		2.5	ug/L	20.0		104	63-131			
1,2-Dichloroethane	18		2.5	ug/L	20.0		90	50-156			
1,2-Dichloropropane	20		2.5	ug/L	20.0		98	61-133			
1,3-Dichlorobenzene	21		2.5	ug/L	20.0		105	66-129			
1,4-Dichlorobenzene	20		2.5	ug/L	20.0		99	65-133			
2-Butanone	100		12	ug/L	100		100	10-180			
2-Hexanone	82		12	ug/L	100		82	12-180			
4-Methyl-2-pentanone	89		12	ug/L	100		89	19-180			
Acetone	87		25	ug/L	100		87	10-180			
Benzene	20		2.5	ug/L	20.0		101	56-136			
Bromodichloromethane	18		2.5	ug/L	20.0		91	58-135			
Bromoform	24		2.5	ug/L	20.0		119	46-148			
Bromomethane	12		2.5	ug/L	20.0		61	10-173			
Carbon disulfide	21		12	ug/L	20.0		106	43-153			
Carbon Tetrachloride	27		2.5	ug/L	20.0		137	54-156			
Chlorobenzene	21		2.5	ug/L	20.0		106	51-139			
Chloroethane	22		2.5	ug/L	20.0		112	27-180			
Chloroform	20		2.5	ug/L	20.0		101	58-139			
Chloromethane	16		2.5	ug/L	20.0		80	33-154			
cis-1,2-Dichloroethene	21		2.5	ug/L	20.0		104	56-128			
cis-1,3-Dichloropropene	17		2.5	ug/L	20.0		87	64-128			
Cyclohexane	21		2.5	ug/L	20.0		105	70-130			
Dibromochloromethane	19		2.5	ug/L	20.0		95	50-140			
Dichlorodifluoromethane	16		2.5	ug/L	20.0		81	10-180			
Ethylbenzene	20		2.5	ug/L	20.0		102	63-133			
Freon 113	20		2.5	ug/L	20.0		98	47-173			
Isopropylbenzene	21		2.5	ug/L	20.0		104	60-132			
m,p-Xylenes	42		5.0	ug/L	40.0		105	64-133			
Methyl acetate	21		2.5	ug/L	20.0		106	70-130			
Methyl cyclohexane	21		2.5	ug/L	20.0		107	70-130			
Methylene Chloride	21		12	ug/L	20.0		103	43-142			
Methyl-tert-Butyl Ether	22		2.5	ug/L	20.0		112	51-145			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A17028 - EPA 5030B_MS - Continued

LCS (2A17028-BS1) Continued Prepared: 01/17/2022 00:00 Analyzed: 01/17/2022 11:43

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Xylene	21		2.5	ug/L	20.0		107	61-129			
Styrene	19		2.5	ug/L	20.0		94	59-136			
Tetrachloroethene	19		2.5	ug/L	20.0		95	60-147			
Toluene	20		2.5	ug/L	20.0		99	64-131			
trans-1,2-Dichloroethene	21		2.5	ug/L	20.0		104	54-134			
trans-1,3-Dichloropropene	19		2.5	ug/L	20.0		96	65-149			
Trichloroethene	19		2.5	ug/L	20.0		97	62-135			
Trichlorofluoromethane	18		2.5	ug/L	20.0		92	56-155			
Vinyl chloride	19		2.5	ug/L	20.0		93	20-167			
4-Bromofluorobenzene	*55*			*ug/L*	*50.0*		*110*	*41-142*			
Dibromofluoromethane	*55*			*ug/L*	*50.0*		*109*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*107*	*41-146*			

Matrix Spike (2A17028-MS1) Prepared: 01/17/2022 00:00 Analyzed: 01/17/2022 21:25

Source: AF00374-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	25		2.5	ug/L	20.0	0.80 U	126	57-148			
1,1,2,2-Tetrachloroethane	20		2.5	ug/L	20.0	0.54 U	102	60-139			
1,1,2-Trichloroethane	21		2.5	ug/L	20.0	0.76 U	107	57-141			
1,1-Dichloroethane	22		2.5	ug/L	20.0	0.62 U	110	57-142			
1,1-Dichloroethene	22		2.5	ug/L	20.0	0.94 U	108	47-139			
1,2,4-Trichlorobenzene	21		2.5	ug/L	20.0	0.70 U	105	52-159			
1,2-Dibromo-3-chloropropane	17		2.5	ug/L	20.0	0.96 U	85	48-150			
1,2-Dibromoethane	20		2.5	ug/L	20.0	0.78 U	102	57-140			
1,2-Dichlorobenzene	22		2.5	ug/L	20.0	0.73 U	109	63-131			
1,2-Dichloroethane	19		2.5	ug/L	20.0	0.63 U	94	50-156			
1,2-Dichloropropane	20		2.5	ug/L	20.0	0.80 U	99	61-133			
1,3-Dichlorobenzene	23		2.5	ug/L	20.0	0.77 U	113	66-129			
1,4-Dichlorobenzene	20		2.5	ug/L	20.0	0.76 U	102	65-133			
2-Butanone	96		12	ug/L	100	4.5 U	96	10-180			
2-Hexanone	84		12	ug/L	100	2.5 U	84	12-180			
4-Methyl-2-pentanone	94		12	ug/L	100	2.5 U	94	19-180			
Acetone	81		25	ug/L	100	10 U	81	10-180			
Benzene	22		2.5	ug/L	20.0	0.71 U	108	56-136			
Bromodichloromethane	19		2.5	ug/L	20.0	0.52 U	97	58-135			
Bromoform	26		2.5	ug/L	20.0	0.75 U	131	46-148			
Bromomethane	16		2.5	ug/L	20.0	0.95 U	79	10-173			
Carbon disulfide	24		12	ug/L	20.0	2.5 U	119	43-153			
Carbon Tetrachloride	28		2.5	ug/L	20.0	0.94 U	138	54-156			
Chlorobenzene	23		2.5	ug/L	20.0	0.72 U	114	51-139			
Chloroethane	24		2.5	ug/L	20.0	0.98 U	122	27-180			
Chloroform	22		2.5	ug/L	20.0	0.80 U	112	58-139			
Chloromethane	18		2.5	ug/L	20.0	0.82 U	89	33-154			
cis-1,2-Dichloroethene	21		2.5	ug/L	20.0	0.53 U	105	56-128			
cis-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.59 U	88	64-128			
Cyclohexane	24		2.5	ug/L	20.0	0.93 U	119	70-130			
Dibromochloromethane	19		2.5	ug/L	20.0	0.50 U	96	50-140			
Dichlorodifluoromethane	17		2.5	ug/L	20.0	0.74 U	85	10-180			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A17028 - EPA 5030B_MS - Continued

Matrix Spike (2A17028-MS1) Continued Prepared: 01/17/2022 00:00 Analyzed: 01/17/2022 21:25

Source: AF00374-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethylbenzene	22		2.5	ug/L	20.0	0.69 U	111	63-133			
Freon 113	23		2.5	ug/L	20.0	0.73 U	114	47-173			
Isopropylbenzene	23		2.5	ug/L	20.0	0.67 U	116	60-132			
m,p-Xylenes	45		5.0	ug/L	40.0	1.3 U	113	64-133			
Methyl acetate	19		2.5	ug/L	20.0	0.95 U	97	70-130			
Methyl cyclohexane	25		2.5	ug/L	20.0	0.64 U	125	70-130			
Methylene Chloride	21		12	ug/L	20.0	2.5 U	107	43-142			
Methyl-tert-Butyl Ether	22		2.5	ug/L	20.0	0.60 U	108	51-145			
o-Xylene	23		2.5	ug/L	20.0	0.53 U	116	61-129			
Styrene	21		2.5	ug/L	20.0	0.61 U	103	59-136			
Tetrachloroethene	21		2.5	ug/L	20.0	0.76 U	105	60-147			
Toluene	21		2.5	ug/L	20.0	0.72 U	107	64-131			
trans-1,2-Dichloroethene	23		2.5	ug/L	20.0	0.73 U	117	54-134			
trans-1,3-Dichloropropene	20		2.5	ug/L	20.0	0.73 U	99	65-149			
Trichloroethene	21		2.5	ug/L	20.0	0.89 U	105	62-135			
Trichlorofluoromethane	21		2.5	ug/L	20.0	0.94 U	107	56-155			
Vinyl chloride	20		2.5	ug/L	20.0	0.71 U	100	20-167			
4-Bromofluorobenzene	*53*			*ug/L*	*50.0*		*107*	*41-142*			
Dibromofluoromethane	*53*			*ug/L*	*50.0*		*106*	*53-146*			
Toluene-d8	*53*			*ug/L*	*50.0*		*106*	*41-146*			

Matrix Spike Dup (2A17028-MSD1) Prepared: 01/17/2022 00:00 Analyzed: 01/17/2022 21:53

Source: AF00374-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	24		2.5	ug/L	20.0	0.80 U	119	57-148	5	25	
1,1,2,2-Tetrachloroethane	21		2.5	ug/L	20.0	0.54 U	104	60-139	1	17	
1,1,2-Trichloroethane	22		2.5	ug/L	20.0	0.76 U	110	57-141	2	16	
1,1-Dichloroethane	21		2.5	ug/L	20.0	0.62 U	105	57-142	4	24	
1,1-Dichloroethene	22		2.5	ug/L	20.0	0.94 U	108	47-139	0.2	16	
1,2,4-Trichlorobenzene	23		2.5	ug/L	20.0	0.70 U	116	52-159	9	24	
1,2-Dibromo-3-chloropropane	20		2.5	ug/L	20.0	0.96 U	101	48-150	17	21	
1,2-Dibromoethane	21		2.5	ug/L	20.0	0.78 U	104	57-140	2	16	
1,2-Dichlorobenzene	22		2.5	ug/L	20.0	0.73 U	110	63-131	0.9	25	
1,2-Dichloroethane	19		2.5	ug/L	20.0	0.63 U	96	50-156	2	18	
1,2-Dichloropropane	21		2.5	ug/L	20.0	0.80 U	103	61-133	4	26	
1,3-Dichlorobenzene	22		2.5	ug/L	20.0	0.77 U	112	66-129	0.5	23	
1,4-Dichlorobenzene	21		2.5	ug/L	20.0	0.76 U	106	65-133	3	23	
2-Butanone	97		12	ug/L	100	4.5 U	97	10-180	1	29	
2-Hexanone	81		12	ug/L	100	2.5 U	81	12-180	4	28	
4-Methyl-2-pentanone	95		12	ug/L	100	2.5 U	95	19-180	0.1	24	
Acetone	76		25	ug/L	100	10 U	76	10-180	6	19	
Benzene	22		2.5	ug/L	20.0	0.71 U	108	56-136	0.4	14	
Bromodichloromethane	19		2.5	ug/L	20.0	0.52 U	95	58-135	2	19	
Bromoform	24		2.5	ug/L	20.0	0.75 U	122	46-148	7	18	
Bromomethane	18		2.5	ug/L	20.0	0.95 U	91	10-173	15	29	
Carbon disulfide	23		12	ug/L	20.0	2.5 U	113	43-153	5	26	
Carbon Tetrachloride	30		2.5	ug/L	20.0	0.94 U	150	54-156	8	27	
Chlorobenzene	23		2.5	ug/L	20.0	0.72 U	116	51-139	1	13	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2A17028 - EPA 5030B_MS - Continued

Matrix Spike Dup (2A17028-MSD1) Continued Prepared: 01/17/2022 00:00 Analyzed: 01/17/2022 21:53

Source: AF00374-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloroethane	24		2.5	ug/L	20.0	0.98 U	119	27-180	3	22	
Chloroform	21		2.5	ug/L	20.0	0.80 U	105	58-139	6	17	
Chloromethane	17		2.5	ug/L	20.0	0.82 U	86	33-154	4	31	
cis-1,2-Dichloroethene	22		2.5	ug/L	20.0	0.53 U	108	56-128	2	17	
cis-1,3-Dichloropropene	17		2.5	ug/L	20.0	0.59 U	85	64-128	4	20	
Cyclohexane	23		2.5	ug/L	20.0	0.93 U	117	70-130	2	20	
Dibromochloromethane	21		2.5	ug/L	20.0	0.50 U	103	50-140	8	18	
Dichlorodifluoromethane	17		2.5	ug/L	20.0	0.74 U	87	10-180	2	26	
Ethylbenzene	22		2.5	ug/L	20.0	0.69 U	111	63-133	0.5	18	
Freon 113	24		2.5	ug/L	20.0	0.73 U	119	47-173	4	30	
Isopropylbenzene	23		2.5	ug/L	20.0	0.67 U	117	60-132	0.8	23	
m,p-Xylenes	45		5.0	ug/L	40.0	1.3 U	112	64-133	0.6	18	
Methyl acetate	18		2.5	ug/L	20.0	0.95 U	92	70-130	6	20	
Methyl cyclohexane	25		2.5	ug/L	20.0	0.64 U	124	70-130	1	20	
Methylene Chloride	22		12	ug/L	20.0	2.5 U	111	43-142	4	23	
Methyl-tert-Butyl Ether	23		2.5	ug/L	20.0	0.60 U	114	51-145	5	22	
o-Xylene	23		2.5	ug/L	20.0	0.53 U	116	61-129	0.9	16	
Styrene	20		2.5	ug/L	20.0	0.61 U	102	59-136	1	32	
Tetrachloroethene	21		2.5	ug/L	20.0	0.76 U	103	60-147	2	21	
Toluene	21		2.5	ug/L	20.0	0.72 U	107	64-131	0.5	16	
trans-1,2-Dichloroethene	23		2.5	ug/L	20.0	0.73 U	114	54-134	3	20	
trans-1,3-Dichloropropene	20		2.5	ug/L	20.0	0.73 U	101	65-149	2	17	
Trichloroethene	20		2.5	ug/L	20.0	0.89 U	99	62-135	6	20	
Trichlorofluoromethane	20		2.5	ug/L	20.0	0.94 U	102	56-155	5	22	
Vinyl chloride	20		2.5	ug/L	20.0	0.71 U	102	20-167	1	24	
4-Bromofluorobenzene	*56*			*ug/L*	*50.0*		*111*	*41-142*			
Dibromofluoromethane	*55*			*ug/L*	*50.0*		*110*	*53-146*			
Toluene-d8	*54*			*ug/L*	*50.0*		*108*	*41-146*			

Dissolved Gases by GC - Quality Control

Batch 2A19013 - Same

Blank (2A19013-BLK1) Prepared: 01/19/2022 08:05 Analyzed: 01/19/2022 09:47

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.00510	U	0.00600	mg/L							
Ethene	0.00510	U	0.00600	mg/L							
Methane	0.00400	U	0.00500	mg/L							

LCS (2A19013-BS1) Prepared: 01/19/2022 08:05 Analyzed: 01/19/2022 09:16

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.362		0.00600	mg/L	0.323		112	70-130			
Ethene	0.356		0.00600	mg/L	0.302		118	70-130			
Methane	0.190		0.00500	mg/L	0.174		109	70-130			

QUALITY CONTROL DATA

Dissolved Gases by GC - Quality Control

Batch 2A19013 - Same - Continued

LCS Dup (2A19013-BSD1) Prepared: 01/19/2022 08:05 Analyzed: 01/19/2022 09:32

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.352		0.00600	mg/L	0.323		109	70-130	3	30	
Ethene	0.345		0.00600	mg/L	0.302		114	70-130	3	30	
Methane	0.183		0.00500	mg/L	0.174		105	70-130	4	30	

Duplicate (2A19013-DUP1) Prepared: 01/19/2022 08:05 Analyzed: 01/19/2022 14:54

Source: AF00363-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethane	0.00510	U	0.00600	mg/L		0.00510 U				30	
Ethene	0.00510	U	0.00600	mg/L		0.00510 U				30	
Methane	0.00400	U	0.00500	mg/L		0.00400 U				30	

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*****	Not reported due to interference.
[CALC]	Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.
QV-01	The associated continuing calibration verification standard exhibited high bias; since the result is ND, there is no impact.

B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported result is an estimated value.
U	The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a “tentative identification".
Q	One or more quality control criteria failed.

AF 00374

Tetra Tech, Inc. CHAIN OF CUSTODY | NUMBER No. 2558 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G08970	KSC-CRCA	Alex Murphy	(321) 292-0842	ENCO - Kaitlin Dykich
SAMPLERS (SIGNATURE)		**FIELD OPERATIONS LEADER**	**PHONE NUMBER**	**ADDRESS**
Chuck Sorden, R Siegel		Chuck Sorden	(321) 591-7580	10775 Central Port Dr
		CARRIER/WAYBILL NUMBER		**CITY, STATE**
				Orlando, FL

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2022)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: 8260 TCL SOMGI	HCl	4°C	RSK175 MEE	COMMENTS
									G	G					
01/14	1055	CRCA-MW0027-035.0-20220114		30	40	GW	G	3			X				
	1125	CRCA-MW0002-032.5-20220114		30	35			3			X				
	1145	CRCA-MW0031-058.0-20220114		53	63			6			X	X			
	1210	CRCA-MW0018-058.0-20220114		53	63			6			X	X			
	1300	CRCA-MW0013-027.5-20220114		25	30			3			X				
	1305	CRCA-MW0019-058.0-20220114		53	63			6			X	X			
01/14	1500	CRCA-MW0032-058.0-20220114		53	63	GW	G	3			X				

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	01/14/2022	1540	1. RECEIVED BY James W Gregory	1/14/22	1840
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: SM-405 0.0°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

ENCO Orlando

SDG: AF00374-TE016

CLASS: 01_VOA_MS

METHOD: EPA 8260D

ANALYSES DATA PACKAGE COVER PAGE

EPA 8260D

Laboratory: ENCO Orlando

SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Client Sample Id:	Lab Sample Id:
CRCA-MW0027-035.0-20220114	AF00374-01
CRCA-MW0002-032.5-20220114	AF00374-02
CRCA-MW0031-058.0-20220114	AF00374-03
CRCA-MW0018-058.0-20220114	AF00374-04
CRCA-MW0013-027.5-20220114	AF00374-05
CRCA-MW0019-058.0-20220114	AF00374-06
CRCA-MW0032-058.0-20220114	AF00374-07

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0027-035.0-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-01 File ID: 225AL013.D

Sampled: 01/14/22 10:55 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 13:34

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	0.71	U	0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0027-035.0-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-01 File ID: 225AL013.D

Sampled: 01/14/22 10:55 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 13:34

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	55	110	53 - 146	
Toluene-d8	50.0	53	105	41 - 146	
4-Bromofluorobenzene	50.0	52	104	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1019799	9.851	1352333	9.845	
1,4-Difluorobenzene	2171085	10.444	2676972	10.438	
Chlorobenzene-d5	1259303	13.223	1499134	13.218	
1,4-Dichlorobenzene-d4	998079	15.486	1293958	15.48	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0002-032.5-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-02 File ID: 225AL014.D

Sampled: 01/14/22 11:25 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 14:02

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	6.6		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	1.1	J	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0002-032.5-20220114

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Ground Water
Laboratory ID: AF00374-02
File ID: 225AL014.D
Sampled: 01/14/22 11:25
Prepared: 01/17/22 11:51
Analyzed: 01/17/22 14:02
Solids:
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Batch: 2A17028
Sequence: AA70175
Calibration: 2111046
Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	53	106	53 - 146	
Toluene-d8	50.0	53	105	41 - 146	
4-Bromofluorobenzene	50.0	54	108	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1080632	9.851	1352333	9.845	
1,4-Difluorobenzene	2254010	10.444	2676972	10.438	
Chlorobenzene-d5	1233818	13.229	1499134	13.218	
1,4-Dichlorobenzene-d4	1014366	15.491	1293958	15.48	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0031-058.0-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-03 File ID: 225AL015.D

Sampled: 01/14/22 11:45 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 14:29

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	7.8		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0031-058.0-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-03 File ID: 225AL015.D

Sampled: 01/14/22 11:45 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 14:29

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	108	53 - 146	
Toluene-d8	50.0	51	103	41 - 146	
4-Bromofluorobenzene	50.0	54	107	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1038129	9.851	1352333	9.845	
1,4-Difluorobenzene	2176016	10.444	2676972	10.438	
Chlorobenzene-d5	1227203	13.229	1499134	13.218	
1,4-Dichlorobenzene-d4	1006647	15.486	1293958	15.48	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0018-058.0-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-04 File ID: 225AL016.D

Sampled: 01/14/22 12:10 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 14:57

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	34		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0018-058.0-20220114

Laboratory: ENCO Orlando | SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) | Project: NASA KSC CRCA

Matrix: Ground Water | Laboratory ID: AF00374-04 | File ID: 225AL016.D

Sampled: 01/14/22 12:10 | Prepared: 01/17/22 11:51 | Analyzed: 01/17/22 14:57

Solids: | Preparation: EPA 5030B_MS | Initial/Final: 5 mL / 5 mL

Batch: 2A17028 | Sequence: AA70175 | Calibration: 2111046 | Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	53	106	53 - 146	
Toluene-d8	50.0	52	105	41 - 146	
4-Bromofluorobenzene	50.0	54	107	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1031823	9.851	1352333	9.845	
1,4-Difluorobenzene	2158610	10.444	2676972	10.438	
Chlorobenzene-d5	1198314	13.229	1499134	13.218	
1,4-Dichlorobenzene-d4	990247	15.485	1293958	15.48	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0013-027.5-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-05 File ID: 225AL017.D

Sampled: 01/14/22 13:00 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 15:25

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	1.1	J	0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0013-027.5-20220114

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Ground Water
Laboratory ID: AF00374-05
File ID: 225AL017.D
Sampled: 01/14/22 13:00
Prepared: 01/17/22 11:51
Analyzed: 01/17/22 15:25
Solids:
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Batch: 2A17028
Sequence: AA70175
Calibration: 2111046
Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	108	53 - 146	
Toluene-d8	50.0	51	102	41 - 146	
4-Bromofluorobenzene	50.0	52	104	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1010008	9.851	1352333	9.845	
1,4-Difluorobenzene	2182032	10.444	2676972	10.438	
Chlorobenzene-d5	1223608	13.229	1499134	13.218	
1,4-Dichlorobenzene-d4	1008071	15.485	1293958	15.48	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0019-058.0-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-06 File ID: 225AL018.D

Sampled: 01/14/22 13:05 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 15:53

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	0.71	U	0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0019-058.0-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-06 File ID: 225AL018.D

Sampled: 01/14/22 13:05 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 15:53

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	54	108	53 - 146	
Toluene-d8	50.0	53	106	41 - 146	
4-Bromofluorobenzene	50.0	53	107	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	993763	9.851	1352333	9.845	
1,4-Difluorobenzene	2088665	10.444	2676972	10.438	
Chlorobenzene-d5	1188253	13.229	1499134	13.218	
1,4-Dichlorobenzene-d4	950908	15.485	1293958	15.48	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0032-058.0-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-07 File ID: 225AL019.D

Sampled: 01/14/22 15:00 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 16:21

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	14		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-MW0032-058.0-20220114

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF00374-07 File ID: 225AL019.D

Sampled: 01/14/22 15:00 Prepared: 01/17/22 11:51 Analyzed: 01/17/22 16:21

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2A17028 Sequence: AA70175 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	55	109	53 - 146	
Toluene-d8	50.0	52	104	41 - 146	
4-Bromofluorobenzene	50.0	52	104	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	984739	9.851	1352333	9.845	
1,4-Difluorobenzene	2109278	10.444	2676972	10.438	
Chlorobenzene-d5	1213145	13.229	1499134	13.218	
1,4-Dichlorobenzene-d4	963527	15.485	1293958	15.48	

* Values outside of QC limits

HOLDING TIME SUMMARY

EPA 8260D

Laboratory: ENCO Orlando

SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-MW0027-035.0-20220114	01/14/22 10:55	01/14/22 15:40	01/17/22 11:51	3.04	NA	01/17/22 13:34	3.00	14.00	
CRCA-MW0002-032.5-20220114	01/14/22 11:25	01/14/22 15:40	01/17/22 11:51	3.02	NA	01/17/22 14:02	3.00	14.00	
CRCA-MW0031-058.0-20220114	01/14/22 11:45	01/14/22 15:40	01/17/22 11:51	3.00	NA	01/17/22 14:29	3.00	14.00	
CRCA-MW0018-058.0-20220114	01/14/22 12:10	01/14/22 15:40	01/17/22 11:51	2.99	NA	01/17/22 14:57	3.00	14.00	
CRCA-MW0013-027.5-20220114	01/14/22 13:00	01/14/22 15:40	01/17/22 11:51	2.95	NA	01/17/22 15:25	3.00	14.00	
CRCA-MW0019-058.0-20220114	01/14/22 13:05	01/14/22 15:40	01/17/22 11:51	2.95	NA	01/17/22 15:53	3.00	14.00	
CRCA-MW0032-058.0-20220114	01/14/22 15:00	01/14/22 15:40	01/17/22 11:51	2.87	NA	01/17/22 16:21	3.00	14.00	

PREPARATION BATCH SUMMARY

EPA 8260D

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Batch: 2A17028 Batch Matrix: Water Preparation: EPA 5030B_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	2A17028-BLK1	225AL011.D	01/17/22 00:00	
LCS	2A17028-BS1	225AL009.D	01/17/22 00:00	
CRCA-MW0027-035.0-20220114	2A17028-MS1	225AL030.D	01/17/22 00:00	
CRCA-MW0027-035.0-20220114	2A17028-MSD1	225AL031.D	01/17/22 00:00	
CRCA-MW0027-035.0-20220114	AF00374-01	225AL013.D	01/17/22 11:51	
CRCA-MW0002-032.5-20220114	AF00374-02	225AL014.D	01/17/22 11:51	
CRCA-MW0031-058.0-20220114	AF00374-03	225AL015.D	01/17/22 11:51	
CRCA-MW0018-058.0-20220114	AF00374-04	225AL016.D	01/17/22 11:51	
CRCA-MW0013-027.5-20220114	AF00374-05	225AL017.D	01/17/22 11:51	
CRCA-MW0019-058.0-20220114	AF00374-06	225AL018.D	01/17/22 11:51	
CRCA-MW0032-058.0-20220114	AF00374-07	225AL019.D	01/17/22 11:51	

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	2A17028-BLK1	File ID:	225AL011.D
Prepared:	01/17/22 00:00	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	01/17/22 12:38	Instrument:	OVGCMS5		
Batch:	2A17028	Sequence:	AA70175	Calibration:	2111046

CAS NO.	COMPOUND	CONC. (ug/L)	Q
75-71-8	Dichlorodifluoromethane	0.74	U
74-87-3	Chloromethane	0.82	U
75-01-4	Vinyl chloride	0.71	U
74-83-9	Bromomethane	0.95	U
75-00-3	Chloroethane	0.98	U
75-69-4	Trichlorofluoromethane	0.94	U
76-13-1	Freon 113	0.73	U
67-64-1	Acetone	10	U
75-35-4	1,1-Dichloroethene	0.94	U
75-15-0	Carbon disulfide	2.5	U
75-09-2	Methylene Chloride	2.5	U
1634-04-4	Methyl-tert-Butyl Ether	0.60	U
156-60-5	trans-1,2-Dichloroethene	0.73	U
156-59-2	cis-1,2-Dichloroethene	0.53	U
75-34-3	1,1-Dichloroethane	0.62	U
78-93-3	2-Butanone	4.5	U
67-66-3	Chloroform	0.80	U
71-55-6	1,1,1-Trichloroethane	0.80	U
79-20-9	Methyl acetate	0.95	U
110-82-7	Cyclohexane	0.93	U
108-87-2	Methyl cyclohexane	0.64	U
56-23-5	Carbon Tetrachloride	0.94	U
107-06-2	1,2-Dichloroethane	0.63	U
71-43-2	Benzene	0.71	U
79-01-6	Trichloroethene	0.89	U
78-87-5	1,2-Dichloropropane	0.80	U
75-27-4	Bromodichloromethane	0.52	U
108-10-1	4-Methyl-2-pentanone	2.5	U
591-78-6	2-Hexanone	2.5	U
10061-01-5	cis-1,3-Dichloropropene	0.59	U

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	2A17028-BLK1	File ID:	225AL011.D
Prepared:	01/17/22 00:00	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	01/17/22 12:38	Instrument:	OVGCMS5		
Batch:	2A17028	Sequence:	AA70175	Calibration:	2111046

CAS NO.	COMPOUND	CONC. (ug/L)	Q
108-88-3	Toluene	0.72	U
10061-02-6	trans-1,3-Dichloropropene	0.73	U
79-00-5	1,1,2-Trichloroethane	0.76	U
127-18-4	Tetrachloroethene	0.76	U
124-48-1	Dibromochloromethane	0.50	U
106-93-4	1,2-Dibromoethane	0.78	U
108-90-7	Chlorobenzene	0.72	U
100-41-4	Ethylbenzene	0.69	U
108-38-3/106-42-3	m,p-Xylenes	1.3	U
95-47-6	o-Xylene	0.53	U
75-25-2	Bromoform	0.75	U
100-42-5	Styrene	0.61	U
98-82-8	Isopropylbenzene	0.67	U
79-34-5	1,1,2,2-Tetrachloroethane	0.54	U
120-82-1	1,2,4-Trichlorobenzene	0.70	U
541-73-1	1,3-Dichlorobenzene	0.77	U
106-46-7	1,4-Dichlorobenzene	0.76	U
95-50-1	1,2-Dichlorobenzene	0.73	U
96-12-8	1,2-Dibromo-3-chloropropane	0.96	U
1330-20-7	Xylenes (Total)	1.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	56	112	53 - 146	
Toluene-d8	50.0	53	105	41 - 146	
4-Bromofluorobenzene	50.0	53	106	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1047020	9.851	1352333	9.845	
1,4-Difluorobenzene	2214927	10.444	2676972	10.438	
Chlorobenzene-d5	1261134	13.229	1499134	13.218	
1,4-Dichlorobenzene-d4	1056087	15.486	1293958	15.48	

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	2A17028	Laboratory ID:	2A17028-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	16	81	10 - 180
Chloromethane	20.0	16	80	33 - 154
Vinyl chloride	20.0	19	93	20 - 167
Bromomethane	20.0	12	61	10 - 173
Chloroethane	20.0	22	112	27 - 180
Trichlorofluoromethane	20.0	18	92	56 - 155
Freon 113	20.0	20	98	47 - 173
Acetone	100	87	87	10 - 180
1,1-Dichloroethene	20.0	19	93	47 - 139
Carbon disulfide	20.0	21	106	43 - 153
Methylene Chloride	20.0	21	103	43 - 142
Methyl-tert-Butyl Ether	20.0	22	112	51 - 145
trans-1,2-Dichloroethene	20.0	21	104	54 - 134
cis-1,2-Dichloroethene	20.0	21	104	56 - 128
1,1-Dichloroethane	20.0	20	102	57 - 142
2-Butanone	100	100	100	10 - 180
Chloroform	20.0	20	101	58 - 139
1,1,1-Trichloroethane	20.0	22	112	57 - 148
Methyl acetate	20.0	21	106	70 - 130
Cyclohexane	20.0	21	105	70 - 130
Methyl cyclohexane	20.0	21	107	70 - 130
Carbon Tetrachloride	20.0	27	137	54 - 156
1,2-Dichloroethane	20.0	18	90	50 - 156
Benzene	20.0	20	101	56 - 136
Trichloroethene	20.0	19	97	62 - 135
1,2-Dichloropropane	20.0	20	98	61 - 133
Bromodichloromethane	20.0	18	91	58 - 135
4-Methyl-2-pentanone	100	89	89	19 - 180
2-Hexanone	100	82	82	12 - 180
cis-1,3-Dichloropropene	20.0	17	87	64 - 128

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	2A17028	Laboratory ID:	2A17028-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Toluene	20.0	20	99	64 - 131
trans-1,3-Dichloropropene	20.0	19	96	65 - 149
1,1,2-Trichloroethane	20.0	20	102	57 - 141
Tetrachloroethene	20.0	19	95	60 - 147
Dibromochloromethane	20.0	19	95	50 - 140
1,2-Dibromoethane	20.0	19	97	57 - 140
Chlorobenzene	20.0	21	106	51 - 139
Ethylbenzene	20.0	20	102	63 - 133
m,p-Xylenes	40.0	42	105	64 - 133
o-Xylene	20.0	21	107	61 - 129
Bromoform	20.0	24	119	46 - 148
Styrene	20.0	19	94	59 - 136
Isopropylbenzene	20.0	21	104	60 - 132
1,1,2,2-Tetrachloroethane	20.0	20	98	60 - 139
1,2,4-Trichlorobenzene	20.0	21	104	52 - 159
1,3-Dichlorobenzene	20.0	21	105	66 - 129
1,4-Dichlorobenzene	20.0	20	99	65 - 133
1,2-Dichlorobenzene	20.0	21	104	63 - 131
1,2-Dibromo-3-chloropropane	20.0	19	96	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-MW0027-035.0-20220114

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2A17028
Laboratory ID: 2A17028-MS1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-MW0027-035.0-20220114

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	ND	17	85	10 - 180
Chloromethane	20.0	ND	18	89	33 - 154
Vinyl chloride	20.0	ND	20	100	20 - 167
Bromomethane	20.0	ND	16	79	10 - 173
Chloroethane	20.0	ND	24	122	27 - 180
Trichlorofluoromethane	20.0	ND	21	107	56 - 155
Freon 113	20.0	ND	23	114	47 - 173
Acetone	100	ND	81	81	10 - 180
1,1-Dichloroethene	20.0	ND	22	108	47 - 139
Carbon disulfide	20.0	ND	24	119	43 - 153
Methylene Chloride	20.0	ND	21	107	43 - 142
Methyl-tert-Butyl Ether	20.0	ND	22	108	51 - 145
trans-1,2-Dichloroethene	20.0	ND	23	117	54 - 134
cis-1,2-Dichloroethene	20.0	ND	21	105	56 - 128
1,1-Dichloroethane	20.0	ND	22	110	57 - 142
2-Butanone	100	ND	96	96	10 - 180
Chloroform	20.0	ND	22	112	58 - 139
1,1,1-Trichloroethane	20.0	ND	25	126	57 - 148
Methyl acetate	20.0	ND	19	97	70 - 130
Cyclohexane	20.0	ND	24	119	70 - 130
Methyl cyclohexane	20.0	ND	25	125	70 - 130
Carbon Tetrachloride	20.0	ND	28	138	54 - 156
1,2-Dichloroethane	20.0	ND	19	94	50 - 156
Benzene	20.0	ND	22	108	56 - 136
Trichloroethene	20.0	ND	21	105	62 - 135
1,2-Dichloropropane	20.0	ND	20	99	61 - 133
Bromodichloromethane	20.0	ND	19	97	58 - 135
4-Methyl-2-pentanone	100	ND	94	94	19 - 180
2-Hexanone	100	ND	84	84	12 - 180
cis-1,3-Dichloropropene	20.0	ND	18	88	64 - 128
Toluene	20.0	ND	21	107	64 - 131

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-MW0027-035.0-20220114

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2A17028
Laboratory ID: 2A17028-MS1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-MW0027-035.0-20220114

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
trans-1,3-Dichloropropene	20.0	ND	20	99	65 - 149
1,1,2-Trichloroethane	20.0	ND	21	107	57 - 141
Tetrachloroethene	20.0	ND	21	105	60 - 147
Dibromochloromethane	20.0	ND	19	96	50 - 140
1,2-Dibromoethane	20.0	ND	20	102	57 - 140
Chlorobenzene	20.0	ND	23	114	51 - 139
Ethylbenzene	20.0	ND	22	111	63 - 133
m,p-Xylenes	40.0	ND	45	113	64 - 133
o-Xylene	20.0	ND	23	116	61 - 129
Bromoform	20.0	ND	26	131	46 - 148
Styrene	20.0	ND	21	103	59 - 136
Isopropylbenzene	20.0	ND	23	116	60 - 132
1,1,2,2-Tetrachloroethane	20.0	ND	20	102	60 - 139
1,2,4-Trichlorobenzene	20.0	ND	21	105	52 - 159
1,3-Dichlorobenzene	20.0	ND	23	113	66 - 129
1,4-Dichlorobenzene	20.0	ND	20	102	65 - 133
1,2-Dichlorobenzene	20.0	ND	22	109	63 - 131
1,2-Dibromo-3-chloropropane	20.0	ND	17	85	48 - 150

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-MW0027-035.0-20220114

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2A17028
Laboratory ID: 2A17028-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-MW0027-035.0-20220114

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	20.0	17	87	2	26	10 - 180
Chloromethane	20.0	17	86	4	31	33 - 154
Vinyl chloride	20.0	20	102	1	24	20 - 167
Bromomethane	20.0	18	91	15	29	10 - 173
Chloroethane	20.0	24	119	3	22	27 - 180
Trichlorofluoromethane	20.0	20	102	5	22	56 - 155
Freon 113	20.0	24	119	4	30	47 - 173
Acetone	100	76	76	6	19	10 - 180
1,1-Dichloroethene	20.0	22	108	0.2	16	47 - 139
Carbon disulfide	20.0	23	113	5	26	43 - 153
Methylene Chloride	20.0	22	111	4	23	43 - 142
Methyl-tert-Butyl Ether	20.0	23	114	5	22	51 - 145
trans-1,2-Dichloroethene	20.0	23	114	3	20	54 - 134
cis-1,2-Dichloroethene	20.0	22	108	2	17	56 - 128
1,1-Dichloroethane	20.0	21	105	4	24	57 - 142
2-Butanone	100	97	97	1	29	10 - 180
Chloroform	20.0	21	105	6	17	58 - 139
1,1,1-Trichloroethane	20.0	24	119	5	25	57 - 148
Methyl acetate	20.0	18	92	6	20	70 - 130
Cyclohexane	20.0	23	117	2	20	70 - 130
Methyl cyclohexane	20.0	25	124	1	20	70 - 130
Carbon Tetrachloride	20.0	30	150	8	27	54 - 156
1,2-Dichloroethane	20.0	19	96	2	18	50 - 156
Benzene	20.0	22	108	0.4	14	56 - 136
Trichloroethene	20.0	20	99	6	20	62 - 135
1,2-Dichloropropane	20.0	21	103	4	26	61 - 133
Bromodichloromethane	20.0	19	95	2	19	58 - 135
4-Methyl-2-pentanone	100	95	95	0.1	24	19 - 180
2-Hexanone	100	81	81	4	28	12 - 180
cis-1,3-Dichloropropene	20.0	17	85	4	20	64 - 128
Toluene	20.0	21	107	0.5	16	64 - 131
trans-1,3-Dichloropropene	20.0	20	101	2	17	65 - 149

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-MW0027-035.0-20220114

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2A17028
Laboratory ID: 2A17028-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-MW0027-035.0-20220114

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1,2-Trichloroethane	20.0	22	110	2	16	57 - 141
Tetrachloroethene	20.0	21	103	2	21	60 - 147
Dibromochloromethane	20.0	21	103	8	18	50 - 140
1,2-Dibromoethane	20.0	21	104	2	16	57 - 140
Chlorobenzene	20.0	23	116	1	13	51 - 139
Ethylbenzene	20.0	22	111	0.5	18	63 - 133
m,p-Xylenes	40.0	45	112	0.6	18	64 - 133
o-Xylene	20.0	23	116	0.9	16	61 - 129
Bromoform	20.0	24	122	7	18	46 - 148
Styrene	20.0	20	102	1	32	59 - 136
Isopropylbenzene	20.0	23	117	0.8	23	60 - 132
1,1,2,2-Tetrachloroethane	20.0	21	104	1	17	60 - 139
1,2,4-Trichlorobenzene	20.0	23	116	9	24	52 - 159
1,3-Dichlorobenzene	20.0	22	112	0.5	23	66 - 129
1,4-Dichlorobenzene	20.0	21	106	3	23	65 - 133
1,2-Dichlorobenzene	20.0	22	110	0.9	25	63 - 131
1,2-Dibromo-3-chloropropane	20.0	20	101	17	21	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA69173
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA69173-SCV1)			Lab File ID: 215KC012.D		Analyzed: 11/08/21 12:44			
Dibromofluoromethane	50.0	109	70 - 130	9.422	9.41825	0.0038	+/-0.5	
Toluene-d8	50.0	107	70 - 130	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	105	70 - 130	14.322	14.322	0.0000	+/-0.5	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA70175
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA70175-CCV1)			Lab File ID: 225AL008.D		Analyzed: 01/17/22 11:14			
Dibromofluoromethane	50.0	113	80 - 120	9.422	9.41825	0.0038	+/-0.5	
Toluene-d8	50.0	108	80 - 120	11.778	11.772	0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	110	80 - 120	14.328	14.322	0.0060	+/-0.5	
LCS (2A17028-BS1)			Lab File ID: 225AL009.D		Analyzed: 01/17/22 11:43			
Dibromofluoromethane	50.0	109	53 - 146	9.422	9.41825	0.0038	+/-0.5	
Toluene-d8	50.0	107	41 - 146	11.778	11.772	0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	110	41 - 142	14.328	14.322	0.0060	+/-0.5	
Blank (2A17028-BLK1)			Lab File ID: 225AL011.D		Analyzed: 01/17/22 12:38			
Dibromofluoromethane	50.0	112	53 - 146	9.422	9.41825	0.0038	+/-0.5	
Toluene-d8	50.0	105	41 - 146	11.778	11.772	0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	106	41 - 142	14.328	14.322	0.0060	+/-0.5	
CRCA-MW0027-035.0-20220114 (AF00374-01)			Lab File ID: 225AL013.D		Analyzed: 01/17/22 13:34			
Dibromofluoromethane	50.0	110	53 - 146	9.422	9.41825	0.0038	+/-0.5	
Toluene-d8	50.0	105	41 - 146	11.778	11.772	0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	104	41 - 142	14.328	14.322	0.0060	+/-0.5	
CRCA-MW0002-032.5-20220114 (AF00374-02)			Lab File ID: 225AL014.D		Analyzed: 01/17/22 14:02			
Dibromofluoromethane	50.0	106	53 - 146	9.428	9.41825	0.0098	+/-0.5	
Toluene-d8	50.0	105	41 - 146	11.778	11.772	0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	108	41 - 142	14.328	14.322	0.0060	+/-0.5	
CRCA-MW0031-058.0-20220114 (AF00374-03)			Lab File ID: 225AL015.D		Analyzed: 01/17/22 14:29			
Dibromofluoromethane	50.0	108	53 - 146	9.428	9.41825	0.0098	+/-0.5	
Toluene-d8	50.0	103	41 - 146	11.778	11.772	0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	107	41 - 142	14.328	14.322	0.0060	+/-0.5	
CRCA-MW0018-058.0-20220114 (AF00374-04)			Lab File ID: 225AL016.D		Analyzed: 01/17/22 14:57			
Dibromofluoromethane	50.0	106	53 - 146	9.428	9.41825	0.0098	+/-0.5	
Toluene-d8	50.0	105	41 - 146	11.778	11.772	0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	107	41 - 142	14.328	14.322	0.0060	+/-0.5	
CRCA-MW0013-027.5-20220114 (AF00374-05)			Lab File ID: 225AL017.D		Analyzed: 01/17/22 15:25			
Dibromofluoromethane	50.0	108	53 - 146	9.422	9.41825	0.0038	+/-0.5	
Toluene-d8	50.0	102	41 - 146	11.778	11.772	0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	104	41 - 142	14.328	14.322	0.0060	+/-0.5	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA70175
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
CRCA-MW0019-058.0-20220114 (AF00374-06)			Lab File ID: 225AL018.D		Analyzed: 01/17/22 15:53			
Dibromofluoromethane	50.0	108	53 - 146	9.428	9.41825	0.0098	+/-0.5	
Toluene-d8	50.0	106	41 - 146	11.778	11.772	0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	107	41 - 142	14.328	14.322	0.0060	+/-0.5	
CRCA-MW0032-058.0-20220114 (AF00374-07)			Lab File ID: 225AL019.D		Analyzed: 01/17/22 16:21			
Dibromofluoromethane	50.0	109	53 - 146	9.428	9.41825	0.0098	+/-0.5	
Toluene-d8	50.0	104	41 - 146	11.778	11.772	0.0060	+/-0.5	
4-Bromofluorobenzene	50.0	104	41 - 142	14.328	14.322	0.0060	+/-0.5	
Matrix Spike (2A17028-MS1)			Lab File ID: 225AL030.D		Analyzed: 01/17/22 21:25			
Dibromofluoromethane	50.0	106	53 - 146	9.416	9.41825	-0.0023	+/-0.5	
Toluene-d8	50.0	106	41 - 146	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	107	41 - 142	14.322	14.322	0.0000	+/-0.5	
Matrix Spike Dup (2A17028-MSD1)			Lab File ID: 225AL031.D		Analyzed: 01/17/22 21:53			
Dibromofluoromethane	50.0	110	53 - 146	9.422	9.41825	0.0038	+/-0.5	
Toluene-d8	50.0	108	41 - 146	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	111	41 - 142	14.322	14.322	0.0000	+/-0.5	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA69173
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA69173-CAL1)			Lab File ID: 215KC003.D			Analyzed: 11/08/21 08:34			
Pentafluorobenzene	1341353	9.851	1352333	9.845	99	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2550205	10.438	2676972	10.438	95	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1343991	13.223	1499134	13.218	90	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1132020	15.48	1293958	15.48	87	50 - 200	0.0000	+/-0.50	
Cal Standard (AA69173-CAL2)			Lab File ID: 215KC004.D			Analyzed: 11/08/21 09:01			
Pentafluorobenzene	1351713	9.845	1352333	9.845	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2541770	10.438	2676972	10.438	95	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1399397	13.223	1499134	13.218	93	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1161047	15.479	1293958	15.48	90	50 - 200	-0.0010	+/-0.50	
Cal Standard (AA69173-CAL3)			Lab File ID: 215KC005.D			Analyzed: 11/08/21 09:29			
Pentafluorobenzene	1342561	9.845	1352333	9.845	99	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2530760	10.438	2676972	10.438	95	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1395960	13.217	1499134	13.218	93	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1163571	15.474	1293958	15.48	90	50 - 200	-0.0060	+/-0.50	
Cal Standard (AA69173-CAL4)			Lab File ID: 215KC006.D			Analyzed: 11/08/21 09:57			
Pentafluorobenzene	1329545	9.845	1352333	9.845	98	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2529195	10.438	2676972	10.438	94	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1407406	13.217	1499134	13.218	94	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1179463	15.479	1293958	15.48	91	50 - 200	-0.0010	+/-0.50	
Cal Standard (AA69173-CAL5)			Lab File ID: 215KC007.D			Analyzed: 11/08/21 10:25			
Pentafluorobenzene	1330054	9.845	1352333	9.845	98	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2593765	10.438	2676972	10.438	97	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1435594	13.217	1499134	13.218	96	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1235201	15.48	1293958	15.48	95	50 - 200	0.0000	+/-0.50	
Cal Standard (AA69173-CAL6)			Lab File ID: 215KC008.D			Analyzed: 11/08/21 10:52			
Pentafluorobenzene	1352333	9.845	1352333	9.845	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2676972	10.438	2676972	10.438	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1499134	13.218	1499134	13.218	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	1293958	15.48	1293958	15.48	100	50 - 200	0.0000	+/-0.50	
Cal Standard (AA69173-CAL7)			Lab File ID: 215KC009.D			Analyzed: 11/08/21 11:20			
Pentafluorobenzene	1375266	9.845	1352333	9.845	102	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2624988	10.438	2676972	10.438	98	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1544754	13.217	1499134	13.218	103	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1391219	15.48	1293958	15.48	108	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA69173
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA69173-CAL8)			Lab File ID: 215KC010.D			Analyzed: 11/08/21 11:48			
Pentafluorobenzene	1357376	9.845	1352333	9.845	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2634382	10.438	2676972	10.438	98	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1568019	13.217	1499134	13.218	105	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1379564	15.48	1293958	15.48	107	50 - 200	0.0000	+/-0.50	
Secondary Cal Check (AA69173-SCV1)			Lab File ID: 215KC012.D			Analyzed: 11/08/21 12:44			
Pentafluorobenzene	1304691	9.845	1352333	9.845	96	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2526000	10.438	2676972	10.438	94	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1492201	13.223	1499134	13.218	100	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1289303	15.479	1293958	15.48	100	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA70175
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (AA70175-CCV1)			Lab File ID: 225AL008.D			Analyzed: 01/17/22 11:14			
Pentafluorobenzene	1054663	9.851	1352333	9.845	78	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2172497	10.444	2676972	10.438	81	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1267752	13.229	1499134	13.218	85	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	1070257	15.486	1293958	15.48	83	50 - 200	0.0060	+/-0.50	
LCS (2A17028-BS1)			Lab File ID: 225AL009.D			Analyzed: 01/17/22 11:43			
Pentafluorobenzene	1087532	9.851	1352333	9.845	80	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2268946	10.444	2676972	10.438	85	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1271343	13.229	1499134	13.218	85	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	1064942	15.485	1293958	15.48	82	50 - 200	0.0050	+/-0.50	
Blank (2A17028-BLK1)			Lab File ID: 225AL011.D			Analyzed: 01/17/22 12:38			
Pentafluorobenzene	1047020	9.851	1352333	9.845	77	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2214927	10.444	2676972	10.438	83	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1261134	13.229	1499134	13.218	84	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	1056087	15.486	1293958	15.48	82	50 - 200	0.0060	+/-0.50	
CRCA-MW0027-035.0-20220114 (AF00374-01)			Lab File ID: 225AL013.D			Analyzed: 01/17/22 13:34			
Pentafluorobenzene	1019799	9.851	1352333	9.845	75	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2171085	10.444	2676972	10.438	81	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1259303	13.223	1499134	13.218	84	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	998079	15.486	1293958	15.48	77	50 - 200	0.0060	+/-0.50	
CRCA-MW0002-032.5-20220114 (AF00374-02)			Lab File ID: 225AL014.D			Analyzed: 01/17/22 14:02			
Pentafluorobenzene	1080632	9.851	1352333	9.845	80	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2254010	10.444	2676972	10.438	84	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1233818	13.229	1499134	13.218	82	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	1014366	15.491	1293958	15.48	78	50 - 200	0.0110	+/-0.50	
CRCA-MW0031-058.0-20220114 (AF00374-03)			Lab File ID: 225AL015.D			Analyzed: 01/17/22 14:29			
Pentafluorobenzene	1038129	9.851	1352333	9.845	77	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2176016	10.444	2676972	10.438	81	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1227203	13.229	1499134	13.218	82	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	1006647	15.486	1293958	15.48	78	50 - 200	0.0060	+/-0.50	
CRCA-MW0018-058.0-20220114 (AF00374-04)			Lab File ID: 225AL016.D			Analyzed: 01/17/22 14:57			
Pentafluorobenzene	1031823	9.851	1352333	9.845	76	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2158610	10.444	2676972	10.438	81	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1198314	13.229	1499134	13.218	80	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	990247	15.485	1293958	15.48	77	50 - 200	0.0050	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA70175
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
CRCA-MW0013-027.5-20220114 (AF00374-05)			Lab File ID: 225AL017.D			Analyzed: 01/17/22 15:25			
Pentafluorobenzene	1010008	9.851	1352333	9.845	75	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2182032	10.444	2676972	10.438	82	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1223608	13.229	1499134	13.218	82	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	1008071	15.485	1293958	15.48	78	50 - 200	0.0050	+/-0.50	
CRCA-MW0019-058.0-20220114 (AF00374-06)			Lab File ID: 225AL018.D			Analyzed: 01/17/22 15:53			
Pentafluorobenzene	993763	9.851	1352333	9.845	73	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2088665	10.444	2676972	10.438	78	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1188253	13.229	1499134	13.218	79	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	950908	15.485	1293958	15.48	73	50 - 200	0.0050	+/-0.50	
CRCA-MW0032-058.0-20220114 (AF00374-07)			Lab File ID: 225AL019.D			Analyzed: 01/17/22 16:21			
Pentafluorobenzene	984739	9.851	1352333	9.845	73	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2109278	10.444	2676972	10.438	79	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1213145	13.229	1499134	13.218	81	50 - 200	0.0110	+/-0.50	
1,4-Dichlorobenzene-d4	963527	15.485	1293958	15.48	74	50 - 200	0.0050	+/-0.50	
Matrix Spike (2A17028-MS1)			Lab File ID: 225AL030.D			Analyzed: 01/17/22 21:25			
Pentafluorobenzene	1001136	9.845	1352333	9.845	74	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2035307	10.438	2676972	10.438	76	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1169255	13.223	1499134	13.218	78	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	995239	15.48	1293958	15.48	77	50 - 200	0.0000	+/-0.50	
Matrix Spike Dup (2A17028-MSD1)			Lab File ID: 225AL031.D			Analyzed: 01/17/22 21:53			
Pentafluorobenzene	1021900	9.845	1352333	9.845	76	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2078030	10.444	2676972	10.438	78	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1178563	13.223	1499134	13.218	79	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1005037	15.48	1293958	15.48	78	50 - 200	0.0000	+/-0.50	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA69173		
Calibration:	2111046	Instrument:	OVGCMS5

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA69173-TUN1	215KC002.D	11/08/21 07:59
Cal Standard	AA69173-CAL1	215KC003.D	11/08/21 08:34
Cal Standard	AA69173-CAL2	215KC004.D	11/08/21 09:01
Cal Standard	AA69173-CAL3	215KC005.D	11/08/21 09:29
Cal Standard	AA69173-CAL4	215KC006.D	11/08/21 09:57
Cal Standard	AA69173-CAL5	215KC007.D	11/08/21 10:25
Cal Standard	AA69173-CAL6	215KC008.D	11/08/21 10:52
Cal Standard	AA69173-CAL7	215KC009.D	11/08/21 11:20
Cal Standard	AA69173-CAL8	215KC010.D	11/08/21 11:48
Secondary Cal Check	AA69173-SCV1	215KC012.D	11/08/21 12:44

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA70175		
Calibration:	2111046	Instrument:	OVGCMS5

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	AA70175-CCV1	225AL008.D	01/17/22 11:14
LCS	2A17028-BS1	225AL009.D	01/17/22 11:43
Blank	2A17028-BLK1	225AL011.D	01/17/22 12:38
CRCA-MW0027-035.0-20220114	AF00374-01	225AL013.D	01/17/22 13:34
CRCA-MW0002-032.5-20220114	AF00374-02	225AL014.D	01/17/22 14:02
CRCA-MW0031-058.0-20220114	AF00374-03	225AL015.D	01/17/22 14:29
CRCA-MW0018-058.0-20220114	AF00374-04	225AL016.D	01/17/22 14:57
CRCA-MW0013-027.5-20220114	AF00374-05	225AL017.D	01/17/22 15:25
CRCA-MW0019-058.0-20220114	AF00374-06	225AL018.D	01/17/22 15:53
CRCA-MW0032-058.0-20220114	AF00374-07	225AL019.D	01/17/22 16:21
CRCA-MW0027-035.0-20220114	2A17028-MS1	225AL030.D	01/17/22 21:25
CRCA-MW0027-035.0-20220114	2A17028-MSD1	225AL031.D	01/17/22 21:53

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Lab File ID:	215KC002.D	Injection Date:	11/08/21
Instrument ID:	OVGCMS5	Injection Time:	07:59
Sequence:	AA69173	Lab Sample ID:	AA69173-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
95	50 - 200% of 174	153	PASS
96	5 - 9% of 95	7.14	PASS
173	Less than 2% of 174	0.158	PASS
174	50 - 200% of 95	65.3	PASS
175	5 - 9% of 174	7.48	PASS
176	95 - 105% of 174	97.9	PASS
177	5 - 10% of 176	6.79	PASS

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS5	Calibration:	2111046
Lab File ID:	225AL008.D	Calibration Date:	11/08/21 08:47
Sequence:	AA70175	Injection Date:	01/17/22
Lab Sample ID:	AA70175-CCV1	Injection Time:	11:14

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
Dichlorodifluoromethane	A	20.0	21	0.6541938	0.690358		5.5	20	
Chloromethane	A	20.0	22	0.8265057	0.8356959		8.5	20	
Vinyl chloride	A	20.0	19	0.5890365	0.571429		-3	20	
Bromomethane	A	20.0	42	0.2183848	0.3875551		110	20	*
Chloroethane	A	20.0	22	0.3313991	0.3090727		7.9	20	
Trichlorofluoromethane	A	20.0	22	0.7198355	0.7778551		8.1	20	
Freon 113	A	50.0	60	0.291157	0.3521419		21	20	*
Acetone	A	250	220	0.1188119	0.1062925		-11	20	
1,1-Dichloroethene	A	50.0	53	0.4497824	0.4788496		6.5	20	
Carbon disulfide	A	250	310	1.280426	1.611419		25	20	*
Methylene Chloride	A	50.0	54	0.5095401	0.5462418		7.2	20	
Methyl-tert-Butyl Ether	A	50.0	57	1.127138	1.285939		14	20	
trans-1,2-Dichloroethene	A	50.0	54	0.4840347	0.5354156		8.4	20	
cis-1,2-Dichloroethene	A	50.0	55	0.539181	0.5969518		11	20	
1,1-Dichloroethane	A	50.0	53	0.9186968	0.9742098		6.0	20	
2-Butanone	A	250	250	6.252422E-02	5.935583E-02		1.0	20	
Chloroform	A	50.0	54	0.9110893	0.9749266		7.0	20	
1,1,1-Trichloroethane	A	50.0	57	0.6829916	0.7801601		14	20	
Methyl acetate	A	50.0	49	0.2758045	0.284818		-2.6	20	
Cyclohexane	A	50.0	57	0.9169544	1.045347		14	20	
Methyl cyclohexane	A	50.0	55	0.6074144	0.5441734		11	20	
Carbon Tetrachloride	A	50.0	66	0.2321685	0.3628714		32	20	*
1,2-Dichloroethane	A	50.0	46	0.3583755	0.3056455		-8.9	20	
Benzene	A	50.0	51	1.081856	1.109942		2.6	20	
Trichloroethene	A	50.0	50	0.2493154	0.2639847		0.90	20	
1,2-Dichloropropane	A	50.0	52	0.2923637	0.3015176		3.1	20	
Bromodichloromethane	A	50.0	47	0.2982542	0.3237367		-6.2	20	
4-Methyl-2-pentanone	A	250	250	3.462393E-02	0.0339577		-1.9	20	
2-Hexanone	A	250	220	0.2638736	0.2511646		-12	20	

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS5	Calibration:	2111046
Lab File ID:	225AL008.D	Calibration Date:	11/08/21 08:47
Sequence:	AA70175	Injection Date:	01/17/22
Lab Sample ID:	AA70175-CCV1	Injection Time:	11:14

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
cis-1,3-Dichloropropene	A	50.0	48	0.4334937	0.4684632		-5	20
Toluene	A	50.0	49	1.251215	1.234361		-1.3	20
trans-1,3-Dichloropropene	A	50.0	47	0.5895958	0.61548		-6.6	20
1,1,2-Trichloroethane	A	50.0	51	0.3797259	0.3897971		2.7	20
Tetrachloroethene	A	50.0	49	0.3511604	0.3367772		-1.2	20
Dibromochloromethane	A	50.0	50	0.3080625	0.3829566		1.0	20
1,2-Dibromoethane	A	50.0	51	0.3790205	0.3866505		2.0	20
Chlorobenzene	A	50.0	52	1.192695	1.24624		4.5	20
Ethylbenzene	A	50.0	53	0.6816257	0.720454		5.7	20
m,p-Xylenes	A	100	100	0.8505266	0.8928118		5.0	20
o-Xylene	A	50.0	54	0.806243	0.8782167		8.9	20
Bromoform	A	50.0	56	0.1441141	0.1951872		12	20
Styrene	A	50.0	48	1.300073	1.426188		-4.2	20
Isopropylbenzene	A	50.0	53	2.096851	2.228934		6.3	20
1,1,2,2-Tetrachloroethane	A	50.0	51	0.5108722	0.5238256		2.5	20
1,2,4-Trichlorobenzene	A	50.0	55	0.4901185	0.5390733		10	20
1,3-Dichlorobenzene	A	50.0	53	1.038443	1.102763		6.2	20
1,4-Dichlorobenzene	A	50.0	49	1.106172	1.124797		-1.2	20
1,2-Dichlorobenzene	A	50.0	52	0.9941358	1.040109		4.6	20
1,2-Dibromo-3-chloropropane	A	50.0	49	8.937632E-02	9.544343E-02		-2.5	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA69173	Instrument:	OVGCMS5
Calibration:	2111046		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1J0534	MS Tune (lower conc.)	AA69173-TUN1	215KC002.D	11/08/21 07:59
A1K0853	8260 1.0 PPB ms5	AA69173-CAL1	215KC003.D	11/08/21 08:34
A1K0854	8260 2.0 PPB ms5	AA69173-CAL2	215KC004.D	11/08/21 09:01
A1K0855	8260 5.0 PPB ms5	AA69173-CAL3	215KC005.D	11/08/21 09:29
A1K0856	8260 10 PPB ms5	AA69173-CAL4	215KC006.D	11/08/21 09:57
A1K0857	8260 20 PPB ms5	AA69173-CAL5	215KC007.D	11/08/21 10:25
A1K0858	8260 50 PPB ms5	AA69173-CAL6	215KC008.D	11/08/21 10:52
A1K0859	8260 80 PPB ms5	AA69173-CAL7	215KC009.D	11/08/21 11:20
A1K0860	8260 100 PPB ms5	AA69173-CAL8	215KC010.D	11/08/21 11:48
A1K0784	8260 SCV 50 ppb/ 20 gases ms5	AA69173-SCV1	215KC012.D	11/08/21 12:44

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	1	0.7443231	2	0.5032873	5	0.6500859	10	0.6034847	20	0.6326341	50	0.6657524
Chloromethane	1	0.9591808	2	0.7599061	5	0.9088898	10	0.7190956	20	0.7791056	50	0.8066778
Vinyl chloride	1	0.6287681	2	0.4579005	5	0.5802045	10	0.5346829	20	0.5806418	50	0.6166854
Bromomethane	1	0.314235	2	0.235516	5	0.2580441	10	0.1796893	20	0.166356	50	0.1910639
Chloroethane	1	0.3698877	2	0.295144	5	0.379722	10	0.3367129	20	0.3305261	50	0.2764016
Trichlorofluoromethane	1	0.7454414	2	0.5730137	5	0.7765681	10	0.6678826	20	0.7148901	50	0.7343901
Freon 113	1	0.2760273	2	0.2282474	5	0.3206633	10	0.2676856	20	0.3005498	50	0.3003269
Acetone	5	0.1397022	10	8.872446E-02	25	0.1379081	50	0.1177967	100	0.1082328	250	0.1113408
1,1-Dichloroethene	1	0.5551111	2	0.3480399	5	0.4846037	10	0.4081321	20	0.4353695	50	0.4352264
Carbon disulfide	5	1.235916	10	0.8842114	25	1.568133	50	1.418763	100	1.30322	250	1.247655
Methylene Chloride	1	~~0.5688659~~	2	~~0.4191163~~	5	0.5510364	10	0.4493755	20	0.4900177	50	0.5027645
Methyl-tert-Butyl Ether	1	1.288251	2	0.7970072	5	1.193041	10	1.011797	20	1.096991	50	1.161448
trans-1,2-Dichloroethene	1	0.5479915	2	0.3272699	5	0.5606375	10	0.4492815	20	0.4566394	50	0.4883376
cis-1,2-Dichloroethene	1	0.6094965	2	0.3746727	5	0.5931276	10	0.4838911	20	0.5274786	50	0.5499629
1,1-Dichloroethane	1	1.054532	2	0.7395986	5	0.9544222	10	0.8435217	20	0.8932607	50	0.9154387
2-Butanone	5	8.161908E-02	10	5.101305E-02	25	7.316614E-02	50	6.082005E-02	100	5.464928E-02	250	5.645621E-02
Chloroform	1	1.008832	2	0.6488803	5	1.043737	10	0.8513928	20	0.9050911	50	0.9193416
1,1,1-Trichloroethane	1	0.6525874	2	0.4974059	5	0.7191703	10	0.626218	20	0.6737452	50	0.7301131
Methyl acetate	1	0.2125839	2	0.2323533	5	0.3277095	10	0.2601266	20	0.2600552	50	0.2882914
Cyclohexane	1	0.9208612	2	0.7618481	5	0.9736839	10	0.8180016	20	0.9073936	50	0.9393019
Methyl cyclohexane	1	1.10599	2	0.6321382	5	0.6583674	10	0.4843794	20	0.4711703	50	0.4740457
Carbon Tetrachloride	1	0.2053364	2	0.1465908	5	0.2168281	10	0.1977961	20	0.2350608	50	0.2539537
1,2-Dichloroethane	1	0.4661978	2	0.2877817	5	0.4136544	10	0.3339956	20	0.3204251	50	0.3268745
Benzene	1	1.215157	2	0.8544046	5	1.239201	10	1.009066	20	1.042526	50	1.057248
Trichloroethene	1	0.3084458	2	0.1615606	5	0.2723411	10	0.2305477	20	0.2427822	50	0.2505902
1,2-Dichloropropane	1	0.3357573	2	0.2346298	5	0.3112306	10	0.2661815	20	0.2825998	50	0.2862619
Bromodichloromethane	1	0.2856437	2	0.2181059	5	0.3196075	10	0.2524084	20	0.2956311	50	0.3136342
4-Methyl-2-pentanone	5	0.0335973	10	2.717004E-02	25	4.115365E-02	50	3.381432E-02	100	3.266988E-02	250	3.395979E-02
2-Hexanone	5	0.2346221	10	0.1586326	25	0.316373	50	0.2799597	100	0.2647496	250	0.2732542
cis-1,3-Dichloropropene	1	0.4707661	2	0.28729	5	0.4318782	10	0.3958572	20	0.4251657	50	0.4549383
Toluene	1	1.543165	2	1.001556	5	1.416301	10	1.152482	20	1.202103	50	1.216139

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	1	0.5940516	2	0.3215135	5	0.6704992	10	0.5470561	20	0.6094881	50	0.6418466
1,1,2-Trichloroethane	1	0.4122051	2	0.2976997	5	0.4105992	10	0.3571677	20	0.3736798	50	0.3862743
Tetrachloroethene	1	0.4542813	2	0.2595404	5	0.4254205	10	0.3121097	20	0.3421058	50	0.3321024
Dibromochloromethane	1	0.308819	2	0.1687334	5	0.3064271	10	0.252532	20	0.3058403	50	0.3498707
1,2-Dibromoethane	1	0.4291323	2	0.2621665	5	0.4130491	10	0.3437992	20	0.3784026	50	0.3889392
Chlorobenzene	1	1.322591	2	0.8904192	5	1.368592	10	1.135273	20	1.208827	50	1.188993
Ethylbenzene	1	0.7657045	2	0.5128638	5	0.7910542	10	0.609316	20	0.6539889	50	0.6912718
m,p-Xylenes	2	0.8998944	4	0.6399989	10	0.994939	20	0.8159444	40	0.8575135	100	0.8697585
o-Xylene	1	0.8046185	2	0.5955422	5	0.9099544	10	0.7294484	20	0.8172523	50	0.8316335
Bromoform	1	0.1198297	2	8.333947E-02	5	0.1226611	10	0.116228	20	0.134467	50	0.1642548
Styrene	1	1.206556	2	0.8642651	5	1.428193	10	1.171098	20	1.328166	50	1.395008
Isopropylbenzene	1	2.327434	2	1.456359	5	2.421774	10	1.940719	20	2.038027	50	2.134133
1,1,2,2-Tetrachloroethane	1	0.5692746	2	0.3549922	5	0.5724161	10	0.4600627	20	0.4842873	50	0.523719
1,2,4-Trichlorobenzene	1	0.4336496	2	0.3705061	5	0.5678038	10	0.4758098	20	0.4717754	50	0.5220548
1,3-Dichlorobenzene	1	1.136817	2	0.7925605	5	1.108209	10	0.969509	20	0.9961456	50	1.051553
1,4-Dichlorobenzene	1	1.3835	2	0.8003121	5	1.211005	10	1.033462	20	1.037534	50	1.095744
1,2-Dichlorobenzene	1	1.039646	2	0.6992396	5	1.151911	10	0.9495296	20	0.9366836	50	1.027779
1,2-Dibromo-3-chloropropane	1	8.219819E-02	2	7.109962E-02	5	9.102152E-02	10	7.738691E-02	20	8.275374E-02	50	9.518161E-02
Dibromofluoromethane	50	0.5213654	55	0.4883742	60	0.4863677	50	0.5418711	65	0.5249781	50	0.5633132
Toluene-d8	50	1.204121	55	1.159988	60	1.15519	50	1.228194	65	1.188561	50	1.231618
4-Bromofluorobenzene	50	0.8302065	55	0.7813489	60	0.7709933	50	0.8118453	65	0.8005242	50	0.8448371

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	80	0.7045673	100	0.7294154								
Chloromethane	80	0.8224336	100	0.8567567								
Vinyl chloride	80	0.6375817	100	0.6758271								
Bromomethane	80	0.1925555	100	0.2096188								
Chloroethane	80	~~0.1733356~~	100	~~0.1636503~~								
Trichlorofluoromethane	80	0.7532025	100	0.7932953								
Freon 113	80	0.3130817	100	0.322674								
Acetone	400	0.1256289	500	0.1211611								
1,1-Dichloroethene	80	0.4570052	100	0.4747715								
Carbon disulfide	400	1.300175	500	1.285334								
Methylene Chloride	80	0.525128	100	0.5389185								
Methyl-tert-Butyl Ether	80	1.22972	100	1.238846								
trans-1,2-Dichloroethene	80	0.5171304	100	0.5249894								
cis-1,2-Dichloroethene	80	0.5800023	100	0.594816								
1,1-Dichloroethane	80	0.9547403	100	0.9940602								
2-Butanone	400	6.240293E-02	500	0.060067								
Chloroform	80	0.9465719	100	0.9648675								
1,1,1-Trichloroethane	80	0.7633687	100	0.801324								
Methyl acetate	80	0.3157171	100	0.3095992								
Cyclohexane	80	0.9931829	100	1.021362								
Methyl cyclohexane	80	0.5119645	100	0.5212596								
Carbon Tetrachloride	80	0.2958359	100	0.3059458								
1,2-Dichloroethane	80	0.3598285	100	0.3582468								
Benzene	80	1.119785	100	1.117458								
Trichloroethene	80	0.2650181	100	0.2632378								
1,2-Dichloropropane	80	0.3078612	100	0.3143878								
Bromodichloromethane	80	0.3448549	100	0.3561479								
4-Methyl-2-pentanone	400	3.854751E-02	500	3.607894E-02								
2-Hexanone	400	0.3015983	500	0.2817997								
cis-1,3-Dichloropropene	80	0.5007618	100	0.5012925								
Toluene	80	1.250312	100	1.227658								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	80	0.6771467	100	0.6551643								
1,1,2-Trichloroethane	80	0.405516	100	0.3946655								
Tetrachloroethene	80	0.3395359	100	0.3441872								
Dibromochloromethane	80	0.3846628	100	0.3876149								
1,2-Dibromoethane	80	0.4140016	100	0.4026731								
Chlorobenzene	80	1.222218	100	1.204646								
Ethylbenzene	80	0.7172093	100	0.7115969								
m,p-Xylenes	160	0.8779626	200	0.8482018								
o-Xylene	80	0.8859882	100	0.8755063								
Bromoform	80	0.2051055	100	0.2070275								
Styrene	80	1.478863	100	1.528434								
Isopropylbenzene	80	2.23132	100	2.225046								
1,1,2,2-Tetrachloroethane	80	0.5696643	100	0.5525615								
1,2,4-Trichlorobenzene	80	0.5399316	100	0.5394168								
1,3-Dichlorobenzene	80	1.108494	100	1.144254								
1,4-Dichlorobenzene	80	1.127868	100	1.159947								
1,2-Dichlorobenzene	80	1.064045	100	1.084253								
1,2-Dibromo-3-chloropropane	80	0.1101637	100	0.1052053								
Dibromofluoromethane	70	0.5089758	75	0.5068323								
Toluene-d8	70	1.160035	75	1.156643								
4-Bromofluorobenzene	70	0.8034247	75	0.7953177								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	0.6541938	11.87968	3.97275	7.769159E-02			20	
Chloromethane	0.8265057	9.585286	4.41	7.394085E-02		0.9997979	0.99	
Vinyl chloride	0.5890365	11.57345	4.5715	5.797002E-02			20	
Bromomethane	0.2183848	22.39829	5.221	5.968524E-02		0.9986744	0.99	
Chloroethane	0.3313991	12.20852	5.449	0.1284504	0.993		0.99	
Trichlorofluoromethane	0.7198355	9.805754	5.6865	0.1673203			20	
Freon 113	0.291157	11.05666	6.546	4.707597E-02			20	
Acetone	0.1188119	13.965	7.3925	0.1723568			20	
1,1-Dichloroethene	0.4497824	13.41611	6.5235	6.360208E-02			20	
Carbon disulfide	1.280426	15.13496	6.61225	6.029833E-02	0.9994526		0.99	
Methylene Chloride	0.5095401	7.277248	7.33	1.997676E-02			20	
Methyl-tert-Butyl Ether	1.127138	14.13484	7.621	4.230198E-02			20	
trans-1,2-Dichloroethene	0.4840347	15.47666	7.53825	4.200009E-02		0.9997235	0.99	
cis-1,2-Dichloroethene	0.539181	14.53438	8.9415	6.731551E-02			20	
1,1-Dichloroethane	0.9186968	10.49641	8.30325	2.877628E-02			20	
2-Butanone	6.252422E-02	16.19997	9.543625	0.1411205		0.9983026	0.99	
Chloroform	0.9110893	13.36055	9.21225	5.204155E-02			20	
1,1,1-Trichloroethane	0.6829916	13.85342	9.475	6.037893E-02			20	
Methyl acetate	0.2758045	14.98942	7.5165	0.118789		0.9988158	0.99	
Cyclohexane	0.9169544	9.61271	9.181	3.295506E-02			20	
Methyl cyclohexane	0.6074144	35.18917	10.44175	4.150477E-02		0.9991179	0.99	
Carbon Tetrachloride	0.2321685	22.69836	9.4055	2.416228E-02		0.9989608	0.99	
1,2-Dichloroethane	0.3583755	15.88794	10.08	0.0321008		0.9991788	0.99	
Benzene	1.081856	11.28933	9.86825	3.218549E-02			20	
Trichloroethene	0.2493154	16.99313	10.44475	3.728466E-02	0.9990389		0.99	
1,2-Dichloropropane	0.2923637	10.90509	10.97675	4.349962E-02			20	
Bromodichloromethane	0.2982542	15.47263	11.01025	3.946928E-02	0.9954972		0.99	
4-Methyl-2-pentanone	3.462393E-02	12.04151	12.12837	6.686337E-02			20	
2-Hexanone	0.2638736	18.55431	12.87525	0.0479684	0.9972145		0.99	
cis-1,3-Dichloropropene	0.4334937	16.03798	11.60338	3.013039E-02	0.9969562		0.99	

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Toluene	1.251215	13.12437	11.8235	3.900333E-02			20	
trans-1,3-Dichloropropene	0.5895958	19.79333	12.1935	7.652679E-02	0.9987486		0.99	
1,1,2-Trichloroethane	0.3797259	10.05906	12.35687	3.745073E-02			20	
Tetrachloroethene	0.3511604	17.58625	12.20325	4.072693E-02	0.9994943		0.99	
Dibromochloromethane	0.3080625	23.42352	12.54563	3.416691E-02	0.9952751		0.99	
1,2-Dibromoethane	0.3790205	14.25926	12.80825	4.673264E-02			20	
Chlorobenzene	1.192695	12.01584	13.23725	3.749004E-02			20	
Ethylbenzene	0.6816257	13.09551	13.20363	2.617679E-02			20	
m,p-Xylenes	0.8505266	11.75631	13.32075	3.483174E-02			20	
o-Xylene	0.806243	12.6639	13.72875	3.077385E-02			20	
Bromoform	0.1441141	30.69529	13.87262	2.547564E-02		0.9962768	0.99	
Styrene	1.300073	16.59021	13.7765	5.839275E-02	0.9973928		0.99	
Isopropylbenzene	2.096851	14.33798	13.99	2.257002E-02			20	
1,1,2,2-Tetrachloroethane	0.5108722	14.82362	14.46525	0.0293586			20	
1,2,4-Trichlorobenzene	0.4901185	13.35787	18.13437	4.828563E-02			20	
1,3-Dichlorobenzene	1.038443	11.3836	15.40975	2.840209E-02			20	
1,4-Dichlorobenzene	1.106172	15.0854	15.49775	7.350592E-03	0.9988395		0.99	
1,2-Dichlorobenzene	0.9941358	13.88404	16.01775	2.737511E-02			20	
1,2-Dibromo-3-chloropropane	8.937632E-02	15.20203	17.07413	4.012998E-02		0.9968684	0.99	
Dibromofluoromethane	0.5177597	5.040217	9.41825	3.669852E-02			20	
Toluene-d8	1.185544	2.73446	11.772	1.988031E-02			20	
4-Bromofluorobenzene	0.8048122	3.007497	14.322	1.411585E-02			20	

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AF00374-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2111046 **Laboratory ID:** AA69173-SCV1

Sequence: AA69173 **Standard ID:** A1K0784

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Cyclohexane	50.0	58	16.0	30.00
Ethylbenzene	50.0	51	1.3	30.00
Carbon Tetrachloride	50.0	54	9.0	30.00
1,3-Dichlorobenzene	50.0	53	6.6	30.00
4-Bromofluorobenzene	50.0	53	5.4	30.00
Toluene-d8	50.0	54	7.3	30.00
Dibromofluoromethane	50.0	54	9.0	30.00
Methyl-tert-Butyl Ether	50.0	54	8.6	30.00
trans-1,2-Dichloroethene	50.0	51	2.7	30.00
cis-1,2-Dichloroethene	50.0	52	4.2	30.00
Tetrachloroethene	50.0	49	-1.1	30.00
Acetone	250	260	2.8	30.00
1,2,4-Trichlorobenzene	50.0	55	9.9	30.00
Chloroform	50.0	52	4.8	30.00
Chlorobenzene	50.0	51	2.0	30.00
Toluene	50.0	49	-1.8	30.00
Methyl cyclohexane	50.0	55	10.4	30.00
m,p-Xylenes	100	100	0.6	30.00
4-Methyl-2-pentanone	250	260	5.1	30.00
1,2-Dichloroethane	50.0	52	3.5	30.00
1,2-Dibromoethane	50.0	50	0.6	30.00
1,4-Dichlorobenzene	50.0	49	-1.7	30.00
trans-1,3-Dichloropropene	50.0	52	4.6	30.00
cis-1,3-Dichloropropene	50.0	46	-8.0	30.00
Styrene	50.0	48	-4.0	30.00
Dibromochloromethane	50.0	49	-2.6	30.00
1,1-Dichloroethene	50.0	50	-0.4	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AF00374-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2111046 **Laboratory ID:** AA69173-SCV1

Sequence: AA69173 **Standard ID:** A1K0784

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
1,2-Dibromo-3-chloropropane	50.0	51	2.5	30.00
1,2-Dichlorobenzene	50.0	54	8.0	30.00
o-Xylene	50.0	52	4.0	30.00
1,1,2,2-Tetrachloroethane	50.0	49	-1.5	30.00
Methyl acetate	50.0	52	3.8	30.00
Trichloroethene	50.0	49	-2.2	30.00
1,1,2-Trichloroethane	50.0	52	3.5	30.00
2-Butanone	250	260	3.0	30.00
1,2-Dichloropropane	50.0	50	0.02	30.00
Freon 113	50.0	52	4.7	30.00
2-Hexanone	250	240	-2.1	30.00
Trichlorofluoromethane	20.0	21	2.6	30.00
Isopropylbenzene	50.0	52	5.0	30.00
1,1-Dichloroethane	50.0	52	3.7	30.00
Bromodichloromethane	50.0	50	-0.3	30.00
Bromoform	50.0	53	7.0	30.00
Carbon disulfide	50.0	55	10.9	30.00
Methylene Chloride	50.0	52	4.3	30.00
Vinyl chloride	20.0	20	-0.7	30.00
Chloroethane	20.0	18	-12.2	30.00
Chloromethane	20.0	20	0.0	30.00
Bromomethane	20.0	23	13.6	30.00
1,1,1-Trichloroethane	50.0	57	14.3	30.00
Benzene	50.0	51	3.0	30.00
Dichlorodifluoromethane	20.0	19	-3.4	30.00

* Values outside of QC limits

ENCO Orlando

SDG: AF00374-TE016

CLASS: 06_VOA_AIR_RSK

METHOD: RSK 175

ANALYSES DATA PACKAGE COVER PAGE

RSK 175

Laboratory: ENCO Orlando

SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Client Sample Id:	Lab Sample Id:
CRCA-MW0031-058.0-20220114	AF00374-03
CRCA-MW0018-058.0-20220114	AF00374-04
CRCA-MW0019-058.0-20220114	AF00374-06

ORGANIC ANALYSIS DATA SHEET

RSK 175

CRCA-MW0031-058.0-20220114

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Ground Water
Laboratory ID: AF00374-03
File ID: 22AN014.D
Sampled: 01/14/22 11:45
Prepared: 01/19/22 08:05
Analyzed: 01/19/22 13:10
Solids:
Preparation: Same
Initial/Final: 1 mL / 1 mL
Batch: 2A19013
Sequence: AA70214
Calibration: 2109039
Instrument: OVGCFID2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	MDL	MRL
74-82-8	Methane	1	0.657		0.00400	0.00500
74-85-1	Ethene	1	0.00510	U	0.00510	0.00600
74-84-0	Ethane	1	0.00510	U	0.00510	0.00600

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

RSK 175

CRCA-MW0018-058.0-20220114

Laboratory: ENCO Orlando | SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) | Project: NASA KSC CRCA

Matrix: Ground Water | Laboratory ID: AF00374-04 | File ID: 22AN015.D

Sampled: 01/14/22 12:10 | Prepared: 01/19/22 08:05 | Analyzed: 01/19/22 13:26

Solids: | Preparation: Same | Initial/Final: 1 mL / 1 mL

Batch: 2A19013 | Sequence: AA70214 | Calibration: 2109039 | Instrument: OVGCFID2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	MDL	MRL
74-82-8	Methane	10	1.15	D	0.0400	0.0500
74-85-1	Ethene	10	0.0510	UD	0.0510	0.0600
74-84-0	Ethane	10	0.0510	UD	0.0510	0.0600

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

RSK 175

CRCA-MW0019-058.0-20220114

Laboratory: ENCO Orlando | SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) | Project: NASA KSC CRCA

Matrix: Ground Water | Laboratory ID: AF00374-06 | File ID: 22AN016.D

Sampled: 01/14/22 13:05 | Prepared: 01/19/22 08:05 | Analyzed: 01/19/22 13:42

Solids: | Preparation: Same | Initial/Final: 1 mL / 1 mL

Batch: 2A19013 | Sequence: AA70214 | Calibration: 2109039 | Instrument: OVGCFID2

CAS NO.	COMPOUND	DILUTION	CONC. (mg/L)	Q	MDL	MRL
74-82-8	Methane	1	0.346		0.00400	0.00500
74-85-1	Ethene	1	0.00510	U	0.00510	0.00600
74-84-0	Ethane	1	0.00510	U	0.00510	0.00600

* Values outside of QC limits

HOLDING TIME SUMMARY

RSK 175

Laboratory: ENCO Orlando

SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-MW0031-058.0-20220114	01/14/22 11:45	01/14/22 15:40	01/19/22 08:05	4.85	NA	01/19/22 13:10	5.00	14.00	
CRCA-MW0018-058.0-20220114	01/14/22 12:10	01/14/22 15:40	01/19/22 08:05	4.83	NA	01/19/22 13:26	5.00	14.00	
CRCA-MW0019-058.0-20220114	01/14/22 13:05	01/14/22 15:40	01/19/22 08:05	4.79	NA	01/19/22 13:42	5.00	14.00	

PREPARATION BATCH SUMMARY

RSK 175

Laboratory: ENCO Orlando SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Batch: 2A19013 Batch Matrix: Water Preparation: Same

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	2A19013-BLK1	22AN005.D	01/19/22 08:05	
LCS	2A19013-BS1	22AN003.D	01/19/22 08:05	
LCS Dup	2A19013-BSD1	22AN004.D	01/19/22 08:05	
CE19388-01 (MW-1A)	2A19013-DUP1	22AN020.D	01/19/22 08:05	
CRCA-MW0031-058.0-20220114	AF00374-03	22AN014.D	01/19/22 08:05	
CRCA-MW0018-058.0-20220114	AF00374-04	22AN015.D	01/19/22 08:05	
CRCA-MW0019-058.0-20220114	AF00374-06	22AN016.D	01/19/22 08:05	

METHOD BLANK DATA SHEET
RSK 175

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	2A19013-BLK1	File ID:	22AN005.D
Prepared:	01/19/22 08:05	Preparation:	Same	Initial/Final:	1 mL / 1 mL
Analyzed:	01/19/22 09:47	Instrument:	OVGCFID2		
Batch:	2A19013	Sequence:	AA70214	Calibration:	2109039

CAS NO.	COMPOUND	CONC. (mg/L)	Q
74-82-8	Methane	0.00400	U
74-85-1	Ethene	0.00510	U
74-84-0	Ethane	0.00510	U

LCS / LCS DUPLICATE RECOVERY

RSK 175

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	2A19013	Laboratory ID:	2A19013-BS1
Preparation:	Same	Initial/Final:	1 mL / 1 mL

COMPOUND	SPIKE ADDED (mg/L)	LCS CONCENTRATION (mg/L)	LCS % REC. #	QC LIMITS REC.
Methane	0.174	0.190	109	70 - 130
Ethene	0.302	0.356	118	70 - 130
Ethane	0.323	0.362	112	70 - 130

COMPOUND	SPIKE ADDED (mg/L)	LCSD CONCENTRATION (mg/L)	LCSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Methane	0.174	0.183	105	4	30	70 - 130
Ethene	0.302	0.345	114	3	30	70 - 130
Ethane	0.323	0.352	109	3	30	70 - 130

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

DUPLICATES

RSK 175

CE19388-01 (MW-1A)

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Matrix: Water
Laboratory ID: 2A19013-DUP1
Batch: 2A19013
Lab Source ID: AF00363-01
Preparation: Same
Initial/Final: 1 mL / 1 mL
Source Sample Name: CE19388-01 (MW-1A)
% Solids:

ANALYTE	CONTROL LIMIT	SAMPLE CONCENTRATION (mg/L)	C	DUPLICATE CONCENTRATION (mg/L)	C	RPD %	Q	METHOD
Methane	30	0.00		ND				RSK 175
Ethene	30	0.00		ND				RSK 175
Ethane	30	0.00		ND				RSK 175

* Values outside of QC limits

ANALYSIS BATCH (SEQUENCE) SUMMARY

RSK 175

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA68194		
Calibration:	2109039	Instrument:	OVGCFID2

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Cal Standard	AA68194-CAL1	21IE003.D	09/10/21 09:01
Cal Standard	AA68194-CAL3	21IE005.D	09/10/21 09:45
Cal Standard	AA68194-CAL4	21IE006.D	09/10/21 10:01
Cal Standard	AA68194-CAL5	21IE007.D	09/10/21 10:17
Cal Standard	AA68194-CAL6	21IE008.D	09/10/21 10:33
Cal Standard	AA68194-CAL7	21IE009.D	09/10/21 10:48
Cal Standard	AA68194-CAL2	21IE021.D	09/10/21 13:53
Secondary Cal Check	AA68194-SCV1	21IE023.D	09/10/21 14:25

ANALYSIS BATCH (SEQUENCE) SUMMARY

RSK 175

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA70214		
Calibration:	2109039	Instrument:	OVGCFID2

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	AA70214-CCV1	22AN001.D	01/19/22 08:44
LCS	2A19013-BS1	22AN003.D	01/19/22 09:16
LCS Dup	2A19013-BSD1	22AN004.D	01/19/22 09:32
Blank	2A19013-BLK1	22AN005.D	01/19/22 09:47
CRCA-MW0031-058.0-20220114	AF00374-03	22AN014.D	01/19/22 13:10
CRCA-MW0018-058.0-20220114	AF00374-04	22AN015.D	01/19/22 13:26
CRCA-MW0019-058.0-20220114	AF00374-06	22AN016.D	01/19/22 13:42
CE19388-01 (MW-1A)	2A19013-DUP1	22AN020.D	01/19/22 14:54
Calibration Check	AA70214-CCV3	22AN023.D	01/19/22 15:47

CONTINUING CALIBRATION CHECK

RSK 175

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCFID2	Calibration:	2109039
Lab File ID:	22AN001.D	Calibration Date:	09/10/21 11:38
Sequence:	AA70214	Injection Date:	01/19/22
Lab Sample ID:	AA70214-CCV1	Injection Time:	08:44

		CONC. (mg/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Methane	A	0.174	0.179	1.475678E+08	1.514734E+08		2.6	20
Ethene	A	0.302	0.341	9.555433E+07	1.077479E+08		13	20
Ethane	A	0.323	0.339	1.392218E+08	1.462749E+08		5.1	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

CONTINUING CALIBRATION CHECK

RSK 175

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCFID2	Calibration:	2109039
Lab File ID:	22AN023.D	Calibration Date:	09/10/21 11:38
Sequence:	AA70214	Injection Date:	01/19/22
Lab Sample ID:	AA70214-CCV3	Injection Time:	15:47

		CONC. (mg/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Methane	A	0.174	0.185	1.475678E+08	1.571525E+08		6.5	20
Ethene	A	0.302	0.346	9.555433E+07	1.095972E+08		15	20
Ethane	A	0.323	0.351	1.392218E+08	1.510836E+08		8.5	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

RSK 175

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA68194	Instrument:	OVGCFID2
Calibration:	2109039		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1I0625	RSK175-Cal 1 09/10/2021	AA68194-CAL1	21IE003.D	09/10/21 09:01
A1I0627	RSK175-Cal 3 09/10/2021	AA68194-CAL3	21IE005.D	09/10/21 09:45
A1I0628	RSK175-Cal 4 09/10/2021	AA68194-CAL4	21IE006.D	09/10/21 10:01
A1I0629	RSK175-Cal 5 09/10/2021	AA68194-CAL5	21IE007.D	09/10/21 10:17
A1I0630	RSK175-Cal 6 09/10/2021	AA68194-CAL6	21IE008.D	09/10/21 10:33
A1I0631	RSK175-Cal 7 09/10/2021	AA68194-CAL7	21IE009.D	09/10/21 10:48
A1I0626	RSK175-Cal 2 09/10/2021	AA68194-CAL2	21IE021.D	09/10/21 13:53
A1A0933	RSK175- SCV/BS water CO2 and MEE	AA68194-SCV1	21IE023.D	09/10/21 14:25

INITIAL CALIBRATION DATA

RSK 175

Laboratory: ENCO Orlando

SDG: AF00374-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Calibration: 2109039

Instrument: OVGCFID2

Matrix: Water

Calibration Date: 09/10/21 11:38

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF
Methane	0.000869	1.794281E+08	0.00869	~~6.856743E+07~~	0.0348	1.460623E+08	0.0869	1.196339E+08	0.174	1.36344E+08	0.348	1.540102E+08
Ethene	0.00151	8.213444E+07	0.0151	~~4.337788E+07~~	0.0603	1.012845E+08	0.151	8.527974E+07	0.302	9.413798E+07	0.603	1.067702E+08
Ethane	0.00161	1.661503E+08	0.0161	~~5.479621E+07~~	0.0646	1.376196E+08	0.161	1.150807E+08	0.323	1.297924E+08	0.646	1.455248E+08

INITIAL CALIBRATION DATA (Continued)

RSK 175

Laboratory:	ENCO Orlando	SDG:	AF00374-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Calibration:	2109039	Instrument:	OVGCFID2
Matrix:	Water	Calibration Date:	09/10/21 11:38

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF
Methane	0.695	1.499281E+08										
Ethene	1.21	1.03719E+08										
Ethane	1.29	1.411628E+08										

INITIAL CALIBRATION DATA

RSK 175

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Calibration: 2109039
Instrument: OVGCFID2
Matrix: Water
Calibration Date: 09/10/21 11:38

Compound	Level 13		Level 14		Level 15		Level 16		Level 17		Level 18	
	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF	mg/L	RF
Methane												
Ethene												
Ethane												

INITIAL CALIBRATION DATA (Continued)

RSK 175

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Calibration: 2109039
Instrument: OVGCFID2
Matrix: Water
Calibration Date: 09/10/21 11:38

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Methane	1.475678E+08	13.45343	1.952167	9.419991E-02			20	
Ethene	9.555433E+07	10.60002	3.7055	0.2724778			20	
Ethane	1.392218E+08	12.20191	4.625167	0.2137797			20	

SECOND-SOURCE CALIBRATION VERIFICATION

RSK 175

Laboratory: ENCO Orlando
SDG: AF00374-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Calibration: 2109039
Laboratory ID: AA68194-SCV1
Sequence: AA68194
Standard ID: A1A0933

ANALYTE	EXPECTED (mg/L)	FOUND (mg/L)	% DRIFT	QC LIMIT
Ethene	0.302	0.333	10.1	25.00
Ethane	0.323	0.328	1.6	25.00
Methane	0.172	0.180	4.4	25.00

* Values outside of QC limits

TETRA TECH ISG
TtEGS, Information Systems Group

Completion Ticket

On 2/4/2022 at 12:58 PM the following files were submitted to Tetra Tech by kdylnicki@encolabs.com with ENCO:

TE016AF00374A1.txt, TE016AF00374A3.txt

If you need to identify this session at a later date refer to Ticket Key:

202224_3010922722_ledd_ENCO

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I Lovelie Metzgar, as the designated Quality Assurance Officer, hereby attest that all electronic deliverables have been thoroughly reviewed and are in agreement with the associated hardcopy data. The enclosed electronic files have been reviewed for accuracy (including significant figures), completeness and format. The laboratory will be responsible for any labor time necessary to correct enclosed electronic deliverables that have been found to be in error. I can be reached at (407) 826-5314 if there are any questions or problems with the enclosed electronic deliverables.

Signature:_____ Title: Quality Assurance Manager Date: 02/07/2022

TABLE OF CONTENTS

ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

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Orlando FL, 32824
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Monday, February 21, 2022
Tetra Tech, Inc. (TE016)
Attn: Alex Murphy
1353 N Courtenay Pkwy, Suite S
Merritt Island, FL 32953

RE: Laboratory Results for
Project Number: 112G08970, Project Name/Desc: NASA KSC CRCA
ENCO Workorder(s): AF01167

Dear Alex Murphy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Monday, February 14, 2022.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Kaitlin Dylnicki

Project Manager

Enclosure(s)

Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Client PM: Alex Murphy
Project Number: 112G08970
ENCO Project ID: AF01167
SDG: AF01167-TE016

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

List of instruments used:

Analytical and Preparation Method	SOP Reference Instrument
EPA 8260D / 5030B_MS	OVGCMS5

Analysis: EPA 8260D

Manual integrations were performed on samples associated with EPA 8260D. All data & explanations are included in the raw data section of the report.

Affected Samples: AA70682-CCV1, CRCA-ASEFFLUENT-20220214[AF01167-01], CRCA-ASINFLUENT-20220214[AF01167-02]
The associated calibration verification standard for multiple analytes exhibited high bias. Analyte(s) not detected in the sample.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Kaitlin Dylnicki
Project Manager

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: CRCA-ASEFFLUENT-20220214 **Lab ID: AF01167-01** **Sampled: 02/14/22 14:00** **Received: 02/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	02/28/22	02/16/22 13:20	02/17/22 05:49

Client ID: CRCA-ASINFLUENT-20220214 **Lab ID: AF01167-02** **Sampled: 02/14/22 14:10** **Received: 02/14/22 15:40**

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	02/28/22	02/16/22 13:20	02/17/22 06:16

SAMPLE DETECTION SUMMARY

Client ID: CRCA-ASINFLUENT-20220214 **Lab ID:** AF01167-02

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Vinyl chloride	2.8		0.71	2.5	ug/L	EPA 8260D	

ANALYTICAL RESULTS

Description: CRCA-ASEFFLUENT-20220214 **Lab Sample ID:** AF01167-01 **Received:** 02/14/22 15:40

Matrix: Ground Water **Sampled:** 02/14/22 14:00 **Work Order:** AF01167

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2B16031	EPA 8260D	02/17/22 05:49	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2B16031	EPA 8260D	02/17/22 05:49	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2B16031	EPA 8260D	02/17/22 05:49	KKW	QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	QV-01
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	QV-01
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	

ANALYTICAL RESULTS

Description: CRCA-ASEFFLUENT-20220214 **Lab Sample ID:** AF01167-01 **Received:** 02/14/22 15:40

Matrix: Ground Water **Sampled:** 02/14/22 14:00 **Work Order:** AF01167

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Vinyl chloride [75-01-4]^	0.71	U	ug/L	1	0.71	2.5	2B16031	EPA 8260D	02/17/22 05:49	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2B16031	EPA 8260D	02/17/22 05:49	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*54*	*1*	*50.0*	*108 %*	*41-142*	*2B16031*	*EPA 8260D*	*02/17/22 05:49*	*KKW*	
Dibromofluoromethane	*51*	*1*	*50.0*	*102 %*	*53-146*	*2B16031*	*EPA 8260D*	*02/17/22 05:49*	*KKW*	
Toluene-d8	*52*	*1*	*50.0*	*103 %*	*41-146*	*2B16031*	*EPA 8260D*	*02/17/22 05:49*	*KKW*	

ANALYTICAL RESULTS

Description: CRCA-ASINFLUENT-20220214 **Lab Sample ID:** AF01167-02 **Received:** 02/14/22 15:40

Matrix: Ground Water **Sampled:** 02/14/22 14:10 **Work Order:** AF01167

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2B16031	EPA 8260D	02/17/22 06:16	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2B16031	EPA 8260D	02/17/22 06:16	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	QV-01
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2B16031	EPA 8260D	02/17/22 06:16	KKW	QV-01
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	QV-01
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	QV-01
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	

ANALYTICAL RESULTS

Description: CRCA-ASINFLUENT-20220214 **Lab Sample ID:** AF01167-02 **Received:** 02/14/22 15:40

Matrix: Ground Water **Sampled:** 02/14/22 14:10 **Work Order:** AF01167

Project: NASA KSC CRCA **Sampled By:** Chuck Sorden

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Vinyl chloride [75-01-4]^	**2.8**		ug/L	1	0.71	2.5	2B16031	EPA 8260D	02/17/22 06:16	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2B16031	EPA 8260D	02/17/22 06:16	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*55*	*1*	*50.0*	*110 %*	*41-142*	*2B16031*	*EPA 8260D*	*02/17/22 06:16*	*KKW*	
Dibromofluoromethane	*50*	*1*	*50.0*	*101 %*	*53-146*	*2B16031*	*EPA 8260D*	*02/17/22 06:16*	*KKW*	
Toluene-d8	*51*	*1*	*50.0*	*102 %*	*41-146*	*2B16031*	*EPA 8260D*	*02/17/22 06:16*	*KKW*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2B16031 - EPA 5030B_MS

Blank (2B16031-BLK1) Prepared: 02/16/2022 13:20 Analyzed: 02/16/2022 22:51

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.80	U	2.5	ug/L							
1,1,2,2-Tetrachloroethane	0.54	U	2.5	ug/L							
1,1,2-Trichloroethane	0.76	U	2.5	ug/L							
1,1-Dichloroethane	0.62	U	2.5	ug/L							
1,1-Dichloroethene	0.94	U	2.5	ug/L							
1,2,4-Trichlorobenzene	0.70	U	2.5	ug/L							
1,2-Dibromo-3-chloropropane	0.96	U	2.5	ug/L							
1,2-Dibromoethane	0.78	U	2.5	ug/L							
1,2-Dichlorobenzene	0.73	U	2.5	ug/L							
1,2-Dichloroethane	0.63	U	2.5	ug/L							
1,2-Dichloropropane	0.80	U	2.5	ug/L							
1,3-Dichlorobenzene	0.77	U	2.5	ug/L							
1,4-Dichlorobenzene	0.76	U	2.5	ug/L							
2-Butanone	4.5	U	12	ug/L							
2-Hexanone	2.5	U	12	ug/L							
4-Methyl-2-pentanone	2.5	U	12	ug/L							
Acetone	10	U	25	ug/L							
Benzene	0.71	U	2.5	ug/L							
Bromodichloromethane	0.52	U	2.5	ug/L							
Bromoform	0.75	U	2.5	ug/L							
Bromomethane	0.95	U	2.5	ug/L							
Carbon disulfide	2.5	U	12	ug/L							
Carbon Tetrachloride	0.94	U	2.5	ug/L							
Chlorobenzene	0.72	U	2.5	ug/L							
Chloroethane	0.98	U	2.5	ug/L							
Chloroform	0.80	U	2.5	ug/L							
Chloromethane	0.82	U	2.5	ug/L							
cis-1,2-Dichloroethene	0.53	U	2.5	ug/L							
cis-1,3-Dichloropropene	0.59	U	2.5	ug/L							
Cyclohexane	0.93	U	2.5	ug/L							
Dibromochloromethane	0.50	U	2.5	ug/L							
Dichlorodifluoromethane	0.74	U	2.5	ug/L							
Ethylbenzene	0.69	U	2.5	ug/L							
Freon 113	0.73	U	2.5	ug/L							
Isopropylbenzene	0.67	U	2.5	ug/L							
m,p-Xylenes	1.3	U	5.0	ug/L							
Methyl acetate	0.95	U	2.5	ug/L							
Methyl cyclohexane	0.64	U	2.5	ug/L							
Methylene Chloride	2.5	U	12	ug/L							
Methyl-tert-Butyl Ether	0.60	U	2.5	ug/L							
o-Xylene	0.53	U	2.5	ug/L							
Styrene	0.61	U	2.5	ug/L							
Tetrachloroethene	0.76	U	2.5	ug/L							
Toluene	0.72	U	2.5	ug/L							
trans-1,2-Dichloroethene	0.73	U	2.5	ug/L							
trans-1,3-Dichloropropene	0.73	U	2.5	ug/L							
Trichloroethene	0.89	U	2.5	ug/L							
Trichlorofluoromethane	0.94	U	2.5	ug/L							
Vinyl chloride	0.71	U	2.5	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2B16031 - EPA 5030B_MS - Continued

Blank (2B16031-BLK1) Continued Prepared: 02/16/2022 13:20 Analyzed: 02/16/2022 22:51

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Xylenes (Total)	1.3	U	5.0	ug/L							
4-Bromofluorobenzene	*56*			*ug/L*	*50.0*		*111*	*41-142*			
Dibromofluoromethane	*53*			*ug/L*	*50.0*		*105*	*53-146*			
Toluene-d8	*51*			*ug/L*	*50.0*		*102*	*41-146*			

LCS (2B16031-BS1) Prepared: 02/16/2022 13:20 Analyzed: 02/16/2022 21:00

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	22		2.5	ug/L	20.0		109	57-148			
1,1,2,2-Tetrachloroethane	18		2.5	ug/L	20.0		92	60-139			
1,1,2-Trichloroethane	18		2.5	ug/L	20.0		88	57-141			
1,1-Dichloroethane	22		2.5	ug/L	20.0		109	57-142			
1,1-Dichloroethene	20		2.5	ug/L	20.0		98	47-139			
1,2,4-Trichlorobenzene	19		2.5	ug/L	20.0		96	52-159			
1,2-Dibromo-3-chloropropane	19		2.5	ug/L	20.0		96	48-150			
1,2-Dibromoethane	18		2.5	ug/L	20.0		89	57-140			
1,2-Dichlorobenzene	20		2.5	ug/L	20.0		102	63-131			
1,2-Dichloroethane	19		2.5	ug/L	20.0		96	50-156			
1,2-Dichloropropane	18		2.5	ug/L	20.0		91	61-133			
1,3-Dichlorobenzene	20		2.5	ug/L	20.0		102	66-129			
1,4-Dichlorobenzene	19		2.5	ug/L	20.0		96	65-133			
2-Butanone	100		12	ug/L	100		100	10-180			
2-Hexanone	82		12	ug/L	100		82	12-180			
4-Methyl-2-pentanone	90		12	ug/L	100		90	19-180			
Acetone	91		25	ug/L	100		91	10-180			
Benzene	20		2.5	ug/L	20.0		99	56-136			
Bromodichloromethane	18		2.5	ug/L	20.0		89	58-135			
Bromoform	22		2.5	ug/L	20.0		109	46-148			
Bromomethane	16		2.5	ug/L	20.0		78	10-173			
Carbon disulfide	23		12	ug/L	20.0		114	43-153			
Carbon Tetrachloride	27		2.5	ug/L	20.0		134	54-156			
Chlorobenzene	19		2.5	ug/L	20.0		96	51-139			
Chloroethane	23		2.5	ug/L	20.0		114	27-180			
Chloroform	20		2.5	ug/L	20.0		100	58-139			
Chloromethane	18		2.5	ug/L	20.0		91	33-154			
cis-1,2-Dichloroethene	21		2.5	ug/L	20.0		103	56-128			
cis-1,3-Dichloropropene	16		2.5	ug/L	20.0		82	64-128			
Cyclohexane	21		2.5	ug/L	20.0		107	70-130			
Dibromochloromethane	17		2.5	ug/L	20.0		83	50-140			
Dichlorodifluoromethane	16		2.5	ug/L	20.0		81	10-180			
Ethylbenzene	19		2.5	ug/L	20.0		93	63-133			
Freon 113	19		2.5	ug/L	20.0		96	47-173			
Isopropylbenzene	19		2.5	ug/L	20.0		97	60-132			
m,p-Xylenes	38		5.0	ug/L	40.0		95	64-133			
Methyl acetate	23		2.5	ug/L	20.0		116	70-130			
Methyl cyclohexane	21		2.5	ug/L	20.0		104	70-130			
Methylene Chloride	22		12	ug/L	20.0		110	43-142			
Methyl-tert-Butyl Ether	22		2.5	ug/L	20.0		111	51-145			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2B16031 - EPA 5030B_MS - Continued

LCS (2B16031-BS1) Continued Prepared: 02/16/2022 13:20 Analyzed: 02/16/2022 21:00

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Xylene	20		2.5	ug/L	20.0		100	61-129			
Styrene	17		2.5	ug/L	20.0		86	59-136			
Tetrachloroethene	24		2.5	ug/L	20.0		119	60-147			
Toluene	17		2.5	ug/L	20.0		87	64-131			
trans-1,2-Dichloroethene	21		2.5	ug/L	20.0		106	54-134			
trans-1,3-Dichloropropene	17		2.5	ug/L	20.0		87	65-149			
Trichloroethene	17		2.5	ug/L	20.0		87	62-135			
Trichlorofluoromethane	19		2.5	ug/L	20.0		93	56-155			
Vinyl chloride	18		2.5	ug/L	20.0		90	20-167			
4-Bromofluorobenzene	*55*			*ug/L*	*50.0*		*109*	*41-142*			
Dibromofluoromethane	*54*			*ug/L*	*50.0*		*108*	*53-146*			
Toluene-d8	*52*			*ug/L*	*50.0*		*105*	*41-146*			

Matrix Spike (2B16031-MS1) Prepared: 02/16/2022 13:20 Analyzed: 02/16/2022 21:28

Source: AF01020-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	2500		250	ug/L	2000	80 U	123	57-148			
1,1,2,2-Tetrachloroethane	1800		250	ug/L	2000	54 U	92	60-139			
1,1,2-Trichloroethane	2000		250	ug/L	2000	76 U	98	57-141			
1,1-Dichloroethane	2300		250	ug/L	2000	62 U	117	57-142			
1,1-Dichloroethene	2300		250	ug/L	2000	94 U	114	47-139			
1,2,4-Trichlorobenzene	1800		250	ug/L	2000	70 U	90	52-159			
1,2-Dibromo-3-chloropropane	1600		250	ug/L	2000	96 U	82	48-150			
1,2-Dibromoethane	1900		250	ug/L	2000	78 U	94	57-140			
1,2-Dichlorobenzene	2100		250	ug/L	2000	73 U	106	63-131			
1,2-Dichloroethane	2000		250	ug/L	2000	63 U	98	50-156			
1,2-Dichloropropane	2100		250	ug/L	2000	80 U	107	61-133			
1,3-Dichlorobenzene	2200		250	ug/L	2000	77 U	111	66-129			
1,4-Dichlorobenzene	2000		250	ug/L	2000	76 U	100	65-133			
2-Butanone	11000		1200	ug/L	10000	450 U	107	10-180			
2-Hexanone	8500		1200	ug/L	10000	250 U	85	12-180			
4-Methyl-2-pentanone	9000		1200	ug/L	10000	250 U	90	19-180			
Acetone	9300		2500	ug/L	10000	1000 U	93	10-180			
Benzene	2200		250	ug/L	2000	71 U	111	56-136			
Bromodichloromethane	1900		250	ug/L	2000	52 U	97	58-135			
Bromoform	2300		250	ug/L	2000	75 U	116	46-148			
Bromomethane	2300		250	ug/L	2000	95 U	116	10-173			
Carbon disulfide	2700		1200	ug/L	2000	250 U	133	43-153			
Carbon Tetrachloride	2700		250	ug/L	2000	94 U	134	54-156			
Chlorobenzene	2100		250	ug/L	2000	72 U	107	51-139			
Chloroethane	2500		250	ug/L	2000	98 U	126	27-180			
Chloroform	2200		250	ug/L	2000	80 U	109	58-139			
Chloromethane	2100		250	ug/L	2000	82 U	103	33-154			
cis-1,2-Dichloroethene	2100		250	ug/L	2000	53 U	107	56-128			
cis-1,3-Dichloropropene	1900		250	ug/L	2000	59 U	94	64-128			
Cyclohexane	2500		250	ug/L	2000	93 U	126	70-130			
Dibromochloromethane	1900		250	ug/L	2000	50 U	93	50-140			
Dichlorodifluoromethane	1900		250	ug/L	2000	74 U	95	10-180			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2B16031 - EPA 5030B_MS - Continued

Matrix Spike (2B16031-MS1) Continued Prepared: 02/16/2022 13:20 Analyzed: 02/16/2022 21:28

Source: AF01020-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethylbenzene	2100		250	ug/L	2000	69 U	106	63-133			
Freon 113	2300		250	ug/L	2000	73 U	114	47-173			
Isopropylbenzene	2300		250	ug/L	2000	67 U	113	60-132			
m,p-Xylenes	4300		500	ug/L	4000	130 U	107	64-133			
Methyl acetate	2200		250	ug/L	2000	95 U	108	70-130			
Methyl cyclohexane	2400		250	ug/L	2000	64 U	121	70-130			
Methylene Chloride	2400		1200	ug/L	2000	250 U	120	43-142			
Methyl-tert-Butyl Ether	2400		250	ug/L	2000	60 U	122	51-145			
o-Xylene	2200		250	ug/L	2000	53 U	111	61-129			
Styrene	2000		250	ug/L	2000	61 U	101	59-136			
Tetrachloroethene	2900		250	ug/L	2000	76 U	143	60-147			
Toluene	2100		250	ug/L	2000	72 U	103	64-131			
trans-1,2-Dichloroethene	2400		250	ug/L	2000	73 U	122	54-134			
trans-1,3-Dichloropropene	1900		250	ug/L	2000	73 U	97	65-149			
Trichloroethene	2000		250	ug/L	2000	89 U	100	62-135			
Trichlorofluoromethane	2300		250	ug/L	2000	94 U	115	56-155			
Vinyl chloride	2200		250	ug/L	2000	71 U	111	20-167			
4-Bromofluorobenzene	*5600*			*ug/L*	*5000*		*111*	*41-142*			
Dibromofluoromethane	*5300*			*ug/L*	*5000*		*105*	*53-146*			
Toluene-d8	*5300*			*ug/L*	*5000*		*106*	*41-146*			

Matrix Spike Dup (2B16031-MSD1) Prepared: 02/16/2022 13:20 Analyzed: 02/16/2022 21:56

Source: AF01020-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	2500		250	ug/L	2000	80 U	123	57-148	0.04	25	
1,1,2,2-Tetrachloroethane	1700		250	ug/L	2000	54 U	87	60-139	6	17	
1,1,2-Trichloroethane	1900		250	ug/L	2000	76 U	94	57-141	4	16	
1,1-Dichloroethane	2300		250	ug/L	2000	62 U	114	57-142	2	24	
1,1-Dichloroethene	2100		250	ug/L	2000	94 U	105	47-139	8	16	
1,2,4-Trichlorobenzene	1800		250	ug/L	2000	70 U	89	52-159	1	24	
1,2-Dibromo-3-chloropropane	2000		250	ug/L	2000	96 U	98	48-150	18	21	
1,2-Dibromoethane	1700		250	ug/L	2000	78 U	87	57-140	7	16	
1,2-Dichlorobenzene	2100		250	ug/L	2000	73 U	106	63-131	0	25	
1,2-Dichloroethane	1900		250	ug/L	2000	63 U	97	50-156	1	18	
1,2-Dichloropropane	2200		250	ug/L	2000	80 U	109	61-133	2	26	
1,3-Dichlorobenzene	2200		250	ug/L	2000	77 U	109	66-129	1	23	
1,4-Dichlorobenzene	2000		250	ug/L	2000	76 U	100	65-133	0.5	23	
2-Butanone	10000		1200	ug/L	10000	450 U	101	10-180	5	29	
2-Hexanone	7900		1200	ug/L	10000	250 U	79	12-180	7	28	
4-Methyl-2-pentanone	8800		1200	ug/L	10000	250 U	88	19-180	3	24	
Acetone	9200		2500	ug/L	10000	1000 U	92	10-180	2	19	
Benzene	2200		250	ug/L	2000	71 U	109	56-136	2	14	
Bromodichloromethane	1900		250	ug/L	2000	52 U	95	58-135	2	19	
Bromoform	2300		250	ug/L	2000	75 U	113	46-148	3	18	
Bromomethane	2400		250	ug/L	2000	95 U	121	10-173	4	29	
Carbon disulfide	2500		1200	ug/L	2000	250 U	123	43-153	8	26	
Carbon Tetrachloride	3100		250	ug/L	2000	94 U	153	54-156	13	27	
Chlorobenzene	2000		250	ug/L	2000	72 U	102	51-139	5	13	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2B16031 - EPA 5030B_MS - Continued

Matrix Spike Dup (2B16031-MSD1) Continued Prepared: 02/16/2022 13:20 Analyzed: 02/16/2022 21:56

Source: AF01020-03

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloroethane	2600		250	ug/L	2000	98 U	131	27-180	4	22	
Chloroform	2200		250	ug/L	2000	80 U	111	58-139	2	17	
Chloromethane	2100		250	ug/L	2000	82 U	105	33-154	2	31	
cis-1,2-Dichloroethene	2200		250	ug/L	2000	53 U	109	56-128	2	17	
cis-1,3-Dichloropropene	1800		250	ug/L	2000	59 U	90	64-128	5	20	
Cyclohexane	2400		250	ug/L	2000	93 U	120	70-130	5	20	
Dibromochloromethane	1800		250	ug/L	2000	50 U	89	50-140	4	18	
Dichlorodifluoromethane	2000		250	ug/L	2000	74 U	98	10-180	2	26	
Ethylbenzene	2100		250	ug/L	2000	69 U	103	63-133	3	18	
Freon 113	2200		250	ug/L	2000	73 U	110	47-173	4	30	
Isopropylbenzene	2200		250	ug/L	2000	67 U	108	60-132	5	23	
m,p-Xylenes	4100		500	ug/L	4000	130 U	102	64-133	5	18	
Methyl acetate	2300		250	ug/L	2000	95 U	113	70-130	4	20	
Methyl cyclohexane	2300		250	ug/L	2000	64 U	117	70-130	3	20	
Methylene Chloride	2300		1200	ug/L	2000	250 U	117	43-142	3	23	
Methyl-tert-Butyl Ether	2300		250	ug/L	2000	60 U	115	51-145	6	22	
o-Xylene	2000		250	ug/L	2000	53 U	101	61-129	9	16	
Styrene	1800		250	ug/L	2000	61 U	92	59-136	10	32	
Tetrachloroethene	2800		250	ug/L	2000	76 U	141	60-147	2	21	
Toluene	1900		250	ug/L	2000	72 U	97	64-131	6	16	
trans-1,2-Dichloroethene	2300		250	ug/L	2000	73 U	116	54-134	5	20	
trans-1,3-Dichloropropene	1900		250	ug/L	2000	73 U	95	65-149	2	17	
Trichloroethene	2000		250	ug/L	2000	89 U	99	62-135	0.3	20	
Trichlorofluoromethane	2100		250	ug/L	2000	94 U	106	56-155	8	22	
Vinyl chloride	2100		250	ug/L	2000	71 U	105	20-167	5	24	
4-Bromofluorobenzene	*5400*			*ug/L*	*5000*		*107*	*41-142*			
Dibromofluoromethane	*5300*			*ug/L*	*5000*		*106*	*53-146*			
Toluene-d8	*5300*			*ug/L*	*5000*		*105*	*41-146*			

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*****	Not reported due to interference.
[CALC]	Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
QV-01	The associated continuing calibration verification standard exhibited high bias; since the result is ND, there is no impact.

B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported result is an estimated value.
U	The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a “tentative identification".
Q	One or more quality control criteria failed.

Tetra Tech, Inc.

CHAIN OF CUSTODY | NUMBER No. 2579 ATF01167 | PAGE 1 OF 1

PROJECT NO: 112GO	FACILITY: CIRCA	PROJECT MANAGER ALEX MURPHY	PHONE NUMBER 321-26	LABORATORY NAME AND CONTACT: ENCO
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER DAN FORESTER	PHONE NUMBER 304-788-1426	ADDRESS
		CARRIER/WAYBILL NUMBER		CITY, STATE ORLANDO, FL

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2022	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS 8260	COMMENTS
									G	HCl		
14 FEB	1400	CIRCA-A$EFFLUENT-20220214CIRCA		/	/	GW	G	3			X	
14 FEB	1410	CIRCA-A$INFLUENT-20220214	CIRCA	/	/	GW	G	3			X	

1. RELINQUISHED BY		DATE 14FEB22	TIME 1530	1. RECEIVED BY		DATE 2/14/22	TIME 1540
2. RELINQUISHED BY		DATE	TIME	2. RECEIVED BY		DATE	TIME
3. RELINQUISHED BY		DATE	TIME	3. RECEIVED BY		DATE	TIME

COMMENTS C-4010 0.4°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

2/14/2022

Environmental Conservation Labs, Inc.

Alex Murphy
Tetra Tech, Inc. (TE016)
1353 N Courtenay Pkwy, Suite S
Merritt Island, FL 32953
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Reference : **Sample Receipt Confirmation - *Please Review***
Project Name / Number : NASA KSC CRCA / 112G08970
Purchase Order # : 1165883

Lab Reference # : AF01167 Lab Receipt Date: 14-Feb-22 15:40
Anticipated ***(Estimated)*** Completion Date: 21-Feb-22 19:00

This is an automated notification from our laboratory information management system (LIMS), indicating the samples we have recently received and their associated analyses. Should any of the following information be in error, please contact us immediately.

Thank you for choosing Environmental Conservation Laboratories. Should any events occur that delay the processing of your samples or inhibit our ability to complete the project within the projected time frame you will be contacted.

Sincerely,

Kaitlin Dylnicki

Client: Tetra Tech, Inc. (TE016) **Project Name:** NASA KSC CRCA
Requested TAT: 5 **Project Number:** 112G08970

Analysis	TAT	Expires	Status
Sample ID: CRCA-ASEFFLUENT-20220214(Lab ID: AF01167-01), Matrix: Ground Water, Sampled: 14-Feb-22 14:00 (GMT-05:00) Eastern Time (US &			
8260D TCL SOM01.2 CLP-LIKE	5	28-Feb-22 23:59	Received
Sample ID: CRCA-ASINFLUENT-20220214(Lab ID: AF01167-02), Matrix: Ground Water, Sampled: 14-Feb-22 14:10 (GMT-05:00) Eastern Time (US &			
8260D TCL SOM01.2 CLP-LIKE	5	28-Feb-22 23:59	Received

Analysis Groups included in this work order

ENCO Orlando

SDG: AF01167-TE016

CLASS: 01_VOA_MS

METHOD: EPA 8260D

ANALYSES DATA PACKAGE COVER PAGE

EPA 8260D

Laboratory: ENCO Orlando

SDG: AF01167-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Client Sample Id:	Lab Sample Id:
CRCA-ASEFFLUENT-20220214	AF01167-01
CRCA-ASINFLUENT-20220214	AF01167-02

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASEFFLUENT-20220214

Laboratory: ENCO Orlando SDG: AF01167-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF01167-01 File ID: 225BK048.D

Sampled: 02/14/22 14:00 Prepared: 02/16/22 13:20 Analyzed: 02/17/22 05:49

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2B16031 Sequence: AA70682 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	0.71	U	0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASEFFLUENT-20220214

Laboratory: ENCO Orlando SDG: AF01167-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF01167-01 File ID: 225BK048.D

Sampled: 02/14/22 14:00 Prepared: 02/16/22 13:20 Analyzed: 02/17/22 05:49

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2B16031 Sequence: AA70682 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	51	102	53 - 146	
Toluene-d8	50.0	52	103	41 - 146	
4-Bromofluorobenzene	50.0	54	108	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1231473	9.833	1352333	9.845	
1,4-Difluorobenzene	2543967	10.426	2676972	10.438	
Chlorobenzene-d5	1498383	13.211	1499134	13.218	
1,4-Dichlorobenzene-d4	1210822	15.474	1293958	15.48	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASINFLUENT-20220214

Laboratory: ENCO Orlando SDG: AF01167-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF01167-02 File ID: 225BK049.D

Sampled: 02/14/22 14:10 Prepared: 02/16/22 13:20 Analyzed: 02/17/22 06:16

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2B16031 Sequence: AA70682 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	2.8		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASINFLUENT-20220214

Laboratory: ENCO Orlando SDG: AF01167-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF01167-02 File ID: 225BK049.D

Sampled: 02/14/22 14:10 Prepared: 02/16/22 13:20 Analyzed: 02/17/22 06:16

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2B16031 Sequence: AA70682 Calibration: 2111046 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	50	101	53 - 146	
Toluene-d8	50.0	51	102	41 - 146	
4-Bromofluorobenzene	50.0	55	110	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1219650	9.833	1352333	9.845	
1,4-Difluorobenzene	2553111	10.427	2676972	10.438	
Chlorobenzene-d5	1474548	13.212	1499134	13.218	
1,4-Dichlorobenzene-d4	1202659	15.468	1293958	15.48	

* Values outside of QC limits

HOLDING TIME SUMMARY

EPA 8260D

Laboratory: ENCO Orlando

SDG: AF01167-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-ASEFFLUENT-20220214	02/14/22 14:00	02/14/22 15:40	02/16/22 13:20	1.97	NA	02/17/22 05:49	3.00	14.00	
CRCA-ASINFLUENT-20220214	02/14/22 14:10	02/14/22 15:40	02/16/22 13:20	1.97	NA	02/17/22 06:16	3.00	14.00	

PREPARATION BATCH SUMMARY

EPA 8260D

Laboratory: ENCO Orlando SDG: AF01167-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Batch: 2B16031 Batch Matrix: Water Preparation: EPA 5030B_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	2B16031-BLK1	225BK033.D	02/16/22 13:20	
LCS	2B16031-BS1	225BK029.D	02/16/22 13:20	
OWS - E ARFF	2B16031-MS1	225BK030.D	02/16/22 13:20	
OWS - E ARFF	2B16031-MSD1	225BK031.D	02/16/22 13:20	
CRCA-ASEFFLUENT-20220214	AF01167-01	225BK048.D	02/16/22 13:20	
CRCA-ASINFLUENT-20220214	AF01167-02	225BK049.D	02/16/22 13:20	

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF01167-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	2B16031-BLK1	File ID:	225BK033.D
Prepared:	02/16/22 13:20	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	02/16/22 22:51	Instrument:	OVGCMS5		
Batch:	2B16031	Sequence:	AA70682	Calibration:	2111046

CAS NO.	COMPOUND	CONC. (ug/L)	Q
75-71-8	Dichlorodifluoromethane	0.74	U
74-87-3	Chloromethane	0.82	U
75-01-4	Vinyl chloride	0.71	U
74-83-9	Bromomethane	0.95	U
75-00-3	Chloroethane	0.98	U
75-69-4	Trichlorofluoromethane	0.94	U
76-13-1	Freon 113	0.73	U
67-64-1	Acetone	10	U
75-35-4	1,1-Dichloroethene	0.94	U
75-15-0	Carbon disulfide	2.5	U
75-09-2	Methylene Chloride	2.5	U
1634-04-4	Methyl-tert-Butyl Ether	0.60	U
156-60-5	trans-1,2-Dichloroethene	0.73	U
156-59-2	cis-1,2-Dichloroethene	0.53	U
75-34-3	1,1-Dichloroethane	0.62	U
78-93-3	2-Butanone	4.5	U
67-66-3	Chloroform	0.80	U
71-55-6	1,1,1-Trichloroethane	0.80	U
79-20-9	Methyl acetate	0.95	U
110-82-7	Cyclohexane	0.93	U
108-87-2	Methyl cyclohexane	0.64	U
56-23-5	Carbon Tetrachloride	0.94	U
107-06-2	1,2-Dichloroethane	0.63	U
71-43-2	Benzene	0.71	U
79-01-6	Trichloroethene	0.89	U
78-87-5	1,2-Dichloropropane	0.80	U
75-27-4	Bromodichloromethane	0.52	U
108-10-1	4-Methyl-2-pentanone	2.5	U
591-78-6	2-Hexanone	2.5	U
10061-01-5	cis-1,3-Dichloropropene	0.59	U

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF01167-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	2B16031-BLK1	File ID:	225BK033.D
Prepared:	02/16/22 13:20	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	02/16/22 22:51	Instrument:	OVGCMS5		
Batch:	2B16031	Sequence:	AA70682	Calibration:	2111046

CAS NO.	COMPOUND	CONC. (ug/L)	Q
108-88-3	Toluene	0.72	U
10061-02-6	trans-1,3-Dichloropropene	0.73	U
79-00-5	1,1,2-Trichloroethane	0.76	U
127-18-4	Tetrachloroethene	0.76	U
124-48-1	Dibromochloromethane	0.50	U
106-93-4	1,2-Dibromoethane	0.78	U
108-90-7	Chlorobenzene	0.72	U
100-41-4	Ethylbenzene	0.69	U
108-38-3/106-42-3	m,p-Xylenes	1.3	U
95-47-6	o-Xylene	0.53	U
75-25-2	Bromoform	0.75	U
100-42-5	Styrene	0.61	U
98-82-8	Isopropylbenzene	0.67	U
79-34-5	1,1,2,2-Tetrachloroethane	0.54	U
120-82-1	1,2,4-Trichlorobenzene	0.70	U
541-73-1	1,3-Dichlorobenzene	0.77	U
106-46-7	1,4-Dichlorobenzene	0.76	U
95-50-1	1,2-Dichlorobenzene	0.73	U
96-12-8	1,2-Dibromo-3-chloropropane	0.96	U
1330-20-7	Xylenes (Total)	1.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	53	105	53 - 146	
Toluene-d8	50.0	51	102	41 - 146	
4-Bromofluorobenzene	50.0	56	111	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1229622	9.833	1352333	9.845	
1,4-Difluorobenzene	2602247	10.427	2676972	10.438	
Chlorobenzene-d5	1479293	13.212	1499134	13.218	
1,4-Dichlorobenzene-d4	1200654	15.468	1293958	15.48	

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF01167-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	2B16031	Laboratory ID:	2B16031-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	16	81	10 - 180
Chloromethane	20.0	18	91	33 - 154
Vinyl chloride	20.0	18	90	20 - 167
Bromomethane	20.0	16	78	10 - 173
Chloroethane	20.0	23	114	27 - 180
Trichlorofluoromethane	20.0	19	93	56 - 155
Freon 113	20.0	19	96	47 - 173
Acetone	100	91	91	10 - 180
1,1-Dichloroethene	20.0	20	98	47 - 139
Carbon disulfide	20.0	23	114	43 - 153
Methylene Chloride	20.0	22	110	43 - 142
Methyl-tert-Butyl Ether	20.0	22	111	51 - 145
trans-1,2-Dichloroethene	20.0	21	106	54 - 134
cis-1,2-Dichloroethene	20.0	21	103	56 - 128
1,1-Dichloroethane	20.0	22	109	57 - 142
2-Butanone	100	100	100	10 - 180
Chloroform	20.0	20	100	58 - 139
1,1,1-Trichloroethane	20.0	22	109	57 - 148
Methyl acetate	20.0	23	116	70 - 130
Cyclohexane	20.0	21	107	70 - 130
Methyl cyclohexane	20.0	21	104	70 - 130
Carbon Tetrachloride	20.0	27	134	54 - 156
1,2-Dichloroethane	20.0	19	96	50 - 156
Benzene	20.0	20	99	56 - 136
Trichloroethene	20.0	17	87	62 - 135
1,2-Dichloropropane	20.0	18	91	61 - 133
Bromodichloromethane	20.0	18	89	58 - 135
4-Methyl-2-pentanone	100	90	90	19 - 180
2-Hexanone	100	82	82	12 - 180
cis-1,3-Dichloropropene	20.0	16	82	64 - 128

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF01167-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	2B16031	Laboratory ID:	2B16031-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Toluene	20.0	17	87	64 - 131
trans-1,3-Dichloropropene	20.0	17	87	65 - 149
1,1,2-Trichloroethane	20.0	18	88	57 - 141
Tetrachloroethene	20.0	24	119	60 - 147
Dibromochloromethane	20.0	17	83	50 - 140
1,2-Dibromoethane	20.0	18	89	57 - 140
Chlorobenzene	20.0	19	96	51 - 139
Ethylbenzene	20.0	19	93	63 - 133
m,p-Xylenes	40.0	38	95	64 - 133
o-Xylene	20.0	20	100	61 - 129
Bromoform	20.0	22	109	46 - 148
Styrene	20.0	17	86	59 - 136
Isopropylbenzene	20.0	19	97	60 - 132
1,1,2,2-Tetrachloroethane	20.0	18	92	60 - 139
1,2,4-Trichlorobenzene	20.0	19	96	52 - 159
1,3-Dichlorobenzene	20.0	20	102	66 - 129
1,4-Dichlorobenzene	20.0	19	96	65 - 133
1,2-Dichlorobenzene	20.0	20	102	63 - 131
1,2-Dibromo-3-chloropropane	20.0	19	96	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

OWS - E ARFF

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2B16031
Laboratory ID: 2B16031-MS1
Preparation: EPA 5030B_MS
Initial/Final: 0.05 mL / 5 mL
Source Sample Name: OWS - E ARFF

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	2000	ND	1900	95	10 - 180
Chloromethane	2000	ND	2100	103	33 - 154
Vinyl chloride	2000	ND	2200	111	20 - 167
Bromomethane	2000	ND	2300	116	10 - 173
Chloroethane	2000	ND	2500	126	27 - 180
Trichlorofluoromethane	2000	ND	2300	115	56 - 155
Freon 113	2000	ND	2300	114	47 - 173
Acetone	10000	ND	9300	93	10 - 180
1,1-Dichloroethene	2000	ND	2300	114	47 - 139
Carbon disulfide	2000	ND	2700	133	43 - 153
Methylene Chloride	2000	ND	2400	120	43 - 142
Methyl-tert-Butyl Ether	2000	ND	2400	122	51 - 145
trans-1,2-Dichloroethene	2000	ND	2400	122	54 - 134
cis-1,2-Dichloroethene	2000	ND	2100	107	56 - 128
1,1-Dichloroethane	2000	ND	2300	117	57 - 142
2-Butanone	10000	ND	11000	107	10 - 180
Chloroform	2000	ND	2200	109	58 - 139
1,1,1-Trichloroethane	2000	ND	2500	123	57 - 148
Methyl acetate	2000	ND	2200	108	70 - 130
Cyclohexane	2000	ND	2500	126	70 - 130
Methyl cyclohexane	2000	ND	2400	121	70 - 130
Carbon Tetrachloride	2000	ND	2700	134	54 - 156
1,2-Dichloroethane	2000	ND	2000	98	50 - 156
Benzene	2000	ND	2200	111	56 - 136
Trichloroethene	2000	ND	2000	100	62 - 135
1,2-Dichloropropane	2000	ND	2100	107	61 - 133
Bromodichloromethane	2000	ND	1900	97	58 - 135
4-Methyl-2-pentanone	10000	ND	9000	90	19 - 180
2-Hexanone	10000	ND	8500	85	12 - 180
cis-1,3-Dichloropropene	2000	ND	1900	94	64 - 128
Toluene	2000	ND	2100	103	64 - 131

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

OWS - E ARFF

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2B16031
Laboratory ID: 2B16031-MS1
Preparation: EPA 5030B_MS
Initial/Final: 0.05 mL / 5 mL
Source Sample Name: OWS - E ARFF

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
trans-1,3-Dichloropropene	2000	ND	1900	97	65 - 149
1,1,2-Trichloroethane	2000	ND	2000	98	57 - 141
Tetrachloroethene	2000	ND	2900	143	60 - 147
Dibromochloromethane	2000	ND	1900	93	50 - 140
1,2-Dibromoethane	2000	ND	1900	94	57 - 140
Chlorobenzene	2000	ND	2100	107	51 - 139
Ethylbenzene	2000	ND	2100	106	63 - 133
m,p-Xylenes	4000	ND	4300	107	64 - 133
o-Xylene	2000	ND	2200	111	61 - 129
Bromoform	2000	ND	2300	116	46 - 148
Styrene	2000	ND	2000	101	59 - 136
Isopropylbenzene	2000	ND	2300	113	60 - 132
1,1,2,2-Tetrachloroethane	2000	ND	1800	92	60 - 139
1,2,4-Trichlorobenzene	2000	ND	1800	90	52 - 159
1,3-Dichlorobenzene	2000	ND	2200	111	66 - 129
1,4-Dichlorobenzene	2000	ND	2000	100	65 - 133
1,2-Dichlorobenzene	2000	ND	2100	106	63 - 131
1,2-Dibromo-3-chloropropane	2000	ND	1600	82	48 - 150

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

OWS - E ARFF

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2B16031
Laboratory ID: 2B16031-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 0.05 mL / 5 mL
Source Sample Name: OWS - E ARFF

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	2000	2000	98	2	26	10 - 180
Chloromethane	2000	2100	105	2	31	33 - 154
Vinyl chloride	2000	2100	105	5	24	20 - 167
Bromomethane	2000	2400	121	4	29	10 - 173
Chloroethane	2000	2600	131	4	22	27 - 180
Trichlorofluoromethane	2000	2100	106	8	22	56 - 155
Freon 113	2000	2200	110	4	30	47 - 173
Acetone	10000	9200	92	2	19	10 - 180
1,1-Dichloroethene	2000	2100	105	8	16	47 - 139
Carbon disulfide	2000	2500	123	8	26	43 - 153
Methylene Chloride	2000	2300	117	3	23	43 - 142
Methyl-tert-Butyl Ether	2000	2300	115	6	22	51 - 145
trans-1,2-Dichloroethene	2000	2300	116	5	20	54 - 134
cis-1,2-Dichloroethene	2000	2200	109	2	17	56 - 128
1,1-Dichloroethane	2000	2300	114	2	24	57 - 142
2-Butanone	10000	10000	101	5	29	10 - 180
Chloroform	2000	2200	111	2	17	58 - 139
1,1,1-Trichloroethane	2000	2500	123	0.04	25	57 - 148
Methyl acetate	2000	2300	113	4	20	70 - 130
Cyclohexane	2000	2400	120	5	20	70 - 130
Methyl cyclohexane	2000	2300	117	3	20	70 - 130
Carbon Tetrachloride	2000	3100	153	13	27	54 - 156
1,2-Dichloroethane	2000	1900	97	1	18	50 - 156
Benzene	2000	2200	109	2	14	56 - 136
Trichloroethene	2000	2000	99	0.3	20	62 - 135
1,2-Dichloropropane	2000	2200	109	2	26	61 - 133
Bromodichloromethane	2000	1900	95	2	19	58 - 135
4-Methyl-2-pentanone	10000	8800	88	3	24	19 - 180
2-Hexanone	10000	7900	79	7	28	12 - 180
cis-1,3-Dichloropropene	2000	1800	90	5	20	64 - 128
Toluene	2000	1900	97	6	16	64 - 131
trans-1,3-Dichloropropene	2000	1900	95	2	17	65 - 149

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

OWS - E ARFF

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2B16031
Laboratory ID: 2B16031-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 0.05 mL / 5 mL
Source Sample Name: OWS - E ARFF

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1,2-Trichloroethane	2000	1900	94	4	16	57 - 141
Tetrachloroethene	2000	2800	141	2	21	60 - 147
Dibromochloromethane	2000	1800	89	4	18	50 - 140
1,2-Dibromoethane	2000	1700	87	7	16	57 - 140
Chlorobenzene	2000	2000	102	5	13	51 - 139
Ethylbenzene	2000	2100	103	3	18	63 - 133
m,p-Xylenes	4000	4100	102	5	18	64 - 133
o-Xylene	2000	2000	101	9	16	61 - 129
Bromoform	2000	2300	113	3	18	46 - 148
Styrene	2000	1800	92	10	32	59 - 136
Isopropylbenzene	2000	2200	108	5	23	60 - 132
1,1,2,2-Tetrachloroethane	2000	1700	87	6	17	60 - 139
1,2,4-Trichlorobenzene	2000	1800	89	1	24	52 - 159
1,3-Dichlorobenzene	2000	2200	109	1	23	66 - 129
1,4-Dichlorobenzene	2000	2000	100	0.5	23	65 - 133
1,2-Dichlorobenzene	2000	2100	106	0	25	63 - 131
1,2-Dibromo-3-chloropropane	2000	2000	98	18	21	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA69173
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA69173-SCV1)				Lab File ID: 215KC012.D		Analyzed: 11/08/21 12:44		
Dibromofluoromethane	50.0	109	70 - 130	9.422	9.41825	0.0038	+/-0.5	
Toluene-d8	50.0	107	70 - 130	11.772	11.772	0.0000	+/-0.5	
4-Bromofluorobenzene	50.0	105	70 - 130	14.322	14.322	0.0000	+/-0.5	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA70682
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA70682-CCV1)				Lab File ID: 225BK028.D		Analyzed: 02/16/22 20:32		
Dibromofluoromethane	50.0	108	80 - 120	9.404	9.41825	-0.0143	+/-0.5	
Toluene-d8	50.0	106	80 - 120	11.76	11.772	-0.0120	+/-0.5	
4-Bromofluorobenzene	50.0	112	80 - 120	14.31	14.322	-0.0120	+/-0.5	
LCS (2B16031-BS1)				Lab File ID: 225BK029.D		Analyzed: 02/16/22 21:00		
Dibromofluoromethane	50.0	108	53 - 146	9.398	9.41825	-0.0203	+/-0.5	
Toluene-d8	50.0	105	41 - 146	11.76	11.772	-0.0120	+/-0.5	
4-Bromofluorobenzene	50.0	109	41 - 142	14.31	14.322	-0.0120	+/-0.5	
Matrix Spike (2B16031-MS1)				Lab File ID: 225BK030.D		Analyzed: 02/16/22 21:28		
Dibromofluoromethane	5000	105	53 - 146	9.404	9.41825	-0.0143	+/-0.5	
Toluene-d8	5000	106	41 - 146	11.76	11.772	-0.0120	+/-0.5	
4-Bromofluorobenzene	5000	111	41 - 142	14.31	14.322	-0.0120	+/-0.5	
Matrix Spike Dup (2B16031-MSD1)				Lab File ID: 225BK031.D		Analyzed: 02/16/22 21:56		
Dibromofluoromethane	5000	106	53 - 146	9.404	9.41825	-0.0143	+/-0.5	
Toluene-d8	5000	105	41 - 146	11.76	11.772	-0.0120	+/-0.5	
4-Bromofluorobenzene	5000	107	41 - 142	14.31	14.322	-0.0120	+/-0.5	
Blank (2B16031-BLK1)				Lab File ID: 225BK033.D		Analyzed: 02/16/22 22:51		
Dibromofluoromethane	50.0	105	53 - 146	9.404	9.41825	-0.0143	+/-0.5	
Toluene-d8	50.0	102	41 - 146	11.76	11.772	-0.0120	+/-0.5	
4-Bromofluorobenzene	50.0	111	41 - 142	14.31	14.322	-0.0120	+/-0.5	
Instrument RL Check (AA70682-CRL1)				Lab File ID: 225BK034.D		Analyzed: 02/16/22 23:19		
Dibromofluoromethane	50.0	103	1 - 199	9.404	9.41825	-0.0143	+/-0.5	
Toluene-d8	50.0	102	1 - 199	11.76	11.772	-0.0120	+/-0.5	
4-Bromofluorobenzene	50.0	110	1 - 199	14.31	14.322	-0.0120	+/-0.5	
CRCA-ASEFFLUENT-20220214 (AF01167-01)				Lab File ID: 225BK048.D		Analyzed: 02/17/22 05:49		
Dibromofluoromethane	50.0	102	53 - 146	9.41	9.41825	-0.0083	+/-0.5	
Toluene-d8	50.0	103	41 - 146	11.76	11.772	-0.0120	+/-0.5	
4-Bromofluorobenzene	50.0	108	41 - 142	14.31	14.322	-0.0120	+/-0.5	
CRCA-ASINFLUENT-20220214 (AF01167-02)				Lab File ID: 225BK049.D		Analyzed: 02/17/22 06:16		
Dibromofluoromethane	50.0	101	53 - 146	9.41	9.41825	-0.0083	+/-0.5	
Toluene-d8	50.0	102	41 - 146	11.76	11.772	-0.0120	+/-0.5	
4-Bromofluorobenzene	50.0	110	41 - 142	14.316	14.322	-0.0060	+/-0.5	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA69173
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA69173-CAL1)			Lab File ID: 215KC003.D			Analyzed: 11/08/21 08:34			
Pentafluorobenzene	1341353	9.851	1352333	9.845	99	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2550205	10.438	2676972	10.438	95	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1343991	13.223	1499134	13.218	90	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1132020	15.48	1293958	15.48	87	50 - 200	0.0000	+/-0.50	
Cal Standard (AA69173-CAL2)			Lab File ID: 215KC004.D			Analyzed: 11/08/21 09:01			
Pentafluorobenzene	1351713	9.845	1352333	9.845	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2541770	10.438	2676972	10.438	95	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1399397	13.223	1499134	13.218	93	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1161047	15.479	1293958	15.48	90	50 - 200	-0.0010	+/-0.50	
Cal Standard (AA69173-CAL3)			Lab File ID: 215KC005.D			Analyzed: 11/08/21 09:29			
Pentafluorobenzene	1342561	9.845	1352333	9.845	99	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2530760	10.438	2676972	10.438	95	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1395960	13.217	1499134	13.218	93	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1163571	15.474	1293958	15.48	90	50 - 200	-0.0060	+/-0.50	
Cal Standard (AA69173-CAL4)			Lab File ID: 215KC006.D			Analyzed: 11/08/21 09:57			
Pentafluorobenzene	1329545	9.845	1352333	9.845	98	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2529195	10.438	2676972	10.438	94	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1407406	13.217	1499134	13.218	94	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1179463	15.479	1293958	15.48	91	50 - 200	-0.0010	+/-0.50	
Cal Standard (AA69173-CAL5)			Lab File ID: 215KC007.D			Analyzed: 11/08/21 10:25			
Pentafluorobenzene	1330054	9.845	1352333	9.845	98	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2593765	10.438	2676972	10.438	97	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1435594	13.217	1499134	13.218	96	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1235201	15.48	1293958	15.48	95	50 - 200	0.0000	+/-0.50	
Cal Standard (AA69173-CAL6)			Lab File ID: 215KC008.D			Analyzed: 11/08/21 10:52			
Pentafluorobenzene	1352333	9.845	1352333	9.845	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2676972	10.438	2676972	10.438	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1499134	13.218	1499134	13.218	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	1293958	15.48	1293958	15.48	100	50 - 200	0.0000	+/-0.50	
Cal Standard (AA69173-CAL7)			Lab File ID: 215KC009.D			Analyzed: 11/08/21 11:20			
Pentafluorobenzene	1375266	9.845	1352333	9.845	102	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2624988	10.438	2676972	10.438	98	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1544754	13.217	1499134	13.218	103	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1391219	15.48	1293958	15.48	108	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA69173
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA69173-CAL8)			Lab File ID: 215KC010.D			Analyzed: 11/08/21 11:48			
Pentafluorobenzene	1357376	9.845	1352333	9.845	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2634382	10.438	2676972	10.438	98	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1568019	13.217	1499134	13.218	105	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1379564	15.48	1293958	15.48	107	50 - 200	0.0000	+/-0.50	
Secondary Cal Check (AA69173-SCV1)			Lab File ID: 215KC012.D			Analyzed: 11/08/21 12:44			
Pentafluorobenzene	1304691	9.845	1352333	9.845	96	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2526000	10.438	2676972	10.438	94	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1492201	13.223	1499134	13.218	100	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1289303	15.479	1293958	15.48	100	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA70682
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (AA70682-CCV1)			Lab File ID: 225BK028.D			Analyzed: 02/16/22 20:32			
Pentafluorobenzene	1240254	9.827	1352333	9.845	92	50 - 200	-0.0180	+/-0.50	
1,4-Difluorobenzene	2631393	10.427	2676972	10.438	98	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	1590670	13.206	1499134	13.218	106	50 - 200	-0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	1277223	15.468	1293958	15.48	99	50 - 200	-0.0120	+/-0.50	
LCS (2B16031-BS1)			Lab File ID: 225BK029.D			Analyzed: 02/16/22 21:00			
Pentafluorobenzene	1267212	9.827	1352333	9.845	94	50 - 200	-0.0180	+/-0.50	
1,4-Difluorobenzene	2666625	10.427	2676972	10.438	100	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	1628052	13.206	1499134	13.218	109	50 - 200	-0.0120	+/-0.50	
1,4-Dichlorobenzene-d4	1260559	15.468	1293958	15.48	97	50 - 200	-0.0120	+/-0.50	
Matrix Spike (2B16031-MS1)			Lab File ID: 225BK030.D			Analyzed: 02/16/22 21:28			
Pentafluorobenzene	1295718	9.833	1352333	9.845	96	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	2642834	10.427	2676972	10.438	99	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	1580389	13.212	1499134	13.218	105	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	1288843	15.468	1293958	15.48	100	50 - 200	-0.0120	+/-0.50	
Matrix Spike Dup (2B16031-MSD1)			Lab File ID: 225BK031.D			Analyzed: 02/16/22 21:56			
Pentafluorobenzene	1280448	9.833	1352333	9.845	95	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	2632896	10.427	2676972	10.438	98	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	1645935	13.212	1499134	13.218	110	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	1283617	15.468	1293958	15.48	99	50 - 200	-0.0120	+/-0.50	
Blank (2B16031-BLK1)			Lab File ID: 225BK033.D			Analyzed: 02/16/22 22:51			
Pentafluorobenzene	1229622	9.833	1352333	9.845	91	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	2602247	10.427	2676972	10.438	97	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	1479293	13.212	1499134	13.218	99	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	1200654	15.468	1293958	15.48	93	50 - 200	-0.0120	+/-0.50	
Instrument RL Check (AA70682-CRL1)			Lab File ID: 225BK034.D			Analyzed: 02/16/22 23:19			
Pentafluorobenzene	1247801	9.833	1352333	9.845	92	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	2597279	10.427	2676972	10.438	97	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	1491135	13.212	1499134	13.218	99	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	1201966	15.468	1293958	15.48	93	50 - 200	-0.0120	+/-0.50	
CRCA-ASEFFLUENT-20220214 (AF01167-01)			Lab File ID: 225BK048.D			Analyzed: 02/17/22 05:49			
Pentafluorobenzene	1231473	9.833	1352333	9.845	91	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	2543967	10.426	2676972	10.438	95	50 - 200	-0.0120	+/-0.50	
Chlorobenzene-d5	1498383	13.211	1499134	13.218	100	50 - 200	-0.0070	+/-0.50	
1,4-Dichlorobenzene-d4	1210822	15.474	1293958	15.48	94	50 - 200	-0.0060	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA70682
Instrument: OVGCMS5
Matrix: Water
Calibration: 2111046

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
CRCA-ASINFLUENT-20220214 (AF01167-02)			Lab File ID: 225BK049.D			Analyzed: 02/17/22 06:16			
Pentafluorobenzene	1219650	9.833	1352333	9.845	90	50 - 200	-0.0120	+/-0.50	
1,4-Difluorobenzene	2553111	10.427	2676972	10.438	95	50 - 200	-0.0110	+/-0.50	
Chlorobenzene-d5	1474548	13.212	1499134	13.218	98	50 - 200	-0.0060	+/-0.50	
1,4-Dichlorobenzene-d4	1202659	15.468	1293958	15.48	93	50 - 200	-0.0120	+/-0.50	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF01167-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA69173		
Calibration:	2111046	Instrument:	OVGCMS5

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA69173-TUN1	215KC002.D	11/08/21 07:59
Cal Standard	AA69173-CAL1	215KC003.D	11/08/21 08:34
Cal Standard	AA69173-CAL2	215KC004.D	11/08/21 09:01
Cal Standard	AA69173-CAL3	215KC005.D	11/08/21 09:29
Cal Standard	AA69173-CAL4	215KC006.D	11/08/21 09:57
Cal Standard	AA69173-CAL5	215KC007.D	11/08/21 10:25
Cal Standard	AA69173-CAL6	215KC008.D	11/08/21 10:52
Cal Standard	AA69173-CAL7	215KC009.D	11/08/21 11:20
Cal Standard	AA69173-CAL8	215KC010.D	11/08/21 11:48
Secondary Cal Check	AA69173-SCV1	215KC012.D	11/08/21 12:44

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF01167-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA70682		
Calibration:	2111046	Instrument:	OVGCMS5

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	AA70682-CCV1	225BK028.D	02/16/22 20:32
LCS	2B16031-BS1	225BK029.D	02/16/22 21:00
OWS - E ARFF	2B16031-MS1	225BK030.D	02/16/22 21:28
OWS - E ARFF	2B16031-MSD1	225BK031.D	02/16/22 21:56
Blank	2B16031-BLK1	225BK033.D	02/16/22 22:51
Instrument RL Check	AA70682-CRL1	225BK034.D	02/16/22 23:19
CRCA-ASEFFLUENT-20220214	AF01167-01	225BK048.D	02/17/22 05:49
CRCA-ASINFLUENT-20220214	AF01167-02	225BK049.D	02/17/22 06:16

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF01167-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Lab File ID:	215KC002.D	Injection Date:	11/08/21
Instrument ID:	OVGCMS5	Injection Time:	07:59
Sequence:	AA69173	Lab Sample ID:	AA69173-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
95	50 - 200% of 174	153	PASS
96	5 - 9% of 95	7.14	PASS
173	Less than 2% of 174	0.158	PASS
174	50 - 200% of 95	65.3	PASS
175	5 - 9% of 174	7.48	PASS
176	95 - 105% of 174	97.9	PASS
177	5 - 10% of 176	6.79	PASS

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF01167-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS5	Calibration:	2111046
Lab File ID:	225BK028.D	Calibration Date:	11/08/21 08:47
Sequence:	AA70682	Injection Date:	02/16/22
Lab Sample ID:	AA70682-CCV1	Injection Time:	20:32

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
Dichlorodifluoromethane	A	20.0	23	0.6541938	0.7461536		14	20	
Chloromethane	A	20.0	24	0.8265057	0.9106461		18	20	
Vinyl chloride	A	20.0	21	0.5890365	0.6181718		4.9	20	
Bromomethane	A	20.0	36	0.2183848	0.3235547		80	20	*
Chloroethane	A	20.0	23	0.3313991	0.3312245		16	20	
Trichlorofluoromethane	A	20.0	22	0.7198355	0.7910134		9.9	20	
Freon 113	A	50.0	51	0.291157	0.2946614		1.2	20	
Acetone	A	250	230	0.1188119	0.1089183		-8.3	20	
1,1-Dichloroethene	A	50.0	50	0.4497824	0.4542965		1.0	20	
Carbon disulfide	A	250	330	1.280426	1.70459		33	20	*
Methylene Chloride	A	50.0	58	0.5095401	0.5862501		15	20	
Methyl-tert-Butyl Ether	A	50.0	59	1.127138	1.31892		17	20	
trans-1,2-Dichloroethene	A	50.0	52	0.4840347	0.5146018		4.5	20	
cis-1,2-Dichloroethene	A	50.0	54	0.539181	0.5823009		8.0	20	
1,1-Dichloroethane	A	50.0	54	0.9186968	0.9892732		7.7	20	
2-Butanone	A	250	270	6.252422E-02	6.256557E-02		6.3	20	
Chloroform	A	50.0	53	0.9110893	0.968213		6.3	20	
1,1,1-Trichloroethane	A	50.0	57	0.6829916	0.7773117		14	20	
Methyl acetate	A	50.0	62	0.2758045	0.3697501		24	20	*
Cyclohexane	A	50.0	59	0.9169544	1.081329		18	20	
Methyl cyclohexane	A	50.0	51	0.6074144	0.4923236		1.1	20	
Carbon Tetrachloride	A	50.0	60	0.2321685	0.3251578		21	20	*
1,2-Dichloroethane	A	50.0	46	0.3583755	0.3065479		-8.6	20	
Benzene	A	50.0	50	1.081856	1.079266		-0.2	20	
Trichloroethene	A	50.0	44	0.2493154	0.2318513		-11	20	
1,2-Dichloropropane	A	50.0	51	0.2923637	0.2963153		1.4	20	
Bromodichloromethane	A	50.0	47	0.2982542	0.323659		-6.2	20	
4-Methyl-2-pentanone	A	250	250	3.462393E-02	3.482847E-02		0.60	20	
2-Hexanone	A	250	230	0.2638736	0.2612126		-8.9	20	

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF01167-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS5	Calibration:	2111046
Lab File ID:	225BK028.D	Calibration Date:	11/08/21 08:47
Sequence:	AA70682	Injection Date:	02/16/22
Lab Sample ID:	AA70682-CCV1	Injection Time:	20:32

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT		
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)	
cis-1,3-Dichloropropene	A	50.0	47	0.4334937	0.4589542		-6.9	20	
Toluene	A	50.0	46	1.251215	1.158805		-7.4	20	
trans-1,3-Dichloropropene	A	50.0	44	0.5895958	0.5824244		-12	20	
1,1,2-Trichloroethane	A	50.0	47	0.3797259	0.358227		-5.7	20	
Tetrachloroethene	A	50.0	66	0.3511604	0.4505944		32	20	*
Dibromochloromethane	A	50.0	45	0.3080625	0.3425336		-9.7	20	
1,2-Dibromoethane	A	50.0	47	0.3790205	0.353849		-6.6	20	
Chlorobenzene	A	50.0	48	1.192695	1.138029		-4.6	20	
Ethylbenzene	A	50.0	47	0.6816257	0.639997		-6.1	20	
m,p-Xylenes	A	100	98	0.8505266	0.8328912		-2.1	20	
o-Xylene	A	50.0	51	0.806243	0.8235222		2.1	20	
Bromoform	A	50.0	53	0.1441141	0.1818806		5.5	20	
Styrene	A	50.0	47	1.300073	1.404056		-5.7	20	
Isopropylbenzene	A	50.0	49	2.096851	2.074611		-1.1	20	
1,1,2,2-Tetrachloroethane	A	50.0	49	0.5108722	0.5034457		-1.5	20	
1,2,4-Trichlorobenzene	A	50.0	47	0.4901185	0.4632691		-5.5	20	
1,3-Dichlorobenzene	A	50.0	51	1.038443	1.069183		3.0	20	
1,4-Dichlorobenzene	A	50.0	48	1.106172	1.094306		-3.8	20	
1,2-Dichlorobenzene	A	50.0	51	0.9941358	1.018916		2.5	20	
1,2-Dibromo-3-chloropropane	A	50.0	43	8.937632E-02	0.0841247		-13	20	

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF01167-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA69173	Instrument:	OVGCMS5
Calibration:	2111046		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1J0534	MS Tune (lower conc.)	AA69173-TUN1	215KC002.D	11/08/21 07:59
A1K0853	8260 1.0 PPB ms5	AA69173-CAL1	215KC003.D	11/08/21 08:34
A1K0854	8260 2.0 PPB ms5	AA69173-CAL2	215KC004.D	11/08/21 09:01
A1K0855	8260 5.0 PPB ms5	AA69173-CAL3	215KC005.D	11/08/21 09:29
A1K0856	8260 10 PPB ms5	AA69173-CAL4	215KC006.D	11/08/21 09:57
A1K0857	8260 20 PPB ms5	AA69173-CAL5	215KC007.D	11/08/21 10:25
A1K0858	8260 50 PPB ms5	AA69173-CAL6	215KC008.D	11/08/21 10:52
A1K0859	8260 80 PPB ms5	AA69173-CAL7	215KC009.D	11/08/21 11:20
A1K0860	8260 100 PPB ms5	AA69173-CAL8	215KC010.D	11/08/21 11:48
A1K0784	8260 SCV 50 ppb/ 20 gases ms5	AA69173-SCV1	215KC012.D	11/08/21 12:44

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	1	0.7443231	2	0.5032873	5	0.6500859	10	0.6034847	20	0.6326341	50	0.6657524
Chloromethane	1	0.9591808	2	0.7599061	5	0.9088898	10	0.7190956	20	0.7791056	50	0.8066778
Vinyl chloride	1	0.6287681	2	0.4579005	5	0.5802045	10	0.5346829	20	0.5806418	50	0.6166854
Bromomethane	1	0.314235	2	0.235516	5	0.2580441	10	0.1796893	20	0.166356	50	0.1910639
Chloroethane	1	0.3698877	2	0.295144	5	0.379722	10	0.3367129	20	0.3305261	50	0.2764016
Trichlorofluoromethane	1	0.7454414	2	0.5730137	5	0.7765681	10	0.6678826	20	0.7148901	50	0.7343901
Freon 113	1	0.2760273	2	0.2282474	5	0.3206633	10	0.2676856	20	0.3005498	50	0.3003269
Acetone	5	0.1397022	10	8.872446E-02	25	0.1379081	50	0.1177967	100	0.1082328	250	0.1113408
1,1-Dichloroethene	1	0.5551111	2	0.3480399	5	0.4846037	10	0.4081321	20	0.4353695	50	0.4352264
Carbon disulfide	5	1.235916	10	0.8842114	25	1.568133	50	1.418763	100	1.30322	250	1.247655
Methylene Chloride	1	~~0.5688659~~	2	~~0.4191163~~	5	0.5510364	10	0.4493755	20	0.4900177	50	0.5027645
Methyl-tert-Butyl Ether	1	1.288251	2	0.7970072	5	1.193041	10	1.011797	20	1.096991	50	1.161448
trans-1,2-Dichloroethene	1	0.5479915	2	0.3272699	5	0.5606375	10	0.4492815	20	0.4566394	50	0.4883376
cis-1,2-Dichloroethene	1	0.6094965	2	0.3746727	5	0.5931276	10	0.4838911	20	0.5274786	50	0.5499629
1,1-Dichloroethane	1	1.054532	2	0.7395986	5	0.9544222	10	0.8435217	20	0.8932607	50	0.9154387
2-Butanone	5	8.161908E-02	10	5.101305E-02	25	7.316614E-02	50	6.082005E-02	100	5.464928E-02	250	5.645621E-02
Chloroform	1	1.008832	2	0.6488803	5	1.043737	10	0.8513928	20	0.9050911	50	0.9193416
1,1,1-Trichloroethane	1	0.6525874	2	0.4974059	5	0.7191703	10	0.626218	20	0.6737452	50	0.7301131
Methyl acetate	1	0.2125839	2	0.2323533	5	0.3277095	10	0.2601266	20	0.2600552	50	0.2882914
Cyclohexane	1	0.9208612	2	0.7618481	5	0.9736839	10	0.8180016	20	0.9073936	50	0.9393019
Methyl cyclohexane	1	1.10599	2	0.6321382	5	0.6583674	10	0.4843794	20	0.4711703	50	0.4740457
Carbon Tetrachloride	1	0.2053364	2	0.1465908	5	0.2168281	10	0.1977961	20	0.2350608	50	0.2539537
1,2-Dichloroethane	1	0.4661978	2	0.2877817	5	0.4136544	10	0.3339956	20	0.3204251	50	0.3268745
Benzene	1	1.215157	2	0.8544046	5	1.239201	10	1.009066	20	1.042526	50	1.057248
Trichloroethene	1	0.3084458	2	0.1615606	5	0.2723411	10	0.2305477	20	0.2427822	50	0.2505902
1,2-Dichloropropane	1	0.3357573	2	0.2346298	5	0.3112306	10	0.2661815	20	0.2825998	50	0.2862619
Bromodichloromethane	1	0.2856437	2	0.2181059	5	0.3196075	10	0.2524084	20	0.2956311	50	0.3136342
4-Methyl-2-pentanone	5	0.0335973	10	2.717004E-02	25	4.115365E-02	50	3.381432E-02	100	3.266988E-02	250	3.395979E-02
2-Hexanone	5	0.2346221	10	0.1586326	25	0.316373	50	0.2799597	100	0.2647496	250	0.2732542
cis-1,3-Dichloropropene	1	0.4707661	2	0.28729	5	0.4318782	10	0.3958572	20	0.4251657	50	0.4549383
Toluene	1	1.543165	2	1.001556	5	1.416301	10	1.152482	20	1.202103	50	1.216139

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	1	0.5940516	2	0.3215135	5	0.6704992	10	0.5470561	20	0.6094881	50	0.6418466
1,1,2-Trichloroethane	1	0.4122051	2	0.2976997	5	0.4105992	10	0.3571677	20	0.3736798	50	0.3862743
Tetrachloroethene	1	0.4542813	2	0.2595404	5	0.4254205	10	0.3121097	20	0.3421058	50	0.3321024
Dibromochloromethane	1	0.308819	2	0.1687334	5	0.3064271	10	0.252532	20	0.3058403	50	0.3498707
1,2-Dibromoethane	1	0.4291323	2	0.2621665	5	0.4130491	10	0.3437992	20	0.3784026	50	0.3889392
Chlorobenzene	1	1.322591	2	0.8904192	5	1.368592	10	1.135273	20	1.208827	50	1.188993
Ethylbenzene	1	0.7657045	2	0.5128638	5	0.7910542	10	0.609316	20	0.6539889	50	0.6912718
m,p-Xylenes	2	0.8998944	4	0.6399989	10	0.994939	20	0.8159444	40	0.8575135	100	0.8697585
o-Xylene	1	0.8046185	2	0.5955422	5	0.9099544	10	0.7294484	20	0.8172523	50	0.8316335
Bromoform	1	0.1198297	2	8.333947E-02	5	0.1226611	10	0.116228	20	0.134467	50	0.1642548
Styrene	1	1.206556	2	0.8642651	5	1.428193	10	1.171098	20	1.328166	50	1.395008
Isopropylbenzene	1	2.327434	2	1.456359	5	2.421774	10	1.940719	20	2.038027	50	2.134133
1,1,2,2-Tetrachloroethane	1	0.5692746	2	0.3549922	5	0.5724161	10	0.4600627	20	0.4842873	50	0.523719
1,2,4-Trichlorobenzene	1	0.4336496	2	0.3705061	5	0.5678038	10	0.4758098	20	0.4717754	50	0.5220548
1,3-Dichlorobenzene	1	1.136817	2	0.7925605	5	1.108209	10	0.969509	20	0.9961456	50	1.051553
1,4-Dichlorobenzene	1	1.3835	2	0.8003121	5	1.211005	10	1.033462	20	1.037534	50	1.095744
1,2-Dichlorobenzene	1	1.039646	2	0.6992396	5	1.151911	10	0.9495296	20	0.9366836	50	1.027779
1,2-Dibromo-3-chloropropane	1	8.219819E-02	2	7.109962E-02	5	9.102152E-02	10	7.738691E-02	20	8.275374E-02	50	9.518161E-02
Dibromofluoromethane	50	0.5213654	55	0.4883742	60	0.4863677	50	0.5418711	65	0.5249781	50	0.5633132
Toluene-d8	50	1.204121	55	1.159988	60	1.15519	50	1.228194	65	1.188561	50	1.231618
4-Bromofluorobenzene	50	0.8302065	55	0.7813489	60	0.7709933	50	0.8118453	65	0.8005242	50	0.8448371

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	80	0.7045673	100	0.7294154								
Chloromethane	80	0.8224336	100	0.8567567								
Vinyl chloride	80	0.6375817	100	0.6758271								
Bromomethane	80	0.1925555	100	0.2096188								
Chloroethane	80	~~0.1733356~~	100	~~0.1636503~~								
Trichlorofluoromethane	80	0.7532025	100	0.7932953								
Freon 113	80	0.3130817	100	0.322674								
Acetone	400	0.1256289	500	0.1211611								
1,1-Dichloroethene	80	0.4570052	100	0.4747715								
Carbon disulfide	400	1.300175	500	1.285334								
Methylene Chloride	80	0.525128	100	0.5389185								
Methyl-tert-Butyl Ether	80	1.22972	100	1.238846								
trans-1,2-Dichloroethene	80	0.5171304	100	0.5249894								
cis-1,2-Dichloroethene	80	0.5800023	100	0.594816								
1,1-Dichloroethane	80	0.9547403	100	0.9940602								
2-Butanone	400	6.240293E-02	500	0.060067								
Chloroform	80	0.9465719	100	0.9648675								
1,1,1-Trichloroethane	80	0.7633687	100	0.801324								
Methyl acetate	80	0.3157171	100	0.3095992								
Cyclohexane	80	0.9931829	100	1.021362								
Methyl cyclohexane	80	0.5119645	100	0.5212596								
Carbon Tetrachloride	80	0.2958359	100	0.3059458								
1,2-Dichloroethane	80	0.3598285	100	0.3582468								
Benzene	80	1.119785	100	1.117458								
Trichloroethene	80	0.2650181	100	0.2632378								
1,2-Dichloropropane	80	0.3078612	100	0.3143878								
Bromodichloromethane	80	0.3448549	100	0.3561479								
4-Methyl-2-pentanone	400	3.854751E-02	500	3.607894E-02								
2-Hexanone	400	0.3015983	500	0.2817997								
cis-1,3-Dichloropropene	80	0.5007618	100	0.5012925								
Toluene	80	1.250312	100	1.227658								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	80	0.6771467	100	0.6551643								
1,1,2-Trichloroethane	80	0.405516	100	0.3946655								
Tetrachloroethene	80	0.3395359	100	0.3441872								
Dibromochloromethane	80	0.3846628	100	0.3876149								
1,2-Dibromoethane	80	0.4140016	100	0.4026731								
Chlorobenzene	80	1.222218	100	1.204646								
Ethylbenzene	80	0.7172093	100	0.7115969								
m,p-Xylenes	160	0.8779626	200	0.8482018								
o-Xylene	80	0.8859882	100	0.8755063								
Bromoform	80	0.2051055	100	0.2070275								
Styrene	80	1.478863	100	1.528434								
Isopropylbenzene	80	2.23132	100	2.225046								
1,1,2,2-Tetrachloroethane	80	0.5696643	100	0.5525615								
1,2,4-Trichlorobenzene	80	0.5399316	100	0.5394168								
1,3-Dichlorobenzene	80	1.108494	100	1.144254								
1,4-Dichlorobenzene	80	1.127868	100	1.159947								
1,2-Dichlorobenzene	80	1.064045	100	1.084253								
1,2-Dibromo-3-chloropropane	80	0.1101637	100	0.1052053								
Dibromofluoromethane	70	0.5089758	75	0.5068323								
Toluene-d8	70	1.160035	75	1.156643								
4-Bromofluorobenzene	70	0.8034247	75	0.7953177								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	0.6541938	11.87968	3.97275	7.769159E-02			20	
Chloromethane	0.8265057	9.585286	4.41	7.394085E-02		0.9997979	0.99	
Vinyl chloride	0.5890365	11.57345	4.5715	5.797002E-02			20	
Bromomethane	0.2183848	22.39829	5.221	5.968524E-02		0.9986744	0.99	
Chloroethane	0.3313991	12.20852	5.449	0.1284504	0.993		0.99	
Trichlorofluoromethane	0.7198355	9.805754	5.6865	0.1673203			20	
Freon 113	0.291157	11.05666	6.546	4.707597E-02			20	
Acetone	0.1188119	13.965	7.3925	0.1723568			20	
1,1-Dichloroethene	0.4497824	13.41611	6.5235	6.360208E-02			20	
Carbon disulfide	1.280426	15.13496	6.61225	6.029833E-02	0.9994526		0.99	
Methylene Chloride	0.5095401	7.277248	7.33	1.997676E-02			20	
Methyl-tert-Butyl Ether	1.127138	14.13484	7.621	4.230198E-02			20	
trans-1,2-Dichloroethene	0.4840347	15.47666	7.53825	4.200009E-02		0.9997235	0.99	
cis-1,2-Dichloroethene	0.539181	14.53438	8.9415	6.731551E-02			20	
1,1-Dichloroethane	0.9186968	10.49641	8.30325	2.877628E-02			20	
2-Butanone	6.252422E-02	16.19997	9.543625	0.1411205		0.9983026	0.99	
Chloroform	0.9110893	13.36055	9.21225	5.204155E-02			20	
1,1,1-Trichloroethane	0.6829916	13.85342	9.475	6.037893E-02			20	
Methyl acetate	0.2758045	14.98942	7.5165	0.118789		0.9988158	0.99	
Cyclohexane	0.9169544	9.61271	9.181	3.295506E-02			20	
Methyl cyclohexane	0.6074144	35.18917	10.44175	4.150477E-02		0.9991179	0.99	
Carbon Tetrachloride	0.2321685	22.69836	9.4055	2.416228E-02		0.9989608	0.99	
1,2-Dichloroethane	0.3583755	15.88794	10.08	0.0321008		0.9991788	0.99	
Benzene	1.081856	11.28933	9.86825	3.218549E-02			20	
Trichloroethene	0.2493154	16.99313	10.44475	3.728466E-02	0.9990389		0.99	
1,2-Dichloropropane	0.2923637	10.90509	10.97675	4.349962E-02			20	
Bromodichloromethane	0.2982542	15.47263	11.01025	3.946928E-02	0.9954972		0.99	
4-Methyl-2-pentanone	3.462393E-02	12.04151	12.12837	6.686337E-02			20	
2-Hexanone	0.2638736	18.55431	12.87525	0.0479684	0.9972145		0.99	
cis-1,3-Dichloropropene	0.4334937	16.03798	11.60338	3.013039E-02	0.9969562		0.99	

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF01167-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2111046
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 11/08/21 08:47

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Toluene	1.251215	13.12437	11.8235	3.900333E-02			20	
trans-1,3-Dichloropropene	0.5895958	19.79333	12.1935	7.652679E-02	0.9987486		0.99	
1,1,2-Trichloroethane	0.3797259	10.05906	12.35687	3.745073E-02			20	
Tetrachloroethene	0.3511604	17.58625	12.20325	4.072693E-02	0.9994943		0.99	
Dibromochloromethane	0.3080625	23.42352	12.54563	3.416691E-02	0.9952751		0.99	
1,2-Dibromoethane	0.3790205	14.25926	12.80825	4.673264E-02			20	
Chlorobenzene	1.192695	12.01584	13.23725	3.749004E-02			20	
Ethylbenzene	0.6816257	13.09551	13.20363	2.617679E-02			20	
m,p-Xylenes	0.8505266	11.75631	13.32075	3.483174E-02			20	
o-Xylene	0.806243	12.6639	13.72875	3.077385E-02			20	
Bromoform	0.1441141	30.69529	13.87262	2.547564E-02		0.9962768	0.99	
Styrene	1.300073	16.59021	13.7765	5.839275E-02	0.9973928		0.99	
Isopropylbenzene	2.096851	14.33798	13.99	2.257002E-02			20	
1,1,2,2-Tetrachloroethane	0.5108722	14.82362	14.46525	0.0293586			20	
1,2,4-Trichlorobenzene	0.4901185	13.35787	18.13437	4.828563E-02			20	
1,3-Dichlorobenzene	1.038443	11.3836	15.40975	2.840209E-02			20	
1,4-Dichlorobenzene	1.106172	15.0854	15.49775	7.350592E-03	0.9988395		0.99	
1,2-Dichlorobenzene	0.9941358	13.88404	16.01775	2.737511E-02			20	
1,2-Dibromo-3-chloropropane	8.937632E-02	15.20203	17.07413	4.012998E-02		0.9968684	0.99	
Dibromofluoromethane	0.5177597	5.040217	9.41825	3.669852E-02			20	
Toluene-d8	1.185544	2.73446	11.772	1.988031E-02			20	
4-Bromofluorobenzene	0.8048122	3.007497	14.322	1.411585E-02			20	

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AF01167-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2111046 **Laboratory ID:** AA69173-SCV1

Sequence: AA69173 **Standard ID:** A1K0784

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Cyclohexane	50.0	58	16.0	30.00
Ethylbenzene	50.0	51	1.3	30.00
Carbon Tetrachloride	50.0	54	9.0	30.00
1,3-Dichlorobenzene	50.0	53	6.6	30.00
4-Bromofluorobenzene	50.0	53	5.4	30.00
Toluene-d8	50.0	54	7.3	30.00
Dibromofluoromethane	50.0	54	9.0	30.00
Methyl-tert-Butyl Ether	50.0	54	8.6	30.00
trans-1,2-Dichloroethene	50.0	51	2.7	30.00
cis-1,2-Dichloroethene	50.0	52	4.2	30.00
Tetrachloroethene	50.0	49	-1.1	30.00
Acetone	250	260	2.8	30.00
1,2,4-Trichlorobenzene	50.0	55	9.9	30.00
Chloroform	50.0	52	4.8	30.00
Chlorobenzene	50.0	51	2.0	30.00
Toluene	50.0	49	-1.8	30.00
Methyl cyclohexane	50.0	55	10.4	30.00
m,p-Xylenes	100	100	0.6	30.00
4-Methyl-2-pentanone	250	260	5.1	30.00
1,2-Dichloroethane	50.0	52	3.5	30.00
1,2-Dibromoethane	50.0	50	0.6	30.00
1,4-Dichlorobenzene	50.0	49	-1.7	30.00
trans-1,3-Dichloropropene	50.0	52	4.6	30.00
cis-1,3-Dichloropropene	50.0	46	-8.0	30.00
Styrene	50.0	48	-4.0	30.00
Dibromochloromethane	50.0	49	-2.6	30.00
1,1-Dichloroethene	50.0	50	-0.4	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AF01167-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2111046 **Laboratory ID:** AA69173-SCV1

Sequence: AA69173 **Standard ID:** A1K0784

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
1,2-Dibromo-3-chloropropane	50.0	51	2.5	30.00
1,2-Dichlorobenzene	50.0	54	8.0	30.00
o-Xylene	50.0	52	4.0	30.00
1,1,2,2-Tetrachloroethane	50.0	49	-1.5	30.00
Methyl acetate	50.0	52	3.8	30.00
Trichloroethene	50.0	49	-2.2	30.00
1,1,2-Trichloroethane	50.0	52	3.5	30.00
2-Butanone	250	260	3.0	30.00
1,2-Dichloropropane	50.0	50	0.02	30.00
Freon 113	50.0	52	4.7	30.00
2-Hexanone	250	240	-2.1	30.00
Trichlorofluoromethane	20.0	21	2.6	30.00
Isopropylbenzene	50.0	52	5.0	30.00
1,1-Dichloroethane	50.0	52	3.7	30.00
Bromodichloromethane	50.0	50	-0.3	30.00
Bromoform	50.0	53	7.0	30.00
Carbon disulfide	50.0	55	10.9	30.00
Methylene Chloride	50.0	52	4.3	30.00
Vinyl chloride	20.0	20	-0.7	30.00
Chloroethane	20.0	18	-12.2	30.00
Chloromethane	20.0	20	0.0	30.00
Bromomethane	20.0	23	13.6	30.00
1,1,1-Trichloroethane	50.0	57	14.3	30.00
Benzene	50.0	51	3.0	30.00
Dichlorodifluoromethane	20.0	19	-3.4	30.00

* Values outside of QC limits

TETRA TECH ISG
TtEGS, Information Systems Group

Completion Ticket

On 3/4/2022 at 11:12 AM the following files were submitted to Tetra Tech by kdylnicki@encolabs.com with ENCO:

TE016AF01167A1.txt, TE016AF01167A3.txt

If you need to identify this session at a later date refer to Ticket Key:

202234_3365447843_ledd_ENCO

You may print this page by clicking on the "Print This Page" button

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I Lovelie Metzgar, as the designated Quality Assurance Officer, hereby attest that all electronic deliverables have been thoroughly reviewed and are in agreement with the associated hardcopy data. The enclosed electronic files have been reviewed for accuracy (including significant figures), completeness and format. The laboratory will be responsible for any labor time necessary to correct enclosed electronic deliverables that have been found to be in error. I can be reached at (407) 826-5314 if there are any questions or problems with the enclosed electronic deliverables.

Signature:_____ Title: Quality Assurance Manager Date: 03/07/2022

TABLE OF CONTENTS

ENCO Laboratories

Accurate. Timely. Responsive. Innovative.

10775 Central Port Drive
Orlando FL, 32824
Phone: 407.826.5314 FAX: 407.850.6945

Tuesday, March 29, 2022
Tetra Tech, Inc. (TE016)
Attn: Alex Murphy
1353 N Courtenay Pkwy, Suite S
Merritt Island, FL 32953

RE: Laboratory Results for
Project Number: 112G08970, Project Name/Desc: NASA KSC CRCA
ENCO Workorder(s): AF02224

Dear Alex Murphy,

Enclosed is a copy of your laboratory report for test samples received by our laboratory on Tuesday, March 22, 2022.

Unless otherwise noted in an attached project narrative, all samples were received in acceptable condition and processed in accordance with the referenced methods/procedures. Results for these procedures apply only to the samples as submitted.

The analytical results contained in this report are in compliance with NELAC standards, except as noted in the project narrative if applicable. This report shall not be reproduced except in full, without the written approval of the Laboratory.

This report contains only those analyses performed by Environmental Conservation Laboratories. Unless otherwise noted, all analyses were performed at ENCO Orlando. Data from outside organizations will be reported under separate cover.

If you have any questions or require further information, please do not hesitate to contact me.

Sincerely,

Kaitlin Dylnicki

Project Manager

Enclosure(s)

Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Client PM: Alex Murphy
Project Number: 112G08970
ENCO Project ID: AF02224
SDG: AF02224-TE016

Overview

All samples submitted were analyzed by Environmental Conservation Laboratories, Inc. in accordance with the methods referenced in the laboratory report. Any particular difficulties encountered during sample handling and processing will be discussed in the Remarks section below.

Remarks

List of instruments used:

Analytical and Preparation Method	SOP Reference Instrument
EPA 8260D / 5030B_MS	OVGCMS5

Analysis: EPA 8260D

Manual integrations were performed on samples associated with EPA 8260D. All data & explanations are included in the raw data section of the report.

I certify that this data package is in compliance with the terms and conditions of the contract, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy package and in computer-readable data submitted on diskette has been authorized by the Laboratory Manager or the Manager's designee, as verified by the following signatures.

Kaitlin Dylnicki
Project Manager

SAMPLE SUMMARY/LABORATORY CHRONICLE

Client ID: CRCA-ASEFFLUENT-20220322	Lab ID: AF02224-01	Sampled: 03/22/22 12:00	Received: 03/22/22 15:30

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	04/05/22	03/24/22 12:55	03/24/22 23:25

Client ID: CRCA-ASINFLUENT-20220322	Lab ID: AF02224-02	Sampled: 03/22/22 12:10	Received: 03/22/22 15:30

Parameter	Preparation	Hold Date/Time(s)	Prep Date/Time(s)	Analysis Date/Time(s)
EPA 8260D	EPA 5030B_MS	04/05/22	03/24/22 12:55	03/24/22 23:53

SAMPLE DETECTION SUMMARY

Client ID: CRCA-ASINFLUENT-20220322 **Lab ID:** AF02224-02

Analyte	Results	Flag	MDL	PQL	Units	Method	Notes
Vinyl chloride	2.9		0.71	2.5	ug/L	EPA 8260D	

ANALYTICAL RESULTS

Description: CRCA-ASEFFLUENT-20220322 **Lab Sample ID:** AF02224-01 **Received:** 03/22/22 15:30

Matrix: Ground Water **Sampled:** 03/22/22 12:00 **Work Order:** AF02224

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2C24024	EPA 8260D	03/24/22 23:25	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2C24024	EPA 8260D	03/24/22 23:25	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	

ANALYTICAL RESULTS

Description: CRCA-ASEFFLUENT-20220322 **Lab Sample ID:** AF02224-01 **Received:** 03/22/22 15:30

Matrix: Ground Water **Sampled:** 03/22/22 12:00 **Work Order:** AF02224

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Vinyl chloride [75-01-4]^	0.71	U	ug/L	1	0.71	2.5	2C24024	EPA 8260D	03/24/22 23:25	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2C24024	EPA 8260D	03/24/22 23:25	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*51*	*1*	*50.0*	*102 %*	*41-142*	*2C24024*	*EPA 8260D*	*03/24/22 23:25*	*KKW*	
Dibromofluoromethane	*47*	*1*	*50.0*	*94 %*	*53-146*	*2C24024*	*EPA 8260D*	*03/24/22 23:25*	*KKW*	
Toluene-d8	*47*	*1*	*50.0*	*94 %*	*41-146*	*2C24024*	*EPA 8260D*	*03/24/22 23:25*	*KKW*	

ANALYTICAL RESULTS

Description: CRCA-ASINFLUENT-20220322 **Lab Sample ID:** AF02224-02 **Received:** 03/22/22 15:30

Matrix: Ground Water **Sampled:** 03/22/22 12:10 **Work Order:** AF02224

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
1,1,1-Trichloroethane [71-55-6]^	0.80	U	ug/L	1	0.80	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,1,2,2-Tetrachloroethane [79-34-5]^	0.54	U	ug/L	1	0.54	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,1,2-Trichloroethane [79-00-5]^	0.76	U	ug/L	1	0.76	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,1-Dichloroethane [75-34-3]^	0.62	U	ug/L	1	0.62	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,1-Dichloroethene [75-35-4]^	0.94	U	ug/L	1	0.94	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,2,4-Trichlorobenzene [120-82-1]^	0.70	U	ug/L	1	0.70	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,2-Dibromo-3-chloropropane [96-12-8]^	0.96	U	ug/L	1	0.96	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,2-Dibromoethane [106-93-4]^	0.78	U	ug/L	1	0.78	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,2-Dichlorobenzene [95-50-1]^	0.73	U	ug/L	1	0.73	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,2-Dichloroethane [107-06-2]^	0.63	U	ug/L	1	0.63	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,2-Dichloropropane [78-87-5]^	0.80	U	ug/L	1	0.80	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,3-Dichlorobenzene [541-73-1]^	0.77	U	ug/L	1	0.77	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
1,4-Dichlorobenzene [106-46-7]^	0.76	U	ug/L	1	0.76	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
2-Butanone [78-93-3]^	4.5	U	ug/L	1	4.5	12	2C24024	EPA 8260D	03/24/22 23:53	KKW	
2-Hexanone [591-78-6]^	2.5	U	ug/L	1	2.5	12	2C24024	EPA 8260D	03/24/22 23:53	KKW	
4-Methyl-2-pentanone [108-10-1]^	2.5	U	ug/L	1	2.5	12	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Acetone [67-64-1]^	10	U	ug/L	1	10	25	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Benzene [71-43-2]^	0.71	U	ug/L	1	0.71	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Bromodichloromethane [75-27-4]^	0.52	U	ug/L	1	0.52	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Bromoform [75-25-2]^	0.75	U	ug/L	1	0.75	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Bromomethane [74-83-9]^	0.95	U	ug/L	1	0.95	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Carbon disulfide [75-15-0]^	2.5	U	ug/L	1	2.5	12	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Carbon Tetrachloride [56-23-5]^	0.94	U	ug/L	1	0.94	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Chlorobenzene [108-90-7]^	0.72	U	ug/L	1	0.72	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Chloroethane [75-00-3]^	0.98	U	ug/L	1	0.98	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Chloroform [67-66-3]^	0.80	U	ug/L	1	0.80	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Chloromethane [74-87-3]^	0.82	U	ug/L	1	0.82	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
cis-1,2-Dichloroethene [156-59-2]^	0.53	U	ug/L	1	0.53	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
cis-1,3-Dichloropropene [10061-01-5]^	0.59	U	ug/L	1	0.59	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Cyclohexane [110-82-7]^	0.93	U	ug/L	1	0.93	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Dibromochloromethane [124-48-1]^	0.50	U	ug/L	1	0.50	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Dichlorodifluoromethane [75-71-8]^	0.74	U	ug/L	1	0.74	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Ethylbenzene [100-41-4]^	0.69	U	ug/L	1	0.69	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Freon 113 [76-13-1]^	0.73	U	ug/L	1	0.73	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Isopropylbenzene [98-82-8]^	0.67	U	ug/L	1	0.67	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
m,p-Xylenes [108-38-3/106-42-3]^	1.3	U	ug/L	1	1.3	5.0	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Methyl acetate [79-20-9]^	0.95	U	ug/L	1	0.95	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Methyl cyclohexane [108-87-2]^	0.64	U	ug/L	1	0.64	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Methylene Chloride [75-09-2]^	2.5	U	ug/L	1	2.5	12	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Methyl-tert-Butyl Ether [1634-04-4]^	0.60	U	ug/L	1	0.60	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
o-Xylene [95-47-6]^	0.53	U	ug/L	1	0.53	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Styrene [100-42-5]^	0.61	U	ug/L	1	0.61	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Tetrachloroethene [127-18-4]^	0.76	U	ug/L	1	0.76	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Toluene [108-88-3]^	0.72	U	ug/L	1	0.72	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
trans-1,2-Dichloroethene [156-60-5]^	0.73	U	ug/L	1	0.73	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
trans-1,3-Dichloropropene [10061-02-6]^	0.73	U	ug/L	1	0.73	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Trichloroethene [79-01-6]^	0.89	U	ug/L	1	0.89	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	

ANALYTICAL RESULTS

Description: CRCA-ASINFLUENT-20220322 **Lab Sample ID:** AF02224-02 **Received:** 03/22/22 15:30

Matrix: Ground Water **Sampled:** 03/22/22 12:10 **Work Order:** AF02224

Project: NASA KSC CRCA **Sampled By:** Dan Forester

Volatile Organic Compounds by GCMS

^ - ENCO Orlando certified analyte [NELAC E83182]

Analyte [CAS Number]	Results	Flag	Units	DF	MDL	PQL	Batch	Method	Analyzed	By	Notes
Trichlorofluoromethane [75-69-4]^	0.94	U	ug/L	1	0.94	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Vinyl chloride [75-01-4]^	**2.9**		ug/L	1	0.71	2.5	2C24024	EPA 8260D	03/24/22 23:53	KKW	
Xylenes (Total) [1330-20-7]	1.3	U	ug/L	1	1.3	5.0	2C24024	EPA 8260D	03/24/22 23:53	KKW	

Surrogates	*Results*	*DF*	*Spike Lvl*	*% Rec*	*% Rec Limits*	*Batch*	*Method*	*Analyzed*	*By*	Notes
4-Bromofluorobenzene	*52*	*1*	*50.0*	*103 %*	*41-142*	*2C24024*	*EPA 8260D*	*03/24/22 23:53*	*KKW*	
Dibromofluoromethane	*46*	*1*	*50.0*	*92 %*	*53-146*	*2C24024*	*EPA 8260D*	*03/24/22 23:53*	*KKW*	
Toluene-d8	*48*	*1*	*50.0*	*97 %*	*41-146*	*2C24024*	*EPA 8260D*	*03/24/22 23:53*	*KKW*	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2C24024 - EPA 5030B_MS

Blank (2C24024-BLK1) Prepared: 03/24/2022 12:55 Analyzed: 03/24/2022 22:29

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	0.80	U	2.5	ug/L							
1,1,2,2-Tetrachloroethane	0.54	U	2.5	ug/L							
1,1,2-Trichloroethane	0.76	U	2.5	ug/L							
1,1-Dichloroethane	0.62	U	2.5	ug/L							
1,1-Dichloroethene	0.94	U	2.5	ug/L							
1,2,4-Trichlorobenzene	0.70	U	2.5	ug/L							
1,2-Dibromo-3-chloropropane	0.96	U	2.5	ug/L							
1,2-Dibromoethane	0.78	U	2.5	ug/L							
1,2-Dichlorobenzene	0.73	U	2.5	ug/L							
1,2-Dichloroethane	0.63	U	2.5	ug/L							
1,2-Dichloropropane	0.80	U	2.5	ug/L							
1,3-Dichlorobenzene	0.77	U	2.5	ug/L							
1,4-Dichlorobenzene	0.76	U	2.5	ug/L							
2-Butanone	4.5	U	12	ug/L							
2-Hexanone	2.5	U	12	ug/L							
4-Methyl-2-pentanone	2.5	U	12	ug/L							
Acetone	10	U	25	ug/L							
Benzene	0.71	U	2.5	ug/L							
Bromodichloromethane	0.52	U	2.5	ug/L							
Bromoform	0.75	U	2.5	ug/L							
Bromomethane	0.95	U	2.5	ug/L							
Carbon disulfide	2.5	U	12	ug/L							
Carbon Tetrachloride	0.94	U	2.5	ug/L							
Chlorobenzene	0.72	U	2.5	ug/L							
Chloroethane	0.98	U	2.5	ug/L							
Chloroform	0.80	U	2.5	ug/L							
Chloromethane	0.82	U	2.5	ug/L							
cis-1,2-Dichloroethene	0.53	U	2.5	ug/L							
cis-1,3-Dichloropropene	0.59	U	2.5	ug/L							
Cyclohexane	0.93	U	2.5	ug/L							
Dibromochloromethane	0.50	U	2.5	ug/L							
Dichlorodifluoromethane	0.74	U	2.5	ug/L							
Ethylbenzene	0.69	U	2.5	ug/L							
Freon 113	0.73	U	2.5	ug/L							
Isopropylbenzene	0.67	U	2.5	ug/L							
m,p-Xylenes	1.3	U	5.0	ug/L							
Methyl acetate	0.95	U	2.5	ug/L							
Methyl cyclohexane	0.64	U	2.5	ug/L							
Methylene Chloride	2.5	U	12	ug/L							
Methyl-tert-Butyl Ether	0.60	U	2.5	ug/L							
o-Xylene	0.53	U	2.5	ug/L							
Styrene	0.61	U	2.5	ug/L							
Tetrachloroethene	0.76	U	2.5	ug/L							
Toluene	0.72	U	2.5	ug/L							
trans-1,2-Dichloroethene	0.73	U	2.5	ug/L							
trans-1,3-Dichloropropene	0.73	U	2.5	ug/L							
Trichloroethene	0.89	U	2.5	ug/L							
Trichlorofluoromethane	0.94	U	2.5	ug/L							
Vinyl chloride	0.71	U	2.5	ug/L							

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2C24024 - EPA 5030B_MS - Continued

Blank (2C24024-BLK1) Continued Prepared: 03/24/2022 12:55 Analyzed: 03/24/2022 22:29

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Xylenes (Total)	1.3	U	5.0	ug/L							
4-Bromofluorobenzene	*51*			*ug/L*	*50.0*		*102*	*41-142*			
Dibromofluoromethane	*47*	*I*		*ug/L*	*50.0*		*94*	*53-146*			
Toluene-d8	*48*	*I*		*ug/L*	*50.0*		*96*	*41-146*			

LCS (2C24024-BS1) Prepared: 03/24/2022 12:55 Analyzed: 03/24/2022 20:38

Analyte	Result	Flag	POL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	20		2.5	ug/L	20.0		101	57-148			
1,1,2,2-Tetrachloroethane	20		2.5	ug/L	20.0		101	60-139			
1,1,2-Trichloroethane	22		2.5	ug/L	20.0		109	57-141			
1,1-Dichloroethane	20		2.5	ug/L	20.0		100	57-142			
1,1-Dichloroethene	20		2.5	ug/L	20.0		98	47-139			
1,2,4-Trichlorobenzene	19		2.5	ug/L	20.0		94	52-159			
1,2-Dibromo-3-chloropropane	21		2.5	ug/L	20.0		105	48-150			
1,2-Dibromoethane	19		2.5	ug/L	20.0		95	57-140			
1,2-Dichlorobenzene	20		2.5	ug/L	20.0		102	63-131			
1,2-Dichloroethane	19		2.5	ug/L	20.0		95	50-156			
1,2-Dichloropropane	21		2.5	ug/L	20.0		104	61-133			
1,3-Dichlorobenzene	20		2.5	ug/L	20.0		102	66-129			
1,4-Dichlorobenzene	22		2.5	ug/L	20.0		110	65-133			
2-Butanone	96		12	ug/L	100		96	10-180			
2-Hexanone	88		12	ug/L	100		88	12-180			
4-Methyl-2-pentanone	79		12	ug/L	100		79	19-180			
Acetone	100		25	ug/L	100		100	10-180			
Benzene	21		2.5	ug/L	20.0		104	56-136			
Bromodichloromethane	20		2.5	ug/L	20.0		98	58-135			
Bromoform	21		2.5	ug/L	20.0		104	46-148			
Bromomethane	12		2.5	ug/L	20.0		62	10-173			
Carbon disulfide	20		12	ug/L	20.0		102	43-153			
Carbon Tetrachloride	19		2.5	ug/L	20.0		97	54-156			
Chlorobenzene	22		2.5	ug/L	20.0		112	51-139			
Chloroethane	19		2.5	ug/L	20.0		96	27-180			
Chloroform	19		2.5	ug/L	20.0		96	58-139			
Chloromethane	14		2.5	ug/L	20.0		68	33-154			
cis-1,2-Dichloroethene	21		2.5	ug/L	20.0		106	56-128			
cis-1,3-Dichloropropene	18		2.5	ug/L	20.0		88	64-128			
Cyclohexane	17		2.5	ug/L	20.0		87	70-130			
Dibromochloromethane	20		2.5	ug/L	20.0		101	50-140			
Dichlorodifluoromethane	10		2.5	ug/L	20.0		50	10-180			
Ethylbenzene	20		2.5	ug/L	20.0		99	63-133			
Freon 113	18		2.5	ug/L	20.0		92	47-173			
Isopropylbenzene	20		2.5	ug/L	20.0		102	60-132			
m,p-Xylenes	44		5.0	ug/L	40.0		110	64-133			
Methyl acetate	16		2.5	ug/L	20.0		79	70-130			
Methyl cyclohexane	19		2.5	ug/L	20.0		95	70-130			
Methylene Chloride	21		12	ug/L	20.0		103	43-142			
Methyl-tert-Butyl Ether	18		2.5	ug/L	20.0		92	51-145			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2C24024 - EPA 5030B_MS - Continued

LCS (2C24024-BS1) Continued Prepared: 03/24/2022 12:55 Analyzed: 03/24/2022 20:38

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
o-Xylene	21		2.5	ug/L	20.0		104	61-129			
Styrene	19		2.5	ug/L	20.0		96	59-136			
Tetrachloroethene	29		2.5	ug/L	20.0		144	60-147			
Toluene	23		2.5	ug/L	20.0		115	64-131			
trans-1,2-Dichloroethene	19		2.5	ug/L	20.0		97	54-134			
trans-1,3-Dichloropropene	21		2.5	ug/L	20.0		105	65-149			
Trichloroethene	20		2.5	ug/L	20.0		101	62-135			
Trichlorofluoromethane	18		2.5	ug/L	20.0		92	56-155			
Vinyl chloride	19		2.5	ug/L	20.0		94	20-167			
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*104*	*41-142*			
Dibromofluoromethane	*48*	*I*		*ug/L*	*50.0*		*96*	*53-146*			
Toluene-d8	*48*	*I*		*ug/L*	*50.0*		*97*	*41-146*			

Matrix Spike (2C24024-MS1) Prepared: 03/24/2022 12:55 Analyzed: 03/24/2022 21:06

Source: AF02224-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	20		2.5	ug/L	20.0	0.80 U	101	57-148			
1,1,2,2-Tetrachloroethane	21		2.5	ug/L	20.0	0.54 U	103	60-139			
1,1,2-Trichloroethane	23		2.5	ug/L	20.0	0.76 U	115	57-141			
1,1-Dichloroethane	20		2.5	ug/L	20.0	0.62 U	100	57-142			
1,1-Dichloroethene	20		2.5	ug/L	20.0	0.94 U	101	47-139			
1,2,4-Trichlorobenzene	21		2.5	ug/L	20.0	0.70 U	106	52-159			
1,2-Dibromo-3-chloropropane	22		2.5	ug/L	20.0	0.96 U	110	48-150			
1,2-Dibromoethane	20		2.5	ug/L	20.0	0.78 U	98	57-140			
1,2-Dichlorobenzene	22		2.5	ug/L	20.0	0.73 U	108	63-131			
1,2-Dichloroethane	20		2.5	ug/L	20.0	0.63 U	100	50-156			
1,2-Dichloropropane	21		2.5	ug/L	20.0	0.80 U	103	61-133			
1,3-Dichlorobenzene	21		2.5	ug/L	20.0	0.77 U	103	66-129			
1,4-Dichlorobenzene	23		2.5	ug/L	20.0	0.76 U	114	65-133			
2-Butanone	95		12	ug/L	100	4.5 U	95	10-180			
2-Hexanone	94		12	ug/L	100	2.5 U	94	12-180			
4-Methyl-2-pentanone	91		12	ug/L	100	2.5 U	91	19-180			
Acetone	99		25	ug/L	100	10 U	99	10-180			
Benzene	21		2.5	ug/L	20.0	0.71 U	105	56-136			
Bromodichloromethane	20		2.5	ug/L	20.0	0.52 U	98	58-135			
Bromoform	21		2.5	ug/L	20.0	0.75 U	104	46-148			
Bromomethane	16		2.5	ug/L	20.0	0.95 U	79	10-173			
Carbon disulfide	21		12	ug/L	20.0	2.5 U	106	43-153			
Carbon Tetrachloride	21		2.5	ug/L	20.0	0.94 U	103	54-156			
Chlorobenzene	23		2.5	ug/L	20.0	0.72 U	114	51-139			
Chloroethane	21		2.5	ug/L	20.0	0.98 U	105	27-180			
Chloroform	20		2.5	ug/L	20.0	0.80 U	98	58-139			
Chloromethane	15		2.5	ug/L	20.0	0.82 U	77	33-154			
cis-1,2-Dichloroethene	21		2.5	ug/L	20.0	0.53 U	104	56-128			
cis-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.59 U	89	64-128			
Cyclohexane	19		2.5	ug/L	20.0	0.93 U	93	70-130			
Dibromochloromethane	21		2.5	ug/L	20.0	0.50 U	104	50-140			
Dichlorodifluoromethane	11		2.5	ug/L	20.0	0.74 U	57	10-180			

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2C24024 - EPA 5030B_MS - Continued

Matrix Spike (2C24024-MS1) Continued Prepared: 03/24/2022 12:55 Analyzed: 03/24/2022 21:06

Source: AF02224-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Ethylbenzene	22		2.5	ug/L	20.0	0.69 U	111	63-133			
Freon 113	19		2.5	ug/L	20.0	0.73 U	97	47-173			
Isopropylbenzene	22		2.5	ug/L	20.0	0.67 U	112	60-132			
m,p-Xylenes	47		5.0	ug/L	40.0	1.3 U	117	64-133			
Methyl acetate	15		2.5	ug/L	20.0	0.95 U	74	70-130			
Methyl cyclohexane	21		2.5	ug/L	20.0	0.64 U	106	70-130			
Methylene Chloride	20		12	ug/L	20.0	2.5 U	102	43-142			
Methyl-tert-Butyl Ether	19		2.5	ug/L	20.0	0.60 U	95	51-145			
o-Xylene	22		2.5	ug/L	20.0	0.53 U	110	61-129			
Styrene	20		2.5	ug/L	20.0	0.61 U	98	59-136			
Tetrachloroethene	22		2.5	ug/L	20.0	0.76 U	111	60-147			
Toluene	23		2.5	ug/L	20.0	0.72 U	113	64-131			
trans-1,2-Dichloroethene	19		2.5	ug/L	20.0	0.73 U	97	54-134			
trans-1,3-Dichloropropene	23		2.5	ug/L	20.0	0.73 U	114	65-149			
Trichloroethene	21		2.5	ug/L	20.0	0.89 U	105	62-135			
Trichlorofluoromethane	20		2.5	ug/L	20.0	0.94 U	102	56-155			
Vinyl chloride	20		2.5	ug/L	20.0	0.71 U	101	20-167			
4-Bromofluorobenzene	*52*			*ug/L*	*50.0*		*104*	*41-142*			
Dibromofluoromethane	*47*	*I*		*ug/L*	*50.0*		*94*	*53-146*			
Toluene-d8	*49*	*I*		*ug/L*	*50.0*		*98*	*41-146*			

Matrix Spike Dup (2C24024-MSD1) Prepared: 03/24/2022 12:55 Analyzed: 03/24/2022 21:34

Source: AF02224-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
1,1,1-Trichloroethane	20		2.5	ug/L	20.0	0.80 U	102	57-148	1	25	
1,1,2,2-Tetrachloroethane	21		2.5	ug/L	20.0	0.54 U	107	60-139	4	17	
1,1,2-Trichloroethane	23		2.5	ug/L	20.0	0.76 U	113	57-141	1	16	
1,1-Dichloroethane	21		2.5	ug/L	20.0	0.62 U	103	57-142	3	24	
1,1-Dichloroethene	21		2.5	ug/L	20.0	0.94 U	105	47-139	5	16	
1,2,4-Trichlorobenzene	23		2.5	ug/L	20.0	0.70 U	114	52-159	7	24	
1,2-Dibromo-3-chloropropane	24		2.5	ug/L	20.0	0.96 U	119	48-150	7	21	
1,2-Dibromoethane	19		2.5	ug/L	20.0	0.78 U	97	57-140	1	16	
1,2-Dichlorobenzene	22		2.5	ug/L	20.0	0.73 U	110	63-131	2	25	
1,2-Dichloroethane	19		2.5	ug/L	20.0	0.63 U	96	50-156	4	18	
1,2-Dichloropropane	21		2.5	ug/L	20.0	0.80 U	105	61-133	2	26	
1,3-Dichlorobenzene	21		2.5	ug/L	20.0	0.77 U	107	66-129	3	23	
1,4-Dichlorobenzene	23		2.5	ug/L	20.0	0.76 U	115	65-133	0.9	23	
2-Butanone	100		12	ug/L	100	4.5 U	100	10-180	5	29	
2-Hexanone	100		12	ug/L	100	2.5 U	100	12-180	6	28	
4-Methyl-2-pentanone	95		12	ug/L	100	2.5 U	95	19-180	4	24	
Acetone	100		25	ug/L	100	10 U	102	10-180	3	19	
Benzene	22		2.5	ug/L	20.0	0.71 U	108	56-136	2	14	
Bromodichloromethane	20		2.5	ug/L	20.0	0.52 U	101	58-135	3	19	
Bromoform	22		2.5	ug/L	20.0	0.75 U	112	46-148	7	18	
Bromomethane	17		2.5	ug/L	20.0	0.95 U	85	10-173	7	29	
Carbon disulfide	21		12	ug/L	20.0	2.5 U	104	43-153	2	26	
Carbon Tetrachloride	21		2.5	ug/L	20.0	0.94 U	107	54-156	4	27	
Chlorobenzene	23		2.5	ug/L	20.0	0.72 U	113	51-139	1	13	

QUALITY CONTROL DATA

Volatile Organic Compounds by GCMS - Quality Control

Batch 2C24024 - EPA 5030B_MS - Continued

Matrix Spike Dup (2C24024-MSD1) Continued Prepared: 03/24/2022 12:55 Analyzed: 03/24/2022 21:34

Source: AF02224-01

Analyte	Result	Flag	PQL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Chloroethane	21		2.5	ug/L	20.0	0.98 U	104	27-180	0.6	22	
Chloroform	20		2.5	ug/L	20.0	0.80 U	98	58-139	0.3	17	
Chloromethane	15		2.5	ug/L	20.0	0.82 U	77	33-154	0.1	31	
cis-1,2-Dichloroethene	20		2.5	ug/L	20.0	0.53 U	100	56-128	4	17	
cis-1,3-Dichloropropene	18		2.5	ug/L	20.0	0.59 U	91	64-128	2	20	
Cyclohexane	18		2.5	ug/L	20.0	0.93 U	90	70-130	3	20	
Dibromochloromethane	20		2.5	ug/L	20.0	0.50 U	102	50-140	2	18	
Dichlorodifluoromethane	11		2.5	ug/L	20.0	0.74 U	56	10-180	2	26	
Ethylbenzene	21		2.5	ug/L	20.0	0.69 U	106	63-133	5	18	
Freon 113	20		2.5	ug/L	20.0	0.73 U	99	47-173	2	30	
Isopropylbenzene	22		2.5	ug/L	20.0	0.67 U	109	60-132	3	23	
m,p-Xylenes	46		5.0	ug/L	40.0	1.3 U	115	64-133	2	18	
Methyl acetate	15		2.5	ug/L	20.0	0.95 U	77	70-130	4	20	
Methyl cyclohexane	21		2.5	ug/L	20.0	0.64 U	104	70-130	1	20	
Methylene Chloride	20		12	ug/L	20.0	2.5 U	100	43-142	2	23	
Methyl-tert-Butyl Ether	20		2.5	ug/L	20.0	0.60 U	98	51-145	3	22	
o-Xylene	21		2.5	ug/L	20.0	0.53 U	106	61-129	4	16	
Styrene	20		2.5	ug/L	20.0	0.61 U	102	59-136	3	32	
Tetrachloroethene	21		2.5	ug/L	20.0	0.76 U	105	60-147	6	21	
Toluene	23		2.5	ug/L	20.0	0.72 U	115	64-131	1	16	
trans-1,2-Dichloroethene	20		2.5	ug/L	20.0	0.73 U	100	54-134	3	20	
trans-1,3-Dichloropropene	22		2.5	ug/L	20.0	0.73 U	112	65-149	2	17	
Trichloroethene	20		2.5	ug/L	20.0	0.89 U	99	62-135	6	20	
Trichlorofluoromethane	20		2.5	ug/L	20.0	0.94 U	102	56-155	0.4	22	
Vinyl chloride	21		2.5	ug/L	20.0	0.71 U	104	20-167	3	24	
4-Bromofluorobenzene	*54*			*ug/L*	*50.0*		*108*	*41-142*			
Dibromofluoromethane	*48*	*I*		*ug/L*	*50.0*		*95*	*53-146*			
Toluene-d8	*49*	*I*		*ug/L*	*50.0*		*98*	*41-146*			

FLAGS/NOTES AND DEFINITIONS

PQL	PQL: Practical Quantitation Limit. The PQL presented is the laboratory MRL.
B	Results are based upon membrane filter colony counts that are outside the method indicated ideal range.
I	The reported value is between the laboratory method detection limit (MDL) and the practical quantitation limit (PQL).
J	Estimated value.
K	Off-scale low; Actual value is known to be less than the value given.
L	Off-scale high; Actual value is known to be greater than value given.
M	Presence of analyte is verified but not quantified; the actual value is less than the MRL but greater than the MDL.
N	Presumptive evidence of presence of material.
O	Sampled, but analysis lost or not performed.
Q	Sample exceeded the accepted holding time.
T	Value reported is less than the laboratory method detection limit. The value is reported for informational purposes only and shall not be used in statistical analysis.
U	Indicates that the compound was analyzed for but not detected.
V	Indicates that the analyte was detected in both the sample and the associated method blank.
Y	The laboratory analysis was from an improperly preserved sample. The data may not be accurate.
Z	Too many colonies were present (TNTC); the numeric value represents the filtration volume.
?	Data are rejected and should not be used. Some or all of the quality control data for the analyte were outside criteria, and the presence or absence of the analyte cannot be determined from the data.
*****	Not reported due to interference.
[CALC]	Calculated analyte - MDL/MRL reported to the highest reporting limit of the component analyses.
QM-07	The spike recovery was outside acceptance limits for the MS and/or MSD. The batch was accepted based on acceptable LCS recovery.

B	The analyte was detected in the associated method blank.
D	The sample was analyzed at dilution.
J	The reported result is an estimated value.
U	The analyte was analyzed for but not detected to the level shown, adjusted for actual sample preparation data and moisture content, where applicable.
E	The concentration indicated for this analyte is an estimated value above the calibration range of the instrument. This value is considered an estimate.
N	The analysis indicates the presence of an analyte for which there is presumptive evidence (85% or greater confidence) to make a “tentative identification".
Q	One or more quality control criteria failed.

Tetra Tech, Inc.

CHAIN OF CUSTODY NUMBER AF0224 No. 2659 PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G089	CRCA	ALEX MURPHY		ENCO
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER: DAN FORESTER	PHONE NUMBER: 304-780-1426	ADDRESS
		CARRIER/WAYBILL NUMBER		CITY, STATE

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2022	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: VOC	COMMENTS
									G	HCL		
22MAR	1200	CRCA-A$EFFLUENT-20220322		/	/	GW	G	3			X	
22MAR	1210	CRCA-A$INFLUENT-20220322		/	/	GW	G	3			X	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	22MAR22	1530	1. RECEIVED BY James W. Drago	3/22/22	1530
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: C-138 0.4°C, C-189 1.8°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

3/23/2022

Environmental Conservation Labs, Inc.

Alex Murphy
Tetra Tech, Inc. (TE016)
1353 N Courtenay Pkwy, Suite S
Merritt Island, FL 32953
Phone: (321) 636-6470
Fax: (321) 636-6473

Reference : **Sample Receipt Confirmation - *Please Review***
Project Name / Number : NASA KSC CRCA / 112G08970
Purchase Order # : 1165883

Lab Reference # : AF02224 Lab Receipt Date: 22-Mar-22 15:30
Anticipated ***(Estimated)*** Completion Date: 29-Mar-22 19:00

This is an automated notification from our laboratory information management system (LIMS), indicating the samples we have recently received and their associated analyses. Should any of the following information be in error, please contact us immediately.

Thank you for choosing Environmental Conservation Laboratories. Should any events occur that delay the processing of your samples or inhibit our ability to complete the project within the projected time frame you will be contacted.

Sincerely,

Kaitlin Dylnicki

Client: Tetra Tech, Inc. (TE016) **Project Name:** NASA KSC CRCA
Requested TAT: 5 **Project Number:** 112G08970

Analysis	TAT	Expires	Status
Sample ID: CRCA-ASEFFLUENT-20220322(Lab ID: AF02224-01), Matrix: Ground Water, Sampled: 22-Mar-22 12:00 (GMT-05:00) Eastern Time (US &			
8260D TCL SOM01.2 CLP-LIKE	5	05-Apr-22 23:59	Received
Sample ID: CRCA-ASINFLUENT-20220322(Lab ID: AF02224-02), Matrix: Ground Water, Sampled: 22-Mar-22 12:10 (GMT-05:00) Eastern Time (US &			
8260D TCL SOM01.2 CLP-LIKE	5	05-Apr-22 23:59	Received

Analysis Groups included in this work order

ENCO Orlando

SDG: AF02224-TE016

CLASS: 01_VOA_MS

METHOD: EPA 8260D

ANALYSES DATA PACKAGE COVER PAGE

EPA 8260D

Laboratory: ENCO Orlando

SDG: AF02224-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Client Sample Id:	Lab Sample Id:
CRCA-ASEFFLUENT-20220322	AF02224-01
CRCA-ASINFLUENT-20220322	AF02224-02

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASEFFLUENT-20220322

Laboratory: ENCO Orlando | SDG: AF02224-TE016

Client: Tetra Tech, Inc. (TE016) | Project: NASA KSC CRCA

Matrix: Ground Water | Laboratory ID: AF02224-01 | File ID: 225CS035.D

Sampled: 03/22/22 12:00 | Prepared: 03/24/22 12:55 | Analyzed: 03/24/22 23:25

Solids: | Preparation: EPA 5030B_MS | Initial/Final: 5 mL / 5 mL

Batch: 2C24024 | Sequence: AA71221 | Calibration: 2203088 | Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	0.71	U	0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASEFFLUENT-20220322

Laboratory: ENCO Orlando SDG: AF02224-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF02224-01 File ID: 225CS035.D

Sampled: 03/22/22 12:00 Prepared: 03/24/22 12:55 Analyzed: 03/24/22 23:25

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2C24024 Sequence: AA71221 Calibration: 2203088 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	47	94	53 - 146	
Toluene-d8	50.0	47	94	41 - 146	
4-Bromofluorobenzene	50.0	51	102	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1261922	9.845	1103250	9.839	
1,4-Difluorobenzene	2670217	10.438	2327606	10.438	
Chlorobenzene-d5	1512922	13.223	1517376	13.218	
1,4-Dichlorobenzene-d4	1241781	15.485	1281351	15.48	

* Values outside of QC limits

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASINFLUENT-20220322

Laboratory: ENCO Orlando SDG: AF02224-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF02224-02 File ID: 225CS036.D

Sampled: 03/22/22 12:10 Prepared: 03/24/22 12:55 Analyzed: 03/24/22 23:53

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2C24024 Sequence: AA71221 Calibration: 2203088 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
75-71-8	Dichlorodifluoromethane	1	0.74	U	0.74	2.5
74-87-3	Chloromethane	1	0.82	U	0.82	2.5
75-01-4	Vinyl chloride	1	2.9		0.71	2.5
74-83-9	Bromomethane	1	0.95	U	0.95	2.5
75-00-3	Chloroethane	1	0.98	U	0.98	2.5
75-69-4	Trichlorofluoromethane	1	0.94	U	0.94	2.5
76-13-1	Freon 113	1	0.73	U	0.73	2.5
67-64-1	Acetone	1	10	U	10	25
75-35-4	1,1-Dichloroethene	1	0.94	U	0.94	2.5
75-15-0	Carbon disulfide	1	2.5	U	2.5	12
75-09-2	Methylene Chloride	1	2.5	U	2.5	12
1634-04-4	Methyl-tert-Butyl Ether	1	0.60	U	0.60	2.5
156-60-5	trans-1,2-Dichloroethene	1	0.73	U	0.73	2.5
156-59-2	cis-1,2-Dichloroethene	1	0.53	U	0.53	2.5
75-34-3	1,1-Dichloroethane	1	0.62	U	0.62	2.5
78-93-3	2-Butanone	1	4.5	U	4.5	12
67-66-3	Chloroform	1	0.80	U	0.80	2.5
71-55-6	1,1,1-Trichloroethane	1	0.80	U	0.80	2.5
79-20-9	Methyl acetate	1	0.95	U	0.95	2.5
110-82-7	Cyclohexane	1	0.93	U	0.93	2.5
108-87-2	Methyl cyclohexane	1	0.64	U	0.64	2.5
56-23-5	Carbon Tetrachloride	1	0.94	U	0.94	2.5
107-06-2	1,2-Dichloroethane	1	0.63	U	0.63	2.5
71-43-2	Benzene	1	0.71	U	0.71	2.5
79-01-6	Trichloroethene	1	0.89	U	0.89	2.5
78-87-5	1,2-Dichloropropane	1	0.80	U	0.80	2.5
75-27-4	Bromodichloromethane	1	0.52	U	0.52	2.5
108-10-1	4-Methyl-2-pentanone	1	2.5	U	2.5	12
591-78-6	2-Hexanone	1	2.5	U	2.5	12
10061-01-5	cis-1,3-Dichloropropene	1	0.59	U	0.59	2.5
108-88-3	Toluene	1	0.72	U	0.72	2.5
10061-02-6	trans-1,3-Dichloropropene	1	0.73	U	0.73	2.5
79-00-5	1,1,2-Trichloroethane	1	0.76	U	0.76	2.5
127-18-4	Tetrachloroethene	1	0.76	U	0.76	2.5
124-48-1	Dibromochloromethane	1	0.50	U	0.50	2.5
106-93-4	1,2-Dibromoethane	1	0.78	U	0.78	2.5
108-90-7	Chlorobenzene	1	0.72	U	0.72	2.5
100-41-4	Ethylbenzene	1	0.69	U	0.69	2.5
108-38-3/106-42-	m,p-Xylenes	1	1.3	U	1.3	5.0
95-47-6	o-Xylene	1	0.53	U	0.53	2.5
75-25-2	Bromoform	1	0.75	U	0.75	2.5

ORGANIC ANALYSIS DATA SHEET

EPA 8260D

CRCA-ASINFLUENT-20220322

Laboratory: ENCO Orlando SDG: AF02224-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Matrix: Ground Water Laboratory ID: AF02224-02 File ID: 225CS036.D

Sampled: 03/22/22 12:10 Prepared: 03/24/22 12:55 Analyzed: 03/24/22 23:53

Solids: Preparation: EPA 5030B_MS Initial/Final: 5 mL / 5 mL

Batch: 2C24024 Sequence: AA71221 Calibration: 2203088 Instrument: OVGCMS5

CAS NO.	COMPOUND	DILUTION	CONC. (ug/L)	Q	MDL	MRL
100-42-5	Styrene	1	0.61	U	0.61	2.5
98-82-8	Isopropylbenzene	1	0.67	U	0.67	2.5
79-34-5	1,1,2,2-Tetrachloroethane	1	0.54	U	0.54	2.5
120-82-1	1,2,4-Trichlorobenzene	1	0.70	U	0.70	2.5
541-73-1	1,3-Dichlorobenzene	1	0.77	U	0.77	2.5
106-46-7	1,4-Dichlorobenzene	1	0.76	U	0.76	2.5
95-50-1	1,2-Dichlorobenzene	1	0.73	U	0.73	2.5
96-12-8	1,2-Dibromo-3-chloropropane	1	0.96	U	0.96	2.5
1330-20-7	Xylenes (Total)	1	1.3	U	1.3	5.0

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	46	92	53 - 146	
Toluene-d8	50.0	48	97	41 - 146	
4-Bromofluorobenzene	50.0	52	103	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1251140	9.845	1103250	9.839	
1,4-Difluorobenzene	2620045	10.438	2327606	10.438	
Chlorobenzene-d5	1533207	13.223	1517376	13.218	
1,4-Dichlorobenzene-d4	1247001	15.486	1281351	15.48	

* Values outside of QC limits

HOLDING TIME SUMMARY

EPA 8260D

Laboratory: ENCO Orlando

SDG: AF02224-TE016

Client: Tetra Tech, Inc. (TE016)

Project: NASA KSC CRCA

Sample Name	Date Collected	Date Received	Date Prepared	Days to Prep	Max Days to Prep	Date Analyzed	Days to Analysis	Max Days to Analysis	Q
CRCA-ASEFFLUENT-20220322	03/22/22 12:00	03/22/22 15:30	03/24/22 12:55	2.04	NA	03/24/22 23:25	2.00	14.00	
CRCA-ASINFLUENT-20220322	03/22/22 12:10	03/22/22 15:30	03/24/22 12:55	2.03	NA	03/24/22 23:53	2.00	14.00	

PREPARATION BATCH SUMMARY

EPA 8260D

Laboratory: ENCO Orlando SDG: AF02224-TE016

Client: Tetra Tech, Inc. (TE016) Project: NASA KSC CRCA

Batch: 2C24024 Batch Matrix: Water Preparation: EPA 5030B_MS

SAMPLE NAME	LAB SAMPLE ID	LAB FILE ID	DATE PREPARED	OBSERVATIONS
Blank	2C24024-BLK1	225CS033.D	03/24/22 12:55	
LCS	2C24024-BS1	225CS029.D	03/24/22 12:55	
CRCA-ASEFFLUENT-20220322	2C24024-MS1	225CS030.D	03/24/22 12:55	
CRCA-ASEFFLUENT-20220322	2C24024-MSD1	225CS031.D	03/24/22 12:55	
CRCA-ASEFFLUENT-20220322	AF02224-01	225CS035.D	03/24/22 12:55	
CRCA-ASINFLUENT-20220322	AF02224-02	225CS036.D	03/24/22 12:55	

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF02224-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	2C24024-BLK1	File ID:	225CS033.D
Prepared:	03/24/22 12:55	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	03/24/22 22:29	Instrument:	OVGCMS5		
Batch:	2C24024	Sequence:	AA71221	Calibration:	2203088

CAS NO.	COMPOUND	CONC. (ug/L)	Q
75-71-8	Dichlorodifluoromethane	0.74	U
74-87-3	Chloromethane	0.82	U
75-01-4	Vinyl chloride	0.71	U
74-83-9	Bromomethane	0.95	U
75-00-3	Chloroethane	0.98	U
75-69-4	Trichlorofluoromethane	0.94	U
76-13-1	Freon 113	0.73	U
67-64-1	Acetone	10	U
75-35-4	1,1-Dichloroethene	0.94	U
75-15-0	Carbon disulfide	2.5	U
75-09-2	Methylene Chloride	2.5	U
1634-04-4	Methyl-tert-Butyl Ether	0.60	U
156-60-5	trans-1,2-Dichloroethene	0.73	U
156-59-2	cis-1,2-Dichloroethene	0.53	U
75-34-3	1,1-Dichloroethane	0.62	U
78-93-3	2-Butanone	4.5	U
67-66-3	Chloroform	0.80	U
71-55-6	1,1,1-Trichloroethane	0.80	U
79-20-9	Methyl acetate	0.95	U
110-82-7	Cyclohexane	0.93	U
108-87-2	Methyl cyclohexane	0.64	U
56-23-5	Carbon Tetrachloride	0.94	U
107-06-2	1,2-Dichloroethane	0.63	U
71-43-2	Benzene	0.71	U
79-01-6	Trichloroethene	0.89	U
78-87-5	1,2-Dichloropropane	0.80	U
75-27-4	Bromodichloromethane	0.52	U
108-10-1	4-Methyl-2-pentanone	2.5	U
591-78-6	2-Hexanone	2.5	U
10061-01-5	cis-1,3-Dichloropropene	0.59	U

METHOD BLANK DATA SHEET
EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF02224-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA

Matrix:	Water	Laboratory ID:	2C24024-BLK1	File ID:	225CS033.D
Prepared:	03/24/22 12:55	Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL
Analyzed:	03/24/22 22:29	Instrument:	OVGCMS5		
Batch:	2C24024	Sequence:	AA71221	Calibration:	2203088

CAS NO.	COMPOUND	CONC. (ug/L)	Q
108-88-3	Toluene	0.72	U
10061-02-6	trans-1,3-Dichloropropene	0.73	U
79-00-5	1,1,2-Trichloroethane	0.76	U
127-18-4	Tetrachloroethene	0.76	U
124-48-1	Dibromochloromethane	0.50	U
106-93-4	1,2-Dibromoethane	0.78	U
108-90-7	Chlorobenzene	0.72	U
100-41-4	Ethylbenzene	0.69	U
108-38-3/106-42-3	m,p-Xylenes	1.3	U
95-47-6	o-Xylene	0.53	U
75-25-2	Bromoform	0.75	U
100-42-5	Styrene	0.61	U
98-82-8	Isopropylbenzene	0.67	U
79-34-5	1,1,2,2-Tetrachloroethane	0.54	U
120-82-1	1,2,4-Trichlorobenzene	0.70	U
541-73-1	1,3-Dichlorobenzene	0.77	U
106-46-7	1,4-Dichlorobenzene	0.76	U
95-50-1	1,2-Dichlorobenzene	0.73	U
96-12-8	1,2-Dibromo-3-chloropropane	0.96	U
1330-20-7	Xylenes (Total)	1.3	U

SYSTEM MONITORING COMPOUND	ADDED (ug/L)	CONC (ug/L)	% REC	QC LIMITS	Q
Dibromofluoromethane	50.0	47	94	53 - 146	
Toluene-d8	50.0	48	96	41 - 146	
4-Bromofluorobenzene	50.0	51	102	41 - 142	

INTERNAL STANDARD	AREA	RT	REF AREA	REF RT	Q
Pentafluorobenzene	1261727	9.845	1103250	9.839	
1,4-Difluorobenzene	2664241	10.438	2327606	10.438	
Chlorobenzene-d5	1522662	13.223	1517376	13.218	
1,4-Dichlorobenzene-d4	1232755	15.485	1281351	15.48	

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF02224-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	2C24024	Laboratory ID:	2C24024-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	10	50	10 - 180
Chloromethane	20.0	14	68	33 - 154
Vinyl chloride	20.0	19	94	20 - 167
Bromomethane	20.0	12	62	10 - 173
Chloroethane	20.0	19	96	27 - 180
Trichlorofluoromethane	20.0	18	92	56 - 155
Freon 113	20.0	18	92	47 - 173
Acetone	100	100	100	10 - 180
1,1-Dichloroethene	20.0	20	98	47 - 139
Carbon disulfide	20.0	20	102	43 - 153
Methylene Chloride	20.0	21	103	43 - 142
Methyl-tert-Butyl Ether	20.0	18	92	51 - 145
trans-1,2-Dichloroethene	20.0	19	97	54 - 134
cis-1,2-Dichloroethene	20.0	21	106	56 - 128
1,1-Dichloroethane	20.0	20	100	57 - 142
2-Butanone	100	96	96	10 - 180
Chloroform	20.0	19	96	58 - 139
1,1,1-Trichloroethane	20.0	20	101	57 - 148
Methyl acetate	20.0	16	79	70 - 130
Cyclohexane	20.0	17	87	70 - 130
Methyl cyclohexane	20.0	19	95	70 - 130
Carbon Tetrachloride	20.0	19	97	54 - 156
1,2-Dichloroethane	20.0	19	95	50 - 156
Benzene	20.0	21	104	56 - 136
Trichloroethene	20.0	20	101	62 - 135
1,2-Dichloropropane	20.0	21	104	61 - 133
Bromodichloromethane	20.0	20	98	58 - 135
4-Methyl-2-pentanone	100	79	79	19 - 180
2-Hexanone	100	88	88	12 - 180
cis-1,3-Dichloropropene	20.0	18	88	64 - 128

LCS / LCS DUPLICATE RECOVERY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF02224-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Matrix:	Water		
Batch:	2C24024	Laboratory ID:	2C24024-BS1
Preparation:	EPA 5030B_MS	Initial/Final:	5 mL / 5 mL

COMPOUND	SPIKE ADDED (ug/L)	LCS CONCENTRATION (ug/L)	LCS % REC. #	QC LIMITS REC.
Toluene	20.0	23	115	64 - 131
trans-1,3-Dichloropropene	20.0	21	105	65 - 149
1,1,2-Trichloroethane	20.0	22	109	57 - 141
Tetrachloroethene	20.0	29	144	60 - 147
Dibromochloromethane	20.0	20	101	50 - 140
1,2-Dibromoethane	20.0	19	95	57 - 140
Chlorobenzene	20.0	22	112	51 - 139
Ethylbenzene	20.0	20	99	63 - 133
m,p-Xylenes	40.0	44	110	64 - 133
o-Xylene	20.0	21	104	61 - 129
Bromoform	20.0	21	104	46 - 148
Styrene	20.0	19	96	59 - 136
Isopropylbenzene	20.0	20	102	60 - 132
1,1,2,2-Tetrachloroethane	20.0	20	101	60 - 139
1,2,4-Trichlorobenzene	20.0	19	94	52 - 159
1,3-Dichlorobenzene	20.0	20	102	66 - 129
1,4-Dichlorobenzene	20.0	22	110	65 - 133
1,2-Dichlorobenzene	20.0	20	102	63 - 131
1,2-Dibromo-3-chloropropane	20.0	21	105	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-ASEFFLUENT-20220322

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2C24024
Laboratory ID: 2C24024-MS1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-ASEFFLUENT-20220322

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
Dichlorodifluoromethane	20.0	ND	11	57	10 - 180
Chloromethane	20.0	ND	15	77	33 - 154
Vinyl chloride	20.0	ND	20	101	20 - 167
Bromomethane	20.0	ND	16	79	10 - 173
Chloroethane	20.0	ND	21	105	27 - 180
Trichlorofluoromethane	20.0	ND	20	102	56 - 155
Freon 113	20.0	ND	19	97	47 - 173
Acetone	100	ND	99	99	10 - 180
1,1-Dichloroethene	20.0	ND	20	101	47 - 139
Carbon disulfide	20.0	ND	21	106	43 - 153
Methylene Chloride	20.0	ND	20	102	43 - 142
Methyl-tert-Butyl Ether	20.0	ND	19	95	51 - 145
trans-1,2-Dichloroethene	20.0	ND	19	97	54 - 134
cis-1,2-Dichloroethene	20.0	ND	21	104	56 - 128
1,1-Dichloroethane	20.0	ND	20	100	57 - 142
2-Butanone	100	ND	95	95	10 - 180
Chloroform	20.0	ND	20	98	58 - 139
1,1,1-Trichloroethane	20.0	ND	20	101	57 - 148
Methyl acetate	20.0	ND	15	74	70 - 130
Cyclohexane	20.0	ND	19	93	70 - 130
Methyl cyclohexane	20.0	ND	21	106	70 - 130
Carbon Tetrachloride	20.0	ND	21	103	54 - 156
1,2-Dichloroethane	20.0	ND	20	100	50 - 156
Benzene	20.0	ND	21	105	56 - 136
Trichloroethene	20.0	ND	21	105	62 - 135
1,2-Dichloropropane	20.0	ND	21	103	61 - 133
Bromodichloromethane	20.0	ND	20	98	58 - 135
4-Methyl-2-pentanone	100	ND	91	91	19 - 180
2-Hexanone	100	ND	94	94	12 - 180
cis-1,3-Dichloropropene	20.0	ND	18	89	64 - 128
Toluene	20.0	ND	23	113	64 - 131

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-ASEFFLUENT-20220322

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2C24024
Laboratory ID: 2C24024-MS1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-ASEFFLUENT-20220322

COMPOUND	SPIKE ADDED (ug/L)	SAMPLE CONCENTRATION (ug/L)	MS CONCENTRATION (ug/L)	MS % REC. #	QC LIMITS REC.
trans-1,3-Dichloropropene	20.0	ND	23	114	65 - 149
1,1,2-Trichloroethane	20.0	ND	23	115	57 - 141
Tetrachloroethene	20.0	ND	22	111	60 - 147
Dibromochloromethane	20.0	ND	21	104	50 - 140
1,2-Dibromoethane	20.0	ND	20	98	57 - 140
Chlorobenzene	20.0	ND	23	114	51 - 139
Ethylbenzene	20.0	ND	22	111	63 - 133
m,p-Xylenes	40.0	ND	47	117	64 - 133
o-Xylene	20.0	ND	22	110	61 - 129
Bromoform	20.0	ND	21	104	46 - 148
Styrene	20.0	ND	20	98	59 - 136
Isopropylbenzene	20.0	ND	22	112	60 - 132
1,1,2,2-Tetrachloroethane	20.0	ND	21	103	60 - 139
1,2,4-Trichlorobenzene	20.0	ND	21	106	52 - 159
1,3-Dichlorobenzene	20.0	ND	21	103	66 - 129
1,4-Dichlorobenzene	20.0	ND	23	114	65 - 133
1,2-Dichlorobenzene	20.0	ND	22	108	63 - 131
1,2-Dibromo-3-chloropropane	20.0	ND	22	110	48 - 150

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-ASEFFLUENT-20220322

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2C24024
Laboratory ID: 2C24024-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-ASEFFLUENT-20220322

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
Dichlorodifluoromethane	20.0	11	56	2	26	10 - 180
Chloromethane	20.0	15	77	0.1	31	33 - 154
Vinyl chloride	20.0	21	104	3	24	20 - 167
Bromomethane	20.0	17	85	7	29	10 - 173
Chloroethane	20.0	21	104	0.6	22	27 - 180
Trichlorofluoromethane	20.0	20	102	0.4	22	56 - 155
Freon 113	20.0	20	99	2	30	47 - 173
Acetone	100	100	102	3	19	10 - 180
1,1-Dichloroethene	20.0	21	105	5	16	47 - 139
Carbon disulfide	20.0	21	104	2	26	43 - 153
Methylene Chloride	20.0	20	100	2	23	43 - 142
Methyl-tert-Butyl Ether	20.0	20	98	3	22	51 - 145
trans-1,2-Dichloroethene	20.0	20	100	3	20	54 - 134
cis-1,2-Dichloroethene	20.0	20	100	4	17	56 - 128
1,1-Dichloroethane	20.0	21	103	3	24	57 - 142
2-Butanone	100	100	100	5	29	10 - 180
Chloroform	20.0	20	98	0.3	17	58 - 139
1,1,1-Trichloroethane	20.0	20	102	1	25	57 - 148
Methyl acetate	20.0	15	77	4	20	70 - 130
Cyclohexane	20.0	18	90	3	20	70 - 130
Methyl cyclohexane	20.0	21	104	1	20	70 - 130
Carbon Tetrachloride	20.0	21	107	4	27	54 - 156
1,2-Dichloroethane	20.0	19	96	4	18	50 - 156
Benzene	20.0	22	108	2	14	56 - 136
Trichloroethene	20.0	20	99	6	20	62 - 135
1,2-Dichloropropane	20.0	21	105	2	26	61 - 133
Bromodichloromethane	20.0	20	101	3	19	58 - 135
4-Methyl-2-pentanone	100	95	95	4	24	19 - 180
2-Hexanone	100	100	100	6	28	12 - 180
cis-1,3-Dichloropropene	20.0	18	91	2	20	64 - 128
Toluene	20.0	23	115	1	16	64 - 131
trans-1,3-Dichloropropene	20.0	22	112	2	17	65 - 149

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

EPA 8260D

CRCA-ASEFFLUENT-20220322

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Matrix: Water
Batch: 2C24024
Laboratory ID: 2C24024-MSD1
Preparation: EPA 5030B_MS
Initial/Final: 5 mL / 5 mL
Source Sample Name: CRCA-ASEFFLUENT-20220322

COMPOUND	SPIKE ADDED (ug/L)	MSD CONCENTRATION (ug/L)	MSD % REC. #	% RPD #	QC LIMITS RPD	QC LIMITS REC.
1,1,2-Trichloroethane	20.0	23	113	1	16	57 - 141
Tetrachloroethene	20.0	21	105	6	21	60 - 147
Dibromochloromethane	20.0	20	102	2	18	50 - 140
1,2-Dibromoethane	20.0	19	97	1	16	57 - 140
Chlorobenzene	20.0	23	113	1	13	51 - 139
Ethylbenzene	20.0	21	106	5	18	63 - 133
m,p-Xylenes	40.0	46	115	2	18	64 - 133
o-Xylene	20.0	21	106	4	16	61 - 129
Bromoform	20.0	22	112	7	18	46 - 148
Styrene	20.0	20	102	3	32	59 - 136
Isopropylbenzene	20.0	22	109	3	23	60 - 132
1,1,2,2-Tetrachloroethane	20.0	21	107	4	17	60 - 139
1,2,4-Trichlorobenzene	20.0	23	114	7	24	52 - 159
1,3-Dichlorobenzene	20.0	21	107	3	23	66 - 129
1,4-Dichlorobenzene	20.0	23	115	0.9	23	65 - 133
1,2-Dichlorobenzene	20.0	22	110	2	25	63 - 131
1,2-Dibromo-3-chloropropane	20.0	24	119	7	21	48 - 150

Column to be used to flag recovery and RPD values with an asterisk

* Values outside of QC limits

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA71109
Instrument: OVGCMS5
Matrix: Water
Calibration: 2203088

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Secondary Cal Check (AA71109-SCV1)			Lab File ID: 225CL014.D		Analyzed: 03/17/22 13:52			
Dibromofluoromethane	50.0	106	70 - 130	9.416	9.41525	0.0008	+/-0.5	
Toluene-d8	50.0	107	70 - 130	11.772	11.7705	0.0015	+/-0.5	
4-Bromofluorobenzene	50.0	108	70 - 130	14.322	14.322	0.0000	+/-0.5	

SURROGATE STANDARD RECOVERY AND RT SUMMARY

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA

Sequence: AA71221
Instrument: OVGCMS5
Matrix: Water
Calibration: 2203088

Surrogate Compound	Spike Level ug/L	% Recovery	Recovery Limits	RT	Calibration RT	RT Diff	RT Diff Limit	Q
Calibration Check (AA71221-CCV1)			Lab File ID: 225CS028.D		Analyzed: 03/24/22 20:10			
Dibromofluoromethane	50.0	97	80 - 120	9.422	9.41525	0.0068	+/-0.5	
Toluene-d8	50.0	98	80 - 120	11.778	11.7705	0.0075	+/-0.5	
4-Bromofluorobenzene	50.0	107	80 - 120	14.328	14.322	0.0060	+/-0.5	
LCS (2C24024-BS1)			Lab File ID: 225CS029.D		Analyzed: 03/24/22 20:38			
Dibromofluoromethane	50.0	96	53 - 146	9.422	9.41525	0.0068	+/-0.5	
Toluene-d8	50.0	97	41 - 146	11.778	11.7705	0.0075	+/-0.5	
4-Bromofluorobenzene	50.0	104	41 - 142	14.328	14.322	0.0060	+/-0.5	
Matrix Spike (2C24024-MS1)			Lab File ID: 225CS030.D		Analyzed: 03/24/22 21:06			
Dibromofluoromethane	50.0	94	53 - 146	9.422	9.41525	0.0068	+/-0.5	
Toluene-d8	50.0	98	41 - 146	11.778	11.7705	0.0075	+/-0.5	
4-Bromofluorobenzene	50.0	104	41 - 142	14.328	14.322	0.0060	+/-0.5	
Matrix Spike Dup (2C24024-MSD1)			Lab File ID: 225CS031.D		Analyzed: 03/24/22 21:34			
Dibromofluoromethane	50.0	95	53 - 146	9.416	9.41525	0.0008	+/-0.5	
Toluene-d8	50.0	98	41 - 146	11.772	11.7705	0.0015	+/-0.5	
4-Bromofluorobenzene	50.0	108	41 - 142	14.328	14.322	0.0060	+/-0.5	
Blank (2C24024-BLK1)			Lab File ID: 225CS033.D		Analyzed: 03/24/22 22:29			
Dibromofluoromethane	50.0	94	53 - 146	9.422	9.41525	0.0068	+/-0.5	
Toluene-d8	50.0	96	41 - 146	11.772	11.7705	0.0015	+/-0.5	
4-Bromofluorobenzene	50.0	102	41 - 142	14.328	14.322	0.0060	+/-0.5	
Instrument RL Check (AA71221-CRL1)			Lab File ID: 225CS034.D		Analyzed: 03/24/22 22:57			
Dibromofluoromethane	50.0	95	1 - 199	9.422	9.41525	0.0068	+/-0.5	
Toluene-d8	50.0	96	1 - 199	11.772	11.7705	0.0015	+/-0.5	
4-Bromofluorobenzene	50.0	105	1 - 199	14.328	14.322	0.0060	+/-0.5	
CRCA-ASEFFLUENT-20220322 (AF02224-01)			Lab File ID: 225CS035.D		Analyzed: 03/24/22 23:25			
Dibromofluoromethane	50.0	94	53 - 146	9.422	9.41525	0.0068	+/-0.5	
Toluene-d8	50.0	94	41 - 146	11.772	11.7705	0.0015	+/-0.5	
4-Bromofluorobenzene	50.0	102	41 - 142	14.328	14.322	0.0060	+/-0.5	
CRCA-ASINFLUENT-20220322 (AF02224-02)			Lab File ID: 225CS036.D		Analyzed: 03/24/22 23:53			
Dibromofluoromethane	50.0	92	53 - 146	9.422	9.41525	0.0068	+/-0.5	
Toluene-d8	50.0	97	41 - 146	11.772	11.7705	0.0015	+/-0.5	
4-Bromofluorobenzene	50.0	103	41 - 142	14.328	14.322	0.0060	+/-0.5	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA71109
Instrument: OVGCMS5
Matrix: Water
Calibration: 2203088

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA71109-CAL1)			Lab File ID: 225CL005.D			Analyzed: 03/17/22 09:42			
Pentafluorobenzene	1134882	9.845	1103250	9.839	103	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2351756	10.438	2327606	10.438	101	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1457741	13.223	1517376	13.218	96	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1241832	15.48	1281351	15.48	97	50 - 200	0.0000	+/-0.50	
Cal Standard (AA71109-CAL2)			Lab File ID: 225CL006.D			Analyzed: 03/17/22 10:10			
Pentafluorobenzene	1109710	9.839	1103250	9.839	101	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2329267	10.438	2327606	10.438	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1434811	13.218	1517376	13.218	95	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	1203792	15.48	1281351	15.48	94	50 - 200	0.0000	+/-0.50	
Cal Standard (AA71109-CAL3)			Lab File ID: 225CL007.D			Analyzed: 03/17/22 10:38			
Pentafluorobenzene	1097554	9.845	1103250	9.839	99	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2372329	10.438	2327606	10.438	102	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1435724	13.217	1517376	13.218	95	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1198663	15.48	1281351	15.48	94	50 - 200	0.0000	+/-0.50	
Cal Standard (AA71109-CAL4)			Lab File ID: 225CL008.D			Analyzed: 03/17/22 11:06			
Pentafluorobenzene	1117290	9.839	1103250	9.839	101	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2301868	10.438	2327606	10.438	99	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1428049	13.218	1517376	13.218	94	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	1228539	15.48	1281351	15.48	96	50 - 200	0.0000	+/-0.50	
Cal Standard (AA71109-CAL5)			Lab File ID: 225CL009.D			Analyzed: 03/17/22 11:33			
Pentafluorobenzene	1123692	9.839	1103250	9.839	102	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2322549	10.438	2327606	10.438	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1455829	13.217	1517376	13.218	96	50 - 200	-0.0010	+/-0.50	
1,4-Dichlorobenzene-d4	1250697	15.479	1281351	15.48	98	50 - 200	-0.0010	+/-0.50	
Cal Standard (AA71109-CAL6)			Lab File ID: 225CL010.D			Analyzed: 03/17/22 12:01			
Pentafluorobenzene	1103250	9.839	1103250	9.839	100	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2327606	10.438	2327606	10.438	100	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1517376	13.218	1517376	13.218	100	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	1281351	15.48	1281351	15.48	100	50 - 200	0.0000	+/-0.50	
Cal Standard (AA71109-CAL7)			Lab File ID: 225CL011.D			Analyzed: 03/17/22 12:29			
Pentafluorobenzene	1140556	9.845	1103250	9.839	103	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2351735	10.438	2327606	10.438	101	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1537240	13.223	1517376	13.218	101	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1356738	15.479	1281351	15.48	106	50 - 200	-0.0010	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA71109
Instrument: OVGCMS5
Matrix: Water
Calibration: 2203088

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Cal Standard (AA71109-CAL8)			Lab File ID: 225CL012.D			Analyzed: 03/17/22 12:56			
Pentafluorobenzene	1153923	9.845	1103250	9.839	105	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2326995	10.433	2327606	10.438	100	50 - 200	-0.0050	+/-0.50	
Chlorobenzene-d5	1578543	13.218	1517376	13.218	104	50 - 200	0.0000	+/-0.50	
1,4-Dichlorobenzene-d4	1377465	15.48	1281351	15.48	108	50 - 200	0.0000	+/-0.50	
Secondary Cal Check (AA71109-SCV1)			Lab File ID: 225CL014.D			Analyzed: 03/17/22 13:52			
Pentafluorobenzene	1126316	9.839	1103250	9.839	102	50 - 200	0.0000	+/-0.50	
1,4-Difluorobenzene	2368107	10.438	2327606	10.438	102	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1532019	13.223	1517376	13.218	101	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1305033	15.48	1281351	15.48	102	50 - 200	0.0000	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA71221
Instrument: OVGCMS5
Matrix: Water
Calibration: 2203088

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
Calibration Check (AA71221-CCV1)			Lab File ID: 225CS028.D			Analyzed: 03/24/22 20:10			
Pentafluorobenzene	1259906	9.851	1103250	9.839	114	50 - 200	0.0120	+/-0.50	
1,4-Difluorobenzene	2668198	10.444	2327606	10.438	115	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1627741	13.223	1517376	13.218	107	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1358078	15.491	1281351	15.48	106	50 - 200	0.0110	+/-0.50	
LCS (2C24024-BS1)			Lab File ID: 225CS029.D			Analyzed: 03/24/22 20:38			
Pentafluorobenzene	1283798	9.845	1103250	9.839	116	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2723998	10.444	2327606	10.438	117	50 - 200	0.0060	+/-0.50	
Chlorobenzene-d5	1605129	13.223	1517376	13.218	106	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1327633	15.486	1281351	15.48	104	50 - 200	0.0060	+/-0.50	
Matrix Spike (2C24024-MS1)			Lab File ID: 225CS030.D			Analyzed: 03/24/22 21:06			
Pentafluorobenzene	1321411	9.845	1103250	9.839	120	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2723264	10.438	2327606	10.438	117	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1611124	13.223	1517376	13.218	106	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1342626	15.485	1281351	15.48	105	50 - 200	0.0050	+/-0.50	
Matrix Spike Dup (2C24024-MSD1)			Lab File ID: 225CS031.D			Analyzed: 03/24/22 21:34			
Pentafluorobenzene	1282547	9.845	1103250	9.839	116	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2669190	10.438	2327606	10.438	115	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1601654	13.223	1517376	13.218	106	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1309689	15.485	1281351	15.48	102	50 - 200	0.0050	+/-0.50	
Blank (2C24024-BLK1)			Lab File ID: 225CS033.D			Analyzed: 03/24/22 22:29			
Pentafluorobenzene	1261727	9.845	1103250	9.839	114	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2664241	10.438	2327606	10.438	114	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1522662	13.223	1517376	13.218	100	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1232755	15.485	1281351	15.48	96	50 - 200	0.0050	+/-0.50	
Instrument RL Check (AA71221-CRL1)			Lab File ID: 225CS034.D			Analyzed: 03/24/22 22:57			
Pentafluorobenzene	1256940	9.845	1103250	9.839	114	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2686769	10.438	2327606	10.438	115	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1508652	13.223	1517376	13.218	99	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1239790	15.486	1281351	15.48	97	50 - 200	0.0060	+/-0.50	
CRCA-ASEFFLUENT-20220322 (AF02224-01)			Lab File ID: 225CS035.D			Analyzed: 03/24/22 23:25			
Pentafluorobenzene	1261922	9.845	1103250	9.839	114	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2670217	10.438	2327606	10.438	115	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1512922	13.223	1517376	13.218	100	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1241781	15.485	1281351	15.48	97	50 - 200	0.0050	+/-0.50	

INTERNAL STANDARD AREA AND RT SUMMARY
EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Sequence: AA71221
Instrument: OVGCMS5
Matrix: Water
Calibration: 2203088

Internal Standard	Response	RT	Reference Response	Reference RT	Area %	Area % Limits	RT Diff	RT Diff Limit	Q
CRCA-ASINFLUENT-20220322 (AF02224-02)			Lab File ID: 225CS036.D			Analyzed: 03/24/22 23:53			
Pentafluorobenzene	1251140	9.845	1103250	9.839	113	50 - 200	0.0060	+/-0.50	
1,4-Difluorobenzene	2620045	10.438	2327606	10.438	113	50 - 200	0.0000	+/-0.50	
Chlorobenzene-d5	1533207	13.223	1517376	13.218	101	50 - 200	0.0050	+/-0.50	
1,4-Dichlorobenzene-d4	1247001	15.486	1281351	15.48	97	50 - 200	0.0060	+/-0.50	

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF02224-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA71109		
Calibration:	2203088	Instrument:	OVGCMS5

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
MS Tune	AA71109-TUN1	225CL002.D	03/17/22 08:14
Cal Standard	AA71109-CAL1	225CL005.D	03/17/22 09:42
Cal Standard	AA71109-CAL2	225CL006.D	03/17/22 10:10
Cal Standard	AA71109-CAL3	225CL007.D	03/17/22 10:38
Cal Standard	AA71109-CAL4	225CL008.D	03/17/22 11:06
Cal Standard	AA71109-CAL5	225CL009.D	03/17/22 11:33
Cal Standard	AA71109-CAL6	225CL010.D	03/17/22 12:01
Cal Standard	AA71109-CAL7	225CL011.D	03/17/22 12:29
Cal Standard	AA71109-CAL8	225CL012.D	03/17/22 12:56
Secondary Cal Check	AA71109-SCV1	225CL014.D	03/17/22 13:52

ANALYSIS BATCH (SEQUENCE) SUMMARY

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF02224-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA71221		
Calibration:	2203088	Instrument:	OVGCMS5

Sample Name	Lab Sample ID	Lab File ID	Analysis Date/Time
Calibration Check	AA71221-CCV1	225CS028.D	03/24/22 20:10
LCS	2C24024-BS1	225CS029.D	03/24/22 20:38
CRCA-ASEFFLUENT-20220322	2C24024-MS1	225CS030.D	03/24/22 21:06
CRCA-ASEFFLUENT-20220322	2C24024-MSD1	225CS031.D	03/24/22 21:34
Blank	2C24024-BLK1	225CS033.D	03/24/22 22:29
Instrument RL Check	AA71221-CRL1	225CS034.D	03/24/22 22:57
CRCA-ASEFFLUENT-20220322	AF02224-01	225CS035.D	03/24/22 23:25
CRCA-ASINFLUENT-20220322	AF02224-02	225CS036.D	03/24/22 23:53

MASS SPECTROMETER INSTRUMENT PERFORMANCE CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF02224-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Lab File ID:	225CL002.D	Injection Date:	03/17/22
Instrument ID:	OVGCMS5	Injection Time:	08:14
Sequence:	AA71109	Lab Sample ID:	AA71109-TUN1

m/z	ION ABUNDANCE CRITERIA	% RELATIVE ABUNDANCE	
95	50 - 200% of 174	167	PASS
96	5 - 9% of 95	7.07	PASS
173	Less than 2% of 174	0.245	PASS
174	50 - 200% of 95	59.8	PASS
175	5 - 9% of 174	6.47	PASS
176	95 - 105% of 174	95.3	PASS
177	5 - 10% of 176	7.26	PASS

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF02224-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS5	Calibration:	2203088
Lab File ID:	225CS028.D	Calibration Date:	03/17/22 00:00
Sequence:	AA71221	Injection Date:	03/24/22
Lab Sample ID:	AA71221-CCV1	Injection Time:	20:10

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
Dichlorodifluoromethane	A	50.0	53	0.7215265	0.7714195		6.9	20
Chloromethane	A	50.0	46	0.9113585	0.841866		-7.6	20
Vinyl chloride	A	50.0	49	0.567574	0.5963651		-2.6	20
Bromomethane	A	50.0	48	0.2464765	0.2694336		-3.2	20
Chloroethane	A	50.0	49	0.3629945	0.3914324		-2.7	20
Trichlorofluoromethane	A	50.0	49	0.7447415	0.7312387		-1.8	20
Freon 113	A	50.0	50	0.3199326	0.3216803		0.50	20
Acetone	A	250	230	0.135601	0.1195978		-7.9	20
1,1-Dichloroethene	A	50.0	47	0.4414173	0.4782992		-5.3	20
Carbon disulfide	A	250	260	1.600987	1.66478		4.0	20
Methylene Chloride	A	50.0	53	0.5947082	0.6046689		1.7	20
Methyl-tert-Butyl Ether	A	50.0	47	1.346357	1.391097		-6.3	20
trans-1,2-Dichloroethene	A	50.0	47	0.5061161	0.5381981		-6.9	20
cis-1,2-Dichloroethene	A	50.0	49	0.5688026	0.6007202		-2.4	20
1,1-Dichloroethane	A	50.0	47	0.9998844	1.025149		-5.4	20
2-Butanone	A	250	250	6.696119E-02	0.0660135		-1.4	20
Chloroform	A	50.0	48	0.9767095	1.012726		-4.4	20
1,1,1-Trichloroethane	A	50.0	48	0.7811563	0.8149068		-3.8	20
Methyl acetate	A	50.0	44	0.4208667	0.3694784		-12	20
Cyclohexane	A	50.0	45	1.088214	1.125348		-11	20
Methyl cyclohexane	A	50.0	48	0.6492293	0.5417982		-4.4	20
Carbon Tetrachloride	A	50.0	47	0.294316	0.3051367		-5.6	20
1,2-Dichloroethane	A	50.0	47	0.3364594	0.315336		-6.3	20
Benzene	A	50.0	50	1.114882	1.114818		-0.006	20
Trichloroethene	A	50.0	47	0.2359674	0.2439429		-5.5	20
1,2-Dichloropropane	A	50.0	49	0.3001878	0.3123955		-2.6	20
Bromodichloromethane	A	50.0	46	0.3050888	0.3282009		-7.4	20
4-Methyl-2-pentanone	A	250	210	4.132074E-02	3.484629E-02		-16	20
2-Hexanone	A	250	220	0.2824122	0.2592379		-13	20

CONTINUING CALIBRATION CHECK

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF02224-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Instrument ID:	OVGCMS5	Calibration:	2203088
Lab File ID:	225CS028.D	Calibration Date:	03/17/22 00:00
Sequence:	AA71221	Injection Date:	03/24/22
Lab Sample ID:	AA71221-CCV1	Injection Time:	20:10

		CONC. (ug/L)		RESPONSE FACTOR			% DIFF / DRIFT	
COMPOUND	TYPE	STD	CCV	ICAL	CCV	MIN (#)	CCV	LIMIT (#)
cis-1,3-Dichloropropene	A	50.0	46	0.462127	0.475482		-8	20
Toluene	A	50.0	54	1.118247	1.201857		7.5	20
trans-1,3-Dichloropropene	A	50.0	52	0.5926703	0.6177359		4.2	20
1,1,2-Trichloroethane	A	50.0	52	0.3618922	0.3753773		3.7	20
Tetrachloroethene	A	50.0	50	0.281055	0.280149		-0.3	20
Dibromochloromethane	A	50.0	49	0.3211915	0.3582671		-1.3	20
1,2-Dibromoethane	A	50.0	48	0.3532996	0.371083		-4.4	20
Chlorobenzene	A	50.0	52	1.119289	1.160269		3.7	20
Ethylbenzene	A	50.0	51	0.6234073	0.6891041		2.3	20
m,p-Xylenes	A	100	110	0.7970556	0.8609849		8.0	20
o-Xylene	A	50.0	51	0.7443198	0.8460173		1.2	20
Bromoform	A	50.0	49	0.1731307	0.1919611		-1.1	20
Styrene	A	50.0	50	1.222125	1.449003		0.50	20
Isopropylbenzene	A	50.0	50	1.972704	2.165895		0.30	20
1,1,2,2-Tetrachloroethane	A	50.0	49	0.5241499	0.5563164		-1	20
1,2,4-Trichlorobenzene	A	50.0	47	0.4074535	0.4479625		-5.6	20
1,3-Dichlorobenzene	A	50.0	49	0.9542082	1.041054		-2.8	20
1,4-Dichlorobenzene	A	50.0	55	1.003404	1.104476		10	20
1,2-Dichlorobenzene	A	50.0	51	0.9029451	1.035466		2.8	20
1,2-Dibromo-3-chloropropane	A	50.0	51	9.447833E-02	0.1080527		1.7	20

Column to be used to flag Response Factor and %Diff/Drift values with an asterisk

* Values outside of QC limits

INITIAL CALIBRATION STANDARDS

EPA 8260D

Laboratory:	ENCO Orlando	SDG:	AF02224-TE016
Client:	Tetra Tech, Inc. (TE016)	Project:	NASA KSC CRCA
Sequence:	AA71109	Instrument:	OVGCMS5
Calibration:	2203088		

Standard ID	Description	Lab Sample ID	Lab File ID	Analysis Date/Time
A1J0534	MS Tune (lower conc.)	AA71109-TUN1	225CL002.D	03/17/22 08:14
A2C0973	8260 1 PPB ms-5	AA71109-CAL1	225CL005.D	03/17/22 09:42
A2C0974	8260 2 PPB ms-5	AA71109-CAL2	225CL006.D	03/17/22 10:10
A2C0975	8260 5 PPB ms-5	AA71109-CAL3	225CL007.D	03/17/22 10:38
A2C0976	8260 10 PPB ms-5	AA71109-CAL4	225CL008.D	03/17/22 11:06
A2C0978	8260 20 PPB ms-5	AA71109-CAL5	225CL009.D	03/17/22 11:33
A2C0979	8260 50 PPB ms-5	AA71109-CAL6	225CL010.D	03/17/22 12:01
A2C0980	8260 80 PPB ms-5	AA71109-CAL7	225CL011.D	03/17/22 12:29
A2C0981	8260 100 PPB ms-5	AA71109-CAL8	225CL012.D	03/17/22 12:56
A2C0983	8260 50 PPB SCV ms5	AA71109-SCV1	225CL014.D	03/17/22 13:52

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2203088
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 03/17/22 00:00

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	1	0.5318615	2	0.7742338	5	0.7066714	10	0.6821058	20	0.6461579	50	0.8079637
Chloromethane	1	0.8000832	2	1.047954	5	0.9534109	10	0.7502439	20	0.8081329	50	0.9768566
Vinyl chloride	1	0.4025969	2	0.5911004	5	0.5790603	10	0.4914794	20	0.4936695	50	0.6501092
Bromomethane	1	0.2531981	2	0.2164529	5	0.2381113	10	0.1957281	20	0.2068627	50	0.2917045
Chloroethane	1	0.3343079	2	0.3342991	5	0.4055746	10	0.3282228	20	0.3204348	50	0.4141192
Trichlorofluoromethane	1	0.6385245	2	0.7291995	5	0.8286973	10	0.6306733	20	0.6331094	50	0.8193283
Freon 113	1	0.2744779	2	0.3435357	5	0.3240296	10	0.2433746	20	0.3073284	50	0.3483399
Acetone	5	9.059092E-02	10	0.177632	25	0.1495198	50	0.1215199	100	0.1229665	250	0.1365774
1,1-Dichloroethene	1	0.2644328	2	0.4101297	5	0.4937707	10	0.3514754	20	0.4272167	50	0.5288312
Carbon disulfide	5	1.118389	10	1.927409	25	1.654696	50	1.494173	100	1.584057	250	1.729106
Methylene Chloride	1	~~0.4645857~~	2	~~0.565846~~	5	0.6434945	10	0.4876129	20	0.5260005	50	0.6396945
Methyl-tert-Butyl Ether	1	0.9233559	2	1.313226	5	1.348034	10	1.174606	20	1.319454	50	1.523918
trans-1,2-Dichloroethene	1	0.3554555	2	0.4997927	5	0.5518362	10	0.419712	20	0.4854845	50	0.5751081
cis-1,2-Dichloroethene	1	0.4414115	2	0.5205189	5	0.6038883	10	0.4862122	20	0.5509606	50	0.6202737
1,1-Dichloroethane	1	0.6716998	2	1.036104	5	1.067701	10	0.8925525	20	0.9450588	50	1.118364
2-Butanone	5	4.915048E-02	10	6.711663E-02	25	7.675795E-02	50	6.143794E-02	100	0.0656728	250	7.040888E-02
Chloroform	1	0.7507829	2	0.9721008	5	1.068986	10	0.8087157	20	0.9283705	50	1.087124
1,1,1-Trichloroethane	1	0.5317293	2	0.8285949	5	0.8679482	10	0.6172569	20	0.7314349	50	0.8738618
Methyl acetate	1	0.3284482	2	0.4521226	5	0.4509846	10	0.3576019	20	0.389969	50	0.4398432
Cyclohexane	1	0.8190719	2	1.050725	5	1.141639	10	0.8693625	20	1.045415	50	1.251961
Methyl cyclohexane	1	1.00848	2	0.8301861	5	0.6104676	10	0.4622919	20	0.5117438	50	0.5882091
Carbon Tetrachloride	1	0.246603	2	0.2652659	5	0.2879322	10	0.2387561	20	0.2808724	50	0.3321245
1,2-Dichloroethane	1	0.2832989	2	0.3579882	5	0.3461788	10	0.2891	20	0.3126263	50	0.3568495
Benzene	1	0.8638013	2	1.172386	5	1.178319	10	0.9785075	20	1.079242	50	1.209483
Trichloroethene	1	0.1477832	2	0.2429949	5	0.2453412	10	0.2132138	20	0.2319843	50	0.2675088
1,2-Dichloropropane	1	0.20844	2	0.3109562	5	0.3238632	10	0.2618569	20	0.283726	50	0.32946
Bromodichloromethane	1	0.1323904	2	0.2964023	5	0.3034065	10	0.2716316	20	0.3022121	50	0.3686144
4-Methyl-2-pentanone	5	4.530232E-02	10	4.753856E-02	25	4.465232E-02	50	3.397849E-02	100	3.784484E-02	250	0.0394932
2-Hexanone	5	0.1775418	10	0.3282697	25	0.3185334	50	0.2674068	100	0.2869557	250	0.2871834
cis-1,3-Dichloropropene	1	0.271967	2	0.4799686	5	0.4847641	10	0.3764182	20	0.4498635	50	0.5317691
Toluene	1	0.8253524	2	1.211693	5	1.258675	10	0.9845741	20	1.094165	50	1.210824

INITIAL CALIBRATION DATA

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2203088
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 03/17/22 00:00

Compound	Level 01		Level 02		Level 03		Level 04		Level 05		Level 06	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	1	0.4393785	2	0.6088607	5	0.5901065	10	0.5530658	20	0.589573	50	0.6410277
1,1,2-Trichloroethane	1	0.2735054	2	0.4153857	5	0.3893645	10	0.2983511	20	0.3592558	50	0.3748267
Tetrachloroethene	1	0.1964684	2	0.3080894	5	0.3038049	10	0.2497323	20	0.2830758	50	0.3017031
Dibromochloromethane	1	0.1891968	2	0.3035417	5	0.3458116	10	0.2818146	20	0.3189214	50	0.3573867
1,2-Dibromoethane	1	0.216225	2	0.3711639	5	0.3859795	10	0.3194498	20	0.3747367	50	0.3755767
Chlorobenzene	1	0.908872	2	1.220718	5	1.236143	10	1.001114	20	1.10787	50	1.169112
Ethylbenzene	1	0.3901928	2	0.6863273	5	0.6546732	10	0.5754389	20	0.6385279	50	0.6869075
m,p-Xylenes	2	0.6080127	4	0.8112828	10	0.9018063	20	0.7423135	40	0.8126779	100	0.8579792
o-Xylene	1	0.5125053	2	0.6779639	5	0.8131646	10	0.6607266	20	0.7688266	50	0.8403435
Bromoform	1	0.1025559	2	0.1489743	5	0.1914017	10	0.1450475	20	0.1706708	50	0.1984571
Styrene	1	0.6784127	2	1.159665	5	1.245546	10	1.075488	20	1.279853	50	1.422007
Isopropylbenzene	1	1.320502	2	2.025058	5	2.109326	10	1.755808	20	2.043332	50	2.198041
1,1,2,2-Tetrachloroethane	1	0.3605579	2	0.5312198	5	0.5519724	10	0.4616473	20	0.5343845	50	0.5660891
1,2,4-Trichlorobenzene	1	0.1015435	2	0.3995707	5	0.4603796	10	0.3771268	20	0.4111368	50	0.4947294
1,3-Dichlorobenzene	1	0.6335801	2	1.019715	5	0.9739768	10	0.8658822	20	0.9243466	50	1.063216
1,4-Dichlorobenzene	1	0.7913309	2	1.099754	5	1.005696	10	0.8650316	20	0.9656775	50	1.09671
1,2-Dichlorobenzene	1	0.5906193	2	0.8775187	5	0.9362098	10	0.8115819	20	0.8970218	50	1.018766
1,2-Dibromo-3-chloropropane	1	5.278492E-02	2	8.799278E-02	5	8.935789E-02	10	8.160506E-02	20	8.879649E-02	50	0.1136941
Dibromofluoromethane	50	0.6055845	55	0.6028528	60	0.5936496	50	0.5945797	65	0.5595134	50	0.655303
Toluene-d8	50	1.350367	55	1.290337	60	1.239347	50	1.316045	65	1.217499	50	1.352192
4-Bromofluorobenzene	50	0.8689314	55	0.842633	60	0.8205953	50	0.8661867	65	0.8038634	50	0.8920307

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2203088
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 03/17/22 00:00

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
Dichlorodifluoromethane	80	0.7973863	100	0.8258315								
Chloromethane	80	0.9593643	100	0.994822								
Vinyl chloride	80	0.6455711	100	0.6870055								
Bromomethane	80	0.3232782	100	~~0.3455616~~								
Chloroethane	80	0.4040031	100	~~0.2110331~~								
Trichlorofluoromethane	80	0.8147704	100	0.8636291								
Freon 113	80	0.3622438	100	0.3561308								
Acetone	400	0.1347497	500	0.1512517								
1,1-Dichloroethene	80	0.5263146	100	0.5291675								
Carbon disulfide	400	1.662734	500	1.637328								
Methylene Chloride	80	0.6336909	100	0.6377557								
Methyl-tert-Butyl Ether	80	1.572506	100	1.595753								
trans-1,2-Dichloroethene	80	0.5775538	100	0.5839857								
cis-1,2-Dichloroethene	80	0.6608542	100	0.6663018								
1,1-Dichloroethane	80	1.127511	100	1.140084								
2-Butanone	400	6.971063E-02	500	7.543424E-02								
Chloroform	80	1.10429	100	1.093306								
1,1,1-Trichloroethane	80	0.8935286	100	0.9048962								
Methyl acetate	80	0.4417664	100	0.506198								
Cyclohexane	80	1.256497	100	1.271044								
Methyl cyclohexane	80	0.5800539	100	0.6024018								
Carbon Tetrachloride	80	0.3484871	100	0.3544864								
1,2-Dichloroethane	80	0.3666777	100	0.3789561								
Benzene	80	1.215126	100	1.222192								
Trichloroethene	80	0.2659834	100	0.2729299								
1,2-Dichloropropane	80	0.3370121	100	0.3461881								
Bromodichloromethane	80	0.3784501	100	0.3876029								
4-Methyl-2-pentanone	400	3.861266E-02	500	4.314354E-02								
2-Hexanone	400	0.2861516	500	0.3072553								
cis-1,3-Dichloropropene	80	0.5506637	100	0.5516022								
Toluene	80	1.191127	100	1.169562								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2203088
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 03/17/22 00:00

Compound	Level 07		Level 08		Level 09		Level 10		Level 11		Level 12	
	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF	ug/L	RF
trans-1,3-Dichloropropene	80	0.6776516	100	0.641699								
1,1,2-Trichloroethane	80	0.3962235	100	0.3882251								
Tetrachloroethene	80	0.2982887	100	0.307277								
Dibromochloromethane	80	0.3947261	100	0.3781332								
1,2-Dibromoethane	80	0.3944805	100	0.3887848								
Chlorobenzene	80	1.175528	100	1.134955								
Ethylbenzene	80	0.6986344	100	0.6565564								
m,p-Xylenes	160	0.8424016	200	0.7999708								
o-Xylene	80	0.8498669	100	0.8311608								
Bromoform	80	0.2093041	100	0.2186339								
Styrene	80	1.48427	100	1.431759								
Isopropylbenzene	80	2.193969	100	2.135596								
1,1,2,2-Tetrachloroethane	80	0.5878311	100	0.5994971								
1,2,4-Trichlorobenzene	80	0.4983428	100	0.5167986								
1,3-Dichlorobenzene	80	1.074374	100	1.078575								
1,4-Dichlorobenzene	80	1.119849	100	1.083185								
1,2-Dichlorobenzene	80	1.052857	100	1.038986								
1,2-Dibromo-3-chloropropane	80	0.1124807	100	0.1291147								
Dibromofluoromethane	70	0.5698148	75	0.5668356								
Toluene-d8	70	1.241952	75	1.242072								
4-Bromofluorobenzene	70	0.82588	75	0.7924975								

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2203088
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 03/17/22 00:00

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Dichlorodifluoromethane	0.7215265	13.89032	3.9735	0.1067621			20	
Chloromethane	0.9113585	11.94693	4.407	7.333113E-02			20	
Vinyl chloride	0.567574	17.14877	4.56875	1.609208E-02		0.9982025	0.99	
Bromomethane	0.2464765	18.96148	5.219286	5.400533E-02		0.99643	0.99	
Chloroethane	0.3629945	11.67449	5.443143	0.2147372	0.9958655		0.99	
Trichlorofluoromethane	0.7447415	13.29707	5.6805	0.1363484			20	
Freon 113	0.3199326	13.24394	6.54375	0.1325465			20	
Acetone	0.135601	18.88562	7.38825	0.125883		0.9985772	0.99	
1,1-Dichloroethene	0.4414173	21.97806	6.517625	6.168663E-02		0.9980699	0.99	
Carbon disulfide	1.600987	14.46821	6.61175	3.897821E-02			20	
Methylene Chloride	0.5947082	11.64168	7.328	0.0405835			20	
Methyl-tert-Butyl Ether	1.346357	16.72938	7.61725	2.633539E-02		0.9992731	0.99	
trans-1,2-Dichloroethene	0.5061161	16.47136	7.536	8.622145E-02	0.9981676		0.99	
cis-1,2-Dichloroethene	0.5688026	14.49128	8.934	0.0295741		0.9993025	0.99	
1,1-Dichloroethane	0.9998844	15.95374	8.300375	3.776943E-02		0.9991451	0.99	
2-Butanone	6.696119E-02	13.07567	9.54	0.1675007			20	
Chloroform	0.9767095	14.07026	9.20875	4.557138E-02		0.9987683	0.99	
1,1,1-Trichloroethane	0.7811563	17.96558	9.4705	2.805339E-02		0.9987524	0.99	
Methyl acetate	0.4208667	13.7555	7.512875	0.1216833			20	
Cyclohexane	1.088214	16.10422	9.178	3.202796E-02	0.9978424		0.99	
Methyl cyclohexane	0.6492293	27.78979	10.43812	4.031415E-02		0.9990275	0.99	
Carbon Tetrachloride	0.294316	15.41767	9.39875	2.922234E-02		0.9989362	0.99	
1,2-Dichloroethane	0.3364594	10.85062	10.07475	1.628048E-02			20	
Benzene	1.114882	11.78077	9.86475	6.515196E-02			20	
Trichloroethene	0.2359674	17.33266	10.4425	0.0789617		0.9993107	0.99	
1,2-Dichloropropane	0.3001878	15.5044	10.976	4.436487E-02		0.9993975	0.99	
Bromodichloromethane	0.3050888	26.93123	11.0065	3.727814E-02		0.9988153	0.99	
4-Methyl-2-pentanone	4.132074E-02	11.03733	12.12338	3.673742E-02			20	
2-Hexanone	0.2824122	16.55719	12.87325	4.040291E-02	0.9976151		0.99	
cis-1,3-Dichloropropene	0.462127	20.88119	11.59975	3.129977E-02		0.9986954	0.99	

INITIAL CALIBRATION DATA (Continued)

EPA 8260D

Laboratory: ENCO Orlando
SDG: AF02224-TE016
Client: Tetra Tech, Inc. (TE016)
Project: NASA KSC CRCA
Calibration: 2203088
Instrument: OVGCMS5
Matrix: Water
Calibration Date: 03/17/22 00:00

Compound	Mean RF	RF RSD	Mean RT	RT RSD	Linear r	Quad COD	LIMIT	Q
Toluene	1.118247	13.05576	11.81975	3.502751E-02			20	
trans-1,3-Dichloropropene	0.5926703	12.31817	12.1905	3.076647E-02			20	
1,1,2-Trichloroethane	0.3618922	13.82112	12.35625	3.864876E-02			20	
Tetrachloroethene	0.281055	13.97527	12.20175	4.419283E-02			20	
Dibromochloromethane	0.3211915	20.33297	12.545	3.699542E-02		0.9977529	0.99	
1,2-Dibromoethane	0.3532996	16.99396	12.80675	8.347743E-02	0.9992198		0.99	
Chlorobenzene	1.119289	10.02891	13.238	3.683204E-02			20	
Ethylbenzene	0.6234073	16.34116	13.20375	2.915258E-02	0.998124		0.99	
m,p-Xylenes	0.7970556	11.21458	13.32	0.0279341			20	
o-Xylene	0.7443198	15.92669	13.729	2.523684E-02	0.9990968		0.99	
Bromoform	0.1731307	22.59643	13.87137	2.246217E-02		0.9992895	0.99	
Styrene	1.222125	21.37146	13.77575	5.096191E-02	0.998195		0.99	
Isopropylbenzene	1.972704	15.14799	13.99225	4.222221E-02	0.9991883		0.99	
1,1,2,2-Tetrachloroethane	0.5241499	14.96854	14.46375	1.082476E-02		0.9997569	0.99	
1,2,4-Trichlorobenzene	0.4074535	32.82431	18.136	4.329281E-02		0.9990027	0.99	
1,3-Dichlorobenzene	0.9542082	15.74313	15.409	2.753959E-02	0.9988288		0.99	
1,4-Dichlorobenzene	1.003404	12.11631	15.49775	2.266096E-02			20	
1,2-Dichlorobenzene	0.9029451	16.85201	16.01625	6.163684E-03		0.9990741	0.99	
1,2-Dibromo-3-chloropropane	9.447833E-02	24.9758	17.08437	0.1015305		0.9979189	0.99	
Dibromofluoromethane	0.5935167	5.126862	9.41525	2.501853E-02			20	
Toluene-d8	1.281226	4.172221	11.7705	1.618069E-02			20	
4-Bromofluorobenzene	0.8390773	4.120662	14.322	1.411585E-02			20	

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AF02224-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2203088 **Laboratory ID:** AA71109-SCV1

Sequence: AA71109 **Standard ID:** A2C0983

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
Cyclohexane	50.0	49	-2.1	30.00
Ethylbenzene	50.0	54	7.0	30.00
Carbon Tetrachloride	50.0	60	19.6	30.00
1,3-Dichlorobenzene	50.0	51	2.4	30.00
4-Bromofluorobenzene	50.0	54	8.5	30.00
Toluene-d8	50.0	54	7.0	30.00
Dibromofluoromethane	50.0	53	5.9	30.00
Methyl-tert-Butyl Ether	50.0	53	5.9	30.00
trans-1,2-Dichloroethene	50.0	50	0.6	30.00
cis-1,2-Dichloroethene	50.0	52	4.3	30.00
Tetrachloroethene	50.0	54	8.0	30.00
Acetone	250	280	11.8	30.00
1,2,4-Trichlorobenzene	50.0	53	6.2	30.00
Chloroform	50.0	52	3.5	30.00
Chlorobenzene	50.0	55	9.1	30.00
Toluene	50.0	55	9.6	30.00
Methyl cyclohexane	50.0	49	-1.7	30.00
m,p-Xylenes	100	110	7.6	30.00
4-Methyl-2-pentanone	250	230	-7.7	30.00
1,2-Dichloroethane	50.0	52	3.1	30.00
1,2-Dibromoethane	50.0	50	-0.08	30.00
1,4-Dichlorobenzene	50.0	56	11.2	30.00
trans-1,3-Dichloropropene	50.0	58	15.2	30.00
cis-1,3-Dichloropropene	50.0	49	-2.2	30.00
Styrene	50.0	51	2.0	30.00
Dibromochloromethane	50.0	52	3.2	30.00
1,1-Dichloroethene	50.0	53	6.4	30.00

SECOND-SOURCE CALIBRATION VERIFICATION

EPA 8260D

Laboratory: ENCO Orlando **SDG:** AF02224-TE016

Client: Tetra Tech, Inc. (TE016) **Project:** NASA KSC CRCA

Calibration: 2203088 **Laboratory ID:** AA71109-SCV1

Sequence: AA71109 **Standard ID:** A2C0983

ANALYTE	EXPECTED (ug/L)	FOUND (ug/L)	% DRIFT	QC LIMIT
1,2-Dibromo-3-chloropropane	50.0	51	1.1	30.00
1,2-Dichlorobenzene	50.0	51	2.6	30.00
o-Xylene	50.0	51	2.8	30.00
1,1,2,2-Tetrachloroethane	50.0	51	1.7	30.00
Methyl acetate	50.0	51	1.6	30.00
Trichloroethene	50.0	51	1.7	30.00
1,1,2-Trichloroethane	50.0	54	8.3	30.00
2-Butanone	250	280	13.2	30.00
1,2-Dichloropropane	50.0	53	5.9	30.00
Freon 113	50.0	57	14.7	30.00
2-Hexanone	250	240	-2.1	30.00
Trichlorofluoromethane	50.0	60	19.8	30.00
Isopropylbenzene	50.0	53	5.5	30.00
1,1-Dichloroethane	50.0	54	7.6	30.00
Bromodichloromethane	50.0	53	6.8	30.00
Bromoform	50.0	57	13.2	30.00
Carbon disulfide	50.0	58	16.0	30.00
Methylene Chloride	50.0	55	9.8	30.00
Vinyl chloride	50.0	57	14.4	30.00
Chloroethane	50.0	59	18.5	30.00
Chloromethane	50.0	51	1.6	30.00
Bromomethane	50.0	43	-14.0	30.00
1,1,1-Trichloroethane	50.0	54	7.2	30.00
Benzene	50.0	56	11.4	30.00
Dichlorodifluoromethane	50.0	47	-5.3	30.00

* Values outside of QC limits

TETRA TECH ISG
TtEGS, Information Systems Group

Completion Ticket

On 4/13/2022 at 11:36 AM the following files were submitted to Tetra Tech by kdylnicki@encolabs.com with ENCO:

TE016AF02224A1.txt, TE016AF02224A3.txt

If you need to identify this session at a later date refer to Ticket Key:

2022413_4534723919_ledd_ENCO

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I Lovelie Metzgar, as the designated Quality Assurance Officer, hereby attest that all electronic deliverables have been thoroughly reviewed and are in agreement with the associated hardcopy data. The enclosed electronic files have been reviewed for accuracy (including significant figures), completeness and format. The laboratory will be responsible for any labor time necessary to correct enclosed electronic deliverables that have been found to be in error. I can be reached at (407) 826-5314 if there are any questions or problems with the enclosed electronic deliverables.

Signature:_____ Title: Quality Assurance Manager Date: 04/14/2022

ANALYTICAL REPORT

April 29, 2022

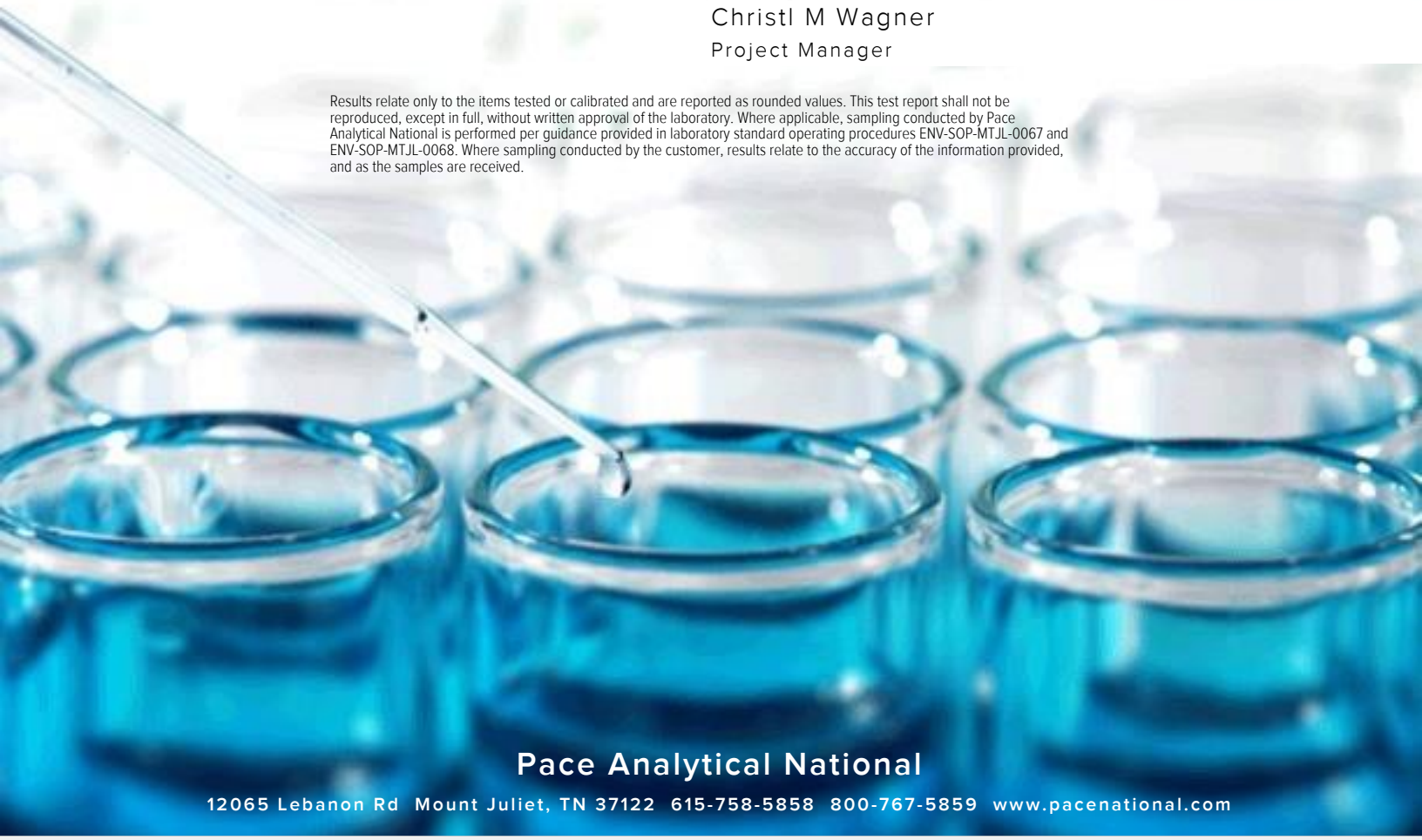
1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Pace Analytical - West Columbia, SC

Sample Delivery Group:	L1486274
Samples Received:	04/26/2022
Project Number:	XD26053
Description:	Nasa KSC-CRLA Air Sampling
Site:	001
Report To:	Kathy Smith 106 Vantage Point Dr. West Columbia, SC 29172

Entire Report Reviewed By:

Christl M Wagner
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

CRCA-AMB01-20220425 L1486274-01 Air

Collected by: Chuck Sorden | Collected date/time: 04/25/22 17:15 | Received date/time: 04/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1855133	1	04/27/22 16:50	04/27/22 16:50	DAH	Mt. Juliet, TN

CRCA-AMB02-20220425 L1486274-02 Air

Collected by: Chuck Sorden | Collected date/time: 04/25/22 17:25 | Received date/time: 04/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1855133	1	04/27/22 17:19	04/27/22 17:19	DAH	Mt. Juliet, TN

CRCA-VMP-01-20220425 L1486274-03 Air

Collected by: Chuck Sorden | Collected date/time: 04/25/22 12:05 | Received date/time: 04/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1855133	1	04/27/22 17:47	04/27/22 17:47	DAH	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1855827	1	04/28/22 16:30	04/28/22 16:30	CEP	Mt. Juliet, TN

CRCA-VMP-02-20220425 L1486274-04 Air

Collected by: Chuck Sorden | Collected date/time: 04/25/22 12:20 | Received date/time: 04/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1855133	1	04/27/22 18:16	04/27/22 18:16	DAH	Mt. Juliet, TN

CRCA-VMP-03-20220425 L1486274-05 Air

Collected by: Chuck Sorden | Collected date/time: 04/25/22 12:35 | Received date/time: 04/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1855133	1	04/27/22 18:44	04/27/22 18:44	DAH	Mt. Juliet, TN

CRCA-VMP-04-20220425 L1486274-06 Air

Collected by: Chuck Sorden | Collected date/time: 04/25/22 12:50 | Received date/time: 04/26/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1855133	1	04/27/22 19:14	04/27/22 19:14	DAH	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Christl M Wagner
Project Manager

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	6.06		1.39	2.85	5.70	1	04/27/2022 16:50	WG1855133
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	04/27/2022 16:50	WG1855133
Benzene	71-43-2	0.235	J	0.228	0.479	0.958	1	04/27/2022 16:50	WG1855133
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	04/27/2022 16:50	WG1855133
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	04/27/2022 16:50	WG1855133
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	04/27/2022 16:50	WG1855133
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	04/27/2022 16:50	WG1855133
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	04/27/2022 16:50	WG1855133
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	04/27/2022 16:50	WG1855133
Carbon tetrachloride	56-23-5	0.945	U	0.461	0.945	1.89	1	04/27/2022 16:50	WG1855133
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	04/27/2022 16:50	WG1855133
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	04/27/2022 16:50	WG1855133
Chloroform	67-66-3	0.730	U	0.349	0.730	1.46	1	04/27/2022 16:50	WG1855133
Chloromethane	74-87-3	1.61		0.213	0.516	1.03	1	04/27/2022 16:50	WG1855133
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	04/27/2022 16:50	WG1855133
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	04/27/2022 16:50	WG1855133
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	04/27/2022 16:50	WG1855133
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	04/27/2022 16:50	WG1855133
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	04/27/2022 16:50	WG1855133
1,3-Dichlorobenzene	541-73-1	2.40	U	1.09	2.40	4.81	1	04/27/2022 16:50	WG1855133
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	04/27/2022 16:50	WG1855133
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	04/27/2022 16:50	WG1855133
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	04/27/2022 16:50	WG1855133
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	04/27/2022 16:50	WG1855133
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	04/27/2022 16:50	WG1855133
trans-1,2-Dichloroethene	156-60-5	26.8		0.267	0.594	1.19	1	04/27/2022 16:50	WG1855133
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	04/27/2022 16:50	WG1855133
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	04/27/2022 16:50	WG1855133
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	04/27/2022 16:50	WG1855133
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	04/27/2022 16:50	WG1855133
Ethanol	64-17-5	5.43		0.500	1.19	2.45	1	04/27/2022 16:50	WG1855133
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	04/27/2022 16:50	WG1855133
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	04/27/2022 16:50	WG1855133
Trichlorofluoromethane	75-69-4	1.20	J	0.460	0.983	1.97	1	04/27/2022 16:50	WG1855133
Dichlorodifluoromethane	75-71-8	2.44	J	0.678	1.48	2.97	1	04/27/2022 16:50	WG1855133
1,1,2-Trichlorotrifluoroethane	76-13-1	1.53	U	0.608	1.53	3.07	1	04/27/2022 16:50	WG1855133
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	04/27/2022 16:50	WG1855133
Heptane	142-82-5	1.02	U	0.425	1.02	2.04	1	04/27/2022 16:50	WG1855133
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	04/27/2022 16:50	WG1855133
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	04/27/2022 16:50	WG1855133
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	04/27/2022 16:50	WG1855133
Methylene Chloride	75-09-2	1.09	J	0.340	0.694	1.39	1	04/27/2022 16:50	WG1855133
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	04/27/2022 16:50	WG1855133
2-Butanone (MEK)	78-93-3	0.923	J	0.240	0.560	3.69	1	04/27/2022 16:50	WG1855133
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	04/27/2022 16:50	WG1855133
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	04/27/2022 16:50	WG1855133
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	04/27/2022 16:50	WG1855133
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	04/27/2022 16:50	WG1855133
2-Propanol	67-63-0	1.99	J	0.649	1.54	3.07	1	04/27/2022 16:50	WG1855133
Propene	115-07-1	1.08	U	0.160	1.08	2.15	1	04/27/2022 16:50	WG1855133
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	04/27/2022 16:50	WG1855133
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	04/27/2022 16:50	WG1855133
Tetrachloroethylene	127-18-4	1.36	U	0.553	1.36	2.72	1	04/27/2022 16:50	WG1855133
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	04/27/2022 16:50	WG1855133
Toluene	108-88-3	0.976	J	0.328	0.942	1.88	1	04/27/2022 16:50	WG1855133
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	04/27/2022 16:50	WG1855133

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	04/27/2022 16:50	WG1855133
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	04/27/2022 16:50	WG1855133
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	04/27/2022 16:50	WG1855133
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	04/27/2022 16:50	WG1855133
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	04/27/2022 16:50	WG1855133
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	04/27/2022 16:50	WG1855133
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	04/27/2022 16:50	WG1855133
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	04/27/2022 16:50	WG1855133
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	04/27/2022 16:50	WG1855133
m&p-Xylene	1330-20-7	1.30	U	0.585	1.30	2.60	1	04/27/2022 16:50	WG1855133
o-Xylene	95-47-6	0.759	U	0.359	0.759	1.52	1	04/27/2022 16:50	WG1855133
(S) 1,4-Bromofluorobenzene	*460-00-4*	*95.4*					*60.0-140*	*04/27/2022 16:50*	WG1855133

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	6.15		1.39	2.85	5.70	1	04/27/2022 17:19	WG1855133
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	04/27/2022 17:19	WG1855133
Benzene	71-43-2	0.479	U	0.228	0.479	0.958	1	04/27/2022 17:19	WG1855133
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	04/27/2022 17:19	WG1855133
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	04/27/2022 17:19	WG1855133
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	04/27/2022 17:19	WG1855133
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	04/27/2022 17:19	WG1855133
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	04/27/2022 17:19	WG1855133
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	04/27/2022 17:19	WG1855133
Carbon tetrachloride	56-23-5	0.506	J	0.461	0.945	1.89	1	04/27/2022 17:19	WG1855133
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	04/27/2022 17:19	WG1855133
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	04/27/2022 17:19	WG1855133
Chloroform	67-66-3	0.730	U	0.349	0.730	1.46	1	04/27/2022 17:19	WG1855133
Chloromethane	74-87-3	1.32		0.213	0.516	1.03	1	04/27/2022 17:19	WG1855133
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	04/27/2022 17:19	WG1855133
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	04/27/2022 17:19	WG1855133
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	04/27/2022 17:19	WG1855133
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	04/27/2022 17:19	WG1855133
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	04/27/2022 17:19	WG1855133
1,3-Dichlorobenzene	541-73-1	2.40	U	1.09	2.40	4.81	1	04/27/2022 17:19	WG1855133
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	04/27/2022 17:19	WG1855133
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	04/27/2022 17:19	WG1855133
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	04/27/2022 17:19	WG1855133
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	04/27/2022 17:19	WG1855133
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	04/27/2022 17:19	WG1855133
trans-1,2-Dichloroethene	156-60-5	0.594	U	0.267	0.594	1.19	1	04/27/2022 17:19	WG1855133
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	04/27/2022 17:19	WG1855133
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	04/27/2022 17:19	WG1855133
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	04/27/2022 17:19	WG1855133
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	04/27/2022 17:19	WG1855133
Ethanol	64-17-5	1.81	J	0.500	1.19	2.45	1	04/27/2022 17:19	WG1855133
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	04/27/2022 17:19	WG1855133
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	04/27/2022 17:19	WG1855133
Trichlorofluoromethane	75-69-4	1.17	J	0.460	0.983	1.97	1	04/27/2022 17:19	WG1855133
Dichlorodifluoromethane	75-71-8	2.35	J	0.678	1.48	2.97	1	04/27/2022 17:19	WG1855133
1,1,2-Trichlorotrifluoroethane	76-13-1	1.53	U	0.608	1.53	3.07	1	04/27/2022 17:19	WG1855133
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	04/27/2022 17:19	WG1855133
Heptane	142-82-5	1.02	U	0.425	1.02	2.04	1	04/27/2022 17:19	WG1855133
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	04/27/2022 17:19	WG1855133
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	04/27/2022 17:19	WG1855133
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	04/27/2022 17:19	WG1855133
Methylene Chloride	75-09-2	0.694	U	0.340	0.694	1.39	1	04/27/2022 17:19	WG1855133
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	04/27/2022 17:19	WG1855133
2-Butanone (MEK)	78-93-3	0.902	J	0.240	0.560	3.69	1	04/27/2022 17:19	WG1855133
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	04/27/2022 17:19	WG1855133
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	04/27/2022 17:19	WG1855133
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	04/27/2022 17:19	WG1855133
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	04/27/2022 17:19	WG1855133
2-Propanol	67-63-0	1.54	U	0.649	1.54	3.07	1	04/27/2022 17:19	WG1855133
Propene	115-07-1	1.08	U	0.160	1.08	2.15	1	04/27/2022 17:19	WG1855133
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	04/27/2022 17:19	WG1855133
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	04/27/2022 17:19	WG1855133
Tetrachloroethylene	127-18-4	1.05	J	0.553	1.36	2.72	1	04/27/2022 17:19	WG1855133
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	04/27/2022 17:19	WG1855133
Toluene	108-88-3	0.441	J	0.328	0.942	1.88	1	04/27/2022 17:19	WG1855133
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	04/27/2022 17:19	WG1855133

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	04/27/2022 17:19	WG1855133
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	04/27/2022 17:19	WG1855133
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	04/27/2022 17:19	WG1855133
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	04/27/2022 17:19	WG1855133
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	04/27/2022 17:19	WG1855133
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	04/27/2022 17:19	WG1855133
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	04/27/2022 17:19	WG1855133
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	04/27/2022 17:19	WG1855133
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	04/27/2022 17:19	WG1855133
m&p-Xylene	1330-20-7	1.30	U	0.585	1.30	2.60	1	04/27/2022 17:19	WG1855133
o-Xylene	95-47-6	0.759	U	0.359	0.759	1.52	1	04/27/2022 17:19	WG1855133
(S) 1,4-Bromofluorobenzene	*460-00-4*	*95.6*					*60.0-140*	*04/27/2022 17:19*	WG1855133

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	2.85	U	1.39	2.85	5.70	1	04/27/2022 17:47	WG1855133
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	04/27/2022 17:47	WG1855133
Benzene	71-43-2	0.648	J	0.228	0.479	0.958	1	04/28/2022 16:30	WG1855827
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	04/27/2022 17:47	WG1855133
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	04/28/2022 16:30	WG1855827
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	04/27/2022 17:47	WG1855133
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	04/27/2022 17:47	WG1855133
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	04/27/2022 17:47	WG1855133
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	04/27/2022 17:47	WG1855133
Carbon tetrachloride	56-23-5	0.945	U	0.461	0.945	1.89	1	04/27/2022 17:47	WG1855133
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	04/28/2022 16:30	WG1855827
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	04/27/2022 17:47	WG1855133
Chloroform	67-66-3	1.82		0.349	0.730	1.46	1	04/27/2022 17:47	WG1855133
Chloromethane	74-87-3	0.516	U	0.213	0.516	1.03	1	04/27/2022 17:47	WG1855133
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	04/27/2022 17:47	WG1855133
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	04/27/2022 17:47	WG1855133
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	04/28/2022 16:30	WG1855827
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	04/28/2022 16:30	WG1855827
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	04/27/2022 17:47	WG1855133
1,3-Dichlorobenzene	541-73-1	2.40	U	1.09	2.40	4.81	1	04/27/2022 17:47	WG1855133
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	04/27/2022 17:47	WG1855133
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	04/28/2022 16:30	WG1855827
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	04/27/2022 17:47	WG1855133
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	04/27/2022 17:47	WG1855133
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	04/27/2022 17:47	WG1855133
trans-1,2-Dichloroethene	156-60-5	0.594	U	0.267	0.594	1.19	1	04/27/2022 17:47	WG1855133
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	04/28/2022 16:30	WG1855827
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	04/28/2022 16:30	WG1855827
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	04/28/2022 16:30	WG1855827
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	04/28/2022 16:30	WG1855827
Ethanol	64-17-5	1.19	U	0.500	1.19	2.45	1	04/27/2022 17:47	WG1855133
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	04/27/2022 17:47	WG1855133
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	04/27/2022 17:47	WG1855133
Trichlorofluoromethane	75-69-4	0.983	U	0.460	0.983	1.97	1	04/27/2022 17:47	WG1855133
Dichlorodifluoromethane	75-71-8	1.48	U	0.678	1.48	2.97	1	04/27/2022 17:47	WG1855133
1,1,2-Trichlorotrifluoroethane	76-13-1	1.53	U	0.608	1.53	3.07	1	04/27/2022 17:47	WG1855133
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	04/27/2022 17:47	WG1855133
Heptane	142-82-5	1.02	U	0.425	1.02	2.04	1	04/28/2022 16:30	WG1855827
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	04/27/2022 17:47	WG1855133
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	04/27/2022 17:47	WG1855133
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	04/27/2022 17:47	WG1855133
Methylene Chloride	75-09-2	0.694	U	0.340	0.694	1.39	1	04/27/2022 17:47	WG1855133
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	04/28/2022 16:30	WG1855827
2-Butanone (MEK)	78-93-3	0.560	U	0.240	0.560	3.69	1	04/27/2022 17:47	WG1855133
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	04/28/2022 16:30	WG1855827
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	04/28/2022 16:30	WG1855827
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	04/27/2022 17:47	WG1855133
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	04/27/2022 17:47	WG1855133
2-Propanol	67-63-0	1.54	U	0.649	1.54	3.07	1	04/27/2022 17:47	WG1855133
Propene	115-07-1	1.08	U	0.160	1.08	2.15	1	04/27/2022 17:47	WG1855133
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	04/27/2022 17:47	WG1855133
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	04/27/2022 17:47	WG1855133
Tetrachloroethylene	127-18-4	1.24	J	0.553	1.36	2.72	1	04/28/2022 16:30	WG1855827
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	04/27/2022 17:47	WG1855133
Toluene	108-88-3	0.335	J	0.328	0.942	1.88	1	04/28/2022 16:30	WG1855827
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	04/27/2022 17:47	WG1855133

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	04/27/2022 17:47	WG1855133
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	04/28/2022 16:30	WG1855827
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	04/28/2022 16:30	WG1855827
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	04/27/2022 17:47	WG1855133
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	04/27/2022 17:47	WG1855133
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	04/27/2022 17:47	WG1855133
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	04/27/2022 17:47	WG1855133
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	04/27/2022 17:47	WG1855133
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	04/27/2022 17:47	WG1855133
m&p-Xylene	1330-20-7	1.30	U	0.585	1.30	2.60	1	04/27/2022 17:47	WG1855133
o-Xylene	95-47-6	0.975	J	0.359	0.759	1.52	1	04/27/2022 17:47	WG1855133
(S) 1,4-Bromofluorobenzene	*460-00-4*	*95.5*					*60.0-140*	*04/27/2022 17:47*	WG1855133
(S) 1,4-Bromofluorobenzene	*460-00-4*	*95.3*					*60.0-140*	*04/28/2022 16:30*	WG1855827

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	2.85	U	1.39	2.85	5.70	1	04/27/2022 18:16	WG1855133
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	04/27/2022 18:16	WG1855133
Benzene	71-43-2	0.479	U	0.228	0.479	0.958	1	04/27/2022 18:16	WG1855133
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	04/27/2022 18:16	WG1855133
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	04/27/2022 18:16	WG1855133
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	04/27/2022 18:16	WG1855133
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	04/27/2022 18:16	WG1855133
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	04/27/2022 18:16	WG1855133
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	04/27/2022 18:16	WG1855133
Carbon tetrachloride	56-23-5	0.945	U	0.461	0.945	1.89	1	04/27/2022 18:16	WG1855133
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	04/27/2022 18:16	WG1855133
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	04/27/2022 18:16	WG1855133
Chloroform	67-66-3	0.808	J	0.349	0.730	1.46	1	04/27/2022 18:16	WG1855133
Chloromethane	74-87-3	0.516	U	0.213	0.516	1.03	1	04/27/2022 18:16	WG1855133
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	04/27/2022 18:16	WG1855133
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	04/27/2022 18:16	WG1855133
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	04/27/2022 18:16	WG1855133
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	04/27/2022 18:16	WG1855133
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	04/27/2022 18:16	WG1855133
1,3-Dichlorobenzene	541-73-1	2.40	U	1.09	2.40	4.81	1	04/27/2022 18:16	WG1855133
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	04/27/2022 18:16	WG1855133
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	04/27/2022 18:16	WG1855133
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	04/27/2022 18:16	WG1855133
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	04/27/2022 18:16	WG1855133
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	04/27/2022 18:16	WG1855133
trans-1,2-Dichloroethene	156-60-5	3.54		0.267	0.594	1.19	1	04/27/2022 18:16	WG1855133
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	04/27/2022 18:16	WG1855133
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	04/27/2022 18:16	WG1855133
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	04/27/2022 18:16	WG1855133
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	04/27/2022 18:16	WG1855133
Ethanol	64-17-5	1.19	U	0.500	1.19	2.45	1	04/27/2022 18:16	WG1855133
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	04/27/2022 18:16	WG1855133
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	04/27/2022 18:16	WG1855133
Trichlorofluoromethane	75-69-4	0.938	J	0.460	0.983	1.97	1	04/27/2022 18:16	WG1855133
Dichlorodifluoromethane	75-71-8	1.43	J	0.678	1.48	2.97	1	04/27/2022 18:16	WG1855133
1,1,2-Trichlorotrifluoroethane	76-13-1	78.2		0.608	1.53	3.07	1	04/27/2022 18:16	WG1855133
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	04/27/2022 18:16	WG1855133
Heptane	142-82-5	1.02	U	0.425	1.02	2.04	1	04/27/2022 18:16	WG1855133
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	04/27/2022 18:16	WG1855133
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	04/27/2022 18:16	WG1855133
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	04/27/2022 18:16	WG1855133
Methylene Chloride	75-09-2	0.694	U	0.340	0.694	1.39	1	04/27/2022 18:16	WG1855133
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	04/27/2022 18:16	WG1855133
2-Butanone (MEK)	78-93-3	1.68	J	0.240	0.560	3.69	1	04/27/2022 18:16	WG1855133
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	04/27/2022 18:16	WG1855133
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	04/27/2022 18:16	WG1855133
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	04/27/2022 18:16	WG1855133
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	04/27/2022 18:16	WG1855133
2-Propanol	67-63-0	1.54	U	0.649	1.54	3.07	1	04/27/2022 18:16	WG1855133
Propene	115-07-1	1.08	U	0.160	1.08	2.15	1	04/27/2022 18:16	WG1855133
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	04/27/2022 18:16	WG1855133
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	04/27/2022 18:16	WG1855133
Tetrachloroethylene	127-18-4	1.36	U	0.553	1.36	2.72	1	04/27/2022 18:16	WG1855133
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	04/27/2022 18:16	WG1855133
Toluene	108-88-3	0.942	U	0.328	0.942	1.88	1	04/27/2022 18:16	WG1855133
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	04/27/2022 18:16	WG1855133

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	04/27/2022 18:16	WG1855133
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	04/27/2022 18:16	WG1855133
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	04/27/2022 18:16	WG1855133
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	04/27/2022 18:16	WG1855133
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	04/27/2022 18:16	WG1855133
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	04/27/2022 18:16	WG1855133
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	04/27/2022 18:16	WG1855133
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	04/27/2022 18:16	WG1855133
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	04/27/2022 18:16	WG1855133
m&p-Xylene	1330-20-7	1.30	U	0.585	1.30	2.60	1	04/27/2022 18:16	WG1855133
o-Xylene	95-47-6	0.889	J	0.359	0.759	1.52	1	04/27/2022 18:16	WG1855133
(S) 1,4-Bromofluorobenzene	*460-00-4*	*94.7*					*60.0-140*	*04/27/2022 18:16*	WG1855133

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	2.85	U	1.39	2.85	5.70	1	04/27/2022 18:44	WG1855133
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	04/27/2022 18:44	WG1855133
Benzene	71-43-2	0.479	U	0.228	0.479	0.958	1	04/27/2022 18:44	WG1855133
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	04/27/2022 18:44	WG1855133
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	04/27/2022 18:44	WG1855133
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	04/27/2022 18:44	WG1855133
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	04/27/2022 18:44	WG1855133
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	04/27/2022 18:44	WG1855133
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	04/27/2022 18:44	WG1855133
Carbon tetrachloride	56-23-5	0.945	U	0.461	0.945	1.89	1	04/27/2022 18:44	WG1855133
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	04/27/2022 18:44	WG1855133
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	04/27/2022 18:44	WG1855133
Chloroform	67-66-3	18.2		0.349	0.730	1.46	1	04/27/2022 18:44	WG1855133
Chloromethane	74-87-3	0.516	U	0.213	0.516	1.03	1	04/27/2022 18:44	WG1855133
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	04/27/2022 18:44	WG1855133
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	04/27/2022 18:44	WG1855133
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	04/27/2022 18:44	WG1855133
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	04/27/2022 18:44	WG1855133
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	04/27/2022 18:44	WG1855133
1,3-Dichlorobenzene	541-73-1	2.40	U	1.09	2.40	4.81	1	04/27/2022 18:44	WG1855133
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	04/27/2022 18:44	WG1855133
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	04/27/2022 18:44	WG1855133
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	04/27/2022 18:44	WG1855133
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	04/27/2022 18:44	WG1855133
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	04/27/2022 18:44	WG1855133
trans-1,2-Dichloroethene	156-60-5	3.37		0.267	0.594	1.19	1	04/27/2022 18:44	WG1855133
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	04/27/2022 18:44	WG1855133
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	04/27/2022 18:44	WG1855133
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	04/27/2022 18:44	WG1855133
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	04/27/2022 18:44	WG1855133
Ethanol	64-17-5	1.19	U	0.500	1.19	2.45	1	04/27/2022 18:44	WG1855133
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	04/27/2022 18:44	WG1855133
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	04/27/2022 18:44	WG1855133
Trichlorofluoromethane	75-69-4	0.983	U	0.460	0.983	1.97	1	04/27/2022 18:44	WG1855133
Dichlorodifluoromethane	75-71-8	1.48	U	0.678	1.48	2.97	1	04/27/2022 18:44	WG1855133
1,1,2-Trichlorotrifluoroethane	76-13-1	1.53	U	0.608	1.53	3.07	1	04/27/2022 18:44	WG1855133
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	04/27/2022 18:44	WG1855133
Heptane	142-82-5	1.02	U	0.425	1.02	2.04	1	04/27/2022 18:44	WG1855133
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	04/27/2022 18:44	WG1855133
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	04/27/2022 18:44	WG1855133
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	04/27/2022 18:44	WG1855133
Methylene Chloride	75-09-2	0.694	U	0.340	0.694	1.39	1	04/27/2022 18:44	WG1855133
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	04/27/2022 18:44	WG1855133
2-Butanone (MEK)	78-93-3	0.560	U	0.240	0.560	3.69	1	04/27/2022 18:44	WG1855133
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	04/27/2022 18:44	WG1855133
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	04/27/2022 18:44	WG1855133
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	04/27/2022 18:44	WG1855133
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	04/27/2022 18:44	WG1855133
2-Propanol	67-63-0	1.54	U	0.649	1.54	3.07	1	04/27/2022 18:44	WG1855133
Propene	115-07-1	1.08	U	0.160	1.08	2.15	1	04/27/2022 18:44	WG1855133
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	04/27/2022 18:44	WG1855133
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	04/27/2022 18:44	WG1855133
Tetrachloroethylene	127-18-4	1.36	U	0.553	1.36	2.72	1	04/27/2022 18:44	WG1855133
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	04/27/2022 18:44	WG1855133
Toluene	108-88-3	0.942	U	0.328	0.942	1.88	1	04/27/2022 18:44	WG1855133
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	04/27/2022 18:44	WG1855133

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	04/27/2022 18:44	WG1855133
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	04/27/2022 18:44	WG1855133
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	04/27/2022 18:44	WG1855133
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	04/27/2022 18:44	WG1855133
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	04/27/2022 18:44	WG1855133
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	04/27/2022 18:44	WG1855133
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	04/27/2022 18:44	WG1855133
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	04/27/2022 18:44	WG1855133
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	04/27/2022 18:44	WG1855133
m&p-Xylene	1330-20-7	1.30	U	0.585	1.30	2.60	1	04/27/2022 18:44	WG1855133
o-Xylene	95-47-6	0.819	J	0.359	0.759	1.52	1	04/27/2022 18:44	WG1855133
(S) 1,4-Bromofluorobenzene	*460-00-4*	*96.1*					*60.0-140*	*04/27/2022 18:44*	WG1855133

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	2.85	U	1.39	2.85	5.70	1	04/27/2022 19:14	WG1855133
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	04/27/2022 19:14	WG1855133
Benzene	71-43-2	0.840	J	0.228	0.479	0.958	1	04/27/2022 19:14	WG1855133
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	04/27/2022 19:14	WG1855133
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	04/27/2022 19:14	WG1855133
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	04/27/2022 19:14	WG1855133
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	04/27/2022 19:14	WG1855133
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	04/27/2022 19:14	WG1855133
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	04/27/2022 19:14	WG1855133
Carbon tetrachloride	56-23-5	0.945	U	0.461	0.945	1.89	1	04/27/2022 19:14	WG1855133
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	04/27/2022 19:14	WG1855133
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	04/27/2022 19:14	WG1855133
Chloroform	67-66-3	9.44		0.349	0.730	1.46	1	04/27/2022 19:14	WG1855133
Chloromethane	74-87-3	0.516	U	0.213	0.516	1.03	1	04/27/2022 19:14	WG1855133
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	04/27/2022 19:14	WG1855133
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	04/27/2022 19:14	WG1855133
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	04/27/2022 19:14	WG1855133
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	04/27/2022 19:14	WG1855133
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	04/27/2022 19:14	WG1855133
1,3-Dichlorobenzene	541-73-1	2.40	U	1.09	2.40	4.81	1	04/27/2022 19:14	WG1855133
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	04/27/2022 19:14	WG1855133
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	04/27/2022 19:14	WG1855133
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	04/27/2022 19:14	WG1855133
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	04/27/2022 19:14	WG1855133
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	04/27/2022 19:14	WG1855133
trans-1,2-Dichloroethene	156-60-5	4.16		0.267	0.594	1.19	1	04/27/2022 19:14	WG1855133
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	04/27/2022 19:14	WG1855133
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	04/27/2022 19:14	WG1855133
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	04/27/2022 19:14	WG1855133
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	04/27/2022 19:14	WG1855133
Ethanol	64-17-5	1.19	U	0.500	1.19	2.45	1	04/27/2022 19:14	WG1855133
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	04/27/2022 19:14	WG1855133
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	04/27/2022 19:14	WG1855133
Trichlorofluoromethane	75-69-4	0.983	J	0.460	0.983	1.97	1	04/27/2022 19:14	WG1855133
Dichlorodifluoromethane	75-71-8	1.64	J	0.678	1.48	2.97	1	04/27/2022 19:14	WG1855133
1,1,2-Trichlorotrifluoroethane	76-13-1	117		0.608	1.53	3.07	1	04/27/2022 19:14	WG1855133
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	04/27/2022 19:14	WG1855133
Heptane	142-82-5	0.442	J	0.425	1.02	2.04	1	04/27/2022 19:14	WG1855133
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	04/27/2022 19:14	WG1855133
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	04/27/2022 19:14	WG1855133
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	04/27/2022 19:14	WG1855133
Methylene Chloride	75-09-2	0.694	U	0.340	0.694	1.39	1	04/27/2022 19:14	WG1855133
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	04/27/2022 19:14	WG1855133
2-Butanone (MEK)	78-93-3	1.80	J	0.240	0.560	3.69	1	04/27/2022 19:14	WG1855133
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	04/27/2022 19:14	WG1855133
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	04/27/2022 19:14	WG1855133
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	04/27/2022 19:14	WG1855133
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	04/27/2022 19:14	WG1855133
2-Propanol	67-63-0	1.54	U	0.649	1.54	3.07	1	04/27/2022 19:14	WG1855133
Propene	115-07-1	1.08	U	0.160	1.08	2.15	1	04/27/2022 19:14	WG1855133
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	04/27/2022 19:14	WG1855133
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	04/27/2022 19:14	WG1855133
Tetrachloroethylene	127-18-4	1.36	U	0.553	1.36	2.72	1	04/27/2022 19:14	WG1855133
Tetrahydrofuran	109-99-9	1.06		0.216	0.442	0.885	1	04/27/2022 19:14	WG1855133
Toluene	108-88-3	0.942	U	0.328	0.942	1.88	1	04/27/2022 19:14	WG1855133
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	04/27/2022 19:14	WG1855133

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	04/27/2022 19:14	WG1855133
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	04/27/2022 19:14	WG1855133
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	04/27/2022 19:14	WG1855133
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	04/27/2022 19:14	WG1855133
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	04/27/2022 19:14	WG1855133
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	04/27/2022 19:14	WG1855133
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	04/27/2022 19:14	WG1855133
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	04/27/2022 19:14	WG1855133
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	04/27/2022 19:14	WG1855133
m&p-Xylene	1330-20-7	1.30	U	0.585	1.30	2.60	1	04/27/2022 19:14	WG1855133
o-Xylene	95-47-6	0.902	J	0.359	0.759	1.52	1	04/27/2022 19:14	WG1855133
(S) 1,4-Bromofluorobenzene	*460-00-4*	*98.6*					*60.0-140*	*04/27/2022 19:14*	WG1855133

Method Blank (MB)

(MB) R3785933-3 04/27/22 11:48

Analyte	MB Result ppbv	MB Qualifier	MB DL ppbv	MB LOD ppbv	MB LOQ ppbv
Acetone	1.20	U	0.584	1.20	2.40
Allyl Chloride	0.250	U	0.114	0.250	0.500
Benzene	0.150	U	0.0715	0.150	0.300
Benzyl Chloride	0.130	U	0.0598	0.130	0.300
Bromodichloromethane	0.150	U	0.0702	0.150	0.300
Bromoform	0.310	U	0.0732	0.310	0.600
Bromomethane	0.200	U	0.0982	0.200	0.400
1,3-Butadiene	0.630	U	0.104	0.630	2.00
Carbon disulfide	0.250	U	0.102	0.250	0.500
Carbon tetrachloride	0.150	U	0.0732	0.150	0.300
Chlorobenzene	0.200	U	0.0832	0.200	0.400
Chloroethane	0.200	U	0.0996	0.200	0.400
Chloroform	0.150	U	0.0717	0.150	0.300
Chloromethane	0.250	U	0.103	0.250	0.500
2-Chlorotoluene	0.200	U	0.0828	0.200	0.400
Cyclohexane	0.200	U	0.0753	0.200	0.400
Dibromochloromethane	0.150	U	0.0727	0.150	0.300
1,2-Dibromoethane	0.150	U	0.0721	0.150	0.300
1,2-Dichlorobenzene	0.300	U	0.128	0.300	0.600
1,3-Dichlorobenzene	0.400	U	0.182	0.400	0.800
1,4-Dichlorobenzene	0.130	U	0.0557	0.130	0.300
1,2-Dichloroethane	0.150	U	0.0700	0.150	0.300
1,1-Dichloroethane	0.150	U	0.0723	0.150	0.300
1,1-Dichloroethene	0.200	U	0.0762	0.200	0.400
cis-1,2-Dichloroethene	0.200	U	0.0784	0.200	0.400
trans-1,2-Dichloroethene	0.150	U	0.0673	0.150	0.300
1,2-Dichloropropane	0.200	U	0.0760	0.200	0.400
cis-1,3-Dichloropropene	0.150	U	0.0689	0.150	0.300
trans-1,3-Dichloropropene	0.150	U	0.0728	0.150	0.300
1,4-Dioxane	0.200	U	0.0833	0.200	0.400
Ethanol	0.630	U	0.265	0.630	1.30
Ethylbenzene	0.200	U	0.0835	0.200	0.400
4-Ethyltoluene	0.200	U	0.0783	0.200	0.400
Trichlorofluoromethane	0.175	U	0.0819	0.175	0.350
Dichlorodifluoromethane	0.300	U	0.137	0.300	0.600
1,1,2-Trichlorotrifluoroethane	0.200	U	0.0793	0.200	0.400
1,2-Dichlorotetrafluoroethane	0.200	U	0.0890	0.200	0.400
Heptane	0.250	U	0.104	0.250	0.500
Hexachloro-1,3-butadiene	0.250	U	0.105	0.250	0.630
n-Hexane	0.500	U	0.206	0.500	1.00

Method Blank (MB)

(MB) R3785933-3 04/27/22 11:48

Analyte	MB Result ppbv	MB Qualifier	MB DL ppbv	MB LOD ppbv	MB LOQ ppbv
Isopropylbenzene	0.200	U	0.0777	0.200	0.400
Methylene Chloride	0.200	U	0.0979	0.200	0.400
Methyl Butyl Ketone	0.300	U	0.133	0.300	1.25
2-Butanone (MEK)	0.190	U	0.0814	0.190	1.25
4-Methyl-2-pentanone (MIBK)	0.190	U	0.0765	0.190	1.25
Methyl Methacrylate	0.200	U	0.0876	0.200	0.400
MTBE	0.130	U	0.0647	0.130	0.300
Naphthalene	0.700	U	0.350	0.700	1.40
2-Propanol	0.625	U	0.264	0.625	1.25
Propene	0.625	U	0.0932	0.625	1.25
Styrene	0.200	U	0.0788	0.200	0.400
1,1,2,2-Tetrachloroethane	0.150	U	0.0743	0.150	0.300
Tetrachloroethylene	0.200	U	0.0814	0.200	0.400
Tetrahydrofuran	0.150	U	0.0734	0.150	0.300
Toluene	0.250	U	0.0870	0.250	0.500
1,2,4-Trichlorobenzene	0.310	U	0.148	0.310	0.630
1,1,1-Trichloroethane	0.150	U	0.0736	0.150	0.300
1,1,2-Trichloroethane	0.200	U	0.0775	0.200	0.400
Trichloroethylene	0.150	U	0.0680	0.150	0.300
1,2,4-Trimethylbenzene	0.200	U	0.0764	0.200	0.400
1,3,5-Trimethylbenzene	0.200	U	0.0779	0.200	0.400
2,2,4-Trimethylpentane	0.300	U	0.133	0.300	0.600
Vinyl chloride	0.200	U	0.0949	0.200	0.400
Vinyl Bromide	0.200	U	0.0852	0.200	0.400
Vinyl acetate	0.250	U	0.116	0.250	0.500
m&p-Xylene	0.300	U	0.135	0.300	0.600
o-Xylene	0.175	U	0.0828	0.175	0.350
(S) 1,4-Bromofluorobenzene	*96.5*				*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3785933-1 04/27/22 10:50 • (LCSD) R3785933-2 04/27/22 11:20

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	3.75	3.62	3.97	96.5	106	58.0-128			9.22	20
Allyl Chloride	3.75	3.15	3.13	84.0	83.5	71.0-131			0.637	20
Benzene	3.75	3.97	4.00	106	107	69.0-119			0.753	20
Benzyl Chloride	3.75	4.20	4.15	112	111	50.0-147			1.20	20
Bromodichloromethane	3.75	4.03	3.99	107	106	72.0-128			0.998	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3785933-1 04/27/22 10:50 • (LCSD) R3785933-2 04/27/22 11:20

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromoform	3.75	4.10	4.10	109	109	66.0-139			0.000	20
Bromomethane	3.75	3.56	3.60	94.9	96.0	63.0-134			1.12	20
1,3-Butadiene	3.75	4.65	4.66	124	124	66.0-134			0.215	20
Carbon disulfide	3.75	3.31	3.32	88.3	88.5	57.0-134			0.302	20
Carbon tetrachloride	3.75	3.94	3.99	105	106	68.0-132			1.26	20
Chlorobenzene	3.75	3.74	3.79	99.7	101	70.0-119			1.33	20
Chloroethane	3.75	3.75	3.78	100	101	63.0-127			0.797	20
Chloroform	3.75	4.01	4.06	107	108	68.0-123			1.24	20
Chloromethane	3.75	4.29	4.25	114	113	59.0-132			0.937	20
2-Chlorotoluene	3.75	3.87	3.88	103	103	74.0-130			0.258	20
Cyclohexane	3.75	3.86	3.90	103	104	70.0-117			1.03	20
Dibromochloromethane	3.75	4.02	3.91	107	104	70.0-130			2.77	20
1,2-Dibromoethane	3.75	3.87	3.91	103	104	74.0-122			1.03	20
1,2-Dichlorobenzene	3.75	3.83	3.85	102	103	63.0-129			0.521	20
1,3-Dichlorobenzene	3.75	3.83	3.92	102	105	65.0-130			2.32	20
1,4-Dichlorobenzene	3.75	3.93	3.93	105	105	60.0-131			0.000	20
1,2-Dichloroethane	3.75	3.79	3.87	101	103	65.0-128			2.09	20
1,1-Dichloroethane	3.75	4.23	4.24	113	113	68.0-126			0.236	20
1,1-Dichloroethene	3.75	3.43	3.41	91.5	90.9	61.0-133			0.585	20
cis-1,2-Dichloroethene	3.75	4.06	4.10	108	109	70.0-121			0.980	20
trans-1,2-Dichloroethene	3.75	2.87	2.80	76.5	74.7	67.0-124			2.47	20
1,2-Dichloropropane	3.75	4.17	4.14	111	110	69.0-123			0.722	20
cis-1,3-Dichloropropene	3.75	4.28	4.25	114	113	70.0-128			0.703	20
trans-1,3-Dichloropropene	3.75	4.37	4.33	117	115	75.0-133			0.920	20
1,4-Dioxane	3.75	3.72	3.71	99.2	98.9	71.0-122			0.269	20
Ethanol	3.75	4.07	4.11	109	110	59.0-125			0.978	20
Ethylbenzene	3.75	3.85	3.89	103	104	70.0-124			1.03	20
4-Ethyltoluene	3.75	4.02	4.01	107	107	67.0-129			0.249	20
Trichlorofluoromethane	3.75	3.68	3.67	98.1	97.9	62.0-126			0.272	20
Dichlorodifluoromethane	3.75	3.93	3.96	105	106	59.0-128			0.760	20
1,1,2-Trichlorotrifluoroethane	3.75	3.04	3.05	81.1	81.3	66.0-126			0.328	20
1,2-Dichlorotetrafluoroethane	3.75	3.63	3.68	96.8	98.1	63.0-121			1.37	20
Heptane	3.75	4.26	4.19	114	112	69.0-123			1.66	20
Hexachloro-1,3-butadiene	3.75	3.67	3.70	97.9	98.7	56.0-138			0.814	20
n-Hexane	3.75	4.23	4.30	113	115	63.0-120			1.64	20
Isopropylbenzene	3.75	3.93	3.96	105	106	68.0-124			0.760	20
Methylene Chloride	3.75	3.35	3.35	89.3	89.3	62.0-115			0.000	20
Methyl Butyl Ketone	3.75	3.99	3.94	106	105	62.0-128			1.26	20
Methyl Ethyl Ketone	3.75	4.15	4.16	111	111	67.0-130			0.241	20
4-Methyl-2-pentanone (MIBK)	3.75	4.07	4.05	109	108	67.0-130			0.493	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3785933-1 04/27/22 10:50 • (LCSD) R3785933-2 04/27/22 11:20

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Methyl Methacrylate	3.75	4.00	3.97	107	106	70.0-128			0.753	20
MTBE	3.75	4.11	4.17	110	111	66.0-126			1.45	20
Naphthalene	3.75	3.95	3.99	105	106	57.0-138			1.01	20
2-Propanol	3.75	4.25	4.29	113	114	52.0-125			0.937	20
Propene	3.75	3.68	3.76	98.1	100	57.0-136			2.15	20
Styrene	3.75	3.87	3.88	103	103	73.0-127			0.258	20
1,1,2,2-Tetrachloroethane	3.75	4.21	4.18	112	111	65.0-127			0.715	20
Tetrachloroethylene	3.75	3.61	3.61	96.3	96.3	66.0-124			0.000	20
Tetrahydrofuran	3.75	4.42	4.35	118	116	64.0-123			1.60	20
Toluene	3.75	3.77	3.79	101	101	66.0-119			0.529	20
1,2,4-Trichlorobenzene	3.75	3.62	3.67	96.5	97.9	55.0-142			1.37	20
1,1,1-Trichloroethane	3.75	4.01	4.01	107	107	68.0-125			0.000	20
1,1,2-Trichloroethane	3.75	3.93	3.85	105	103	73.0-119			2.06	20
Trichloroethylene	3.75	3.76	3.76	100	100	71.0-123			0.000	20
1,2,4-Trimethylbenzene	3.75	4.04	4.07	108	109	66.0-132			0.740	20
1,3,5-Trimethylbenzene	3.75	4.01	4.01	107	107	67.0-130			0.000	20
2,2,4-Trimethylpentane	3.75	4.19	4.31	112	115	68.0-121			2.82	20
Vinyl chloride	3.75	4.07	4.12	109	110	64.0-127			1.22	20
Vinyl Bromide	3.75	3.51	3.52	93.6	93.9	71.0-126			0.284	20
Vinyl acetate	3.75	4.40	4.49	117	120	56.0-139			2.02	20
m&p-Xylene	7.50	8.05	8.11	107	108	61.0-134			0.743	20
o-Xylene	3.75	3.94	3.97	105	106	67.0-125			0.759	20
(S) 1,4-Bromofluorobenzene				*101*	*100*	*60.0-140*				

Method Blank (MB)

(MB) R3786359-3 04/28/22 10:31

Analyte	MB Result ppbv	MB Qualifier	MB DL ppbv	MB LOD ppbv	MB LOQ ppbv
Benzene	0.150	U	0.0715	0.150	0.300
Bromodichloromethane	0.150	U	0.0702	0.150	0.300
Chlorobenzene	0.200	U	0.0832	0.200	0.400
Dibromochloromethane	0.150	U	0.0727	0.150	0.300
1,2-Dibromoethane	0.150	U	0.0721	0.150	0.300
1,2-Dichloroethane	0.150	U	0.0700	0.150	0.300
1,2-Dichloropropane	0.200	U	0.0760	0.200	0.400
cis-1,3-Dichloropropene	0.150	U	0.0689	0.150	0.300
trans-1,3-Dichloropropene	0.150	U	0.0728	0.150	0.300
1,4-Dioxane	0.200	U	0.0833	0.200	0.400
Heptane	0.250	U	0.104	0.250	0.500
Methyl Butyl Ketone	0.300	U	0.133	0.300	1.25
4-Methyl-2-pentanone (MIBK)	0.190	U	0.0765	0.190	1.25
Methyl Methacrylate	0.200	U	0.0876	0.200	0.400
Tetrachloroethylene	0.200	U	0.0814	0.200	0.400
Toluene	0.250	U	0.0870	0.250	0.500
1,1,2-Trichloroethane	0.200	U	0.0775	0.200	0.400
Trichloroethylene	0.150	U	0.0680	0.150	0.300
(S) 1,4-Bromofluorobenzene	*96.6*				*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3786359-1 04/28/22 09:33 • (LCSD) R3786359-2 04/28/22 10:03

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Benzene	3.75	3.97	3.98	106	106	69.0-119			0.252	20
Bromodichloromethane	3.75	4.01	3.99	107	106	72.0-128			0.500	20
Chlorobenzene	3.75	3.84	3.84	102	102	70.0-119			0.000	20
Dibromochloromethane	3.75	3.98	3.97	106	106	70.0-130			0.252	20
1,2-Dibromoethane	3.75	3.98	3.96	106	106	74.0-122			0.504	20
1,2-Dichloroethane	3.75	3.88	3.82	103	102	65.0-128			1.56	20
1,2-Dichloropropane	3.75	4.18	4.09	111	109	69.0-123			2.18	20
cis-1,3-Dichloropropene	3.75	4.25	4.18	113	111	70.0-128			1.66	20
trans-1,3-Dichloropropene	3.75	4.30	4.27	115	114	75.0-133			0.700	20
1,4-Dioxane	3.75	3.81	3.80	102	101	71.0-122			0.263	20
Heptane	3.75	4.22	4.20	113	112	69.0-123			0.475	20
Methyl Butyl Ketone	3.75	4.00	3.93	107	105	62.0-128			1.77	20
4-Methyl-2-pentanone (MIBK)	3.75	4.03	4.06	107	108	67.0-130			0.742	20
Methyl Methacrylate	3.75	4.02	4.06	107	108	70.0-128			0.990	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3786359-1 04/28/22 09:33 • (LCSD) R3786359-2 04/28/22 10:03

Analyte	Spike Amount ppbv	LCS Result ppbv	LCSD Result ppbv	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Tetrachloroethylene	3.75	3.76	3.72	100	99.2	66.0-124			1.07	20
Toluene	3.75	3.81	3.89	102	104	66.0-119			2.08	20
1,1,2-Trichloroethane	3.75	3.92	3.88	105	103	73.0-119			1.03	20
Trichloroethylene	3.75	3.85	3.82	103	102	71.0-123			0.782	20
(S) 1,4-Bromofluorobenzene				*101*	*101*	*60.0-140*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

DL	Detection Limit.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Pace Analytical - West Columbia, SC

106 Vantage Point Dr.
West Columbia, SC 29172

Billing Information:
PM
106 Vantage Point Dr.
West Columbia, SC 29172

Report To:
Kathy Smith

Email To:
kathy.smith@pacelabs.com

Project Description: NASA KSC-CRCA Air Sampling

City/State Collected: Kennedy Space Center, FL

Please Circle: PT MT CT ET

Phone: (321) 636-6470

Client Project #: 112G08970

Lab Project #: PACEWCSC-TETRATECHFL

Collected by (print): Chuck Sorden

Site/Facility ID #: KSC - CRCA

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Three Day
___ Next Day ___ Five Day
___ Two Day

Date Results Needed

Analysis: DODTO-15 Summa

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE
MT JULIET, TN
12065 Lebanon Road Mt Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L148627Y
D129

Acctnum: PACEWCSC
Template: T207717
Prelogin: P919097
PM: 844 - Christi M Wagner
PB: DL 4/14/22

Shipped Via: FedEX Ground

Sample ID	Can #	Flow Cont. #	Collection Date	Collection Time	Canister Pressure/Vacuum Initial	Canister Pressure/Vacuum Final	DODTO-15 Summa	Rem./Contaminant	Sample # (lab only)
CRCA-AMB01-20220425	~~10728~~ 9060	~~007858~~ 005443	04/25/22	0920 - 1715	30" Hg	1.5" Hg	X		-01
CRCA-AMB02-20220425	8777	010059		0925 - 1725	29" Hg	2.0" Hg	X		02
CRCA-VMP01-20220425	10728	007858		1105 - 1205	30" Hg	0" Hg	X		03
CRCA-VMP02-20220425	5757	021324		1120 - 1220	30" Hg	1" Hg	X		04
CRCA-VMP03-20220425	20986	011448		1135 - 1235	29" Hg	1" Hg	X		05
CRCA-VMP04-20220425	12149	007813	04/25/22	1150 - 1250	30" Hg	11" Hg	X		06

Remarks:

Samples returned via: __ UPS X FedEx __ Courier __ _____

Tracking # 5349 7824 4432
5349 7824 4443

Hold #

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)	Date:	Time:
	04/25/22	1730	Fed Ex	04/25/22	1730
Relinquished by : (Signature) Fed Ex	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature) D. Ramsey	Date: 4-26-22	Time: 0900

Condition: (lab use only)
0

COC Seal Intact: ___ Y ___ N ___ NA

NCF:

Chain of Custody

Pace Analytical®

Workorder: XD26053 Workorder Name: NASA KSC-CRCA Air Sampli Owner Received Date: 4/26/2022 Results Requested By: 5/6/2022

Report To:	Subcontract To:
Kathy E. Smith	Project #
Pace Analytical	
106 Vantage Point Drive	Pace-National
Columbia SC, 29223	
803-227-2706	
Kathy.Smith@pacelabs.com	

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: DOD TO-15 Summa												LAB USE ONLY
1	CRCA-AMB01-20220425	grab	04/25/2022 @ 1715	XD26053-001	Aqueous						X												
2	CRCA-AMB02-20220425	grab	04/25/2022 @ 1725	XD26053-002	Aqueous						X												
3	CRCA-VMP01-20220425	grab	04/25/2022 @ 1205	XD26053-003	Aqueous						X												
4	CRCA-VMP02-20220425	grab	04/25/2022 @ 1220	XD26053-004	Aqueous						X												
5	CRCA-VMP03-20220425	grab	04/25/2022 @ 1235	XD26053-005	Aqueous						X												
6	CRCA-VMP04-20220425	grab	04/25/2022 @ 1250	XD26053-006	Aqueous						X												
7																							
8																							
9																							
10																							

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1					
2					
3					

Cooler Temperature on Receipt _____ °C	Custody Seal Y or N	Received on Ice Y or N	Sample Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Alex Murphy

Project Name: KSC - CRCA

Project Number: 112G08970

Lot Number:**XD19036**

Date Completed:05/09/2022

05/23/2022 2:21 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Tetra Tech
Lot Number: XD19036

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
Surrogate recovery for the following samples was outside the upper control limit: XD19036-005, XD19036-006. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

Tetra Tech

Lot Number: XD19036

Project Name: KSC - CRCA

Project Number: 112G08970

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	CRCA-MW0018-058.0-20220418	Aqueous	04/18/2022 1015	04/19/2022
002	CRCA-MW0019-058.0-20220418	Aqueous	04/18/2022 1125	04/19/2022
003	CRCA-MW0031-058.0-20220418	Aqueous	04/18/2022 1215	04/19/2022
004	CRCA-MW0032-058.0-20220418	Aqueous	04/18/2022 1355	04/19/2022
005	CRCA-ASINFLUENT-20220418	Aqueous	04/18/2022 1430	04/19/2022
006	CRCA-ASEFFLUENT-20220418	Aqueous	04/18/2022 1445	04/19/2022

(6 samples)

Detection Summary

Tetra Tech

Lot Number: XD19036

Project Name: KSC - CRCA

Project Number: 112G08970

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	CRCA-MW0018-058.0-20220418	Aqueous	Vinyl chloride	8260D	33		ug/L	6
001	CRCA-MW0018-058.0-20220418	Aqueous	Ethene	RSK - 175	2.6	I	ug/L	7
001	CRCA-MW0018-058.0-20220418	Aqueous	Methane	RSK - 175	800		ug/L	7
002	CRCA-MW0019-058.0-20220418	Aqueous	Vinyl chloride	8260D	0.52	I	ug/L	9
002	CRCA-MW0019-058.0-20220418	Aqueous	Methane	RSK - 175	260		ug/L	10
003	CRCA-MW0031-058.0-20220418	Aqueous	Vinyl chloride	8260D	12		ug/L	12
003	CRCA-MW0031-058.0-20220418	Aqueous	Methane	RSK - 175	420		ug/L	13
004	CRCA-MW0032-058.0-20220418	Aqueous	Chloroethane	8260D	1.9	I	ug/L	14
004	CRCA-MW0032-058.0-20220418	Aqueous	Vinyl chloride	8260D	12		ug/L	15
005	CRCA-ASINFLUENT-20220418	Aqueous	PFBS	PFAS by ID	1.2	I	ng/L	18
005	CRCA-ASINFLUENT-20220418	Aqueous	PFHxS	PFAS by ID	5.5		ng/L	18
005	CRCA-ASINFLUENT-20220418	Aqueous	PFBA	PFAS by ID	36000	D	ng/L	18
005	CRCA-ASINFLUENT-20220418	Aqueous	PFHpA	PFAS by ID	8.0		ng/L	18
005	CRCA-ASINFLUENT-20220418	Aqueous	PFHxA	PFAS by ID	19		ng/L	18
005	CRCA-ASINFLUENT-20220418	Aqueous	PFNA	PFAS by ID	1.1	I	ng/L	18
005	CRCA-ASINFLUENT-20220418	Aqueous	PFOA	PFAS by ID	17		ng/L	18
005	CRCA-ASINFLUENT-20220418	Aqueous	PFPeA	PFAS by ID	23		ng/L	18
005	CRCA-ASINFLUENT-20220418	Aqueous	PFOS	PFAS by ID	5.2		ng/L	18
006	CRCA-ASEFFLUENT-20220418	Aqueous	Vinyl chloride	8260D	2.6		ug/L	21
006	CRCA-ASEFFLUENT-20220418	Aqueous	PFBS	PFAS by ID	1.1	I	ng/L	22
006	CRCA-ASEFFLUENT-20220418	Aqueous	PFHxS	PFAS by ID	5.3		ng/L	22
006	CRCA-ASEFFLUENT-20220418	Aqueous	PFBA	PFAS by ID	32000	D	ng/L	22
006	CRCA-ASEFFLUENT-20220418	Aqueous	PFDA	PFAS by ID	4.0		ng/L	22
006	CRCA-ASEFFLUENT-20220418	Aqueous	PFHpA	PFAS by ID	8.3		ng/L	22
006	CRCA-ASEFFLUENT-20220418	Aqueous	PFHxA	PFAS by ID	20		ng/L	22
006	CRCA-ASEFFLUENT-20220418	Aqueous	PFNA	PFAS by ID	3.1	I	ng/L	22
006	CRCA-ASEFFLUENT-20220418	Aqueous	PFOA	PFAS by ID	19		ng/L	22
006	CRCA-ASEFFLUENT-20220418	Aqueous	PFPeA	PFAS by ID	24		ng/L	22
006	CRCA-ASEFFLUENT-20220418	Aqueous	PFOS	PFAS by ID	21		ng/L	22

(29 detections)

Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-001**

Description: **CRCA-MW0018-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1015** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1151	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
Q = Out of holding time
V = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
I = Estimated result < LOQ and ≥ DL
D = Dilution > 1
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-001**

Description: **CRCA-MW0018-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1015** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1151	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	**75-01-4**	**8260D**	**33**		**1.0**	0.80	**0.40**	**ug/L**	**1**
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		97	81-118
Bromofluorobenzene		99	85-114
Toluene-d8		96	89-112
Dibromofluoromethane		90	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Dissolved Gases

Client: **Tetra Tech** Laboratory ID: **XD19036-001**

Description: **CRCA-MW0018-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1015** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		RSK - 175	1	04/27/2022 1208	JM1		39557

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Ethane	74-84-0	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Ethene	**74-85-1**	**RSK - 175**	**2.6**	**I**	**10**	5.0	**2.5**	**ug/L**	**1**
Methane	**74-82-8**	**RSK - 175**	**800**		**10**	5.0	**2.5**	**ug/L**	**1**
Propane	74-98-6	RSK - 175	7.5	U	15	7.5	5.0	ug/L	1

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-002**

Description: **CRCA-MW0019-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1125** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1347	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
Q = Out of holding time
V = Detected in the method blank
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E = Quantitation of compound exceeded the calibration range
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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-002**

Description: **CRCA-MW0019-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1125** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1347	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	**75-01-4**	**8260D**	**0.52**	**I**	**1.0**	0.80	**0.40**	**ug/L**	**1**
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		100	81-118
Bromofluorobenzene		102	85-114
Toluene-d8		96	89-112
Dibromofluoromethane		94	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Dissolved Gases

Client: **Tetra Tech** Laboratory ID: **XD19036-002**

Description: **CRCA-MW0019-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1125** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		RSK - 175	1	04/27/2022 1224	JM1		39557

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Ethane	74-84-0	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Ethene	74-85-1	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Methane	**74-82-8**	**RSK - 175**	**260**		**10**	5.0	**2.5**	**ug/L**	**1**
Propane	74-98-6	RSK - 175	7.5	U	15	7.5	5.0	ug/L	1

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-003**

Description: **CRCA-MW0031-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1215** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1411	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation
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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-003**

Description: **CRCA-MW0031-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1215** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1411	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	**75-01-4**	**8260D**	**12**		**1.0**	0.80	**0.40**	**ug/L**	**1**
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		98	81-118
Bromofluorobenzene		96	85-114
Toluene-d8		97	89-112
Dibromofluoromethane		92	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Dissolved Gases

Client: **Tetra Tech** Laboratory ID: **XD19036-003**

Description: **CRCA-MW0031-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1215** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		RSK - 175	1	04/27/2022 1240	JM1		39557

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Ethane	74-84-0	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Ethene	74-85-1	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Methane	**74-82-8**	**RSK - 175**	**420**		**10**	5.0	**2.5**	**ug/L**	**1**
Propane	74-98-6	RSK - 175	7.5	U	15	7.5	5.0	ug/L	1

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
Q = Out of holding time
V = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
I = Estimated result < LOQ and ≥ DL
D = Dilution > 1
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-004**

Description: **CRCA-MW0032-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1355** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1435	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	**75-00-3**	**8260D**	**1.9**	**I**	**2.0**	0.80	**0.40**	**ug/L**	**1**
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
Q = Out of holding time
V = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
I = Estimated result < LOQ and ≥ DL
D = Dilution > 1
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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-004**

Description: **CRCA-MW0032-058.0-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1355** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1435	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	**75-01-4**	**8260D**	**12**		**1.0**	0.80	**0.40**	**ug/L**	**1**
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		99	81-118
Bromofluorobenzene		98	85-114
Toluene-d8		96	89-112
Dibromofluoromethane		91	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-005**

Description: **CRCA-ASINFLUENT-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1430** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1458	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

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LOD = Limit of Detection
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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-005**

Description: **CRCA-ASINFLUENT-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1430** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1458	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		101	81-118
Bromofluorobenzene		97	85-114
Toluene-d8		97	89-112
Dibromofluoromethane		93	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-005**

Description: **CRCA-ASINFLUENT-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1430** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	04/29/2022 1842	ASD	04/22/2022 1645	39107
2	SOP SPE	PFAS by ID SOP QSM B-15	100	05/02/2022 2305	NK1	04/22/2022 1645	39107

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	4.0	UQ	7.9	4.0	2.0	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	4.0	U	7.9	4.0	2.0	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.2**	**I**	**4.0**	2.0	**0.99**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**5.5**		**4.0**	2.0	**0.99**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**36000**	**D**	**400**	200	**99**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**8.0**		**4.0**	2.0	**0.99**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**19**		**4.0**	2.0	**0.99**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**1.1**	**I**	**4.0**	2.0	**0.99**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**17**		**4.0**	2.0	**0.99**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**23**		**4.0**	2.0	**0.99**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	4.0	2.0	0.99	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**5.2**		**4.0**	2.0	**0.99**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	178	50-150		132	50-150
13C2_6:2FTS		119	50-150		137	50-150
13C2_8:2FTS		96	50-150		129	50-150
13C2_PFDoA		77	50-150		130	50-150
13C2_PFTeDA		76	50-150		133	50-150
13C3_PFBS		75	50-150		122	50-150
13C3_PFHxS		93	50-150		114	50-150
13C3-HFPO-DA		80	50-150		120	50-150
13C4_PFBA	N	12	50-150		112	50-150
13C4_PFHpA		92	50-150		124	50-150
13C5_PFHxA		80	50-150		121	50-150
13C5_PFPeA		61	50-150		120	50-150
13C6_PFDA		83	50-150		123	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
Q = Out of holding time
V = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
I = Estimated result < LOQ and ≥ DL
D = Dilution > 1
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-005**

Description: **CRCA-ASINFLUENT-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1430** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		85	50-150		118	50-150
13C8_PFOA		90	50-150		124	50-150
13C8_PFOS		86	50-150		121	50-150
13C9_PFNA		91	50-150		126	50-150
d-EtFOSA		69	50-150		111	50-150
d5-EtFOSAA		85	50-150		127	50-150
d3-MeFOSAA		86	50-150		97	50-150

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-006**

Description: **CRCA-ASEFFLUENT-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1445** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1520	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
Q = Out of holding time
V = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
I = Estimated result < LOQ and ≥ DL
D = Dilution > 1
Q = Surrogate failure
L = LCS/LCSD failure
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Volatile Organic Compounds by GC/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-006**

Description: **CRCA-ASEFFLUENT-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1445** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	04/27/2022 1520	BWS		39529

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	**75-01-4**	**8260D**	**2.6**		**1.0**	0.80	**0.40**	**ug/L**	**1**
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		100	81-118
Bromofluorobenzene		98	85-114
Toluene-d8		95	89-112
Dibromofluoromethane		92	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-006**

Description: **CRCA-ASEFFLUENT-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1445** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	04/29/2022 1853	ASD	04/22/2022 1645	39107
2	SOP SPE	PFAS by ID SOP QSM B-15	100	05/02/2022 2316	NK1	04/22/2022 1645	39107

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	**375-73-5**	**PFAS by ID SOP**	**1.1**	**I**	**3.9**	2.0	**0.97**	**ng/L**	**1**
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	**355-46-4**	**PFAS by ID SOP**	**5.3**		**3.9**	2.0	**0.97**	**ng/L**	**1**
Perfluoro-n-butanoic acid (PFBA)	**375-22-4**	**PFAS by ID SOP**	**32000**	**D**	**390**	200	**97**	**ng/L**	**2**
Perfluoro-n-decanoic acid (PFDA)	**335-76-2**	**PFAS by ID SOP**	**4.0**		**3.9**	2.0	**0.97**	**ng/L**	**1**
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	**375-85-9**	**PFAS by ID SOP**	**8.3**		**3.9**	2.0	**0.97**	**ng/L**	**1**
Perfluoro-n-hexanoic acid (PFHxA)	**307-24-4**	**PFAS by ID SOP**	**20**		**3.9**	2.0	**0.97**	**ng/L**	**1**
Perfluoro-n-nonanoic acid (PFNA)	**375-95-1**	**PFAS by ID SOP**	**3.1**	**I**	**3.9**	2.0	**0.97**	**ng/L**	**1**
Perfluoro-n-octanoic acid (PFOA)	**335-67-1**	**PFAS by ID SOP**	**19**		**3.9**	2.0	**0.97**	**ng/L**	**1**
Perfluoro-n-pentanoic acid (PFPeA)	**2706-90-3**	**PFAS by ID SOP**	**24**		**3.9**	2.0	**0.97**	**ng/L**	**1**
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	**1763-23-1**	**PFAS by ID SOP**	**21**		**3.9**	2.0	**0.97**	**ng/L**	**1**

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	181	50-150		116	50-150
13C2_6:2FTS		123	50-150		110	50-150
13C2_8:2FTS		98	50-150		106	50-150
13C2_PFDoA		78	50-150		108	50-150
13C2_PFTeDA		77	50-150		107	50-150
13C3_PFBS		78	50-150		106	50-150
13C3_PFHxS		87	50-150		108	50-150
13C3-HFPO-DA		82	50-150		108	50-150
13C4_PFBA	N	12	50-150		98	50-150
13C4_PFHpA		92	50-150		108	50-150
13C5_PFHxA		85	50-150		107	50-150
13C5_PFPeA		64	50-150		102	50-150
13C6_PFDA		86	50-150		105	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOQ
Q = Out of holding time
V = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
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I = Estimated result < LOQ and ≥ DL
D = Dilution > 1
Q = Surrogate failure
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S = MS/MSD failure

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PFAS by LC/MS/MS

Client: **Tetra Tech** Laboratory ID: **XD19036-006**

Description: **CRCA-ASEFFLUENT-20220418** Matrix: **Aqueous**

Date Sampled: **04/18/2022 1445** Project Name: **KSC - CRCA**

Date Received: **04/19/2022** Project Number: **112G08970**

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		86	50-150		104	50-150
13C8_PFOA		93	50-150		104	50-150
13C8_PFOS		88	50-150		107	50-150
13C9_PFNA		92	50-150		107	50-150
d-EtFOSA		70	50-150		98	50-150
d5-EtFOSAA		82	50-150		111	50-150
d3-MeFOSAA		84	50-150		100	50-150

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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QC Summary

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ39529-001
Batch: 39529
Analytical Method: 8260D
Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	04/27/2022 1117
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	04/27/2022 1117
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	04/27/2022 1117
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	04/27/2022 1117
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	04/27/2022 1117
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	04/27/2022 1117
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	04/27/2022 1117
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	04/27/2022 1117
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	04/27/2022 1117
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	04/27/2022 1117
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	04/27/2022 1117
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
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I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ39529-001
Batch: 39529
Analytical Method: 8260D
Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	04/27/2022 1117

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		98	81-118
Bromofluorobenzene		98	85-114
Toluene-d8		98	89-112
Dibromofluoromethane		92	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
I = Estimated result < LOQ and ≥ DL
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P = The RPD between two GC columns exceeds 40%
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Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ39529-002
Batch: 39529
Analytical Method: 8260D
Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	100		1	105	39-160	04/27/2022 0908
Benzene	50	48		1	96	79-120	04/27/2022 0908
Bromodichloromethane	50	52		1	105	79-125	04/27/2022 0908
Bromoform	50	51		1	102	66-130	04/27/2022 0908
Bromomethane (Methyl bromide)	50	46		1	91	53-141	04/27/2022 0908
2-Butanone (MEK)	100	100		1	105	56-143	04/27/2022 0908
Carbon disulfide	50	51		1	102	64-133	04/27/2022 0908
Carbon tetrachloride	50	51		1	103	72-136	04/27/2022 0908
Chlorobenzene	50	49		1	97	82-118	04/27/2022 0908
Chloroethane	50	47		1	94	60-138	04/27/2022 0908
Chloroform	50	48		1	95	79-124	04/27/2022 0908
Chloromethane (Methyl chloride)	50	46		1	93	50-139	04/27/2022 0908
Cyclohexane	50	50		1	99	71-130	04/27/2022 0908
1,2-Dibromo-3-chloropropane (DBCP)	50	59		1	117	62-128	04/27/2022 0908
Dibromochloromethane	50	58		1	116	74-126	04/27/2022 0908
1,2-Dibromoethane (EDB)	50	54		1	108	77-121	04/27/2022 0908
1,2-Dichlorobenzene	50	50		1	100	80-119	04/27/2022 0908
1,3-Dichlorobenzene	50	51		1	102	80-119	04/27/2022 0908
1,4-Dichlorobenzene	50	49		1	97	79-118	04/27/2022 0908
Dichlorodifluoromethane	50	47		1	93	32-152	04/27/2022 0908
1,1-Dichloroethane	50	48		1	96	77-125	04/27/2022 0908
1,2-Dichloroethane	50	48		1	96	73-128	04/27/2022 0908
1,1-Dichloroethene	50	49		1	98	71-131	04/27/2022 0908
cis-1,2-Dichloroethene	50	49		1	98	78-123	04/27/2022 0908
trans-1,2-Dichloroethene	50	50		1	99	75-124	04/27/2022 0908
1,2-Dichloropropane	50	47		1	95	78-122	04/27/2022 0908
cis-1,3-Dichloropropene	50	49		1	98	75-124	04/27/2022 0908
trans-1,3-Dichloropropene	50	49		1	98	73-127	04/27/2022 0908
Ethylbenzene	50	51		1	102	79-121	04/27/2022 0908
2-Hexanone	100	95		1	95	57-139	04/27/2022 0908
Isopropylbenzene	50	54		1	108	72-131	04/27/2022 0908
Methyl acetate	50	57		1	114	56-136	04/27/2022 0908
Methyl tertiary butyl ether (MTBE)	50	53		1	105	71-124	04/27/2022 0908
4-Methyl-2-pentanone	100	100		1	104	67-130	04/27/2022 0908
Methylcyclohexane	50	47		1	95	72-132	04/27/2022 0908
Methylene chloride	50	47		1	94	74-124	04/27/2022 0908
Styrene	50	56		1	111	78-123	04/27/2022 0908
1,1,2,2-Tetrachloroethane	50	54		1	108	71-121	04/27/2022 0908
Tetrachloroethene	50	48		1	96	74-129	04/27/2022 0908
Toluene	50	50		1	101	80-121	04/27/2022 0908
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	49		1	98	70-136	04/27/2022 0908
1,2,4-Trichlorobenzene	50	53		1	106	69-130	04/27/2022 0908
1,1,1-Trichloroethane	50	50		1	99	74-131	04/27/2022 0908
1,1,2-Trichloroethane	50	51		1	102	80-119	04/27/2022 0908

LOQ = Limit of Quantitation
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Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ39529-002
Batch: 39529
Analytical Method: 8260D
Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	48		1	95	79-123	04/27/2022 0908
Trichlorofluoromethane	50	47		1	93	65-141	04/27/2022 0908
Vinyl chloride	50	48		1	95	58-137	04/27/2022 0908
Xylenes (total)	100	110		1	107	79-121	04/27/2022 0908

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		92	81-118
Bromofluorobenzene		99	85-114
Toluene-d8		91	89-112
Dibromofluoromethane		90	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
I = Estimated result < LOQ and ≥ DL
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N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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Note: Calculations are performed before rounding to avoid round-off errors in calculated results

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Dissolved Gases - MB

Sample ID: XQ39557-001
Batch: 39557
Analytical Method: RSK - 175
Matrix: Aqueous

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Ethane	5.0	U	1	10	5.0	2.5	ug/L	04/27/2022 1120
Ethene	5.0	U	1	10	5.0	2.5	ug/L	04/27/2022 1120
Methane	5.0	U	1	10	5.0	2.5	ug/L	04/27/2022 1120
Propane	7.5	U	1	15	7.5	5.0	ug/L	04/27/2022 1120

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
I = Estimated result < LOQ and ≥ DL
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N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved Gases - LCS

Sample ID: XQ39557-002
Batch: 39557
Analytical Method: RSK - 175
Matrix: Aqueous

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Ethane	550	630		1	114	74-131	04/27/2022 1009
Ethene	520	590		1	114	72-133	04/27/2022 1009
Methane	300	320		1	110	73-125	04/27/2022 1009
Propane	810	930		1	114	74-123	04/27/2022 1009

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
I = Estimated result < LOQ and ≥ DL
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N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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Note: Calculations are performed before rounding to avoid round-off errors in calculated results

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Dissolved Gases - LCSD

Sample ID: XQ39557-003
Batch: 39557
Analytical Method: RSK - 175
Matrix: Aqueous

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
Ethane	550	640		1	116	1.3	74-131	30	04/27/2022 1023
Ethene	520	590		1	115	1.3	72-133	30	04/27/2022 1023
Methane	300	320		1	110	0.44	73-125	30	04/27/2022 1023
Propane	810	950		1	117	2.6	74-123	30	04/27/2022 1023

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection
U = Not detected at or above the LOQ
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ39107-001
Batch: 39107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/22/2022 1645

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	04/29/2022 1726
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	04/29/2022 1726
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	04/29/2022 1726
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	04/29/2022 1726
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	04/29/2022 1726
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	04/29/2022 1726
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	04/29/2022 1726
EtFOSA	4.0	U	1	8.0	4.0	2.0	ng/L	04/29/2022 1726
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	04/29/2022 1726
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	04/29/2022 1726
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	04/29/2022 1726

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	50-150
13C2_6:2FTS		105	50-150
13C2_8:2FTS		88	50-150
13C2_PFDoA		82	50-150
13C2_PFTeDA		79	50-150
13C3_PFBS		91	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA		94	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		87	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		93	50-150

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Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ39107-001
Batch: 39107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/22/2022 1645

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		79	50-150
13C7_PFUdA		85	50-150
13C8_PFOA		94	50-150
13C8_PFOS		84	50-150
13C9_PFNA		91	50-150
d-EtFOSA		67	50-150
d5-EtFOSAA		84	50-150
d3-MeFOSAA		86	50-150

LOQ = Limit of Quantitation
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LOD = Limit of Detection

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PFAS by LC/MS/MS - LCS

Sample ID: XQ39107-002
Batch: 39107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/22/2022 1645

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	15		1	104	70-150	04/29/2022 1737
11Cl-PF3OUdS	15	15		1	99	70-150	04/29/2022 1737
8:2 FTS	15	15		1	99	67-138	04/29/2022 1737
6:2 FTS	15	17		1	109	64-140	04/29/2022 1737
4:2 FTS	15	16		1	105	63-143	04/29/2022 1737
GenX	32	32		1	99	70-150	04/29/2022 1737
ADONA	15	16		1	105	70-150	04/29/2022 1737
EtFOSA	16	21		1	130	70-150	04/29/2022 1737
EtFOSAA	16	17		1	106	61-135	04/29/2022 1737
MeFOSAA	16	16		1	99	65-136	04/29/2022 1737
PFBS	14	15		1	107	72-130	04/29/2022 1737
PFDS	15	16		1	105	53-142	04/29/2022 1737
PFHpS	15	17		1	112	69-134	04/29/2022 1737
PFNS	15	17		1	108	69-127	04/29/2022 1737
PFPeS	15	16		1	109	71-127	04/29/2022 1737
PFHxS	15	14		1	98	68-131	04/29/2022 1737
PFBA	16	17		1	108	73-129	04/29/2022 1737
PFDA	16	18		1	109	71-129	04/29/2022 1737
PFDoA	16	17		1	107	72-134	04/29/2022 1737
PFHpA	16	17		1	107	72-130	04/29/2022 1737
PFHxA	16	17		1	106	72-129	04/29/2022 1737
PFNA	16	17		1	107	69-130	04/29/2022 1737
PFOA	16	17		1	104	71-133	04/29/2022 1737
PFPeA	16	17		1	107	72-129	04/29/2022 1737
PFTeDA	16	17		1	104	71-132	04/29/2022 1737
PFTrDA	16	16		1	98	65-144	04/29/2022 1737
PFUdA	16	18		1	110	69-133	04/29/2022 1737
PFOS	15	17		1	113	65-140	04/29/2022 1737

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		95	50-150
13C2_6:2FTS		99	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		81	50-150
13C2_PFTeDA		72	50-150
13C3_PFBS		93	50-150
13C3_PFHxS		93	50-150
13C3-HFPO-DA		93	50-150
13C4_PFBA		90	50-150
13C4_PFHpA		91	50-150
13C5_PFHxA		90	50-150
13C5_PFPeA		92	50-150

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DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ39107-002
Batch: 39107
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 04/22/2022 1645

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		83	50-150
13C7_PFUdA		86	50-150
13C8_PFOA		95	50-150
13C8_PFOS		83	50-150
13C9_PFNA		93	50-150
d-EtFOSA		60	50-150
d5-EtFOSAA		85	50-150
d3-MeFOSAA		87	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody
and
Miscellaneous Documents

Tetra Tech, Inc.

CHAIN OF CUSTODY | NUMBER No. 2615 | PAGE 1 OF 1

PROJECT NO: 112G 08970	FACILITY: KSC-CRCA	PROJECT MANAGER: Alex Murphy	PHONE NUMBER: (321) 292-0842	LABORATORY NAME AND CONTACT: Pace Analytical — Katy Smith
SAMPLERS (SIGNATURE): - Chuck Sorden		FIELD OPERATIONS LEADER: Chuck Sorden	PHONE NUMBER: (321) 591-7580	ADDRESS: 106 Vantage Point Dr.
		CARRIER/WAYBILL NUMBER		CITY, STATE: West Columbia, SC

STANDARD TAT ☒
RUSH TAT ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G G P
PRESERVATIVE USED: HCl/4°C HCl/4°C 4°C

TYPE OF ANALYSIS: VOC; Dissolved Gasses; PFAS QSM Table B-15

XD19036
KES12

DATE YEAR 2022	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	VOC	Dissolved Gasses	PFAS QSM Table B-15	COMMENTS
04/18	1015	CRCA-MW0018-058.0-20220418		53	63	GW	G	5	X	X		
	1125	CRCA-MW0019-058.0-20220418		"		"	"	1	1	1		
	1215	CRCA-MW0031-058.0-20220418		"		"	"	5	"	X		
	1355	CRCA-MW0032-058.0-20220418		53	63	"	"	3	X			
	1430	CRCA-ASINFLUENT-20220418		—	—	"	"	5	1		X	
04/18	1445	CRCA-ASEFFLUENT-20220418		—	—	GW	G	5	X		X	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	04/18/22	1600	1. RECEIVED BY FedEx	04/18/22	1600
2. RELINQUISHED BY FedEx	4/19/22	1015	2. RECEIVED BY Houston N Roberts	4/19/22	1015
3. RELINQUISHED BY	DATE	TIME	3. RECEIVED BY	DATE	TIME

COMMENTS: T= 4.9°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

PACE ANALYTICAL SERVICES, LLC

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: TEC / 04/19/2022 Lot #: XD190036

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

4.9 / 4.9 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☑ No	☐ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: KNR Date: 04/19/2022

Comments:

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Alex Murphy

Project Name: KSC - CRCA

Project Number: 112G08970

Lot Number:**XE25024**

Date Completed:06/16/2022

06/17/2022 2:55 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.

Case Narrative
Tetra Tech
Lot Number: XE25024

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples was in compliance with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). For undiluted analysis. For undiluted analysis, the extract is prepared for injection by adding 182 uL of sample extract + 8 uL of reagent water + 10 uL of internal standard solution to a polypropylene autosampler vial. An extra correction factor of 0.91 (182 uL / 200 uL = 0.91) applies. The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1/0.91.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Surrogate recovery for the following sample(s) was outside the upper control limit: XE25001-001, XE25001-002, XE25001-003, XE25001-004, XE25024-001, XE25024-002. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Volatiles
Reanalysis of the following sample was performed outside of the analytical holding time: XE25024-001. The above sample was reanalyzed for Vinyl Chloride recovering outside control limits in hte CCV. All data has been reported.

The laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for analytical batch 44290 exceeded acceptance criteria for the following analytes: Acetone. This analyte was biased high and were not detected in the samples affected.

PFAS
Surrogate recovery for the following samples was outside the upper control limit: XE25024-001, XE25024-002. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

Tetra Tech

Lot Number: XE25024

Project Name: KSC - CRCA

Project Number: 112G08970

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	CRCA-ASINFLUENT-20220524	Aqueous	05/24/2022 1100	05/25/2022
002	CRCA-ASEFFLUENT-20220524	Aqueous	05/24/2022 1115	05/25/2022

(2 samples)

Detection Summary

Tetra Tech

Lot Number: XE25024

Project Name: KSC - CRCA

Project Number: 112G08970

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	CRCA-ASINFLUENT-20220524	Aqueous	Vinyl chloride	8260D	2.4	H	ug/L	10
001	CRCA-ASINFLUENT-20220524	Aqueous	PFBS	PFAS by ID	0.94	J	ng/L	11
001	CRCA-ASINFLUENT-20220524	Aqueous	PFHxS	PFAS by ID	5.7		ng/L	11
001	CRCA-ASINFLUENT-20220524	Aqueous	PFBA	PFAS by ID	34000	D	ng/L	11
001	CRCA-ASINFLUENT-20220524	Aqueous	PFHpA	PFAS by ID	7.6		ng/L	11
001	CRCA-ASINFLUENT-20220524	Aqueous	PFHxA	PFAS by ID	16		ng/L	11
001	CRCA-ASINFLUENT-20220524	Aqueous	PFNA	PFAS by ID	0.91	J	ng/L	11
001	CRCA-ASINFLUENT-20220524	Aqueous	PFOA	PFAS by ID	15		ng/L	11
001	CRCA-ASINFLUENT-20220524	Aqueous	PFPeA	PFAS by ID	22		ng/L	11
001	CRCA-ASINFLUENT-20220524	Aqueous	PFOS	PFAS by ID	5.4		ng/L	11
002	CRCA-ASEFFLUENT-20220524	Aqueous	PFBS	PFAS by ID	1.2	J	ng/L	15
002	CRCA-ASEFFLUENT-20220524	Aqueous	PFHxS	PFAS by ID	5.1		ng/L	15
002	CRCA-ASEFFLUENT-20220524	Aqueous	PFBA	PFAS by ID	34000	D	ng/L	15
002	CRCA-ASEFFLUENT-20220524	Aqueous	PFHpA	PFAS by ID	8.4		ng/L	15
002	CRCA-ASEFFLUENT-20220524	Aqueous	PFHxA	PFAS by ID	20		ng/L	15
002	CRCA-ASEFFLUENT-20220524	Aqueous	PFOA	PFAS by ID	16		ng/L	15
002	CRCA-ASEFFLUENT-20220524	Aqueous	PFPeA	PFAS by ID	21		ng/L	15
002	CRCA-ASEFFLUENT-20220524	Aqueous	PFOS	PFAS by ID	5.1		ng/L	15

(18 detections)

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XE25024-001

Description: CRCA-ASINFLUENT-20220524 | Matrix: Aqueous

Date Sampled: 05/24/2022 1100 | Project Name: KSC - CRCA

Date Received: 05/25/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	06/06/2022 1226	BWS		43935
2	5030B	8260D	1	06/09/2022 0116	SDC		44290

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XE25024-001

Description: CRCA-ASINFLUENT-20220524 | Matrix: Aqueous

Date Sampled: 05/24/2022 1100 | Project Name: KSC - CRCA

Date Received: 05/25/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	06/06/2022 1226	BWS		43935
2	5030B	8260D	1	06/09/2022 0116	SDC		44290

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	3.0		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Run 1 Acceptance Limits	Q	Run 2 % Recovery	Run 2 Acceptance Limits
1,2-Dichloroethane-d4		105	81-118	H	102	81-118
Bromofluorobenzene		113	85-114	H	102	85-114
Toluene-d8		97	89-112	H	107	89-112
Dibromofluoromethane		109	80-119	H	109	80-119

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XE25024-001

Description: CRCA-ASINFLUENT-20220524 | Matrix: Aqueous

Date Sampled: 05/24/2022 1100 | Project Name: KSC - CRCA

Date Received: 05/25/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	06/06/2022 1226	BWS		43935
2	5030B	8260D	1	06/09/2022 0116	SDC		44290

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	UHL	20	10	5.0	ug/L	2
Benzene	71-43-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromodichloromethane	75-27-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromoform	75-25-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	UH	2.0	0.80	0.40	ug/L	2
2-Butanone (MEK)	78-93-3	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Carbon disulfide	75-15-0	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Carbon tetrachloride	56-23-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chlorobenzene	108-90-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chloroethane	75-00-3	8260D	0.80	UH	2.0	0.80	0.40	ug/L	2
Chloroform	67-66-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	UH	2.0	1.0	0.50	ug/L	2
Cyclohexane	110-82-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Dibromochloromethane	124-48-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichlorobenzene	95-50-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,3-Dichlorobenzene	541-73-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,4-Dichlorobenzene	106-46-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Dichlorodifluoromethane	75-71-8	8260D	1.2	UH	2.0	1.2	0.60	ug/L	2
1,1-Dichloroethane	75-34-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichloroethane	107-06-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1-Dichloroethene	75-35-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichloropropane	78-87-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Ethylbenzene	100-41-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
2-Hexanone	591-78-6	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Isopropylbenzene	98-82-8	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Methyl acetate	79-20-9	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
4-Methyl-2-pentanone	108-10-1	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Methylcyclohexane	108-87-2	8260D	0.80	UH	5.0	0.80	0.40	ug/L	2
Methylene chloride	75-09-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Styrene	100-42-5	8260D	0.82	UH	1.0	0.82	0.41	ug/L	2
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Tetrachloroethene	127-18-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Toluene	108-88-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	UH	1.0	0.84	0.42	ug/L	2
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1,1-Trichloroethane	71-55-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XE25024-001

Description: CRCA-ASINFLUENT-20220524 | Matrix: Aqueous

Date Sampled: 05/24/2022 1100 | Project Name: KSC - CRCA

Date Received: 05/25/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	06/06/2022 1226	BWS		43935
2	5030B	8260D	1	06/09/2022 0116	SDC		44290

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1,1,2-Trichloroethane	79-00-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Trichloroethene	79-01-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Trichlorofluoromethane	75-69-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Vinyl chloride	75-01-4	8260D	2.4	H	1.0	0.80	0.40	ug/L	2
Xylenes (total)	1330-20-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		105	81-118	H	102	81-118
Bromofluorobenzene		113	85-114	H	102	85-114
Toluene-d8		97	89-112	H	107	89-112
Dibromofluoromethane		109	80-119	H	109	80-119

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XE25024-001
Description: CRCA-ASINFLUENT-20220524 | Matrix: Aqueous
Date Sampled: 05/24/2022 1100 | Project Name: KSC - CRCA
Date Received: 05/25/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	06/07/2022 1546	MMM	06/01/2022 1651	43531
2	SOP SPE	PFAS by ID SOP QSM B-15	100	06/09/2022 1916	MMM	06/01/2022 1651	43531
3	SOP SPE	PFAS by ID SOP QSM B-15	1	06/14/2022 2006	ASD	06/09/2022 1402	44372

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.8	UQ	7.6	3.8	1.9	ng/L	3
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	UQ	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	0.94	J	3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.7		3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	34000	D	360	180	91	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	7.6		3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	16		3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	0.91	J	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	15		3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	22		3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5.4		3.6	1.8	0.91	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS	N	236	50-150		109	50-150	N	209	50-150
13C2_6:2FTS		150	50-150		128	50-150	N	179	50-150
13C2_8:2FTS		124	50-150		101	50-150		109	50-150
13C2_PFDoA		111	50-150		105	50-150		91	50-150
13C2_PFTeDA		102	50-150		105	50-150		85	50-150
13C3_PFBS		89	50-150		98	50-150		84	50-150
13C3_PFHxS		128	50-150		114	50-150		106	50-150
13C3-HFPO-DA		88	50-150		111	50-150		86	50-150
13C4_PFBA	N	12	50-150		95	50-150	N	13	50-150
13C4_PFHpA		119	50-150		114	50-150		110	50-150
13C5_PFHxA		106	50-150		117	50-150		94	50-150
13C5_PFPeA		73	50-150		107	50-150		66	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XE25024-001
Description: CRCA-ASINFLUENT-20220524
Matrix: Aqueous
Date Sampled: 05/24/2022 1100
Project Name: KSC - CRCA
Date Received: 05/25/2022
Project Number: 112G08970

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		115	50-150		124	50-150		104	50-150
13C7_PFUdA		128	50-150		99	50-150		99	50-150
13C8_PFOA		111	50-150		104	50-150		101	50-150
13C8_PFOS		109	50-150		118	50-150		106	50-150
13C9_PFNA		121	50-150		109	50-150		107	50-150
d-EtFOSA		78	50-150		146	50-150		71	50-150
d5-EtFOSAA		99	50-150		118	50-150		98	50-150
d3-MeFOSAA		101	50-150		124	50-150		106	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOQ
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
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W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XE25024-002

Description: CRCA-ASEFFLUENT-20220524 | Matrix: Aqueous

Date Sampled: 05/24/2022 1115 | Project Name: KSC - CRCA

Date Received: 05/25/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	06/06/2022 1251	BWS		43935

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XE25024-002

Description: CRCA-ASEFFLUENT-20220524 | Matrix: Aqueous

Date Sampled: 05/24/2022 1115 | Project Name: KSC - CRCA

Date Received: 05/25/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	06/06/2022 1251	BWS		43935

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		105	81-118
Bromofluorobenzene		111	85-114
Toluene-d8		95	89-112
Dibromofluoromethane		108	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOQ	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XE25024-002
Description: CRCA-ASEFFLUENT-20220524 | Matrix: Aqueous
Date Sampled: 05/24/2022 1115 | Project Name: KSC - CRCA
Date Received: 05/25/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	06/07/2022 1557	MMM	06/01/2022 1651	43531
2	SOP SPE	PFAS by ID SOP QSM B-15	100	06/09/2022 1927	MMM	06/01/2022 1651	43531
3	SOP SPE	PFAS by ID SOP QSM B-15	1	06/14/2022 2017	ASD	06/09/2022 1402	44372

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UQ	7.4	3.7	1.9	ng/L	3
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.9	UQ	7.7	3.9	1.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.9	U	7.7	3.9	1.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.2	J	3.9	2.0	0.97	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.1		3.9	2.0	0.97	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	34000	D	390	200	97	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	8.4		3.9	2.0	0.97	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	20		3.9	2.0	0.97	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	16		3.9	2.0	0.97	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	21		3.9	2.0	0.97	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	2.0	U	3.9	2.0	0.97	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5.1		3.9	2.0	0.97	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits	Run 3 Q	Run 3 % Recovery	Run 3 Acceptance Limits
13C2_4:2FTS	N	223	50-150		113	50-150	N	216	50-150
13C2_6:2FTS	N	151	50-150		134	50-150	N	178	50-150
13C2_8:2FTS		124	50-150		113	50-150		107	50-150
13C2_PFDoA		96	50-150		118	50-150		99	50-150
13C2_PFTeDA		91	50-150		109	50-150		91	50-150
13C3_PFBS		89	50-150		108	50-150		87	50-150
13C3_PFHxS		117	50-150		111	50-150		108	50-150
13C3-HFPO-DA		91	50-150		113	50-150		88	50-150
13C4_PFBA	N	13	50-150		97	50-150	N	14	50-150
13C4_PFHpA		110	50-150		117	50-150		107	50-150
13C5_PFHxA		97	50-150		118	50-150		93	50-150
13C5_PFPeA		81	50-150		111	50-150		71	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOQ | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XE25024-002
Description: CRCA-ASEFFLUENT-20220524
Matrix: Aqueous
Date Sampled: 05/24/2022 1115
Project Name: KSC - CRCA
Date Received: 05/25/2022
Project Number: 112G08970

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits	Q	Run 3 % Recovery	Acceptance Limits
13C6_PFDA		109	50-150		111	50-150		105	50-150
13C7_PFUdA		117	50-150		110	50-150		99	50-150
13C8_PFOA		109	50-150		116	50-150		104	50-150
13C8_PFOS		109	50-150		121	50-150		105	50-150
13C9_PFNA		115	50-150		107	50-150		107	50-150
d-EtFOSA		84	50-150		137	50-150		80	50-150
d5-EtFOSAA		104	50-150		120	50-150		101	50-150
d3-MeFOSAA		114	50-150		129	50-150		107	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
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W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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QC Summary

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ43935-001
Batch: 43935
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	06/06/2022 0954
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	06/06/2022 0954
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	06/06/2022 0954
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	06/06/2022 0954
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	06/06/2022 0954
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	06/06/2022 0954
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	06/06/2022 0954
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	06/06/2022 0954
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	06/06/2022 0954
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	06/06/2022 0954
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	06/06/2022 0954
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ43935-001
Batch: 43935
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	06/06/2022 0954

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		104	81-118
Bromofluorobenzene		112	85-114
Toluene-d8		96	89-112
Dibromofluoromethane		106	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ43935-002
Batch: 43935
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	92		1	92	39-160	06/06/2022 0904
Benzene	50	47		1	95	79-120	06/06/2022 0904
Bromodichloromethane	50	48		1	95	79-125	06/06/2022 0904
Bromoform	50	41		1	83	66-130	06/06/2022 0904
Bromomethane (Methyl bromide)	50	59		1	117	53-141	06/06/2022 0904
2-Butanone (MEK)	100	110		1	109	56-143	06/06/2022 0904
Carbon disulfide	50	47		1	95	64-133	06/06/2022 0904
Carbon tetrachloride	50	44		1	88	72-136	06/06/2022 0904
Chlorobenzene	50	46		1	92	82-118	06/06/2022 0904
Chloroethane	50	58		1	115	60-138	06/06/2022 0904
Chloroform	50	47		1	94	79-124	06/06/2022 0904
Chloromethane (Methyl chloride)	50	68		1	136	50-139	06/06/2022 0904
Cyclohexane	50	45		1	91	71-130	06/06/2022 0904
1,2-Dibromo-3-chloropropane (DBCP)	50	46		1	93	62-128	06/06/2022 0904
Dibromochloromethane	50	45		1	89	74-126	06/06/2022 0904
1,2-Dibromoethane (EDB)	50	46		1	92	77-121	06/06/2022 0904
1,2-Dichlorobenzene	50	51		1	101	80-119	06/06/2022 0904
1,3-Dichlorobenzene	50	45		1	91	80-119	06/06/2022 0904
1,4-Dichlorobenzene	50	46		1	91	79-118	06/06/2022 0904
Dichlorodifluoromethane	50	74		1	147	32-152	06/06/2022 0904
1,1-Dichloroethane	50	49		1	98	77-125	06/06/2022 0904
1,2-Dichloroethane	50	46		1	93	73-128	06/06/2022 0904
1,1-Dichloroethene	50	47		1	95	71-131	06/06/2022 0904
cis-1,2-Dichloroethene	50	47		1	93	78-123	06/06/2022 0904
trans-1,2-Dichloroethene	50	48		1	96	75-124	06/06/2022 0904
1,2-Dichloropropane	50	49		1	97	78-122	06/06/2022 0904
cis-1,3-Dichloropropene	50	46		1	93	75-124	06/06/2022 0904
trans-1,3-Dichloropropene	50	48		1	97	73-127	06/06/2022 0904
Ethylbenzene	50	46		1	92	79-121	06/06/2022 0904
2-Hexanone	100	92		1	92	57-139	06/06/2022 0904
Isopropylbenzene	50	46		1	91	72-131	06/06/2022 0904
Methyl acetate	50	51		1	103	56-136	06/06/2022 0904
Methyl tertiary butyl ether (MTBE)	50	49		1	99	71-124	06/06/2022 0904
4-Methyl-2-pentanone	100	97		1	97	67-130	06/06/2022 0904
Methylcyclohexane	50	45		1	90	72-132	06/06/2022 0904
Methylene chloride	50	48		1	96	74-124	06/06/2022 0904
Styrene	50	46		1	92	78-123	06/06/2022 0904
1,1,2,2-Tetrachloroethane	50	47		1	94	71-121	06/06/2022 0904
Tetrachloroethene	50	47		1	94	74-129	06/06/2022 0904
Toluene	50	46		1	92	80-121	06/06/2022 0904
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	47		1	94	70-136	06/06/2022 0904
1,2,4-Trichlorobenzene	50	48		1	95	69-130	06/06/2022 0904
1,1,1-Trichloroethane	50	44		1	89	74-131	06/06/2022 0904
1,1,2-Trichloroethane	50	47		1	94	80-119	06/06/2022 0904

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ43935-002
Batch: 43935
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	45		1	90	79-123	06/06/2022 0904
Trichlorofluoromethane	50	52		1	104	65-141	06/06/2022 0904
Vinyl chloride	50	62		1	124	58-137	06/06/2022 0904
Xylenes (total)	100	93		1	93	79-121	06/06/2022 0904

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		93	81-118
Bromofluorobenzene		95	85-114
Toluene-d8		90	89-112
Dibromofluoromethane		95	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ44290-001
Batch: 44290
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	06/08/2022 2213
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	06/08/2022 2213
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	06/08/2022 2213
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	06/08/2022 2213
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	06/08/2022 2213
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	06/08/2022 2213
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	06/08/2022 2213
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	06/08/2022 2213
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	06/08/2022 2213
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	06/08/2022 2213
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	06/08/2022 2213
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213

LOQ = Limit of Quantitation
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LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ44290-001
Batch: 44290
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	06/08/2022 2213

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		104	81-118
Bromofluorobenzene		103	85-114
Toluene-d8		106	89-112
Dibromofluoromethane		107	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ44290-002
Batch: 44290
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	170	N	1	171	39-160	06/08/2022 2110
Benzene	50	50		1	100	79-120	06/08/2022 2110
Bromodichloromethane	50	50		1	101	79-125	06/08/2022 2110
Bromoform	50	49		1	98	66-130	06/08/2022 2110
Bromomethane (Methyl bromide)	50	35		1	71	53-141	06/08/2022 2110
2-Butanone (MEK)	100	130		1	126	56-143	06/08/2022 2110
Carbon disulfide	50	46		1	93	64-133	06/08/2022 2110
Carbon tetrachloride	50	49		1	97	72-136	06/08/2022 2110
Chlorobenzene	50	50		1	100	82-118	06/08/2022 2110
Chloroethane	50	42		1	83	60-138	06/08/2022 2110
Chloroform	50	48		1	96	79-124	06/08/2022 2110
Chloromethane (Methyl chloride)	50	42		1	85	50-139	06/08/2022 2110
Cyclohexane	50	42		1	84	71-130	06/08/2022 2110
1,2-Dibromo-3-chloropropane (DBCP)	50	54		1	108	62-128	06/08/2022 2110
Dibromochloromethane	50	54		1	107	74-126	06/08/2022 2110
1,2-Dibromoethane (EDB)	50	51		1	102	77-121	06/08/2022 2110
1,2-Dichlorobenzene	50	50		1	100	80-119	06/08/2022 2110
1,3-Dichlorobenzene	50	49		1	99	80-119	06/08/2022 2110
1,4-Dichlorobenzene	50	47		1	93	79-118	06/08/2022 2110
Dichlorodifluoromethane	50	36		1	72	32-152	06/08/2022 2110
1,1-Dichloroethane	50	49		1	99	77-125	06/08/2022 2110
1,2-Dichloroethane	50	49		1	98	73-128	06/08/2022 2110
1,1-Dichloroethene	50	50		1	99	71-131	06/08/2022 2110
cis-1,2-Dichloroethene	50	50		1	101	78-123	06/08/2022 2110
trans-1,2-Dichloroethene	50	50		1	100	75-124	06/08/2022 2110
1,2-Dichloropropane	50	51		1	101	78-122	06/08/2022 2110
cis-1,3-Dichloropropene	50	49		1	97	75-124	06/08/2022 2110
trans-1,3-Dichloropropene	50	46		1	92	73-127	06/08/2022 2110
Ethylbenzene	50	53		1	106	79-121	06/08/2022 2110
2-Hexanone	100	100		1	102	57-139	06/08/2022 2110
Isopropylbenzene	50	58		1	116	72-131	06/08/2022 2110
Methyl acetate	50	56		1	112	56-136	06/08/2022 2110
Methyl tertiary butyl ether (MTBE)	50	41		1	83	71-124	06/08/2022 2110
4-Methyl-2-pentanone	100	100		1	104	67-130	06/08/2022 2110
Methylcyclohexane	50	54		1	107	72-132	06/08/2022 2110
Methylene chloride	50	49		1	99	74-124	06/08/2022 2110
Styrene	50	55		1	111	78-123	06/08/2022 2110
1,1,2,2-Tetrachloroethane	50	48		1	96	71-121	06/08/2022 2110
Tetrachloroethene	50	50		1	100	74-129	06/08/2022 2110
Toluene	50	52		1	104	80-121	06/08/2022 2110
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	40		1	80	70-136	06/08/2022 2110
1,2,4-Trichlorobenzene	50	54		1	108	69-130	06/08/2022 2110
1,1,1-Trichloroethane	50	49		1	98	74-131	06/08/2022 2110
1,1,2-Trichloroethane	50	50		1	99	80-119	06/08/2022 2110

LOQ = Limit of Quantitation
DL = Detection Limit
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Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ44290-002
Batch: 44290
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	49		1	98	79-123	06/08/2022 2110
Trichlorofluoromethane	50	45		1	90	65-141	06/08/2022 2110
Vinyl chloride	50	42		1	83	58-137	06/08/2022 2110
Xylenes (total)	100	110		1	109	79-121	06/08/2022 2110

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		98	81-118
Bromofluorobenzene		100	85-114
Toluene-d8		100	89-112
Dibromofluoromethane		99	80-119

LOQ = Limit of Quantitation
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LOD = Limit of Detection

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J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ43531-001
Batch: 43531
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2022 1651

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	06/07/2022 1350
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	06/07/2022 1350
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	06/07/2022 1350
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	06/07/2022 1350
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	06/07/2022 1350
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	06/07/2022 1350
EtFOSA	4.0	U	1	8.0	4.0	2.0	ng/L	06/07/2022 1350
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	06/07/2022 1350
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	06/07/2022 1350
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	06/07/2022 1350

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		107	50-150
13C2_6:2FTS		108	50-150
13C2_8:2FTS		113	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		100	50-150
13C3_PFBS		103	50-150
13C3_PFHxS		107	50-150
13C3-HFPO-DA		111	50-150
13C4_PFBA		101	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		108	50-150
13C5_PFPeA		106	50-150
13C6_PFDA		111	50-150

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N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ43531-001
Batch: 43531
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2022 1651

Surrogate	Q	% Rec	Acceptance Limit
13C7_PFUdA		113	50-150
13C8_PFOA		107	50-150
13C8_PFOS		101	50-150
13C9_PFNA		114	50-150
d-EtFOSA		85	50-150
d5-EtFOSAA		95	50-150
d3-MeFOSAA		97	50-150

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LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ43531-002
Batch: 43531
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2022 1651

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	104	70-150	06/07/2022 1400
11Cl-PF3OUdS	15	16		1	107	70-150	06/07/2022 1400
8:2 FTS	15	15		1	100	67-138	06/07/2022 1400
4:2 FTS	15	15		1	102	63-143	06/07/2022 1400
GenX	32	32		1	99	70-150	06/07/2022 1400
ADONA	15	17		1	111	70-150	06/07/2022 1400
EtFOSA	16	15		1	94	70-150	06/07/2022 1400
EtFOSAA	16	18		1	113	61-135	06/07/2022 1400
MeFOSAA	16	16		1	98	65-136	06/07/2022 1400
PFBS	14	13		1	90	72-130	06/07/2022 1400
PFDS	15	16		1	103	53-142	06/07/2022 1400
PFHpS	15	15		1	100	69-134	06/07/2022 1400
PFNS	15	18		1	115	69-127	06/07/2022 1400
PFPeS	15	15		1	101	71-127	06/07/2022 1400
PFHxS	15	15		1	100	68-131	06/07/2022 1400
PFBA	16	17		1	105	73-129	06/07/2022 1400
PFDA	16	17		1	108	71-129	06/07/2022 1400
PFDoA	16	16		1	98	72-134	06/07/2022 1400
PFHpA	16	15		1	93	72-130	06/07/2022 1400
PFHxA	16	18		1	110	72-129	06/07/2022 1400
PFNA	16	16		1	103	69-130	06/07/2022 1400
PFOA	16	15		1	92	71-133	06/07/2022 1400
PFPeA	16	17		1	104	72-129	06/07/2022 1400
PFTeDA	16	17		1	105	71-132	06/07/2022 1400
PFTrDA	16	15		1	97	65-144	06/07/2022 1400
PFUdA	16	16		1	99	69-133	06/07/2022 1400
PFOS	15	15		1	98	65-140	06/07/2022 1400

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		111	50-150
13C2_6:2FTS		109	50-150
13C2_8:2FTS		114	50-150
13C2_PFDoA		104	50-150
13C2_PFTeDA		103	50-150
13C3_PFBS		118	50-150
13C3_PFHxS		118	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		116	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		113	50-150

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LOD = Limit of Detection

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+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ43531-002
Batch: 43531
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2022 1651

Surrogate	Q	% Rec	Acceptance Limit
13C7_PFUdA		119	50-150
13C8_PFOA		120	50-150
13C8_PFOS		103	50-150
13C9_PFNA		127	50-150
d-EtFOSA		68	50-150
d5-EtFOSAA		107	50-150
d3-MeFOSAA		97	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: XQ43531-003
Batch: 43531
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2022 1651

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	15		1	102	1.7	70-150	30	06/07/2022 1411
11Cl-PF3OUdS	15	16		1	105	1.8	70-150	30	06/07/2022 1411
8:2 FTS	15	18		1	117	16	67-138	30	06/07/2022 1411
4:2 FTS	15	17		1	114	12	63-143	30	06/07/2022 1411
GenX	32	26		1	82	19	70-150	30	06/07/2022 1411
ADONA	15	15		1	100	10	70-150	30	06/07/2022 1411
EtFOSA	16	19		1	116	21	70-150	30	06/07/2022 1411
EtFOSAA	16	18		1	110	2.3	61-135	30	06/07/2022 1411
MeFOSAA	16	16		1	102	4.0	65-136	30	06/07/2022 1411
PFBS	14	16		1	115	24	72-130	30	06/07/2022 1411
PFDS	15	16		1	107	4.1	53-142	30	06/07/2022 1411
PFHpS	15	15		1	99	1.2	69-134	30	06/07/2022 1411
PFNS	15	16		1	104	9.8	69-127	30	06/07/2022 1411
PFPeS	15	18		1	123	19	71-127	30	06/07/2022 1411
PFHxS	15	16		1	111	11	68-131	30	06/07/2022 1411
PFBA	16	16		1	98	6.8	73-129	30	06/07/2022 1411
PFDA	16	16		1	100	7.6	71-129	30	06/07/2022 1411
PFDoA	16	15		1	95	2.7	72-134	30	06/07/2022 1411
PFHpA	16	16		1	97	3.9	72-130	30	06/07/2022 1411
PFHxA	16	17		1	106	3.5	72-129	30	06/07/2022 1411
PFNA	16	17		1	105	2.6	69-130	30	06/07/2022 1411
PFOA	16	16		1	101	8.7	71-133	30	06/07/2022 1411
PFPeA	16	15		1	94	9.9	72-129	30	06/07/2022 1411
PFTeDA	16	17		1	106	1.2	71-132	30	06/07/2022 1411
PFTrDA	16	15		1	93	3.5	65-144	30	06/07/2022 1411
PFUdA	16	19		1	119	18	69-133	30	06/07/2022 1411
PFOS	15	15		1	98	0.21	65-140	30	06/07/2022 1411

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		93	50-150
13C2_6:2FTS		116	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		106	50-150
13C2_PFTeDA		96	50-150
13C3_PFBS		106	50-150
13C3_PFHxS		117	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		110	50-150
13C4_PFHpA		113	50-150
13C5_PFHxA		105	50-150
13C5_PFPeA		113	50-150
13C6_PFDA		112	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: XQ43531-003
Batch: 43531
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/01/2022 1651

Surrogate	Q	% Rec	Acceptance Limit
13C7_PFUdA		108	50-150
13C8_PFOA		109	50-150
13C8_PFOS		104	50-150
13C9_PFNA		115	50-150
d-EtFOSA		60	50-150
d5-EtFOSAA		100	50-150
d3-MeFOSAA		104	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ44372-001
Batch: 44372
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/09/2022 1402

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	06/14/2022 1849

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	50-150
13C2_6:2FTS		129	50-150
13C2_8:2FTS		104	50-150
13C2_PFDoA		98	50-150
13C2_PFTeDA		93	50-150
13C3_PFBS		105	50-150
13C3_PFHxS		105	50-150
13C3-HFPO-DA		106	50-150
13C4_PFBA		104	50-150
13C4_PFHpA		107	50-150
13C5_PFHxA		101	50-150
13C5_PFPeA		104	50-150
13C6_PFDA		102	50-150
13C7_PFUdA		97	50-150
13C8_PFOA		107	50-150
13C8_PFOS		106	50-150
13C9_PFNA		105	50-150
d-EtFOSA		80	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		102	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ44372-002
Batch: 44372
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/09/2022 1402

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
6:2 FTS	15	16		1	105	64-140	06/14/2022 1900

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		104	50-150
13C2_6:2FTS		125	50-150
13C2_8:2FTS		106	50-150
13C2_PFDoA		95	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		111	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		100	50-150
13C6_PFDA		104	50-150
13C7_PFUdA		99	50-150
13C8_PFOA		105	50-150
13C8_PFOS		101	50-150
13C9_PFNA		103	50-150
d-EtFOSA		72	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: XQ44372-003
Batch: 44372
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 06/09/2022 1402

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
6:2 FTS	15	16		1	107	2.1	64-140	30	06/14/2022 1911

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		104	50-150
13C2_6:2FTS		119	50-150
13C2_8:2FTS		99	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		94	50-150
13C3_PFBS		100	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		101	50-150
13C4_PFHpA		106	50-150
13C5_PFHxA		102	50-150
13C5_PFPeA		97	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		104	50-150
13C8_PFOS		101	50-150
13C9_PFNA		102	50-150
d-EtFOSA		74	50-150
d5-EtFOSAA		98	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOQ
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

Tetra Tech, Inc.

CHAIN OF CUSTODY | NUMBER No. 2657 | PAGE 1 OF 1

PROJECT NO: 112G-08970	FACILITY: KSC-CRCA	PROJECT MANAGER: Alex Murphy	PHONE NUMBER: (321) 292-0842	LABORATORY NAME AND CONTACT: Pace Analytical — Patty Smith
SAMPLERS (SIGNATURE): - Chuck Sorden		FIELD OPERATIONS LEADER: Chuck Sorden	PHONE NUMBER: (321) 591-7580	ADDRESS: 106 Vantage Point Dr.
		CARRIER/WAYBILL NUMBER		CITY, STATE: West Columbia, SC

STANDARD TAT ☒
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2022)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: 8260 VOCs; PFAS QSM Table B-15	COMMENTS
									G	P		
										HCl/4°C	4°C	
05/24	1100	CRCA-ASINFLUENT-20220524		—	—	GW	G	5	X	X		
	1115	CRCA-ASEFFLUENT-20220524		—	—	GW	G	5	X	X		

XE25024
KBS2

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	05/24/22	1500	1. RECEIVED BY: FedEx	05/24/22	1500
2. RELINQUISHED BY: FedEx	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY: Fedex	5/25/22	1000	3. RECEIVED BY: K Reed	5/25/22	1000

COMMENTS: 2.3°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. T:NUS-001

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: KAR / 05/25/2022 Lot #: XG25024

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

2.3 / 2.3 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 5 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☑ No	☐ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: KAR Date: 05/25/2022

Comments:

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Alex Murphy

Project Name: CRCA Monthly

Project Number: 112G08970

Lot Number:**XG01006**

Date Completed:07/19/2022

07/19/2022 3:44 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Tetra Tech
Lot Number: XG01006

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC

Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Surrogate recovery for the following sample was outside control limits: XG01006-001. Evidence of matrix interference is present; therefore, re-extraction and/or re-analysis was not performed.

Sample Summary

Tetra Tech

Lot Number: XG01006

Project Name: CRCA Monthly

Project Number: 112G08970

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	CRCA-REDUX-20220629	Aqueous	06/29/2022 0800	
002	CRCA-ASEFFLUENT-20220629	Aqueous	06/29/2022 0815	06/30/2022
003	CRCA-ASINFLUENT-20220629	Aqueous	06/29/2022 0830	06/30/2022

(3 samples)

Detection Summary

Tetra Tech

Lot Number: XG01006

Project Name: CRCA Monthly

Project Number: 112G08970

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	CRCA-REDUX-20220629	Aqueous	PFHpA	PFAS by ID	5.3	ID	ng/L	5
001	CRCA-REDUX-20220629	Aqueous	PFHxA	PFAS by ID	48	QD	ng/L	5
001	CRCA-REDUX-20220629	Aqueous	PFOA	PFAS by ID	10	ID	ng/L	5
001	CRCA-REDUX-20220629	Aqueous	PFPeA	PFAS by ID	270	QD	ng/L	5
002	CRCA-ASEFFLUENT-20220629	Aqueous	Vinyl chloride	8260D	2.9		ug/L	8
002	CRCA-ASEFFLUENT-20220629	Aqueous	PFBA	PFAS by ID	39000	D	ng/L	9
003	CRCA-ASINFLUENT-20220629	Aqueous	Chloromethane (Methyl	8260D	0.59	I	ug/L	11
003	CRCA-ASINFLUENT-20220629	Aqueous	PFBA	PFAS by ID	40000	D	ng/L	13

(8 detections)

PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XG01006-001
Description: CRCA-REDUX-20220629 | Matrix: Aqueous
Date Sampled: 06/29/2022 0800 | Project Name: CRCA Monthly
Date Received: 06/30/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	5	07/15/2022 1239	MMM	07/12/2022 1145	47693

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	18	U	36	18	8.9	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	18	U	36	18	8.9	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	18	UQ	36	18	8.9	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	18	UQ	36	18	8.9	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	18	UQ	36	18	8.9	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	18	UQ	36	18	8.9	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	18	U	36	18	8.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	18	U	36	18	8.9	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	18	U	36	18	8.9	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	18	U	36	18	8.9	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	9.0	UQ	18	9.0	4.5	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	9.0	UQ	18	9.0	4.5	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9.0	UQ	18	9.0	4.5	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	5.3	ID	18	9.0	4.5	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	48	QD	18	9.0	4.5	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	10	ID	18	9.0	4.5	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	270	QD	18	9.0	4.5	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	9.0	U	18	9.0	4.5	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS	N	12	50-150
13C2_6:2FTS	N	251	50-150
13C2_8:2FTS	N	190	50-150
13C2_PFDoA		96	50-150
13C2_PFTeDA		56	50-150
13C3_PFBS	N	28	50-150
13C3_PFHxS		92	50-150
13C3-HFPO-DA	N	10	50-150
13C4_PFBA	N	0.90	50-150
13C4_PFHpA		56	50-150
13C5_PFHxA	N	21	50-150
13C5_PFPeA	N	5.7	50-150
13C6_PFDA		121	50-150
13C7_PFUdA		113	50-150

LOQ = Limit of Quantitation | V = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | I = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
Q = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | D = Dilution > 1 | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: XG01006-001
Description: CRCA-REDUX-20220629			Matrix: Aqueous
Date Sampled: 06/29/2022 0800		Project Name: CRCA Monthly	
Date Received: 06/30/2022		Project Number: 112G08970	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		94	50-150
13C8_PFOS		117	50-150
13C9_PFNA		116	50-150
d-EtFOSA		91	50-150
d5-EtFOSAA		106	50-150
d3-MeFOSAA		113	50-150

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG01006-002
Description: CRCA-ASEFFLUENT-20220629 | Matrix: Aqueous
Date Sampled: 06/29/2022 0815 | Project Name: CRCA Monthly
Date Received: 06/30/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/07/2022 1527	BBW		47285

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
Q = Out of holding time
V = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
I = Estimated result < LOQ and ≥ DL
D = Dilution > 1
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG01006-002

Description: CRCA-ASEFFLUENT-20220629 | Matrix: Aqueous

Date Sampled: 06/29/2022 0815 | Project Name: CRCA Monthly

Date Received: 06/30/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/07/2022 1527	BBW		47285

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	2.9		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		93	81-118
Bromofluorobenzene		93	85-114
Toluene-d8		94	89-112
Dibromofluoromethane		100	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XG01006-002
Description: CRCA-ASEFFLUENT-20220629
Matrix: Aqueous
Date Sampled: 06/29/2022 0815
Project Name: CRCA Monthly
Date Received: 06/30/2022
Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	200	07/15/2022 1250	MMM	07/12/2022 1145	47693

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	800	U	1600	800	390	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	800	U	1600	800	390	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	800	U	1600	800	390	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	800	U	1600	800	390	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	800	U	1600	800	390	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	800	U	1600	800	390	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	800	U	1600	800	390	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	800	U	1600	800	390	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	800	U	1600	800	390	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	800	U	1600	800	390	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	39000	D	780	390	190	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	390	U	780	390	190	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	390	U	780	390	190	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		112	50-150
13C2_6:2FTS		105	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		106	50-150
13C2_PFTeDA		99	50-150
13C3_PFBS		101	50-150
13C3_PFHxS		108	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		98	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		103	50-150
13C6_PFDA		96	50-150
13C7_PFUdA		105	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
Q = Out of holding time
V = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
I = Estimated result < LOQ and ≥ DL
D = Dilution > 1
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: XG01006-002
Description: CRCA-ASEFFLUENT-20220629			Matrix: Aqueous
Date Sampled: 06/29/2022 0815		Project Name: CRCA Monthly	
Date Received: 06/30/2022		Project Number: 112G08970	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		98	50-150
13C8_PFOS		99	50-150
13C9_PFNA		91	50-150
d-EtFOSA		114	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG01006-003
Description: CRCA-ASINFLUENT-20220629 | Matrix: Aqueous
Date Sampled: 06/29/2022 0830 | Project Name: CRCA Monthly
Date Received: 06/30/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/07/2022 1551	BBW		47285

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	0.59	I	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | V = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | I = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
Q = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | D = Dilution > 1 | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG01006-003

Description: CRCA-ASINFLUENT-20220629 | Matrix: Aqueous

Date Sampled: 06/29/2022 0830 | Project Name: CRCA Monthly

Date Received: 06/30/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/07/2022 1551	BBW		47285

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		92	81-118
Bromofluorobenzene		92	85-114
Toluene-d8		94	89-112
Dibromofluoromethane		101	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XG01006-003
Description: CRCA-ASINFLUENT-20220629
Matrix: Aqueous
Date Sampled: 06/29/2022 0830
Project Name: CRCA Monthly
Date Received: 06/30/2022
Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	200	07/15/2022 1300	MMM	07/12/2022 1145	47693

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	750	U	1500	750	370	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	750	U	1500	750	370	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	750	U	1500	750	370	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	750	U	1500	750	370	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	750	U	1500	750	370	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	750	U	1500	750	370	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	750	U	1500	750	370	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	750	U	1500	750	370	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	750	U	1500	750	370	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	750	U	1500	750	370	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	40000	D	730	370	180	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	370	U	730	370	180	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		104	50-150
13C2_6:2FTS		111	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		100	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		103	50-150
13C5_PFPeA		102	50-150
13C6_PFDA		97	50-150
13C7_PFUdA		103	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
Q = Out of holding time
V = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
I = Estimated result < LOQ and ≥ DL
D = Dilution > 1
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech			Laboratory ID: XG01006-003
Description: CRCA-ASINFLUENT-20220629			Matrix: Aqueous
Date Sampled: 06/29/2022 0830		Project Name: CRCA Monthly	
Date Received: 06/30/2022		Project Number: 112G08970	

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		101	50-150
13C8_PFOS		102	50-150
13C9_PFNA		95	50-150
d-EtFOSA		114	50-150
d5-EtFOSAA		103	50-150
d3-MeFOSAA		101	50-150

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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QC Summary

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ47285-001
Batch: 47285
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	07/07/2022 1110
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	07/07/2022 1110
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	07/07/2022 1110
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	07/07/2022 1110
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	07/07/2022 1110
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	07/07/2022 1110
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	07/07/2022 1110
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	07/07/2022 1110
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	07/07/2022 1110
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	07/07/2022 1110
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	07/07/2022 1110
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ47285-001
Batch: 47285
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	07/07/2022 1110

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		90	81-118
Bromofluorobenzene		93	85-114
Toluene-d8		93	89-112
Dibromofluoromethane		97	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ47285-002
Batch: 47285
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	86		1	86	39-160	07/07/2022 0921
Benzene	50	49		1	98	79-120	07/07/2022 0921
Bromodichloromethane	50	50		1	100	79-125	07/07/2022 0921
Bromoform	50	52		1	104	66-130	07/07/2022 0921
Bromomethane (Methyl bromide)	50	54		1	107	53-141	07/07/2022 0921
2-Butanone (MEK)	100	120		1	115	56-143	07/07/2022 0921
Carbon disulfide	50	40		1	81	64-133	07/07/2022 0921
Carbon tetrachloride	50	48		1	97	72-136	07/07/2022 0921
Chlorobenzene	50	50		1	101	82-118	07/07/2022 0921
Chloroethane	50	52		1	103	60-138	07/07/2022 0921
Chloroform	50	49		1	99	79-124	07/07/2022 0921
Chloromethane (Methyl chloride)	50	40		1	80	50-139	07/07/2022 0921
Cyclohexane	50	36		1	71	71-130	07/07/2022 0921
1,2-Dibromo-3-chloropropane (DBCP)	50	44		1	89	62-128	07/07/2022 0921
Dibromochloromethane	50	53		1	106	74-126	07/07/2022 0921
1,2-Dibromoethane (EDB)	50	52		1	104	77-121	07/07/2022 0921
1,2-Dichlorobenzene	50	51		1	101	80-119	07/07/2022 0921
1,3-Dichlorobenzene	50	51		1	102	80-119	07/07/2022 0921
1,4-Dichlorobenzene	50	51		1	102	79-118	07/07/2022 0921
Dichlorodifluoromethane	50	42		1	83	32-152	07/07/2022 0921
1,1-Dichloroethane	50	45		1	91	77-125	07/07/2022 0921
1,2-Dichloroethane	50	48		1	97	73-128	07/07/2022 0921
1,1-Dichloroethene	50	44		1	88	71-131	07/07/2022 0921
cis-1,2-Dichloroethene	50	50		1	100	78-123	07/07/2022 0921
trans-1,2-Dichloroethene	50	48		1	97	75-124	07/07/2022 0921
1,2-Dichloropropane	50	49		1	98	78-122	07/07/2022 0921
cis-1,3-Dichloropropene	50	50		1	101	75-124	07/07/2022 0921
trans-1,3-Dichloropropene	50	50		1	101	73-127	07/07/2022 0921
Ethylbenzene	50	50		1	100	79-121	07/07/2022 0921
2-Hexanone	100	86		1	86	57-139	07/07/2022 0921
Isopropylbenzene	50	51		1	102	72-131	07/07/2022 0921
Methyl acetate	50	46		1	93	56-136	07/07/2022 0921
Methyl tertiary butyl ether (MTBE)	50	48		1	96	71-124	07/07/2022 0921
4-Methyl-2-pentanone	100	88		1	88	67-130	07/07/2022 0921
Methylcyclohexane	50	48		1	95	72-132	07/07/2022 0921
Methylene chloride	50	46		1	91	74-124	07/07/2022 0921
Styrene	50	51		1	102	78-123	07/07/2022 0921
1,1,2,2-Tetrachloroethane	50	51		1	101	71-121	07/07/2022 0921
Tetrachloroethene	50	52		1	105	74-129	07/07/2022 0921
Toluene	50	50		1	100	80-121	07/07/2022 0921
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	45		1	90	70-136	07/07/2022 0921
1,2,4-Trichlorobenzene	50	52		1	103	69-130	07/07/2022 0921
1,1,1-Trichloroethane	50	48		1	97	74-131	07/07/2022 0921
1,1,2-Trichloroethane	50	51		1	103	80-119	07/07/2022 0921

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ47285-002
Batch: 47285
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	51		1	102	79-123	07/07/2022 0921
Trichlorofluoromethane	50	49		1	98	65-141	07/07/2022 0921
Vinyl chloride	50	50		1	100	58-137	07/07/2022 0921
Xylenes (total)	100	100		1	100	79-121	07/07/2022 0921

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		92	81-118
Bromofluorobenzene		91	85-114
Toluene-d8		95	89-112
Dibromofluoromethane		100	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ47693-001
Batch: 47693
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/12/2022 1145

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	07/14/2022 1933
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	07/14/2022 1933
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/14/2022 1933
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/14/2022 1933
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	07/14/2022 1933
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	07/14/2022 1933
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	07/14/2022 1933
EtFOSA	4.0	U	1	8.0	4.0	2.0	ng/L	07/14/2022 1933
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/14/2022 1933
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	07/14/2022 1933
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	07/14/2022 1933

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		106	50-150
13C2_6:2FTS		103	50-150
13C2_8:2FTS		98	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		94	50-150
13C3_PFBS		96	50-150
13C3_PFHxS		96	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		94	50-150
13C5_PFHxA		96	50-150
13C5_PFPeA		97	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ47693-001
Batch: 47693
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/12/2022 1145

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		98	50-150
13C7_PFUdA		101	50-150
13C8_PFOA		103	50-150
13C8_PFOS		102	50-150
13C9_PFNA		101	50-150
d-EtFOSA		89	50-150
d5-EtFOSAA		101	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ47693-002
Batch: 47693
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/12/2022 1145

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	12		1	83	50-150	07/14/2022 1944
11Cl-PF3OUdS	15	12		1	80	50-150	07/14/2022 1944
8:2 FTS	15	13		1	87	67-138	07/14/2022 1944
6:2 FTS	15	13		1	83	64-140	07/14/2022 1944
4:2 FTS	15	12		1	79	63-143	07/14/2022 1944
GenX	32	28		1	89	50-150	07/14/2022 1944
ADONA	15	13		1	86	50-150	07/14/2022 1944
EtFOSA	16	16		1	97	50-150	07/14/2022 1944
EtFOSAA	16	13		1	80	61-135	07/14/2022 1944
MeFOSAA	16	13		1	81	65-136	07/14/2022 1944
PFBS	14	12		1	88	72-130	07/14/2022 1944
PFDS	15	13		1	82	53-142	07/14/2022 1944
PFHpS	15	13		1	82	69-134	07/14/2022 1944
PFNS	15	12		1	80	69-127	07/14/2022 1944
PFPeS	15	13		1	88	71-127	07/14/2022 1944
PFHxS	15	12		1	85	68-131	07/14/2022 1944
PFBA	16	14		1	87	73-129	07/14/2022 1944
PFDA	16	14		1	85	71-129	07/14/2022 1944
PFDoA	16	13		1	81	72-134	07/14/2022 1944
PFHpA	16	13		1	82	72-130	07/14/2022 1944
PFHxA	16	13		1	83	72-129	07/14/2022 1944
PFNA	16	14		1	86	69-130	07/14/2022 1944
PFOA	16	15		1	91	71-133	07/14/2022 1944
PFPeA	16	14		1	85	72-129	07/14/2022 1944
PFTeDA	16	13		1	84	71-132	07/14/2022 1944
PFTrDA	16	13		1	82	65-144	07/14/2022 1944
PFUdA	16	13		1	82	69-133	07/14/2022 1944
PFOS	15	12		1	84	65-140	07/14/2022 1944

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		111	50-150
13C2_6:2FTS		119	50-150
13C2_8:2FTS		94	50-150
13C2_PFDoA		102	50-150
13C2_PFTeDA		93	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		98	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		101	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ47693-002
Batch: 47693
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 07/12/2022 1145

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		99	50-150
13C7_PFUdA		103	50-150
13C8_PFOA		97	50-150
13C8_PFOS		104	50-150
13C9_PFNA		101	50-150
d-EtFOSA		74	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		102	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

Pace Analytical

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 135318

Client: TETRA TECH	Report to Contact: Alex Murphy	Telephone No. / E-mail: (321) 636-6470 / Alex.Murphy@tetratech.com	Quote No.
Address: 1353 N COURTENAY PKWY	Sampler's Signature:	Analysis (Attach list if more space is needed)	Page 1 of 1
City: MERRITT ISLAND	State: FL	Zip Code: 32953	Printed Name: Chuck Sorden		XG01006
Project Name: CRCA MONTHLY SYS SAMPLE					XES2
Project No.: 112908970	P.O. No.				Remarks / Carrier I.D.

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Grab / Composite	Matrix: Aqueous	Matrix: Solid	Matrix: Non Aqueous	No of Containers by Preservative Type: Unpres.	No of Containers by Preservative Type: H2SO4	No of Containers by Preservative Type: HNO3	No of Containers by Preservative Type: HCl	No of Containers by Preservative Type: NaOH	No of Containers by Preservative Type: Na2S2O3	No of Containers by Preservative Type: Field Filtered	PFAS	VOC
CRCA-RDUX-20220629	29 JUN 22	0800	G	X			2			2				2	2
CRCA-ASEFFLUENT-20220629		0815	G	X			2			2				2	2
CRCA-ASINFLUENT-20220629		0830	G	X			2			2				2	2

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by	06/29/22	1530	1. Received by		
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FedEx	Date 6/30/22	Time 1035	4. Laboratory received by: K. Reed	Date 6/30/22	Time 1035

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle): (Yes) No Ice Pack
Receipt Temp. 3.3 °C
Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK-Field/Client Copy

Pace Analytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: KAR / 06/30/2022 Lot #: XG01006

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

3.3 / 3.3 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 6 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☑ No	☐ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote # NA

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: KAR Date: 06/30/2022

Comments: MISSING: did not receive vials for sample -001

ANALYTICAL REPORT

April 12, 2023

Revised Report

Pace Analytical - West Columbia, SC

Sample Delivery Group:	L1518164
Samples Received:	07/23/2022
Project Number:	XG26033
Description:	NASA KSC-CRCA Air sampling
Site:	01
Report To:	Kathy Smith 106 Vantage Point Dr. West Columbia, SC 29172

Entire Report Reviewed By:

Nancy McLain
Project Manager

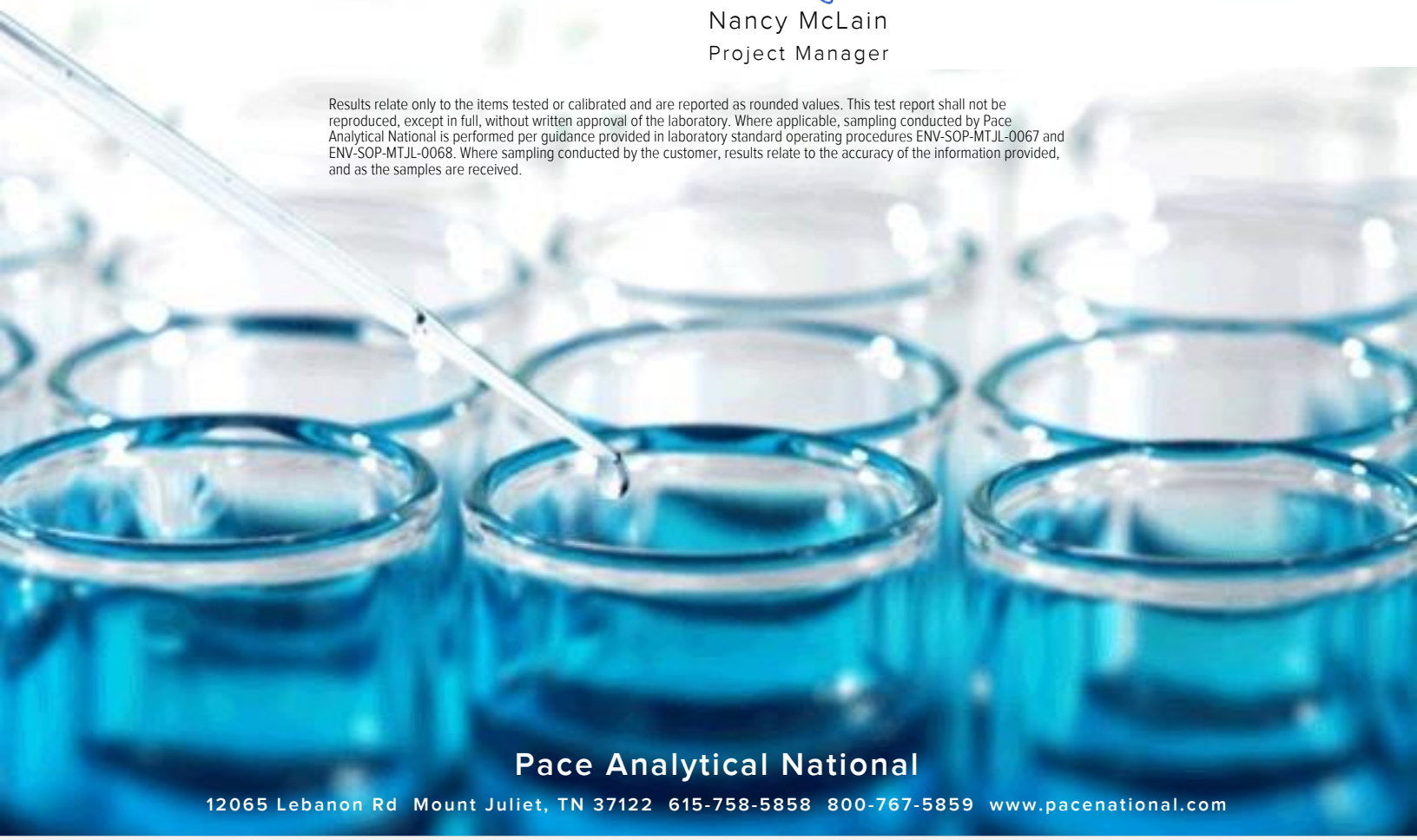


TABLE OF CONTENTS

CRCA-AMB01-0220722 L1518164-01 Air

Collected by: Chuck Sorden | Collected date/time: 07/22/22 15:45 | Received date/time: 07/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1900825	1	07/26/22 11:37	07/26/22 11:37	DAH	Mt. Juliet, TN

CRCA-AMB02-0220722 L1518164-02 Air

Collected by: Chuck Sorden | Collected date/time: 07/22/22 15:50 | Received date/time: 07/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1900825	1	07/26/22 12:18	07/26/22 12:18	DAH	Mt. Juliet, TN

CRCA-VMP01-0220722 L1518164-03 Air

Collected by: Chuck Sorden | Collected date/time: 07/22/22 12:00 | Received date/time: 07/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1900825	1	07/26/22 12:58	07/26/22 12:58	DAH	Mt. Juliet, TN

CRCA-VMP02-0220722 L1518164-04 Air

Collected by: Chuck Sorden | Collected date/time: 07/22/22 12:20 | Received date/time: 07/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1900825	1	07/26/22 13:38	07/26/22 13:38	DAH	Mt. Juliet, TN

CRCA-VMP03-0220722 L1518164-05 Air

Collected by: Chuck Sorden | Collected date/time: 07/22/22 12:40 | Received date/time: 07/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1900825	1	07/26/22 14:17	07/26/22 14:17	DAH	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1903843	10	08/01/22 12:44	08/01/22 12:44	CEP	Mt. Juliet, TN

CRCA-VMP04-0220722 L1518164-06 Air

Collected by: Chuck Sorden | Collected date/time: 07/22/22 12:55 | Received date/time: 07/23/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1900825	1	07/26/22 14:57	07/26/22 14:57	DAH	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1903843	10	08/01/22 13:10	08/01/22 13:10	CEP	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Nancy McLain
Project Manager

Report Revision History

Level II Report - Version 1: 08/07/22 21:36
Level IV Report - Version 2: 08/08/22 08:17
Level II Report - Version 3: 04/12/23 06:34

Project Narrative

TO-15 Volatile Organic Compounds (MS)

SURROGATE RECOVERY

Analytical Method: TO-15 **SDG:** L1518164
Matrix: Air

Sample ID	Lab Sample ID	Instrument	File ID	DMC-1 *% Rec.*	TOT Out
CRCA-AMB01-022 0722	L1518164-01	AIRMS7	0726_06	98.4	0
CRCA-AMB02-022 0722	L1518164-02	AIRMS7	0726_07	97.6	0
CRCA-VMP01-0220 722	L1518164-03	AIRMS7	0726_08	98.9	0
CRCA-VMP02-022 0722	L1518164-04	AIRMS7	0726_09	97.5	0
CRCA-VMP03-022 0722	L1518164-05	AIRMS7	0726_10	97.8	0
CRCA-VMP03-022 0722	L1518164-05	AIRMS9	0801_06	90.0	0
CRCA-VMP04-022 0722	L1518164-06	AIRMS7	0726_11	98.2	0
CRCA-VMP04-022 0722	L1518164-06	AIRMS9	0801_07	89.5	0
BLANK	R3819755-3	AIRMS7	0726_04	95.2	0
BLANK	R3821343-3	AIRMS9	0801_04	91.1	0
LCS	R3819755-1	AIRMS7	0726_02	99.2	0
LCS	R3821343-1	AIRMS9	0801_02	94.8	0
LCSD	R3819755-2	AIRMS7	0726_03	99.4	0
LCSD	R3821343-2	AIRMS9	0801_03	95.2	0

Parm Abbreviation	Parameter	QC LIMITS
DMC-1	1,4-Bromofluorobenzene	60.0 - 140

*: Value outside the established quality control limits.
D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

LABORATORY CONTROL SAMPLE
LABORATORY CONTROL SAMPLE DUPLICATE
RECOVERY

L1518164-01,02,03,04,05,06

SAMPLE NO.:
R3819755-1
R3819755-2

LCS Sample / File ID:	R3819755-1 / 0726_02	**SDG:**	L1518164
LCSD Sample / File ID:	R3819755-2 / 0726_03	**Analytical Batch:**	WG1900825
Instrument ID:	AIRMS7	**Dilution Factor:**	1
Analytical Method:	TO-15	**Matrix:**	Air

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	RPD	RPD Limit
	ppbv	*ppbv*	*ppbv*	*%*	*%*	*%*	*%*	*%*
Acetone	3.75	3.44	3.45	91.7	92.0	58.0 - 128	0.290	20
Allyl Chloride	3.75	3.79	3.81	101	102	71.0 - 131	0.526	20
Benzene	3.75	3.74	3.73	99.7	99.5	69.0 - 119	0.268	20
Benzyl Chloride	3.75	3.83	3.79	102	101	50.0 - 147	1.05	20
Bromodichloromethane	3.75	3.63	3.65	96.8	97.3	72.0 - 128	0.549	20
Bromoform	3.75	3.79	3.79	101	101	66.0 - 139	0.000	20
Bromomethane	3.75	3.64	3.60	97.1	96.0	63.0 - 134	1.10	20
1,3-Butadiene	3.75	3.61	3.44	96.3	91.7	66.0 - 134	4.82	20
Carbon disulfide	3.75	3.80	3.78	101	101	57.0 - 134	0.528	20
Carbon tetrachloride	3.75	3.74	3.70	99.7	98.7	68.0 - 132	1.08	20
Chlorobenzene	3.75	3.63	3.61	96.8	96.3	70.0 - 119	0.552	20
Chloroethane	3.75	3.69	3.67	98.4	97.9	63.0 - 127	0.543	20
Chloroform	3.75	3.69	3.69	98.4	98.4	68.0 - 123	0.000	20
Chloromethane	3.75	3.98	3.75	106	100	59.0 - 132	5.95	20
2-Chlorotoluene	3.75	3.76	3.78	100	101	74.0 - 130	0.531	20
Cyclohexane	3.75	4.08	4.00	109	107	70.0 - 117	1.98	20
Dibromochloromethane	3.75	3.66	3.68	97.6	98.1	70.0 - 130	0.545	20
1,2-Dibromoethane	3.75	3.78	3.78	101	101	74.0 - 122	0.000	20
1,2-Dichlorobenzene	3.75	3.76	3.84	100	102	63.0 - 129	2.11	20
1,3-Dichlorobenzene	3.75	3.81	3.75	102	100	65.0 - 130	1.59	20
1,4-Dichlorobenzene	3.75	3.76	3.73	100	99.5	60.0 - 131	0.801	20
1,2-Dichloroethane	3.75	3.56	3.71	94.9	98.9	65.0 - 128	4.13	20
1,1-Dichloroethane	3.75	3.84	3.77	102	101	68.0 - 126	1.84	20
1,1-Dichloroethene	3.75	3.83	3.79	102	101	61.0 - 133	1.05	20
cis-1,2-Dichloroethene	3.75	3.89	3.86	104	103	70.0 - 121	0.774	20
trans-1,2-Dichloroethene	3.75	3.82	3.83	102	102	67.0 - 124	0.261	20
1,2-Dichloropropane	3.75	3.78	3.77	101	101	69.0 - 123	0.265	20
cis-1,3-Dichloropropene	3.75	3.90	3.84	104	102	70.0 - 128	1.55	20
trans-1,3-Dichloropropene	3.75	3.84	3.81	102	102	75.0 - 133	0.784	20
1,4-Dioxane	3.75	3.69	3.62	98.4	96.5	71.0 - 122	1.92	20
Ethanol	3.75	3.57	3.25	95.2	86.7	59.0 - 125	9.38	20
Ethylbenzene	3.75	3.76	3.80	100	101	70.0 - 124	1.06	20
4-Ethyltoluene	3.75	3.90	3.94	104	105	67.0 - 129	1.02	20
Trichlorofluoromethane	3.75	3.61	3.68	96.3	98.1	62.0 - 126	1.92	20
Dichlorodifluoromethane	3.75	3.69	3.58	98.4	95.5	59.0 - 128	3.03	20
1,1,2-Trichlorotrifluoroethane	3.75	3.69	3.68	98.4	98.1	66.0 - 126	0.271	20
1,2-Dichlorotetrafluoroethane	3.75	3.86	3.76	103	100	63.0 - 121	2.62	20
Heptane	3.75	3.89	3.90	104	104	69.0 - 123	0.257	20
Hexachloro-1,3-butadiene	3.75	3.55	3.65	94.7	97.3	56.0 - 138	2.78	20
n-Hexane	3.75	3.99	3.99	106	106	63.0 - 120	0.000	20
Isopropylbenzene	3.75	4.08	4.08	109	109	68.0 - 124	0.000	20
Methylene Chloride	3.75	3.68	3.60	98.1	96.0	62.0 - 115	2.20	20

*: Value outside the established quality control limits.

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

LABORATORY CONTROL SAMPLE
LABORATORY CONTROL SAMPLE DUPLICATE
RECOVERY

L1518164-01,02,03,04,05,06

SAMPLE NO.:
R3819755-1
R3819755-2

LCS Sample / File ID:	R3819755-1 / 0726_02	**SDG:**	L1518164
LCSD Sample / File ID:	R3819755-2 / 0726_03	**Analytical Batch:**	WG1900825
Instrument ID:	AIRMS7	**Dilution Factor:**	1
Analytical Method:	TO-15	**Matrix:**	Air

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	RPD	RPD Limit
	ppbv	*ppbv*	*ppbv*	*%*	*%*	*%*	*%*	*%*
Methyl Butyl Ketone	3.75	3.59	3.68	95.7	98.1	62.0 - 128	2.48	20
Methyl Ethyl Ketone	3.75	3.78	3.86	101	103	67.0 - 130	2.09	20
4-Methyl-2-pentanone (MIBK)	3.75	3.73	3.78	99.5	101	67.0 - 130	1.33	20
Methyl Methacrylate	3.75	3.84	3.84	102	102	70.0 - 128	0.000	20
MTBE	3.75	3.85	3.86	103	103	66.0 - 126	0.259	20
Naphthalene	3.75	3.48	3.58	92.8	95.5	57.0 - 138	2.83	20
2-Propanol	3.75	3.64	3.72	97.1	99.2	52.0 - 125	2.17	20
Propene	3.75	3.87	3.79	103	101	57.0 - 136	2.09	20
Styrene	3.75	4.00	4.05	107	108	73.0 - 127	1.24	20
1,1,2,2-Tetrachloroethane	3.75	3.72	3.73	99.2	99.5	65.0 - 127	0.268	20
Tetrachloroethylene	3.75	3.68	3.69	98.1	98.4	66.0 - 124	0.271	20
Tetrahydrofuran	3.75	3.90	3.91	104	104	64.0 - 123	0.256	20
Toluene	3.75	3.82	3.81	102	102	66.0 - 119	0.262	20
1,2,4-Trichlorobenzene	3.75	3.37	3.50	89.9	93.3	55.0 - 142	3.78	20
1,1,1-Trichloroethane	3.75	3.68	3.70	98.1	98.7	68.0 - 125	0.542	20
1,1,2-Trichloroethane	3.75	3.68	3.74	98.1	99.7	73.0 - 119	1.62	20
Trichloroethylene	3.75	3.75	3.73	100	99.5	71.0 - 123	0.535	20
1,2,4-Trimethylbenzene	3.75	3.97	3.97	106	106	66.0 - 132	0.000	20
1,3,5-Trimethylbenzene	3.75	3.84	3.85	102	103	67.0 - 130	0.260	20
2,2,4-Trimethylpentane	3.75	4.02	3.97	107	106	68.0 - 121	1.25	20
Vinyl chloride	3.75	3.89	3.82	104	102	64.0 - 127	1.82	20
Vinyl Bromide	3.75	3.73	3.71	99.5	98.9	71.0 - 126	0.538	20
Vinyl acetate	3.75	3.89	3.91	104	104	56.0 - 139	0.513	20
m&p-Xylene	7.50	7.83	7.88	104	105	61.0 - 134	0.637	20
o-Xylene	3.75	4.00	4.00	107	107	67.0 - 125	0.000	20

*: Value outside the established quality control limits.

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

LABORATORY CONTROL SAMPLE
LABORATORY CONTROL SAMPLE DUPLICATE
RECOVERY

L1518164-05,06

SAMPLE NO.:
R3821343-1
R3821343-2

LCS Sample / File ID:	R3821343-1 / 0801_02	**SDG:**	L1518164
LCSD Sample / File ID:	R3821343-2 / 0801_03	**Analytical Batch:**	WG1903843
Instrument ID:	AIRMS9	**Dilution Factor:**	1
Analytical Method:	TO-15	**Matrix:**	Air

Analyte	Spike Amount	LCS Result	LCSD Result	LCS Rec.	LCSD Rec.	Rec. Limits	RPD	RPD Limit
	ppbv	*ppbv*	*ppbv*	*%*	*%*	*%*	*%*	*%*
2-Propanol	3.75	3.11	3.07	82.9	81.9	52.0 - 125	1.29	20

*: Value outside the established quality control limits.

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

Lab Sample ID:	R3819755-3	**SDG:**	L1518164
Lab File ID:	0726_04	**Preparation Date/Time:**	07/26/22 09:45
Instrument ID:	AIRMS7	**Analysis Date/Time:**	07/26/22 09:45
Analytical Batch:	WG1900825	**Dilution Factor:**	1
Analytical Method:	TO-15	**Matrix:**	Air

Sample ID	Lab Sample ID	Instrument	File ID	Analysis *date/time*
LCS	R3819755-1	AIRMS7	0726_02	07/26/22 08:25
LCSD	R3819755-2	AIRMS7	0726_03	07/26/22 09:05
CRCA-AMB01-0220722	L1518164-01	AIRMS7	0726_06	07/26/22 11:37
CRCA-AMB02-0220722	L1518164-02	AIRMS7	0726_07	07/26/22 12:18
CRCA-VMP01-0220722	L1518164-03	AIRMS7	0726_08	07/26/22 12:58
CRCA-VMP02-0220722	L1518164-04	AIRMS7	0726_09	07/26/22 13:38
CRCA-VMP03-0220722	L1518164-05	AIRMS7	0726_10	07/26/22 14:17
CRCA-VMP04-0220722	L1518164-06	AIRMS7	0726_11	07/26/22 14:57

Lab Sample ID:	R3821343-3	**SDG:**	L1518164
Lab File ID:	0801_04	**Preparation Date/Time:**	08/01/22 10:08
Instrument ID:	AIRMS9	**Analysis Date/Time:**	08/01/22 10:08
Analytical Batch:	WG1903843	**Dilution Factor:**	1
Analytical Method:	TO-15	**Matrix:**	Air

Sample ID	Lab Sample ID	Instrument	File ID	Analysis *date/time*
LCS	R3821343-1	AIRMS9	0801_02	08/01/22 09:09
LCSD	R3821343-2	AIRMS9	0801_03	08/01/22 09:39
CRCA-VMP03-0220722	L1518164-05	AIRMS9	0801_06	08/01/22 12:44
CRCA-VMP04-0220722	L1518164-06	AIRMS9	0801_07	08/01/22 13:10

5A-OR

GC/MS INSTRUMENT PERFORMANCE CHECK

Lab File ID:	0725_01	**SDG:**	L1518164
Instrument ID:	AIRMS7	**Analytical Method:**	TO-15
Analysis Date/Time:	07/25/22 08:52		

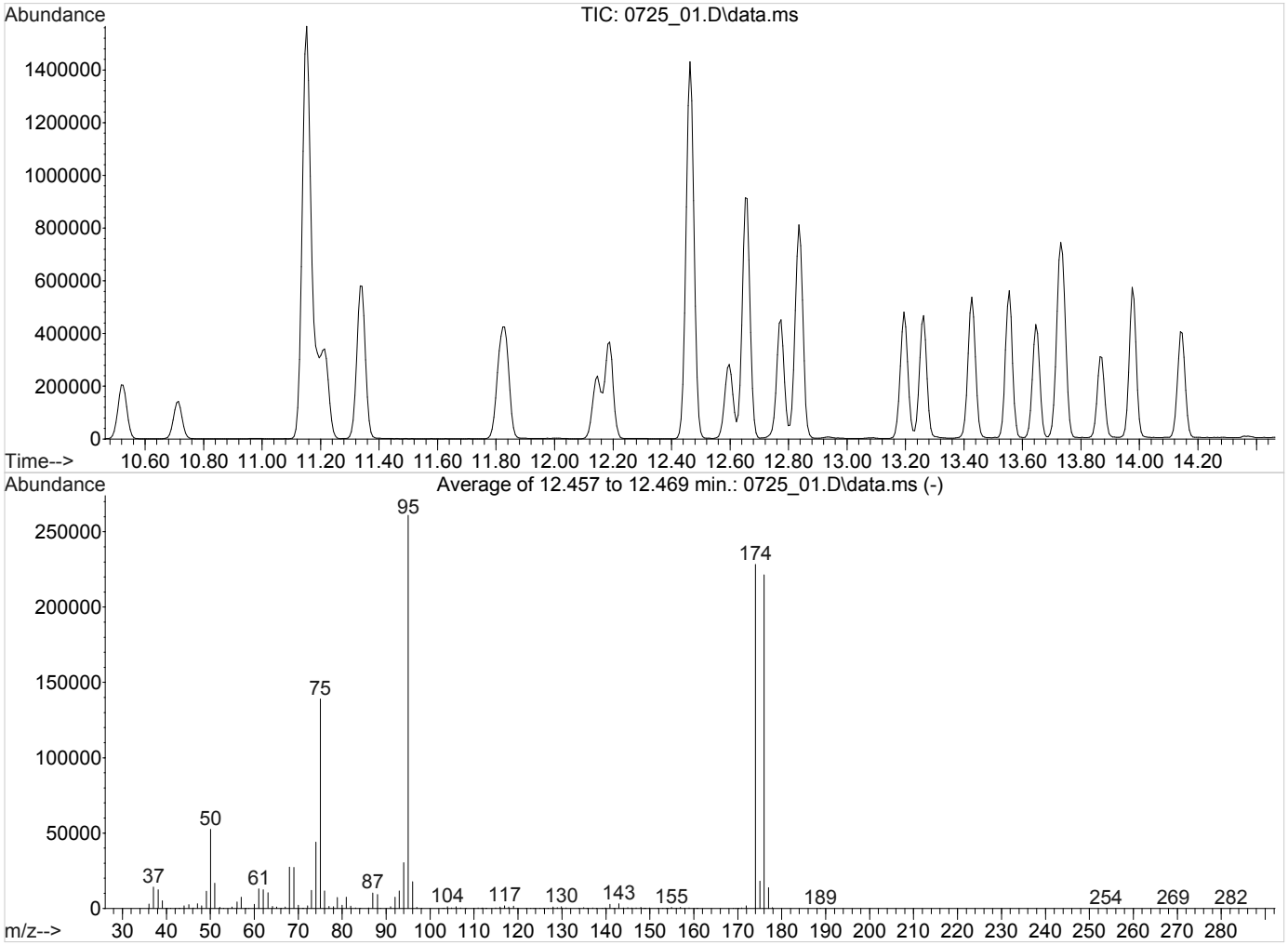
Target Mass (m/e)	Relative Mass	Low Limit	High Limit	% Relative Abundance
50	95	8	40.40	20
75	95	30	66.40	53
95	95	100	100.40	100
96	95	5	9.40	7
173	174	0	2.40	0
174	95	50	120.40	88
175	174	4	9.40	8
176	174	93	101.40	97
177	176	5	9.40	6

Sample ID	Lab Sample ID	File ID	Analysis date/time
STD-0.19	0.19	0725_03	07/25/22 10:08
STD-0.31	0.31	0725_04	07/25/22 10:46
STD-0.63	0.63	0725_05	07/25/22 11:24
STD-1.25	1.25	0725_06	07/25/22 12:01
STD-2.5	2.5	0725_07	07/25/22 12:40
STD-3.75	3.75	0725_08	07/25/22 13:20
STD-10.0	10.0	0725_09	07/25/22 13:57
STD-25	25	0725_10	07/25/22 14:35
STD-50	50	0725_11	07/25/22 15:17
STD-100	100	0725_12	07/25/22 16:02
SSCV	AIRMS70725220725_14589475	0725_14	07/25/22 17:20

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_01.D
Acq On : 25 Jul 2022 8:52 am
Operator :
Sample : ICV AMS 3.75 ppbv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Title :
Last Update : Mon Jul 25 14:36:50 2022



Spectrum Information: Average of 12.457 to 12.469 min.

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	20.1	52453	PASS
75	95	30	66	53.2	138963	PASS
95	95	100	100	100.0	261056	PASS
96	95	5	9	6.8	17677	PASS
173	174	0.00	2	0.0	0	PASS
174	95	50	120	87.5	228416	PASS
175	174	4	9	7.9	18057	PASS
176	174	93	101	96.9	221355	PASS
177	176	5	9	6.2	13823	PASS

5A-OR

GC/MS INSTRUMENT PERFORMANCE CHECK

Lab File ID: 0726_01T
Instrument ID: AIRMS7
Analysis Date/Time: 07/26/22 07:45

SDG: L1518164
Analytical Method: TO-15

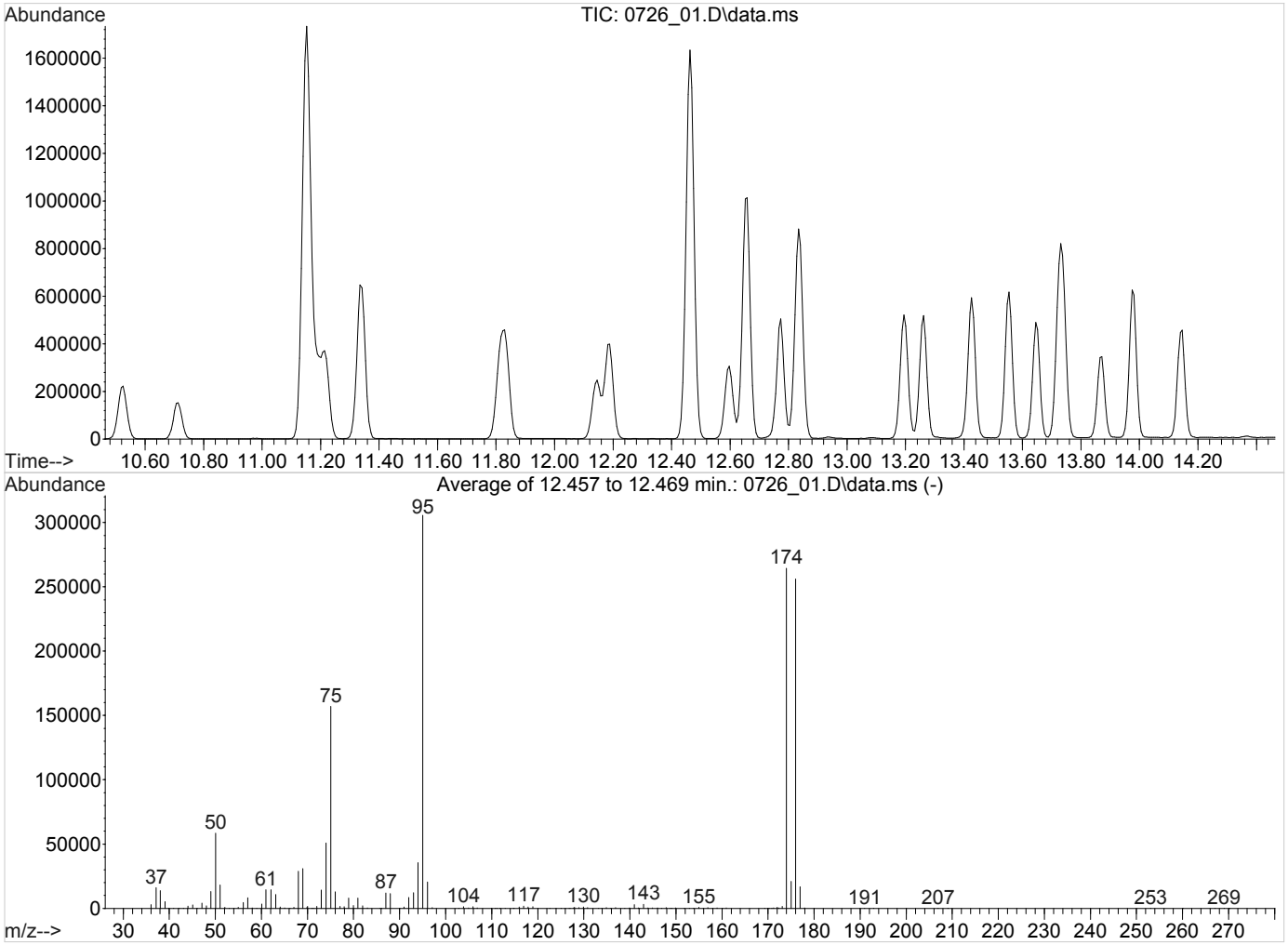
Target Mass (m/e)	Relative Mass	Low Limit	High Limit	% Relative Abundance
50	95	8	40.40	19
75	95	30	66.40	51
95	95	100	100.40	100
96	95	5	9.40	7
173	174	0	2.40	1
174	95	50	120.40	86
175	174	4	9.40	8
176	174	93	101.40	97
177	176	5	9.40	6

Sample ID	Lab Sample ID	File ID	Analysis date/time
ICV	AIRMS70726220726_01589475	0726_01	07/26/22 07:45
LCS	R3819755-1	0726_02	07/26/22 08:25
LCSD	R3819755-2	0726_03	07/26/22 09:05
BLANK	R3819755-3	0726_04	07/26/22 09:45
CRCA-AMB01-0220722	L1518164-01	0726_06	07/26/22 11:37
CRCA-AMB02-0220722	L1518164-02	0726_07	07/26/22 12:18
CRCA-VMP01-0220722	L1518164-03	0726_08	07/26/22 12:58
CRCA-VMP02-0220722	L1518164-04	0726_09	07/26/22 13:38
CRCA-VMP03-0220722	L1518164-05	0726_10	07/26/22 14:17
CRCA-VMP04-0220722	L1518164-06	0726_11	07/26/22 14:57
CCV	AIRMS70726220726_26589475	0726_26	07/27/22 01:22

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_01.D
Acq On : 26 Jul 2022 7:45 am
Operator :
Sample : ICV AMS 3.75 ppbv
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Title :
Last Update : Mon Jul 25 16:35:00 2022



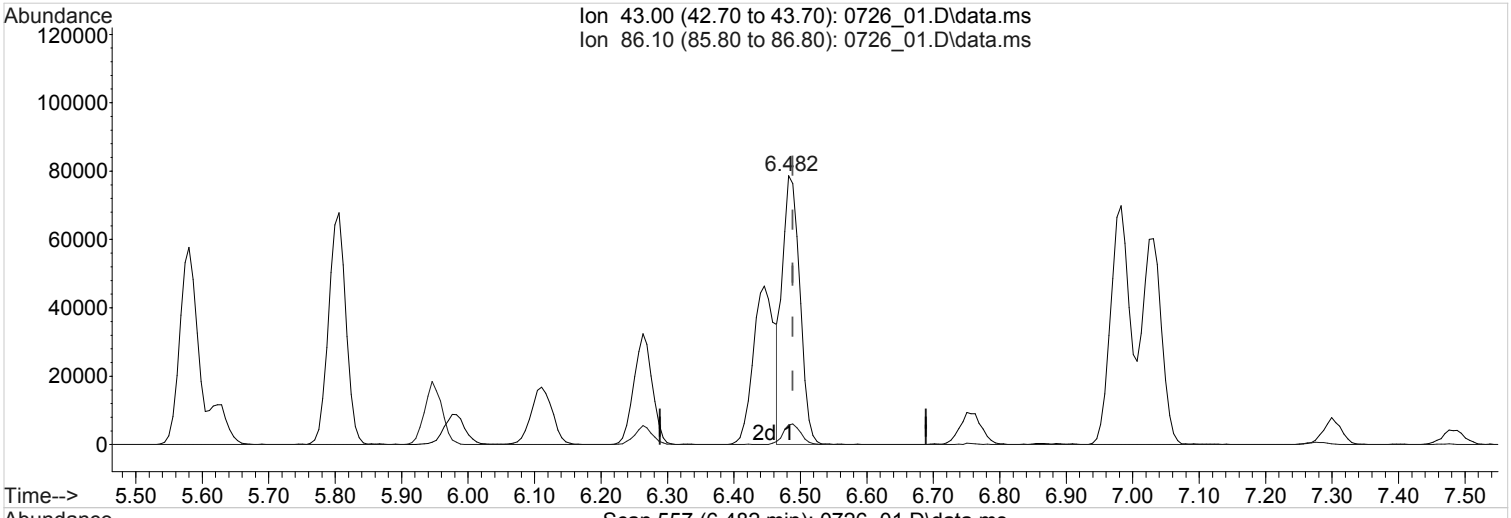
Spectrum Information: Average of 12.457 to 12.469 min.

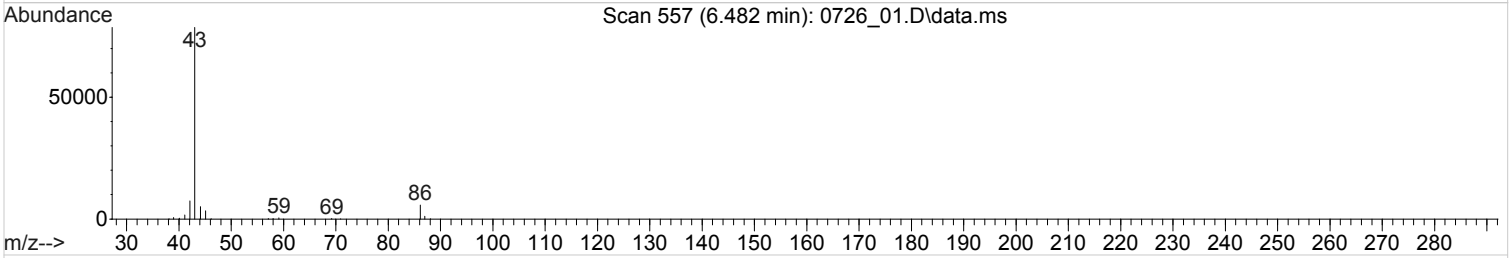
Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	19.1	58376	PASS
75	95	30	66	51.3	156971	PASS
95	95	100	100	100.0	305749	PASS
96	95	5	9	6.7	20515	PASS
173	174	0.00	2	0.6	1525	PASS
174	95	50	120	86.5	264384	PASS
175	174	4	9	7.9	20981	PASS
176	174	93	101	96.9	256235	PASS
177	176	5	9	6.5	16771	PASS

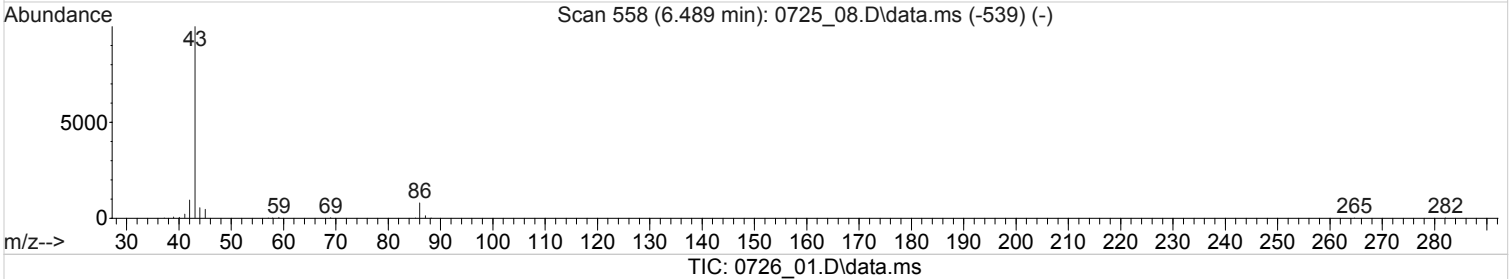
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_01.D
Acq On : 26 Jul 2022 7:45 am
Operator :
Sample : ICV AMS 3.75 ppbv
Misc :
ALS Vial : 1 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 08:32:26 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration







TIC: 0726_01.D\data.ms

(35) Vinyl Acetate (T,M)

6.482min (-0.006) 2.1416119 ppbv

Qvalue = 99

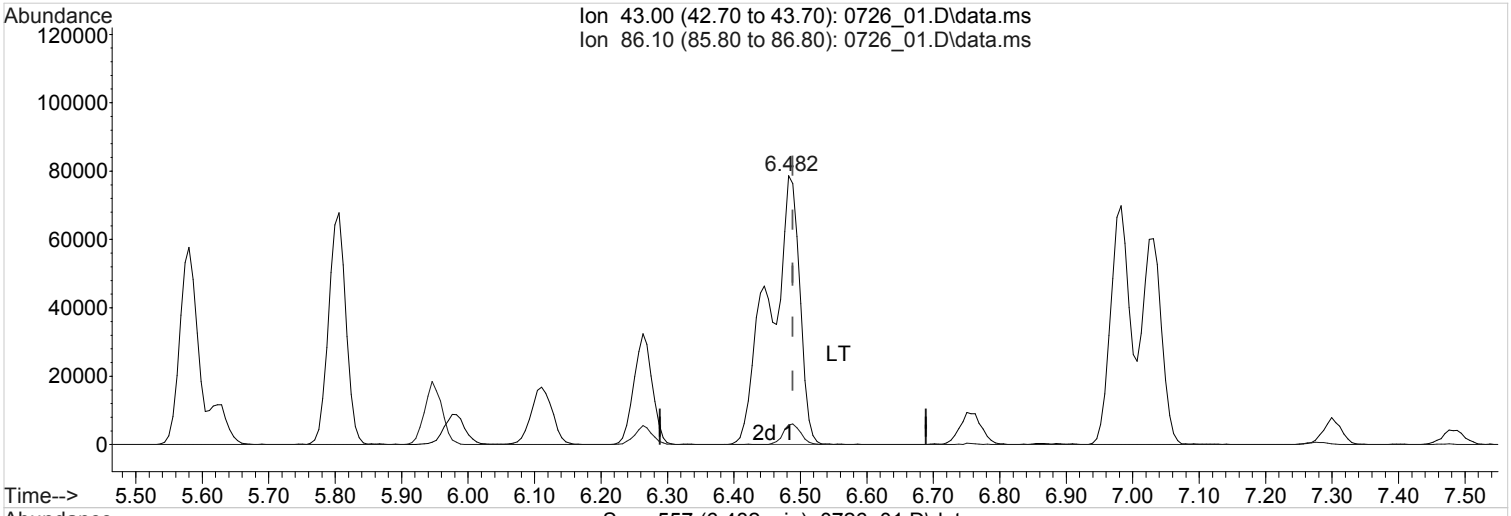
response 143136

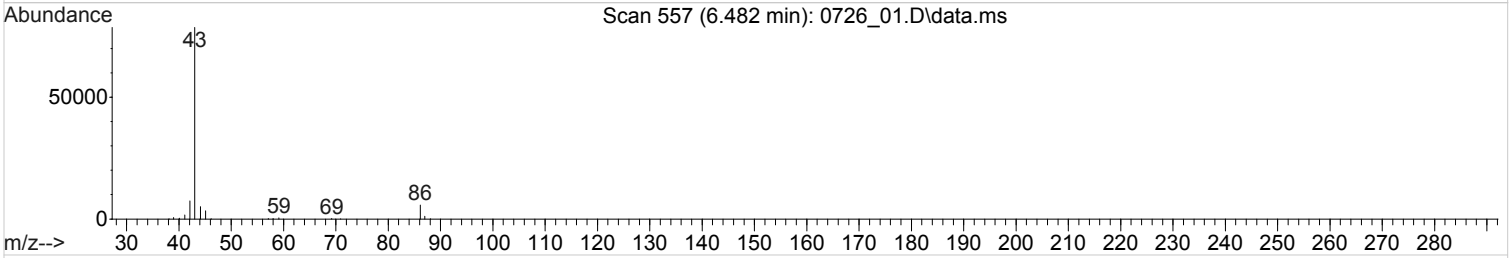
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	7.96
0.00	0.00	0.00
0.00	0.00	0.00

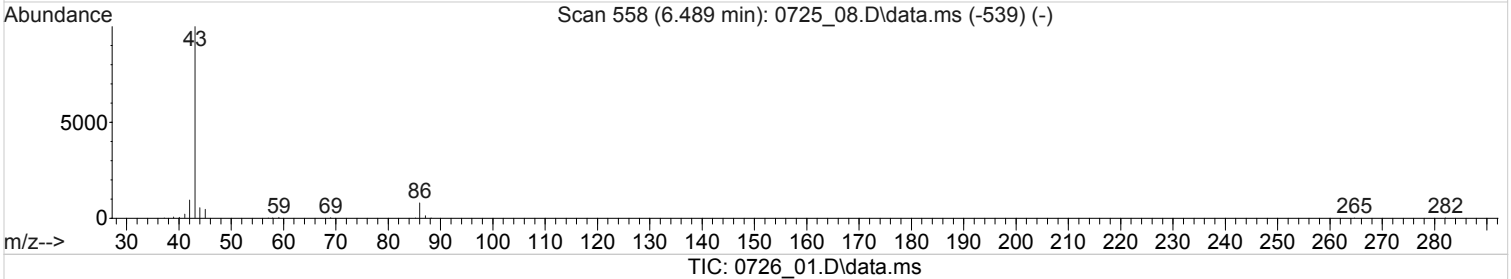
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_01.D
Acq On : 26 Jul 2022 7:45 am
Operator :
Sample : ICV AMS 3.75 ppbv
Misc :
ALS Vial : 1 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 08:32:26 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration







TIC: 0726_01.D\data.ms

(35) Vinyl Acetate (T,M)

6.482min (-0.006) 3.7132285 ppbv m

response 248176

Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.59#
0.00	0.00	0.00
0.00	0.00	0.00

5A-OR

GC/MS INSTRUMENT PERFORMANCE CHECK

Lab File ID: 0727A_01
Instrument ID: AIRMS9
Analysis Date/Time: 07/27/22 12:09

SDG: L1518164
Analytical Method: TO-15

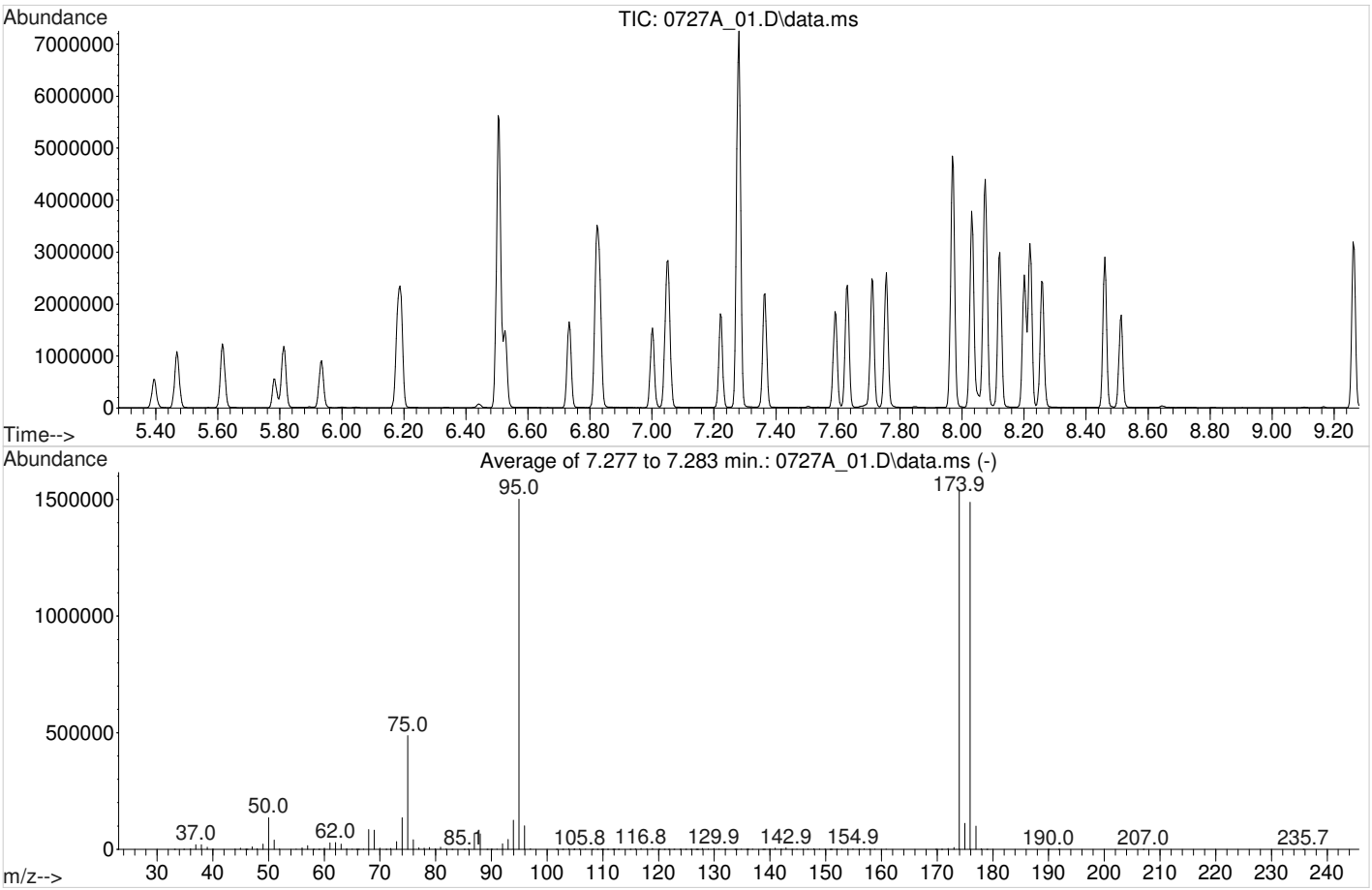
Target Mass (m/e)	Relative Mass	Low Limit	High Limit	% Relative Abundance
50	95	8	40.40	9
75	95	30	66.40	32
95	95	100	100.40	100
96	95	5	9.40	7
173	174	0	2.40	0
174	95	50	120.40	102
175	174	4	9.40	7
176	174	93	101.40	97
177	176	5	9.40	7

Sample ID	Lab Sample ID	File ID	Analysis date/time
STD-0.19	0.19	0727A_03	07/27/22 13:02
STD-0.31	0.31	0727A_04	07/27/22 13:27
STD-0.63	0.63	0727A_05	07/27/22 13:52
STD-1.25	1.25	0727A_06	07/27/22 14:18
STD-2.5	2.5	0727A_07	07/27/22 14:45
STD-3.75	3.75	0727A_08	07/27/22 15:15
STD-10.0	10.0	0727A_09	07/27/22 15:41
STD-25	25	0727A_10	07/27/22 16:08
STD-50	50	0727A_11	07/27/22 16:40
STD-100	100	0727A_12	07/27/22 17:18
SSCV	AIRMS9072722A0727A_14589824	0727A_14	07/27/22 18:14

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_01.D
Acq On : 27 Jul 2022 12:09 pm
Operator :
Sample : ICV AMS 3.75 PPBV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : C:\GCMS\1\methods\TOAIRMS9G12V.M
Title :
Last Update : Wed Jul 13 09:25:49 2022



Spectrum Information: Average of 7.277 to 7.283 min.

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	9.1	136081	PASS
75	95	30	66	32.4	487189	PASS
95	95	100	100	100.0	1501905	PASS
96	95	5	9	6.7	100528	PASS
173	174	0.00	2	0.5	7698	PASS
174	95	50	120	102.4	1538560	PASS
175	174	4	9	7.2	111251	PASS
176	174	93	101	96.7	1488043	PASS
177	176	5	9	6.7	99691	PASS

5A-OR

GC/MS INSTRUMENT PERFORMANCE CHECK

Lab File ID: 0801_01T
Instrument ID: AIRMS9
Analysis Date/Time: 08/01/22 08:39

SDG: L1518164
Analytical Method: TO-15

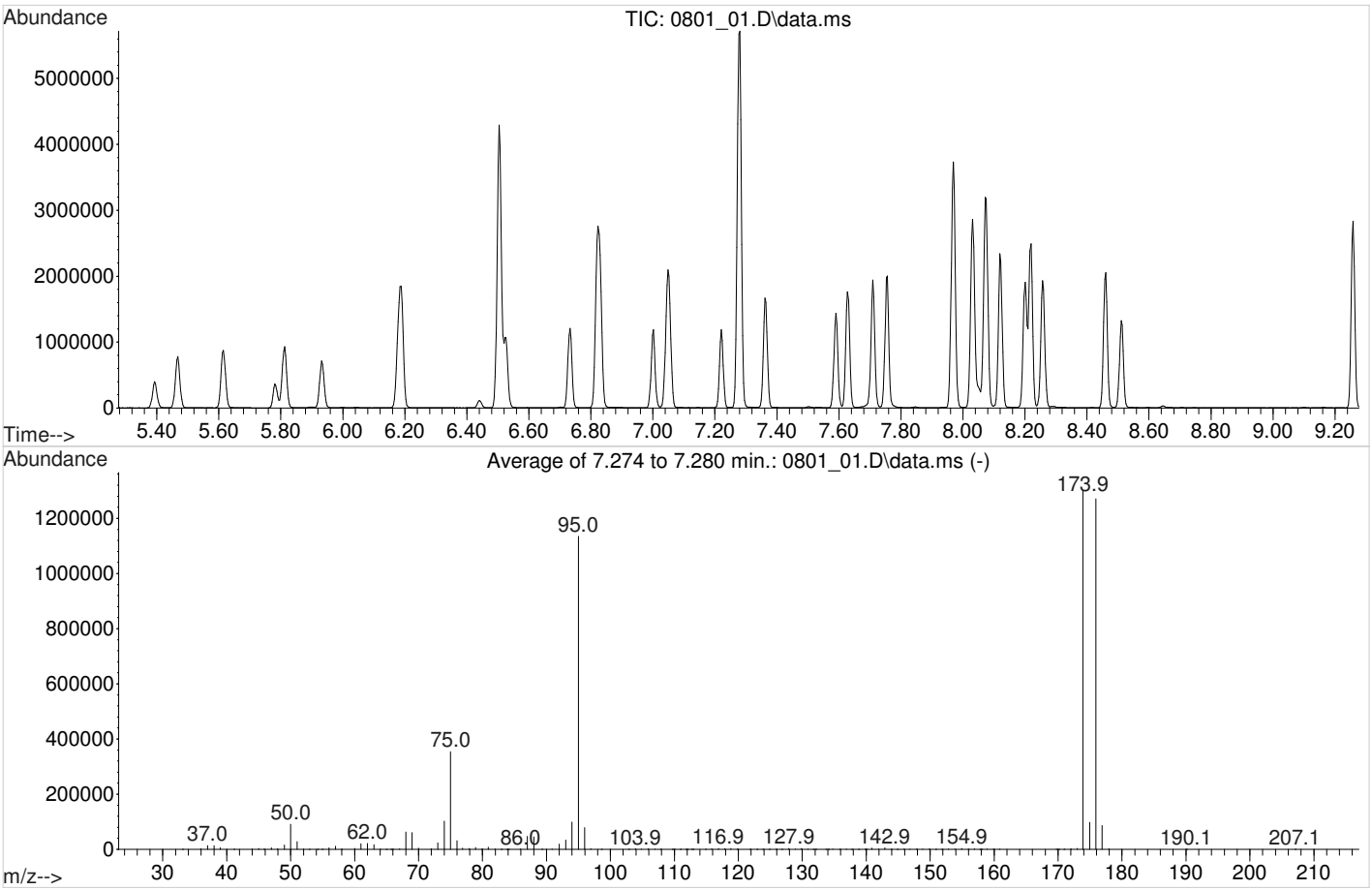
Target Mass (m/e)	Relative Mass	Low Limit	High Limit	% Relative Abundance
50	95	8	40.40	8
75	95	30	66.40	31
95	95	100	100.40	100
96	95	5	9.40	7
173	174	0	2.40	0
174	95	50	120.40	115
175	174	4	9.40	8
176	174	93	101.40	98
177	176	5	9.40	7

Sample ID	Lab Sample ID	File ID	Analysis date/time
ICV	AIRMS90801220801_01589824	0801_01	08/01/22 08:39
LCS	R3821343-1	0801_02	08/01/22 09:09
LCSD	R3821343-2	0801_03	08/01/22 09:39
BLANK	R3821343-3	0801_04	08/01/22 10:08
CRCA-VMP03-0220722	L1518164-05	0801_06	08/01/22 12:44
CRCA-VMP04-0220722	L1518164-06	0801_07	08/01/22 13:10
CCV	AIRMS90801220801_10589824	0801_10	08/01/22 15:08

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_01.D
Acq On : 01 Aug 2022 08:39 am
Operator :
Sample : ICV AMS 3.75 PPBV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Integration File: rteint.p

Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Title :
Last Update : Thu Jul 28 09:58:39 2022



Spectrum Information: Average of 7.274 to 7.280 min.

Target Mass	Rel. to Mass	Lower Limit%	Upper Limit%	Rel. Abn%	Raw Abn	Result Pass/Fail
50	95	8	40	8.1	91592	PASS
75	95	30	66	31.2	353941	PASS
95	95	100	100	100.0	1134492	PASS
96	95	5	9	6.9	78534	PASS
173	174	0.00	2	0.3	3875	PASS
174	95	50	120	114.7	1301099	PASS
175	174	4	9	7.6	98280	PASS
176	174	93	101	97.7	1270869	PASS
177	176	5	9	6.8	86739	PASS

INTERNAL STANDARD AND RETENTION TIME

SDG:	L1518164	**Analytical Method:**	TO-15
Instrument ID:	AIRMS7	**Calibration Start Date:**	07/25/22 10:08
Std File:	0726_01	**Calibration End Date:**	07/25/22 16:02
		Std Analysis Date:	07/26/22 07:45

Sample ID	File ID	DFB		BCM		CB	
		Response	*RT*	*Response*	*RT*	*Response*	*RT*
STANDARD		918959	8.09	219898	7.27	847864	11.15
UPPER LIMIT		1203532		288231		1134988	
LOWER LIMIT		515799		123527		486423	
LCS R3819755-1 WG1900825 1x	0726_02	888174	8.10	210432	7.28	813648	11.16
LCSD R3819755-2 WG1900825 1x	0726_03	879242	8.10	209383	7.28	801844	11.15
BLANK R3819755-3 WG1900825 1x	0726_04	874638	8.10	212224	7.28	794061	11.16
L1518164-01 WG1900825 1x	0726_06	839035	8.10	199358	7.27	766110	11.16
L1518164-02 WG1900825 1x	0726_07	823347	8.10	196912	7.28	754558	11.15
L1518164-03 WG1900825 1x	0726_08	849376	8.10	201392	7.28	768346	11.16
L1518164-04 WG1900825 1x	0726_09	852130	8.10	204146	7.28	771128	11.16
L1518164-05 WG1900825 1x	0726_10	843614	8.10	202586	7.28	764735	11.16
L1518164-06 WG1900825 1x	0726_11	834439	8.10	200878	7.28	766278	11.15

DFB - 1,4-DIFLUOROBENZENE BCM - BROMOCHLOROMETHANE
CB - CHLOROBENZENE-D5

*: Value outside the established quality control limits.
D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

INTERNAL STANDARD AND RETENTION TIME

SDG:	L1518164	**Analytical Method:**	TO-15
Instrument ID:	AIRMS9	**Calibration Start Date:**	07/27/22 13:02
Std File:	0801_01	**Calibration End Date:**	07/27/22 17:18
		Std Analysis Date:	08/01/22 08:39

Sample ID	File ID	DFB		BCM		CB	
		Response	*RT*	*Response*	*RT*	*Response*	*RT*
STANDARD		1907348	4.32	564293	3.37	1742636	6.50
UPPER LIMIT		3310798		979685		3023628	
LOWER LIMIT		1418914		419865		1295840	
LCS R3821343-1 WG1903843 1x	0801_02	1915891	4.32	567209	3.37	1757162	6.51
LCSD R3821343-2 WG1903843 1x	0801_03	1958486	4.32	575603	3.37	1791640	6.51
BLANK R3821343-3 WG1903843 1x	0801_04	1895163	4.32	570271	3.37	1716421	6.50
L1518164-05 WG1903843 10x	0801_06	1858608	4.32	564303	3.38	1714627	6.51
L1518164-06 WG1903843 10x	0801_07	1845825	4.32	566827	3.38	1703887	6.51

DFB - 1,4-DIFLUOROBENZENE BCM - BROMOCHLOROMETHANE
CB - CHLOROBENZENE-D5

*: Value outside the established quality control limits.
D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-AMB01-0220722

Lab Sample ID:	L1518164-01	**SDG:**	L1518164
Client Sample ID:	CRCA-AMB01-0220722	**Collected Date/Time:**	07/22/22 15:45
Lab File ID:	0726_06	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 11:37
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 11:37
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
Acetone	67-64-1	5.60	4.92	J	1.39	2.85	5.70
Allyl Chloride	107-05-1	0	0.783	U	0.357	0.783	1.57
Benzene	71-43-2	7.81	0.610	J	0.228	0.479	0.958
Benzyl Chloride	100-44-7	0	0.675	U	0.311	0.675	1.56
Bromodichloromethane	75-27-4	0	1.01	U	0.471	1.01	2.01
Bromoform	75-25-2	0	3.21	U	0.757	3.21	6.21
Bromomethane	74-83-9	0	0.776	U	0.381	0.776	1.55
1,3-Butadiene	106-99-0	0	1.39	U	0.230	1.39	4.43
Carbon disulfide	75-15-0	5.78	2.52		0.317	0.778	1.56
Carbon tetrachloride	56-23-5	7.60	0.945	U	0.461	0.945	1.89
Chlorobenzene	108-90-7	0	0.924	U	0.385	0.924	1.85
Chloroethane	75-00-3	0	0.528	U	0.263	0.528	1.06
Chloroform	67-66-3	0	0.730	U	0.349	0.730	1.46
Chloromethane	74-87-3	0	0.516	U	0.213	0.516	1.03
2-Chlorotoluene	95-49-8	0	1.03	U	0.427	1.03	2.06
Cyclohexane	110-82-7	0	0.689	U	0.259	0.689	1.38
Dibromochloromethane	124-48-1	0	1.28	U	0.618	1.28	2.55
1,2-Dibromoethane	106-93-4	0	1.15	U	0.554	1.15	2.31
1,2-Dichlorobenzene	95-50-1	0	1.80	U	0.770	1.80	3.61
1,3-Dichlorobenzene	541-73-1	0	2.40	U	1.09	2.40	4.81
1,4-Dichlorobenzene	106-46-7	0	0.782	U	0.335	0.782	1.80
1,2-Dichloroethane	107-06-2	0	0.607	U	0.283	0.607	1.21
1,1-Dichloroethane	75-34-3	0	0.601	U	0.290	0.601	1.20
1,1-Dichloroethene	75-35-4	0	0.793	U	0.302	0.793	1.59
cis-1,2-Dichloroethene	156-59-2	7.04	1.42	J	0.311	0.793	1.59
trans-1,2-Dichloroethene	156-60-5	6.15	101		0.267	0.594	1.19
1,2-Dichloropropane	78-87-5	0	0.924	U	0.351	0.924	1.85
cis-1,3-Dichloropropene	10061-01-5	0	0.681	U	0.313	0.681	1.36
trans-1,3-Dichloropropene	10061-02-6	0	0.681	U	0.331	0.681	1.36
1,4-Dioxane	123-91-1	0	0.721	U	0.300	0.721	1.44
Ethanol	64-17-5	5.17	2.88	B	0.500	1.19	2.45
Ethylbenzene	100-41-4	0	0.867	U	0.362	0.867	1.73
4-Ethyltoluene	622-96-8	0	0.982	U	0.384	0.982	1.96
Trichlorofluoromethane	75-69-4	4.99	1.18	J	0.460	0.983	1.97
Dichlorodifluoromethane	75-71-8	3.91	1.46	J	0.678	1.48	2.97
1,1,2-Trichlorotrifluoroethane	76-13-1	5.42	1.53	U	0.608	1.53	3.07
1,2-Dichlorotetrafluoroethane	76-14-2	0	1.40	U	0.622	1.40	2.80
Heptane	142-82-5	0	1.02	U	0.425	1.02	2.04
Hexachloro-1,3-butadiene	87-68-3	0	2.67	U	1.12	2.67	6.73
n-Hexane	110-54-3	6.26	1.76	U	0.726	1.76	3.53
Isopropylbenzene	98-82-8	0	0.983	U	0.382	0.983	1.97
Methylene Chloride	75-09-2	0	0.694	U	0.340	0.694	1.39
Methyl Butyl Ketone	591-78-6	0	1.23	U	0.544	1.23	5.11

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-AMB01-0220722

Lab Sample ID:	L1518164-01	**SDG:**	L1518164
Client Sample ID:	CRCA-AMB01-0220722	**Collected Date/Time:**	07/22/22 15:45
Lab File ID:	0726_06	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 11:37
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 11:37
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
2-Butanone (MEK)	78-93-3	7.04	0.767	J	0.240	0.560	3.69
4-Methyl-2-pentanone (MIBK)	108-10-1	0	0.778	U	0.313	0.778	5.12
Methyl Methacrylate	80-62-6	0	0.819	U	0.359	0.819	1.64
MTBE	1634-04-4	0	0.468	U	0.233	0.468	1.08
Naphthalene	91-20-3	0	3.66	U	1.83	3.66	7.33
2-Propanol	67-63-0	5.64	2.56	J	0.649	1.54	3.07
Propene	115-07-1	3.87	0.222	J	0.160	1.08	2.15
Styrene	100-42-5	0	0.851	U	0.335	0.851	1.70
1,1,2,2-Tetrachloroethane	79-34-5	0	1.03	U	0.511	1.03	2.06
Tetrachloroethylene	127-18-4	0	1.36	U	0.553	1.36	2.72
Tetrahydrofuran	109-99-9	0	0.442	U	0.216	0.442	0.885
Toluene	108-88-3	0	0.942	U	0.328	0.942	1.88
1,2,4-Trichlorobenzene	120-82-1	0	2.29	U	1.10	2.29	4.66
1,1,1-Trichloroethane	71-55-6	0	0.816	U	0.400	0.816	1.63
1,1,2-Trichloroethane	79-00-5	0	1.09	U	0.422	1.09	2.18
Trichloroethylene	79-01-6	8.37	7.77		0.364	0.804	1.61
1,2,4-Trimethylbenzene	95-63-6	13.27	0.409	J	0.375	0.982	1.96
1,3,5-Trimethylbenzene	108-67-8	0	0.982	U	0.382	0.982	1.96
2,2,4-Trimethylpentane	540-84-1	0	1.40	U	0.621	1.40	2.80
Vinyl chloride	75-01-4	0	0.511	U	0.243	0.511	1.02
Vinyl Bromide	593-60-2	0	0.875	U	0.373	0.875	1.75
Vinyl acetate	108-05-4	0	0.880	U	0.408	0.880	1.76
m&p-Xylene	1330-20-7	11.34	1.30	U	0.585	1.30	2.60
o-Xylene	95-47-6	0	0.759	U	0.359	0.759	1.52

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_06.D
Acq On : 26 Jul 2022 11:37 am
Operator :
Sample : L1518164-01 1x WG1900825
Misc :
ALS Vial : 6 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 11:59:41 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

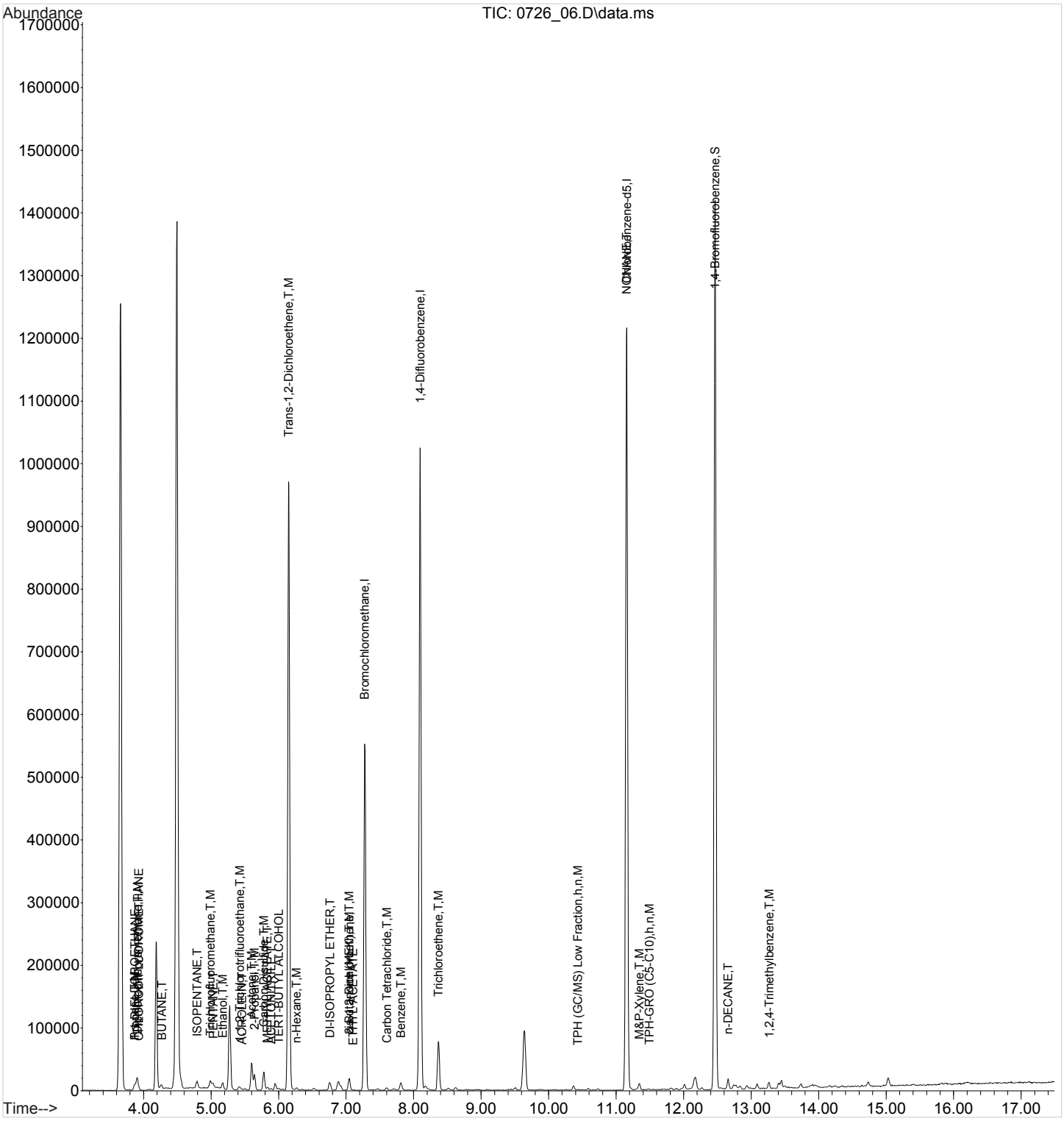
Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.275	130	199358	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	839035	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.158	117	766110	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	553674	3.9365895	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 98.41%				
Target Compounds							Qvalue
2) Propene	3.867	41	1734	0.1289901	ppbv	#	89
3) BUTANE	4.269	43	4254	0.1078712	ppbv		98
4) 1,1-DIFLUOROETHANE	3.873	65	2307	0.2447596	ppbv		85
5) Dichlorodifluoromethane	3.910	85	10328	0.2956478	ppbv		99
6) CHLORODIFLUOROMETHANE	3.928	67	956	0.2255419	ppbv		92
13) ISOPENTANE	4.794	43	4825	0.2927323	ppbv	#	96
15) Trichlorofluoromethane	4.989	101	9510	0.2097984	ppbv		98
16) PENTANE	5.031	43	4775	0.1874710	ppbv	#	93
17) Ethanol	5.172	45	10326	1.5257304	ppbv		99
18) ACROLEIN	5.458	56	911	0.1345390	ppbv		94
19) 1,1,2-Trichlorotrifluo...	5.422	101	2335	0.0713883	ppbv		97
21) Acetone	5.598	43	58856	2.0653904	ppbv		94
23) 2-Propanol	5.641	45	28544	1.0350568	ppbv	#	1
24) Carbon Disulfide	5.781	76	41778	0.8092452	ppbv		97
26) METHYL ACETATE	5.830	43	3773	0.1221552	ppbv	#	60
27) ACETONITRILE	5.891	41	2338	0.1836131	ppbv		94
28) Methylene Chloride	5.946	49	5941	Below Cal		98	
29) TERT-BUTYL ALCOHOL	6.001	59	3439	0.1123289	ppbv	#	89
31) Trans-1,2-Dichloroethene	6.147	61	609063	25.4231435	ppbv		99
33) n-Hexane	6.263	57	1535	0.0720928	ppbv	#	81
36) DI-ISOPROPYL ETHER	6.763	45	2974	0.0665031	ppbv	#	46
38) ETHYL ACETATE	7.104	45	306	0.0604628	ppbv	#	1
39) 2-Butanone (MEK)	7.043	72	1888	0.2596545	ppbv		93
40) cis-1,2-Dichloroethene	7.043	61	7898	0.3583921	ppbv		98
45) Carbon Tetrachloride	7.604	117	2533	0.0723684	ppbv		95
48) Benzene	7.811	78	8879	0.1913632	ppbv		98
52) Trichloroethene	8.366	95	29582	1.4484224	ppbv		97
70) NONANE	11.152	43	7550	0.1655084	ppbv	#	89
73) M&P-Xylene	11.341	91	6553	0.1230314	ppbv		100
80) n-DECANE	12.658	43	4693	0.0959548	ppbv		98
88) 1,2,4-Trimethylbenzene	13.268	105	6101	0.0832880	ppbv		98
101) TPH (GC/MS) Low Fraction	10.430	TIC	3831965m	32.1789857	ppbv		
102) TPH-GRO (C5-C10)	11.493	TIC	4460897m	45.9553588	ppbv		

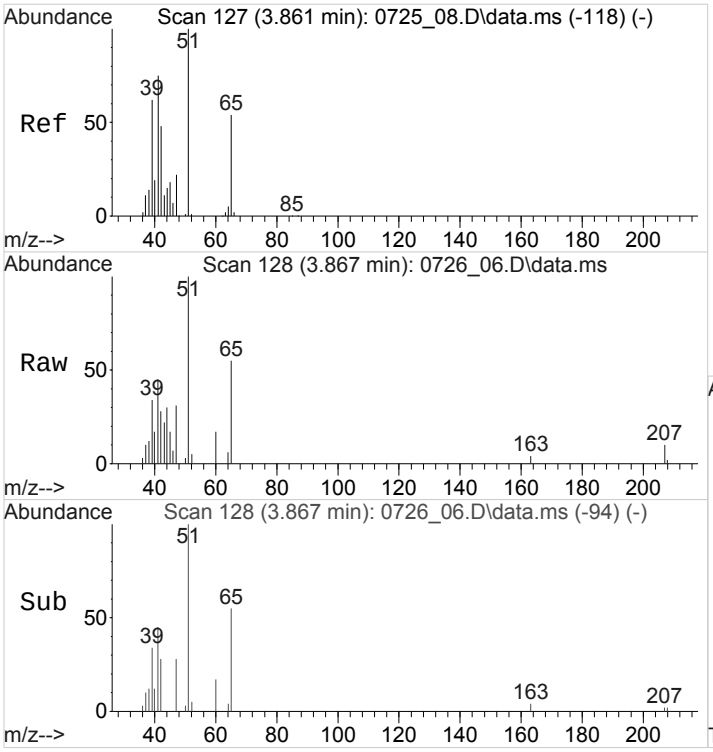
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_06.D
Acq On : 26 Jul 2022 11:37 am
Operator :
Sample : L1518164-01 1x WG1900825
Misc :
ALS Vial : 6 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 11:59:41 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

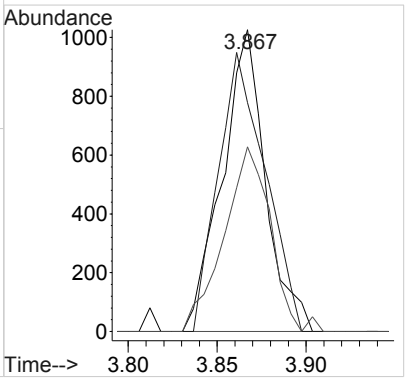


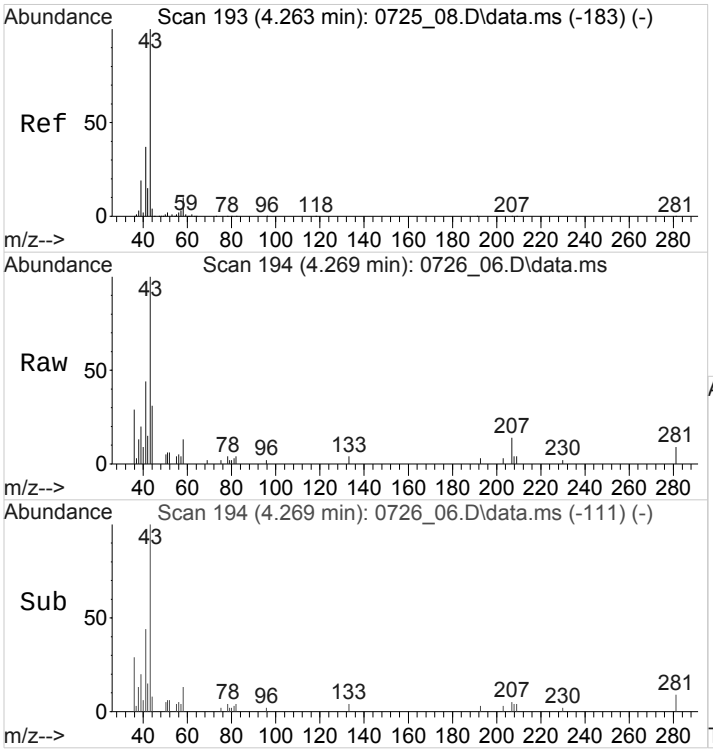


#2
Propene
Concen: 0.1289901 ppbv
RT: 3.867 min Scan# 128
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 41 Resp: 1734

Ion	Ratio	Lower	Upper
41	100		
39	100.5	66.1	99.1#
42	65.8	52.8	79.2

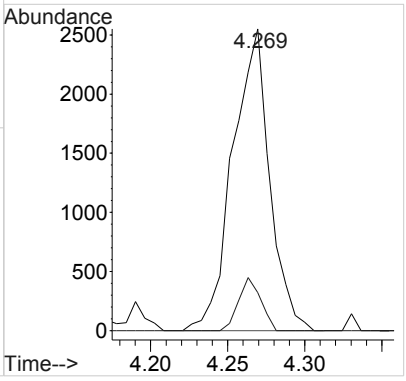




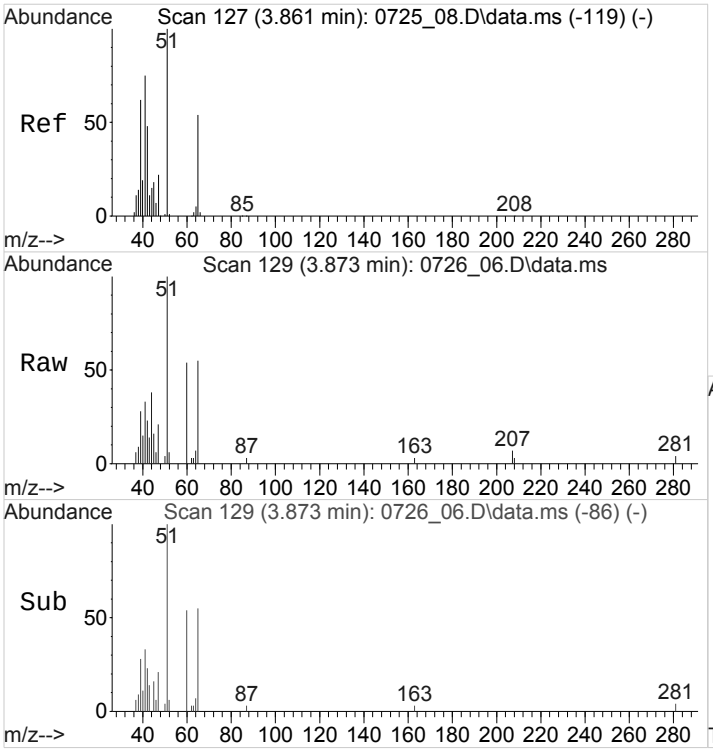
#3
BUTANE
Concen: 0.1078712 ppbv
RT: 4.269 min Scan# 194
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 43 Resp: 4254

Ion	Ratio	Lower	Upper
43	100		
58	10.6	9.0	13.4



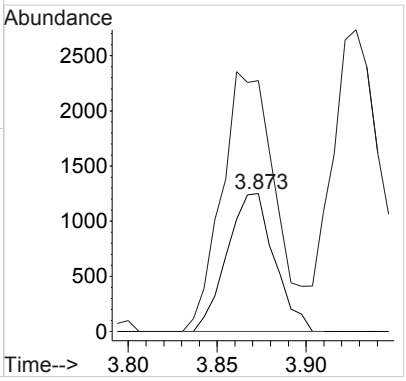
ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	30 of 377

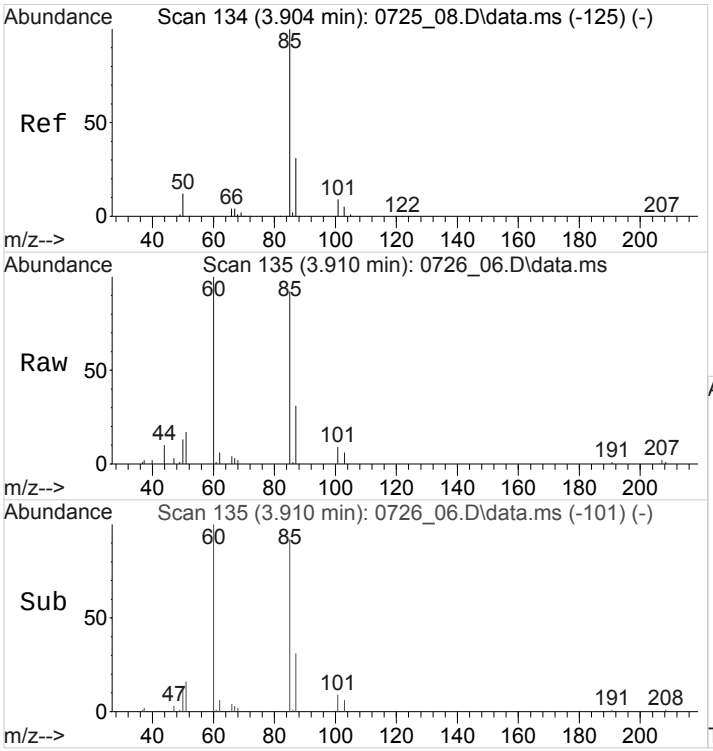


#4
1,1-DIFLUOROETHANE
Concen: 0.2447596 ppbv
RT: 3.873 min Scan# 129
Delta R.T. 0.012 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 65 Resp: 2307

Ion	Ratio	Lower	Upper
65	100		
51	210.9	151.1	226.7

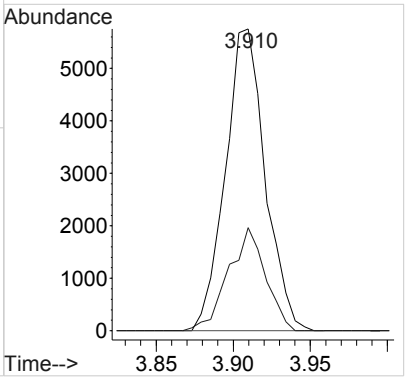


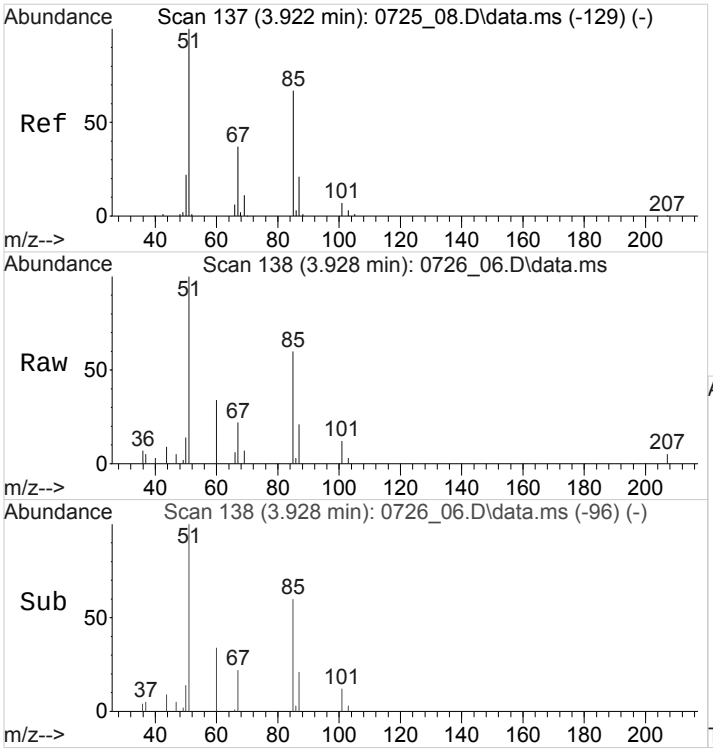


#5
Dichlorodifluoromethane
Concen: 0.2956478 ppbv
RT: 3.910 min Scan# 135
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 85 Resp: 10328

Ion	Ratio	Lower	Upper
85	100		
87	31.8	25.8	38.8

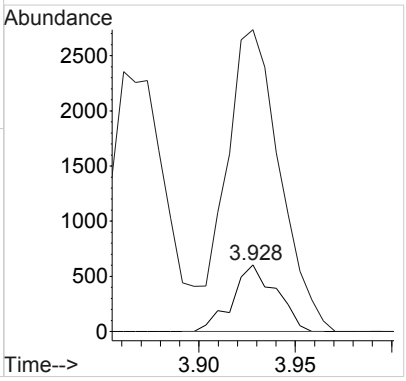


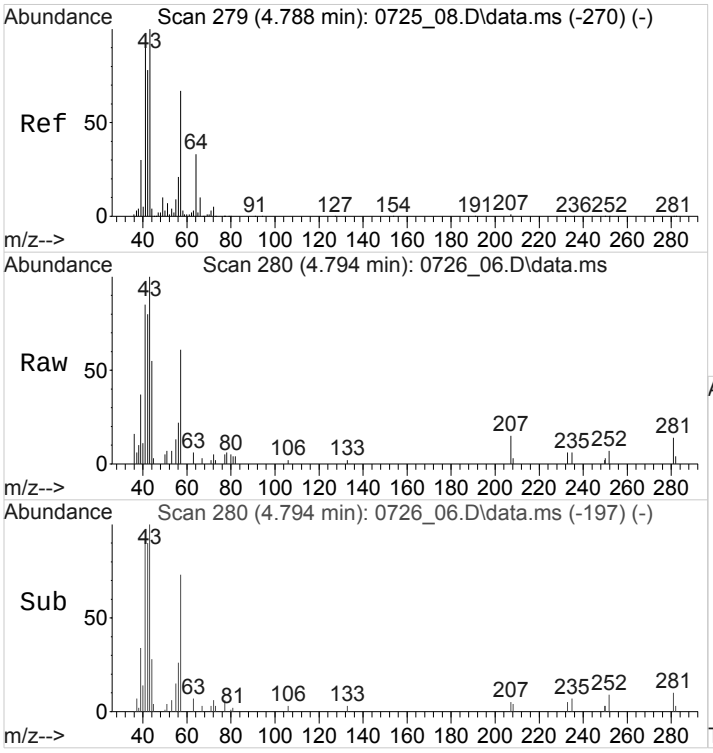


#6
CHLORODIFLUOROMETHANE
Concen: 0.2255419 ppbv
RT: 3.928 min Scan# 138
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 67 Resp: 956

Ion	Ratio	Lower	Upper
67	100		
51	554.6	463.4	695.0

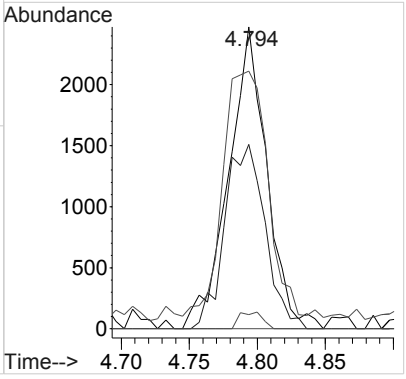




#13
ISOPENTANE
Concen: 0.2927323 ppbv
RT: 4.794 min Scan# 280
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 43 Resp: 4825

Ion	Ratio	Lower	Upper
43	100		
57	64.7	56.3	84.5
41	94.1	77.0	115.4
72	3.4	4.8	7.2#



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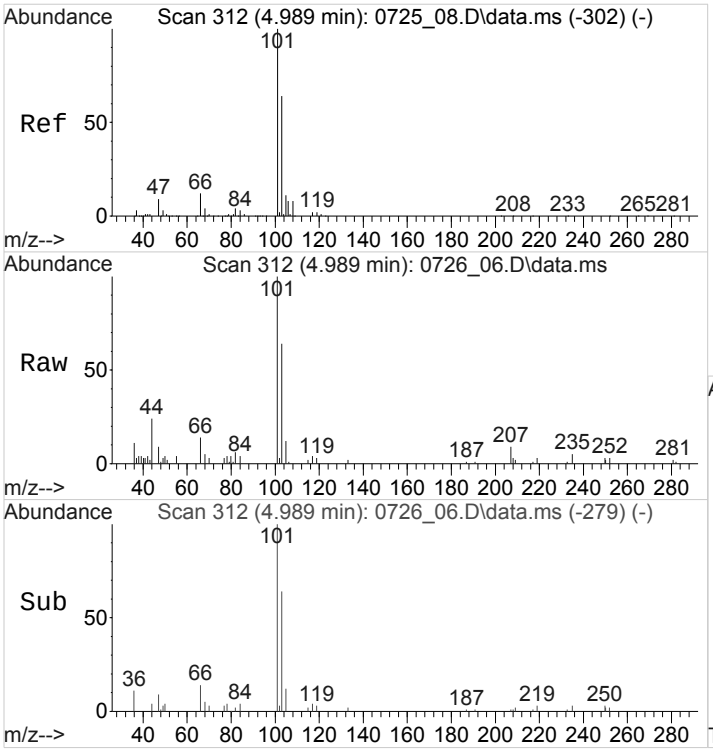
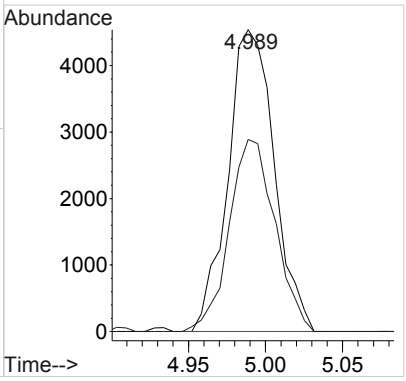
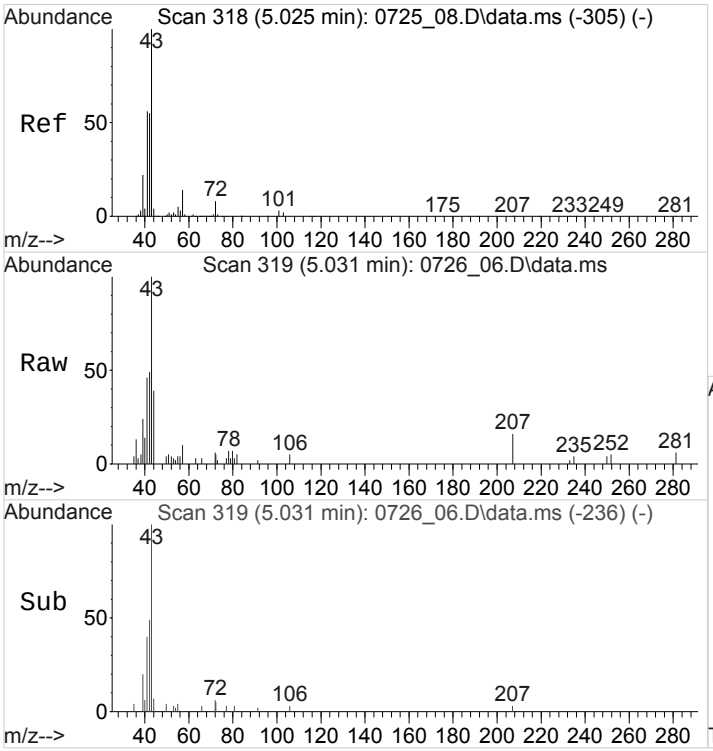


#15
Trichlorofluoromethane
Concen: 0.2097984 ppbv
RT: 4.989 min Scan# 312
Delta R.T. -0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion:101 Resp: 9510

Ion	Ratio	Lower	Upper
101	100		
103	62.8	51.7	77.5

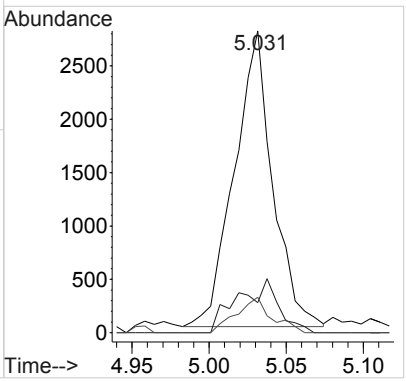




#16
PENTANE
Concen: 0.1874710 ppbv
RT: 5.031 min Scan# 319
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 43 Resp: 4775

Ion	Ratio	Lower	Upper
43	100		
57	19.5	12.7	19.1#
72	11.1	7.8	11.8



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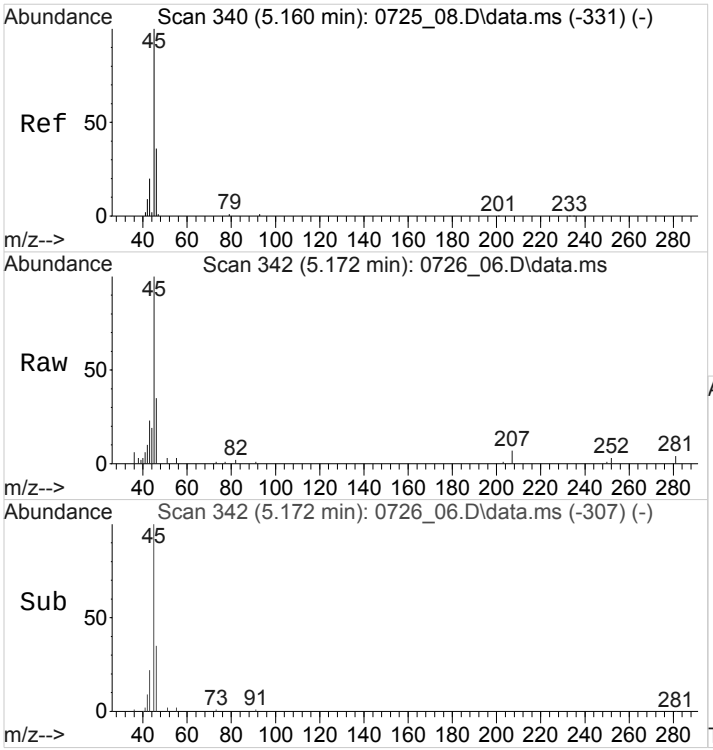
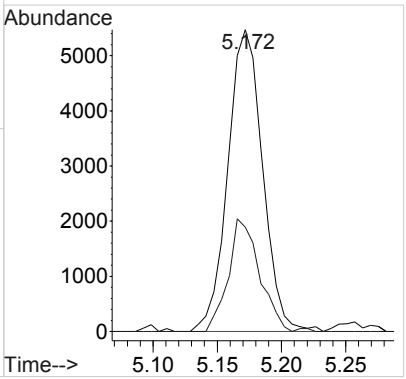
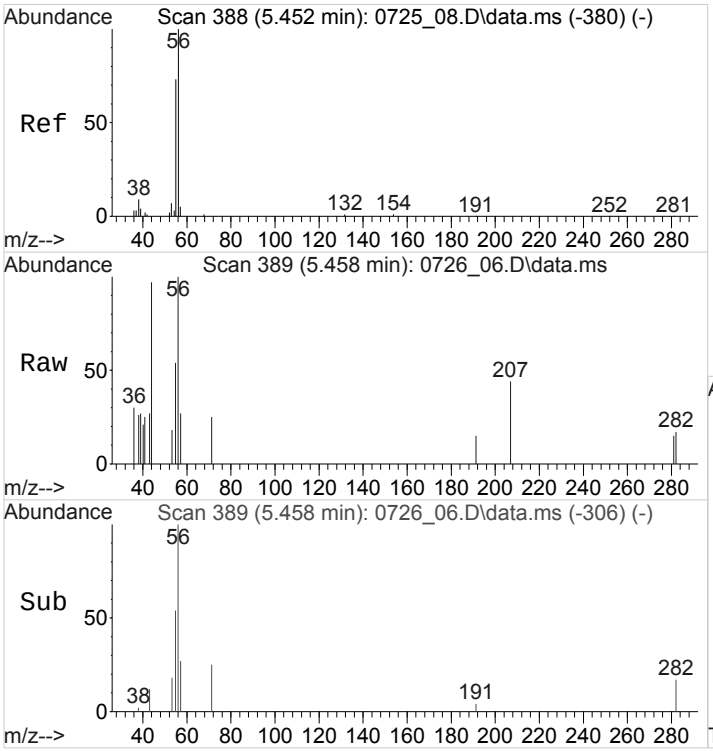


#17
Ethanol
Concen: 1.5257304 ppbv
RT: 5.172 min Scan# 342
Delta R.T. 0.013 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 45 Resp: 10326

Ion	Ratio	Lower	Upper
45	100		
46	33.3	26.3	39.5

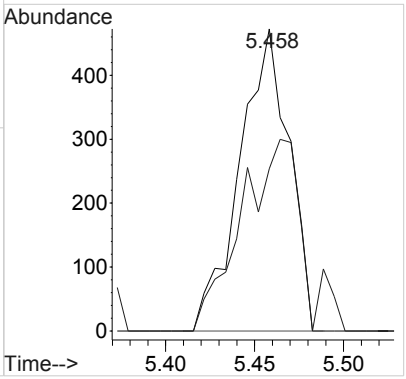




#18
ACROLEIN
Concen: 0.1345390 ppbv
RT: 5.458 min Scan# 389
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 56 Resp: 911

Ion	Ratio	Lower	Upper
56	100		
55	79.1	59.5	89.3



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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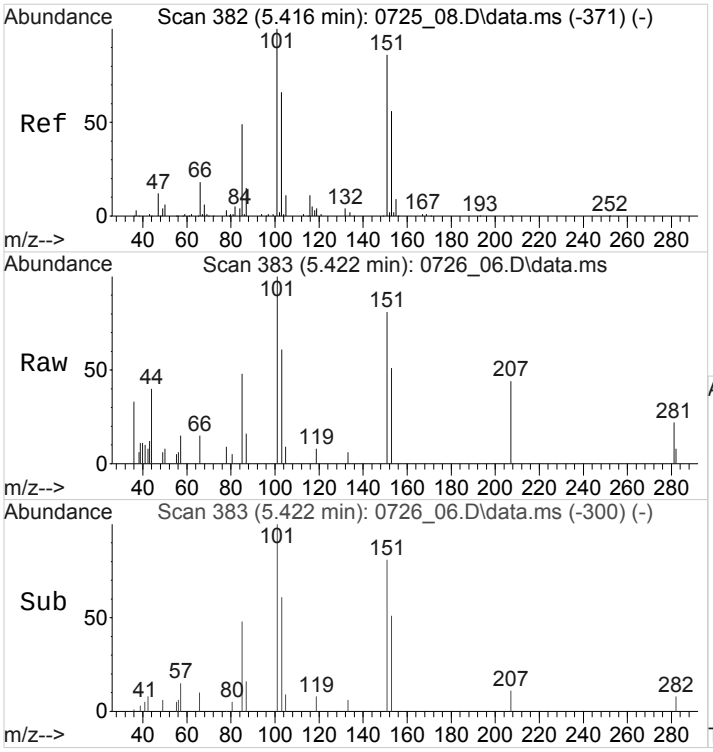
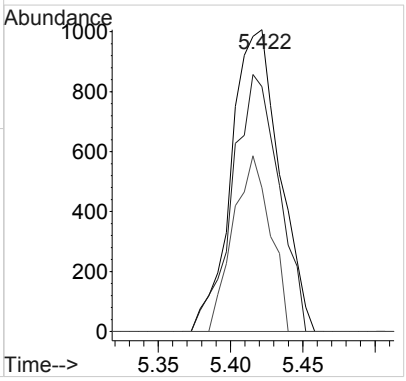
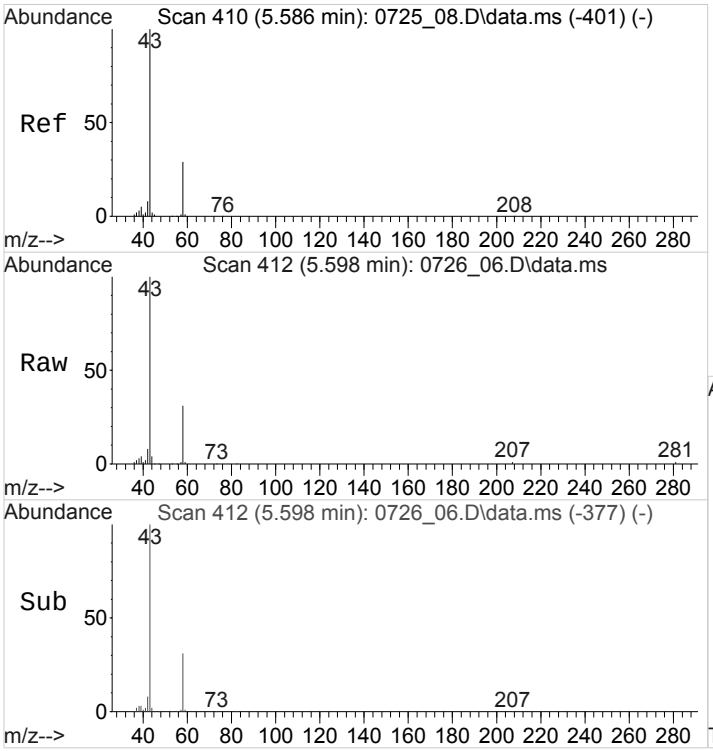


#19
1,1,2-Trichlorotrifluoroethane
Concen: 0.0713883 ppbv
RT: 5.422 min Scan# 383
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion:101 Resp: 2335

Ion	Ratio	Lower	Upper
101	100		
151	82.0	67.9	101.9
85	45.1	37.1	55.7

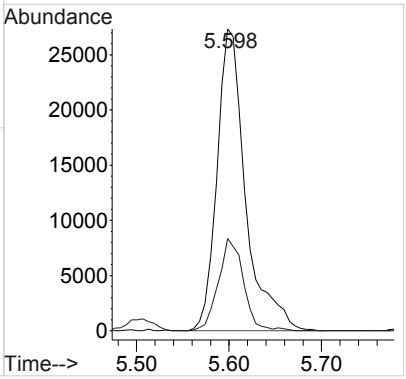




#21
Acetone
Concen: 2.0653904 ppbv
RT: 5.598 min Scan# 412
Delta R.T. 0.012 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 43 Resp: 58856

Ion	Ratio	Lower	Upper
43	100		
58	26.8	23.9	35.9



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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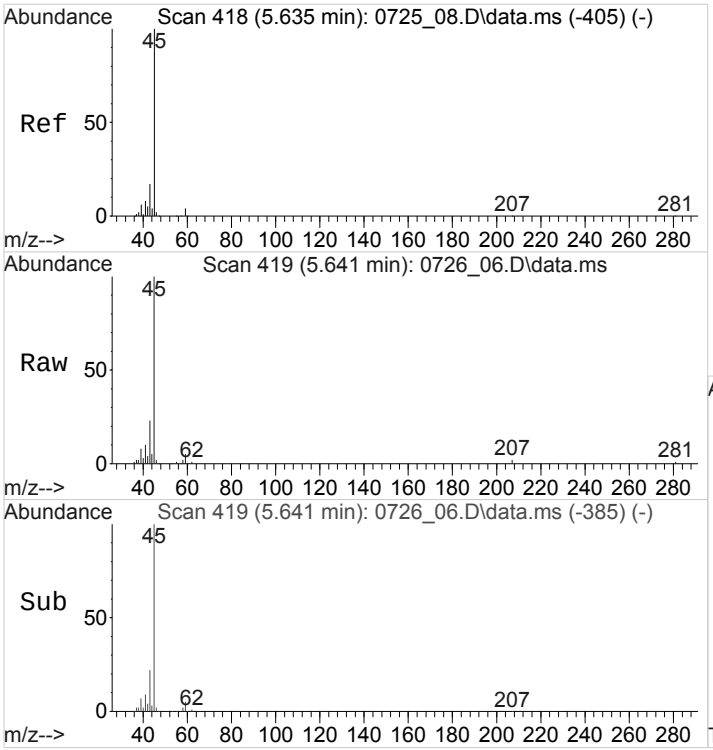
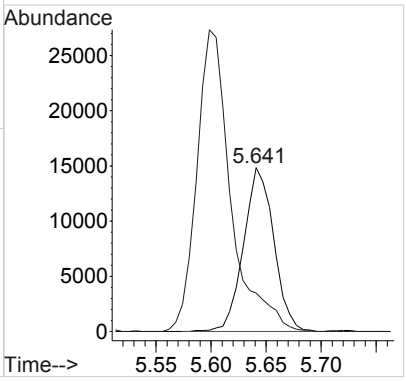
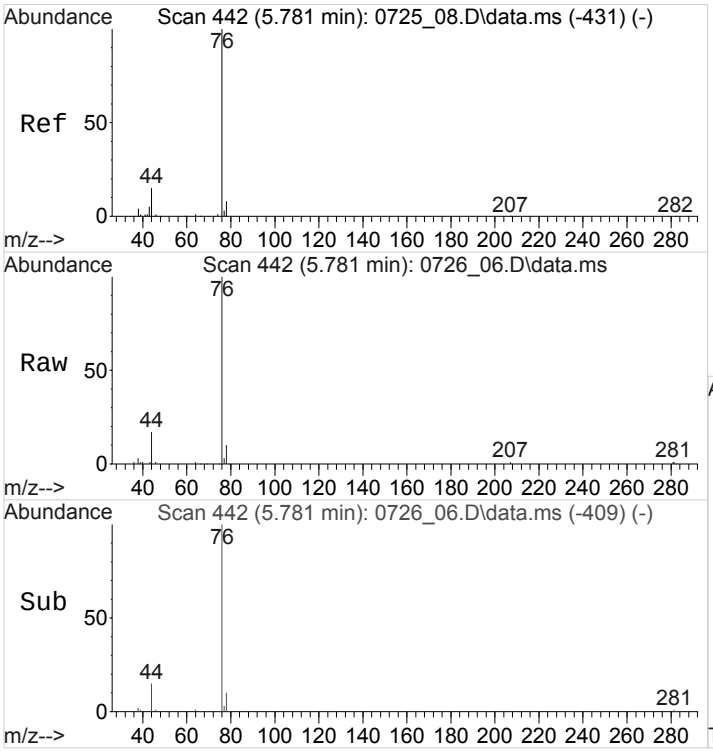


#23
2-Propanol
Concen: 1.0350568 ppbv
RT: 5.641 min Scan# 419
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 45 Resp: 28544

Ion	Ratio	Lower	Upper
45	100		
43	206.2	15.6	23.4#

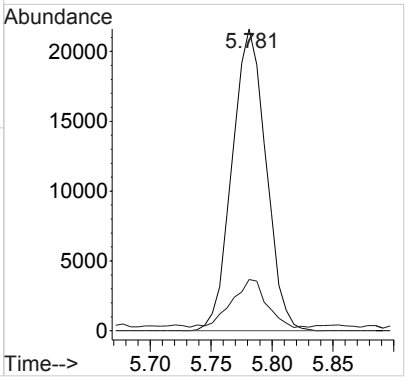


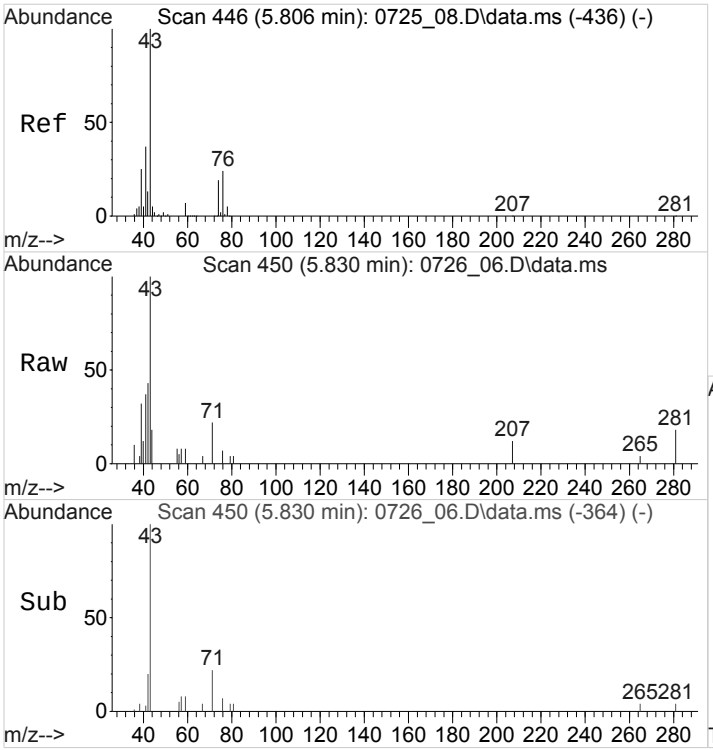


#24
Carbon Disulfide
Concen: 0.8092452 ppbv
RT: 5.781 min Scan# 442
Delta R.T. -0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 76 Resp: 41778

Ion	Ratio	Lower	Upper
76	100		
44	16.1	12.0	18.0

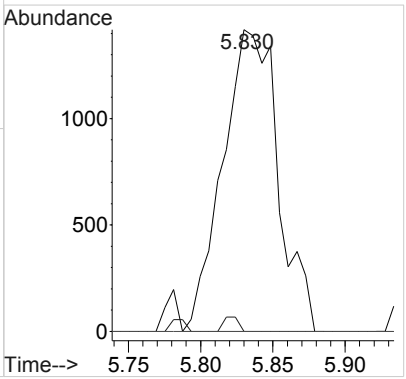


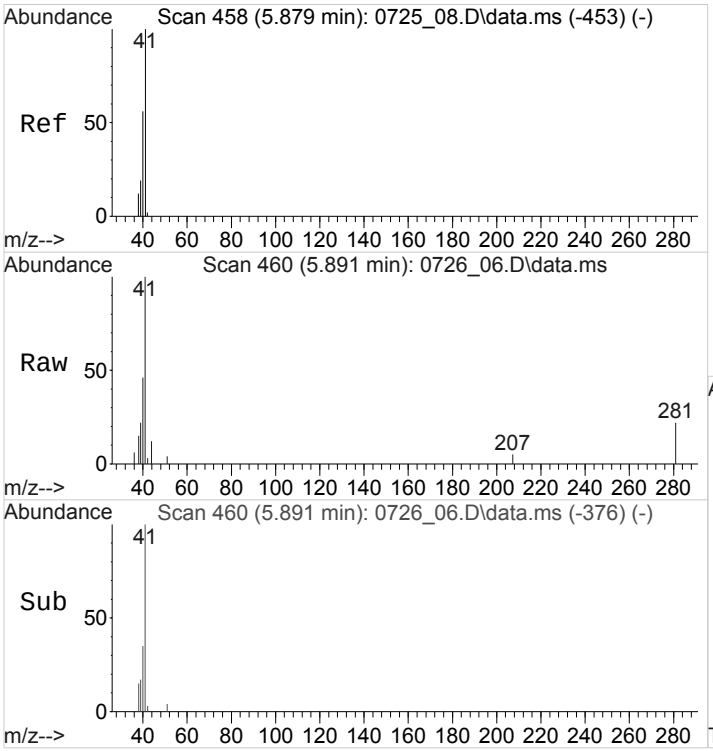


#26
METHYL ACETATE
Concen: 0.1221552 ppbv
RT: 5.830 min Scan# 450
Delta R.T. 0.024 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 43 Resp: 3773

Ion	Ratio	Lower	Upper
43	100		
74	1.3	15.7	23.5#
29	0.0	0.0	0.0

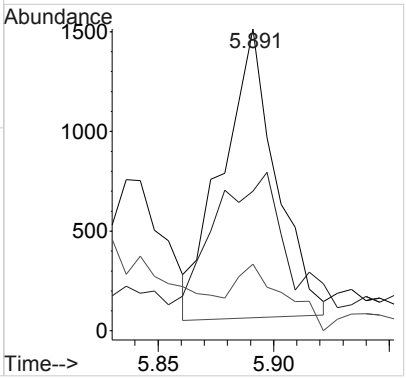


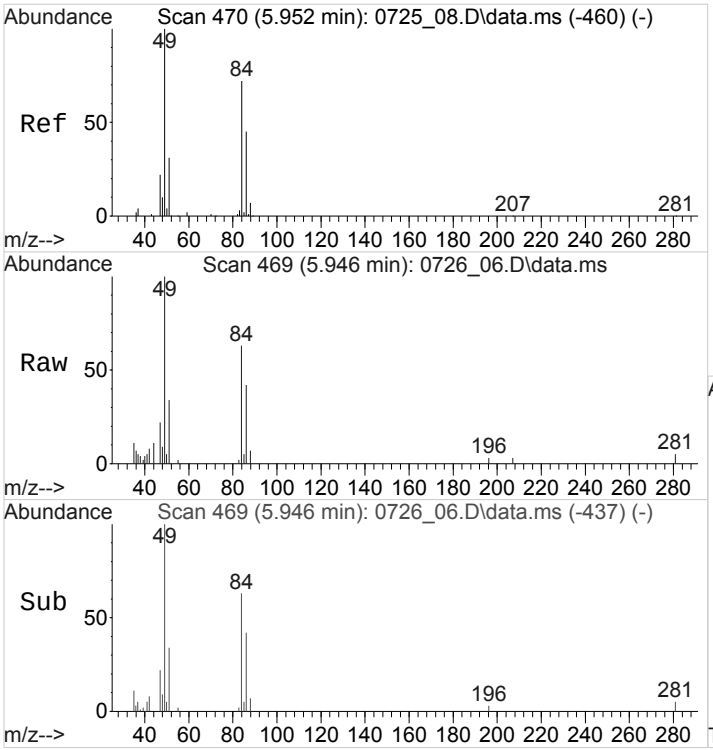


#27
ACETONITRILE
Concen: 0.1836131 ppbv
RT: 5.891 min Scan# 460
Delta R.T. 0.012 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 41 Resp: 2338

Ion	Ratio	Lower	Upper
41	100		
40	57.6	41.5	62.3
39	20.6	15.7	23.5

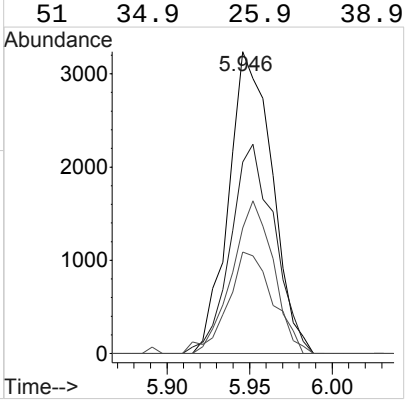


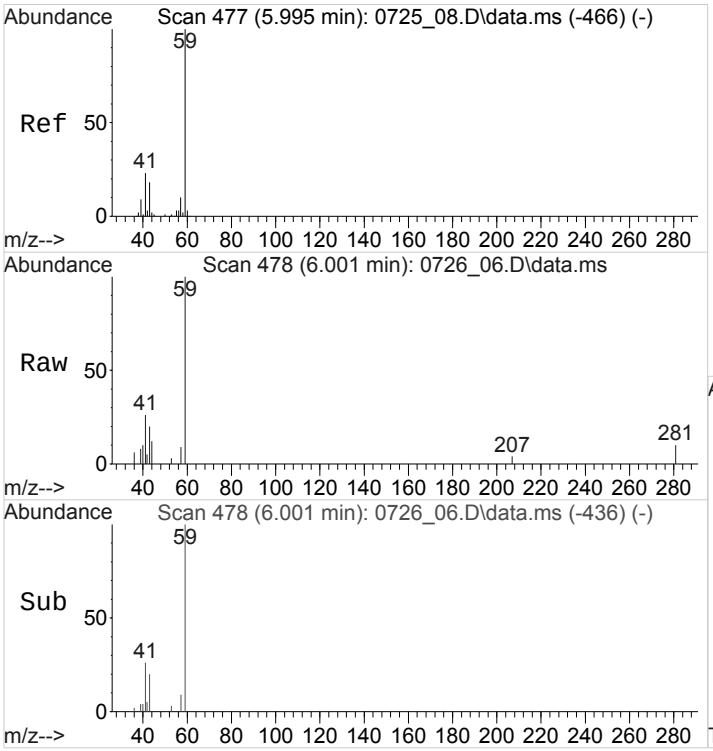


#28
Methylene Chloride
Concen: Below Cal
RT: 5.946 min Scan# 469
Delta R.T. -0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 49 Resp: 5941

Ion	Ratio	Lower	Upper
49	100		
84	69.7	55.8	83.8
86	47.8	36.6	55.0
51	34.9	25.9	38.9

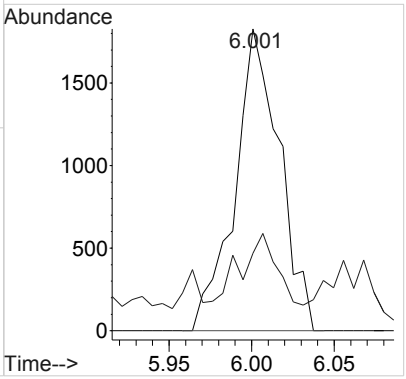


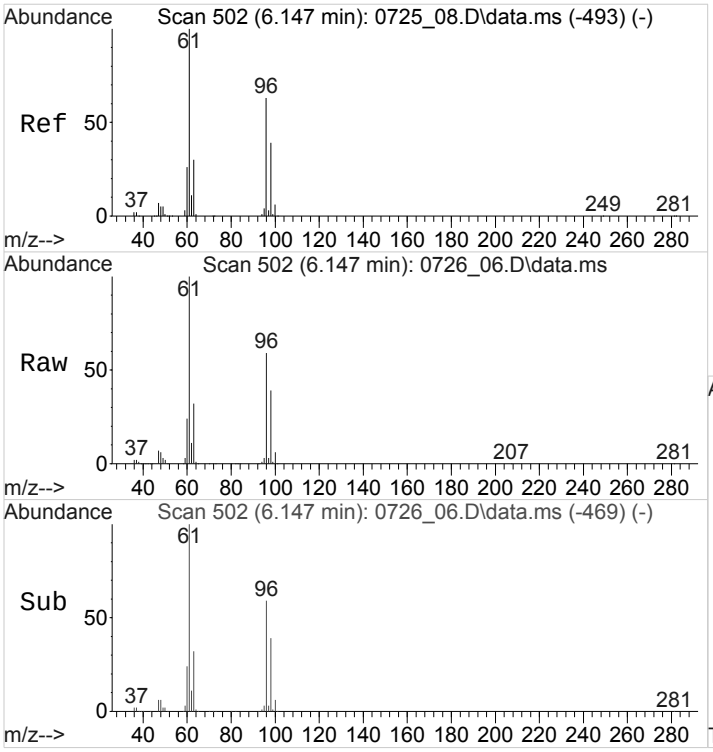


#29
TERT-BUTYL ALCOHOL
Concen: 0.1123289 ppbv
RT: 6.001 min Scan# 478
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 59 Resp: 3439

Ion	Ratio	Lower	Upper
59	100		
41	33.2	22.0	33.0#

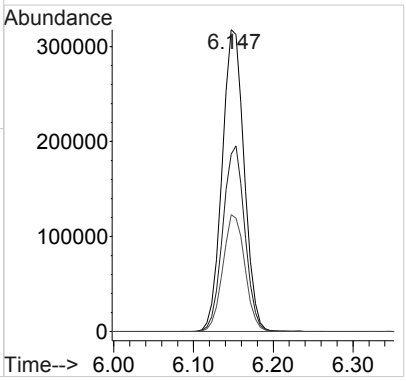


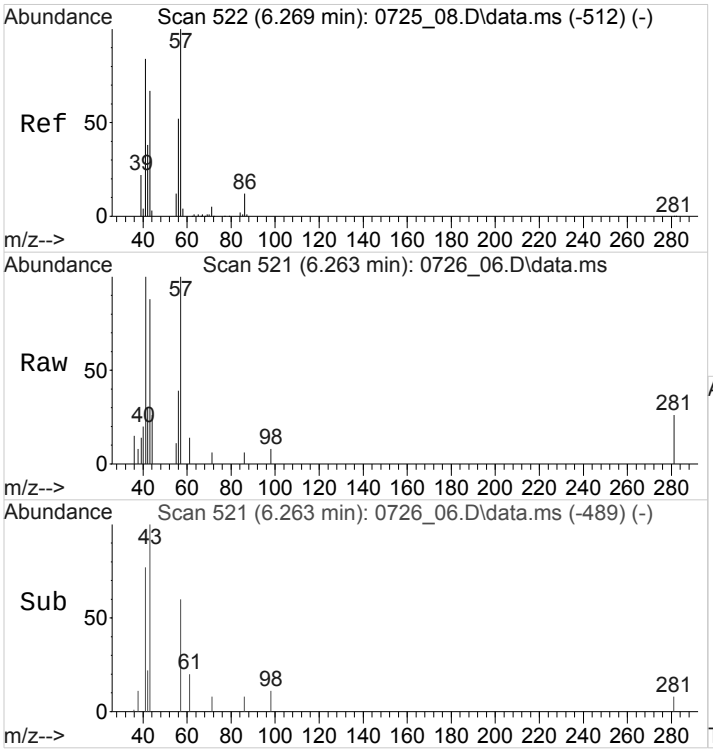


#31
Trans-1,2-Dichloroethene
Concen: 25.4231435 ppbv
RT: 6.147 min Scan# 502
Delta R.T. -0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 61 Resp: 609063

Ion	Ratio	Lower	Upper
61	100		
96	61.4	49.8	74.6
98	38.9	30.5	45.7

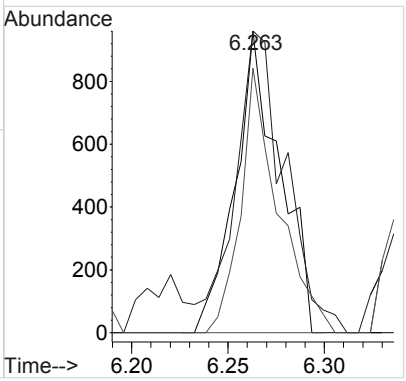


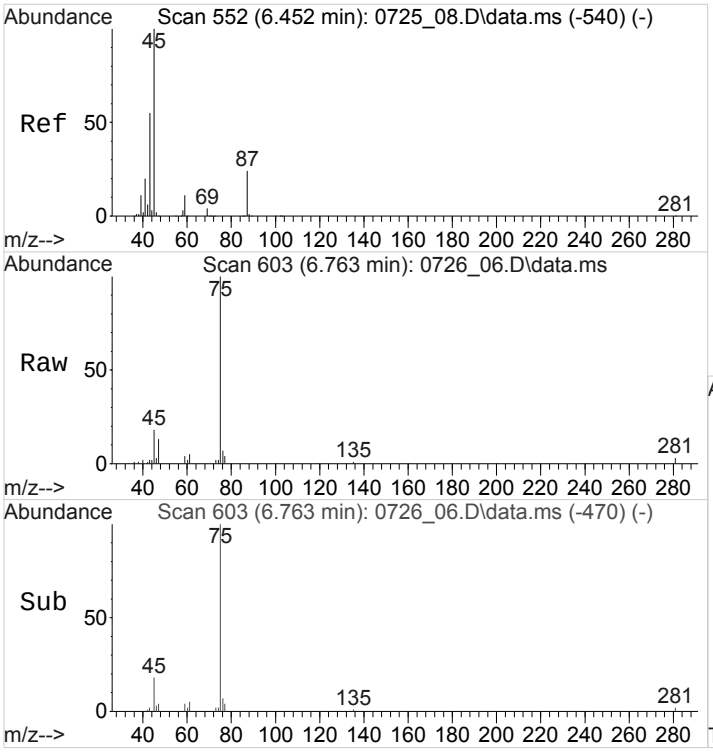


#33
n-Hexane
Concen: 0.0720928 ppbv
RT: 6.263 min Scan# 521
Delta R.T. -0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 57 Resp: 1535

Ion	Ratio	Lower	Upper
57	100		
41	111.9	68.5	102.7#
43	74.4	54.9	82.3

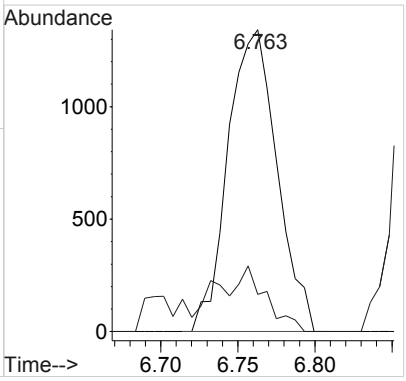


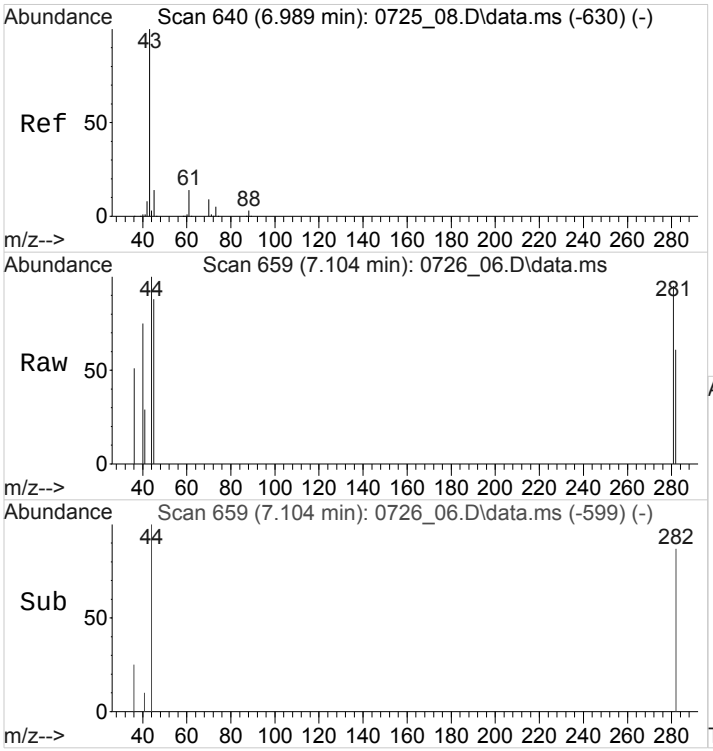


#36
DI-ISOPROPYL ETHER
Concen: 0.0665031 ppbv
RT: 6.763 min Scan# 603
Delta R.T. 0.311 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 45 Resp: 2974

Ion	Ratio	Lower	Upper
45	100		
43	12.6	39.9	59.9#

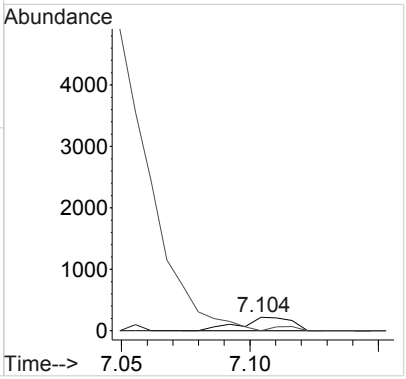


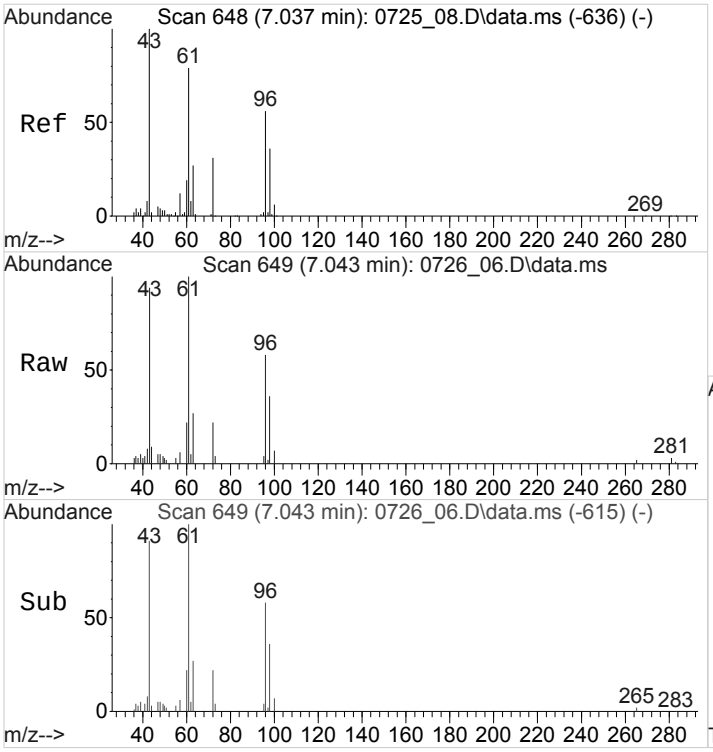


#38
ETHYL ACETATE
Concen: 0.0604628 ppbv
RT: 7.104 min Scan# 659
Delta R.T. 0.116 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 45 Resp: 306

Ion	Ratio	Lower	Upper
45	100		
70	0.0	52.4	78.6#
43	2947.4	566.5	849.7#

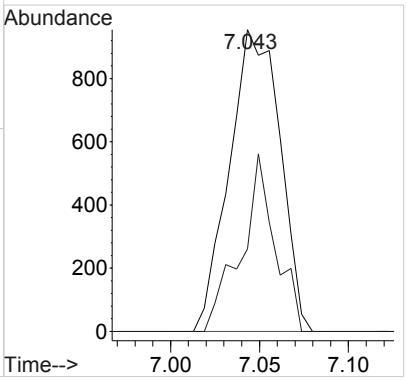


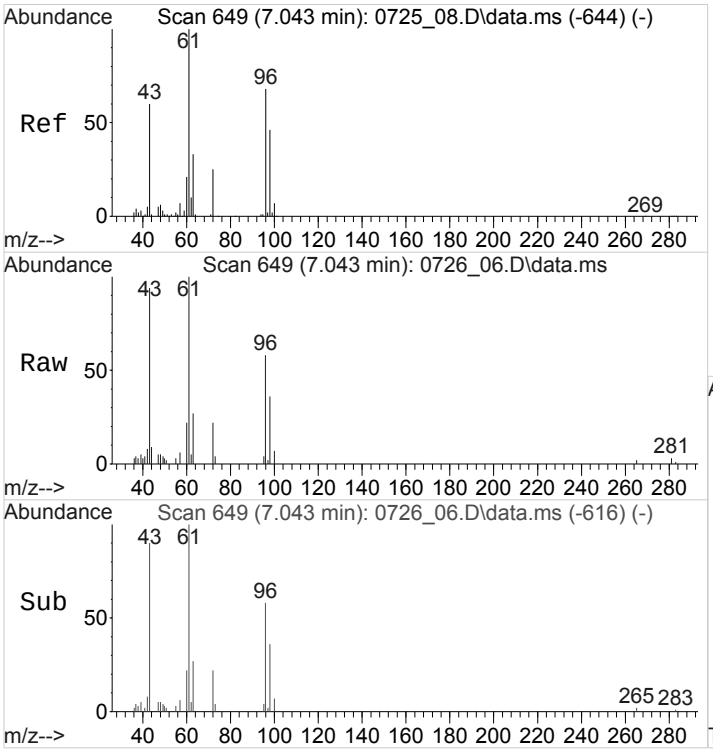


#39
2-Butanone (MEK)
Concen: 0.2596545 ppbv
RT: 7.043 min Scan# 649
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 72 Resp: 1888

Ion	Ratio	Lower	Upper
72	100		
57	39.6	28.6	42.8

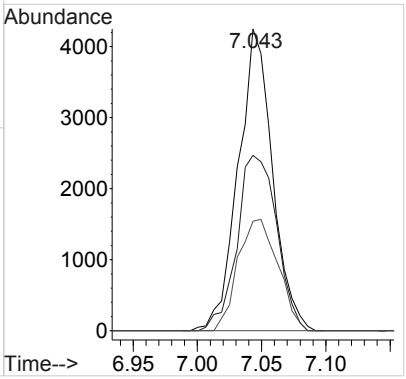


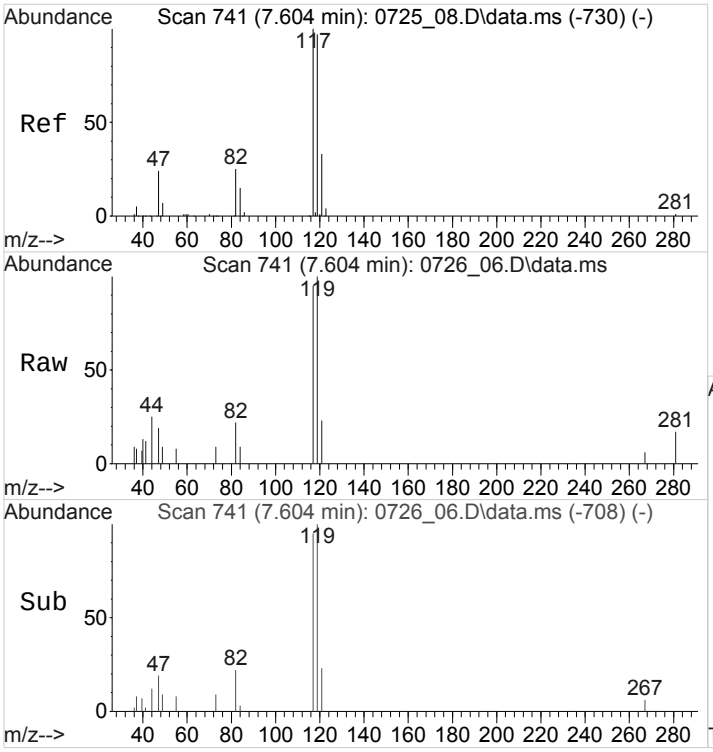


#40
cis-1,2-Dichloroethene
Concen: 0.3583921 ppbv
RT: 7.043 min Scan# 649
Delta R.T. -0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 61 Resp: 7898

Ion	Ratio	Lower	Upper
61	100		
96	67.3	55.3	82.9
98	43.1	35.4	53.2

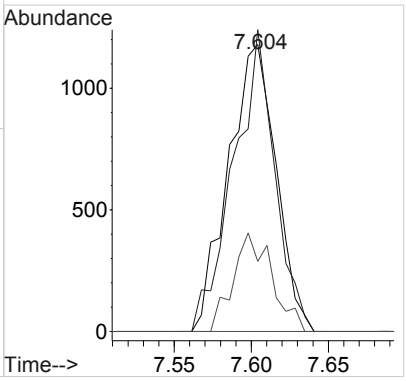


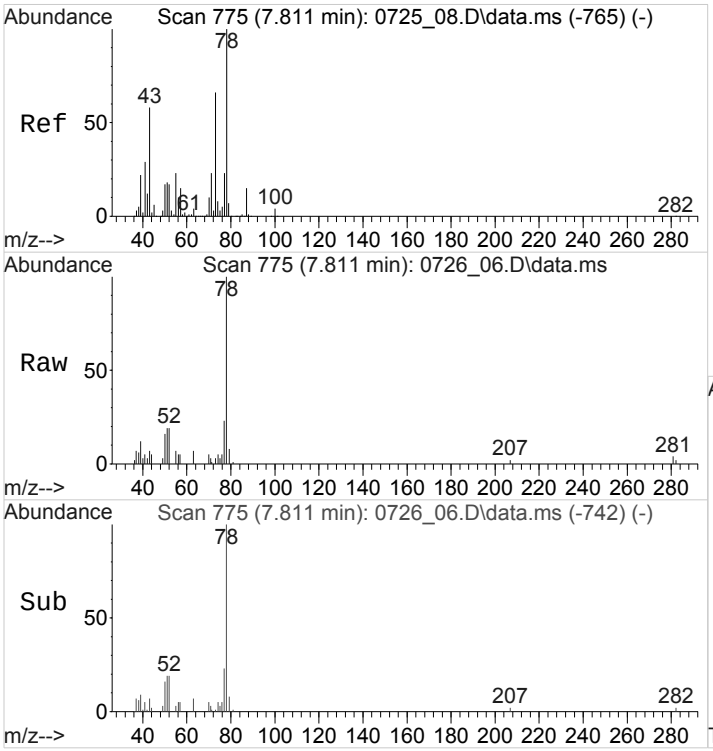


#45
Carbon Tetrachloride
Concen: 0.0723684 ppbv
RT: 7.604 min Scan# 741
Delta R.T. -0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion:117 Resp: 2533

Ion	Ratio	Lower	Upper
117	100		
119	91.0	77.2	115.8
121	28.1	24.6	36.8

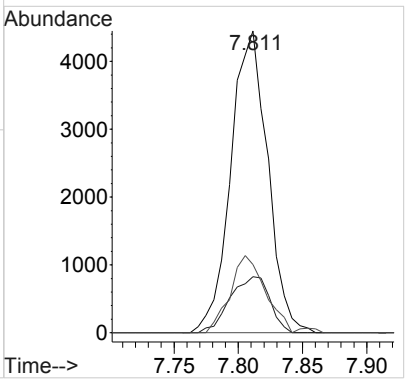


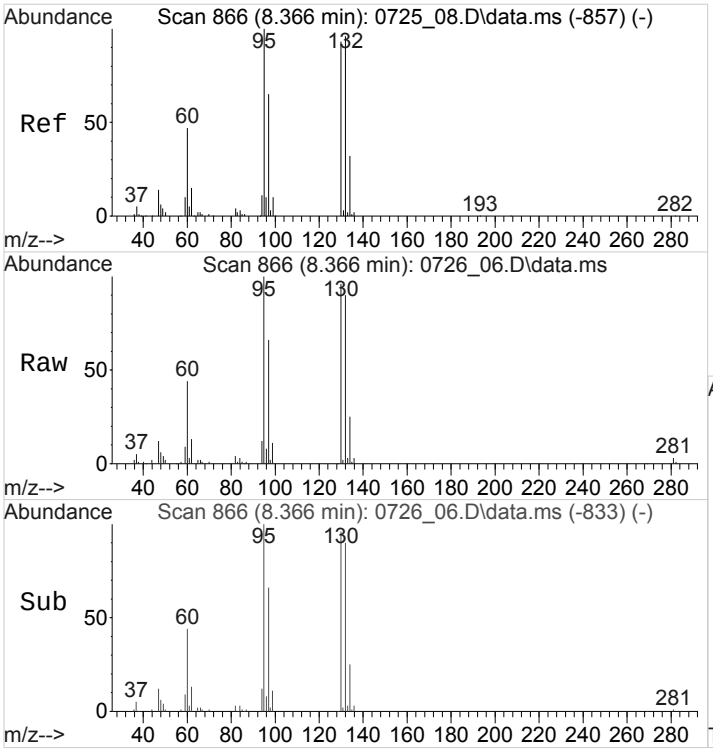


#48
Benzene
Concen: 0.1913632 ppbv
RT: 7.811 min Scan# 775
Delta R.T. -0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 78 Resp: 8879

Ion	Ratio	Lower	Upper
78	100		
51	20.0	16.3	24.5
77	24.7	18.4	27.6

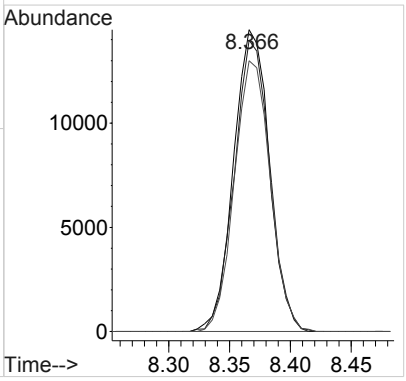


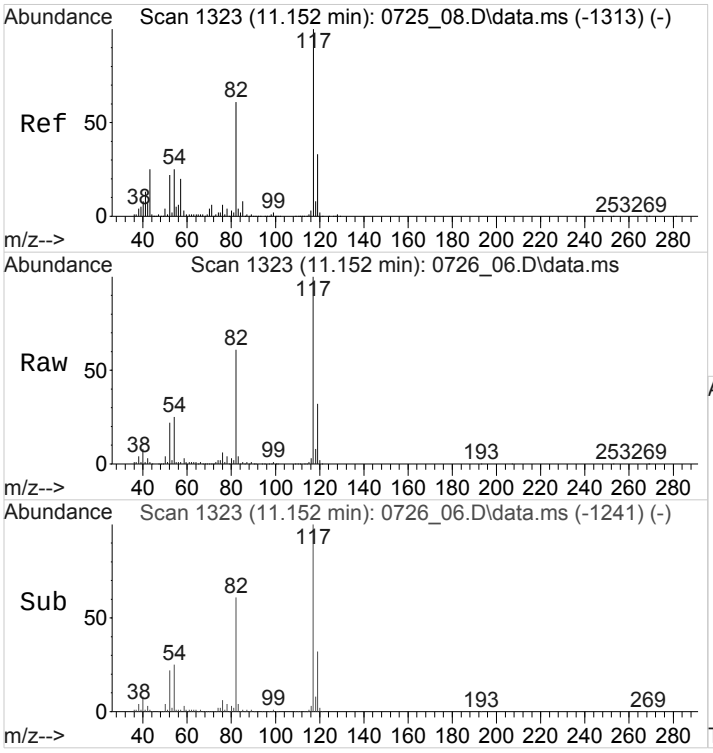


#52
Trichloroethene
Concen: 1.4484224 ppbv
RT: 8.366 min Scan# 866
Delta R.T. -0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 95 Resp: 29582

Ion	Ratio	Lower	Upper
95	100		
130	95.9	78.1	117.1
132	89.9	74.8	112.2

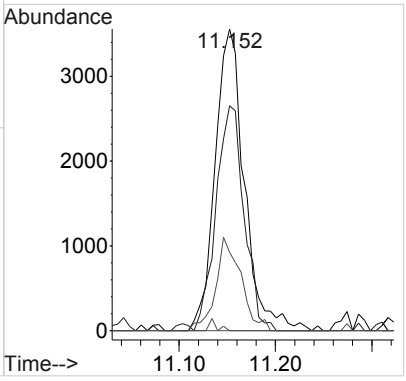




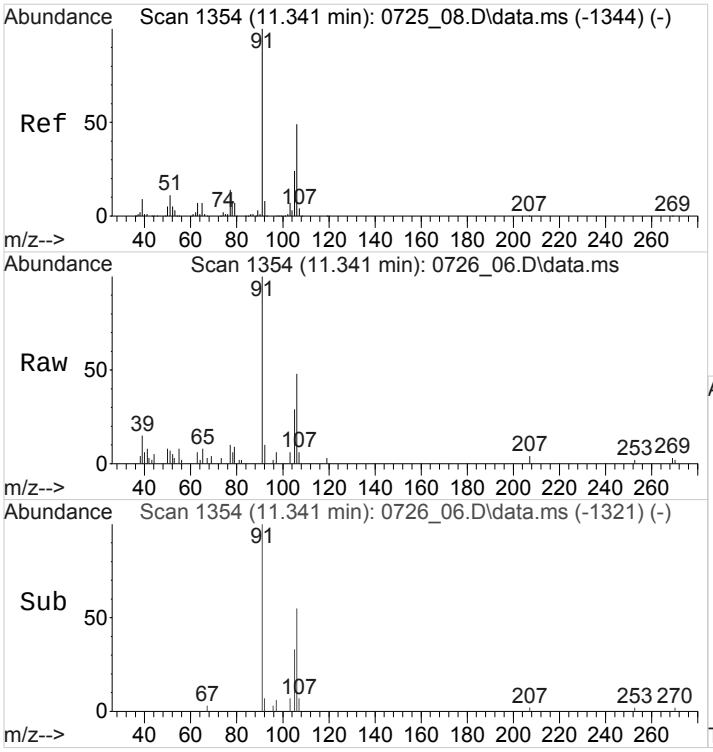
#70
NONANE
Concen: 0.1655084 ppbv
RT: 11.152 min Scan# 1323
Delta R.T. -0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 43 Resp: 7550

Ion	Ratio	Lower	Upper
43	100		
57	71.3	65.4	98.0
71	26.5	18.3	27.5
128	1.0	2.5	3.7#



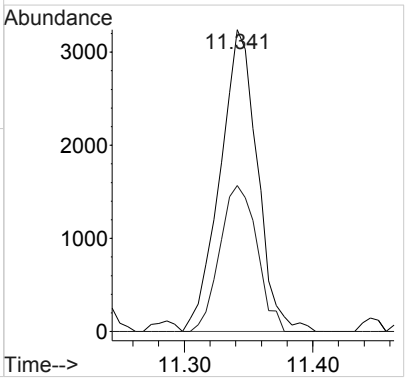
ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	43 of 377

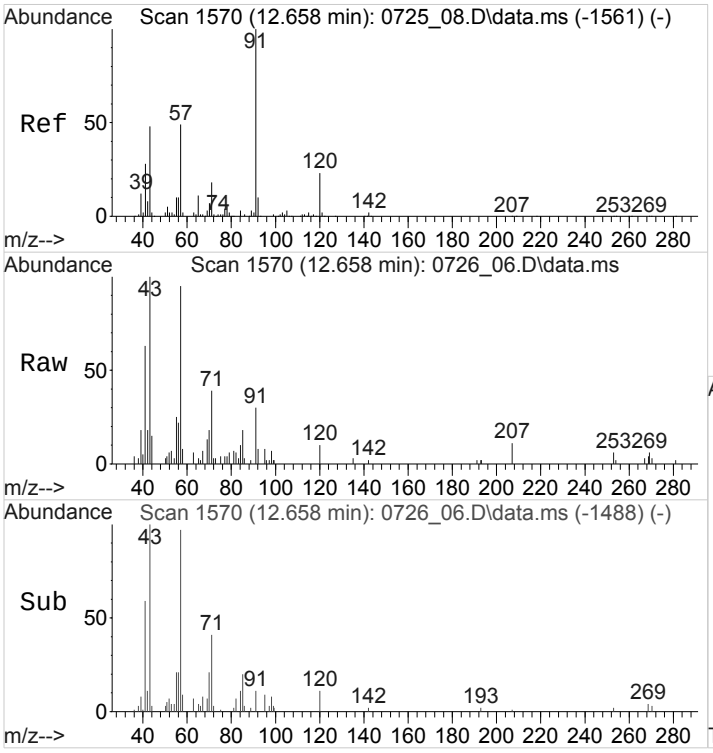


#73
M&P-Xylene
Concen: 0.1230314 ppbv
RT: 11.341 min Scan# 1354
Delta R.T. -0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 91 Resp: 6553

Ion	Ratio	Lower	Upper
91	100		
106	48.1	38.6	58.0

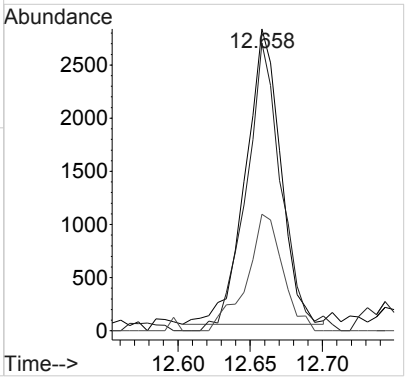




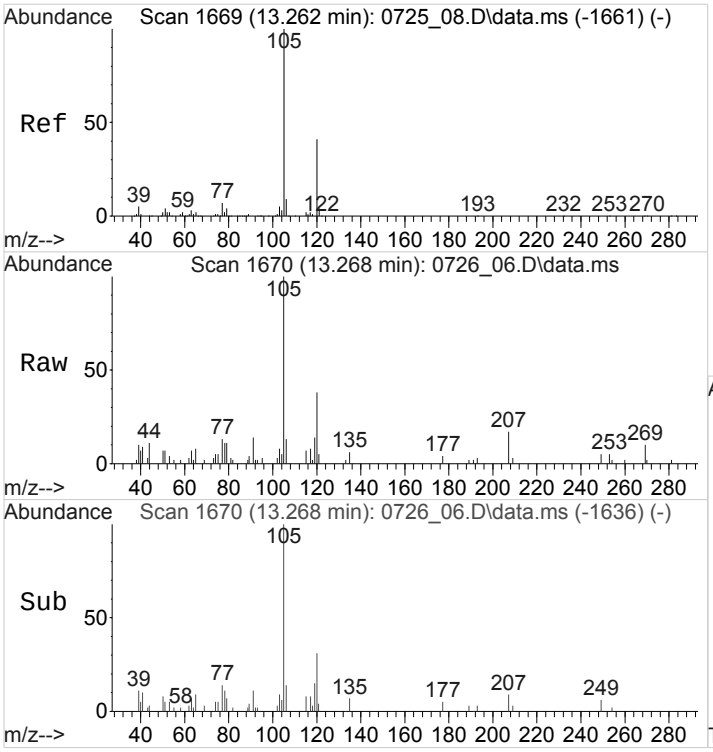
#80
n-DECANE
Concen: 0.0959548 ppbv
RT: 12.658 min Scan# 1570
Delta R.T. -0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion: 43 Resp: 4693

Ion	Ratio	Lower	Upper
43	100		
57	98.1	80.0	120.0
71	40.3	30.4	45.6



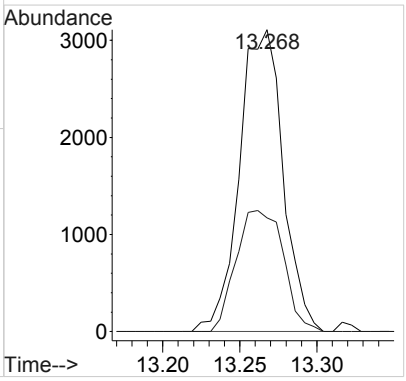
ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	44 of 377

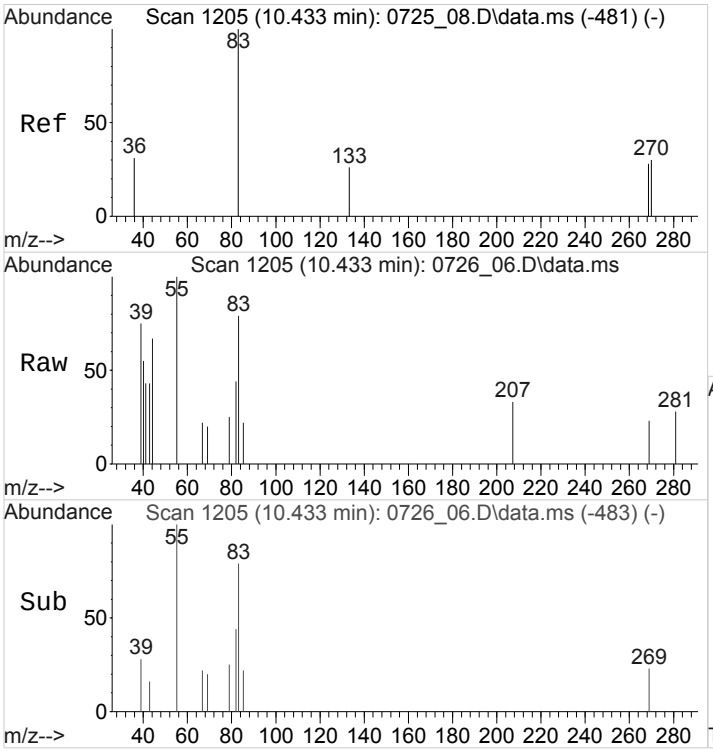


#88
1,2,4-Trimethylbenzene
Concen: 0.0832880 ppbv
RT: 13.268 min Scan# 1670
Delta R.T. 0.006 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion:105 Resp: 6101

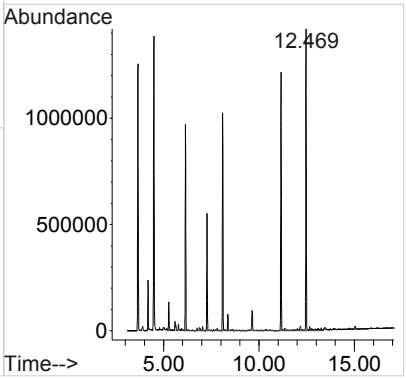
Ion	Ratio	Lower	Upper
105	100		
120	43.7	36.1	54.1



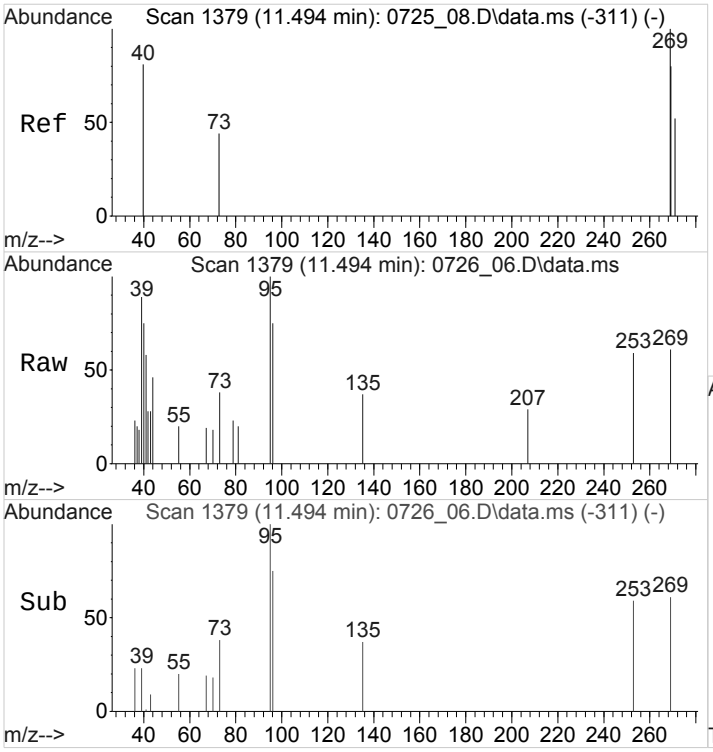


#101
TPH (GC/MS) Low Fraction
Concen: 32.1789857 ppbv m
RT: 10.430 min Scan# 1205
Delta R.T. 0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion:TIC Resp: 3831965

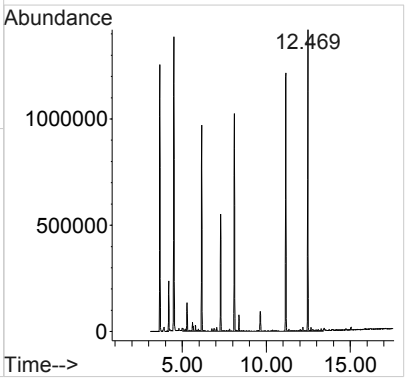


ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	45 of 377



#102
TPH-GRO (C5-C10)
Concen: 45.9553588 ppbv m
RT: 11.493 min Scan# 1379
Delta R.T. 0.000 min
Lab File: 0726_06.D
Acq: 26 Jul 2022 11:37 am

Tgt Ion:TIC Resp: 4460897



SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-AMB02-0220722

Lab Sample ID:	L1518164-02	**SDG:**	L1518164
Client Sample ID:	CRCA-AMB02-0220722	**Collected Date/Time:**	07/22/22 15:50
Lab File ID:	0726_07	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 12:18
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 12:18
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
Acetone	67-64-1	5.60	4.87	J	1.39	2.85	5.70
Allyl Chloride	107-05-1	0	0.783	U	0.357	0.783	1.57
Benzene	71-43-2	0	0.479	U	0.228	0.479	0.958
Benzyl Chloride	100-44-7	0	0.675	U	0.311	0.675	1.56
Bromodichloromethane	75-27-4	0	1.01	U	0.471	1.01	2.01
Bromoform	75-25-2	0	3.21	U	0.757	3.21	6.21
Bromomethane	74-83-9	0	0.776	U	0.381	0.776	1.55
1,3-Butadiene	106-99-0	0	1.39	U	0.230	1.39	4.43
Carbon disulfide	75-15-0	0	0.778	U	0.317	0.778	1.56
Carbon tetrachloride	56-23-5	7.60	0.945	U	0.461	0.945	1.89
Chlorobenzene	108-90-7	0	0.924	U	0.385	0.924	1.85
Chloroethane	75-00-3	0	0.528	U	0.263	0.528	1.06
Chloroform	67-66-3	0	0.730	U	0.349	0.730	1.46
Chloromethane	74-87-3	4.17	1.12		0.213	0.516	1.03
2-Chlorotoluene	95-49-8	0	1.03	U	0.427	1.03	2.06
Cyclohexane	110-82-7	0	0.689	U	0.259	0.689	1.38
Dibromochloromethane	124-48-1	0	1.28	U	0.618	1.28	2.55
1,2-Dibromoethane	106-93-4	0	1.15	U	0.554	1.15	2.31
1,2-Dichlorobenzene	95-50-1	0	1.80	U	0.770	1.80	3.61
1,3-Dichlorobenzene	541-73-1	0	2.40	U	1.09	2.40	4.81
1,4-Dichlorobenzene	106-46-7	0	0.782	U	0.335	0.782	1.80
1,2-Dichloroethane	107-06-2	0	0.607	U	0.283	0.607	1.21
1,1-Dichloroethane	75-34-3	0	0.601	U	0.290	0.601	1.20
1,1-Dichloroethene	75-35-4	0	0.793	U	0.302	0.793	1.59
cis-1,2-Dichloroethene	156-59-2	0	0.793	U	0.311	0.793	1.59
trans-1,2-Dichloroethene	156-60-5	6.15	0.277	J	0.267	0.594	1.19
1,2-Dichloropropane	78-87-5	0	0.924	U	0.351	0.924	1.85
cis-1,3-Dichloropropene	10061-01-5	0	0.681	U	0.313	0.681	1.36
trans-1,3-Dichloropropene	10061-02-6	0	0.681	U	0.331	0.681	1.36
1,4-Dioxane	123-91-1	0	0.721	U	0.300	0.721	1.44
Ethanol	64-17-5	5.17	3.17	B	0.500	1.19	2.45
Ethylbenzene	100-41-4	0	0.867	U	0.362	0.867	1.73
4-Ethyltoluene	622-96-8	0	0.982	U	0.384	0.982	1.96
Trichlorofluoromethane	75-69-4	4.99	1.10	J	0.460	0.983	1.97
Dichlorodifluoromethane	75-71-8	3.90	1.55	J	0.678	1.48	2.97
1,1,2-Trichlorotrifluoroethane	76-13-1	5.42	1.53	U	0.608	1.53	3.07
1,2-Dichlorotetrafluoroethane	76-14-2	0	1.40	U	0.622	1.40	2.80
Heptane	142-82-5	0	1.02	U	0.425	1.02	2.04
Hexachloro-1,3-butadiene	87-68-3	0	2.67	U	1.12	2.67	6.73
n-Hexane	110-54-3	0	1.76	U	0.726	1.76	3.53
Isopropylbenzene	98-82-8	0	0.983	U	0.382	0.983	1.97
Methylene Chloride	75-09-2	0	0.694	U	0.340	0.694	1.39
Methyl Butyl Ketone	591-78-6	0	1.23	U	0.544	1.23	5.11

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

Lab Sample ID:	L1518164-02	**SDG:**	L1518164
Client Sample ID:	CRCA-AMB02-0220722	**Collected Date/Time:**	07/22/22 15:50
Lab File ID:	0726_07	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 12:18
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 12:18
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
2-Butanone (MEK)	78-93-3	7.05	0.525	J	0.240	0.560	3.69
4-Methyl-2-pentanone (MIBK)	108-10-1	0	0.778	U	0.313	0.778	5.12
Methyl Methacrylate	80-62-6	0	0.819	U	0.359	0.819	1.64
MTBE	1634-04-4	0	0.468	U	0.233	0.468	1.08
Naphthalene	91-20-3	0	3.66	U	1.83	3.66	7.33
2-Propanol	67-63-0	5.64	1.54	J	0.649	1.54	3.07
Propene	115-07-1	3.86	0.210	J	0.160	1.08	2.15
Styrene	100-42-5	0	0.851	U	0.335	0.851	1.70
1,1,2,2-Tetrachloroethane	79-34-5	0	1.03	U	0.511	1.03	2.06
Tetrachloroethylene	127-18-4	0	1.36	U	0.553	1.36	2.72
Tetrahydrofuran	109-99-9	0	0.442	U	0.216	0.442	0.885
Toluene	108-88-3	9.62	0.942	U	0.328	0.942	1.88
1,2,4-Trichlorobenzene	120-82-1	0	2.29	U	1.10	2.29	4.66
1,1,1-Trichloroethane	71-55-6	0	0.816	U	0.400	0.816	1.63
1,1,2-Trichloroethane	79-00-5	0	1.09	U	0.422	1.09	2.18
Trichloroethylene	79-01-6	8.38	0.804	U	0.364	0.804	1.61
1,2,4-Trimethylbenzene	95-63-6	0	0.982	U	0.375	0.982	1.96
1,3,5-Trimethylbenzene	108-67-8	0	0.982	U	0.382	0.982	1.96
2,2,4-Trimethylpentane	540-84-1	0	1.40	U	0.621	1.40	2.80
Vinyl chloride	75-01-4	0	0.511	U	0.243	0.511	1.02
Vinyl Bromide	593-60-2	0	0.875	U	0.373	0.875	1.75
Vinyl acetate	108-05-4	0	0.880	U	0.408	0.880	1.76
m&p-Xylene	1330-20-7	0	1.30	U	0.585	1.30	2.60
o-Xylene	95-47-6	0	0.759	U	0.359	0.759	1.52

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_07.D
Acq On : 26 Jul 2022 12:18 pm
Operator :
Sample : L1518164-02 1x WG1900825
Misc :
ALS Vial : 7 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 13:56:34 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

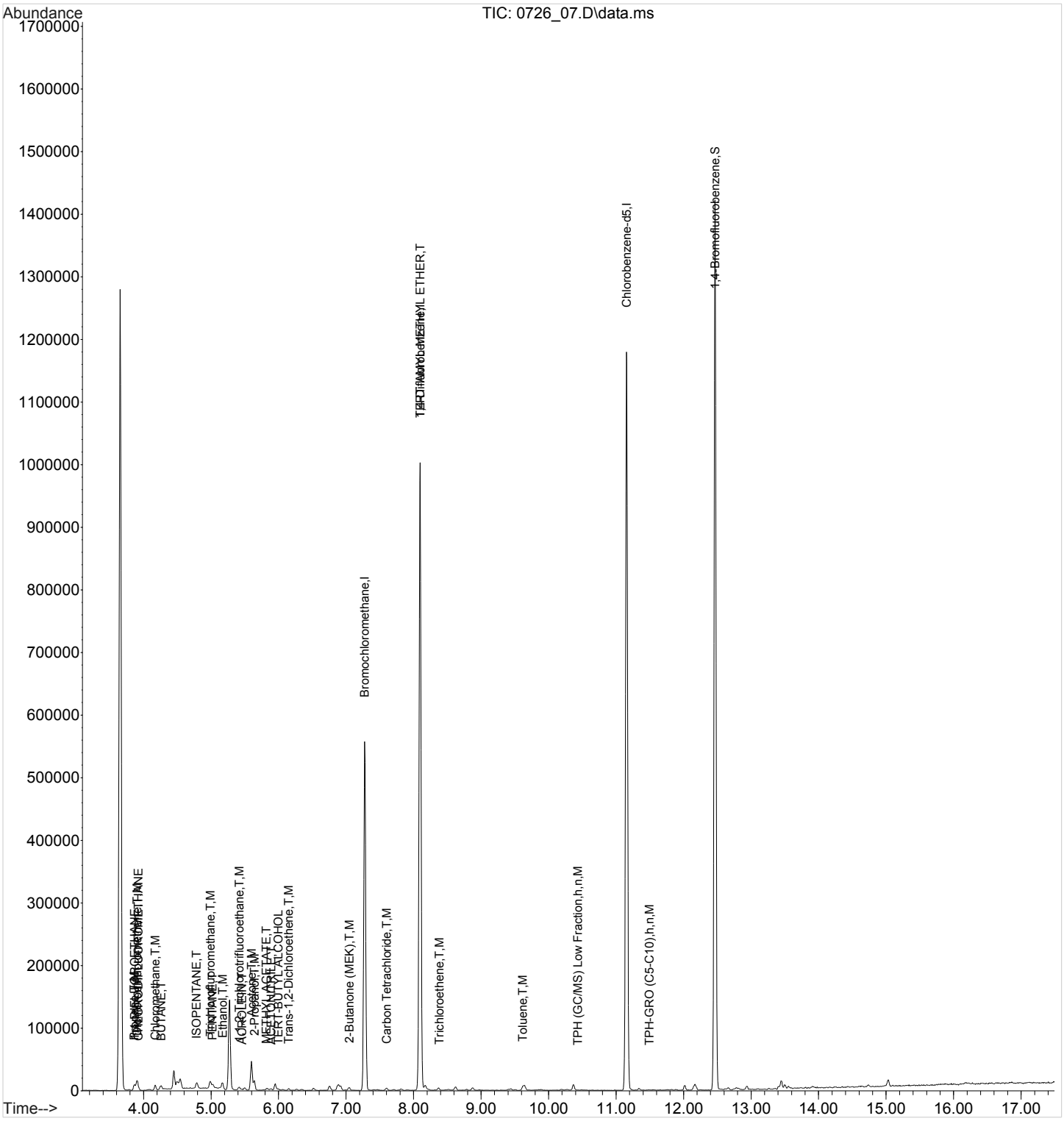
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	7.275	130	196912	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	8.098	114	823347	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	11.152	117	754558	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	12.463	95	541004	3.9053951	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 97.63%			
Target Compounds						Qvalue
2) Propene	3.861	41	1624	0.1223080	ppbv #	78
3) BUTANE	4.257	43	4150	0.1065412	ppbv	100
4) 1,1-DIFLUOROETHANE	3.867	65	2419	0.2598301	ppbv	100
5) Dichlorodifluoromethane	3.904	85	10823	0.3136661	ppbv	98
6) CHLORODIFLUOROMETHANE	3.922	67	1025	0.2448244	ppbv	92
8) Chloromethane	4.172	50	7573	0.5420409	ppbv	94
13) ISOPENTANE	4.782	43	4330	0.2659639	ppbv	92
15) Trichlorofluoromethane	4.989	101	8784	0.1961894	ppbv	96
16) PENTANE	5.019	43	4315	0.1715154	ppbv	98
17) Ethanol	5.172	45	11223	1.6788663	ppbv	96
18) ACROLEIN	5.458	56	1114	0.1665622	ppbv #	73
19) 1,1,2-Trichlorotrifluo...	5.416	101	2246	0.0695203	ppbv	95
21) Acetone	5.599	43	57718	2.0506152	ppbv	97
23) 2-Propanol	5.641	45	17039	0.6255398	ppbv #	1
26) METHYL ACETATE	5.818	43	3184	0.1043662	ppbv #	77
27) ACETONITRILE	5.891	41	2425	0.1928112	ppbv #	82
28) Methylene Chloride	5.946	49	5801	Below Cal		98
29) TERT-BUTYL ALCOHOL	5.995	59	2081	0.0688166	ppbv #	71
31) Trans-1,2-Dichloroethene	6.147	61	1651	0.0697711	ppbv	97
39) 2-Butanone (MEK)	7.050	72	1275	0.1775275	ppbv	93
45) Carbon Tetrachloride	7.598	117	2494	0.0721392	ppbv	94
49) TERT-AMYL METHYL ETHER	8.098	73	11093	0.2622281	ppbv #	22
52) Trichloroethene	8.379	95	1301	0.0649146	ppbv	96
62) Toluene	9.616	91	3537	0.0642770	ppbv	96
101) TPH (GC/MS) Low Fraction	10.430	TIC	955043m	8.1427675	ppbv	
102) TPH-GRO (C5-C10)	11.493	TIC	1542516m	16.1339987	ppbv	

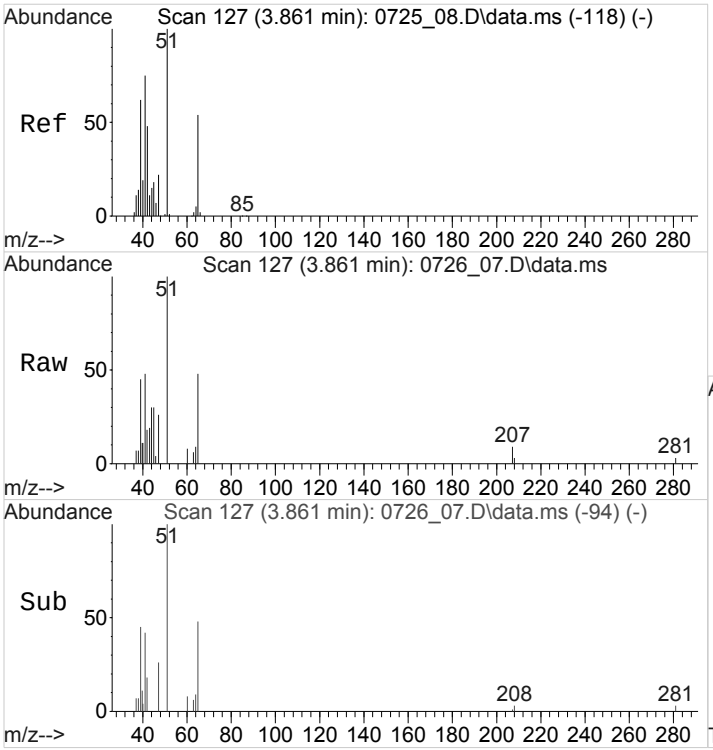
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_07.D
Acq On : 26 Jul 2022 12:18 pm
Operator :
Sample : L1518164-02 1x WG1900825
Misc :
ALS Vial : 7 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 13:56:34 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

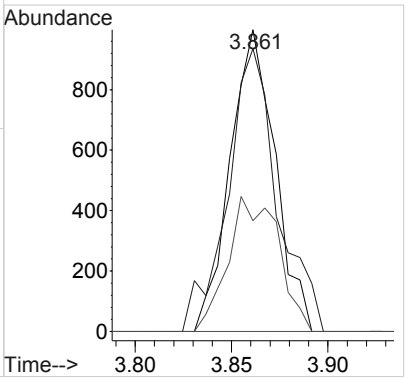


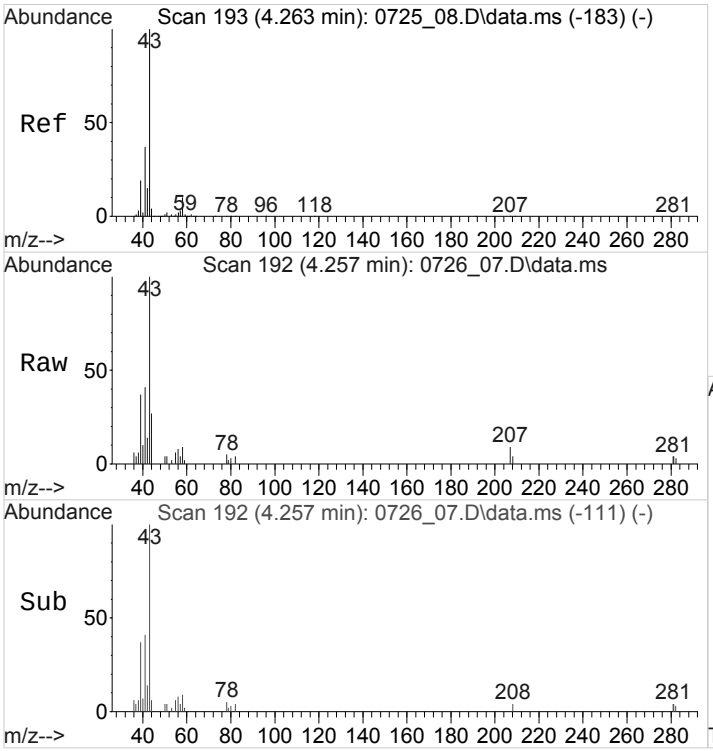


#2
Propene
Concen: 0.1223080 ppbv
RT: 3.861 min Scan# 127
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 41 Resp: 1624

Ion	Ratio	Lower	Upper
41	100		
39	103.9	66.1	99.1#
42	50.0	52.8	79.2#

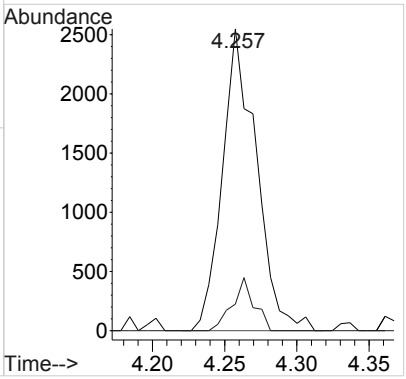


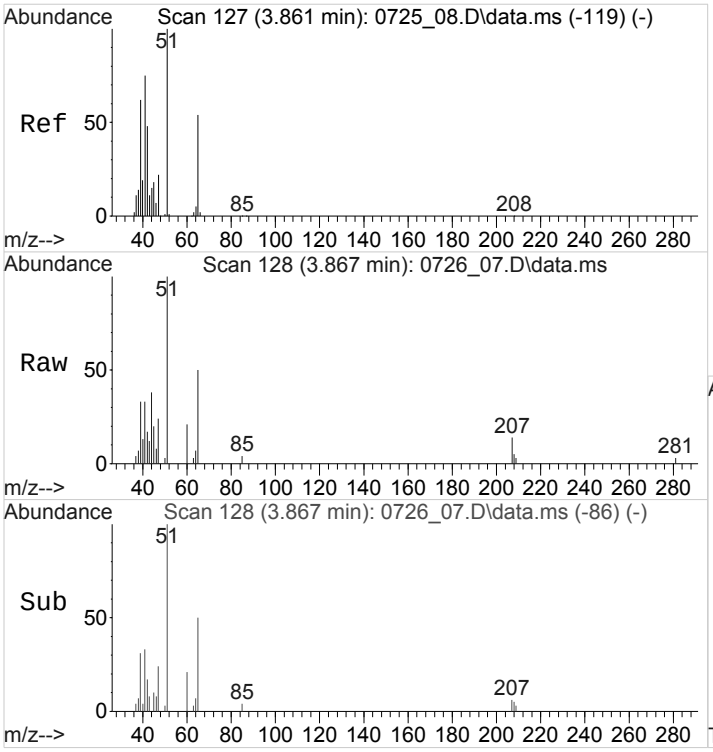


#3
BUTANE
Concen: 0.1065412 ppbv
RT: 4.257 min Scan# 192
Delta R.T. -0.006 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 43 Resp: 4150

Ion	Ratio	Lower	Upper
43	100		
58	11.3	9.0	13.4

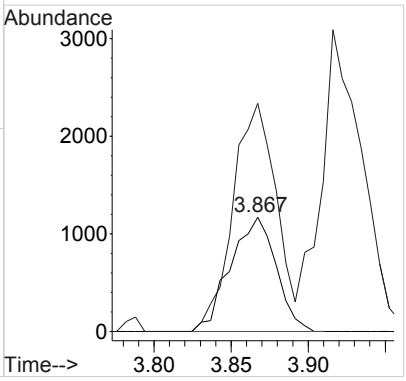


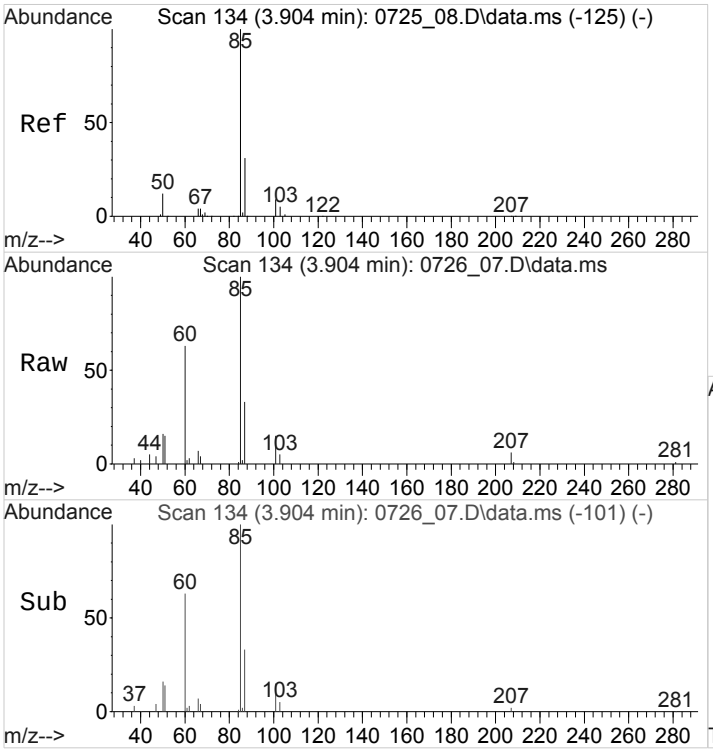


#4
1,1-DIFLUOROETHANE
Concen: 0.2598301 ppbv
RT: 3.867 min Scan# 128
Delta R.T. 0.006 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 65 Resp: 2419

Ion	Ratio	Lower	Upper
65	100		
51	188.9	151.1	226.7

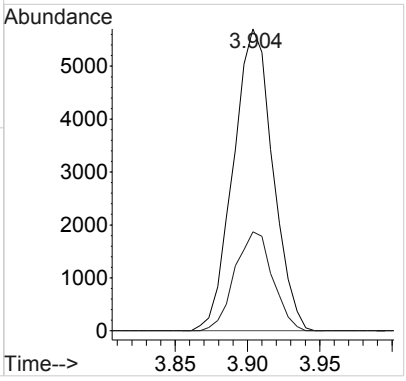




#5
Dichlorodifluoromethane
Concen: 0.3136661 ppbv
RT: 3.904 min Scan# 134
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 85 Resp: 10823

Ion	Ratio	Lower	Upper
85	100		
87	31.3	25.8	38.8



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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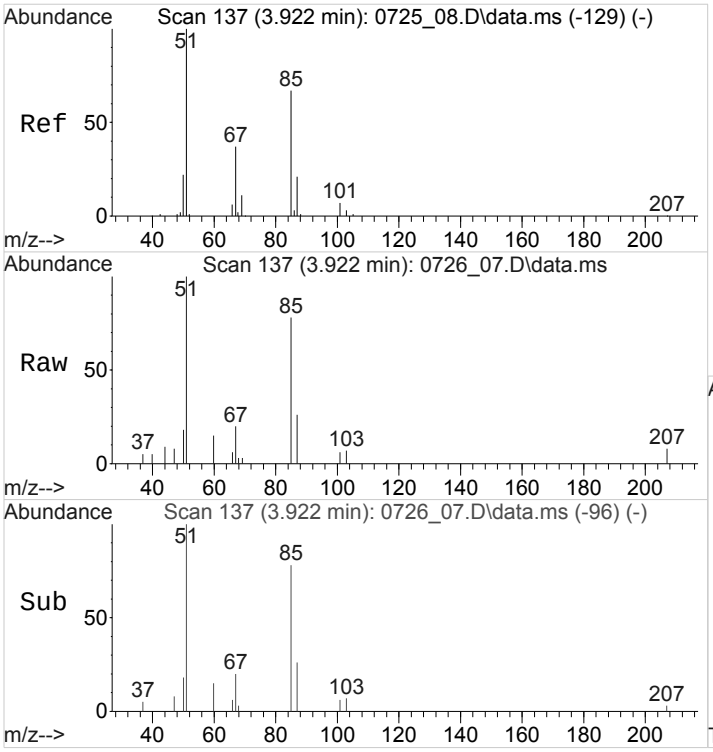
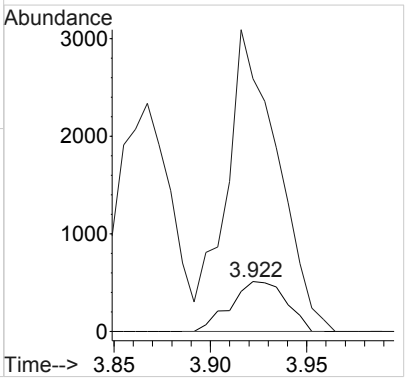
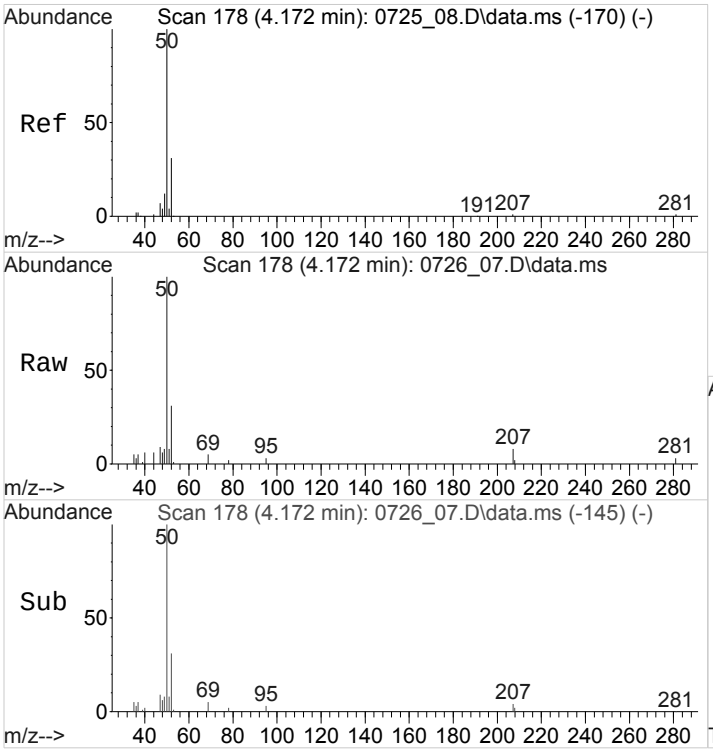


#6
CHLORODIFLUOROMETHANE
Concen: 0.2448244 ppbv
RT: 3.922 min Scan# 137
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 67 Resp: 1025

Ion	Ratio	Lower	Upper
67	100		
51	553.7	463.4	695.0

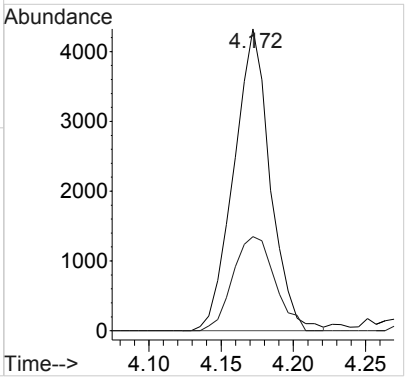




#8
Chloromethane
Concen: 0.5420409 ppbv
RT: 4.172 min Scan# 178
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 50 Resp: 7573

Ion	Ratio	Lower	Upper
50	100		
52	35.8	25.8	38.8



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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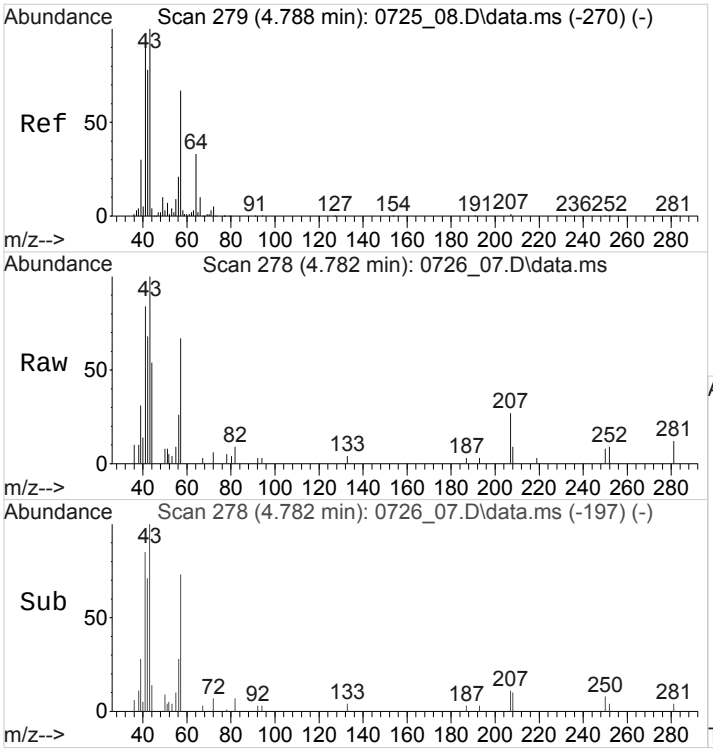
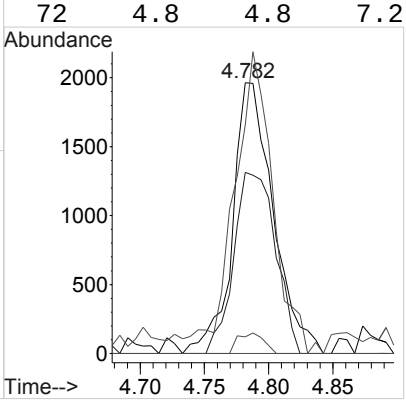
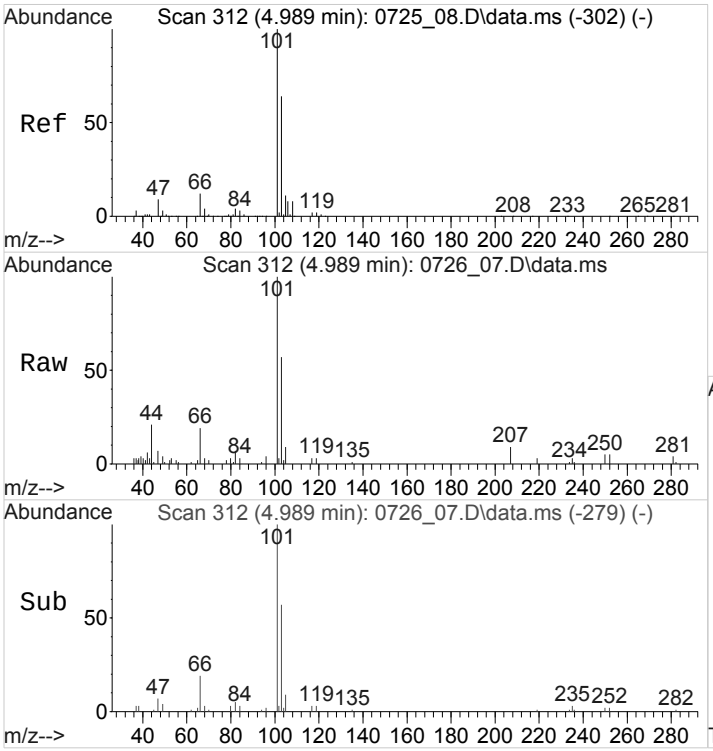


#13
ISOPENTANE
Concen: 0.2659639 ppbv
RT: 4.782 min Scan# 278
Delta R.T. -0.006 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 43 Resp: 4330

Ion	Ratio	Lower	Upper
43	100		
57	68.7	56.3	84.5
41	108.7	77.0	115.4
72	4.8	4.8	7.2

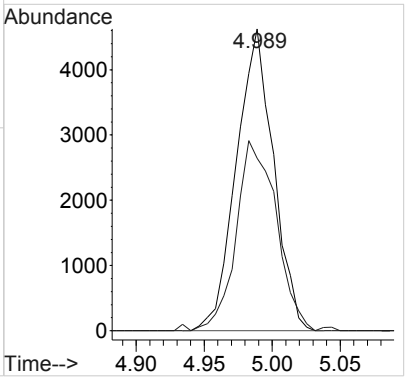




#15
Trichlorofluoromethane
Concen: 0.1961894 ppbv
RT: 4.989 min Scan# 312
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion:101 Resp: 8784

Ion	Ratio	Lower	Upper
101	100		
103	68.1	51.7	77.5



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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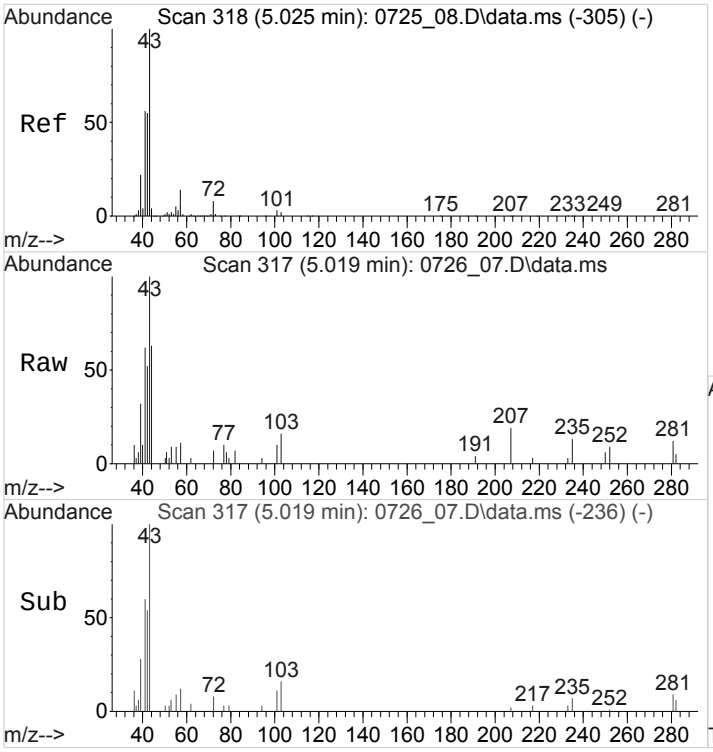
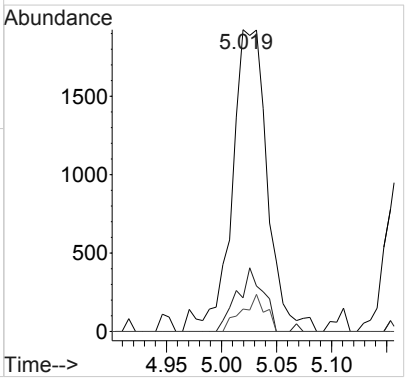
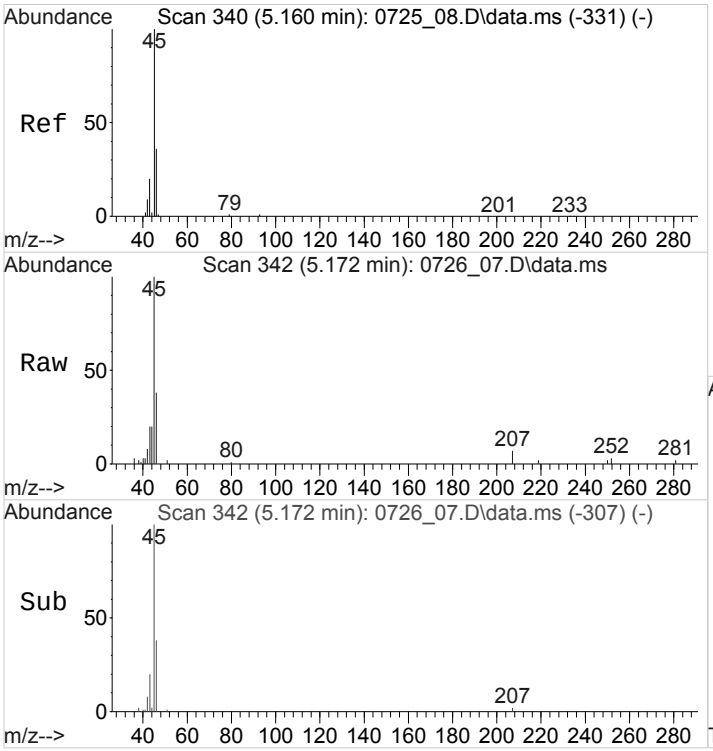


#16
PENTANE
Concen: 0.1715154 ppbv
RT: 5.019 min Scan# 317
Delta R.T. -0.006 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 43 Resp: 4315

Ion	Ratio	Lower	Upper
43	100		
57	15.7	12.7	19.1
72	8.2	7.8	11.8

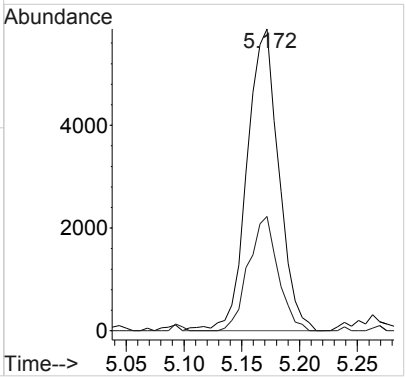




#17
Ethanol
Concen: 1.6788663 ppbv
RT: 5.172 min Scan# 342
Delta R.T. 0.013 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 45 Resp: 11223

Ion	Ratio	Lower	Upper
45	100		
46	35.3	26.3	39.5



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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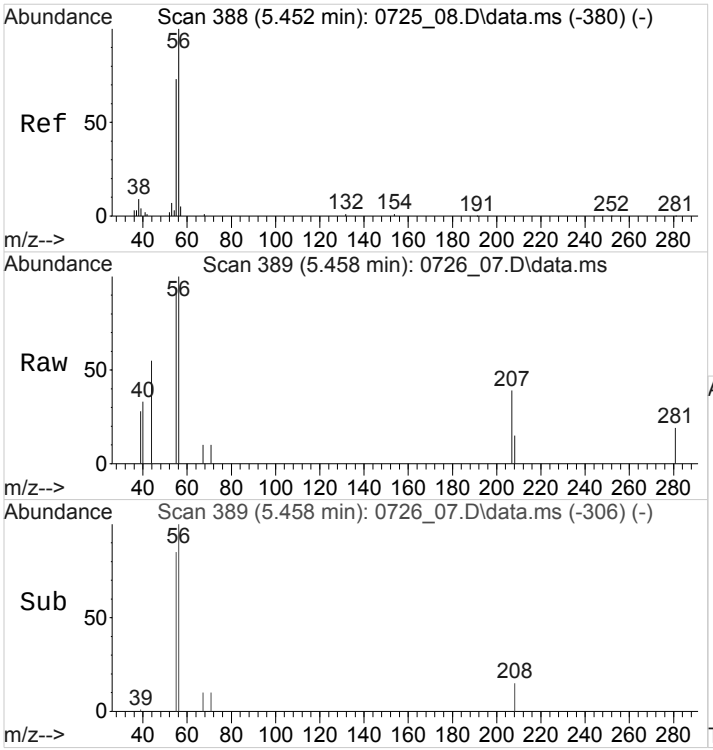
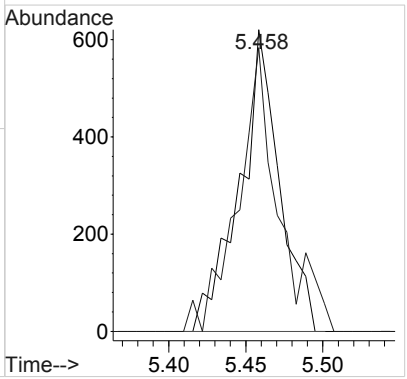
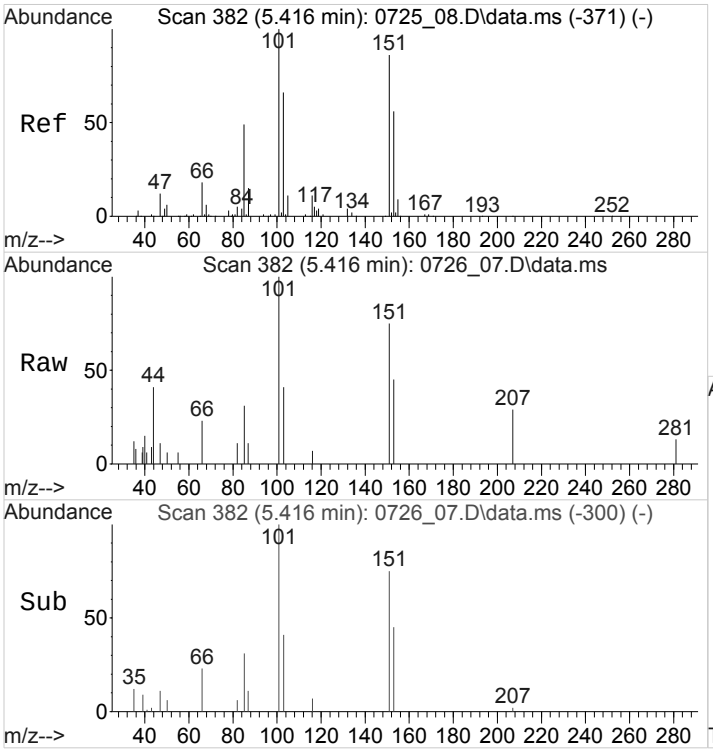


#18
ACROLEIN
Concen: 0.1665622 ppbv
RT: 5.458 min Scan# 389
Delta R.T. 0.006 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 56 Resp: 1114

Ion	Ratio	Lower	Upper
56	100		
55	97.0	59.5	89.3#

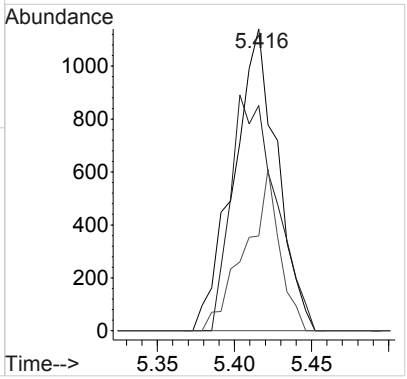


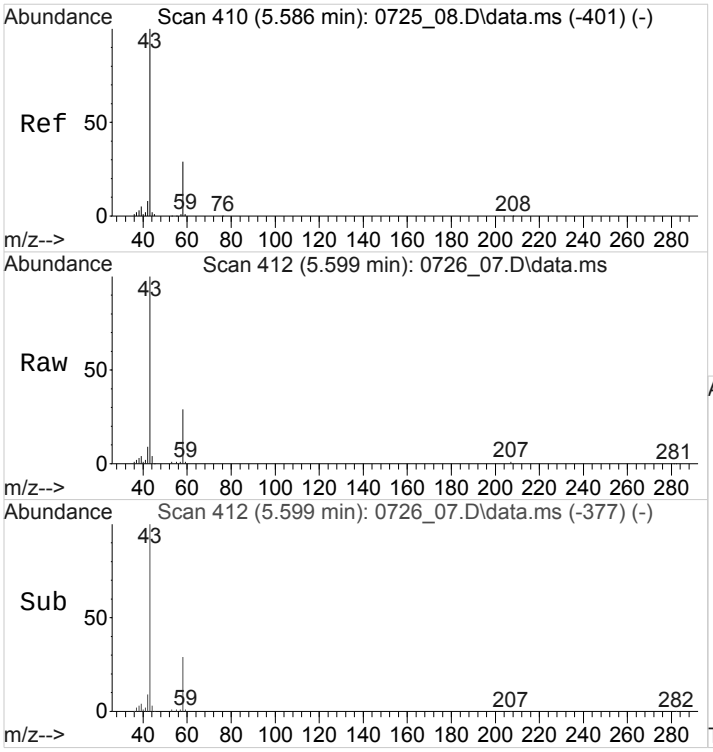


#19
1,1,2-Trichlorotrifluoroethane
Concen: 0.0695203 ppbv
RT: 5.416 min Scan# 382
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion:101 Resp: 2246

Ion	Ratio	Lower	Upper
101	100		
151	81.2	67.9	101.9
85	41.6	37.1	55.7

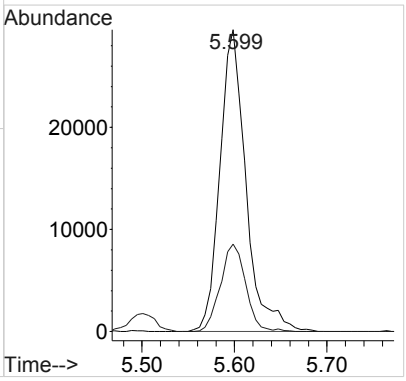


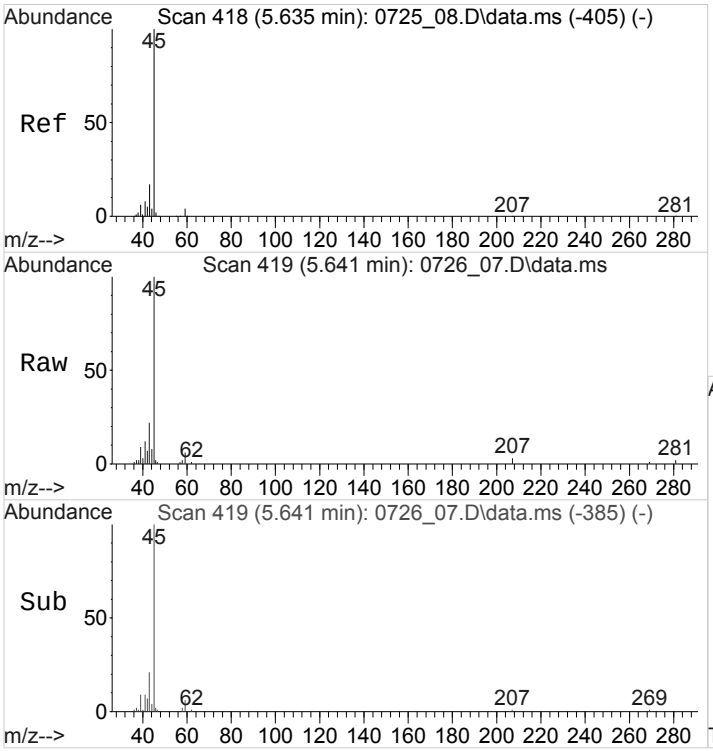


#21
Acetone
Concen: 2.0506152 ppbv
RT: 5.599 min Scan# 412
Delta R.T. 0.012 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 43 Resp: 57718

Ion	Ratio	Lower	Upper
43	100		
58	28.2	23.9	35.9

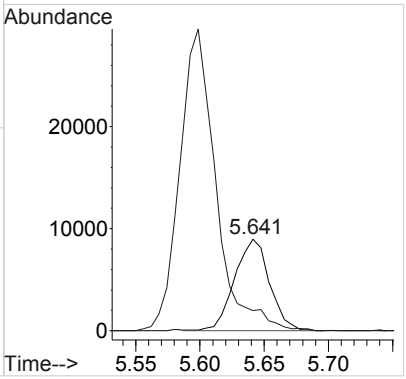


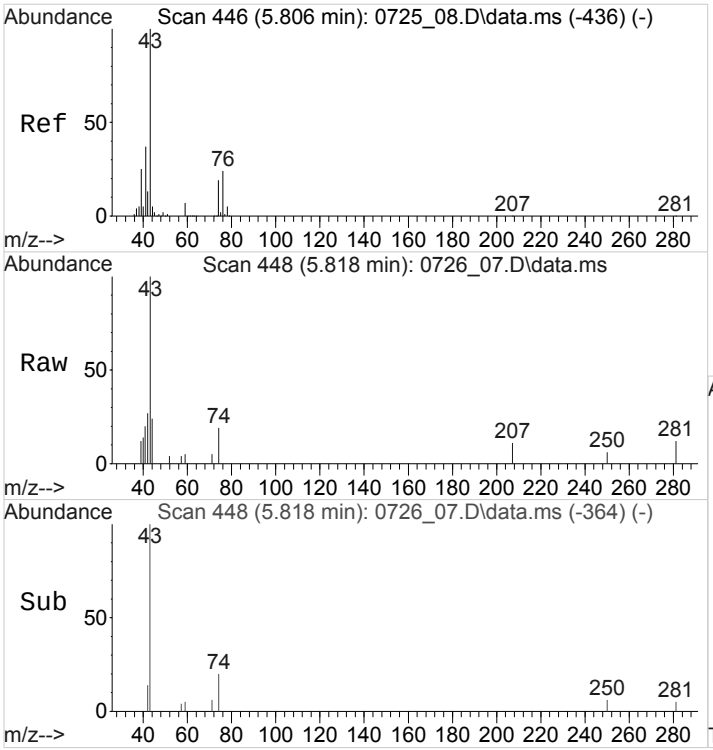


#23
2-Propanol
Concen: 0.6255398 ppbv
RT: 5.641 min Scan# 419
Delta R.T. 0.006 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 45 Resp: 17039

Ion	Ratio	Lower	Upper
45	100		
43	338.7	15.6	23.4#

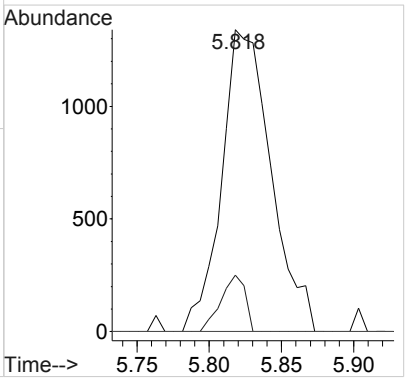


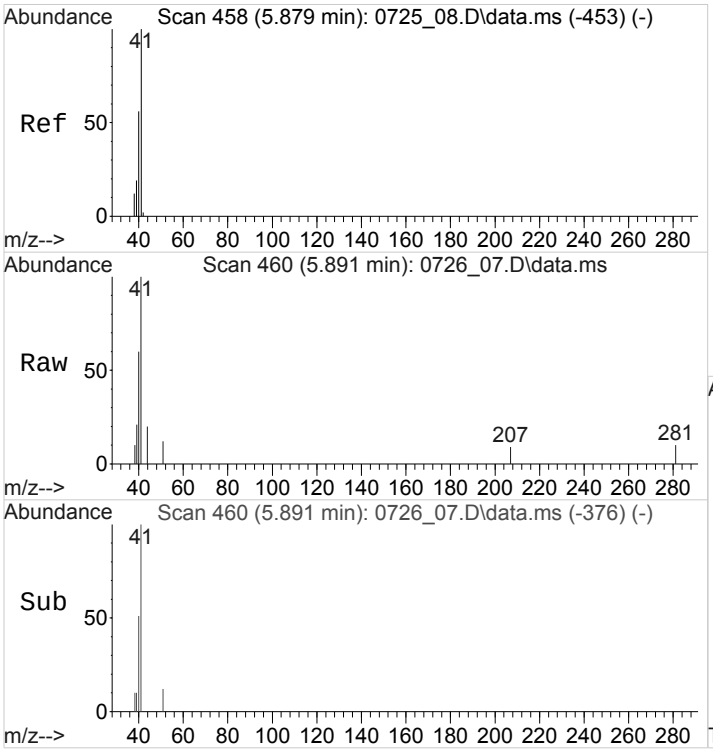


#26
METHYL ACETATE
Concen: 0.1043662 ppbv
RT: 5.818 min Scan# 448
Delta R.T. 0.012 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 43 Resp: 3184

Ion	Ratio	Lower	Upper
43	100		
74	9.2	15.7	23.5#
29	0.0	0.0	0.0

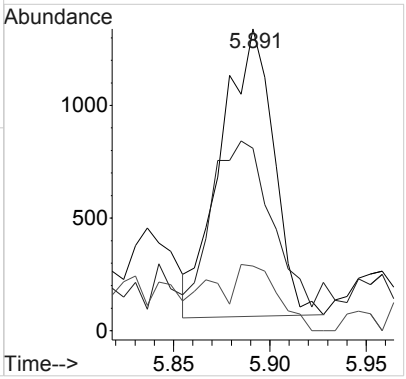


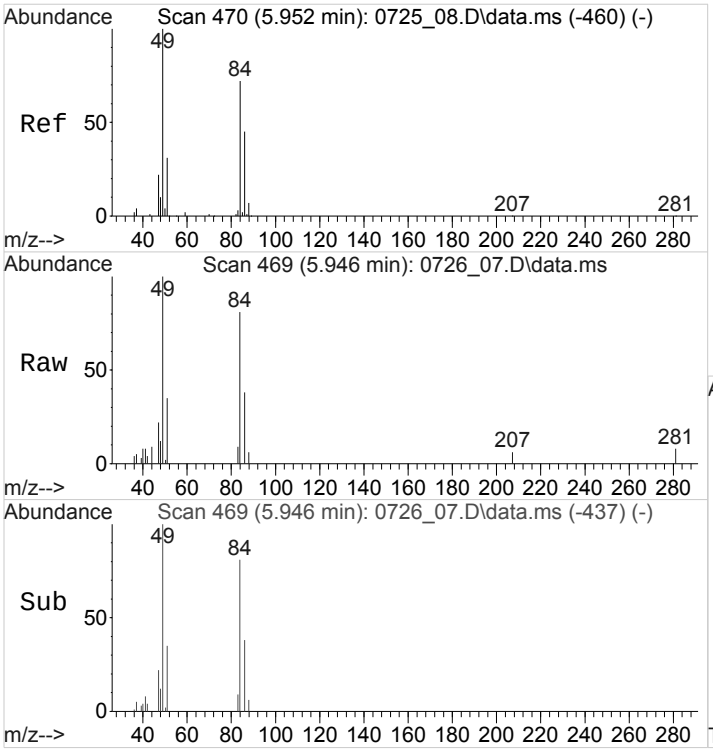


#27
ACETONITRILE
Concen: 0.1928112 ppbv
RT: 5.891 min Scan# 460
Delta R.T. 0.012 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 41 Resp: 2425

Ion	Ratio	Lower	Upper
41	100		
40	68.1	41.5	62.3#
39	17.8	15.7	23.5

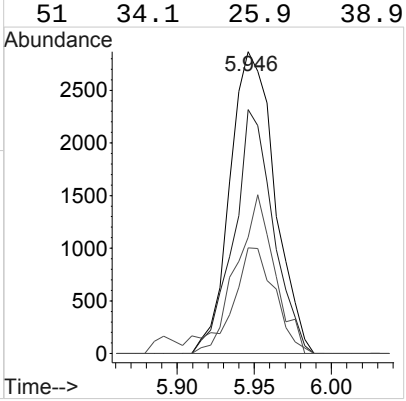


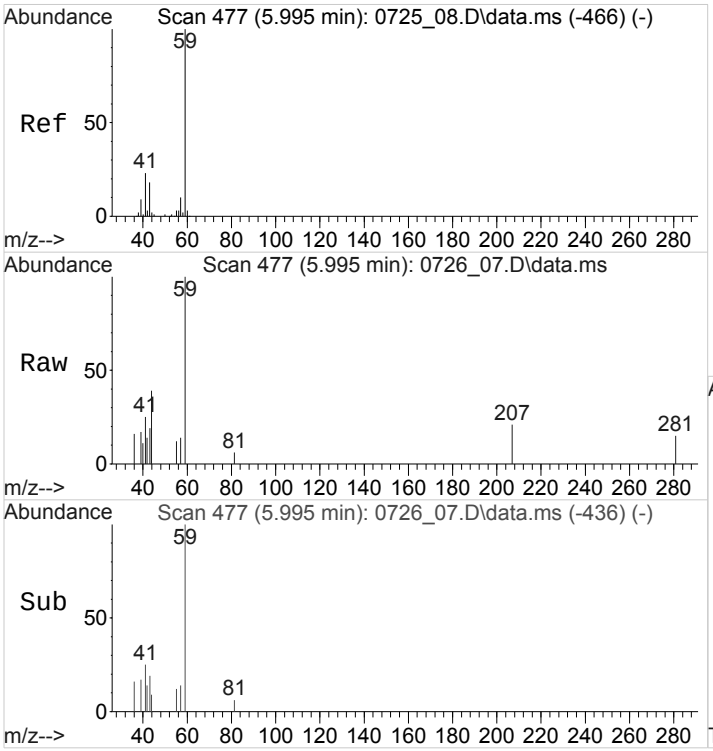


#28
Methylene Chloride
Concen: Below Cal
RT: 5.946 min Scan# 469
Delta R.T. -0.006 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 49 Resp: 5801

Ion	Ratio	Lower	Upper
49	100		
84	71.1	55.8	83.8
86	44.7	36.6	55.0
51	34.1	25.9	38.9

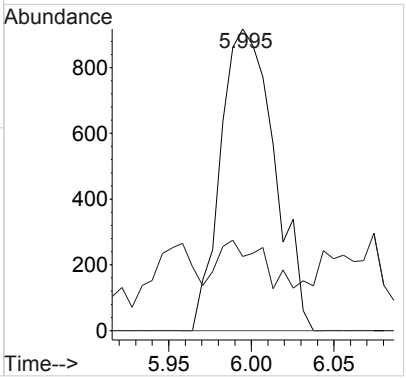


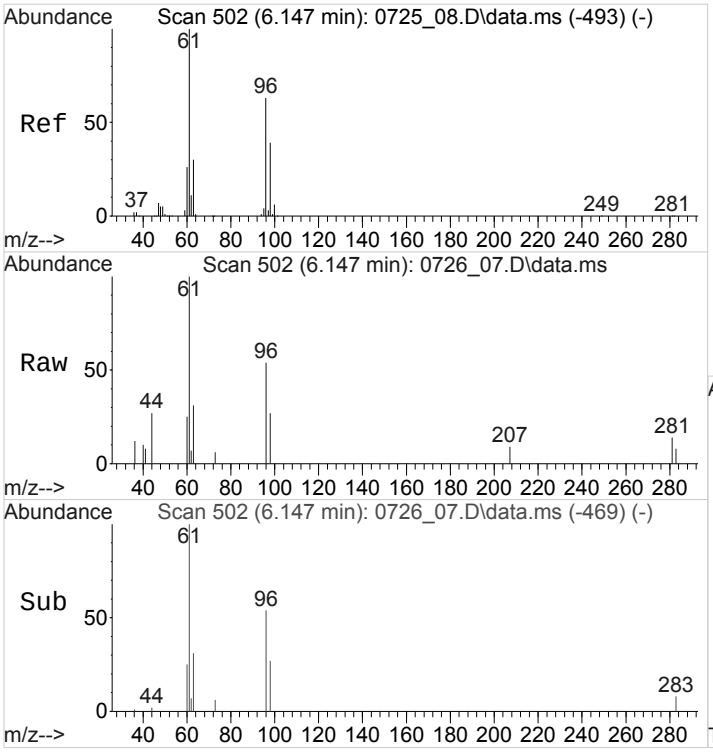


#29
TERT-BUTYL ALCOHOL
Concen: 0.0688166 ppbv
RT: 5.995 min Scan# 477
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 59 Resp: 2081

Ion	Ratio	Lower	Upper
59	100		
41	12.4	22.0	33.0#

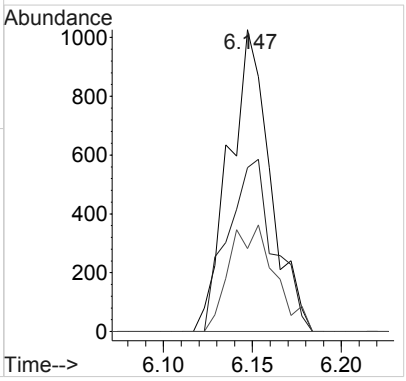


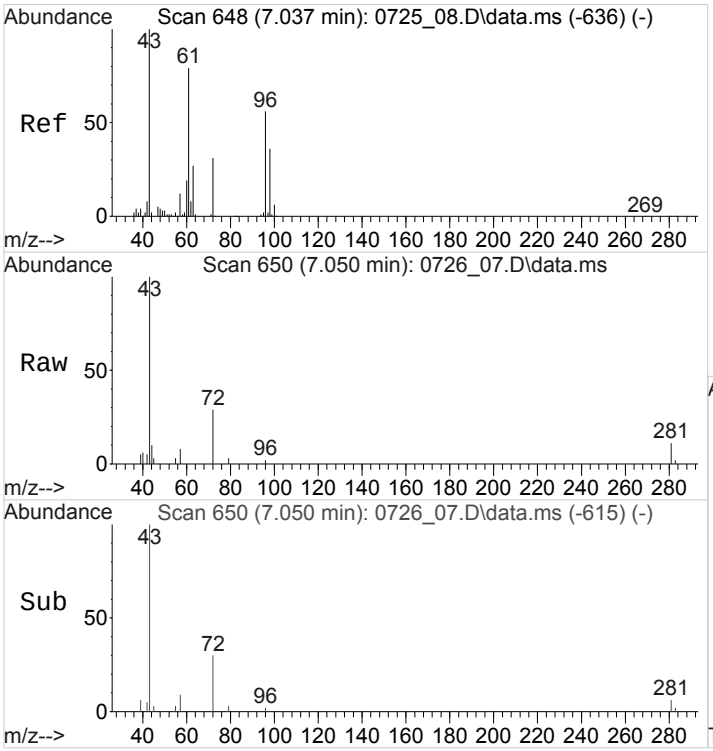


#31
Trans-1,2-Dichloroethene
Concen: 0.0697711 ppbv
RT: 6.147 min Scan# 502
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 61 Resp: 1651

Ion	Ratio	Lower	Upper
61	100		
96	64.7	49.8	74.6
98	39.1	30.5	45.7

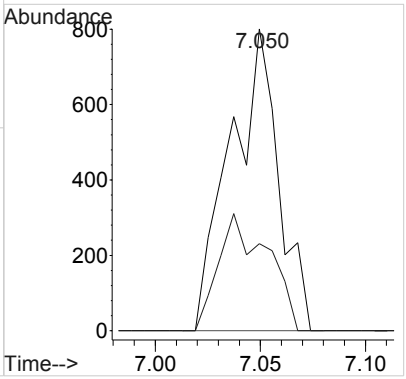


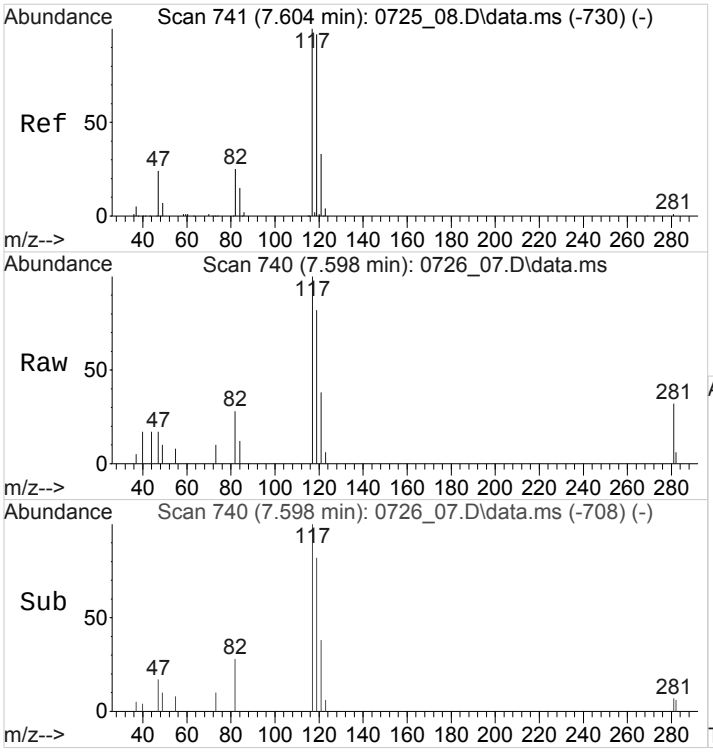


#39
2-Butanone (MEK)
Concen: 0.1775275 ppbv
RT: 7.050 min Scan# 650
Delta R.T. 0.012 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 72 Resp: 1275

Ion	Ratio	Lower	Upper
72	100		
57	39.6	28.6	42.8

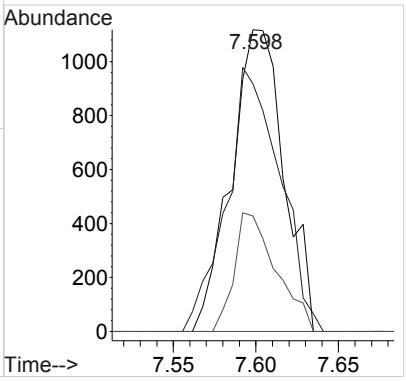


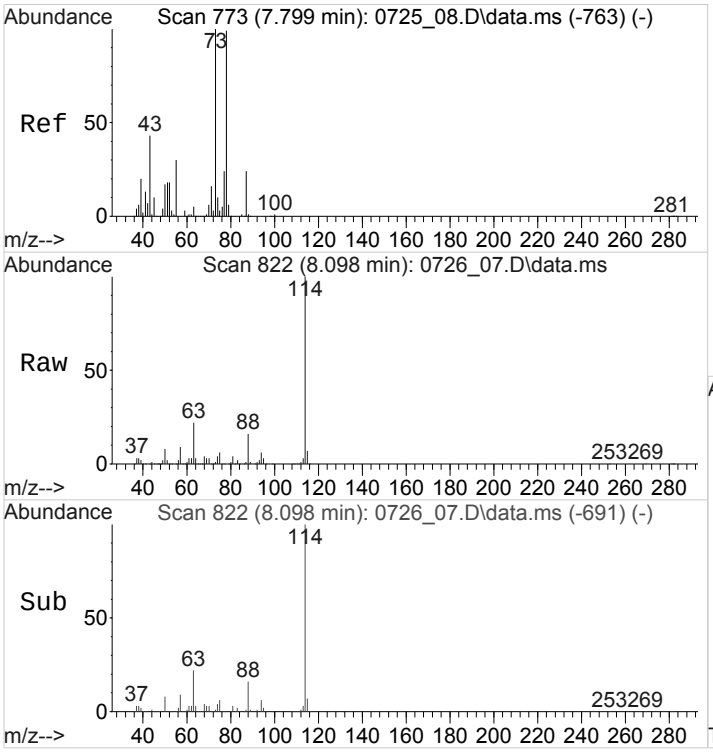


#45
Carbon Tetrachloride
Concen: 0.0721392 ppbv
RT: 7.598 min Scan# 740
Delta R.T. -0.006 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion:117 Resp: 2494

Ion	Ratio	Lower	Upper
117	100		
119	88.4	77.2	115.8
121	31.0	24.6	36.8

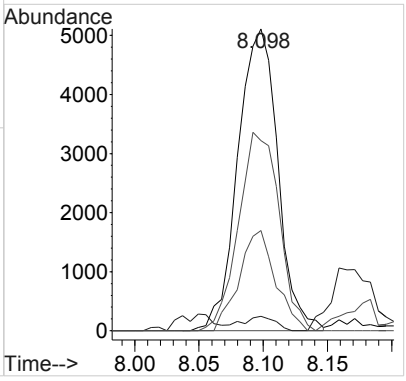




#49
TERT-AMYL METHYL ETHER
Concen: 0.2622281 ppbv
RT: 8.098 min Scan# 822
Delta R.T. 0.299 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 73 Resp: 11093

Ion	Ratio	Lower	Upper
73	100		
43	4.1	85.6	128.4#
55	30.2	32.6	49.0#
87	66.8	19.1	28.7#



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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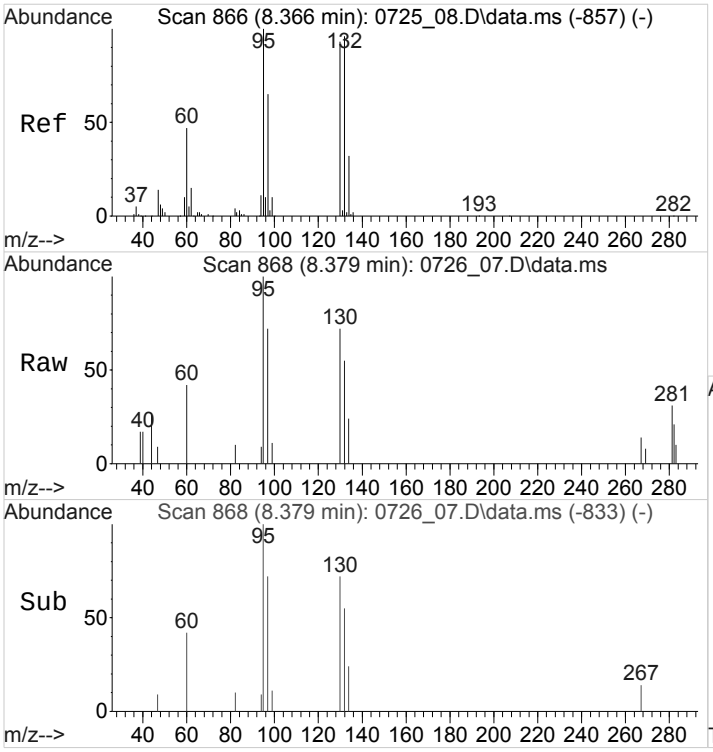
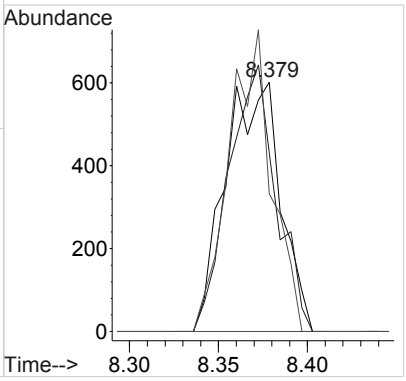
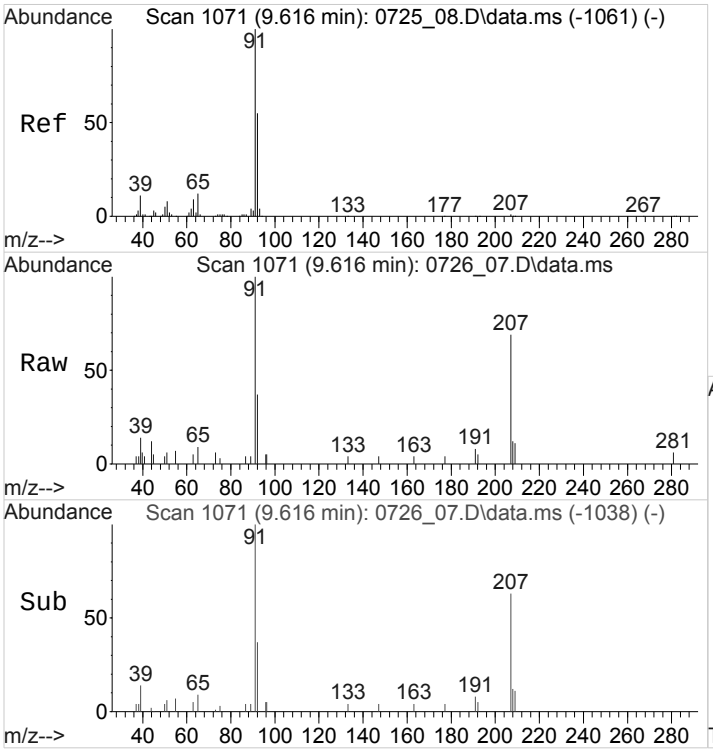


#52
Trichloroethene
Concen: 0.0649146 ppbv
RT: 8.379 min Scan# 868
Delta R.T. 0.012 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 95 Resp: 1301

Ion	Ratio	Lower	Upper
95	100		
130	91.0	78.1	117.1
132	92.9	74.8	112.2

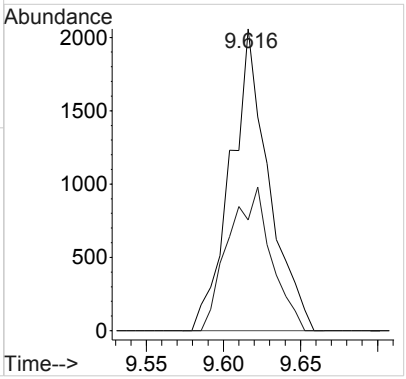


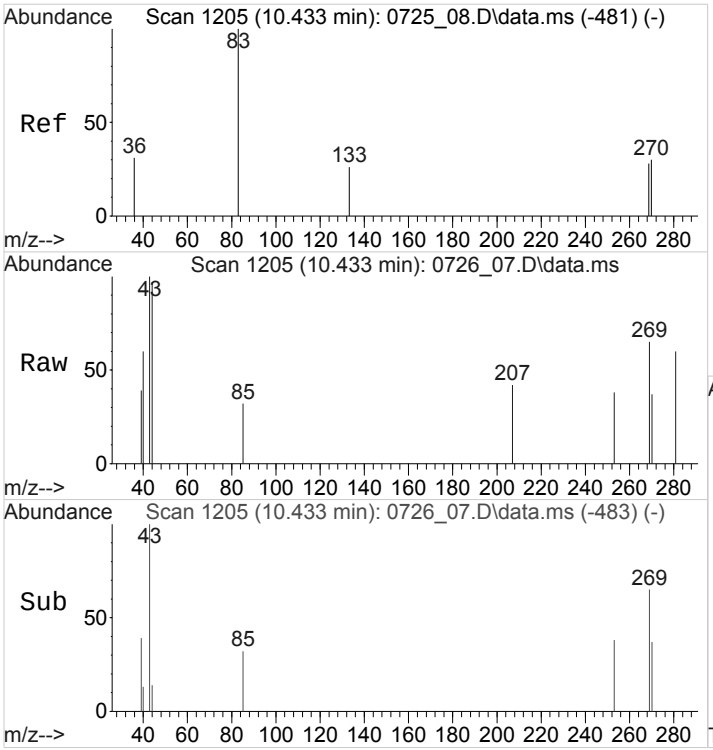


#62
Toluene
Concen: 0.0642770 ppbv
RT: 9.616 min Scan# 1071
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion: 91 Resp: 3537

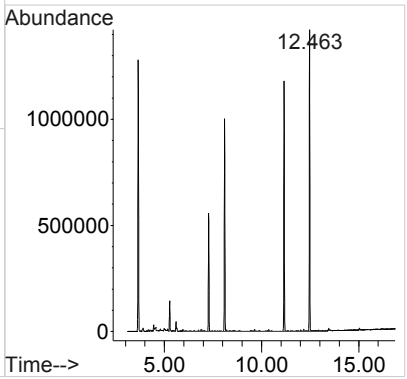
Ion	Ratio	Lower	Upper
91	100		
92	53.4	45.4	68.0

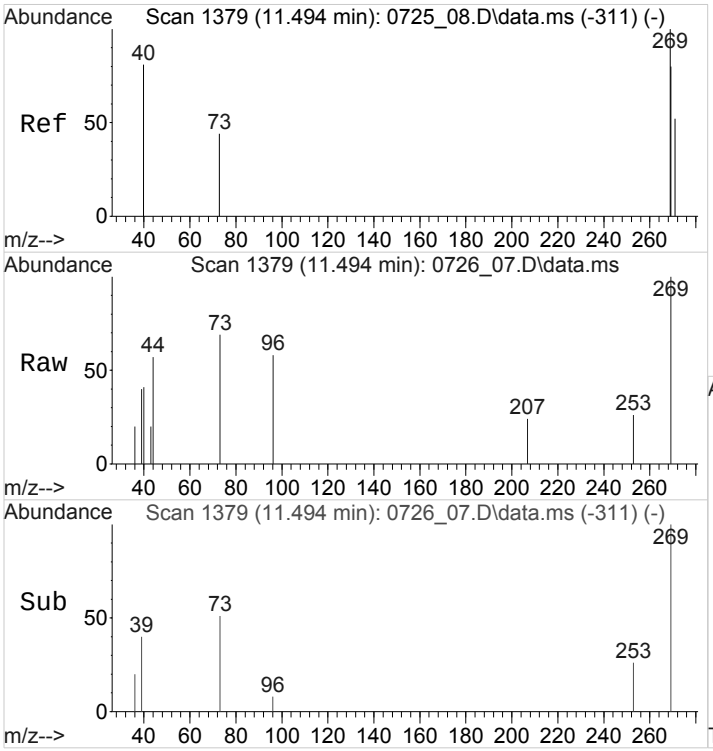




#101
TPH (GC/MS) Low Fraction
Concen: 8.1427675 ppbv m
RT: 10.430 min Scan# 1205
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

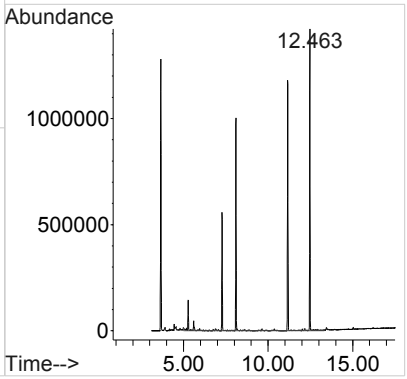
Tgt Ion:TIC Resp: 955043





#102
TPH-GRO (C5-C10)
Concen: 16.1339987 ppbv m
RT: 11.493 min Scan# 1379
Delta R.T. 0.000 min
Lab File: 0726_07.D
Acq: 26 Jul 2022 12:18 pm

Tgt Ion:TIC Resp: 1542516



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-VMP01-0220722

Lab Sample ID:	L1518164-03	**SDG:**	L1518164
Client Sample ID:	CRCA-VMP01-0220722	**Collected Date/Time:**	07/22/22 12:00
Lab File ID:	0726_08	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 12:58
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 12:58
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
Acetone	67-64-1	5.59	8.55		1.39	2.85	5.70
Allyl Chloride	107-05-1	0	0.783	U	0.357	0.783	1.57
Benzene	71-43-2	7.82	0.431	J	0.228	0.479	0.958
Benzyl Chloride	100-44-7	0	0.675	U	0.311	0.675	1.56
Bromodichloromethane	75-27-4	0	1.01	U	0.471	1.01	2.01
Bromoform	75-25-2	0	3.21	U	0.757	3.21	6.21
Bromomethane	74-83-9	0	0.776	U	0.381	0.776	1.55
1,3-Butadiene	106-99-0	0	1.39	U	0.230	1.39	4.43
Carbon disulfide	75-15-0	5.78	0.430	J	0.317	0.778	1.56
Carbon tetrachloride	56-23-5	0	0.945	U	0.461	0.945	1.89
Chlorobenzene	108-90-7	0	0.924	U	0.385	0.924	1.85
Chloroethane	75-00-3	0	0.528	U	0.263	0.528	1.06
Chloroform	67-66-3	0	0.730	U	0.349	0.730	1.46
Chloromethane	74-87-3	0	0.516	U	0.213	0.516	1.03
2-Chlorotoluene	95-49-8	0	1.03	U	0.427	1.03	2.06
Cyclohexane	110-82-7	0	0.689	U	0.259	0.689	1.38
Dibromochloromethane	124-48-1	0	1.28	U	0.618	1.28	2.55
1,2-Dibromoethane	106-93-4	0	1.15	U	0.554	1.15	2.31
1,2-Dichlorobenzene	95-50-1	0	1.80	U	0.770	1.80	3.61
1,3-Dichlorobenzene	541-73-1	13.65	1.99	J	1.09	2.40	4.81
1,4-Dichlorobenzene	106-46-7	0	0.782	U	0.335	0.782	1.80
1,2-Dichloroethane	107-06-2	0	0.607	U	0.283	0.607	1.21
1,1-Dichloroethane	75-34-3	0	0.601	U	0.290	0.601	1.20
1,1-Dichloroethene	75-35-4	0	0.793	U	0.302	0.793	1.59
cis-1,2-Dichloroethene	156-59-2	0	0.793	U	0.311	0.793	1.59
trans-1,2-Dichloroethene	156-60-5	6.15	0.951	J	0.267	0.594	1.19
1,2-Dichloropropane	78-87-5	0	0.924	U	0.351	0.924	1.85
cis-1,3-Dichloropropene	10061-01-5	0	0.681	U	0.313	0.681	1.36
trans-1,3-Dichloropropene	10061-02-6	0	0.681	U	0.331	0.681	1.36
1,4-Dioxane	123-91-1	0	0.721	U	0.300	0.721	1.44
Ethanol	64-17-5	5.17	4.03	B	0.500	1.19	2.45
Ethylbenzene	100-41-4	11.22	0.867	U	0.362	0.867	1.73
4-Ethyltoluene	622-96-8	0	0.982	U	0.384	0.982	1.96
Trichlorofluoromethane	75-69-4	5	2.25		0.460	0.983	1.97
Dichlorodifluoromethane	75-71-8	0	1.48	U	0.678	1.48	2.97
1,1,2-Trichlorotrifluoroethane	76-13-1	5.42	22.8		0.608	1.53	3.07
1,2-Dichlorotetrafluoroethane	76-14-2	0	1.40	U	0.622	1.40	2.80
Heptane	142-82-5	7.82	1.48	J	0.425	1.02	2.04
Hexachloro-1,3-butadiene	87-68-3	0	2.67	U	1.12	2.67	6.73
n-Hexane	110-54-3	6.26	1.76	U	0.726	1.76	3.53
Isopropylbenzene	98-82-8	0	0.983	U	0.382	0.983	1.97
Methylene Chloride	75-09-2	0	0.694	U	0.340	0.694	1.39
Methyl Butyl Ketone	591-78-6	0	1.23	U	0.544	1.23	5.11

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-VMP01-0220722

Lab Sample ID:	L1518164-03	**SDG:**	L1518164
Client Sample ID:	CRCA-VMP01-0220722	**Collected Date/Time:**	07/22/22 12:00
Lab File ID:	0726_08	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 12:58
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 12:58
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
2-Butanone (MEK)	78-93-3	7.04	1.32	J	0.240	0.560	3.69
4-Methyl-2-pentanone (MIBK)	108-10-1	0	0.778	U	0.313	0.778	5.12
Methyl Methacrylate	80-62-6	0	0.819	U	0.359	0.819	1.64
MTBE	1634-04-4	0	0.468	U	0.233	0.468	1.08
Naphthalene	91-20-3	0	3.66	U	1.83	3.66	7.33
2-Propanol	67-63-0	0	1.54	U	0.649	1.54	3.07
Propene	115-07-1	0	1.08	U	0.160	1.08	2.15
Styrene	100-42-5	11.84	0.851	U	0.335	0.851	1.70
1,1,2,2-Tetrachloroethane	79-34-5	0	1.03	U	0.511	1.03	2.06
Tetrachloroethylene	127-18-4	0	1.36	U	0.553	1.36	2.72
Tetrahydrofuran	109-99-9	0	0.442	U	0.216	0.442	0.885
Toluene	108-88-3	0	0.942	U	0.328	0.942	1.88
1,2,4-Trichlorobenzene	120-82-1	0	2.29	U	1.10	2.29	4.66
1,1,1-Trichloroethane	71-55-6	0	0.816	U	0.400	0.816	1.63
1,1,2-Trichloroethane	79-00-5	0	1.09	U	0.422	1.09	2.18
Trichloroethylene	79-01-6	8.37	17.1		0.364	0.804	1.61
1,2,4-Trimethylbenzene	95-63-6	13.26	0.982	U	0.375	0.982	1.96
1,3,5-Trimethylbenzene	108-67-8	0	0.982	U	0.382	0.982	1.96
2,2,4-Trimethylpentane	540-84-1	0	1.40	U	0.621	1.40	2.80
Vinyl chloride	75-01-4	0	0.511	U	0.243	0.511	1.02
Vinyl Bromide	593-60-2	0	0.875	U	0.373	0.875	1.75
Vinyl acetate	108-05-4	0	0.880	U	0.408	0.880	1.76
m&p-Xylene	1330-20-7	11.34	1.03	J	0.585	1.30	2.60
o-Xylene	95-47-6	11.82	0.413	J	0.359	0.759	1.52

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_08.D
Acq On : 26 Jul 2022 12:58 pm
Operator :
Sample : L1518164-03 1x WG1900825
Misc :
ALS Vial : 8 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 13:58:10 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

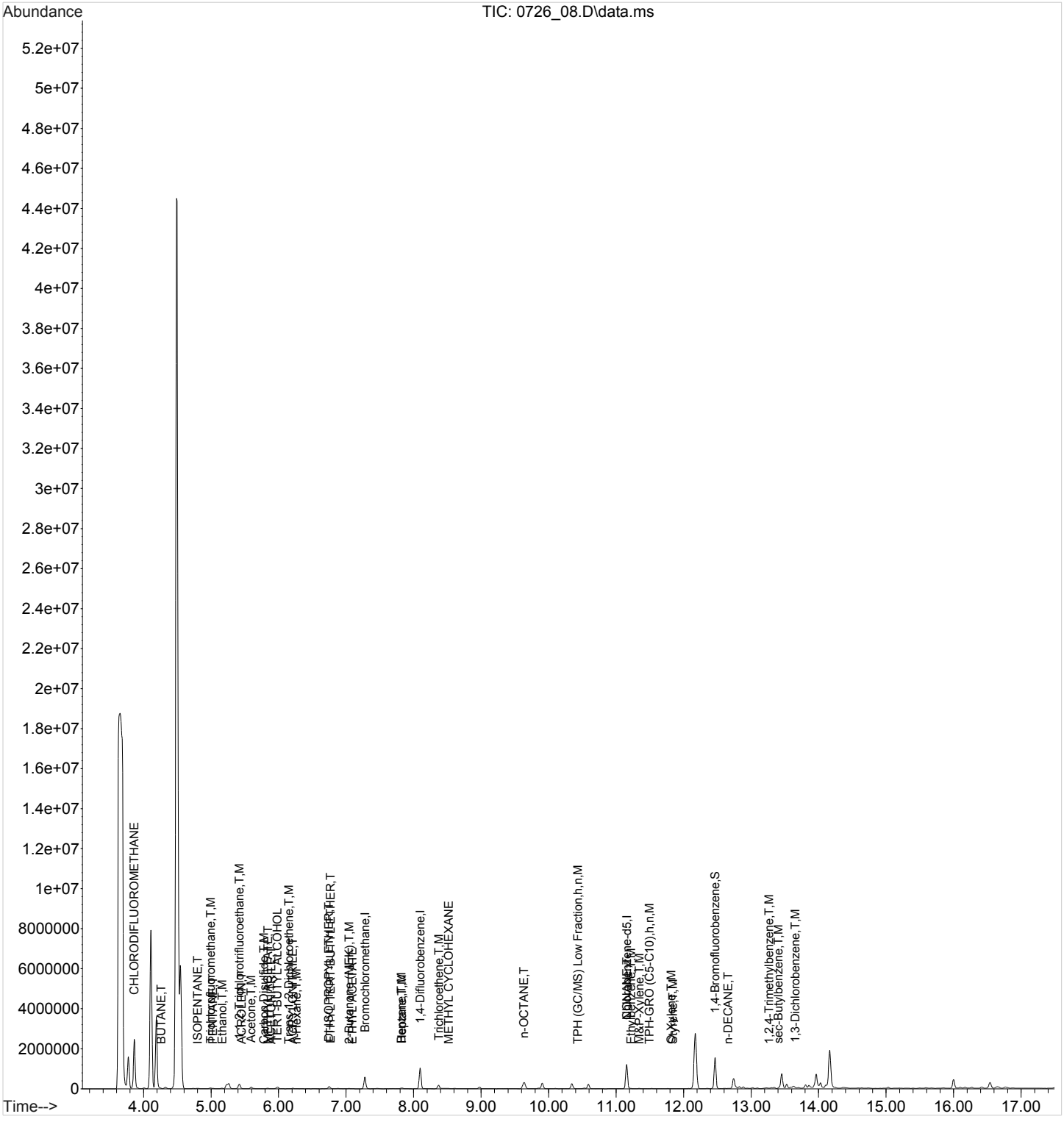
Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.281	130	201392	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	849376	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.158	117	768346	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	557934	3.9553336	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 98.88%				
Target Compounds							Qvalue
3) BUTANE	4.257	43	5299	0.1330127	ppbv		97
6) CHLORODIFLUOROMETHANE	3.861	67	1105	0.2580614	ppbv	#	1
13) ISOPENTANE	4.800	43	5293	0.3178825	ppbv	#	61
15) Trichlorofluoromethane	4.995	101	18376	0.4012953	ppbv		96
16) PENTANE	5.026	43	9722	0.3778400	ppbv		99
17) Ethanol	5.166	45	14658	2.1439361	ppbv		97
18) ACROLEIN	5.452	56	2484	0.3631389	ppbv		92
19) 1,1,2-Trichlorotrifluo...	5.416	101	98330	2.9758971	ppbv		100
21) Acetone	5.592	43	103662	3.6009945	ppbv		98
24) Carbon Disulfide	5.781	76	7183	0.1377304	ppbv		96
26) METHYL ACETATE	5.842	43	17966	0.5757954	ppbv	#	59
27) ACETONITRILE	5.891	41	1436	0.1116362	ppbv	#	70
28) Methylene Chloride	5.952	49	5828	Below Cal		#	91
29) TERT-BUTYL ALCOHOL	5.983	59	93329	3.0176404	ppbv		95
31) Trans-1,2-Dichloroethene	6.153	61	5808	0.2399856	ppbv		97
32) ACRYLONITRILE	6.208	53	2035	0.1542006	ppbv	#	55
33) n-Hexane	6.263	57	2906	0.1351048	ppbv		96
36) DI-ISOPROPYL ETHER	6.745	45	24816	0.5493184	ppbv	#	62
37) ETHYL TERT-BUTYL ETHER	6.769	59	9990	0.2167782	ppbv	#	82
38) ETHYL ACETATE	7.092	45	2922	0.5715293	ppbv	#	1
39) 2-Butanone (MEK)	7.043	72	3294	0.4484448	ppbv		98
48) Benzene	7.818	78	6336	0.1348931	ppbv	#	86
51) Heptane	7.824	43	16089	0.3625356	ppbv	#	77
52) Trichloroethene	8.372	95	65894	3.1870852	ppbv		99
54) METHYL CYCLOHEXANE	8.519	83	4275	0.1504965	ppbv	#	80
61) n-OCTANE	9.634	43	5251	0.1251192	ppbv	#	40
70) NONANE	11.158	43	5444	0.1178885	ppbv	#	90
72) Ethylbenzene	11.219	91	4903	0.0699526	ppbv		99
73) M&P-Xylene	11.341	91	12668	0.2371473	ppbv		100
74) O-Xylene	11.817	91	4958	0.0951509	ppbv		97
77) Styrene	11.841	104	2848	0.0631765	ppbv	#	88
80) n-DECANE	12.658	43	5540	0.1129433	ppbv	#	21
88) 1,2,4-Trimethylbenzene	13.262	105	4078	0.0555089	ppbv		100
89) sec-Butylbenzene	13.402	105	5663	0.0538688	ppbv	#	62
90) 1,3-Dichlorobenzene	13.652	146	17512	0.3310761	ppbv		96
101) TPH (GC/MS) Low Fraction	10.430	TIC	15654835m	131.0791534	ppbv		
102) TPH-GRO (C5-C10)	11.493	TIC	17863304m	183.4890145	ppbv		

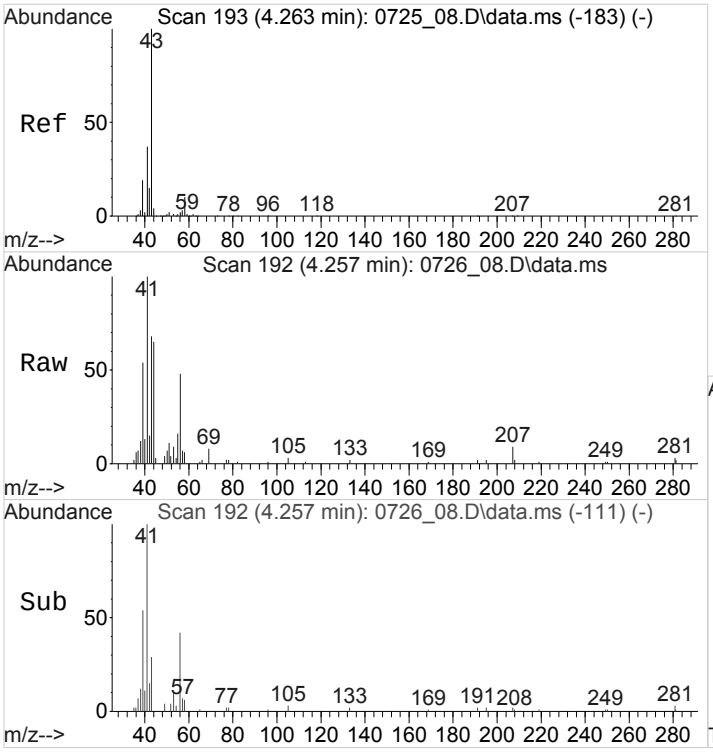
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_08.D
Acq On : 26 Jul 2022 12:58 pm
Operator :
Sample : L1518164-03 1x WG1900825
Misc :
ALS Vial : 8 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 13:58:10 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

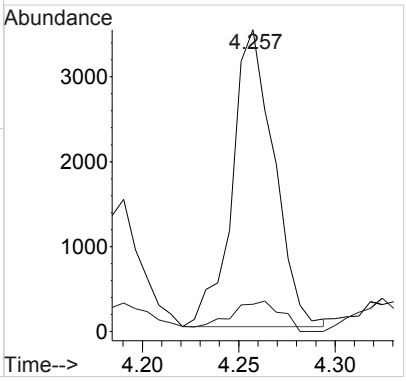


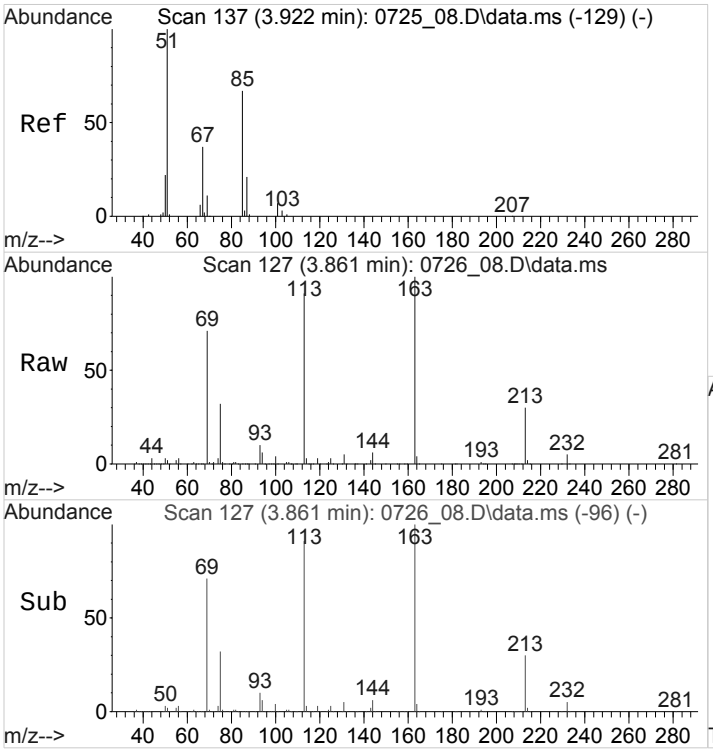


#3
BUTANE
Concen: 0.1330127 ppbv
RT: 4.257 min Scan# 192
Delta R.T. -0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 43 Resp: 5299

Ion	Ratio	Lower	Upper
43	100		
58	12.5	9.0	13.4

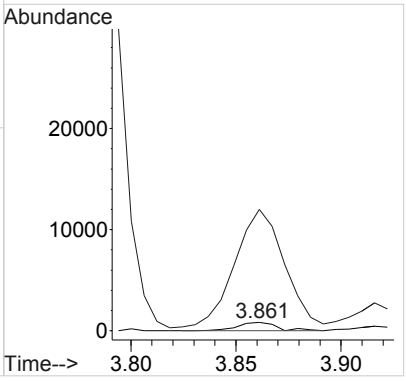




#6
CHLORODIFLUOROMETHANE
Concen: 0.2580614 ppbv
RT: 3.861 min Scan# 127
Delta R.T. -0.061 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 67 Resp: 1105

Ion	Ratio	Lower	Upper
67	100		
51	1744.1	463.4	695.0#



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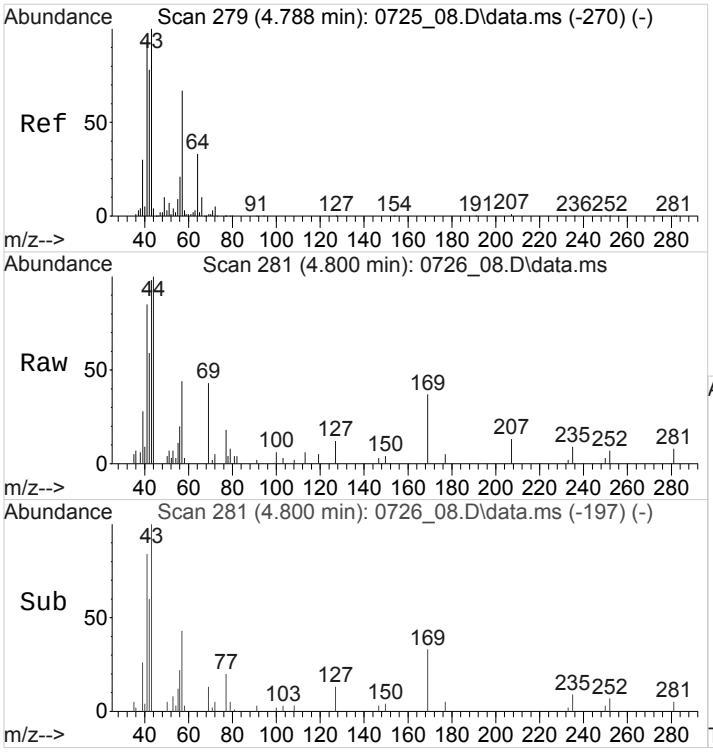
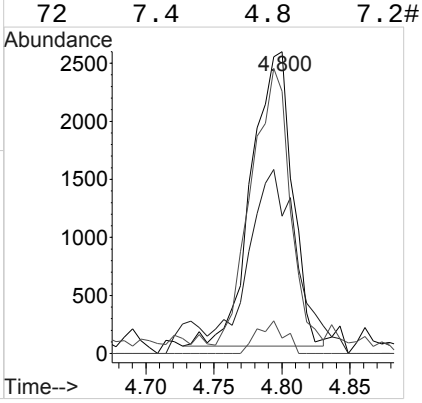
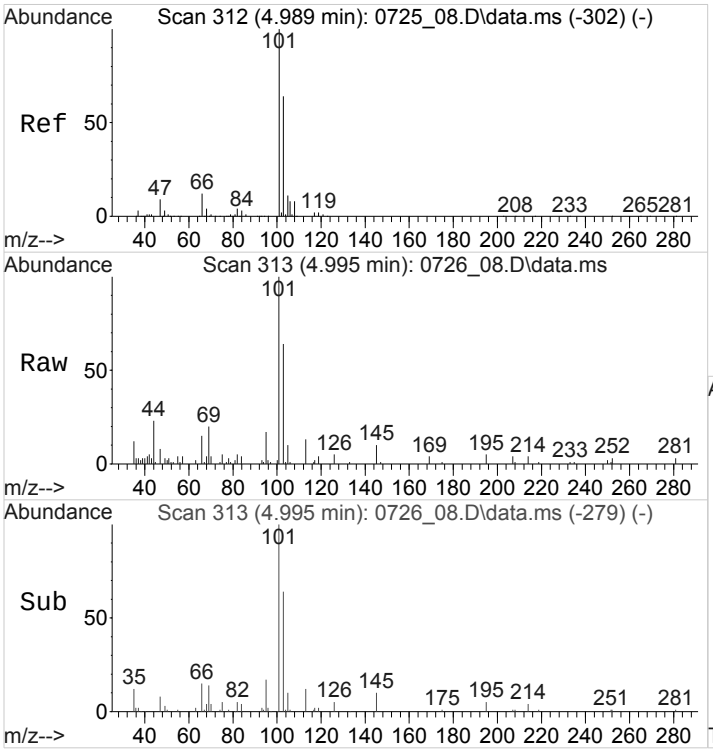


#13
ISOPENTANE
Concen: 0.3178825 ppbv
RT: 4.800 min Scan# 281
Delta R.T. 0.012 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 43 Resp: 5293

Ion	Ratio	Lower	Upper
43	100		
57	0.0	56.3	84.5#
41	89.1	77.0	115.4
72	7.4	4.8	7.2#

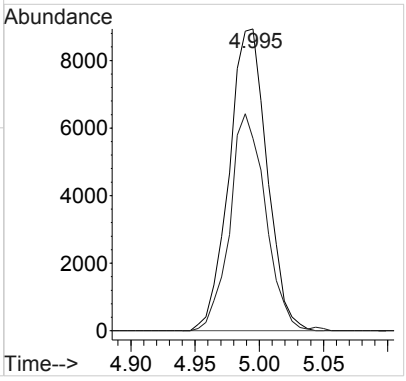




#15
Trichlorofluoromethane
Concen: 0.4012953 ppbv
RT: 4.995 min Scan# 313
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion:101 Resp: 18376

Ion	Ratio	Lower	Upper
101	100		
103	67.9	51.7	77.5



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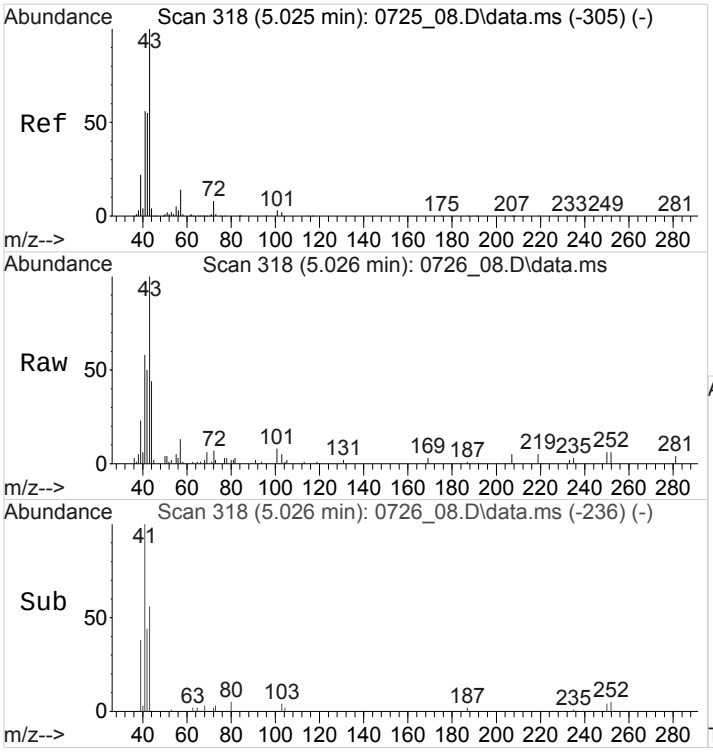
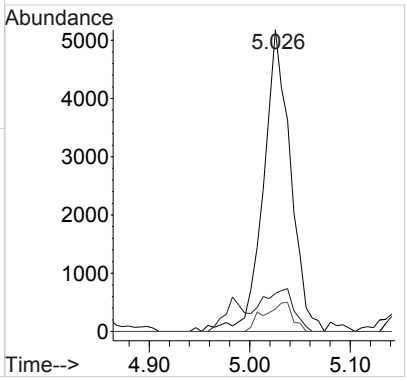
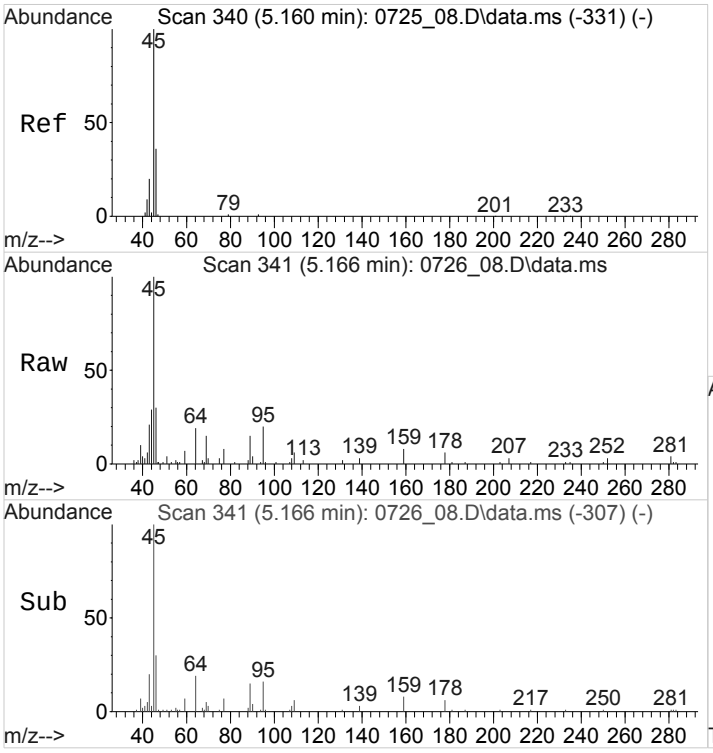


#16
PENTANE
Concen: 0.3778400 ppbv
RT: 5.026 min Scan# 318
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 43 Resp: 9722

Ion	Ratio	Lower	Upper
43	100		
57	16.3	12.7	19.1
72	10.1	7.8	11.8

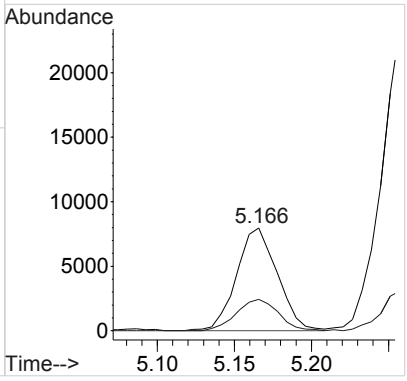




#17
Ethanol
Concen: 2.1439361 ppbv
RT: 5.166 min Scan# 341
Delta R.T. 0.007 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 45 Resp: 14658

Ion	Ratio	Lower	Upper
45	100		
46	31.4	26.3	39.5



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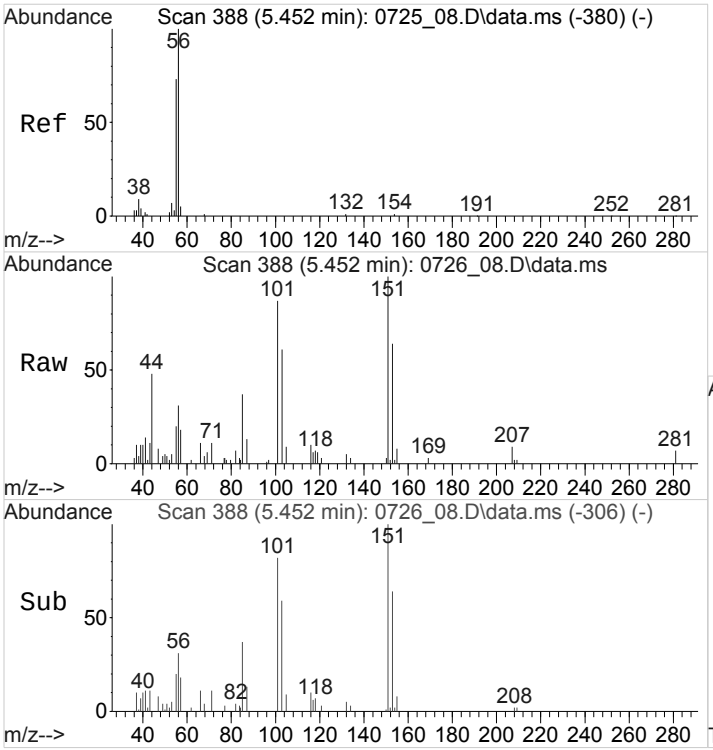
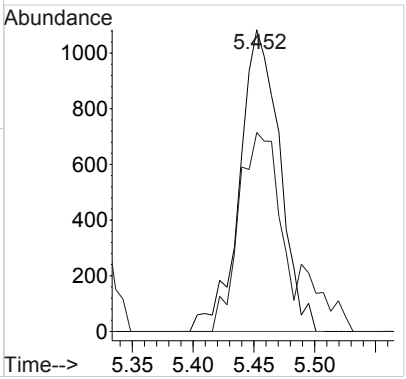
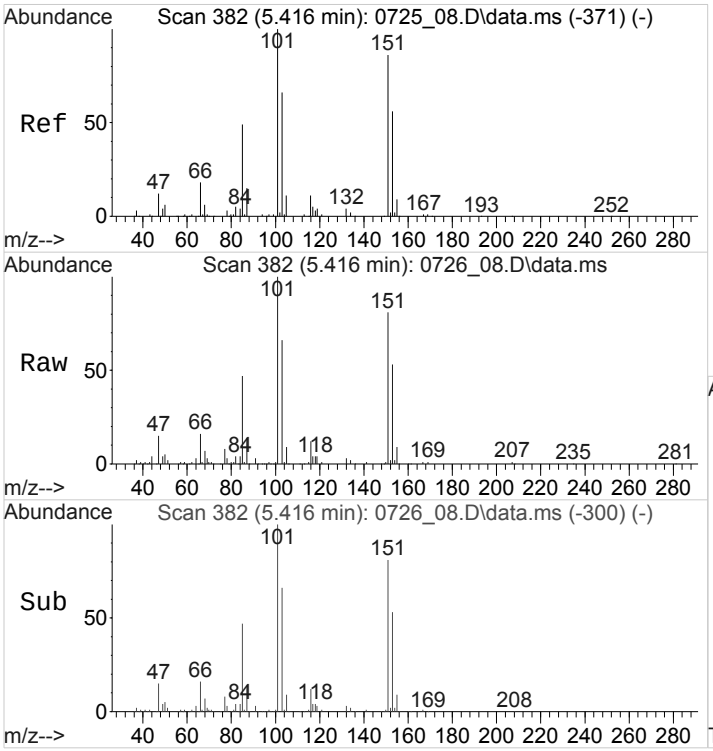


#18
ACROLEIN
Concen: 0.3631389 ppbv
RT: 5.452 min Scan# 388
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 56 Resp: 2484

Ion	Ratio	Lower	Upper
56	100		
55	67.2	59.5	89.3

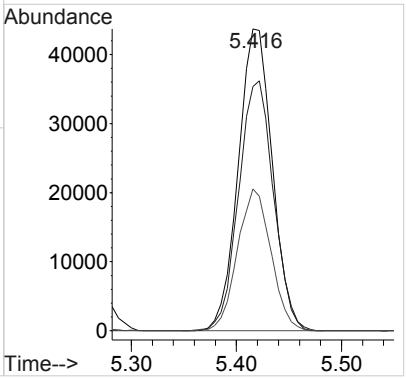




#19
1,1,2-Trichlorotrifluoroethane
Concen: 2.9758971 ppbv
RT: 5.416 min Scan# 382
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion:101 Resp: 98330

Ion	Ratio	Lower	Upper
101	100		
151	85.0	67.9	101.9
85	46.4	37.1	55.7



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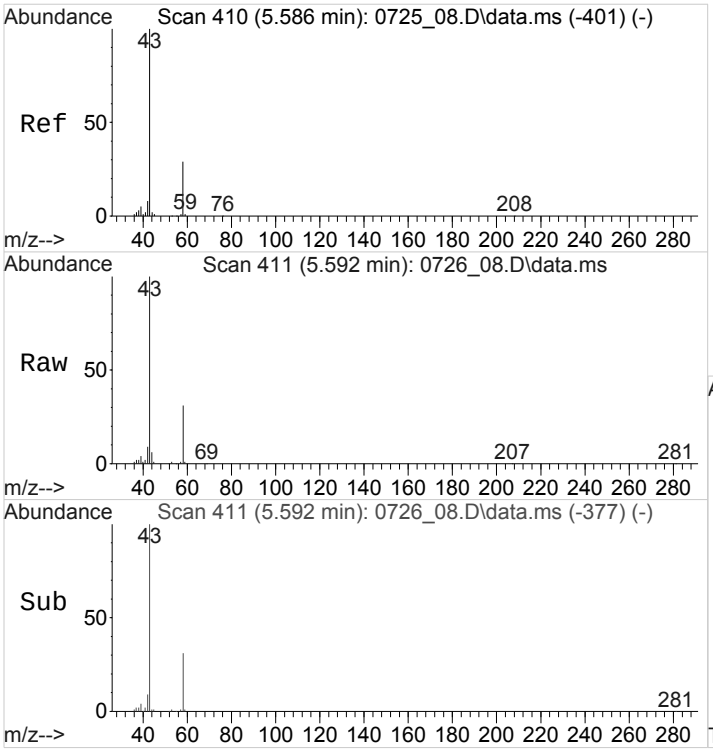
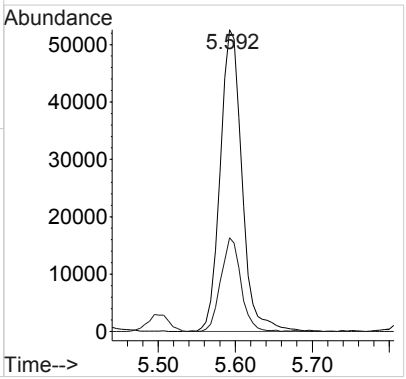
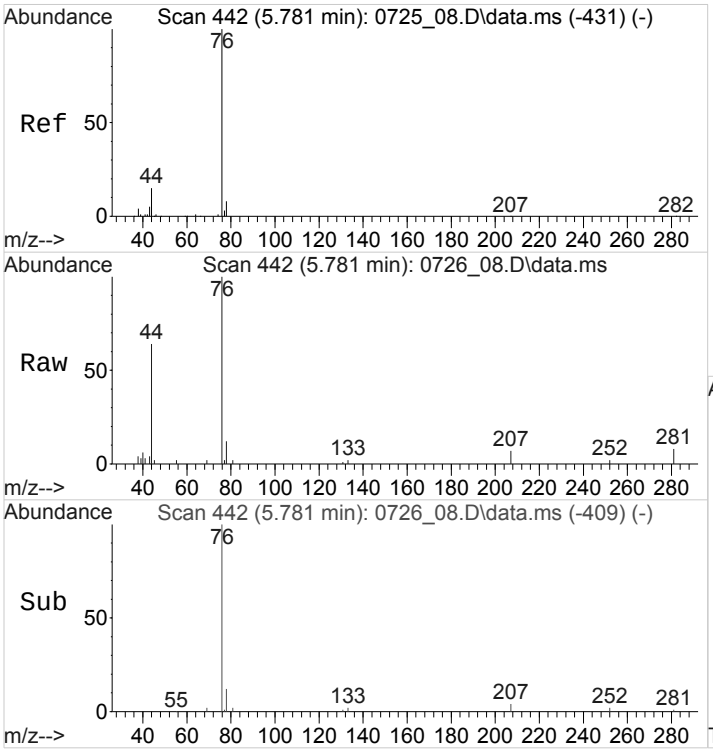


#21
Acetone
Concen: 3.6009945 ppbv
RT: 5.592 min Scan# 411
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 43 Resp: 103662

Ion	Ratio	Lower	Upper
43	100		
58	28.6	23.9	35.9

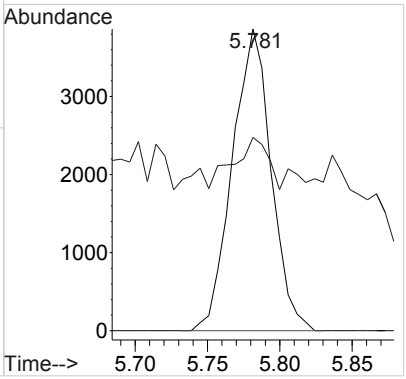




#24
Carbon Disulfide
Concen: 0.1377304 ppbv
RT: 5.781 min Scan# 442
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 76 Resp: 7183

Ion	Ratio	Lower	Upper
76	100		
44	16.5	12.0	18.0



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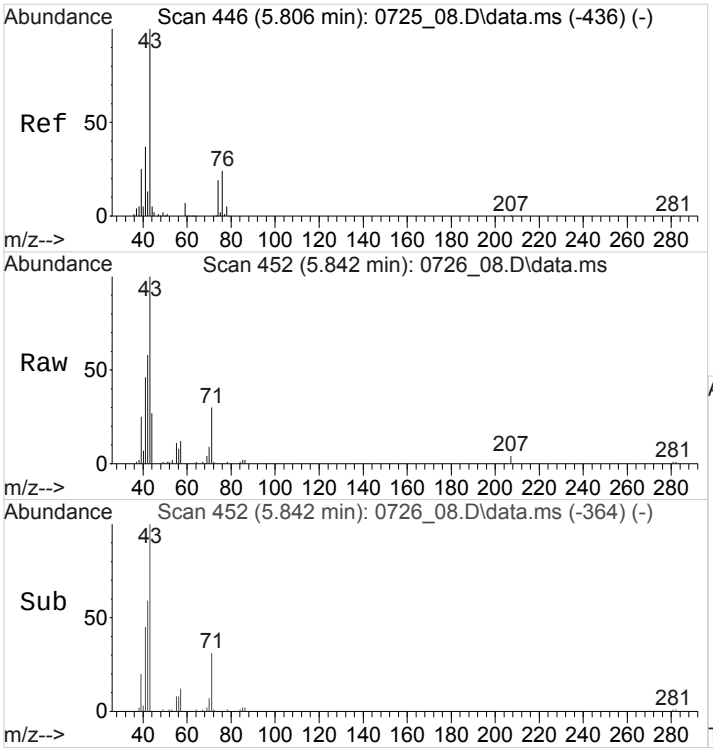
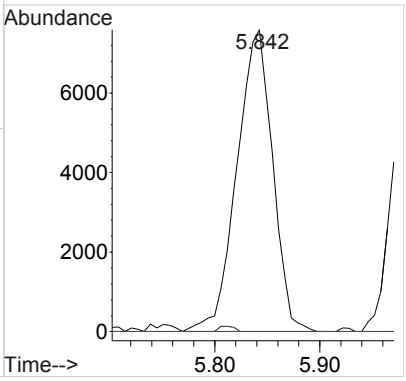
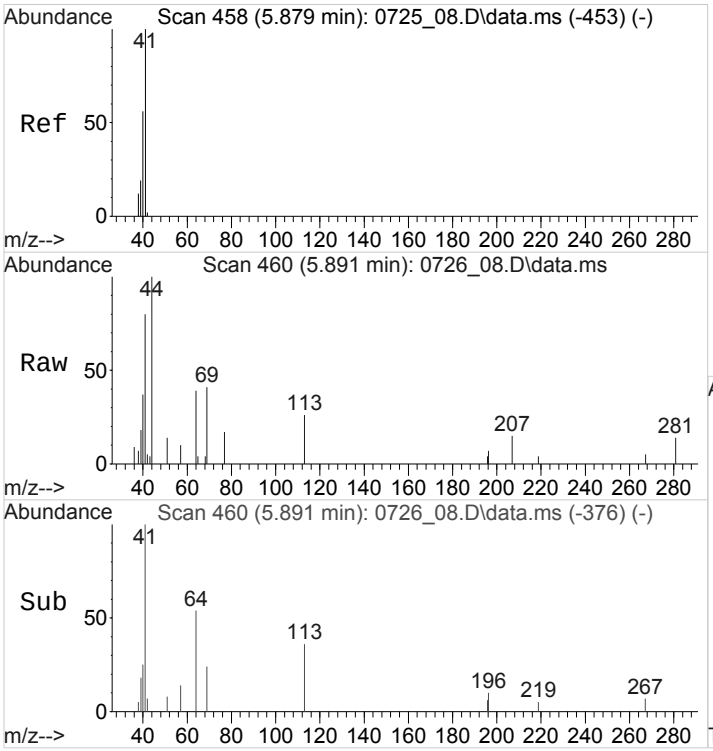


#26
METHYL ACETATE
Concen: 0.5757954 ppbv
RT: 5.842 min Scan# 452
Delta R.T. 0.037 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 43 Resp: 17966

Ion	Ratio	Lower	Upper
43	100		
74	0.7	15.7	23.5#
29	0.0	0.0	0.0

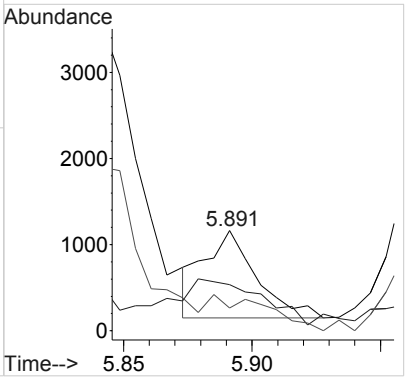


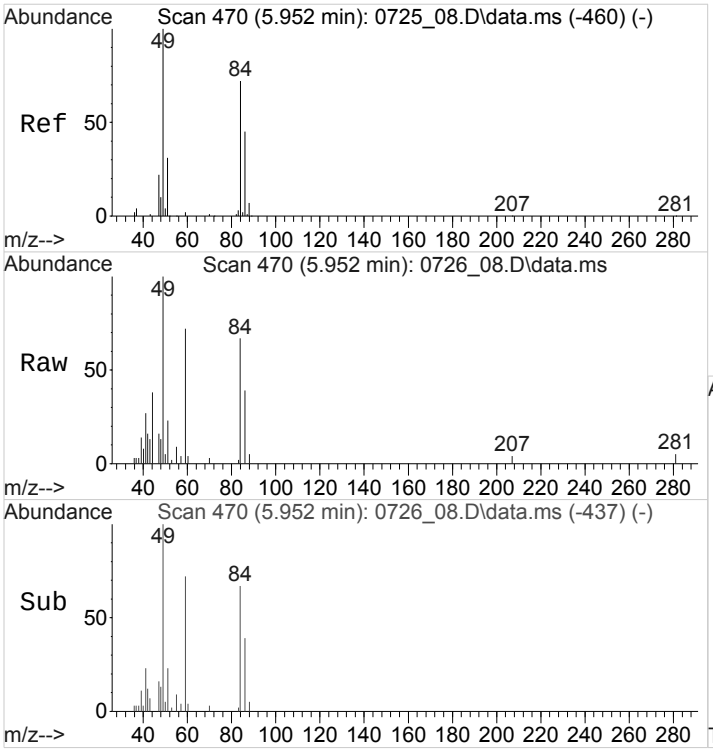


#27
ACETONITRILE
Concen: 0.1116362 ppbv
RT: 5.891 min Scan# 460
Delta R.T. 0.012 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 41 Resp: 1436

Ion	Ratio	Lower	Upper
41	100		
40	65.5	41.5	62.3#
39	46.1	15.7	23.5#

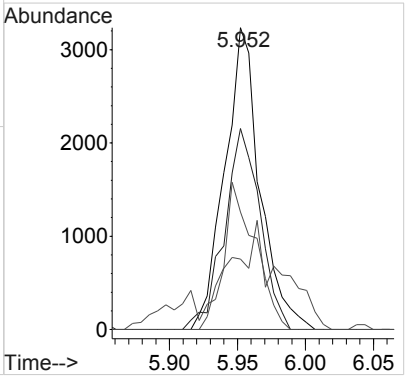


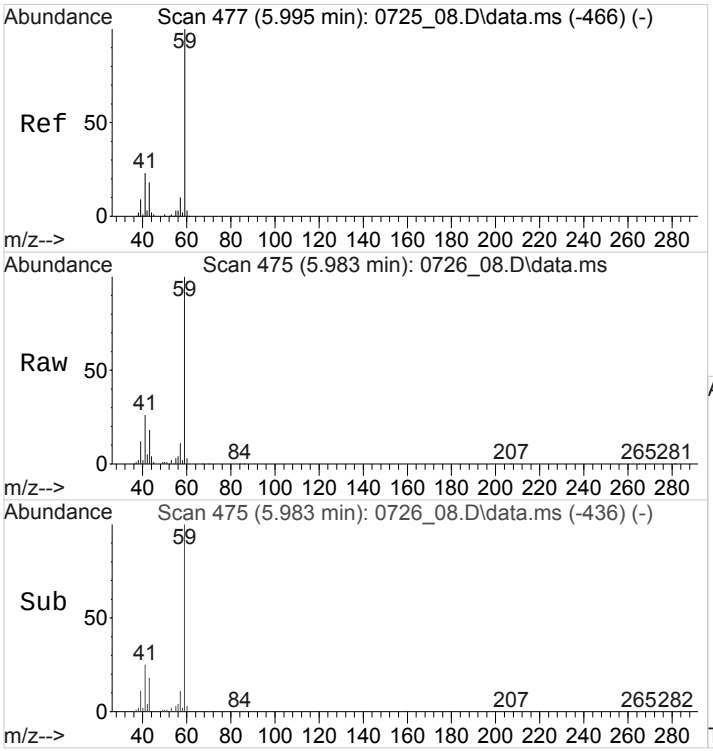


#28
Methylene Chloride
Concen: Below Cal
RT: 5.952 min Scan# 470
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 49 Resp: 5828

Ion	Ratio	Lower	Upper
49	100		
84	67.5	55.8	83.8
86	43.9	36.6	55.0
51	50.2	25.9	38.9#

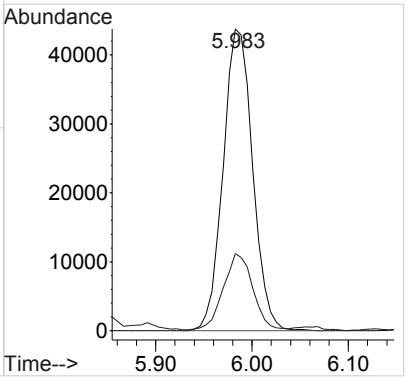


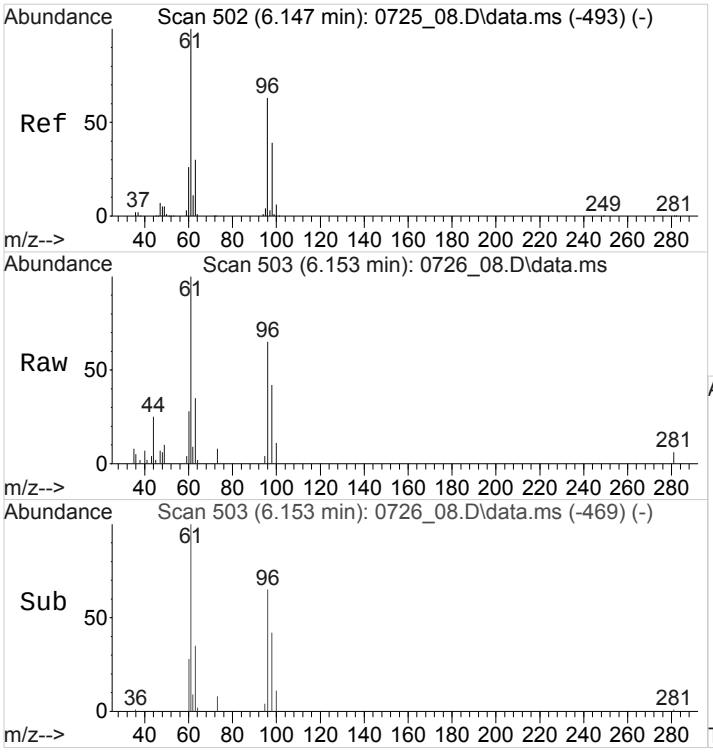


#29
TERT-BUTYL ALCOHOL
Concen: 3.0176404 ppbv
RT: 5.983 min Scan# 475
Delta R.T. -0.012 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 59 Resp: 93329

Ion	Ratio	Lower	Upper
59	100		
41	24.9	22.0	33.0

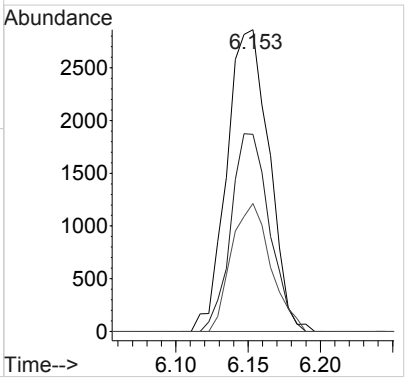


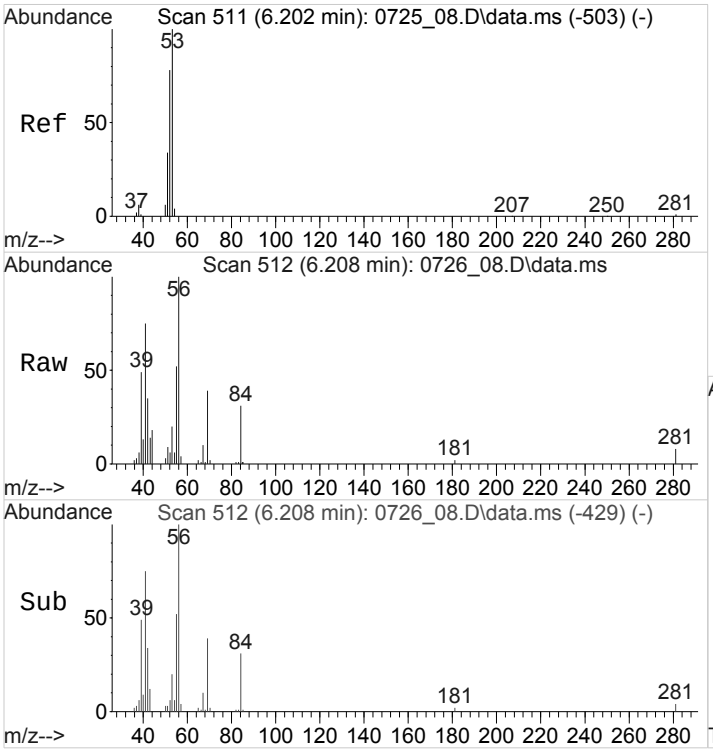


#31
Trans-1,2-Dichloroethene
Concen: 0.2399856 ppbv
RT: 6.153 min Scan# 503
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 61 Resp: 5808

Ion	Ratio	Lower	Upper
61	100		
96	59.5	49.8	74.6
98	39.5	30.5	45.7

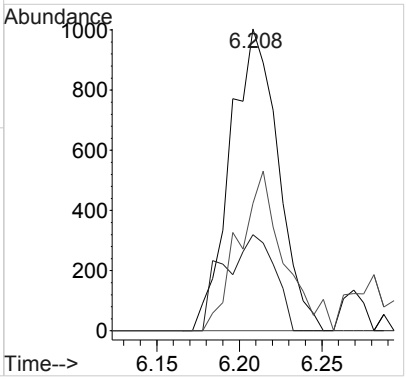




#32
ACRYLONITRILE
Concen: 0.1542006 ppbv
RT: 6.208 min Scan# 512
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 53 Resp: 2035

Ion	Ratio	Lower	Upper
53	100		
52	33.8	66.7	100.1#
51	49.4	28.8	43.2#



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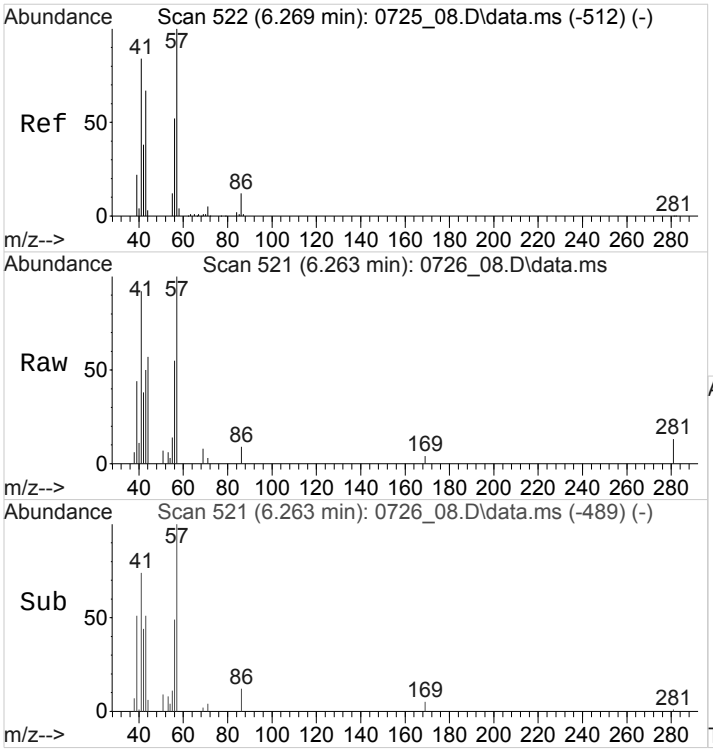
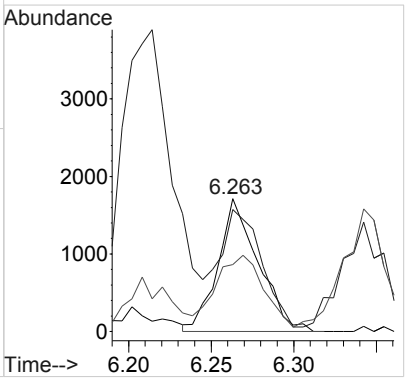
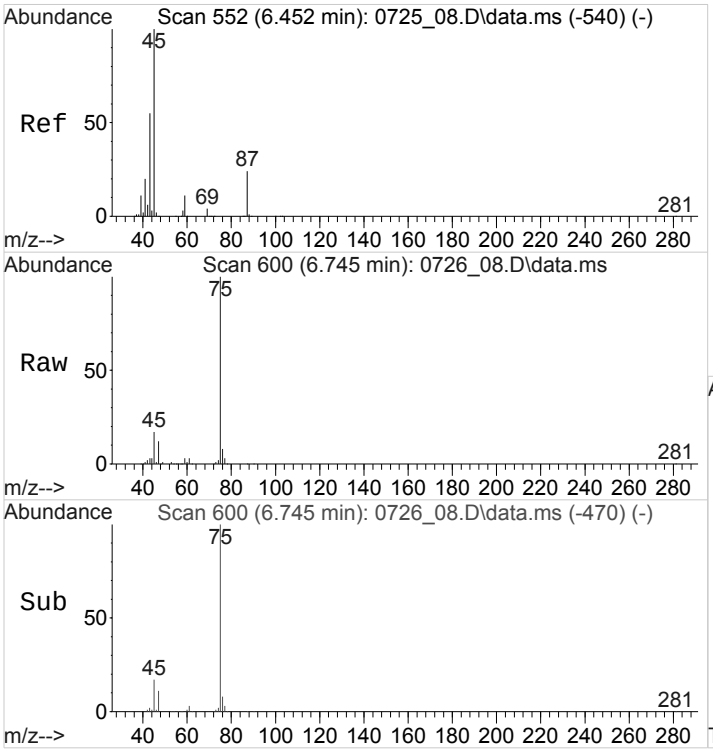


#33
n-Hexane
Concen: 0.1351048 ppbv
RT: 6.263 min Scan# 521
Delta R.T. -0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 57 Resp: 2906

Ion	Ratio	Lower	Upper
57	100		
41	92.1	68.5	102.7
43	69.4	54.9	82.3

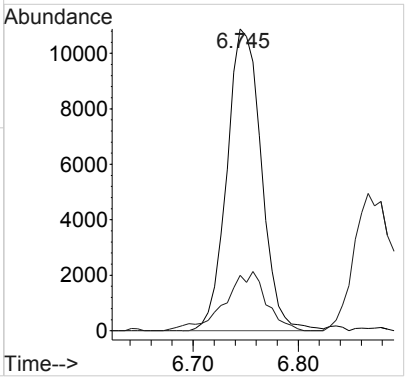


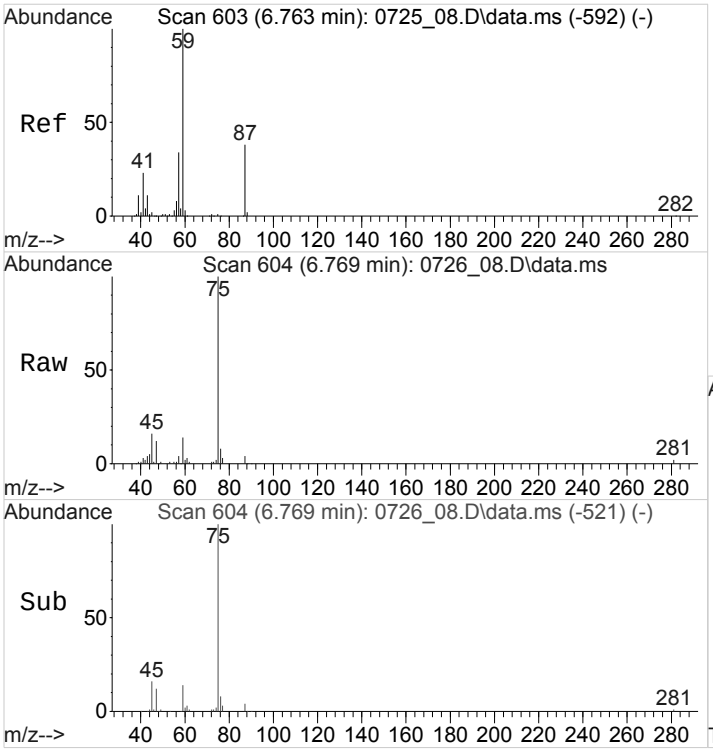


#36
DI-ISOPROPYL ETHER
Concen: 0.5493184 ppbv
RT: 6.745 min Scan# 600
Delta R.T. 0.293 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 45 Resp: 24816

Ion	Ratio	Lower	Upper
45	100		
43	23.6	39.9	59.9#

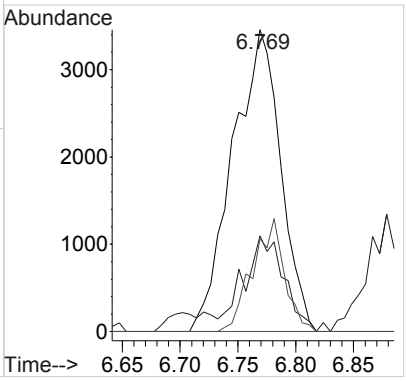


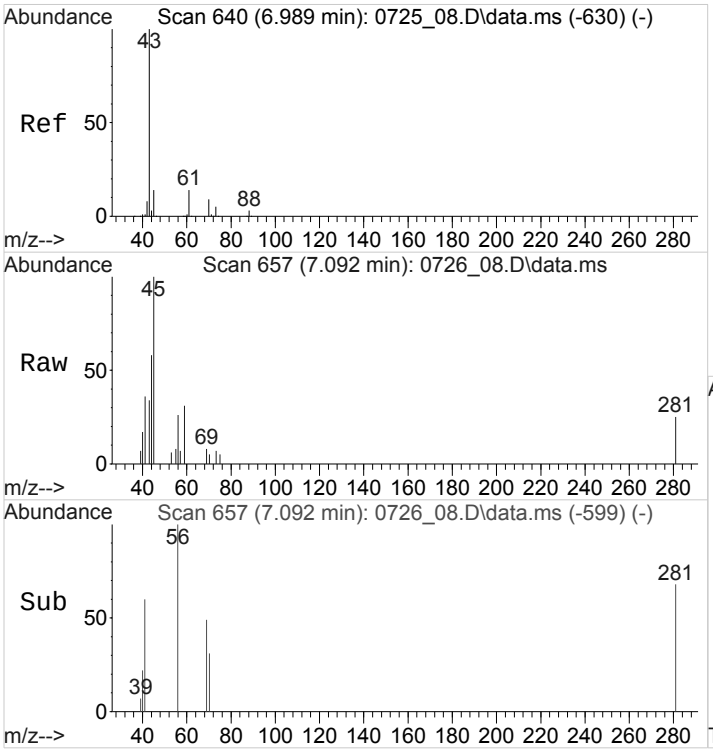


#37
ETHYL TERT-BUTYL ETHER
Concen: 0.2167782 ppbv
RT: 6.769 min Scan# 604
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 59 Resp: 9990

Ion	Ratio	Lower	Upper
59	100		
57	26.5	27.3	40.9#
87	24.9	30.5	45.7#

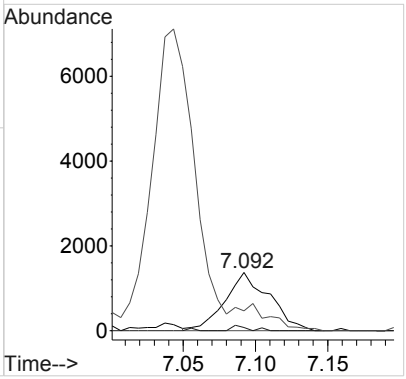


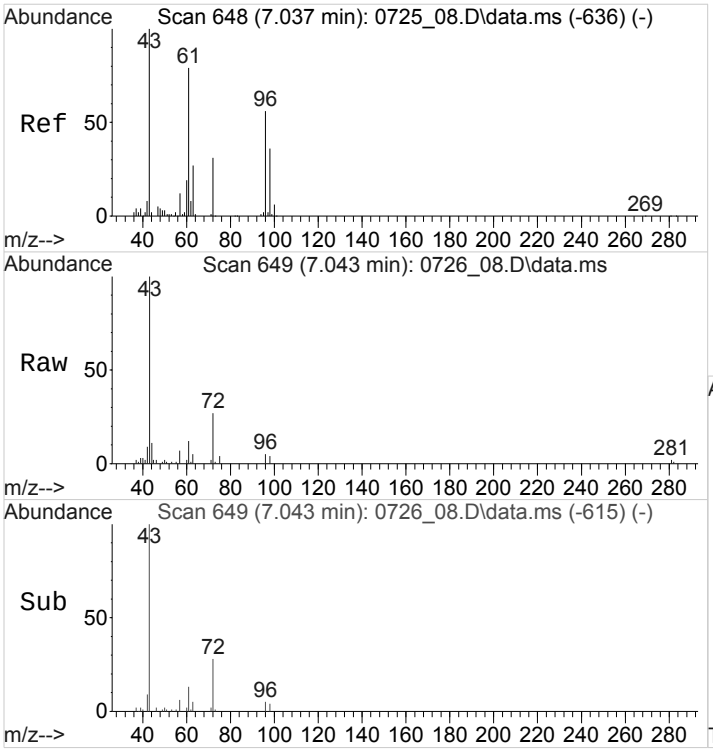


#38
ETHYL ACETATE
Concen: 0.5715293 ppbv
RT: 7.092 min Scan# 657
Delta R.T. 0.104 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 45 Resp: 2922

Ion	Ratio	Lower	Upper
45	100		
70	3.4	52.4	78.6#
43	0.0	566.5	849.7#

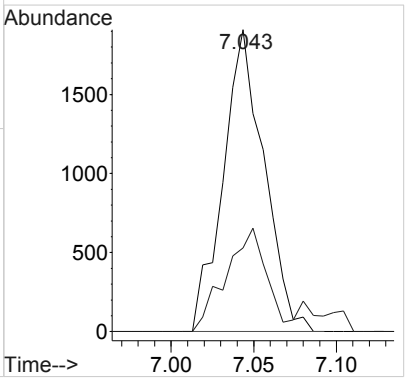


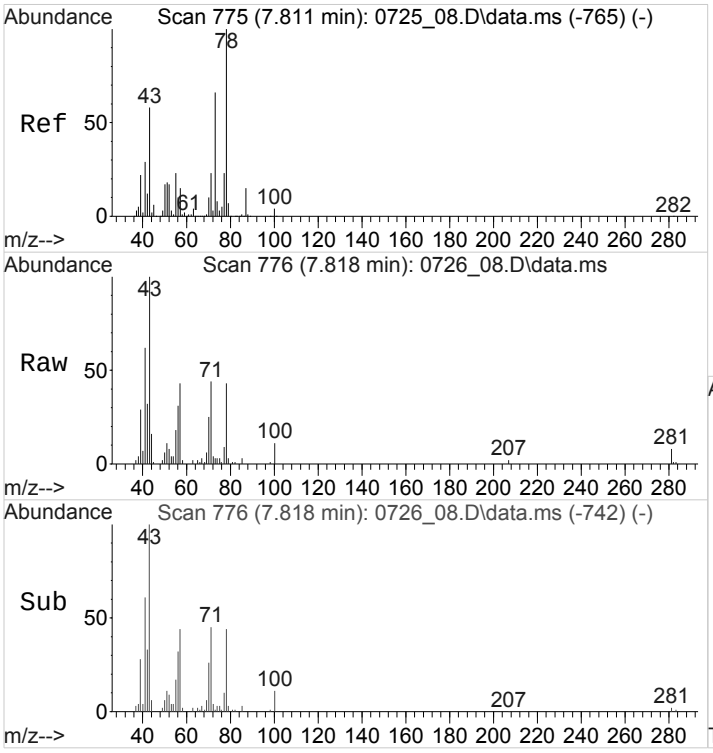


#39
2-Butanone (MEK)
Concen: 0.4484448 ppbv
RT: 7.043 min Scan# 649
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 72 Resp: 3294

Ion	Ratio	Lower	Upper
72	100		
57	34.5	28.6	42.8

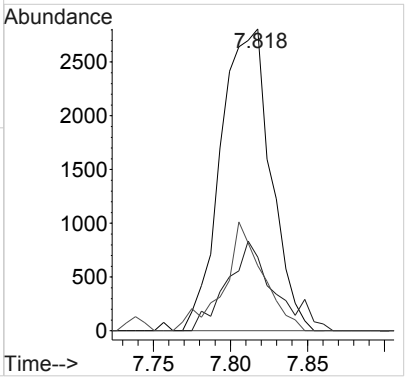


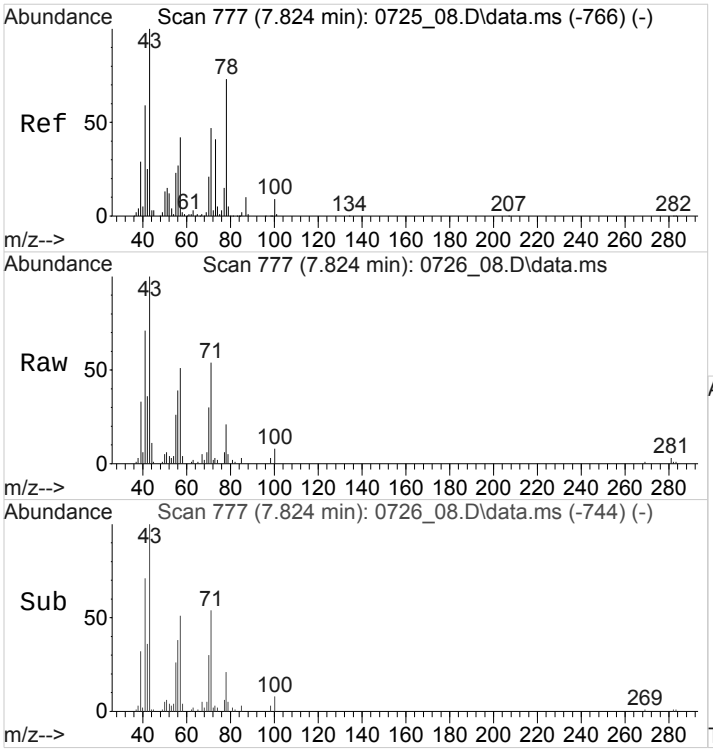


#48
Benzene
Concen: 0.1348931 ppbv
RT: 7.818 min Scan# 776
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 78 Resp: 6336

Ion	Ratio	Lower	Upper
78	100		
51	28.2	16.3	24.5#
77	28.2	18.4	27.6#

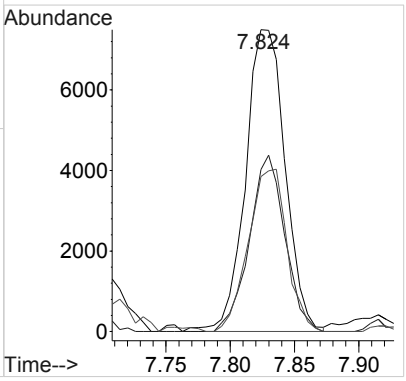


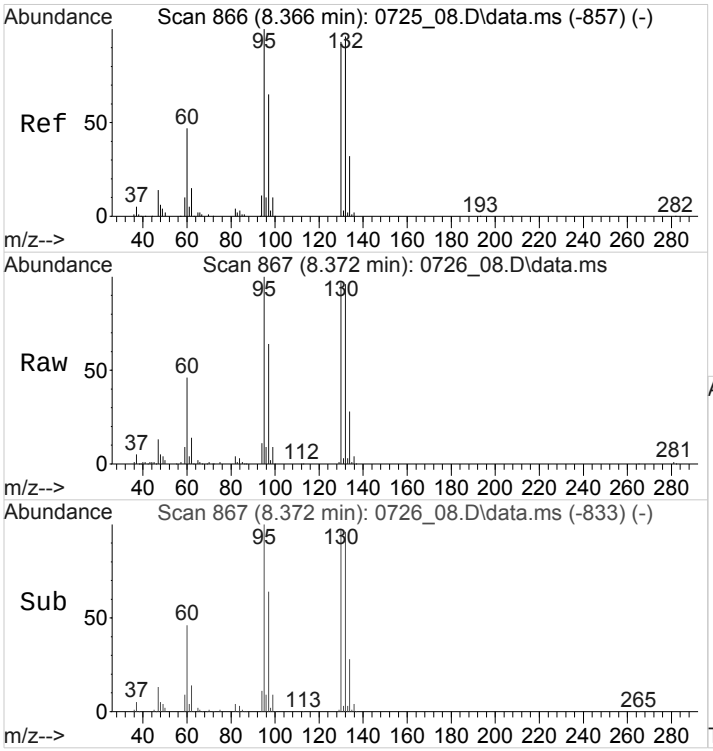


#51
Heptane
Concen: 0.3625356 ppbv
RT: 7.824 min Scan# 777
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 43 Resp: 16089

Ion	Ratio	Lower	Upper
43	100		
71	52.5	34.2	51.2#
57	52.3	26.7	40.1#

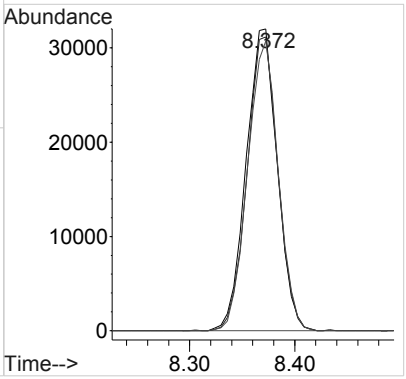




#52
Trichloroethene
Concen: 3.1870852 ppbv
RT: 8.372 min Scan# 867
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 95 Resp: 65894

Ion	Ratio	Lower	Upper
95	100		
130	95.8	78.1	117.1
132	94.4	74.8	112.2



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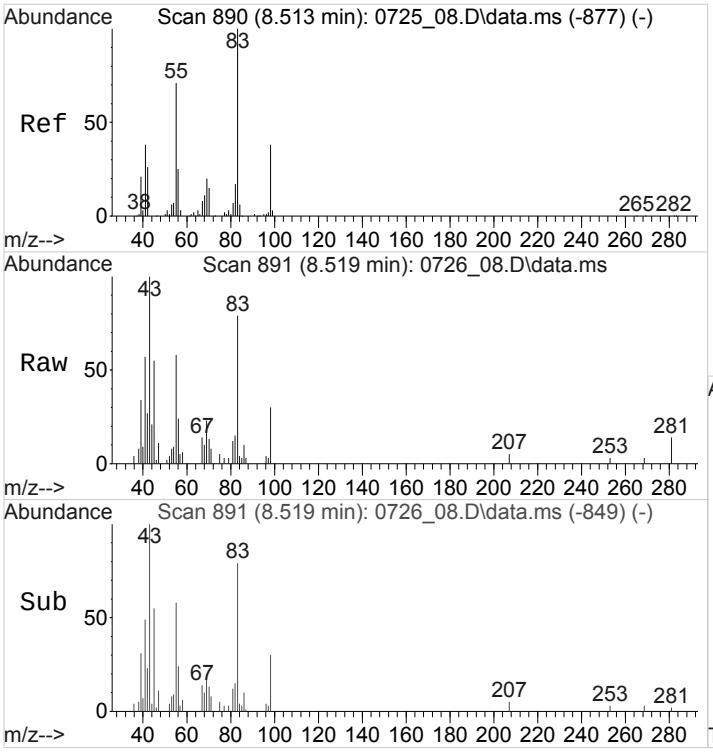
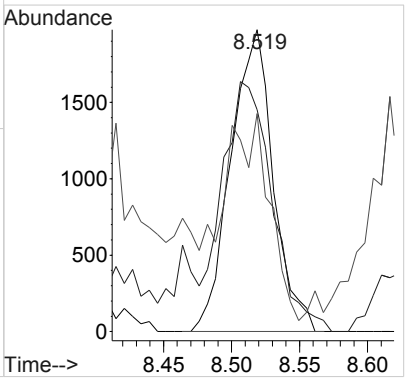
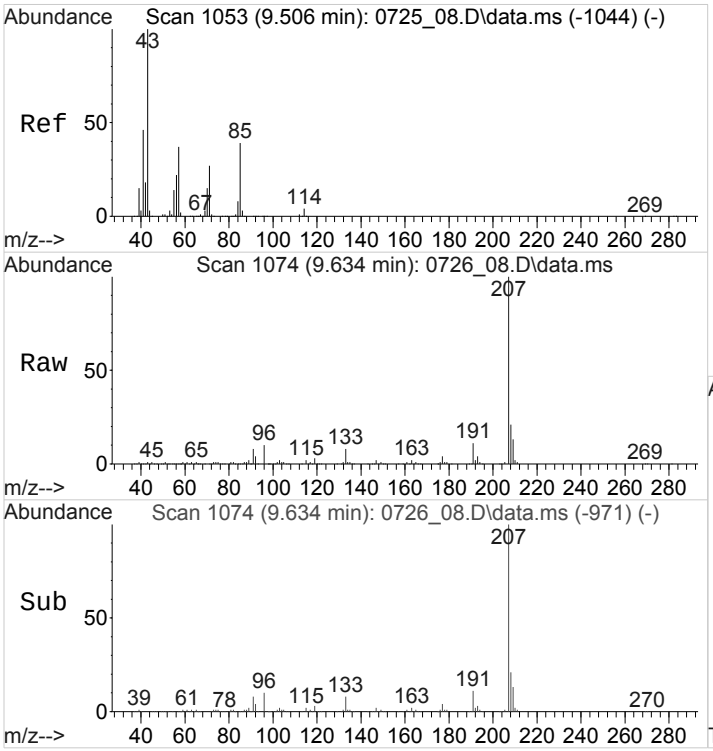


#54
METHYL CYCLOHEXANE
Concen: 0.1504965 ppbv
RT: 8.519 min Scan# 891
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 83 Resp: 4275

Ion	Ratio	Lower	Upper
83	100		
55	97.7	69.5	104.3
41	74.6	40.7	61.1#

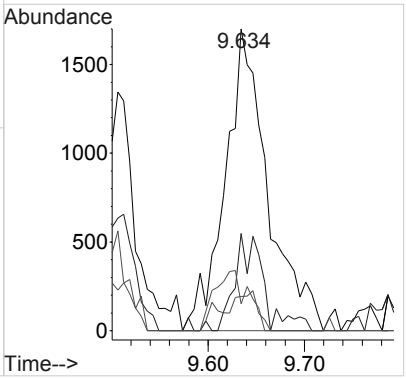




#61
n-OCTANE
Concen: 0.1251192 ppbv
RT: 9.634 min Scan# 1074
Delta R.T. 0.128 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 43 Resp: 5251

Ion	Ratio	Lower	Upper
43	100		
57	0.0	30.2	45.4#
85	0.0	30.3	45.5#
71	0.0	20.8	31.2#



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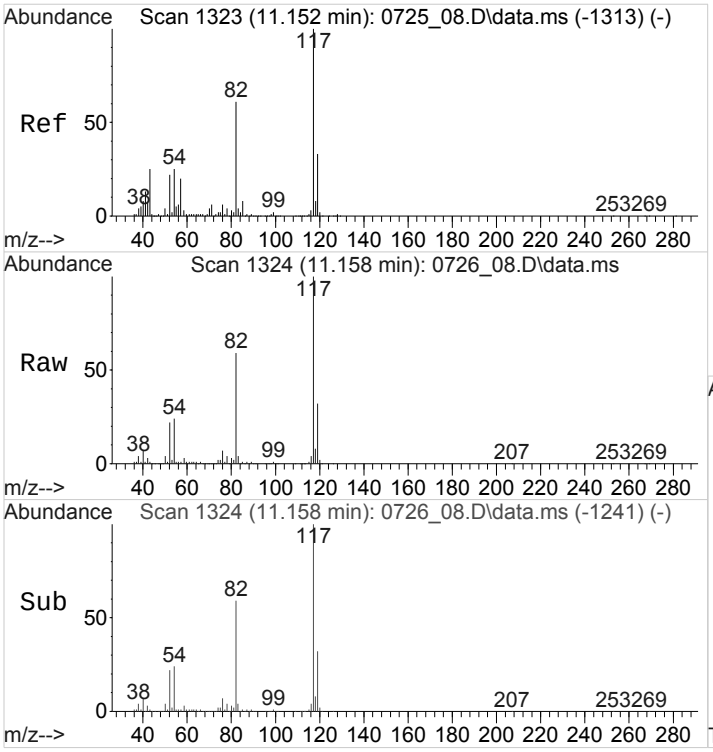
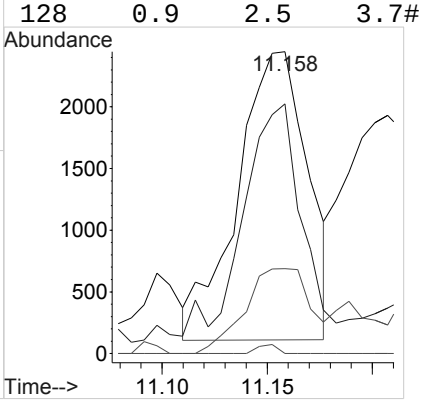
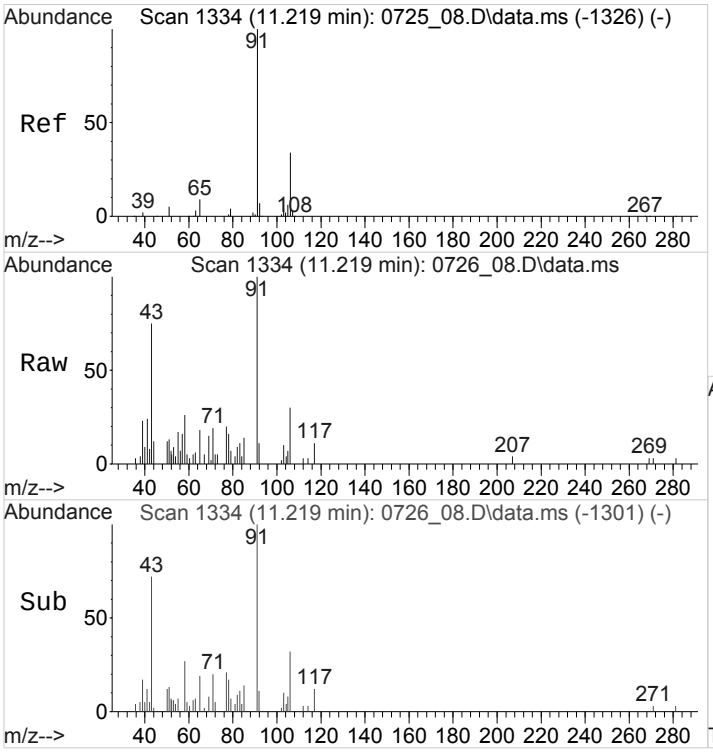


#70
NONANE
Concen: 0.1178885 ppbv
RT: 11.158 min Scan# 1324
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 43 Resp: 5444

Ion	Ratio	Lower	Upper
43	100		
57	72.0	65.4	98.0
71	27.4	18.3	27.5
128	0.9	2.5	3.7#

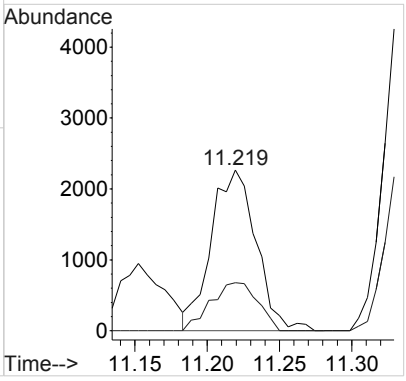


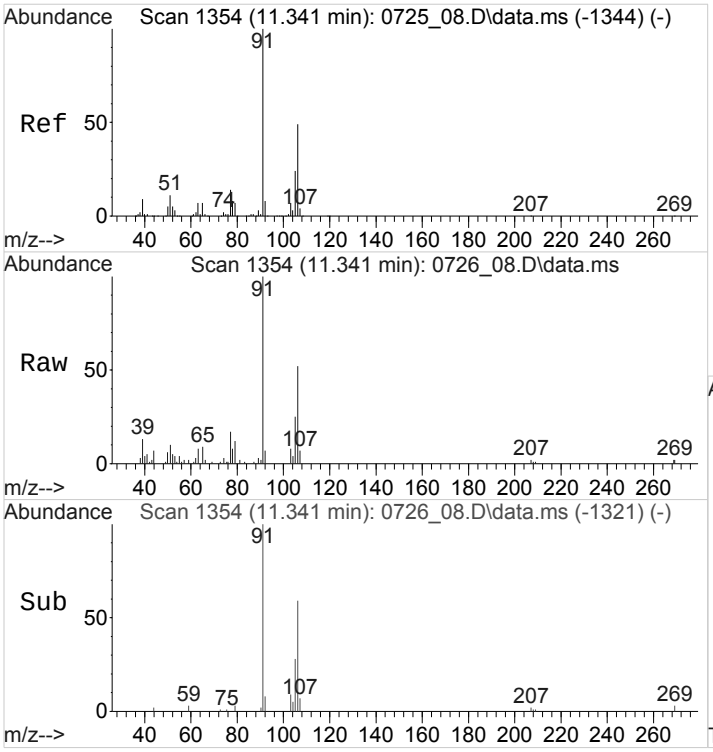


#72
Ethylbenzene
Concen: 0.0699526 ppbv
RT: 11.219 min Scan# 1334
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 91 Resp: 4903

Ion	Ratio	Lower	Upper
91	100		
106	31.3	25.3	37.9

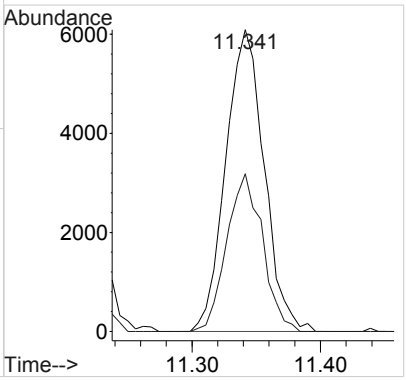


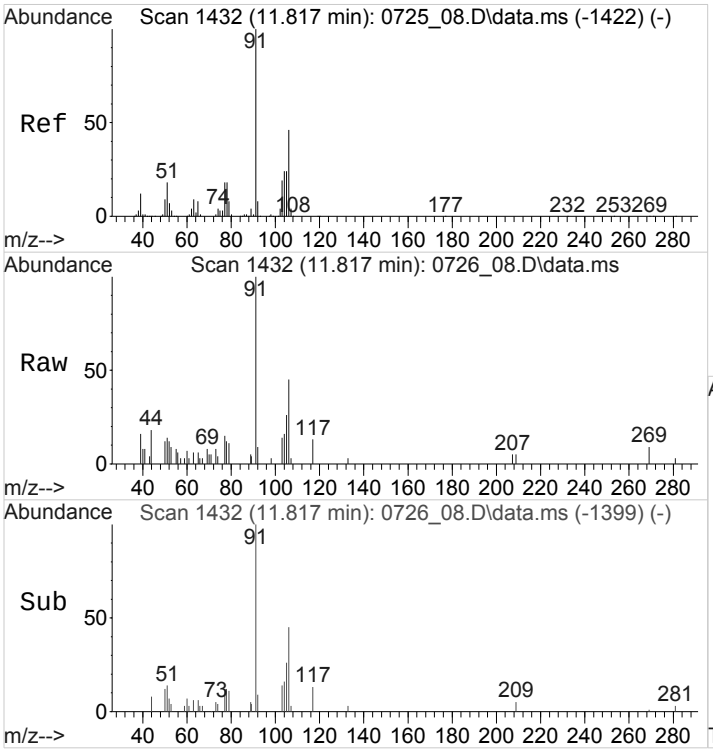


#73
M&P-Xylene
Concen: 0.2371473 ppbv
RT: 11.341 min Scan# 1354
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 91 Resp: 12668

Ion	Ratio	Lower	Upper
91	100		
106	48.6	38.6	58.0

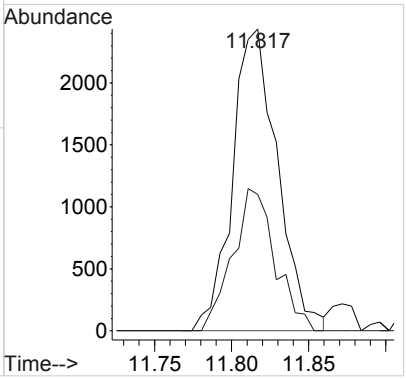




#74
O-Xylene
Concen: 0.0951509 ppbv
RT: 11.817 min Scan# 1432
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 91 Resp: 4958

Ion	Ratio	Lower	Upper
91	100		
106	44.4	36.9	55.3



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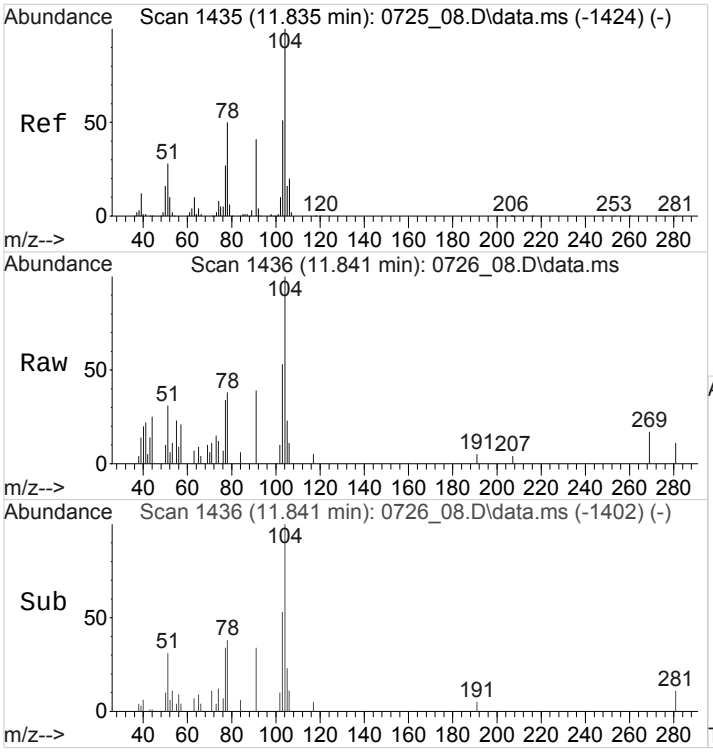
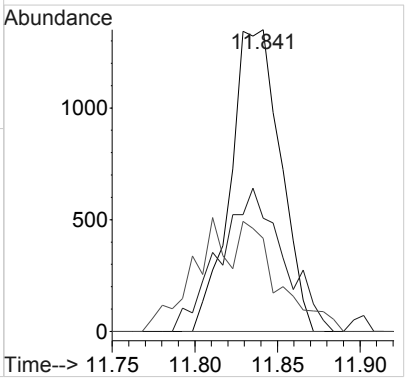
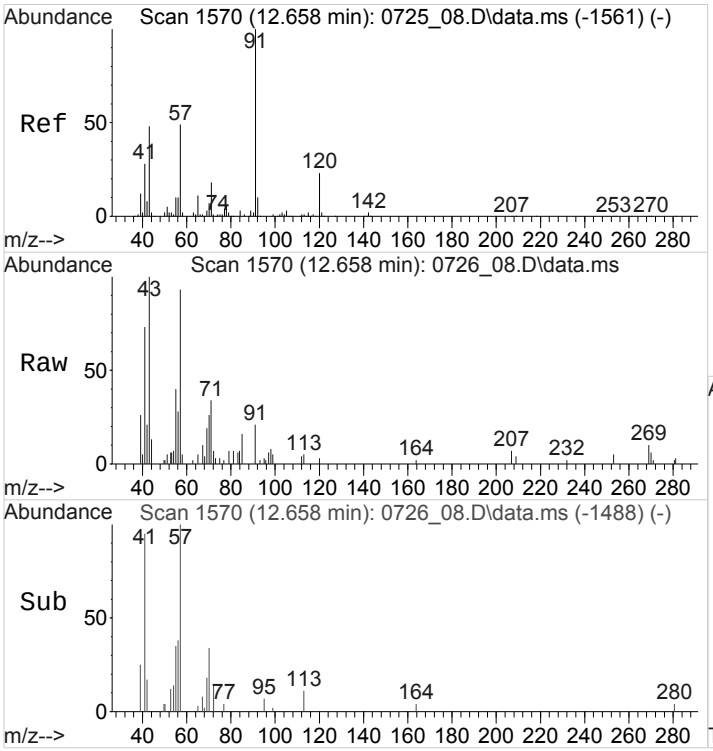


#77
Styrene
Concen: 0.0631765 ppbv
RT: 11.841 min Scan# 1436
Delta R.T. 0.006 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion:104 Resp: 2848

Ion	Ratio	Lower	Upper
104	100		
78	60.5	42.5	63.7
51	28.6	30.1	45.1#

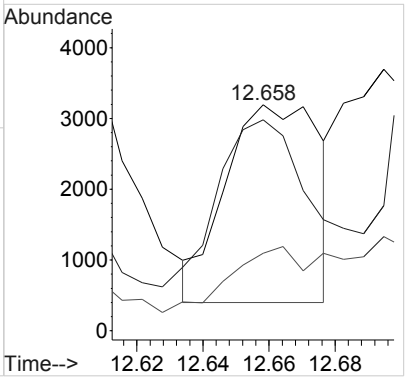




#80
n-DECANE
Concen: 0.1129433 ppbv
RT: 12.658 min Scan# 1570
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion: 43 Resp: 5540

Ion	Ratio	Lower	Upper
43	100		
57	0.0	80.0	120.0#
71	24.8	30.4	45.6#



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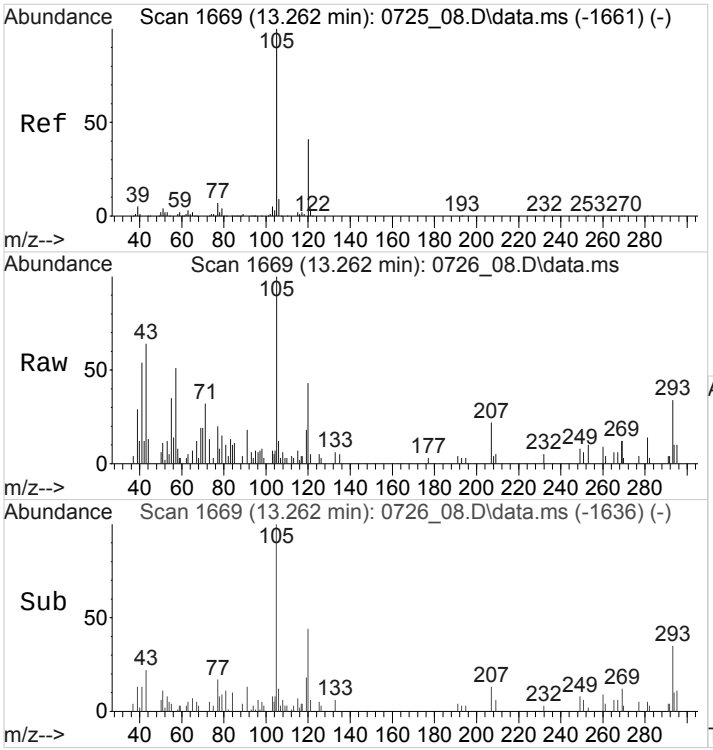
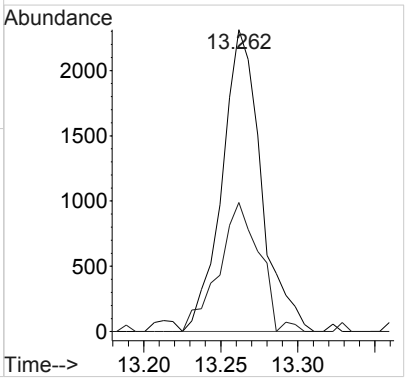
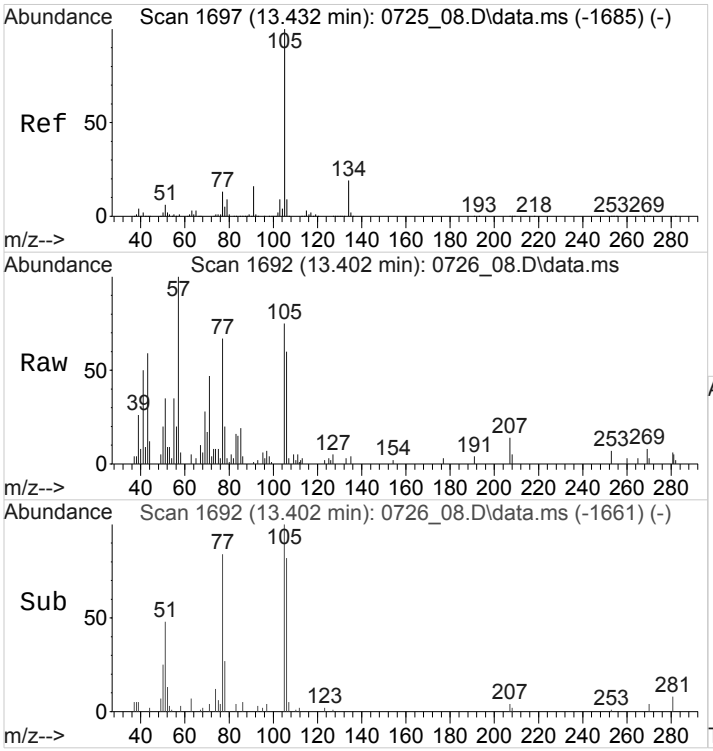


#88
1,2,4-Trimethylbenzene
Concen: 0.0555089 ppbv
RT: 13.262 min Scan# 1669
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion:105 Resp: 4078

Ion	Ratio	Lower	Upper
105	100		
120	44.8	36.1	54.1

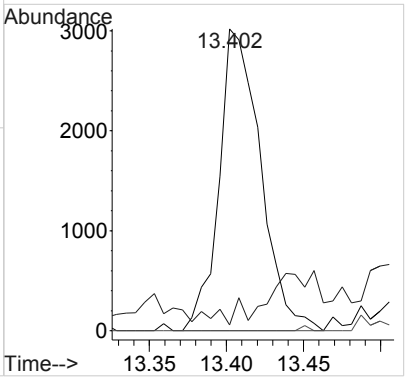




#89
sec-Butylbenzene
Concen: 0.0538688 ppbv
RT: 13.402 min Scan# 1692
Delta R.T. -0.030 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion:105 Resp: 5663

Ion	Ratio	Lower	Upper
105	100		
91	2.0	13.4	20.2#
134	0.0	14.9	22.3#



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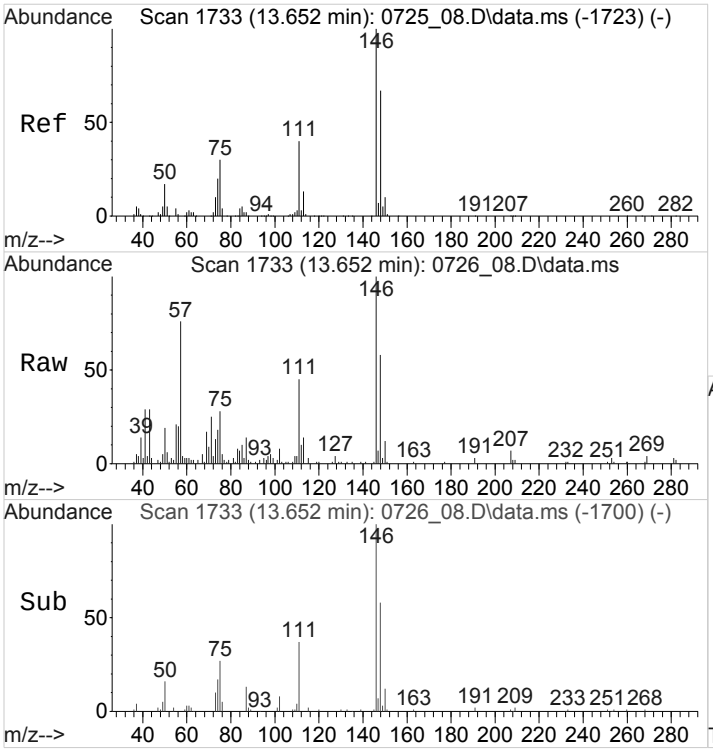
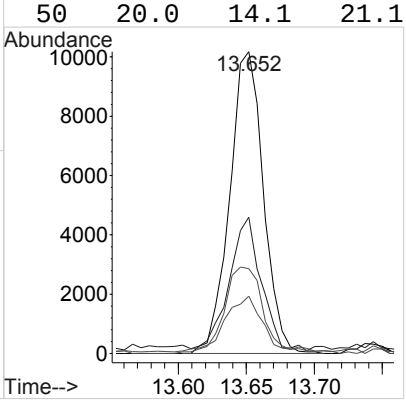
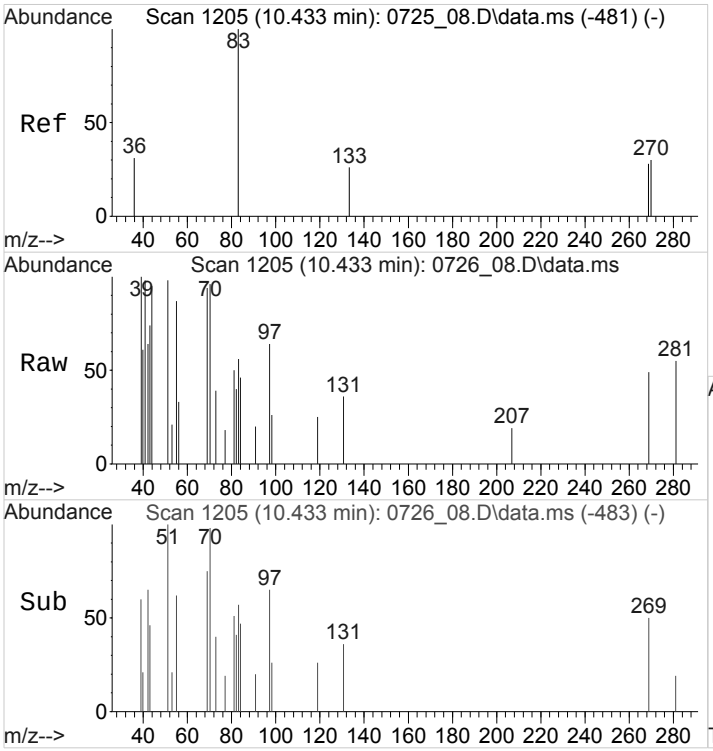


#90
1,3-Dichlorobenzene
Concen: 0.3310761 ppbv
RT: 13.652 min Scan# 1733
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion:146 Resp: 17512

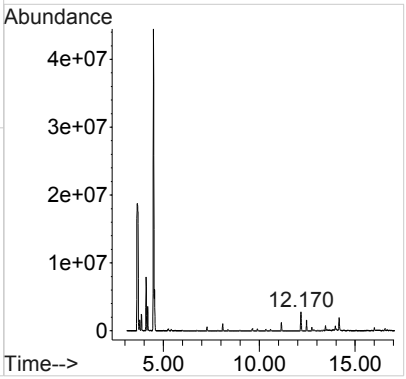
Ion	Ratio	Lower	Upper
146	100		
111	40.0	31.4	47.0
75	33.2	24.2	36.2
50	20.0	14.1	21.1





#101
TPH (GC/MS) Low Fraction
Concen: 131.0791534 ppbv m
RT: 10.430 min Scan# 1205
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion:TIC Resp:15654835



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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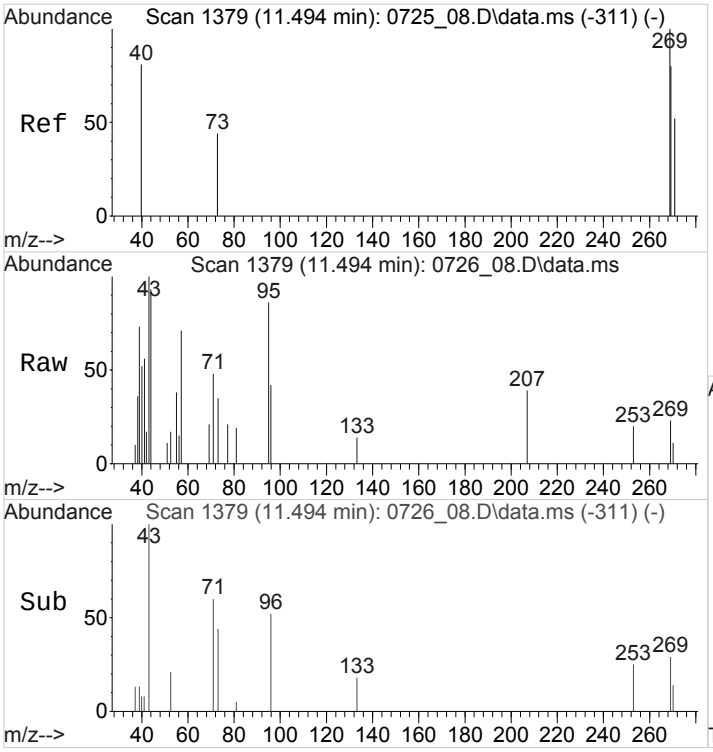
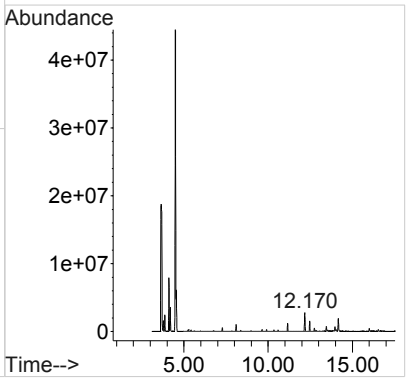


#102
TPH-GRO (C5-C10)
Concen: 183.4890145 ppbv m
RT: 11.493 min Scan# 1379
Delta R.T. 0.000 min
Lab File: 0726_08.D
Acq: 26 Jul 2022 12:58 pm

Tgt Ion:TIC Resp:17863304



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-VMP02-0220722

Lab Sample ID:	L1518164-04	**SDG:**	L1518164
Client Sample ID:	CRCA-VMP02-0220722	**Collected Date/Time:**	07/22/22 12:20
Lab File ID:	0726_09	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 13:38
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 13:38
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
Acetone	67-64-1	5.59	6.18		1.39	2.85	5.70
Allyl Chloride	107-05-1	0	0.783	U	0.357	0.783	1.57
Benzene	71-43-2	7.81	0.326	J	0.228	0.479	0.958
Benzyl Chloride	100-44-7	0	0.675	U	0.311	0.675	1.56
Bromodichloromethane	75-27-4	0	1.01	U	0.471	1.01	2.01
Bromoform	75-25-2	0	3.21	U	0.757	3.21	6.21
Bromomethane	74-83-9	0	0.776	U	0.381	0.776	1.55
1,3-Butadiene	106-99-0	0	1.39	U	0.230	1.39	4.43
Carbon disulfide	75-15-0	0	0.778	U	0.317	0.778	1.56
Carbon tetrachloride	56-23-5	0	0.945	U	0.461	0.945	1.89
Chlorobenzene	108-90-7	0	0.924	U	0.385	0.924	1.85
Chloroethane	75-00-3	0	0.528	U	0.263	0.528	1.06
Chloroform	67-66-3	0	0.730	U	0.349	0.730	1.46
Chloromethane	74-87-3	0	0.516	U	0.213	0.516	1.03
2-Chlorotoluene	95-49-8	0	1.03	U	0.427	1.03	2.06
Cyclohexane	110-82-7	0	0.689	U	0.259	0.689	1.38
Dibromochloromethane	124-48-1	0	1.28	U	0.618	1.28	2.55
1,2-Dibromoethane	106-93-4	0	1.15	U	0.554	1.15	2.31
1,2-Dichlorobenzene	95-50-1	0	1.80	U	0.770	1.80	3.61
1,3-Dichlorobenzene	541-73-1	0	2.40	U	1.09	2.40	4.81
1,4-Dichlorobenzene	106-46-7	0	0.782	U	0.335	0.782	1.80
1,2-Dichloroethane	107-06-2	0	0.607	U	0.283	0.607	1.21
1,1-Dichloroethane	75-34-3	0	0.601	U	0.290	0.601	1.20
1,1-Dichloroethene	75-35-4	0	0.793	U	0.302	0.793	1.59
cis-1,2-Dichloroethene	156-59-2	0	0.793	U	0.311	0.793	1.59
trans-1,2-Dichloroethene	156-60-5	6.15	7.09		0.267	0.594	1.19
1,2-Dichloropropane	78-87-5	0	0.924	U	0.351	0.924	1.85
cis-1,3-Dichloropropene	10061-01-5	0	0.681	U	0.313	0.681	1.36
trans-1,3-Dichloropropene	10061-02-6	0	0.681	U	0.331	0.681	1.36
1,4-Dioxane	123-91-1	0	0.721	U	0.300	0.721	1.44
Ethanol	64-17-5	5.17	2.07	B J	0.500	1.19	2.45
Ethylbenzene	100-41-4	11.21	0.867	U	0.362	0.867	1.73
4-Ethyltoluene	622-96-8	0	0.982	U	0.384	0.982	1.96
Trichlorofluoromethane	75-69-4	4.98	0.776	J	0.460	0.983	1.97
Dichlorodifluoromethane	75-71-8	0	1.48	U	0.678	1.48	2.97
1,1,2-Trichlorotrifluoroethane	76-13-1	5.42	43.9		0.608	1.53	3.07
1,2-Dichlorotetrafluoroethane	76-14-2	0	1.40	U	0.622	1.40	2.80
Heptane	142-82-5	7.82	1.60	J	0.425	1.02	2.04
Hexachloro-1,3-butadiene	87-68-3	0	2.67	U	1.12	2.67	6.73
n-Hexane	110-54-3	0	1.76	U	0.726	1.76	3.53
Isopropylbenzene	98-82-8	0	0.983	U	0.382	0.983	1.97
Methylene Chloride	75-09-2	0	0.694	U	0.340	0.694	1.39
Methyl Butyl Ketone	591-78-6	0	1.23	U	0.544	1.23	5.11

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-VMP02-0220722

Lab Sample ID:	L1518164-04	**SDG:**	L1518164
Client Sample ID:	CRCA-VMP02-0220722	**Collected Date/Time:**	07/22/22 12:20
Lab File ID:	0726_09	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 13:38
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 13:38
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
2-Butanone (MEK)	78-93-3	7.04	0.888	J	0.240	0.560	3.69
4-Methyl-2-pentanone (MIBK)	108-10-1	0	0.778	U	0.313	0.778	5.12
Methyl Methacrylate	80-62-6	0	0.819	U	0.359	0.819	1.64
MTBE	1634-04-4	0	0.468	U	0.233	0.468	1.08
Naphthalene	91-20-3	0	3.66	U	1.83	3.66	7.33
2-Propanol	67-63-0	0	1.54	U	0.649	1.54	3.07
Propene	115-07-1	0	1.08	U	0.160	1.08	2.15
Styrene	100-42-5	11.84	0.851	U	0.335	0.851	1.70
1,1,2,2-Tetrachloroethane	79-34-5	0	1.03	U	0.511	1.03	2.06
Tetrachloroethylene	127-18-4	10.19	1.36	U	0.553	1.36	2.72
Tetrahydrofuran	109-99-9	0	0.442	U	0.216	0.442	0.885
Toluene	108-88-3	0	0.942	U	0.328	0.942	1.88
1,2,4-Trichlorobenzene	120-82-1	0	2.29	U	1.10	2.29	4.66
1,1,1-Trichloroethane	71-55-6	0	0.816	U	0.400	0.816	1.63
1,1,2-Trichloroethane	79-00-5	0	1.09	U	0.422	1.09	2.18
Trichloroethylene	79-01-6	8.37	19.4		0.364	0.804	1.61
1,2,4-Trimethylbenzene	95-63-6	0	0.982	U	0.375	0.982	1.96
1,3,5-Trimethylbenzene	108-67-8	0	0.982	U	0.382	0.982	1.96
2,2,4-Trimethylpentane	540-84-1	0	1.40	U	0.621	1.40	2.80
Vinyl chloride	75-01-4	0	0.511	U	0.243	0.511	1.02
Vinyl Bromide	593-60-2	0	0.875	U	0.373	0.875	1.75
Vinyl acetate	108-05-4	0	0.880	U	0.408	0.880	1.76
m&p-Xylene	1330-20-7	11.34	1.02	J	0.585	1.30	2.60
o-Xylene	95-47-6	11.82	0.455	J	0.359	0.759	1.52

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_09.D
Acq On : 26 Jul 2022 1:38 pm
Operator :
Sample : L1518164-04 1x WG1900825
Misc :
ALS Vial : 9 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 14:00:46 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

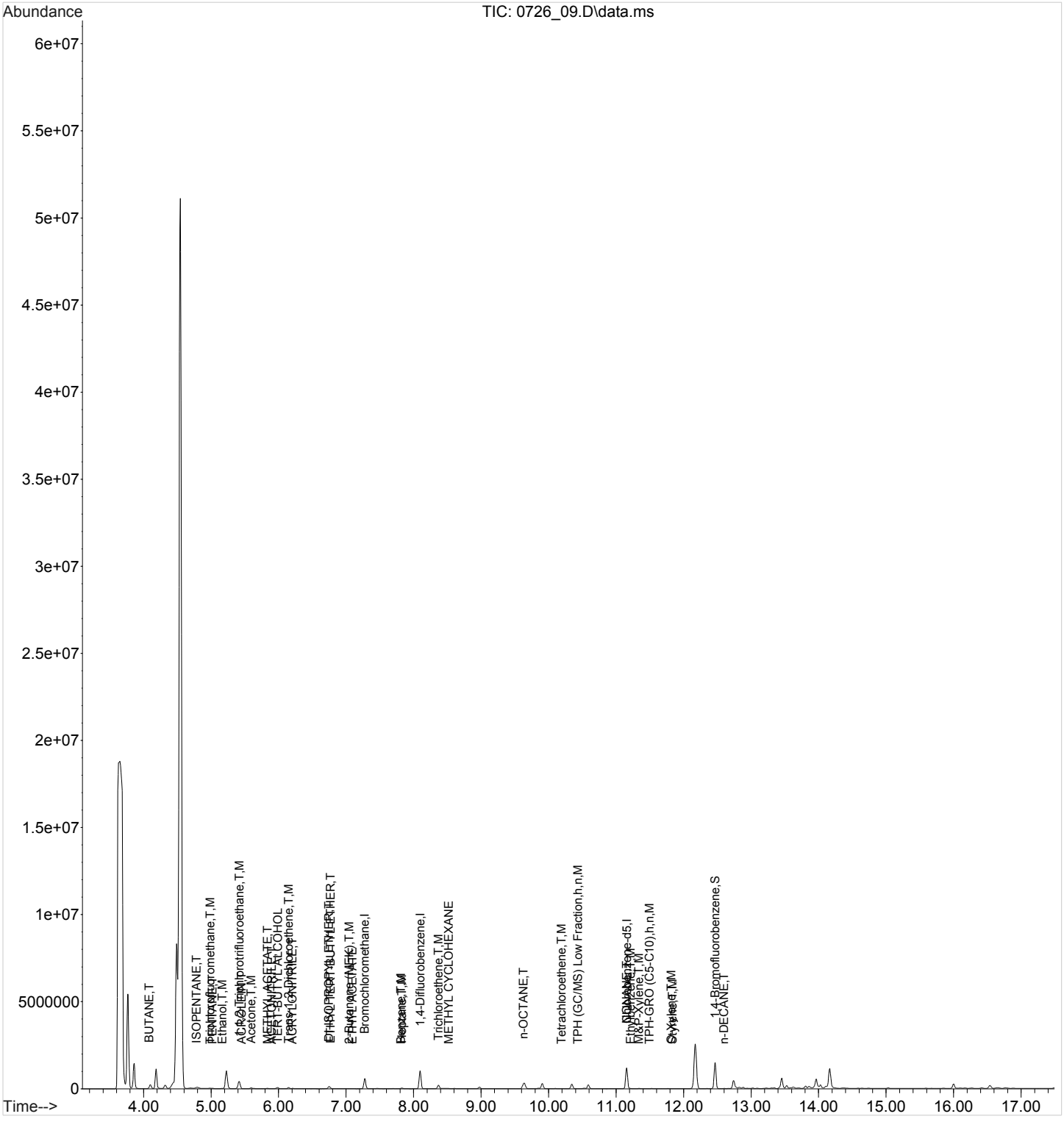
Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.275	130	204146	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	852130	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.158	117	771128	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	551957	3.8988444	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 97.47%				
Target Compounds							Qvalue
3) BUTANE	4.081	43	23143	0.5730867	ppbv	#	76
13) ISOPENTANE	4.782	43	4465	0.2645377	ppbv	#	89
15) Trichlorofluoromethane	4.983	101	6391	0.1376839	ppbv		99
16) PENTANE	5.019	43	9422	0.3612407	ppbv		99
17) Ethanol	5.166	45	7643	1.1028141	ppbv		91
18) ACROLEIN	5.452	56	1370	0.1975800	ppbv		100
19) 1,1,2-Trichlorotrifluo...	5.416	101	192047	5.7337762	ppbv		99
21) Acetone	5.592	43	75875	2.6001770	ppbv		96
26) METHYL ACETATE	5.836	43	18311	0.5789355	ppbv	#	58
27) ACETONITRILE	5.897	41	1399	0.1072926	ppbv	#	75
28) Methylene Chloride	5.952	49	5475	Below Cal		#	92
29) TERT-BUTYL ALCOHOL	5.989	59	82392	2.6280720	ppbv		97
31) Trans-1,2-Dichloroethene	6.147	61	43975	1.7925269	ppbv		98
32) ACRYLONITRILE	6.202	53	2131	0.1592965	ppbv	#	52
36) DI-ISOPROPYL ETHER	6.745	45	30417	0.6642172	ppbv	#	64
37) ETHYL TERT-BUTYL ETHER	6.769	59	11335	0.2426459	ppbv	#	83
38) ETHYL ACETATE	7.092	45	1107	0.2136029	ppbv	#	1
39) 2-Butanone (MEK)	7.043	72	2244	0.3013766	ppbv		93
48) Benzene	7.812	78	4817	0.1022222	ppbv	#	76
51) Heptane	7.824	43	17440	0.3917078	ppbv	#	75
52) Trichloroethene	8.366	95	75266	3.6286139	ppbv		98
54) METHYL CYCLOHEXANE	8.519	83	4792	0.1681517	ppbv	#	73
61) n-OCTANE	9.628	43	5171	0.1228148	ppbv	#	40
65) Tetrachloroethene	10.189	166	1829	0.0648308	ppbv		92
70) NONANE	11.152	43	5020	0.1083555	ppbv	#	92
72) Ethylbenzene	11.213	91	4919	0.0699277	ppbv		95
73) M&P-Xylene	11.335	91	12641	0.2357881	ppbv		99
74) O-Xylene	11.817	91	5475	0.1046938	ppbv		94
77) Styrene	11.835	104	2584	0.0571134	ppbv	#	75
80) n-DECANE	12.597	43	5738	0.1165579	ppbv	#	23
101) TPH (GC/MS) Low Fraction	10.430	TIC	15457318m	128.9583996	ppbv		
102) TPH-GRO (C5-C10)	11.493	TIC	19954538m	204.2303660	ppbv		

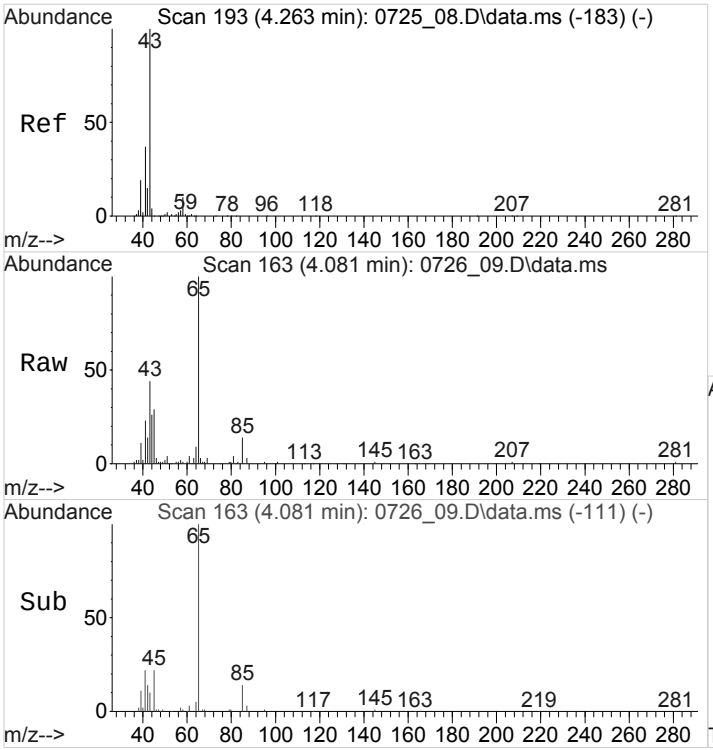
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_09.D
Acq On : 26 Jul 2022 1:38 pm
Operator :
Sample : L1518164-04 1x WG1900825
Misc :
ALS Vial : 9 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 14:00:46 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

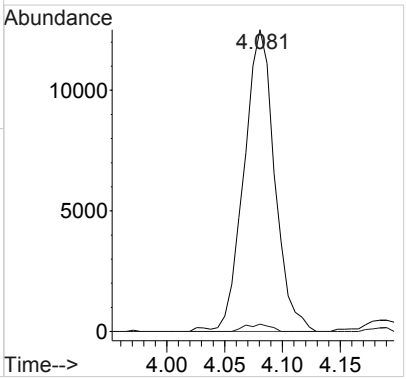


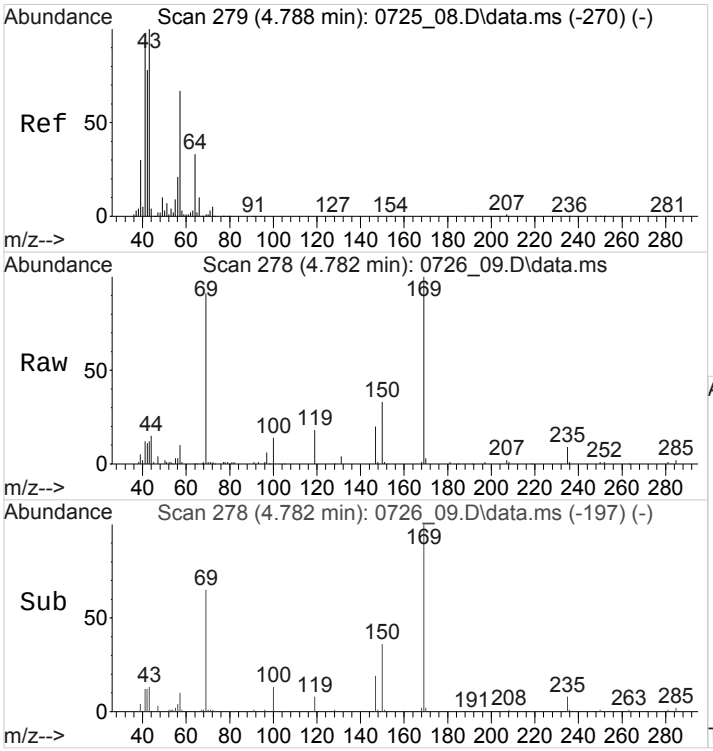


#3
BUTANE
Concen: 0.5730867 ppbv
RT: 4.081 min Scan# 163
Delta R.T. -0.182 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 43 Resp: 23143

Ion	Ratio	Lower	Upper
43	100		
58	2.0	9.0	13.4#

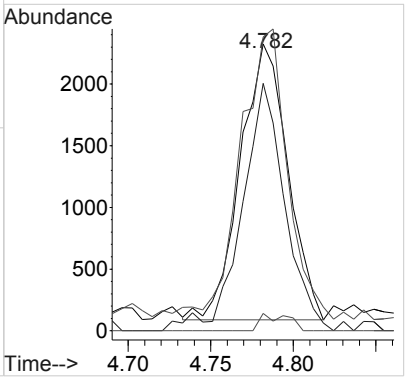




#13
ISOPENTANE
Concen: 0.2645377 ppbv
RT: 4.782 min Scan# 278
Delta R.T. -0.006 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 43 Resp: 4465

Ion	Ratio	Lower	Upper
43	100		
57	81.4	56.3	84.5
41	105.8	77.0	115.4
72	3.7	4.8	7.2#



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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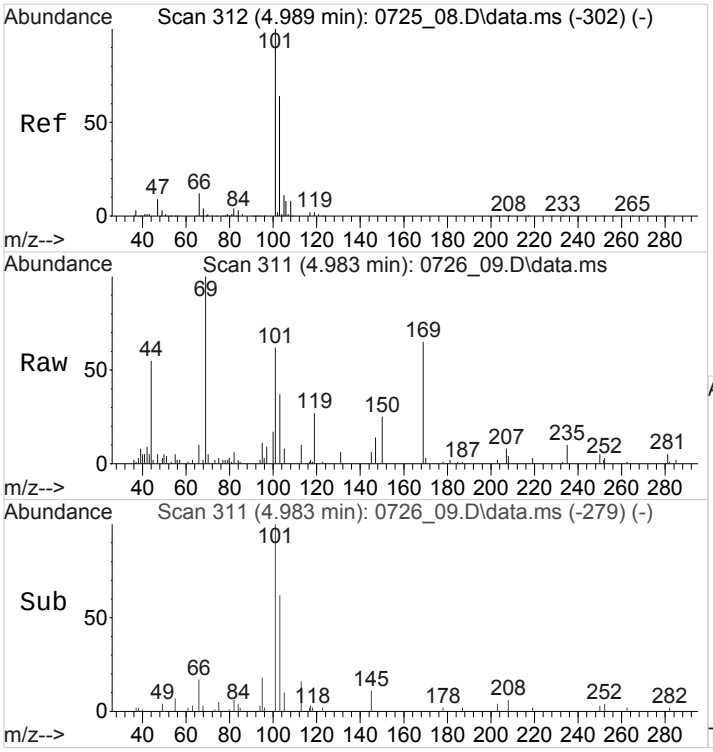
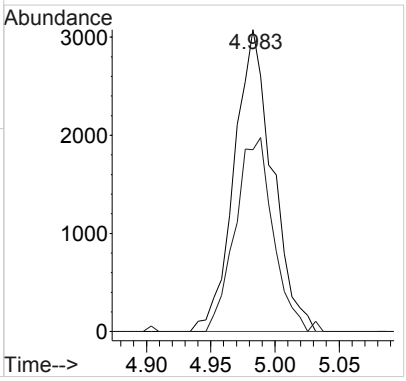
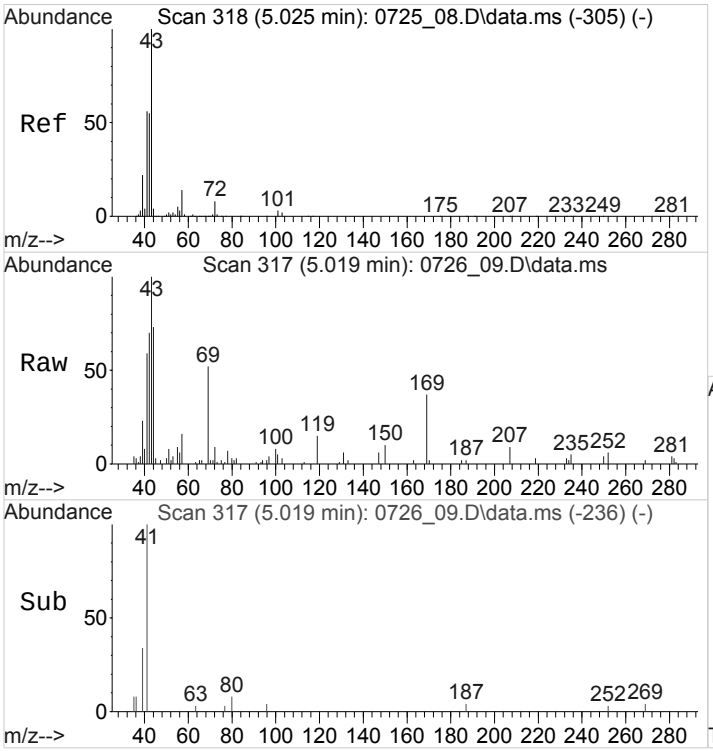


#15
Trichlorofluoromethane
Concen: 0.1376839 ppbv
RT: 4.983 min Scan# 311
Delta R.T. -0.006 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion:101 Resp: 6391

Ion	Ratio	Lower	Upper
101	100		
103	64.0	51.7	77.5

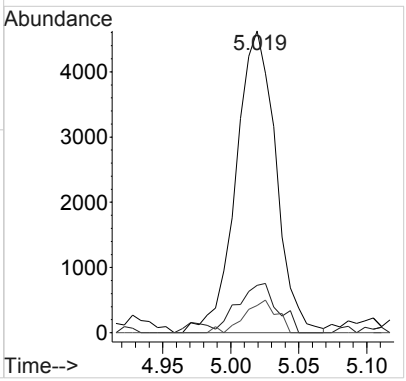




#16
PENTANE
Concen: 0.3612407 ppbv
RT: 5.019 min Scan# 317
Delta R.T. -0.006 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 43 Resp: 9422

Ion	Ratio	Lower	Upper
43	100		
57	16.1	12.7	19.1
72	8.7	7.8	11.8



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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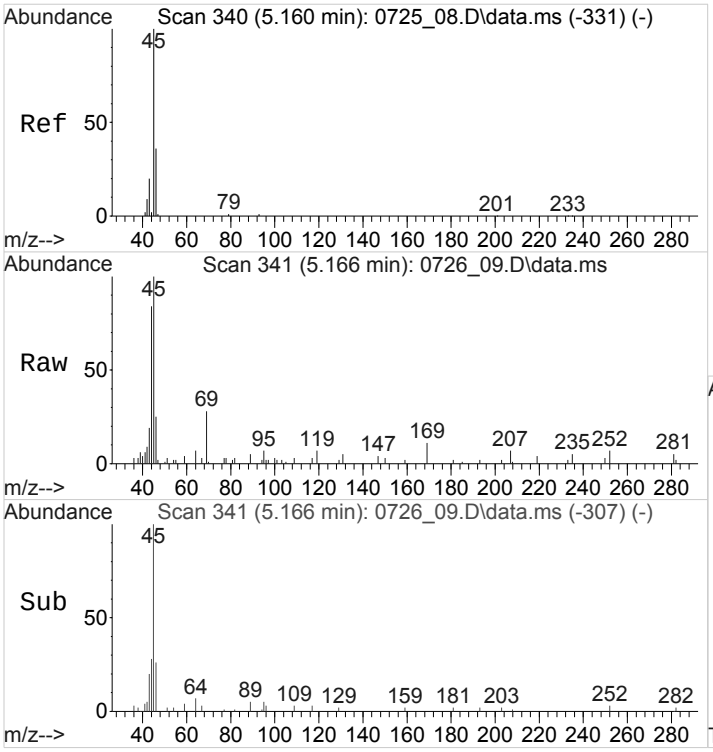
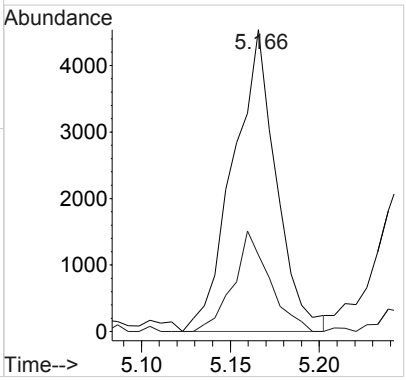
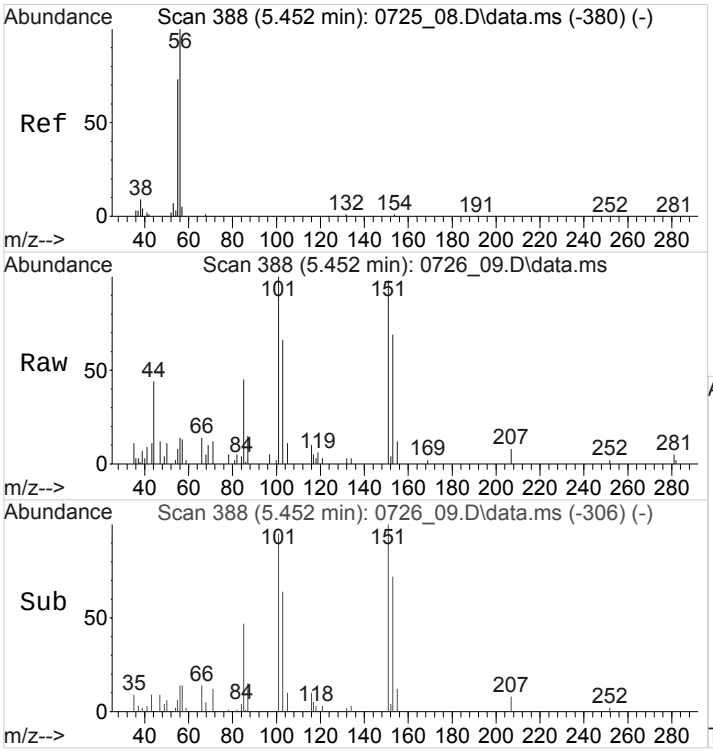


#17
Ethanol
Concen: 1.1028141 ppbv
RT: 5.166 min Scan# 341
Delta R.T. 0.007 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 45 Resp: 7643

Ion	Ratio	Lower	Upper
45	100		
46	28.0	26.3	39.5

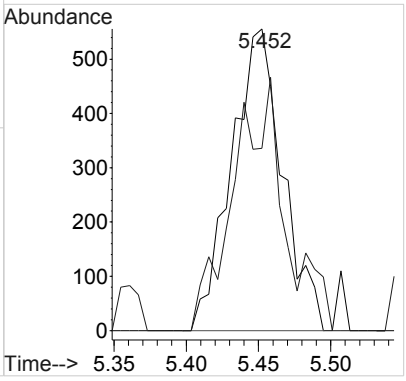


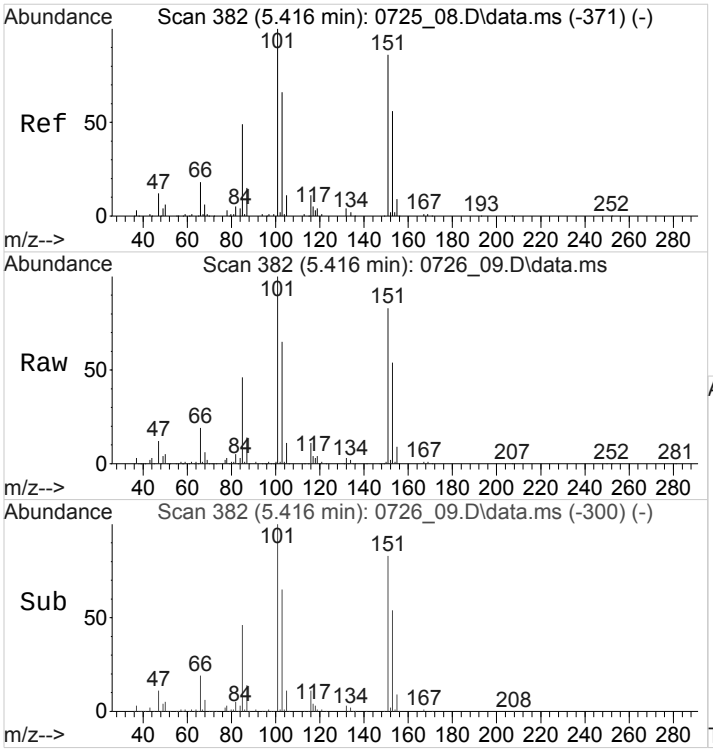


#18
ACROLEIN
Concen: 0.1975800 ppbv
RT: 5.452 min Scan# 388
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 56 Resp: 1370

Ion	Ratio	Lower	Upper
56	100		
55	74.7	59.5	89.3

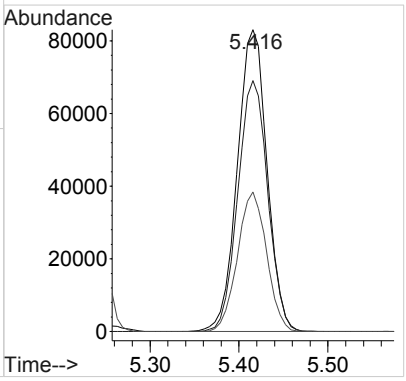


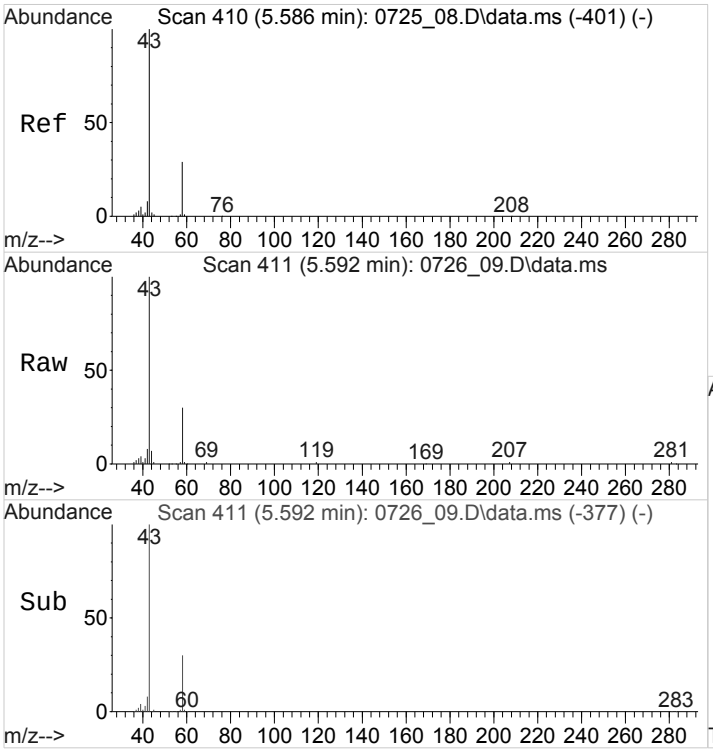


#19
1,1,2-Trichlorotrifluoroethane
Concen: 5.7337762 ppbv
RT: 5.416 min Scan# 382
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion:101 Resp: 192047

Ion	Ratio	Lower	Upper
101	100		
151	83.8	67.9	101.9
85	45.3	37.1	55.7

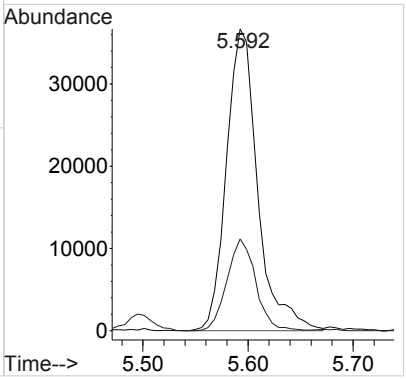




#21
Acetone
Concen: 2.6001770 ppbv
RT: 5.592 min Scan# 411
Delta R.T. 0.006 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 43 Resp: 75875

Ion	Ratio	Lower	Upper
43	100		
58	28.0	23.9	35.9



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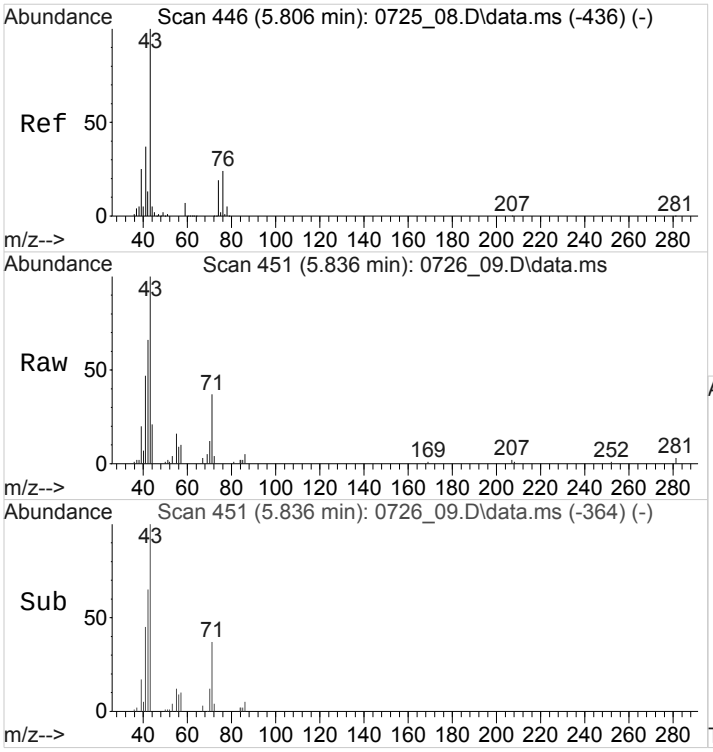
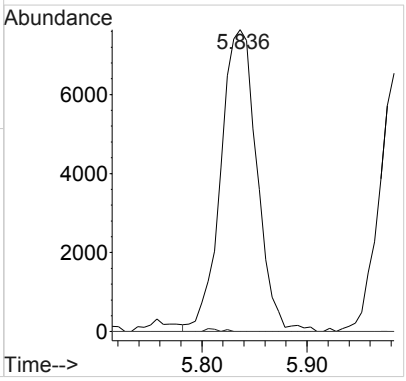
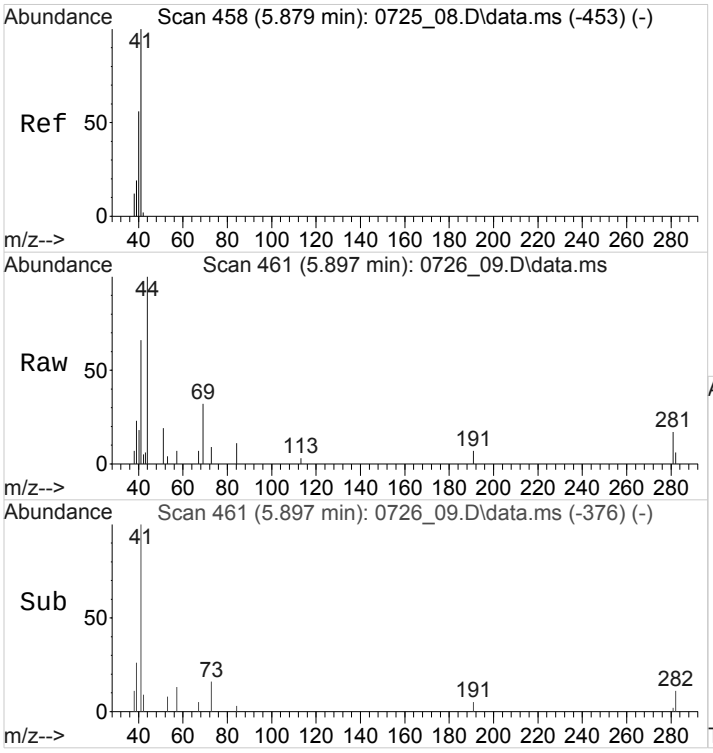


#26
METHYL ACETATE
Concen: 0.5789355 ppbv
RT: 5.836 min Scan# 451
Delta R.T. 0.031 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 43 Resp: 18311

Ion	Ratio	Lower	Upper
43	100		
74	0.4	15.7	23.5#
29	0.0	0.0	0.0

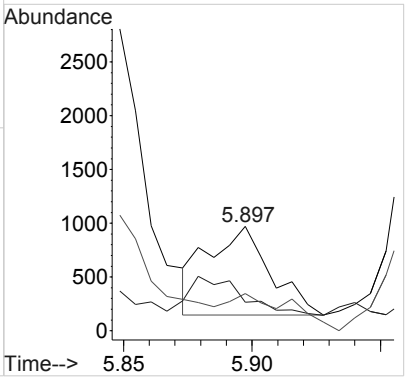




#27
ACETONITRILE
Concen: 0.1072926 ppbv
RT: 5.897 min Scan# 461
Delta R.T. 0.018 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 41 Resp: 1399

Ion	Ratio	Lower	Upper
41	100		
40	41.1	41.5	62.3#
39	42.5	15.7	23.5#



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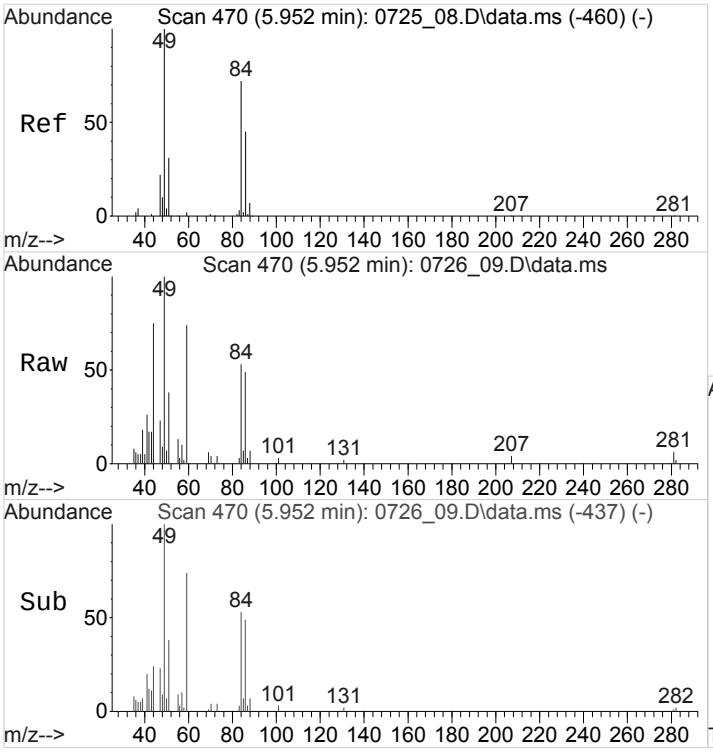
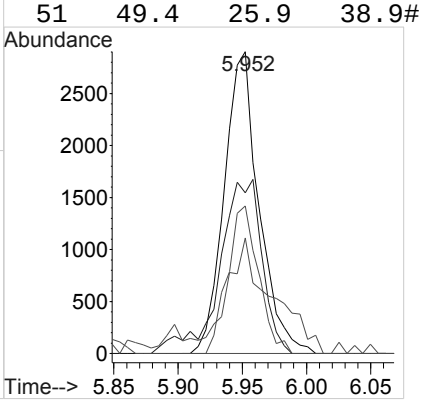
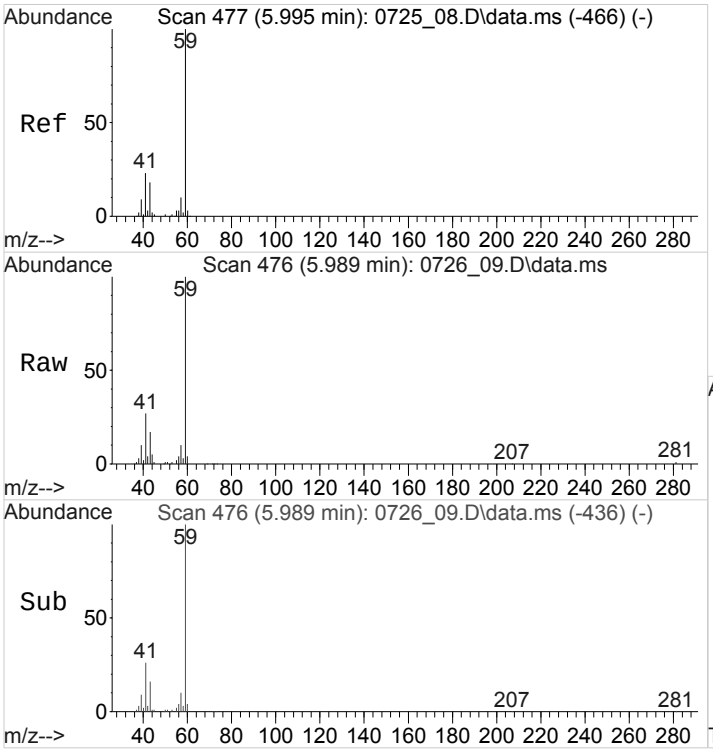


#28
Methylene Chloride
Concen: Below Cal
RT: 5.952 min Scan# 470
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 49 Resp: 5475

Ion	Ratio	Lower	Upper
49	100		
84	70.2	55.8	83.8
86	43.7	36.6	55.0
51	49.4	25.9	38.9#

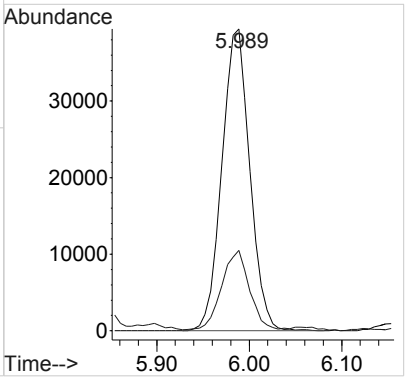




#29
TERT-BUTYL ALCOHOL
Concen: 2.6280720 ppbv
RT: 5.989 min Scan# 476
Delta R.T. -0.006 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 59 Resp: 82392

Ion	Ratio	Lower	Upper
59	100		
41	25.7	22.0	33.0



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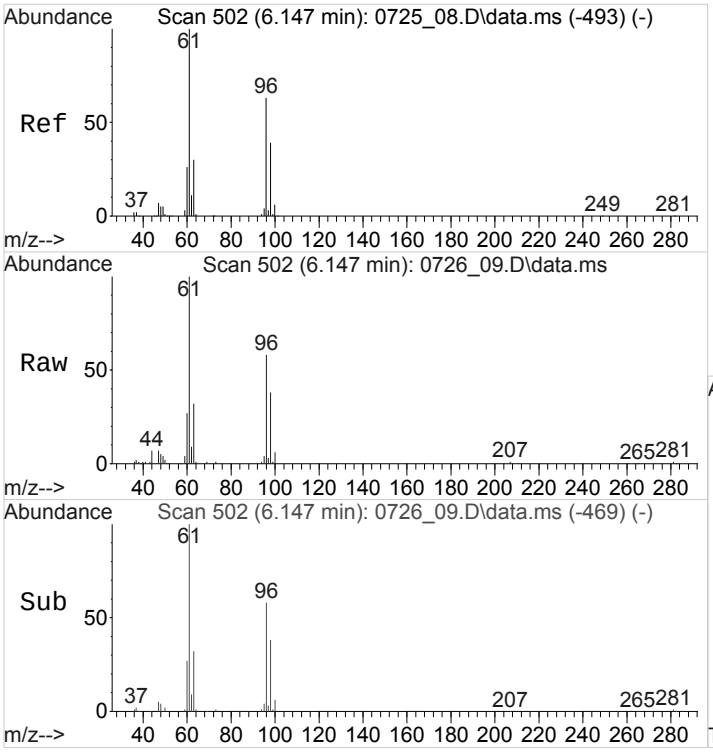
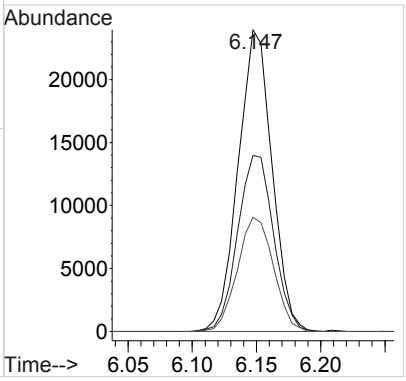
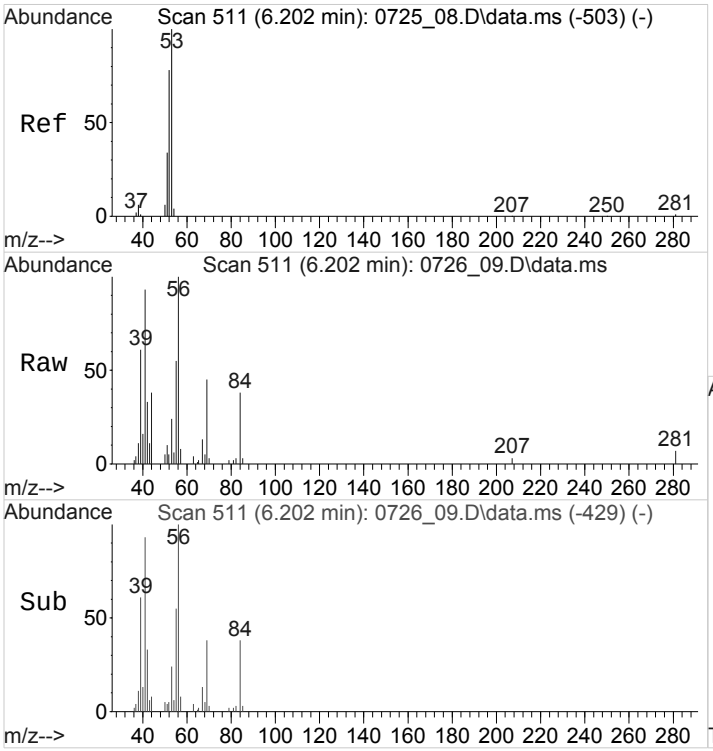


#31
Trans-1,2-Dichloroethene
Concen: 1.7925269 ppbv
RT: 6.147 min Scan# 502
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 61 Resp: 43975

Ion	Ratio	Lower	Upper
61	100		
96	61.9	49.8	74.6
98	40.2	30.5	45.7

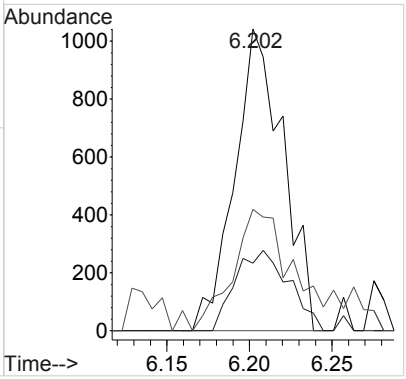




#32
ACRYLONITRILE
Concen: 0.1592965 ppbv
RT: 6.202 min Scan# 511
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 53 Resp: 2131

Ion	Ratio	Lower	Upper
53	100		
52	29.5	66.7	100.1#
51	48.0	28.8	43.2#



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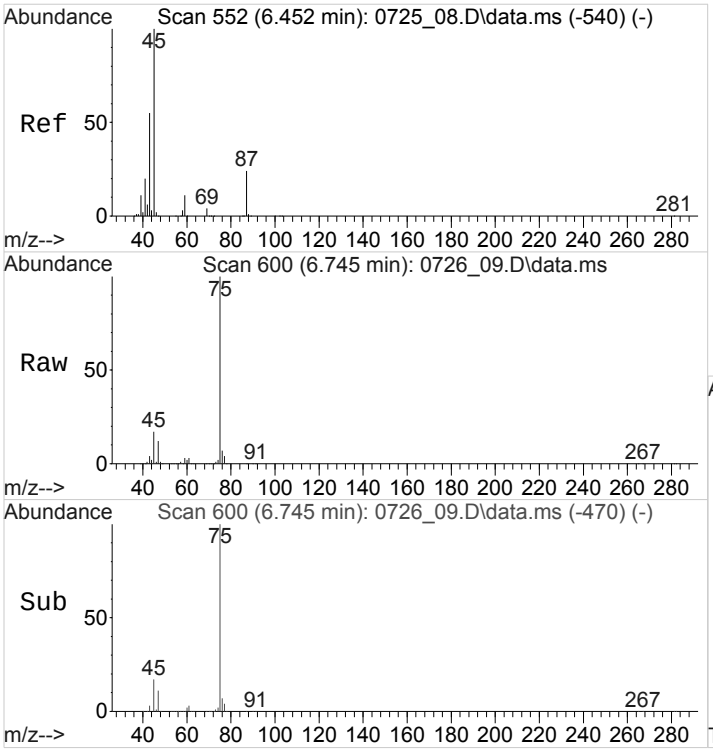
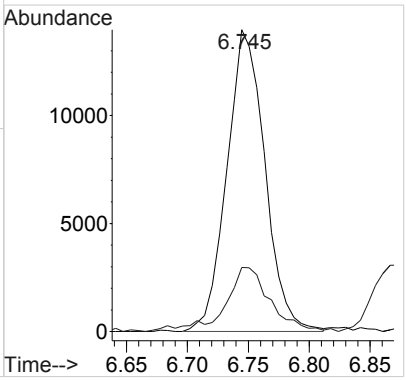
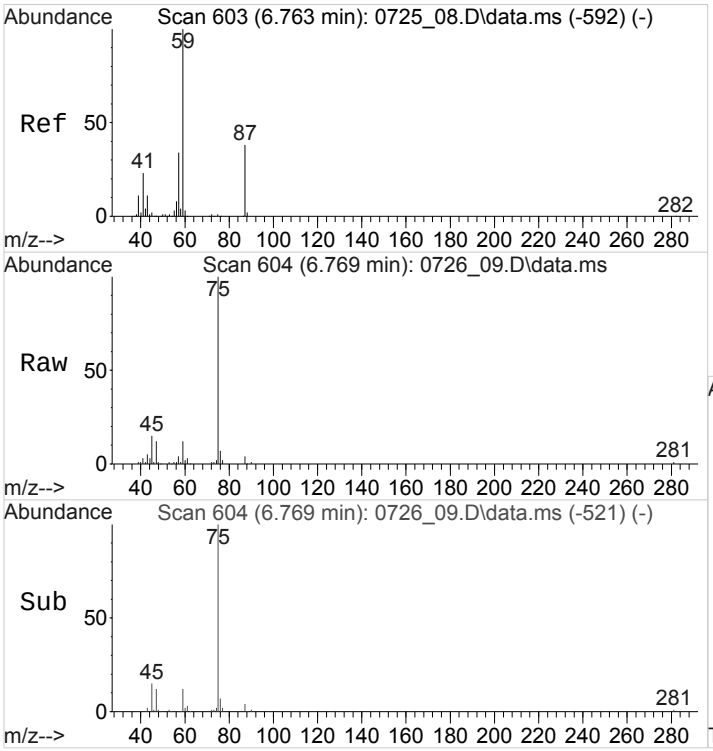


#36
DI-ISOPROPYL ETHER
Concen: 0.6642172 ppbv
RT: 6.745 min Scan# 600
Delta R.T. 0.293 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 45 Resp: 30417

Ion	Ratio	Lower	Upper
45	100		
43	25.2	39.9	59.9#

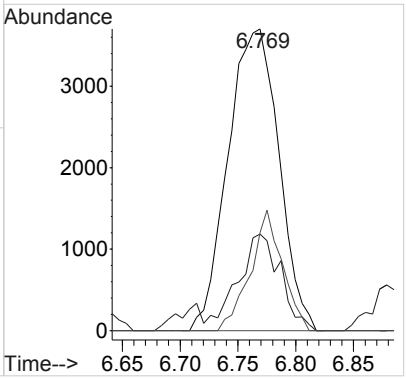




#37
ETHYL TERT-BUTYL ETHER
Concen: 0.2426459 ppbv
RT: 6.769 min Scan# 604
Delta R.T. 0.006 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 59 Resp: 11335

Ion	Ratio	Lower	Upper
59	100		
57	26.9	27.3	40.9#
87	25.2	30.5	45.7#



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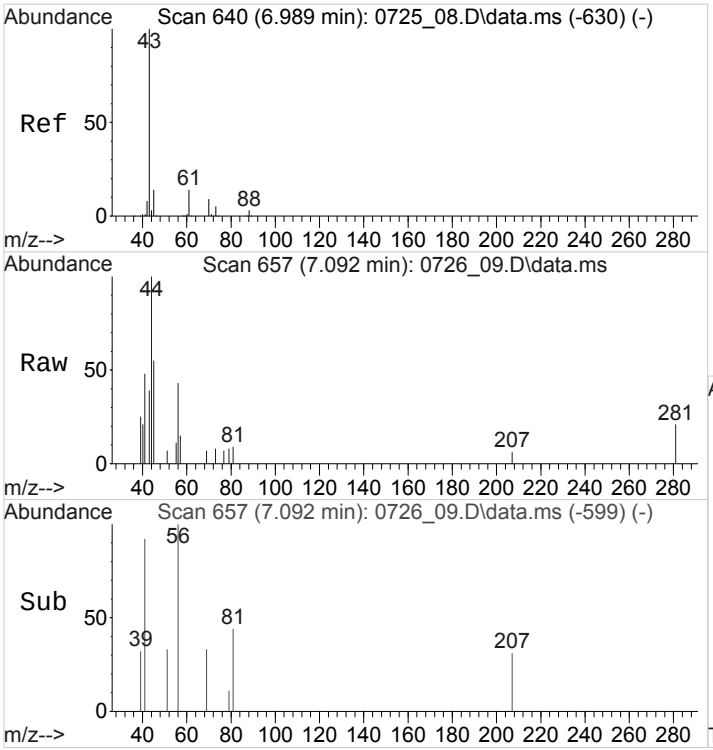
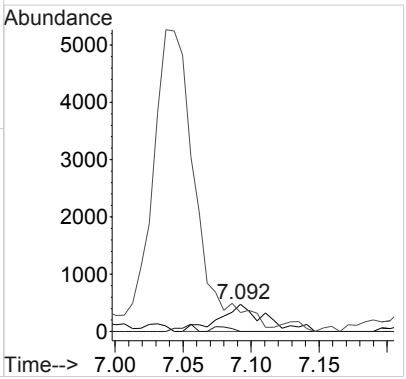
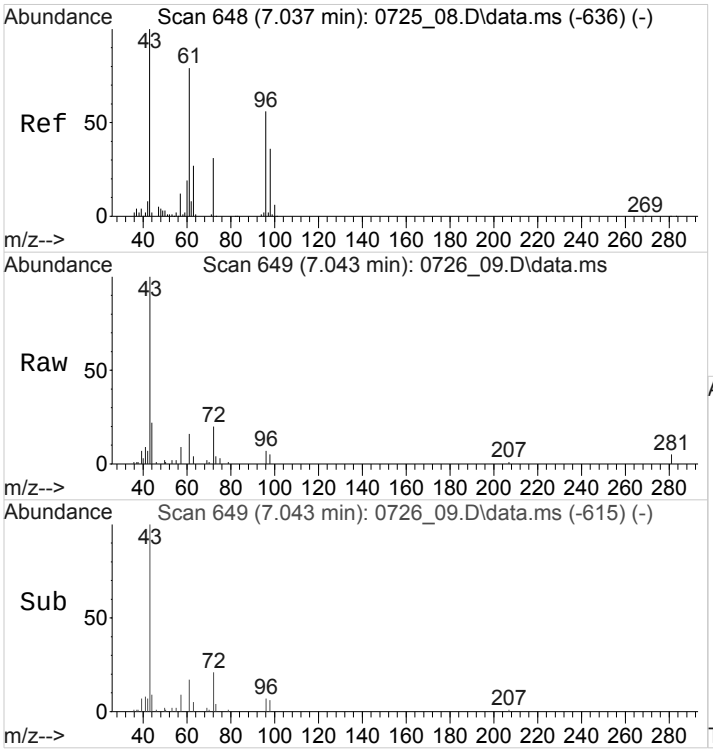


#38
ETHYL ACETATE
Concen: 0.2136029 ppbv
RT: 7.092 min Scan# 657
Delta R.T. 0.104 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 45 Resp: 1107

Ion	Ratio	Lower	Upper
45	100		
70	7.2	52.4	78.6#
43	0.0	566.5	849.7#

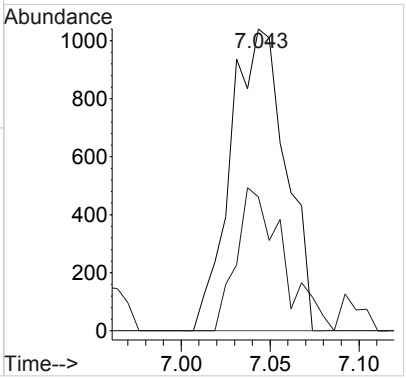


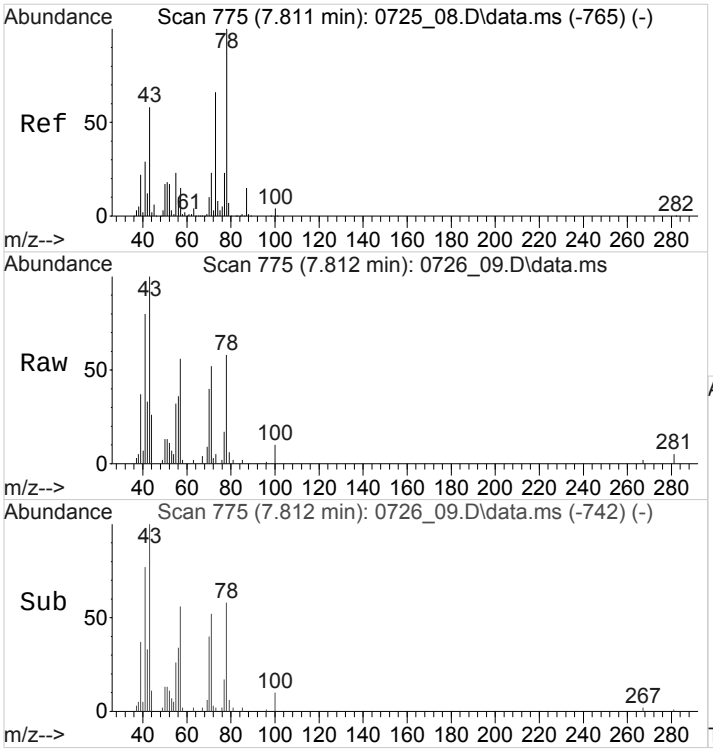


#39
2-Butanone (MEK)
Concen: 0.3013766 ppbv
RT: 7.043 min Scan# 649
Delta R.T. 0.006 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 72 Resp: 2244

Ion	Ratio	Lower	Upper
72	100		
57	39.9	28.6	42.8

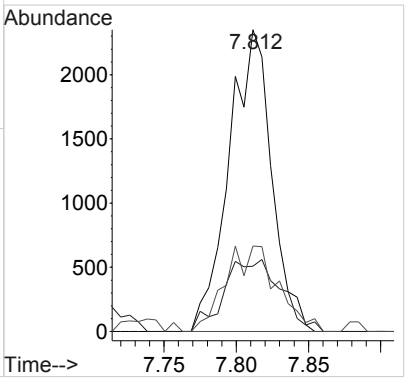


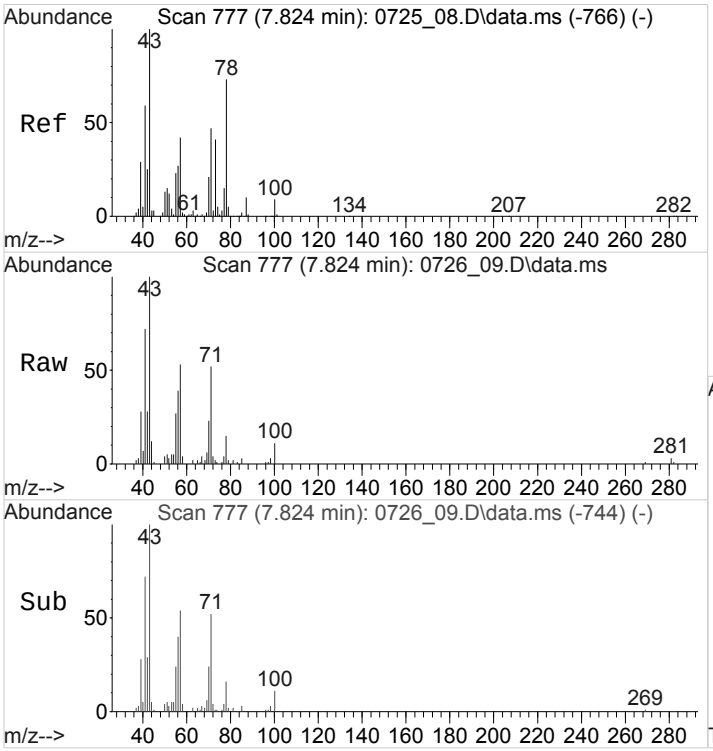


#48
Benzene
Concen: 0.1022222 ppbv
RT: 7.812 min Scan# 775
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 78 Resp: 4817

Ion	Ratio	Lower	Upper
78	100		
51	31.6	16.3	24.5#
77	34.7	18.4	27.6#

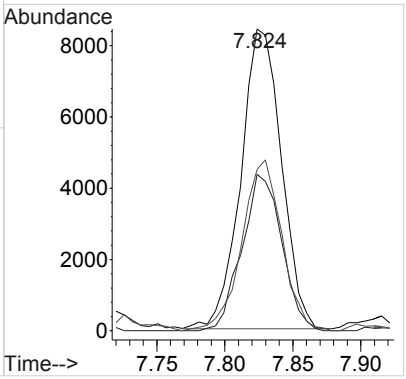




#51
Heptane
Concen: 0.3917078 ppbv
RT: 7.824 min Scan# 777
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 43 Resp: 17440

Ion	Ratio	Lower	Upper
43	100		
71	51.2	34.2	51.2
57	56.1	26.7	40.1#



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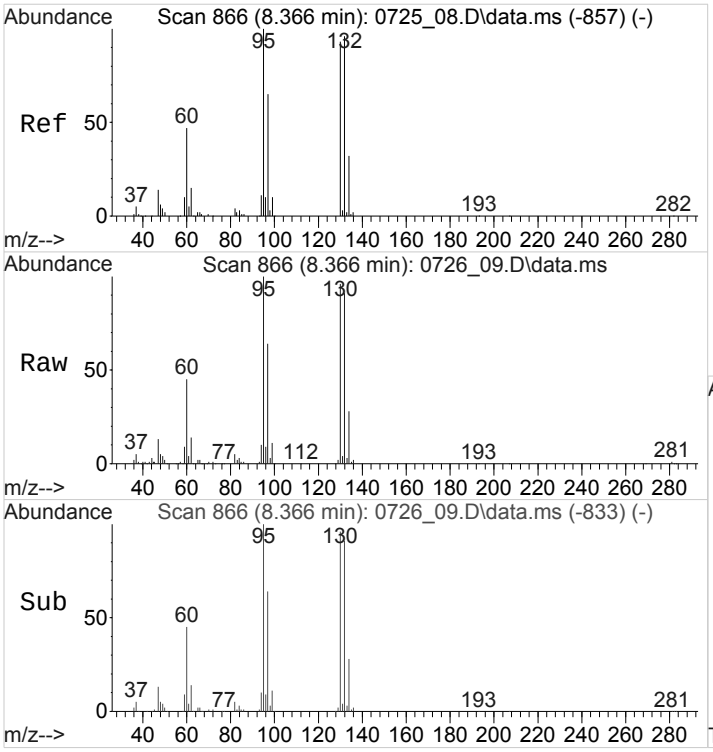
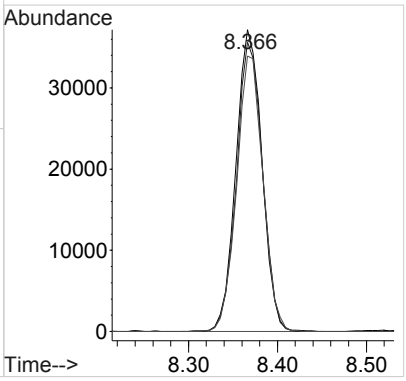
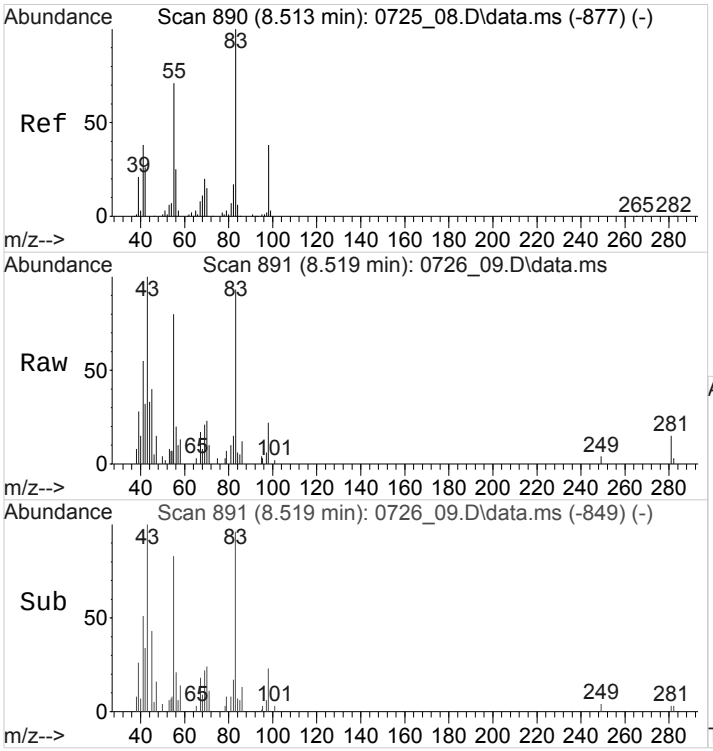


#52
Trichloroethene
Concen: 3.6286139 ppbv
RT: 8.366 min Scan# 866
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 95 Resp: 75266

Ion	Ratio	Lower	Upper
95	100		
130	95.6	78.1	117.1
132	92.4	74.8	112.2

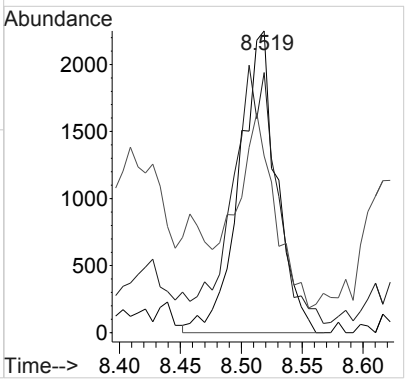




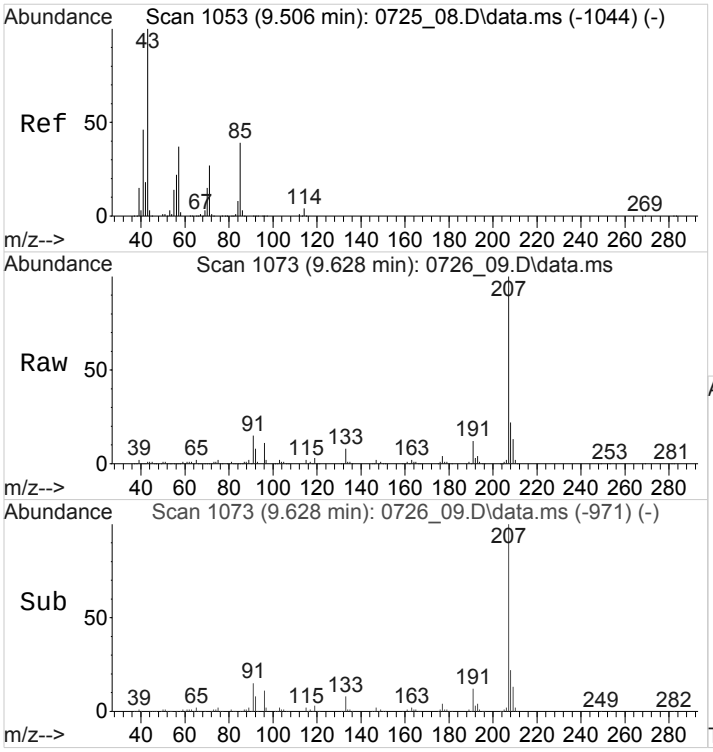
#54
METHYL CYCLOHEXANE
Concen: 0.1681517 ppbv
RT: 8.519 min Scan# 891
Delta R.T. 0.006 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 83 Resp: 4792

Ion	Ratio	Lower	Upper
83	100		
55	110.1	69.5	104.3#
41	72.7	40.7	61.1#



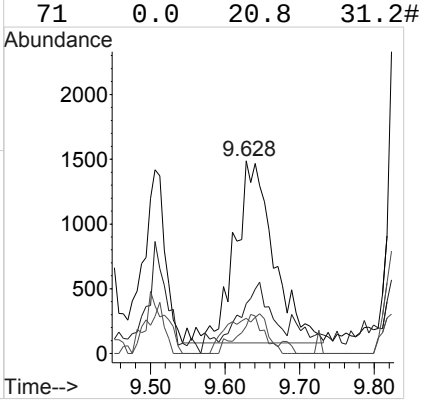
ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	101 of 377

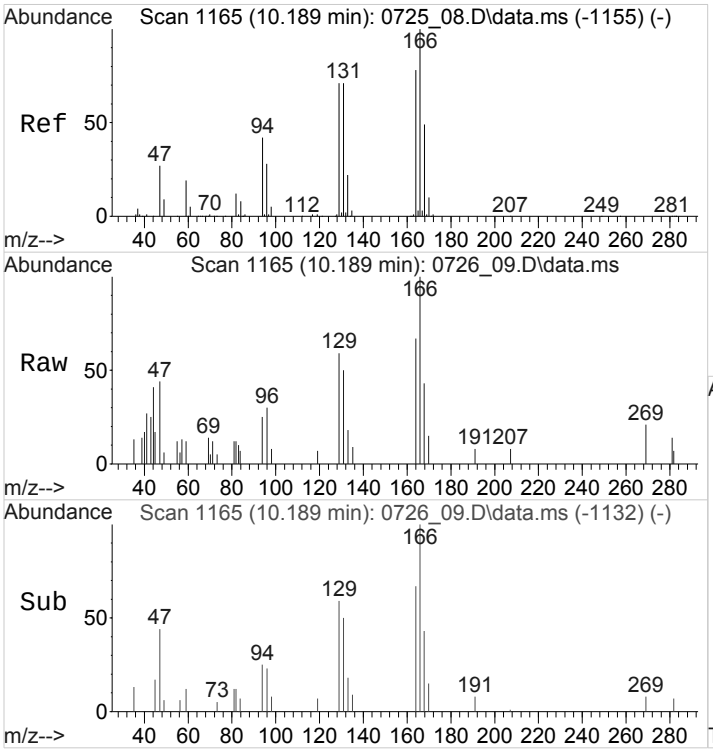


#61
n-OCTANE
Concen: 0.1228148 ppbv
RT: 9.628 min Scan# 1073
Delta R.T. 0.122 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 43 Resp: 5171

Ion	Ratio	Lower	Upper
43	100		
57	0.0	30.2	45.4#
85	0.0	30.3	45.5#
71	0.0	20.8	31.2#

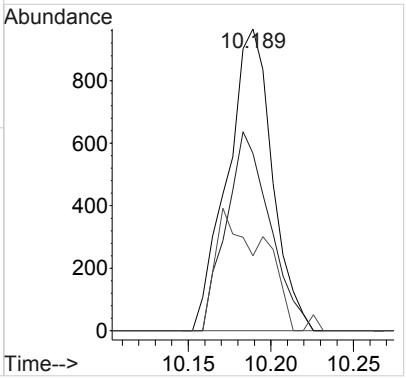




#65
Tetrachloroethene
Concen: 0.0648308 ppbv
RT: 10.189 min Scan# 1165
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion:166 Resp: 1829

Ion	Ratio	Lower	Upper
166	100		
129	64.0	59.4	89.2
94	42.4	34.9	52.3



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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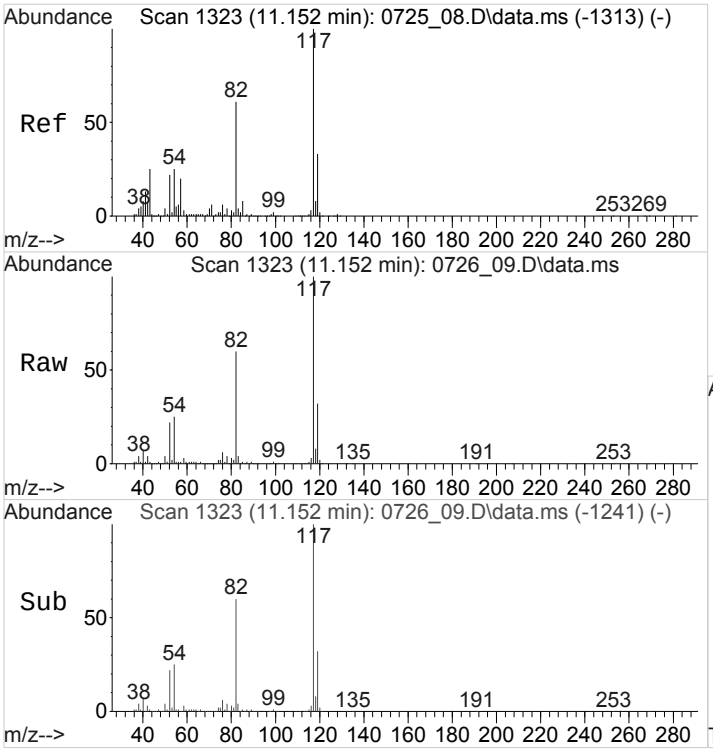
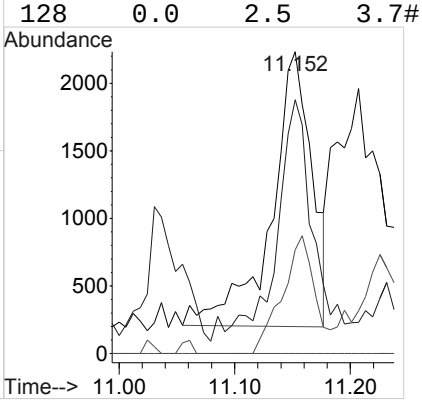
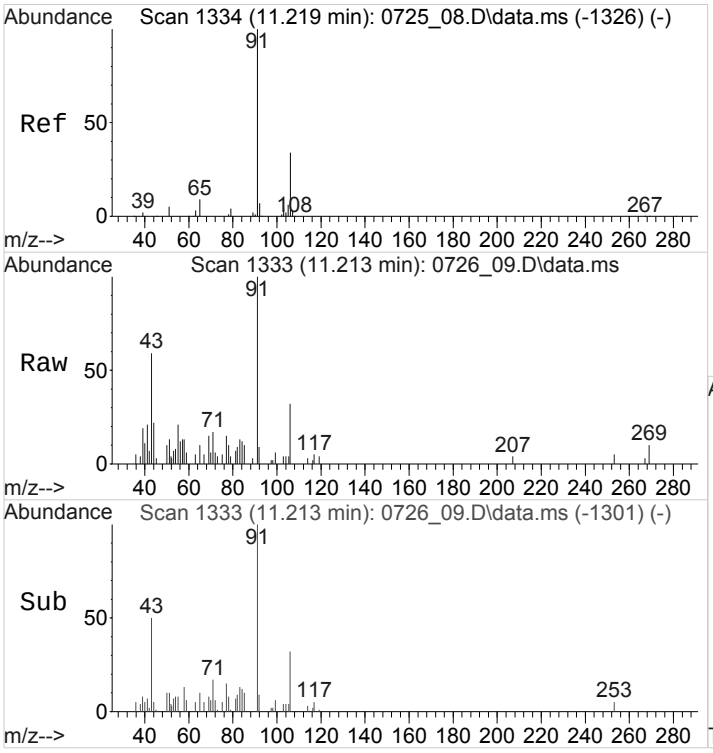


#70
NONANE
Concen: 0.1083555 ppbv
RT: 11.152 min Scan# 1323
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 43 Resp: 5020

Ion	Ratio	Lower	Upper
43	100		
57	78.5	65.4	98.0
71	34.0	18.3	27.5#
128	0.0	2.5	3.7#

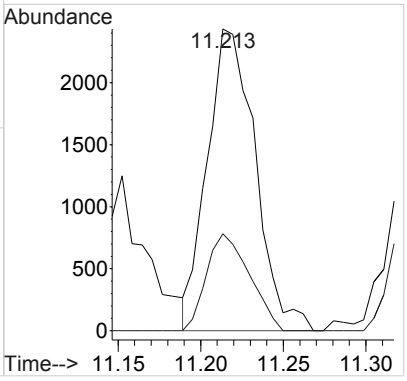




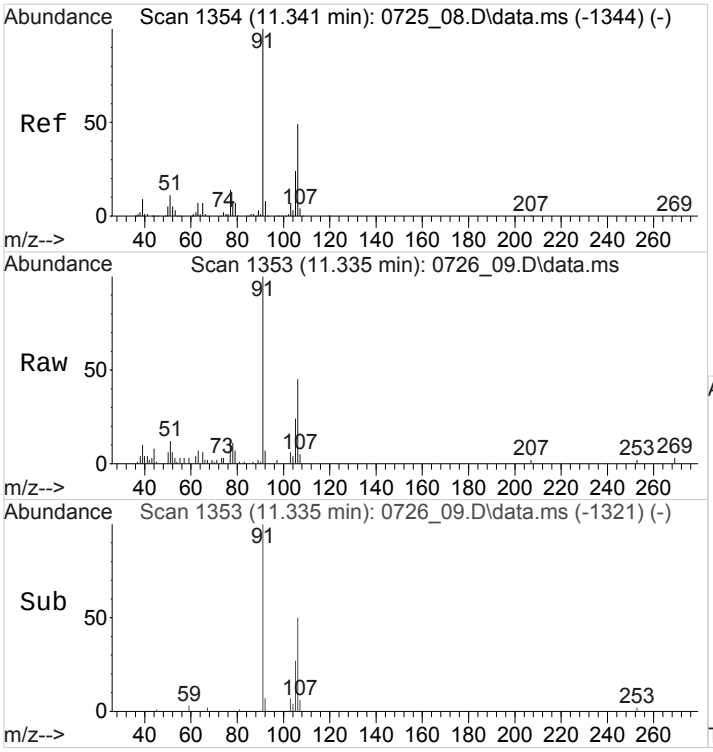
#72
Ethylbenzene
Concen: 0.0699277 ppbv
RT: 11.213 min Scan# 1333
Delta R.T. -0.006 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 91 Resp: 4919

Ion	Ratio	Lower	Upper
91	100		
106	28.8	25.3	37.9



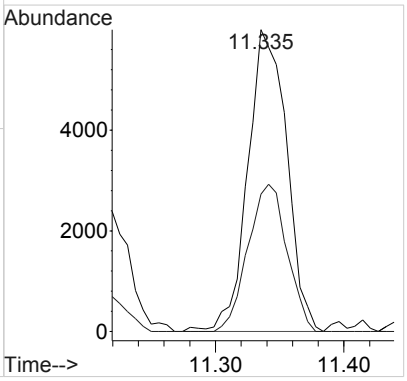
ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	103 of 377

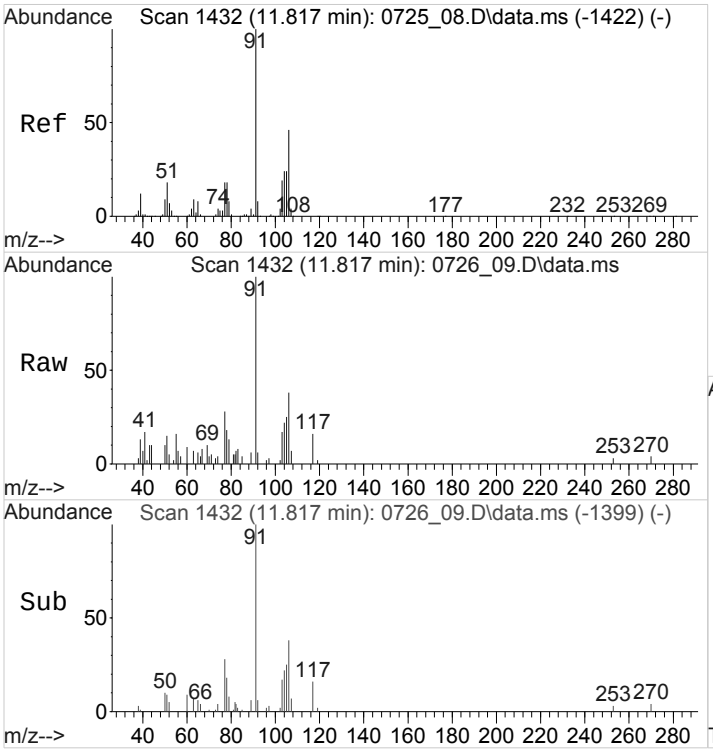


#73
M&P-Xylene
Concen: 0.2357881 ppbv
RT: 11.335 min Scan# 1353
Delta R.T. -0.006 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 91 Resp: 12641

Ion	Ratio	Lower	Upper
91	100		
106	49.0	38.6	58.0

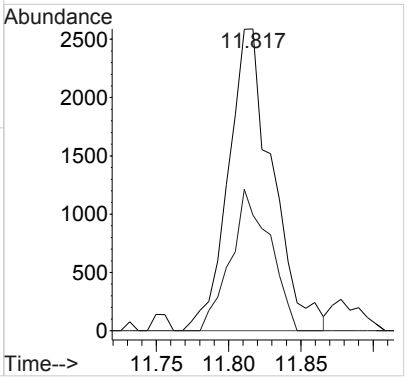


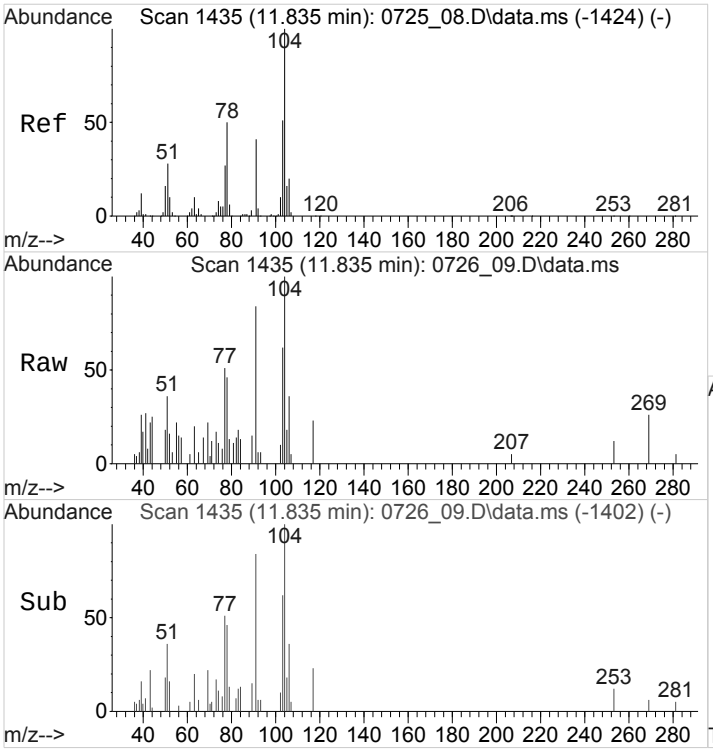


#74
O-Xylene
Concen: 0.1046938 ppbv
RT: 11.817 min Scan# 1432
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 91 Resp: 5475

Ion	Ratio	Lower	Upper
91	100		
106	42.0	36.9	55.3

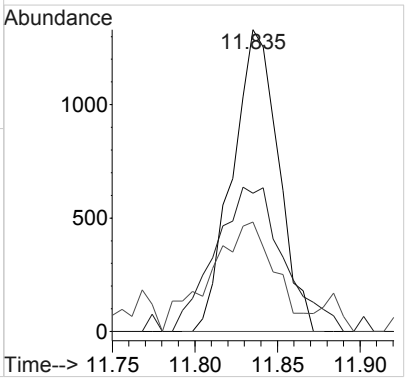


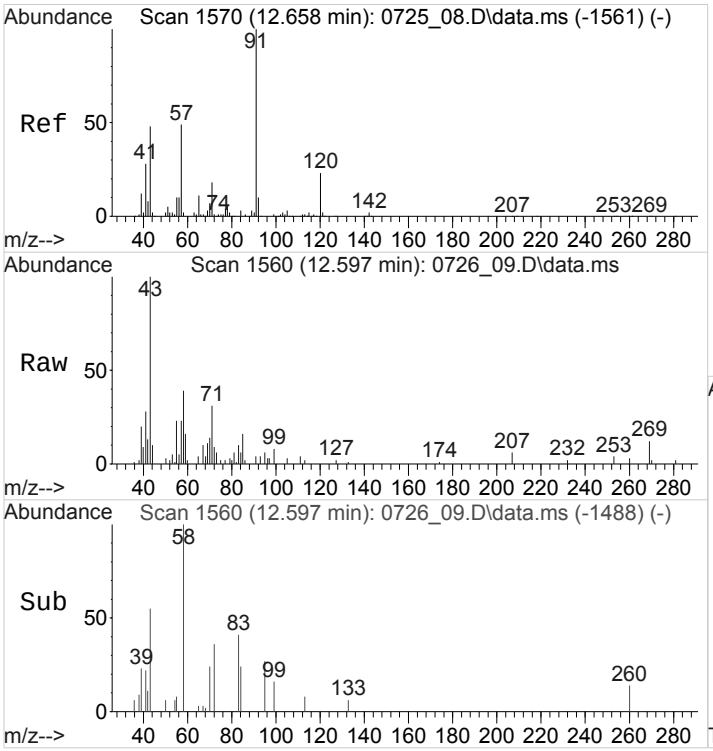


#77
Styrene
Concen: 0.0571134 ppbv
RT: 11.835 min Scan# 1435
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion:104 Resp: 2584

Ion	Ratio	Lower	Upper
104	100		
78	71.6	42.5	63.7#
51	52.1	30.1	45.1#

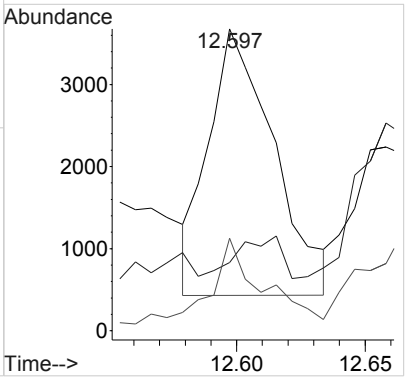


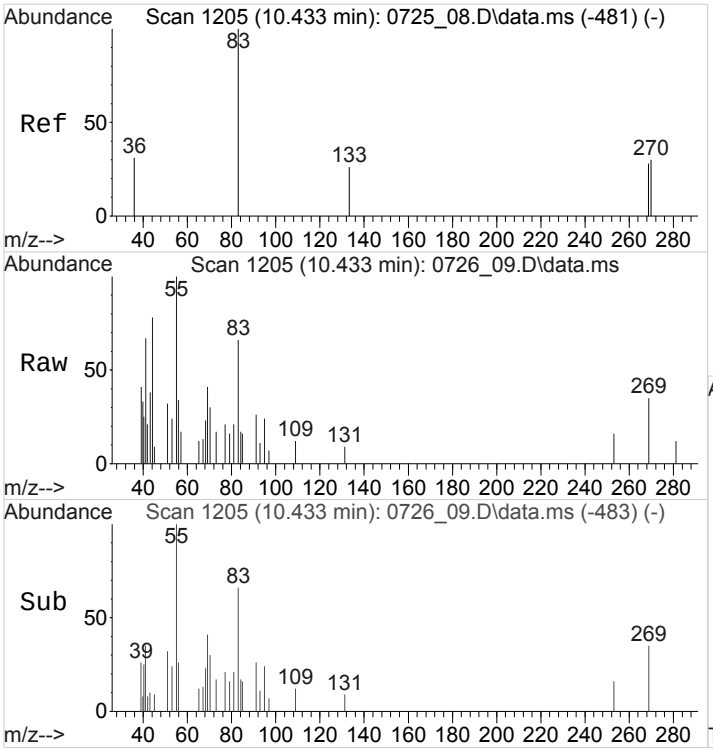


#80
n-DECANE
Concen: 0.1165579 ppbv
RT: 12.597 min Scan# 1560
Delta R.T. -0.061 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion: 43 Resp: 5738

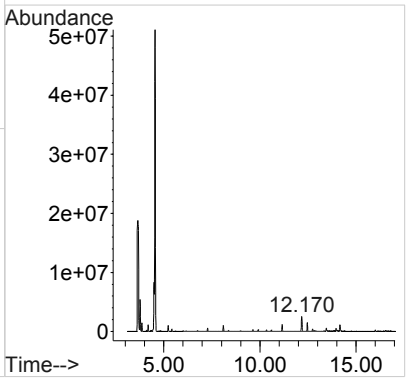
Ion	Ratio	Lower	Upper
43	100		
57	0.0	80.0	120.0#
71	29.0	30.4	45.6#

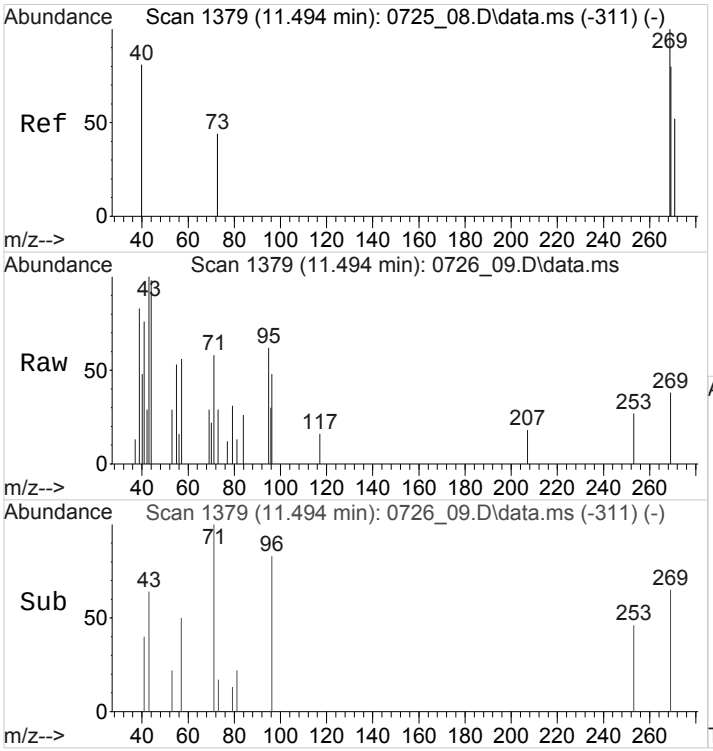




#101
TPH (GC/MS) Low Fraction
Concen: 128.9583996 ppbv m
RT: 10.430 min Scan# 1205
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

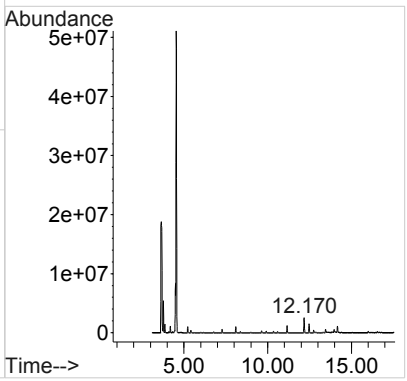
Tgt Ion:TIC Resp:15457318





#102
TPH-GRO (C5-C10)
Concen: 204.2303660 ppbv m
RT: 11.493 min Scan# 1379
Delta R.T. 0.000 min
Lab File: 0726_09.D
Acq: 26 Jul 2022 1:38 pm

Tgt Ion:TIC Resp:19954538



SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-VMP03-0220722

Lab Sample ID:	L1518164-05	**SDG:**	L1518164
Client Sample ID:	CRCA-VMP03-0220722	**Collected Date/Time:**	07/22/22 12:40
Lab File ID:	0726_10	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 14:17
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 14:17
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
Acetone	67-64-1	0	2.85	U	1.39	2.85	5.70
Allyl Chloride	107-05-1	0	0.783	U	0.357	0.783	1.57
Benzene	71-43-2	0	0.479	U	0.228	0.479	0.958
Benzyl Chloride	100-44-7	0	0.675	U	0.311	0.675	1.56
Bromodichloromethane	75-27-4	0	1.01	U	0.471	1.01	2.01
Bromoform	75-25-2	0	3.21	U	0.757	3.21	6.21
Bromomethane	74-83-9	0	0.776	U	0.381	0.776	1.55
1,3-Butadiene	106-99-0	0	1.39	U	0.230	1.39	4.43
Carbon disulfide	75-15-0	0	0.778	U	0.317	0.778	1.56
Carbon tetrachloride	56-23-5	0	0.945	U	0.461	0.945	1.89
Chlorobenzene	108-90-7	0	0.924	U	0.385	0.924	1.85
Chloroethane	75-00-3	0	0.528	U	0.263	0.528	1.06
Chloroform	67-66-3	7.28	18.1		0.349	0.730	1.46
Chloromethane	74-87-3	0	0.516	U	0.213	0.516	1.03
2-Chlorotoluene	95-49-8	0	1.03	U	0.427	1.03	2.06
Cyclohexane	110-82-7	0	0.689	U	0.259	0.689	1.38
Dibromochloromethane	124-48-1	0	1.28	U	0.618	1.28	2.55
1,2-Dibromoethane	106-93-4	0	1.15	U	0.554	1.15	2.31
1,2-Dichlorobenzene	95-50-1	0	1.80	U	0.770	1.80	3.61
1,3-Dichlorobenzene	541-73-1	13.65	2.40	U	1.09	2.40	4.81
1,4-Dichlorobenzene	106-46-7	13.74	0.542	J	0.335	0.782	1.80
1,2-Dichloroethane	107-06-2	0	0.607	U	0.283	0.607	1.21
1,1-Dichloroethane	75-34-3	0	0.601	U	0.290	0.601	1.20
1,1-Dichloroethene	75-35-4	0	0.793	U	0.302	0.793	1.59
cis-1,2-Dichloroethene	156-59-2	0	0.793	U	0.311	0.793	1.59
trans-1,2-Dichloroethene	156-60-5	6.15	2.01		0.267	0.594	1.19
1,2-Dichloropropane	78-87-5	0	0.924	U	0.351	0.924	1.85
cis-1,3-Dichloropropene	10061-01-5	0	0.681	U	0.313	0.681	1.36
trans-1,3-Dichloropropene	10061-02-6	0	0.681	U	0.331	0.681	1.36
1,4-Dioxane	123-91-1	0	0.721	U	0.300	0.721	1.44
Ethanol	64-17-5	5.14	12.7		0.500	1.19	2.45
Ethylbenzene	100-41-4	11.22	0.867	U	0.362	0.867	1.73
4-Ethyltoluene	622-96-8	0	0.982	U	0.384	0.982	1.96
Trichlorofluoromethane	75-69-4	4.99	1.17	J	0.460	0.983	1.97
Dichlorodifluoromethane	75-71-8	3.90	1.51	J	0.678	1.48	2.97
1,1,2-Trichlorotrifluoroethane	76-13-1	5.42	11.0		0.608	1.53	3.07
1,2-Dichlorotetrafluoroethane	76-14-2	0	1.40	U	0.622	1.40	2.80
Heptane	142-82-5	7.82	1.42	J	0.425	1.02	2.04
Hexachloro-1,3-butadiene	87-68-3	0	2.67	U	1.12	2.67	6.73
n-Hexane	110-54-3	6.27	0.924	J	0.726	1.76	3.53
Isopropylbenzene	98-82-8	0	0.983	U	0.382	0.983	1.97
Methylene Chloride	75-09-2	0	0.694	U	0.340	0.694	1.39
Methyl Butyl Ketone	591-78-6	0	1.23	U	0.544	1.23	5.11

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-VMP03-0220722

Lab Sample ID:	L1518164-05	**SDG:**	L1518164
Client Sample ID:	CRCA-VMP03-0220722	**Collected Date/Time:**	07/22/22 12:40
Lab File ID:	0726_10	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 14:17
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 14:17
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
2-Butanone (MEK)	78-93-3	7.03	1.89	J	0.240	0.560	3.69
4-Methyl-2-pentanone (MIBK)	108-10-1	0	0.778	U	0.313	0.778	5.12
Methyl Methacrylate	80-62-6	0	0.819	U	0.359	0.819	1.64
MTBE	1634-04-4	0	0.468	U	0.233	0.468	1.08
Naphthalene	91-20-3	0	3.66	U	1.83	3.66	7.33
Propene	115-07-1	0	1.08	U	0.160	1.08	2.15
Styrene	100-42-5	0	0.851	U	0.335	0.851	1.70
1,1,2,2-Tetrachloroethane	79-34-5	0	1.03	U	0.511	1.03	2.06
Tetrachloroethylene	127-18-4	10.19	1.36	U	0.553	1.36	2.72
Tetrahydrofuran	109-99-9	0	0.442	U	0.216	0.442	0.885
Toluene	108-88-3	0	0.942	U	0.328	0.942	1.88
1,2,4-Trichlorobenzene	120-82-1	0	2.29	U	1.10	2.29	4.66
1,1,1-Trichloroethane	71-55-6	0	0.816	U	0.400	0.816	1.63
1,1,2-Trichloroethane	79-00-5	0	1.09	U	0.422	1.09	2.18
Trichloroethylene	79-01-6	8.37	13.7		0.364	0.804	1.61
1,2,4-Trimethylbenzene	95-63-6	0	0.982	U	0.375	0.982	1.96
1,3,5-Trimethylbenzene	108-67-8	0	0.982	U	0.382	0.982	1.96
2,2,4-Trimethylpentane	540-84-1	0	1.40	U	0.621	1.40	2.80
Vinyl chloride	75-01-4	0	0.511	U	0.243	0.511	1.02
Vinyl Bromide	593-60-2	0	0.875	U	0.373	0.875	1.75
Vinyl acetate	108-05-4	0	0.880	U	0.408	0.880	1.76
m&p-Xylene	1330-20-7	11.34	0.975	J	0.585	1.30	2.60
o-Xylene	95-47-6	11.82	0.365	J	0.359	0.759	1.52

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_10.D
Acq On : 26 Jul 2022 2:17 pm
Operator :
Sample : L1518164-05 1x WG1900825
Misc :
ALS Vial : 10 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 14:02:58 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

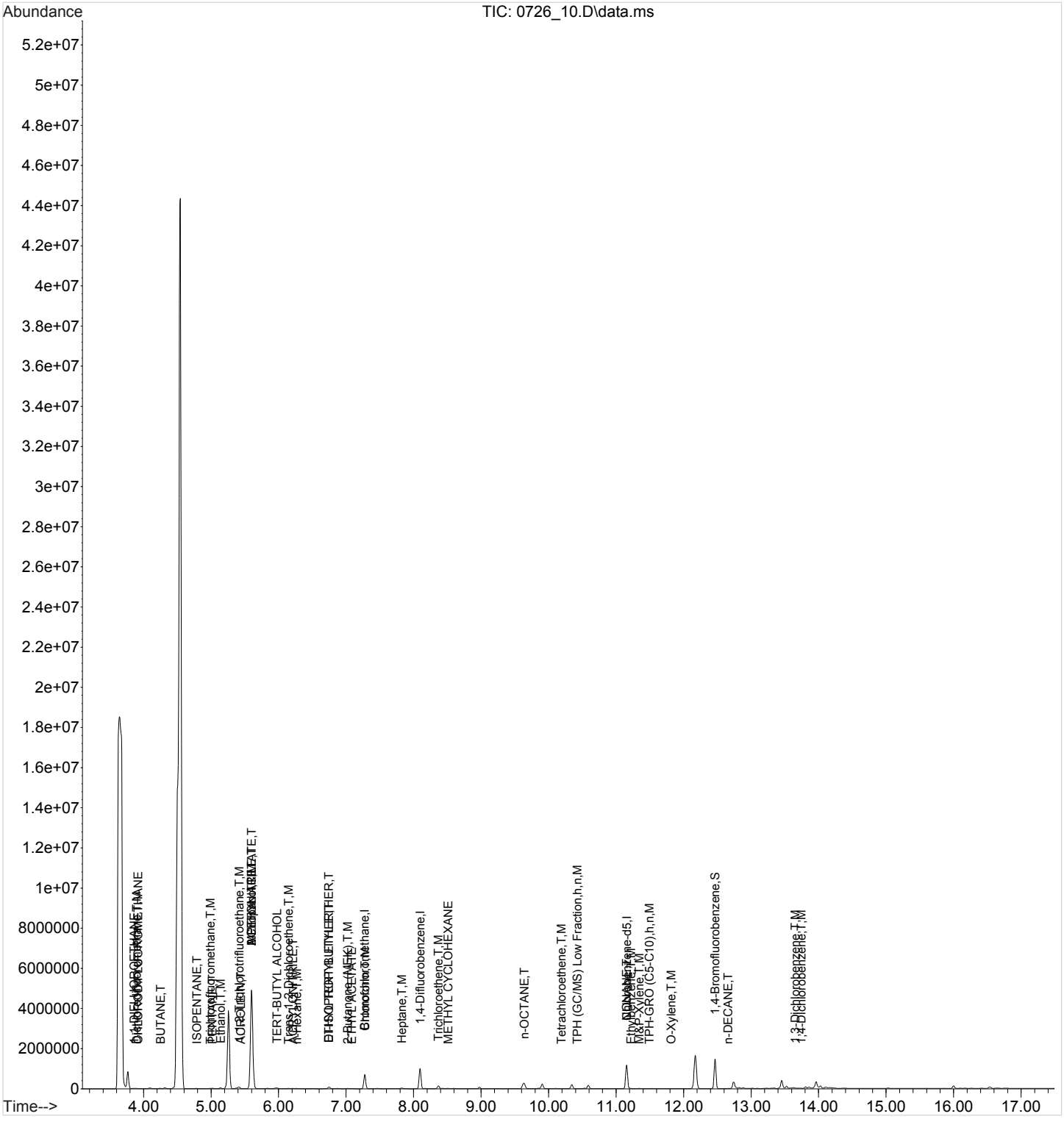
Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.275	130	202586	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	843614	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.159	117	764735	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	548991	3.9103118	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 97.76%				
Target Compounds						Qvalue	
3) BUTANE	4.251	43	8460	0.2111069	ppbv		100
4) 1,1-DIFLUOROETHANE	3.861	65	2390	0.2495251	ppbv		90
5) Dichlorodifluoromethane	3.898	85	10857	0.3058387	ppbv		99
6) CHLORODIFLUOROMETHANE	3.916	67	838	0.1945528	ppbv		93
13) ISOPENTANE	4.788	43	5315	0.3173225	ppbv		98
15) Trichlorofluoromethane	4.989	101	9594	0.2082790	ppbv		100
16) PENTANE	5.019	43	13311	0.5142754	ppbv		99
17) Ethanol	5.141	45	46290	6.7306512	ppbv		98
18) ACROLEIN	5.440	56	1362	0.1979388	ppbv	#	76
19) 1,1,2-Trichlorotrifluo...	5.416	101	47900	1.4411201	ppbv		87
23) 2-Propanol	5.599	45	7411566	264.4743616	ppbv		95
26) METHYL ACETATE	5.599	43	1629687	51.9222798	ppbv	#	57
27) ACETONITRILE	5.599	41	633006	48.9205328	ppbv	#	22
28) Methylene Chloride	5.952	49	5445	Below Cal	#	91	
29) TERT-BUTYL ALCOHOL	5.977	59	67291	2.1629209	ppbv		97
31) Trans-1,2-Dichloroethene	6.147	61	12317	0.5059367	ppbv		96
32) ACRYLONITRILE	6.214	53	1824	0.1373976	ppbv	#	25
33) n-Hexane	6.269	57	5669	0.2620079	ppbv		96
36) DI-ISOPROPYL ETHER	6.745	45	20871	0.4592704	ppbv	#	62
37) ETHYL TERT-BUTYL ETHER	6.745	59	8438	0.1820214	ppbv	#	85
38) ETHYL ACETATE	7.086	45	5051	0.9821288	ppbv	#	1
39) 2-Butanone (MEK)	7.025	72	4731	0.6402818	ppbv		99
42) Chloroform	7.281	83	118252	3.7132018	ppbv		95
51) Heptane	7.824	43	15245	0.3458639	ppbv	#	76
52) Trichloroethene	8.366	95	52415	2.5524638	ppbv		99
54) METHYL CYCLOHEXANE	8.513	83	4050	0.1435494	ppbv	#	71
61) n-OCTANE	9.641	43	4275	0.1025591	ppbv	#	40
65) Tetrachloroethene	10.189	166	1794	0.0642322	ppbv		93
70) NONANE	11.152	43	3912	0.0852920	ppbv	#	85
72) Ethylbenzene	11.219	91	4606	0.0660255	ppbv		97
73) M&P-Xylene	11.341	91	11944	0.2246497	ppbv		99
74) O-Xylene	11.817	91	4364	0.0841467	ppbv		90
80) n-DECANE	12.658	43	3026	0.0619820	ppbv	#	20
90) 1,3-Dichlorobenzene	13.652	146	7042	0.1337624	ppbv	#	94
92) 1,4-Dichlorobenzene	13.743	146	4743	0.0900914	ppbv		92
101) TPH (GC/MS) Low Fraction	10.430	TIC	11202719m	94.2441587	ppbv		
102) TPH-GRO (C5-C10)	11.493	TIC	32443446m	334.8274991	ppbv		

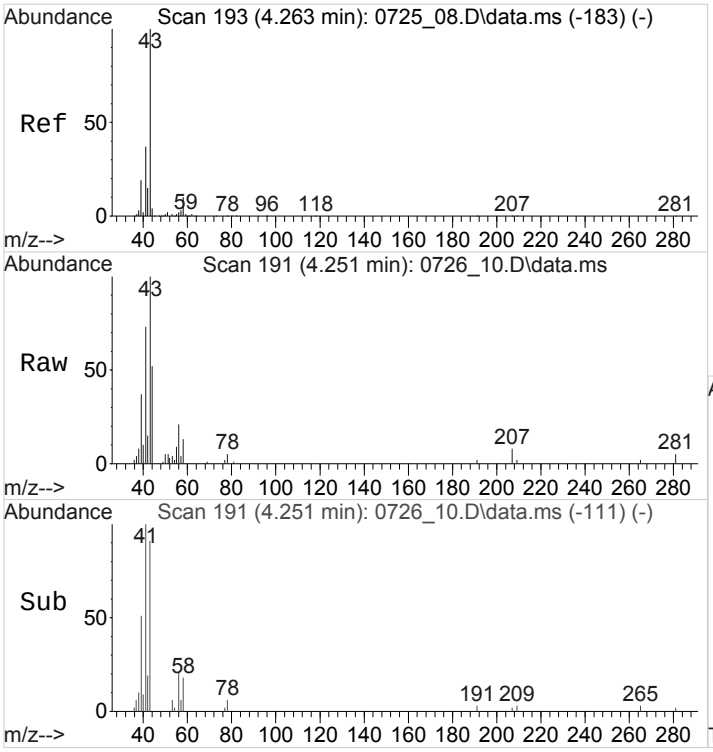
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_10.D
Acq On : 26 Jul 2022 2:17 pm
Operator :
Sample : L1518164-05 1x WG1900825
Misc :
ALS Vial : 10 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 14:02:58 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

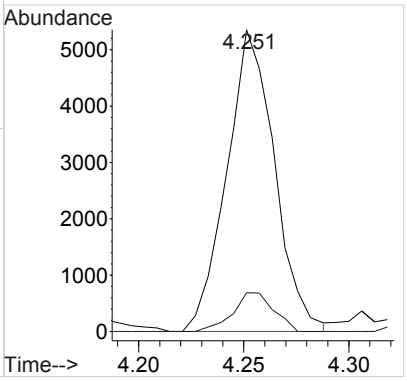


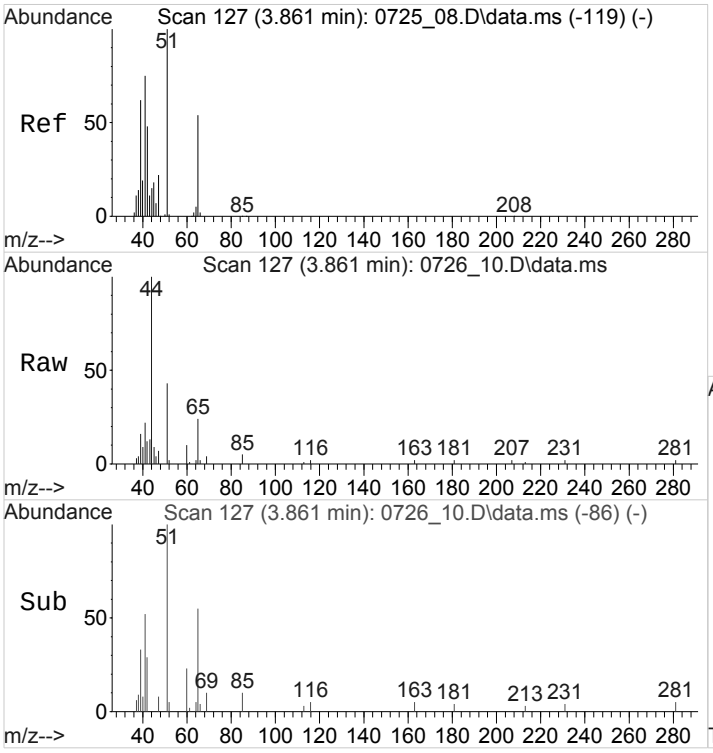


#3
BUTANE
Concen: 0.2111069 ppbv
RT: 4.251 min Scan# 191
Delta R.T. -0.012 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 43 Resp: 8460

Ion	Ratio	Lower	Upper
43	100		
58	11.0	9.0	13.4

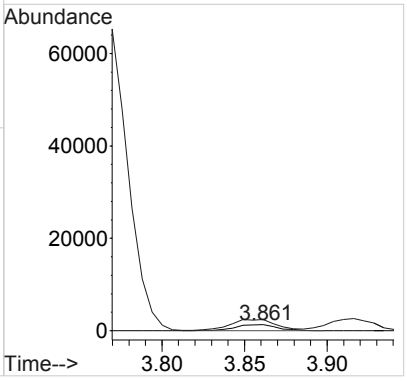


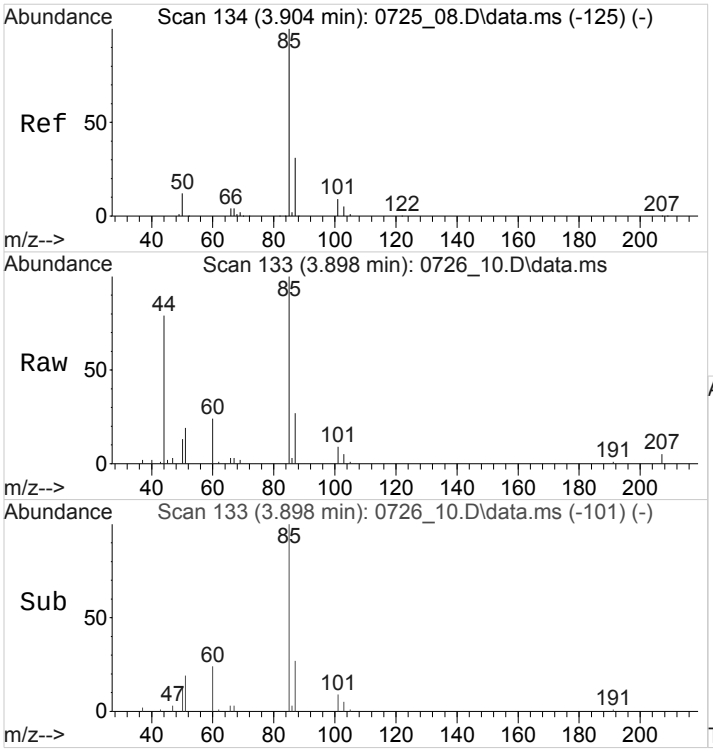


#4
1,1-DIFLUOROETHANE
Concen: 0.2495251 ppbv
RT: 3.861 min Scan# 127
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 65 Resp: 2390

Ion	Ratio	Lower	Upper
65	100		
51	203.7	151.1	226.7

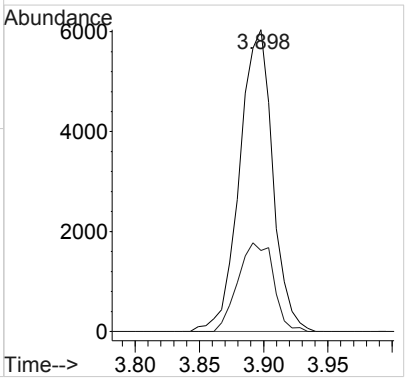


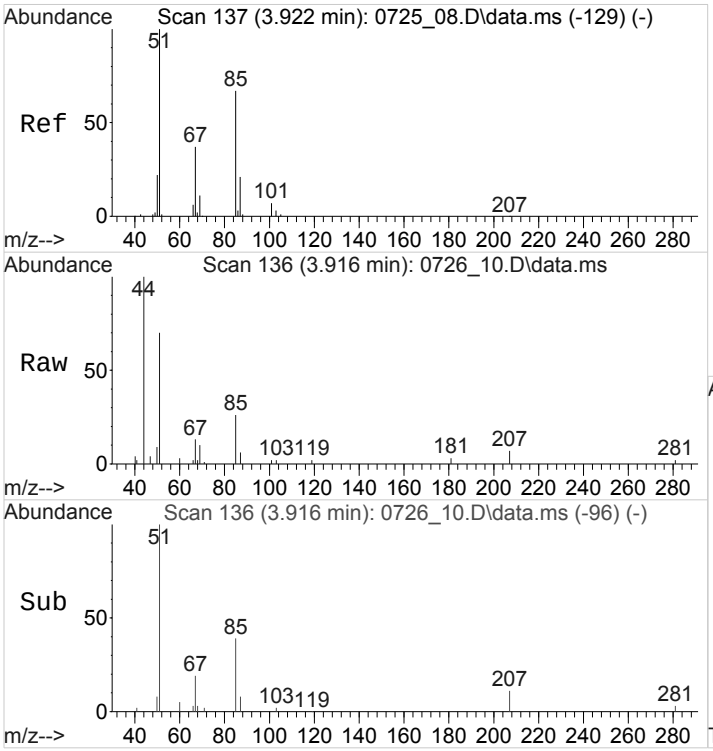


#5
Dichlorodifluoromethane
Concen: 0.3058387 ppbv
RT: 3.898 min Scan# 133
Delta R.T. -0.006 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 85 Resp: 10857

Ion	Ratio	Lower	Upper
85	100		
87	31.6	25.8	38.8

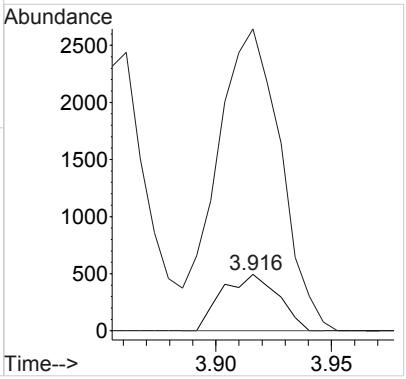




#6
CHLORODIFLUOROMETHANE
Concen: 0.1945528 ppbv
RT: 3.916 min Scan# 136
Delta R.T. -0.006 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 67 Resp: 838

Ion	Ratio	Lower	Upper
67	100		
51	599.3	463.4	695.0



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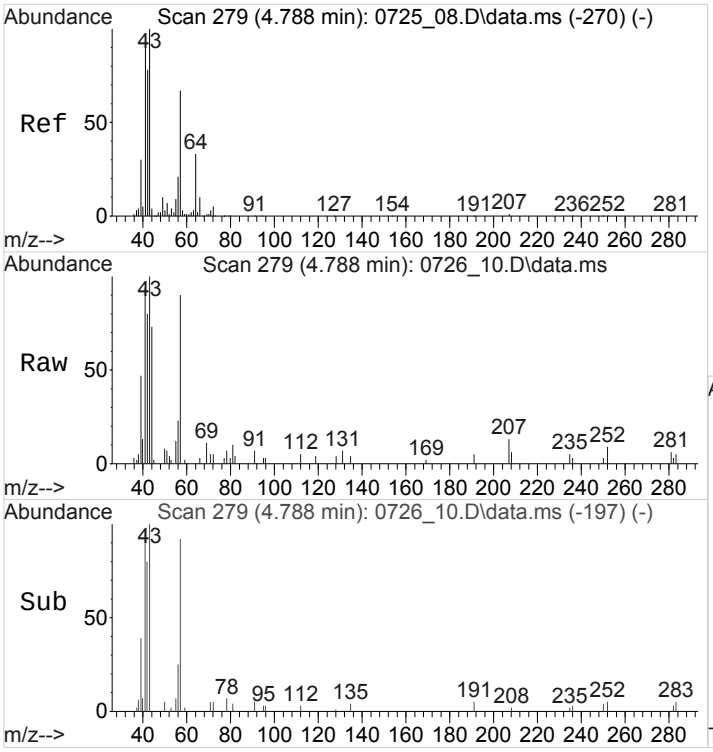
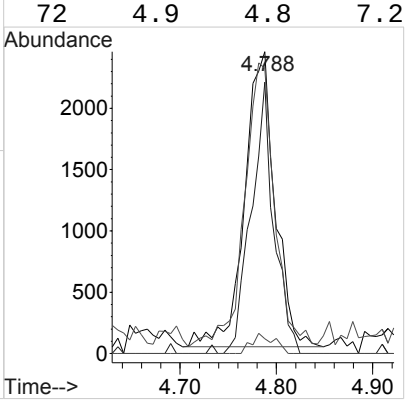
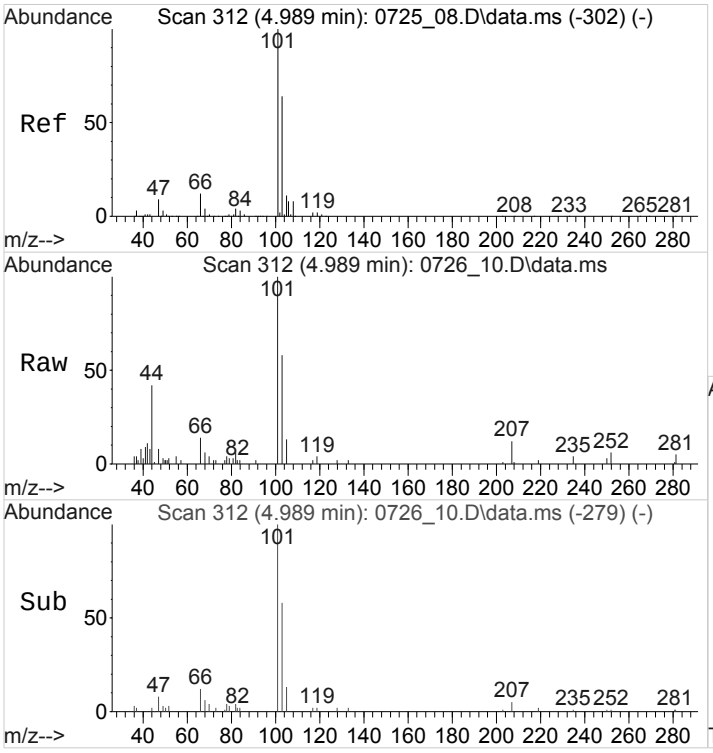


#13
ISOPENTANE
Concen: 0.3173225 ppbv
RT: 4.788 min Scan# 279
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 43 Resp: 5315

Ion	Ratio	Lower	Upper
43	100		
57	68.2	56.3	84.5
41	94.8	77.0	115.4
72	4.9	4.8	7.2

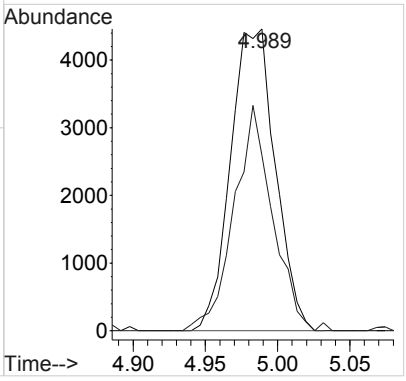




#15
Trichlorofluoromethane
Concen: 0.2082790 ppbv
RT: 4.989 min Scan# 312
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion:101 Resp: 9594

Ion	Ratio	Lower	Upper
101	100		
103	64.5	51.7	77.5



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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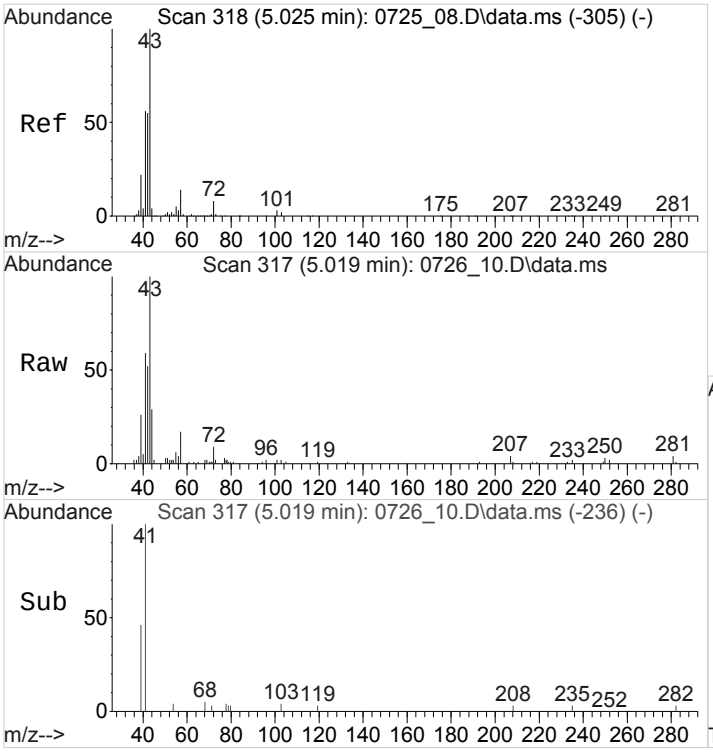
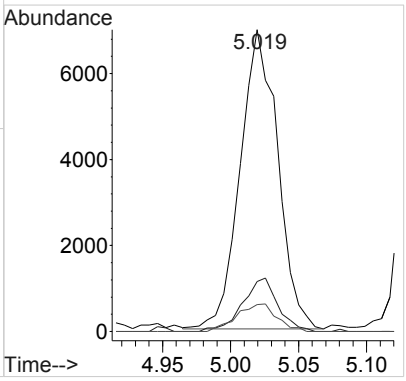
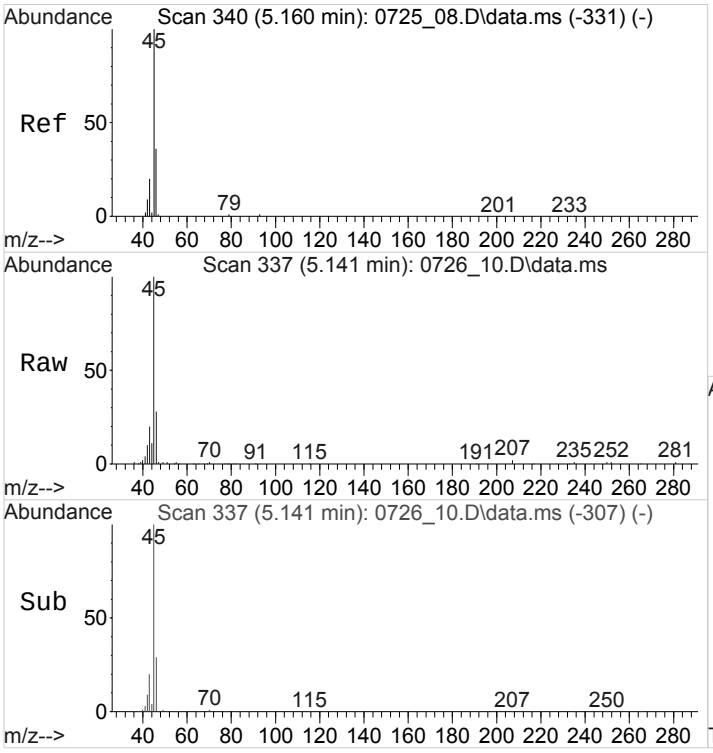


#16
PENTANE
Concen: 0.5142754 ppbv
RT: 5.019 min Scan# 317
Delta R.T. -0.006 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 43 Resp: 13311

Ion	Ratio	Lower	Upper
43	100		
57	16.8	12.7	19.1
72	9.8	7.8	11.8

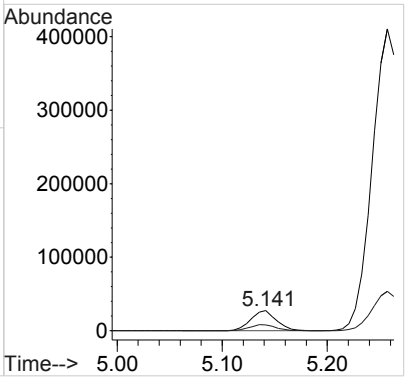




#17
Ethanol
Concen: 6.7306512 ppbv
RT: 5.141 min Scan# 337
Delta R.T. -0.018 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 45 Resp: 46290

Ion	Ratio	Lower	Upper
45	100		
46	31.6	26.3	39.5



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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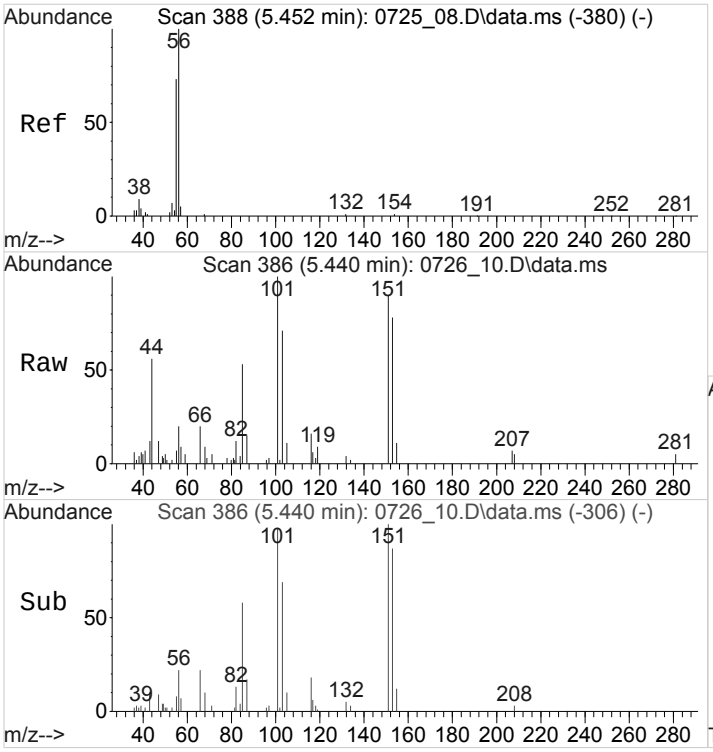
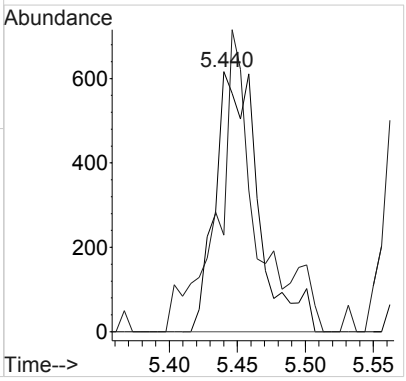
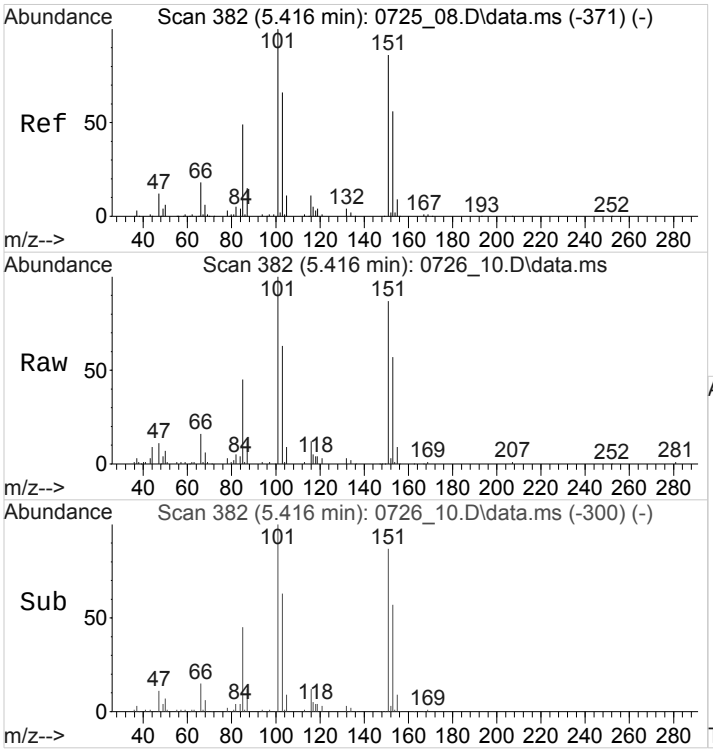


#18
ACROLEIN
Concen: 0.1979388 ppbv
RT: 5.440 min Scan# 386
Delta R.T. -0.012 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 56 Resp: 1362

Ion	Ratio	Lower	Upper
56	100		
55	95.1	59.5	89.3#

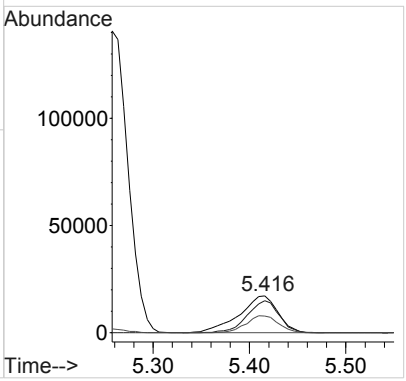




#19
1,1,2-Trichlorotrifluoroethane
Concen: 1.4411201 ppbv
RT: 5.416 min Scan# 382
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion:101 Resp: 47900

Ion	Ratio	Lower	Upper
101	100		
151	72.4	67.9	101.9
85	38.5	37.1	55.7



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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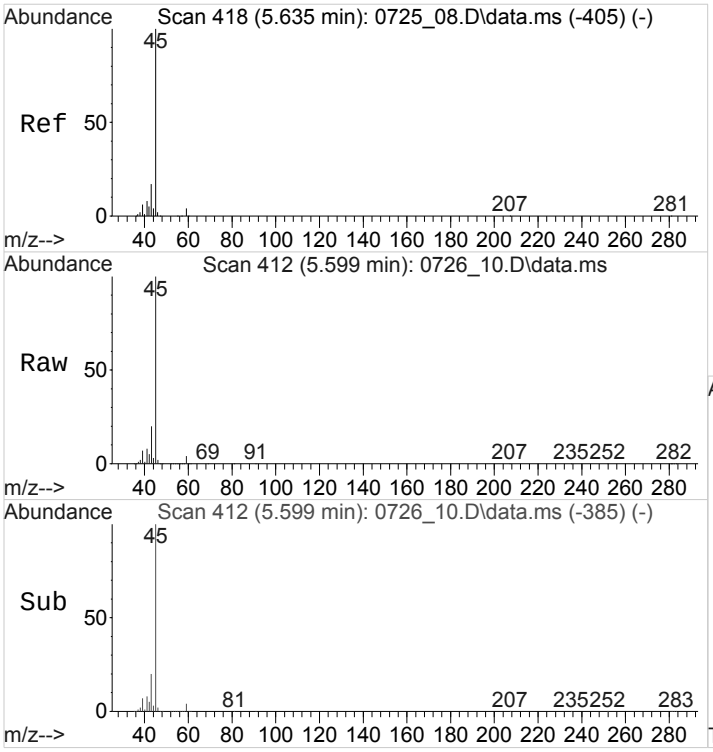
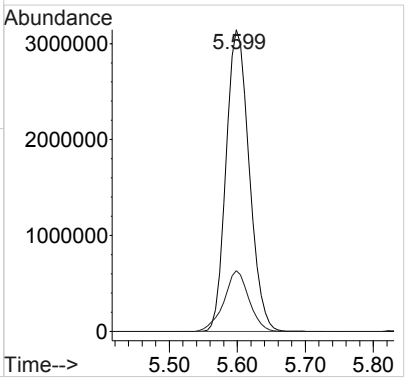
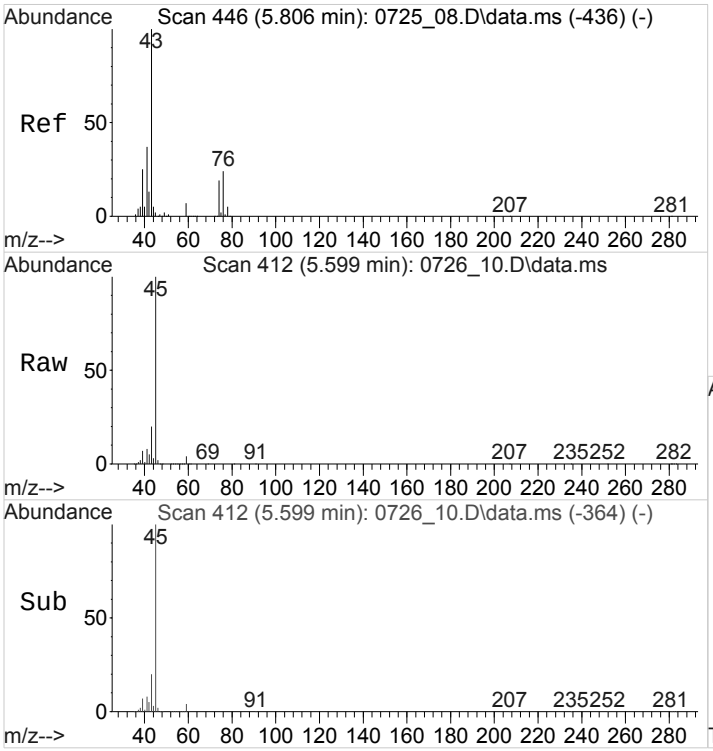


#23
2-Propanol
Concen: 264.4743616 ppbv
RT: 5.599 min Scan# 412
Delta R.T. -0.036 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 45 Resp: 7411566

Ion	Ratio	Lower	Upper
45	100		
43	22.0	15.6	23.4

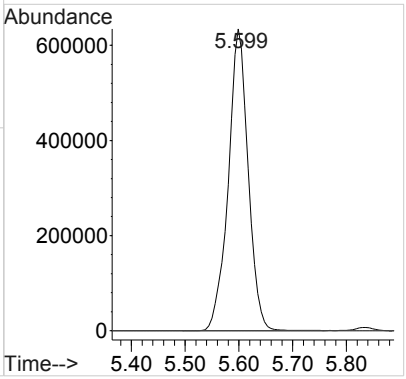


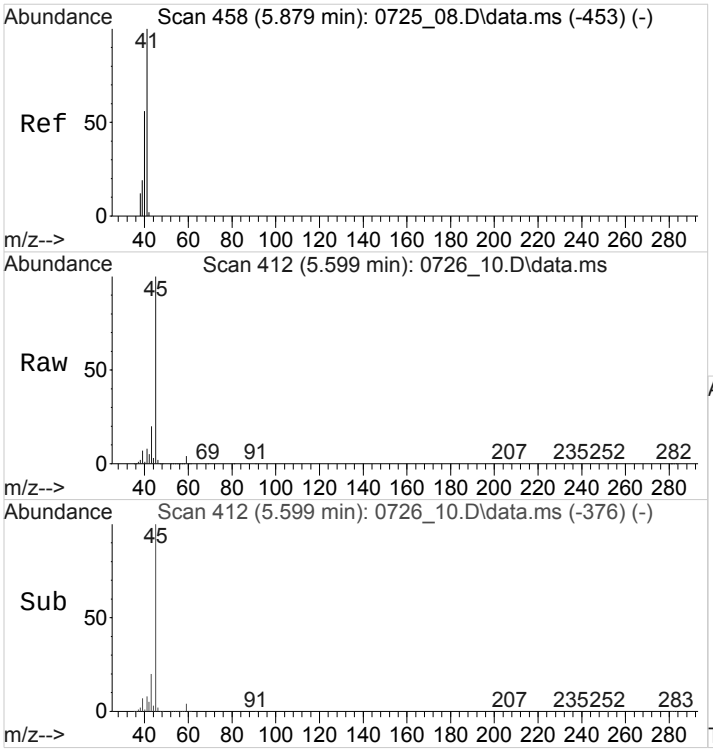


#26
METHYL ACETATE
Concen: 51.9222798 ppbv
RT: 5.599 min Scan# 412
Delta R.T. -0.207 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 43 Resp: 1629687

Ion	Ratio	Lower	Upper
43	100		
74	0.0	15.7	23.5#
29	0.0	0.0	0.0

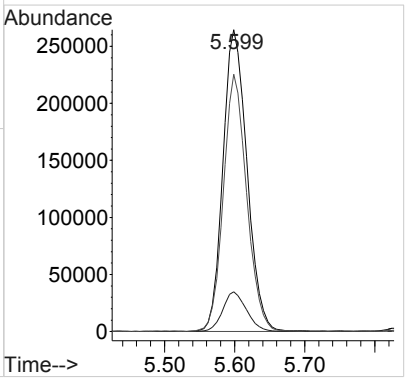


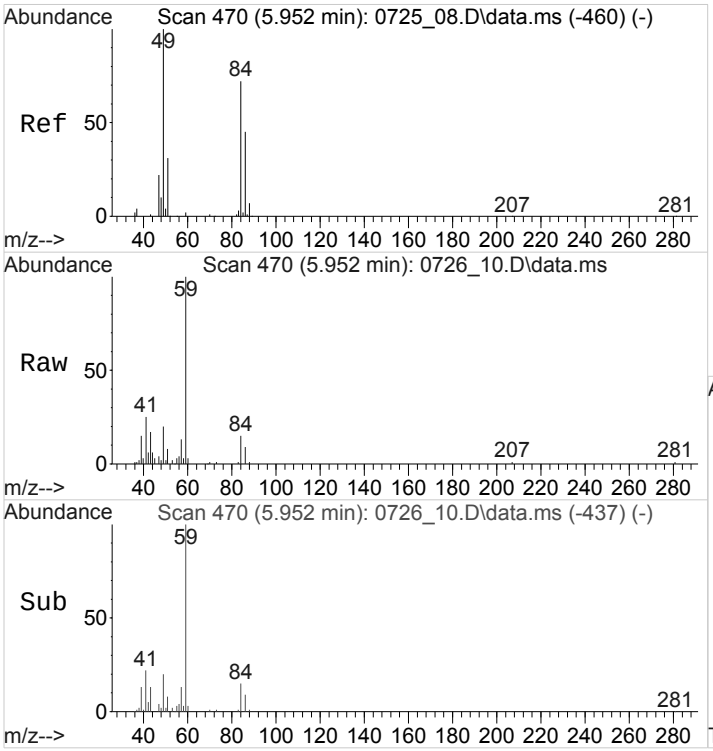


#27
ACETONITRILE
Concen: 48.9205328 ppbv
RT: 5.599 min Scan# 412
Delta R.T. -0.280 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 41 Resp: 633006

Ion	Ratio	Lower	Upper
41	100		
40	12.8	41.5	62.3#
39	82.4	15.7	23.5#

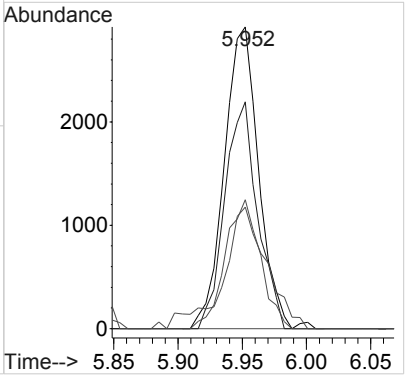


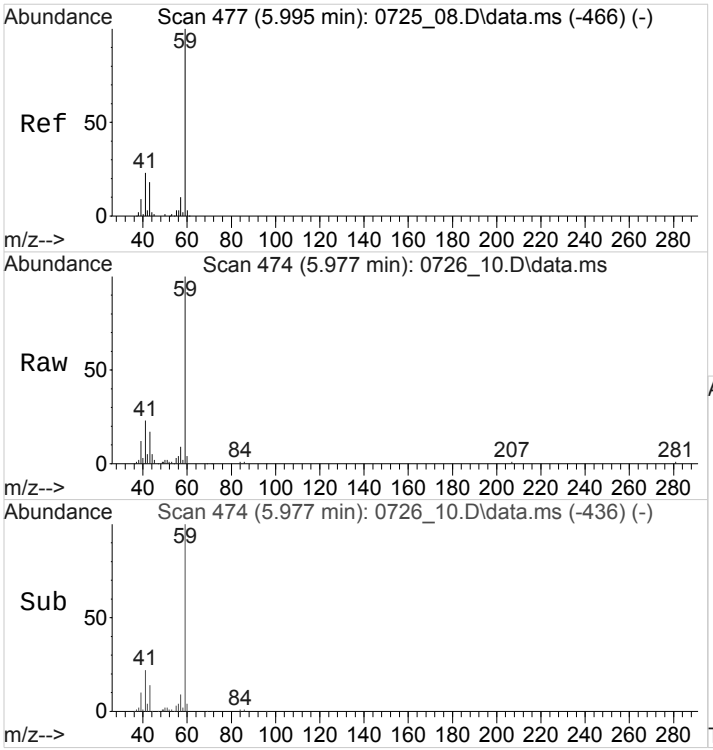


#28
Methylene Chloride
Concen: Below Cal
RT: 5.952 min Scan# 470
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 49 Resp: 5445

Ion	Ratio	Lower	Upper
49	100		
84	71.6	55.8	83.8
86	43.4	36.6	55.0
51	50.8	25.9	38.9#

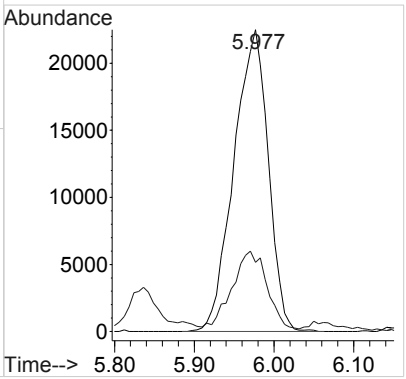


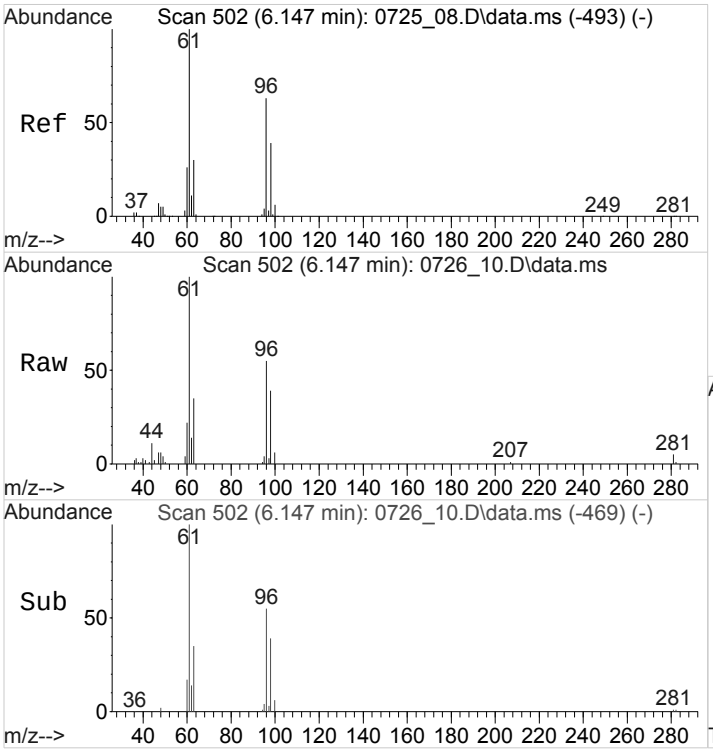


#29
TERT-BUTYL ALCOHOL
Concen: 2.1629209 ppbv
RT: 5.977 min Scan# 474
Delta R.T. -0.018 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 59 Resp: 67291

Ion	Ratio	Lower	Upper
59	100		
41	25.8	22.0	33.0

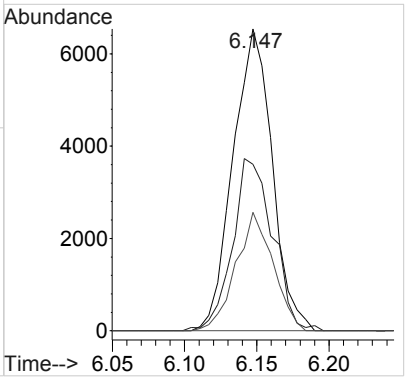


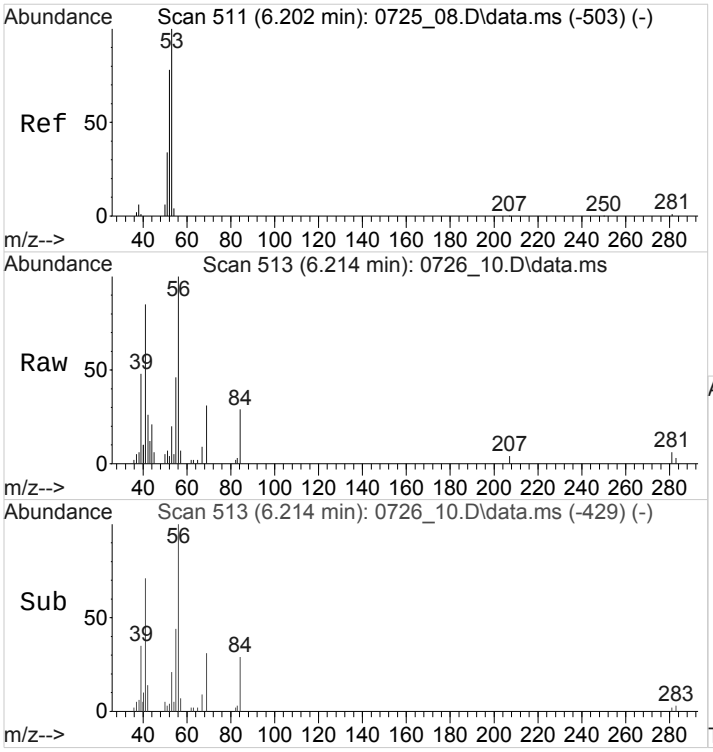


#31
Trans-1,2-Dichloroethene
Concen: 0.5059367 ppbv
RT: 6.147 min Scan# 502
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 61 Resp: 12317

Ion	Ratio	Lower	Upper
61	100		
96	58.4	49.8	74.6
98	37.2	30.5	45.7

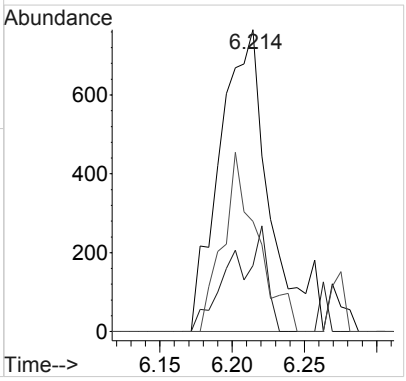


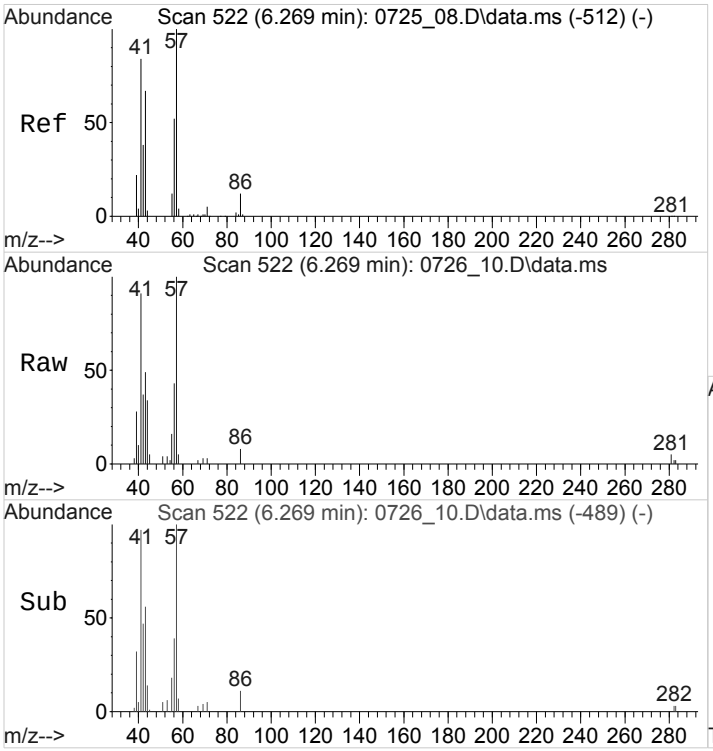


#32
ACRYLONITRILE
Concen: 0.1373976 ppbv
RT: 6.214 min Scan# 513
Delta R.T. 0.012 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 53 Resp: 1824

Ion	Ratio	Lower	Upper
53	100		
52	10.6	66.7	100.1#
51	0.0	28.8	43.2#

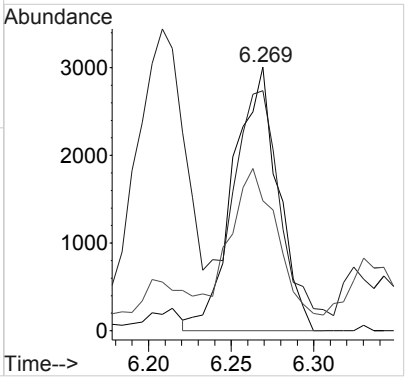


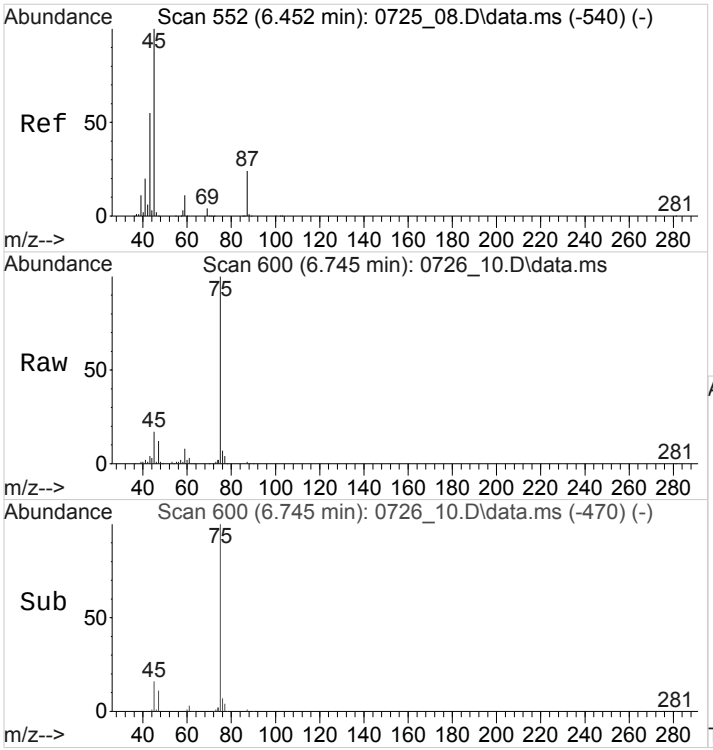


#33
n-Hexane
Concen: 0.2620079 ppbv
RT: 6.269 min Scan# 522
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 57 Resp: 5669

Ion	Ratio	Lower	Upper
57	100		
41	79.4	68.5	102.7
43	68.8	54.9	82.3

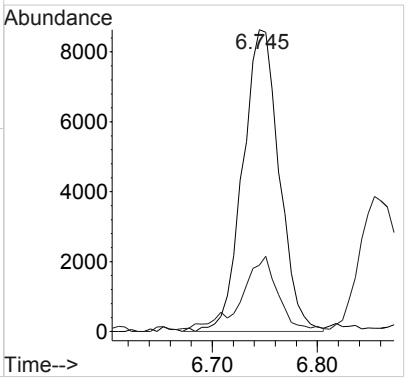


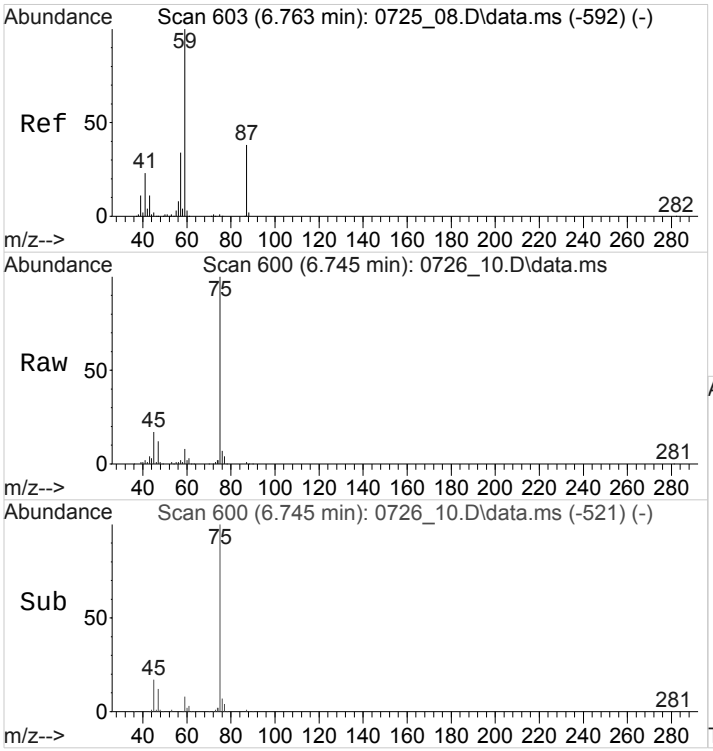


#36
DI-ISOPROPYL ETHER
Concen: 0.4592704 ppbv
RT: 6.745 min Scan# 600
Delta R.T. 0.293 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 45 Resp: 20871

Ion	Ratio	Lower	Upper
45	100		
43	23.6	39.9	59.9#

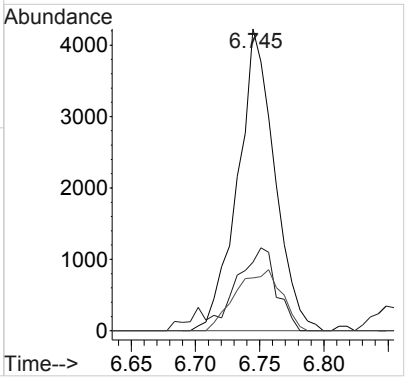




#37
ETHYL TERT-BUTYL ETHER
Concen: 0.1820214 ppbv
RT: 6.745 min Scan# 600
Delta R.T. -0.018 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 59 Resp: 8438

Ion	Ratio	Lower	Upper
59	100		
57	29.5	27.3	40.9
87	25.2	30.5	45.7#



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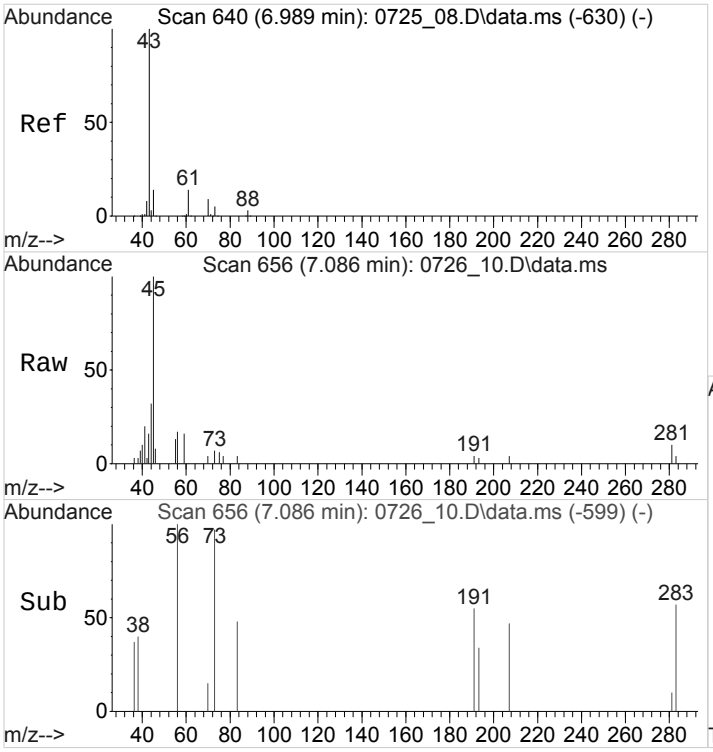
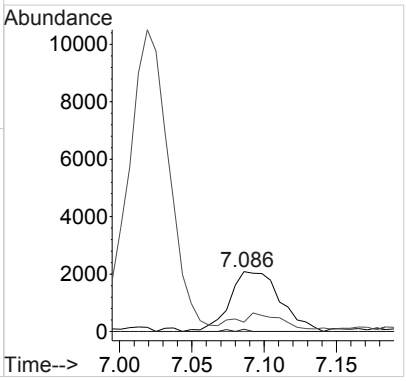
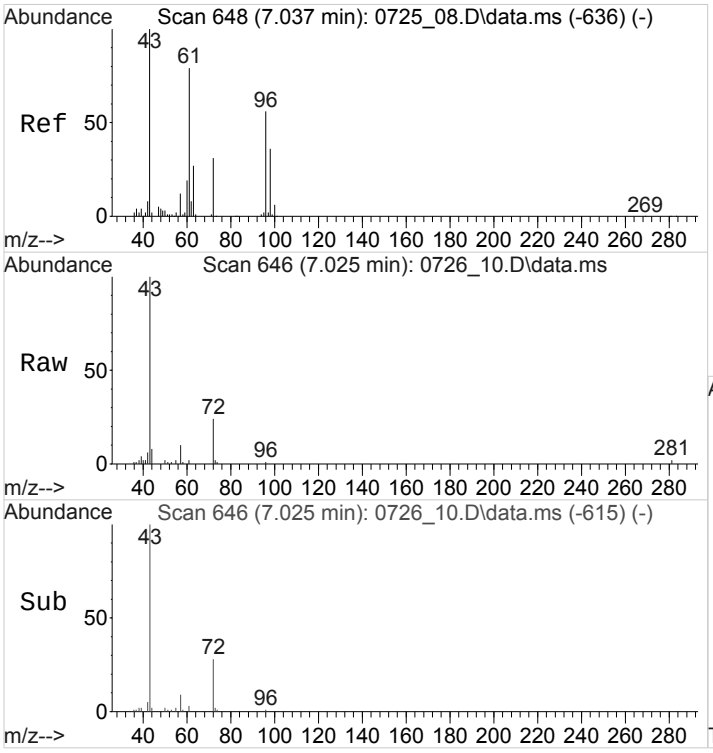


#38
ETHYL ACETATE
Concen: 0.9821288 ppbv
RT: 7.086 min Scan# 656
Delta R.T. 0.098 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 45 Resp: 5051

Ion	Ratio	Lower	Upper
45	100		
70	1.0	52.4	78.6#
43	21.8	566.5	849.7#

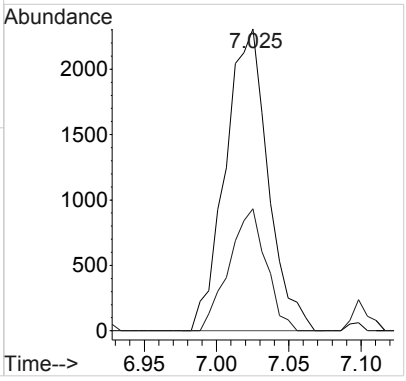




#39
2-Butanone (MEK)
Concen: 0.6402818 ppbv
RT: 7.025 min Scan# 646
Delta R.T. -0.012 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 72 Resp: 4731

Ion	Ratio	Lower	Upper
72	100		
57	35.2	28.6	42.8



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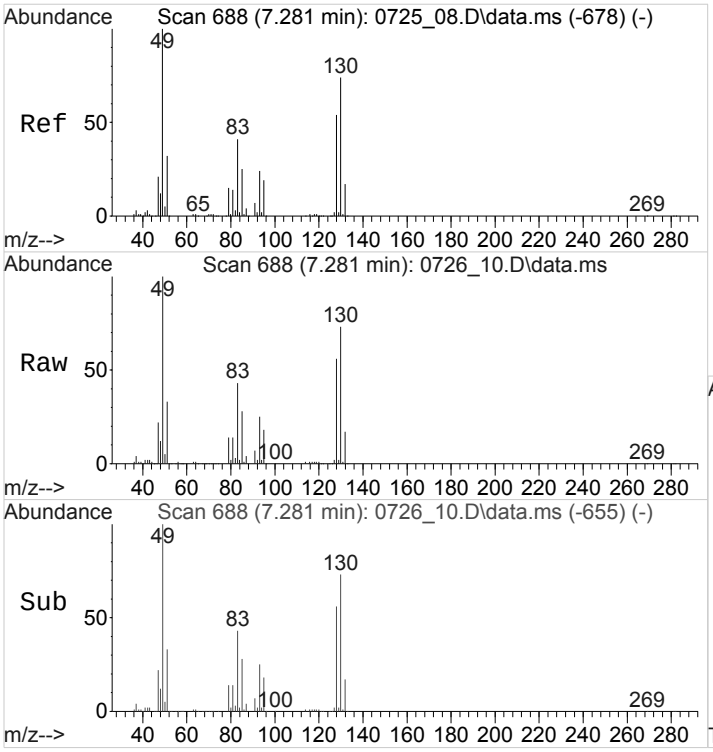
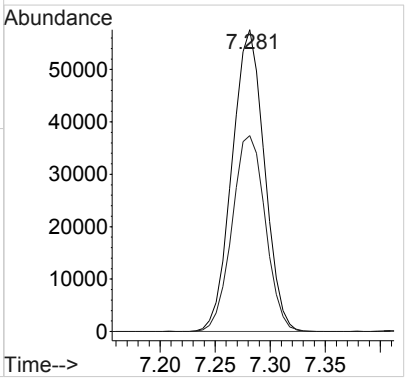
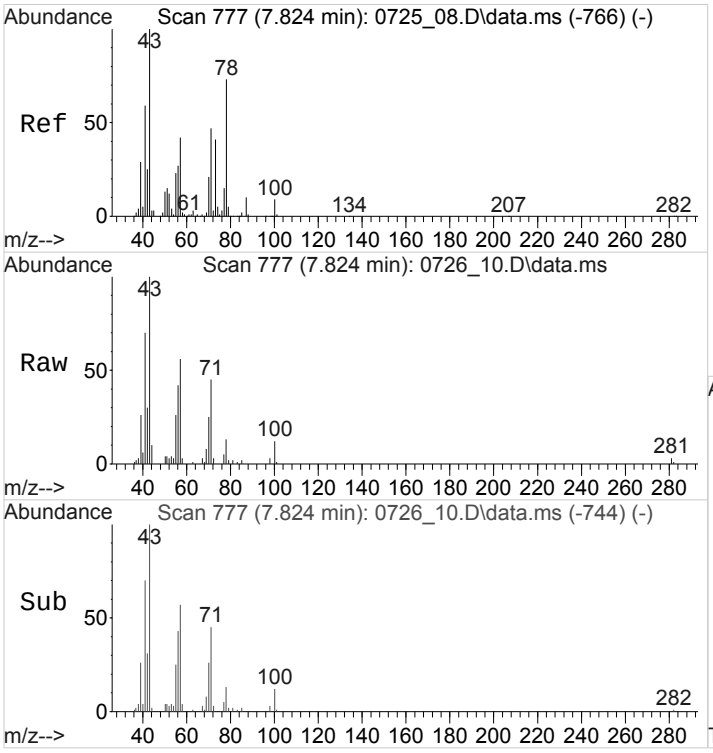


#42
Chloroform
Concen: 3.7132018 ppbv
RT: 7.281 min Scan# 688
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 83 Resp: 118252

Ion	Ratio	Lower	Upper
83	100		
85	66.7	50.4	75.6

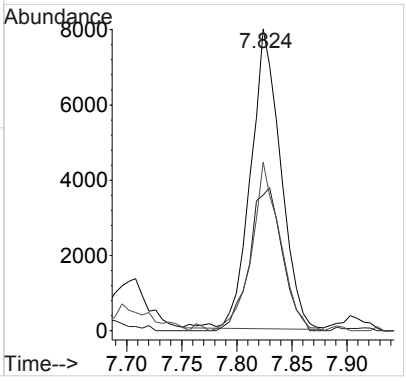




#51
Heptane
Concen: 0.3458639 ppbv
RT: 7.824 min Scan# 777
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 43 Resp: 15245

Ion	Ratio	Lower	Upper
43	100		
71	52.0	34.2	51.2#
57	53.4	26.7	40.1#



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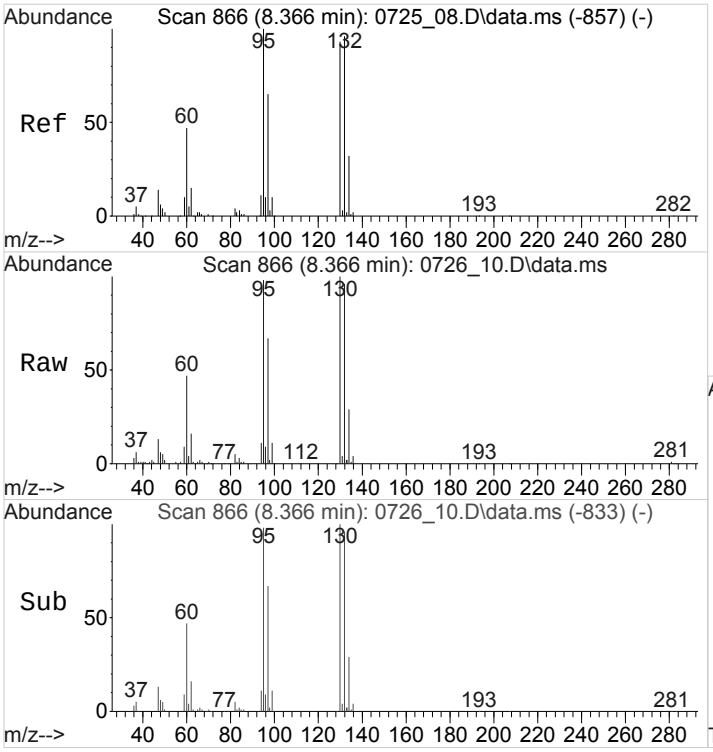
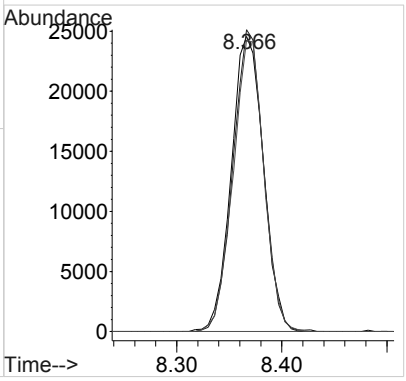
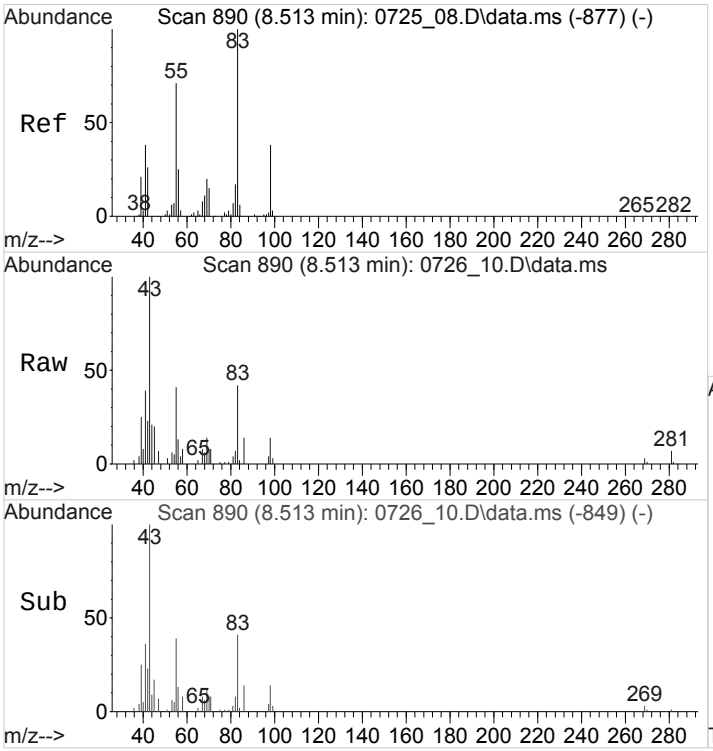


#52
Trichloroethene
Concen: 2.5524638 ppbv
RT: 8.366 min Scan# 866
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 95 Resp: 52415

Ion	Ratio	Lower	Upper
95	100		
130	96.7	78.1	117.1
132	94.7	74.8	112.2

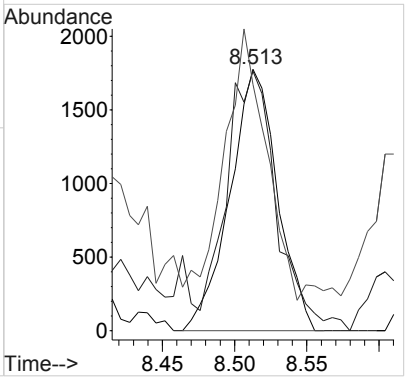




#54
METHYL CYCLOHEXANE
Concen: 0.1435494 ppbv
RT: 8.513 min Scan# 890
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 83 Resp: 4050

Ion	Ratio	Lower	Upper
83	100		
55	104.8	69.5	104.3#
41	81.8	40.7	61.1#



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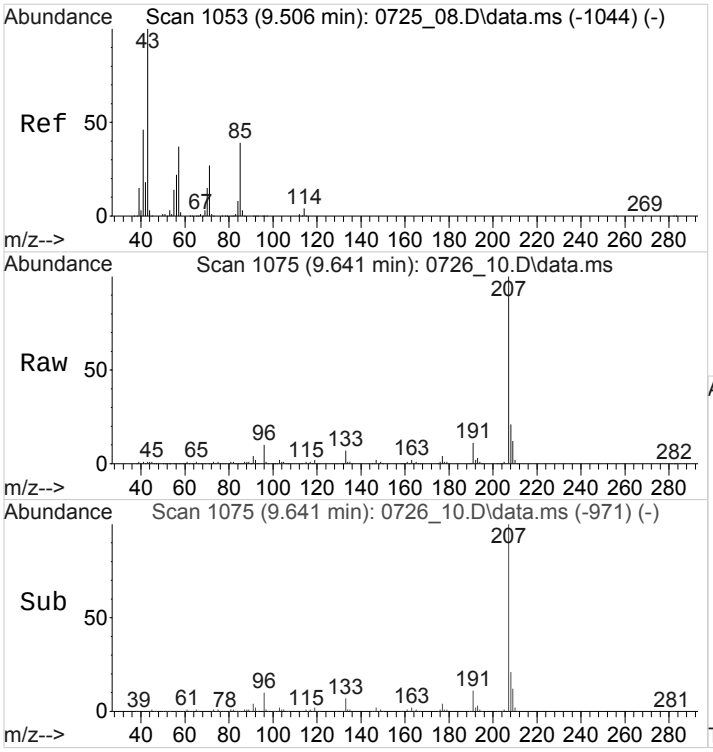
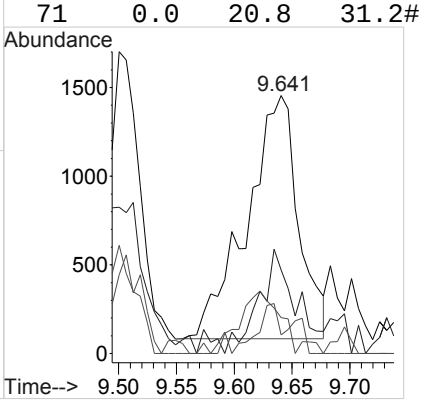
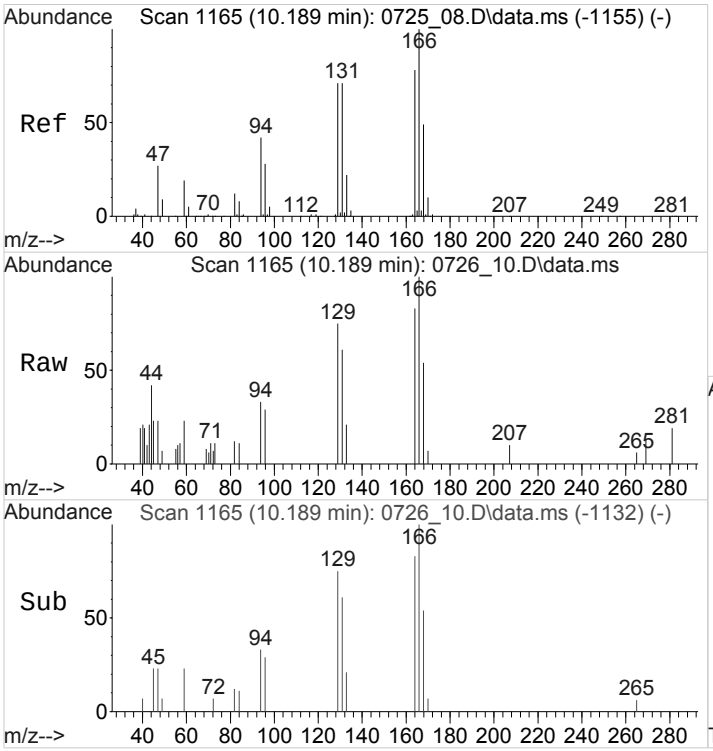


#61
n-OCTANE
Concen: 0.1025591 ppbv
RT: 9.641 min Scan# 1075
Delta R.T. 0.134 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 43 Resp: 4275

Ion	Ratio	Lower	Upper
43	100		
57	0.0	30.2	45.4#
85	0.0	30.3	45.5#
71	0.0	20.8	31.2#

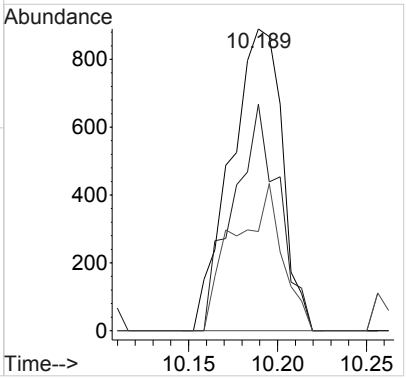




#65
Tetrachloroethene
Concen: 0.0642322 ppbv
RT: 10.189 min Scan# 1165
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion:166 Resp: 1794

Ion	Ratio	Lower	Upper
166	100		
129	66.6	59.4	89.2
94	45.0	34.9	52.3



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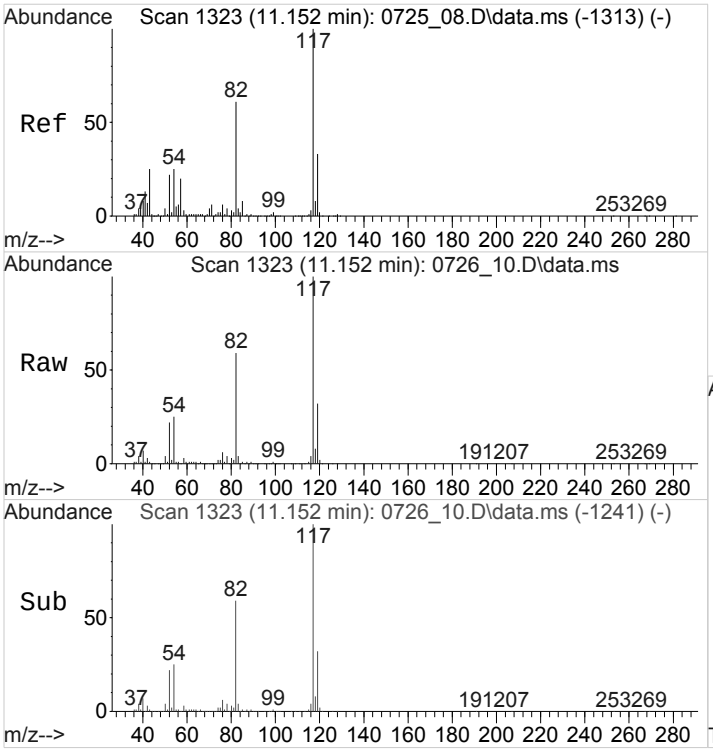
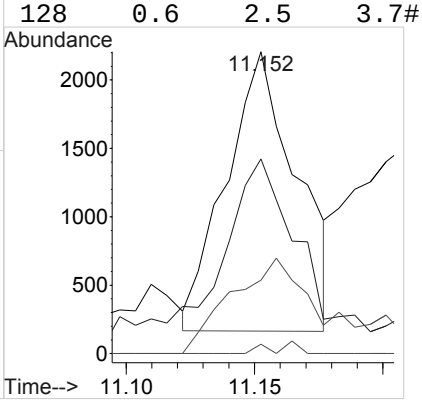
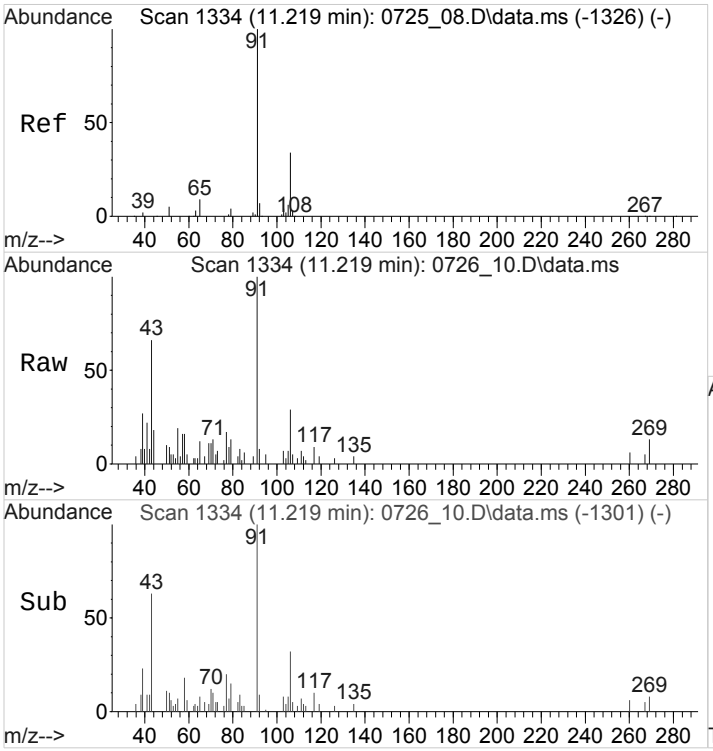


#70
NONANE
Concen: 0.0852920 ppbv
RT: 11.152 min Scan# 1323
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 43 Resp: 3912

Ion	Ratio	Lower	Upper
43	100		
57	87.8	65.4	98.0
71	0.0	18.3	27.5#
128	0.6	2.5	3.7#

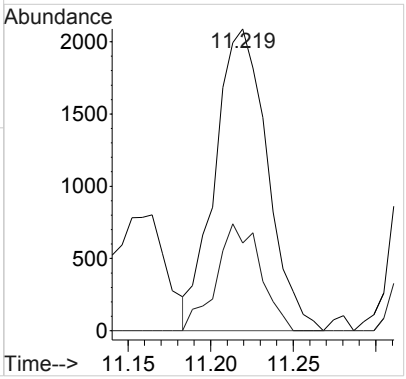




#72
Ethylbenzene
Concen: 0.0660255 ppbv
RT: 11.219 min Scan# 1334
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 91 Resp: 4606

Ion	Ratio	Lower	Upper
91	100		
106	29.9	25.3	37.9



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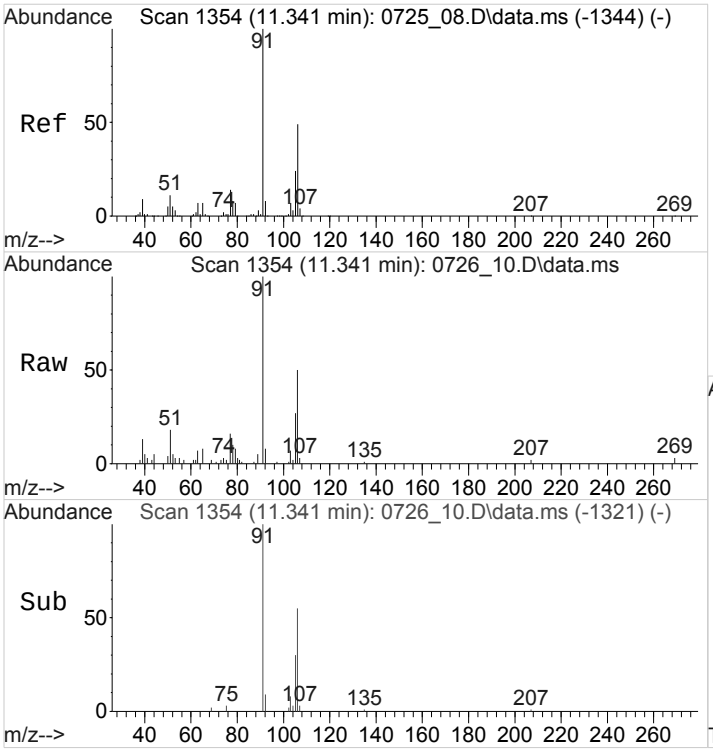
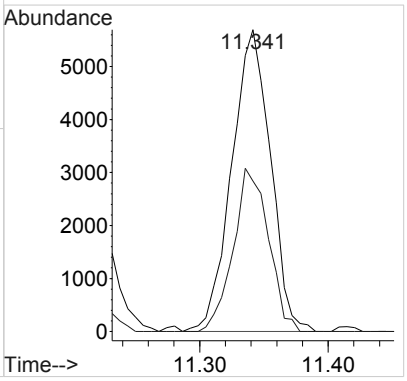
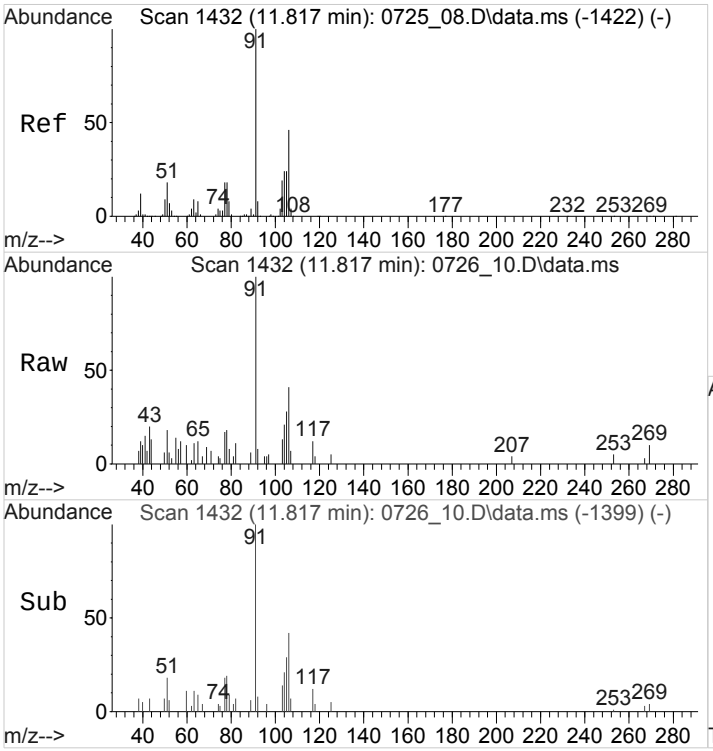


#73
M&P-Xylene
Concen: 0.2246497 ppbv
RT: 11.341 min Scan# 1354
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 91 Resp: 11944

Ion	Ratio	Lower	Upper
91	100		
106	49.1	38.6	58.0

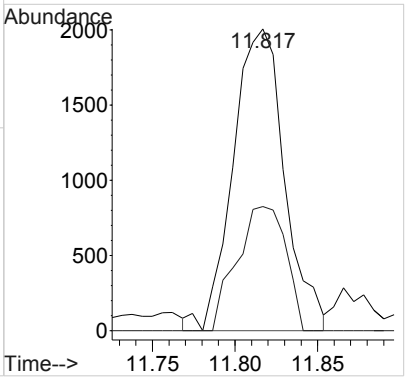


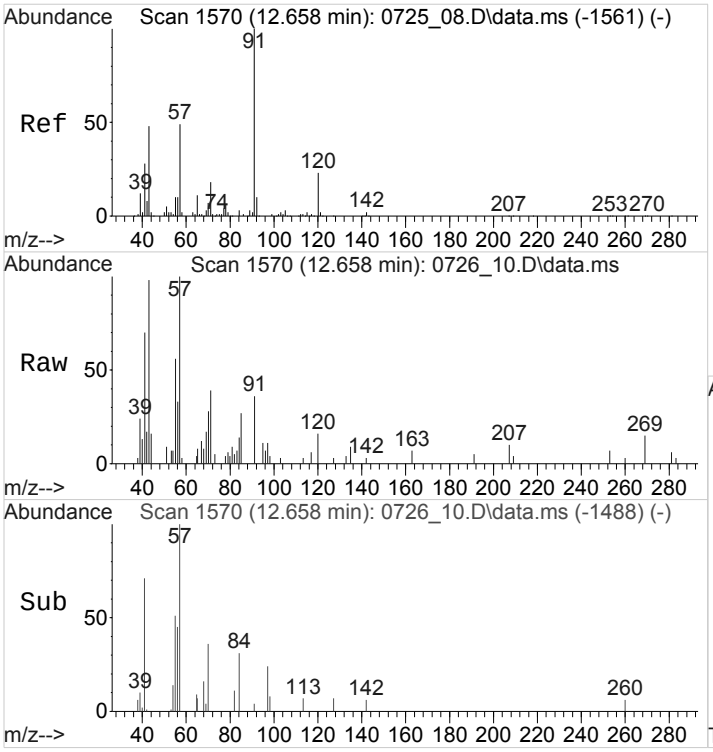


#74
O-Xylene
Concen: 0.0841467 ppbv
RT: 11.817 min Scan# 1432
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 91 Resp: 4364

Ion	Ratio	Lower	Upper
91	100		
106	39.2	36.9	55.3

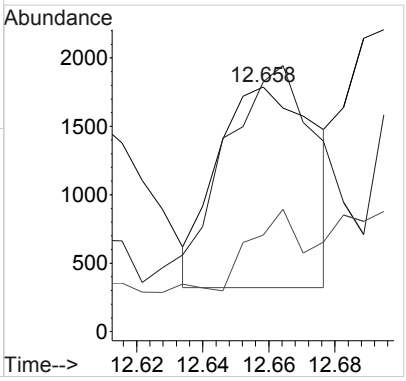


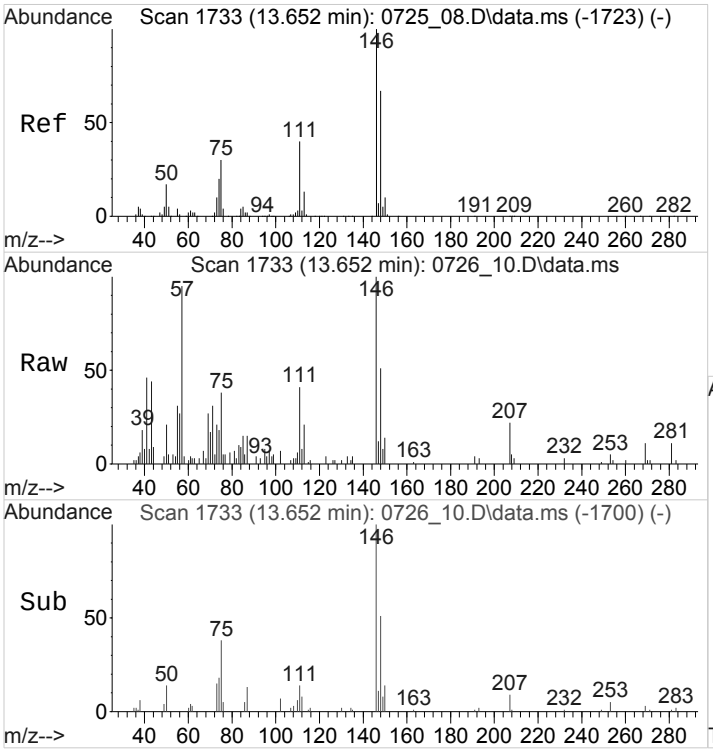


#80
n-DECANE
Concen: 0.0619820 ppbv
RT: 12.658 min Scan# 1570
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion: 43 Resp: 3026

Ion	Ratio	Lower	Upper
43	100		
57	0.0	80.0	120.0#
71	21.6	30.4	45.6#

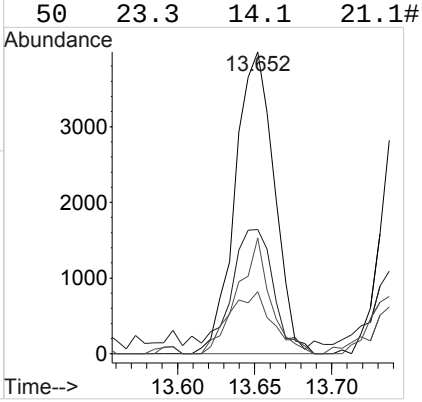




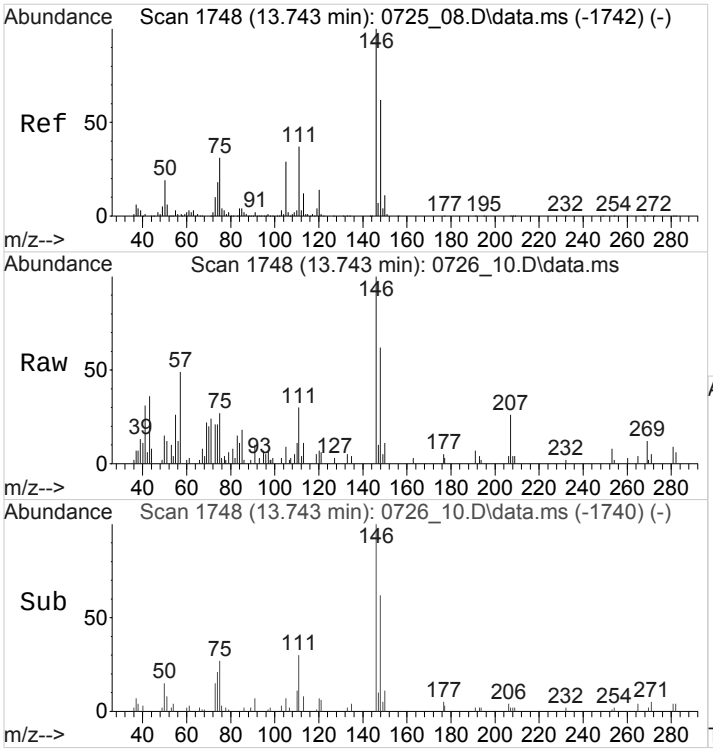
#90
1,3-Dichlorobenzene
Concen: 0.1337624 ppbv
RT: 13.652 min Scan# 1733
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion:146 Resp: 7042

Ion	Ratio	Lower	Upper
146	100		
111	42.1	31.4	47.0
75	32.3	24.2	36.2
50	23.3	14.1	21.1#



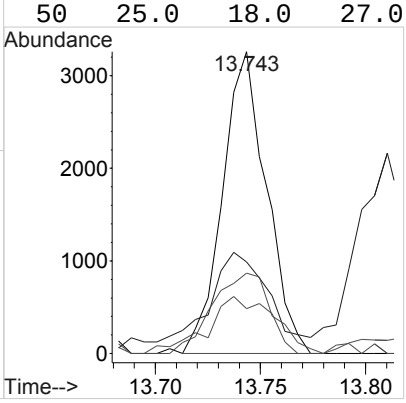
ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	127 of 377

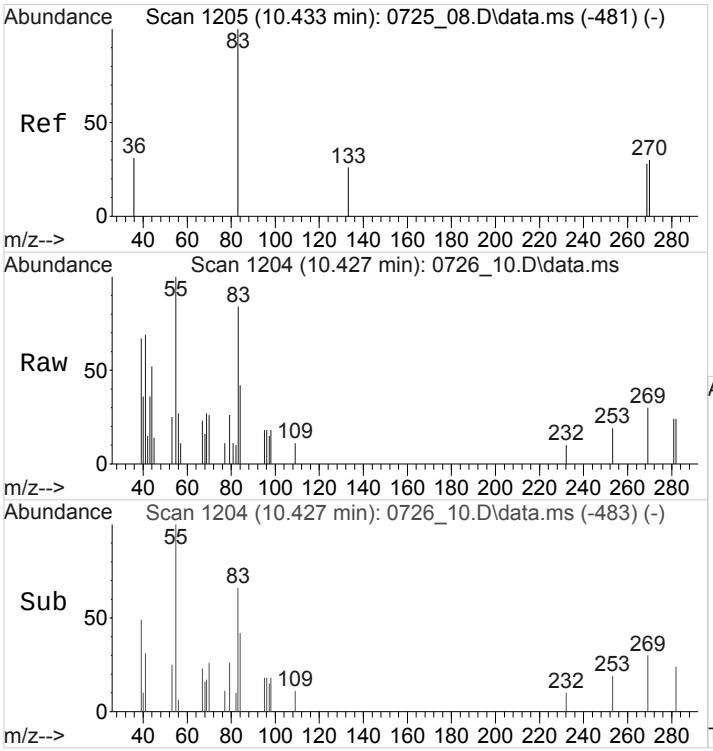


#92
1,4-Dichlorobenzene
Concen: 0.0900914 ppbv
RT: 13.743 min Scan# 1748
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion:146 Resp: 4743

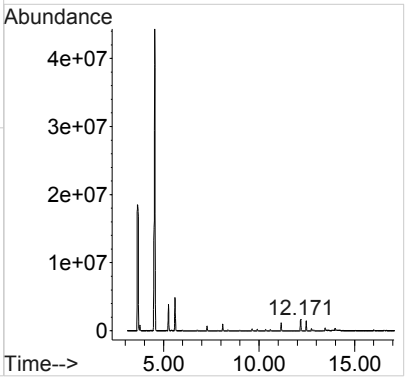
Ion	Ratio	Lower	Upper
146	100		
111	31.9	30.7	46.1
75	36.9	26.2	39.4
50	25.0	18.0	27.0



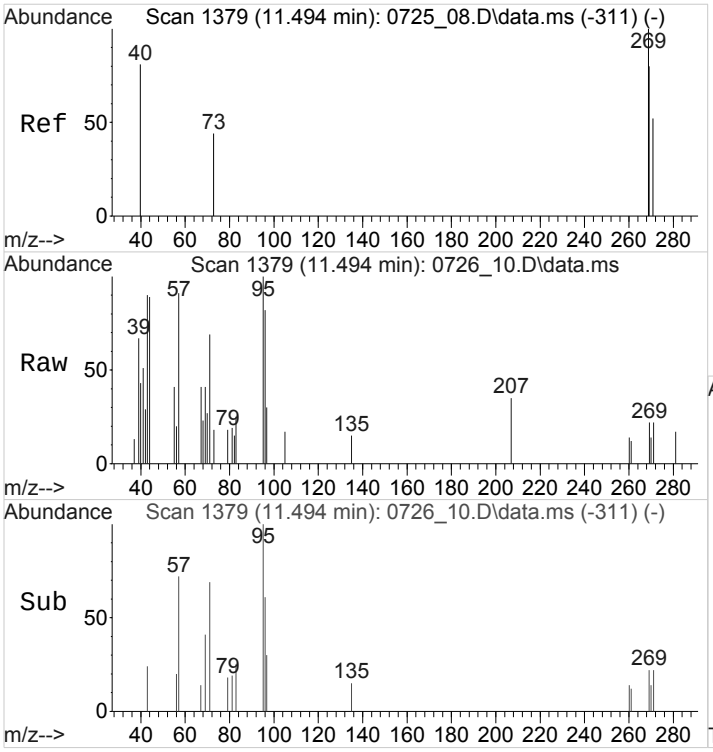


#101
TPH (GC/MS) Low Fraction
Concen: 94.2441587 ppbv m
RT: 10.430 min Scan# 1204
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion:TIC Resp:11202719

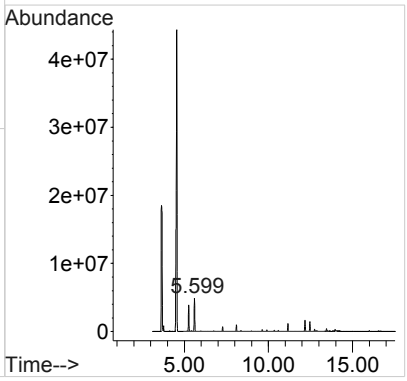


ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	128 of 377



#102
TPH-GRO (C5-C10)
Concen: 334.8274991 ppbv m
RT: 11.493 min Scan# 1379
Delta R.T. 0.000 min
Lab File: 0726_10.D
Acq: 26 Jul 2022 2:17 pm

Tgt Ion:TIC Resp:32443446



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	129 of 377

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-VMP03-0220722

Lab Sample ID:	L1518164-05	**SDG:**	L1518164
Client Sample ID:	CRCA-VMP03-0220722	**Collected Date/Time:**	07/22/22 12:40
Lab File ID:	0801_06	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS9	**Preparation Date/Time:**	08/01/22 12:44
Analytical Batch:	WG1903843	**Analysis Date/Time:**	08/01/22 12:44
Dilution Factor:	10	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	20 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
2-Propanol	67-63-0	2.31	622		6.49	15.4	30.7

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_06.D
Acq On : 01 Aug 2022 12:44 pm
Operator :
Sample : L1518164-05 10x WG1903843
Misc :
ALS Vial : 6 Sample Multiplier: 1

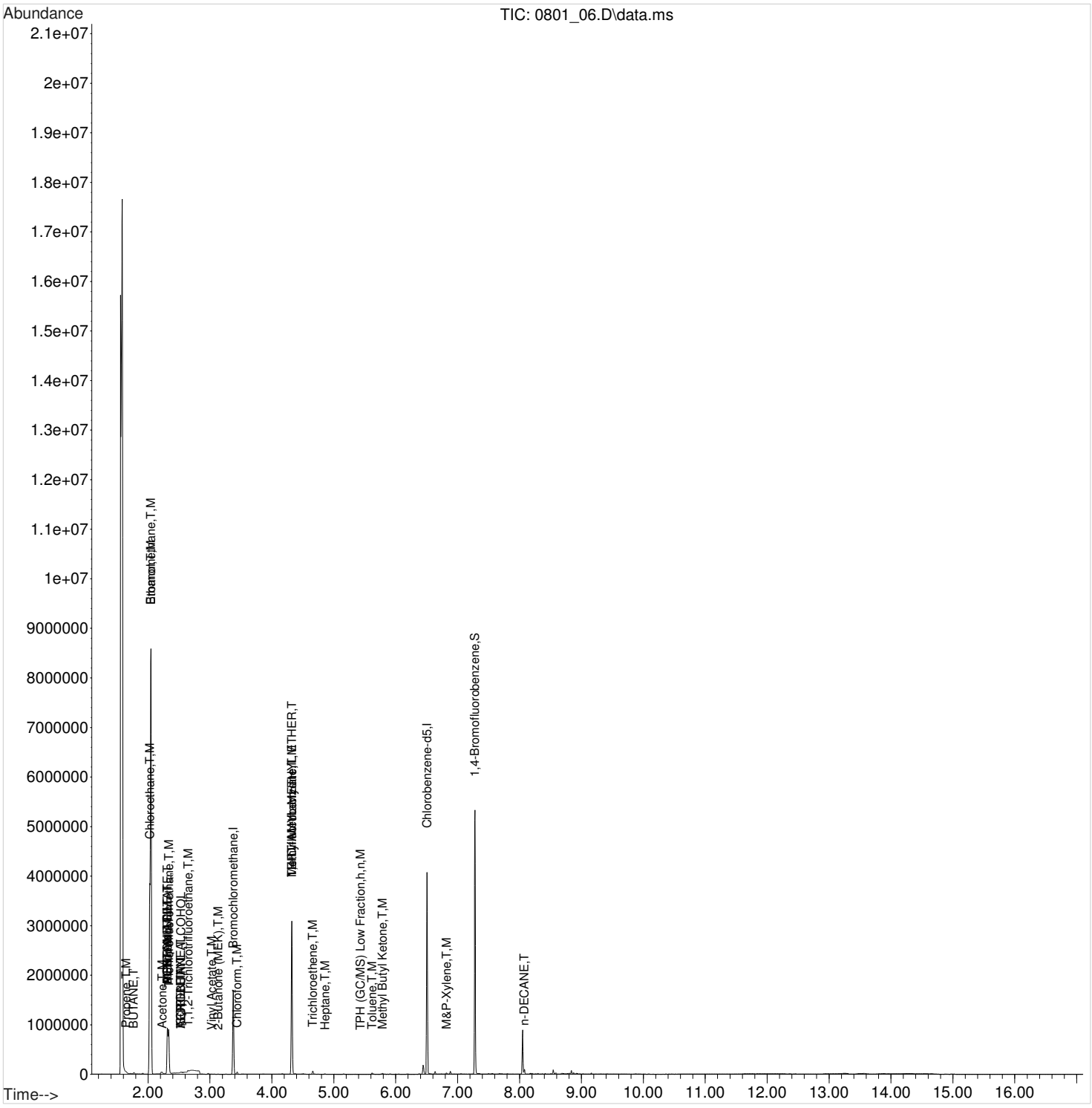
Quant Time: Aug 01 13:32:33 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

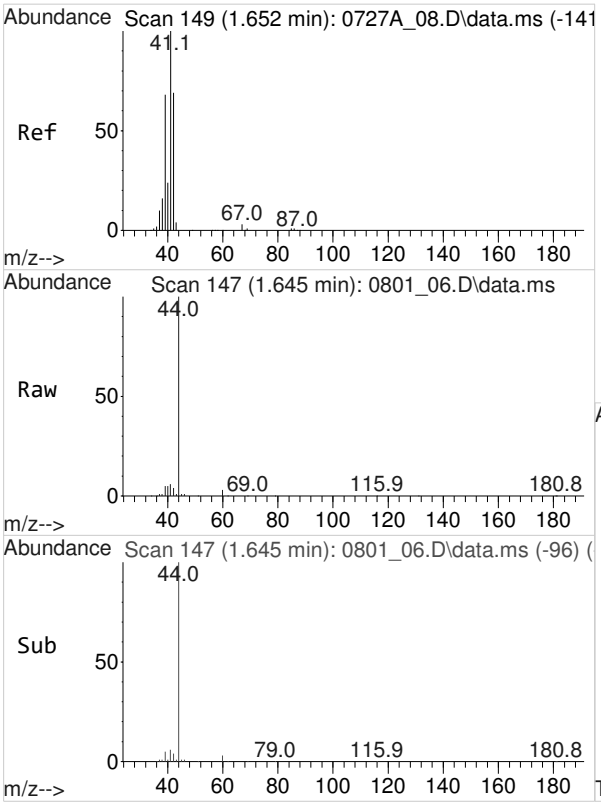
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
Internal Standards					
1) Bromochloromethane	3.378	130	564303	4.0000000 ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	1858608	4.0000000 ppbv	0.00
71) Chlorobenzene-d5	6.507	117	1714627	4.0000000 ppbv	0.00
System Monitoring Compounds					
85) 1,4-Bromofluorobenzene	7.277	95	1046961	3.5995680 ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 89.99%		
Target Compounds					Qvalue
2) Propene	1.645	41	2458	0.1350384 ppbv	90
3) BUTANE	1.766	43	7203	0.1924204 ppbv #	57
11) Bromomethane	2.047	94	6041	0.1803162 ppbv #	25
12) Chloroethane	2.028	64	1285	0.0890370 ppbv #	56
13) ISOPENTANE	2.528	41	1511	0.1096511 ppbv #	1
15) Trichlorofluoromethane	2.335	101	57269	0.9294732 ppbv	97
16) PENTANE	2.312	43	132900	4.6229271 ppbv #	60
17) Ethanol	2.047	45	11042	1.4835899 ppbv #	62
18) ACROLEIN	2.528	56	615	0.0573877 ppbv	90
19) 1,1,2-Trichlorotrifluo...	2.646	101	6557	0.1243829 ppbv	94
21) Acetone	2.229	43	18659	0.7648621 ppbv	91
23) 2-Propanol	2.312	45	752883	25.3420634 ppbv	95
26) METHYL ACETATE	2.312	43	132900	4.0511849 ppbv #	41
27) ACETONITRILE	2.312	41	49458	3.5447937 ppbv #	31
29) TERT-BUTYL ALCOHOL	2.532	59	7181	0.1867946 ppbv	99
35) Vinyl Acetate	3.029	43	3310	0.0831306 ppbv #	87
39) 2-Butanone (MEK)	3.131	72	1589	0.1040314 ppbv	97
42) Chloroform	3.438	83	22247	0.3893858 ppbv	99
49) TERT-AMYL METHYL ETHER	4.322	73	10477	0.1433578 ppbv #	17
51) Heptane	4.857	43	1841	0.0605475 ppbv	98
52) Trichloroethene	4.660	95	12338	0.2777128 ppbv	93
56) Methyl Methacrylate	4.322	69	24404	0.8335228 ppbv #	95
62) Toluene	5.618	91	12256	0.1103580 ppbv	99
66) Methyl Butyl Ketone	5.787	43	3868	0.1181546 ppbv #	40
73) M&P-Xylene	6.820	91	9287	0.0846797 ppbv	92
80) n-DECANE	8.078	43	3211	0.0734400 ppbv #	1
101) TPH (GC/MS) Low Fraction	5.430	TIC	1281257m	5.5428718 ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	-874339m	Below Cal	

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

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_06.D
Acq On : 01 Aug 2022 12:44 pm
Operator :
Sample : L1518164-05 10x WG1903843
Misc :
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Aug 01 13:32:33 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

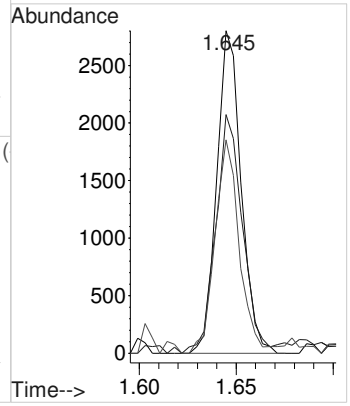


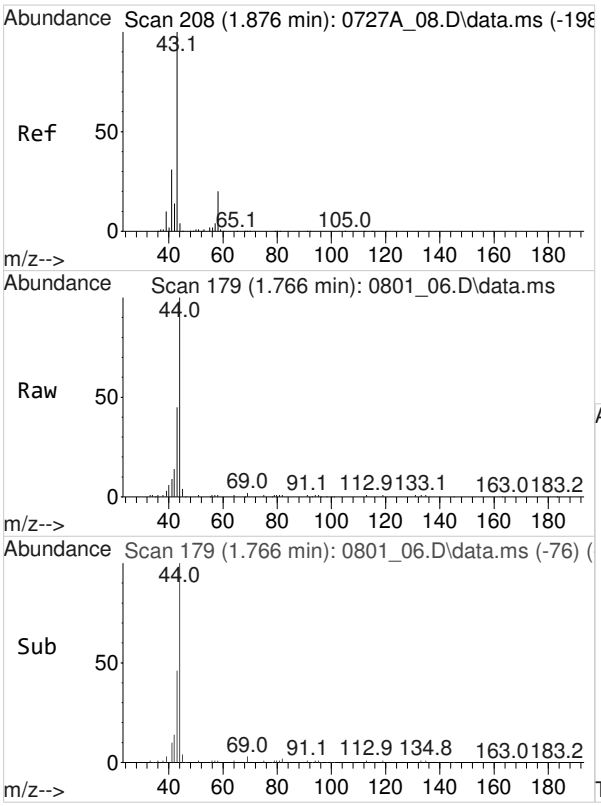


#2
Propene
Concen: 0.1350384 ppbv
RT: 1.645 min Scan# 147
Delta R.T. -0.007 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 41 Resp: 2458

Ion	Ratio	Lower	Upper
41	100		
39	82.1	54.9	82.3
42	65.8	55.3	82.9

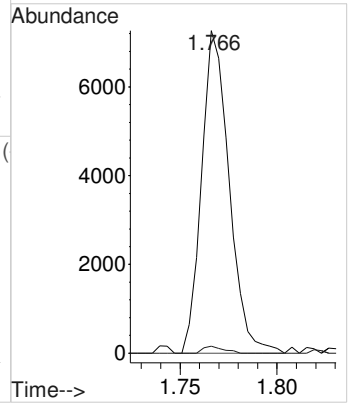


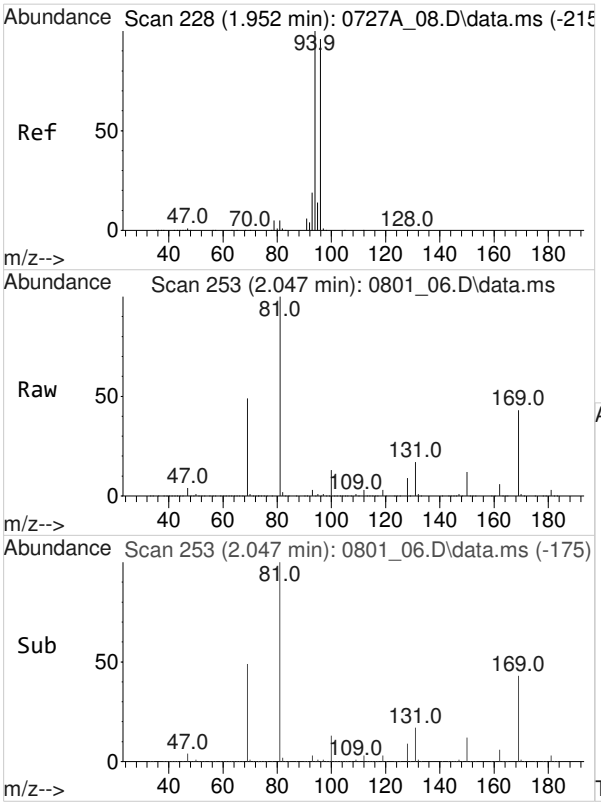


#3
BUTANE
Concen: 0.1924204 ppbv
RT: 1.766 min Scan# 179
Delta R.T. -0.110 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 43 Resp: 7203

Ion	Ratio	Lower	Upper
43	100		
58	0.0	15.6	23.4#

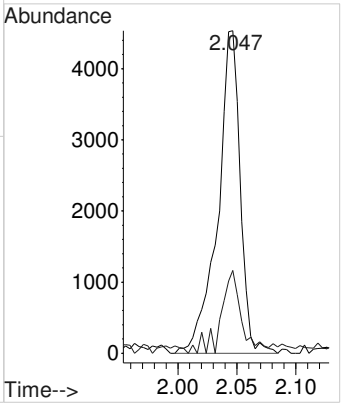


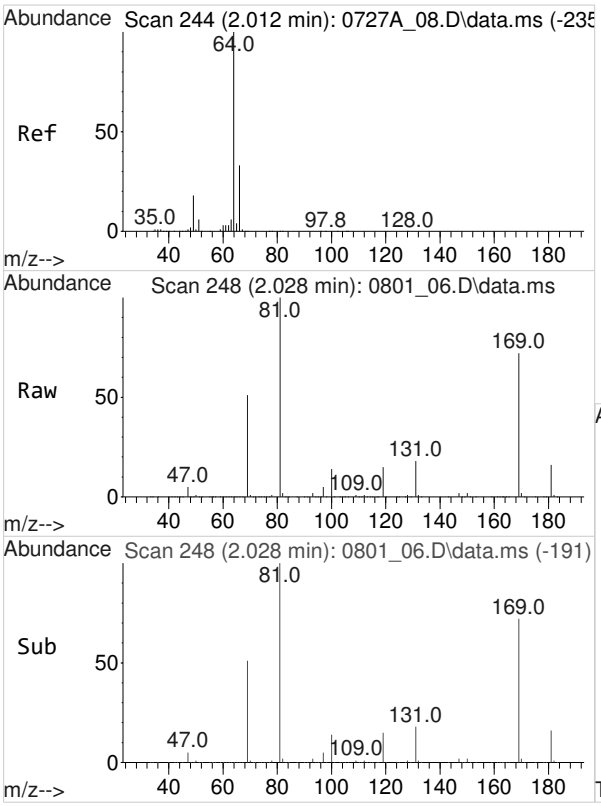


#11
Bromomethane
Concen: 0.1803162 ppbv
RT: 2.047 min Scan# 253
Delta R.T. 0.095 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 94 Resp: 6041

Ion	Ratio	Lower	Upper
94	100		
96	22.1	76.2	114.4#

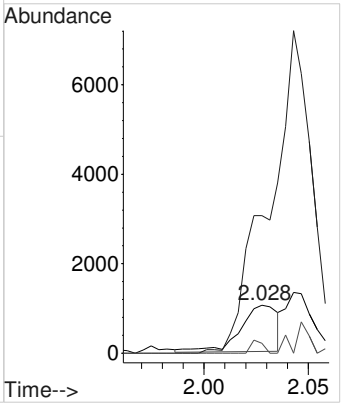


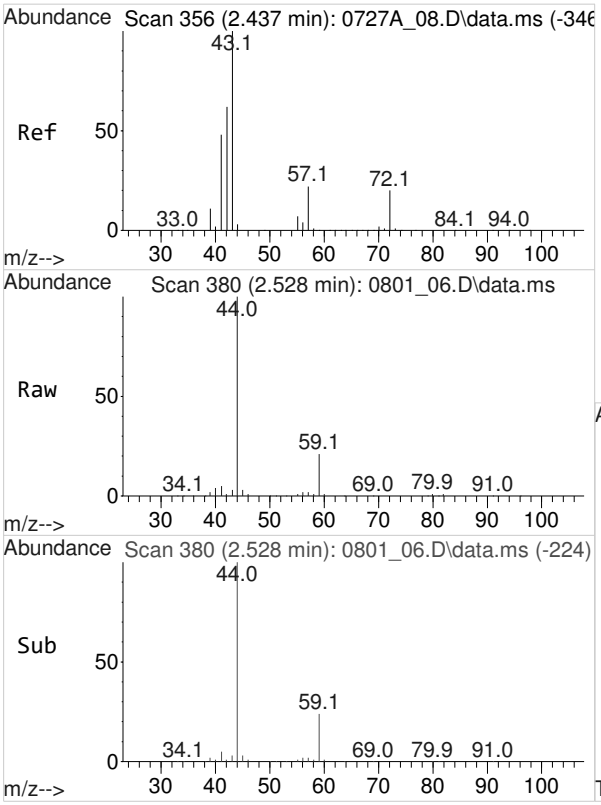


#12
Chloroethane
Concen: 0.0890370 ppbv
RT: 2.028 min Scan# 248
Delta R.T. 0.016 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 64 Resp: 1285

Ion	Ratio	Lower	Upper
64	100		
66	0.0	26.2	39.2#
49	9.2	13.7	20.5#

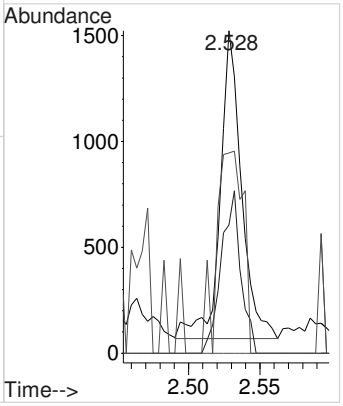


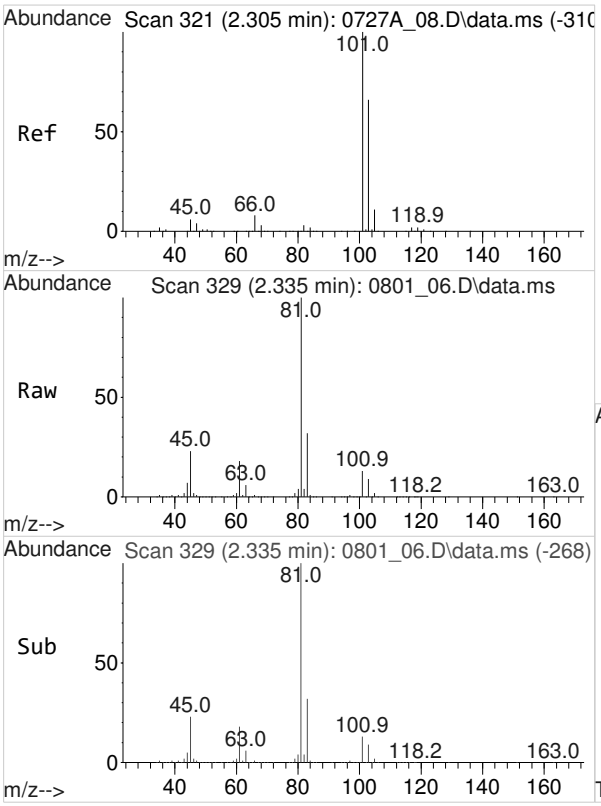


#13
ISOPENTANE
Concen: 0.1096511 ppbv
RT: 2.528 min Scan# 380
Delta R.T. 0.091 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 41 Resp: 1511

Ion	Ratio	Lower	Upper
41	100		
57	48.0	35.0	52.4
43	0.0	166.8	250.2#
72	0.0	31.8	47.6#

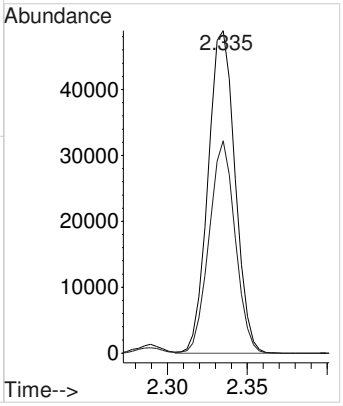


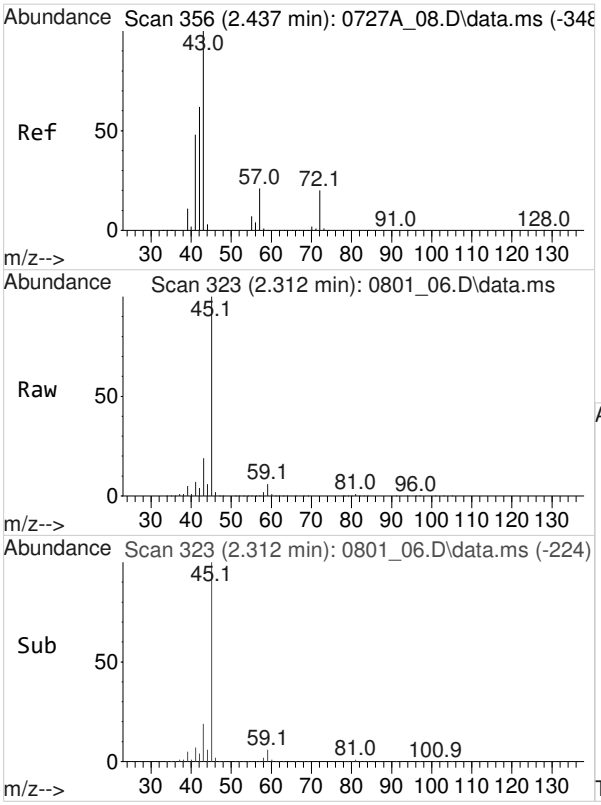


#15
Trichlorofluoromethane
Concen: 0.9294732 ppbv
RT: 2.335 min Scan# 329
Delta R.T. 0.030 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion:101 Resp: 57269

Ion	Ratio	Lower	Upper
101	100		
103	63.6	52.8	79.2

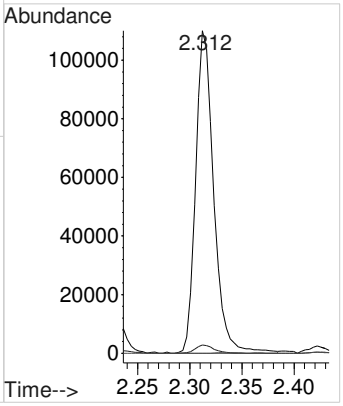


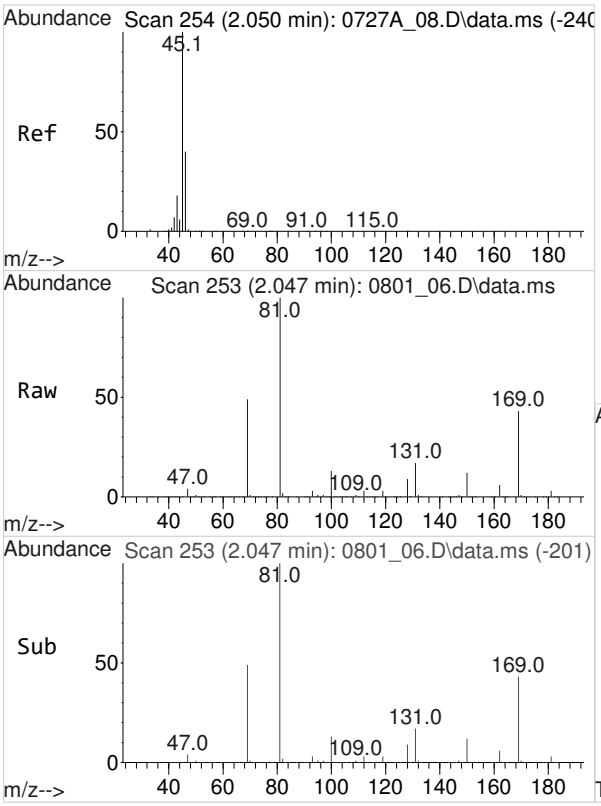


#16
PENTANE
Concen: 4.6229271 ppbv
RT: 2.312 min Scan# 323
Delta R.T. -0.125 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 43 Resp: 132900

Ion	Ratio	Lower	Upper
43	100		
57	2.7	16.8	25.2#
72	0.2	15.3	22.9#

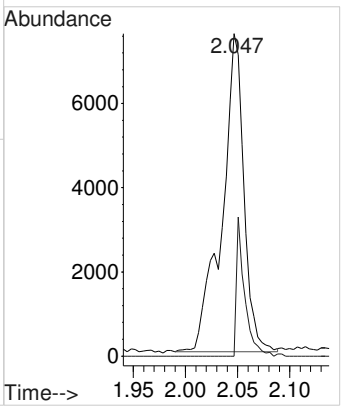


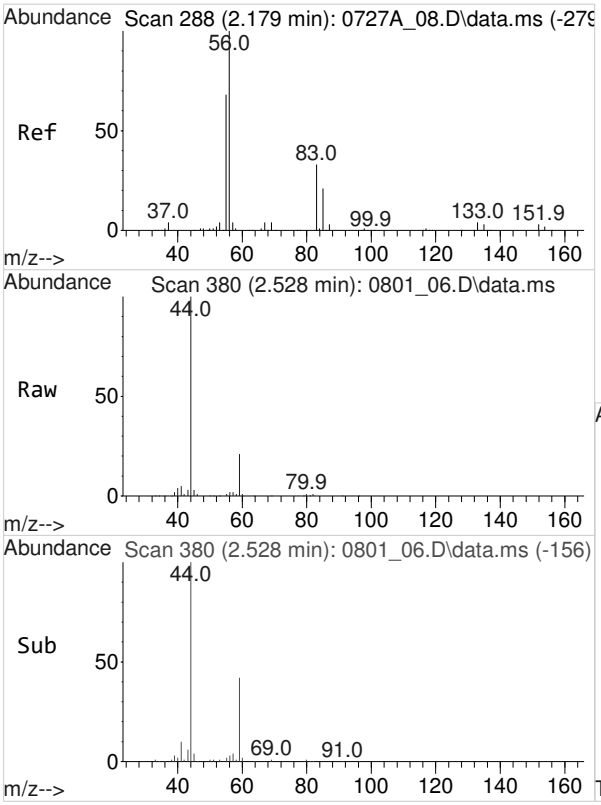


#17
Ethanol
Concen: 1.4835899 ppbv
RT: 2.047 min Scan# 253
Delta R.T. -0.003 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 45 Resp: 11042

Ion	Ratio	Lower	Upper
45	100		
46	16.4	32.0	48.0#

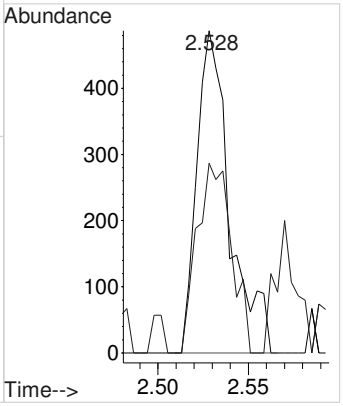


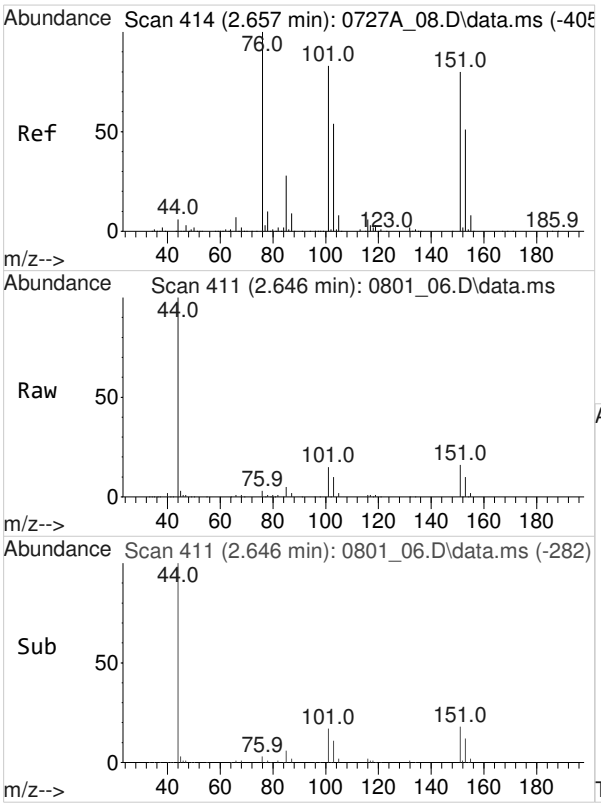


#18
ACROLEIN
Concen: 0.0573877 ppbv
RT: 2.528 min Scan# 380
Delta R.T. 0.349 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 56 Resp: 615

Ion	Ratio	Lower	Upper
56	100		
55	61.8	55.9	83.9

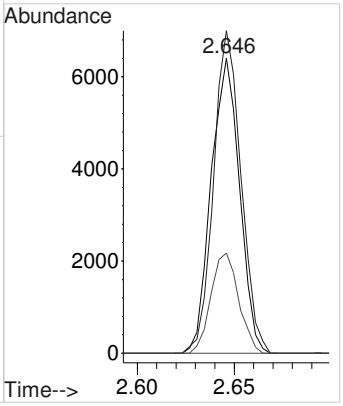


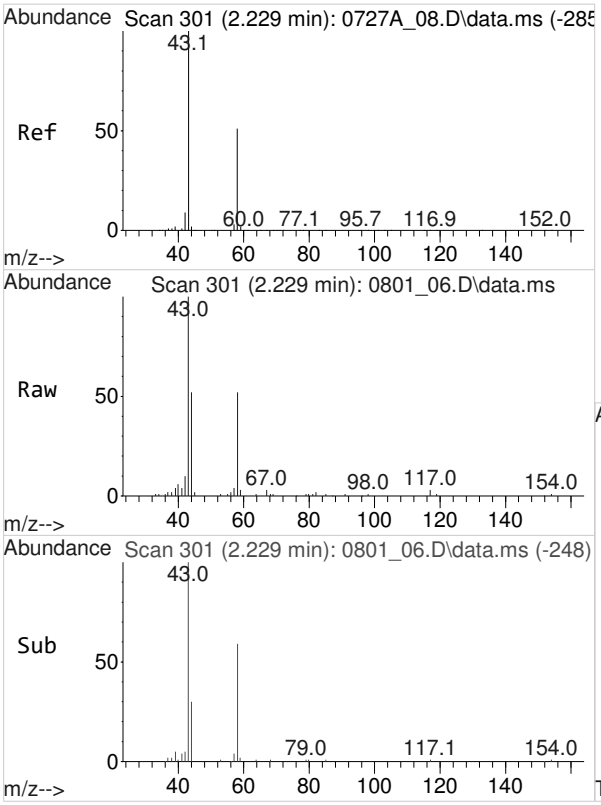


#19
1,1,2-Trichlorotrifluoroethane
Concen: 0.1243829 ppbv
RT: 2.646 min Scan# 411
Delta R.T. -0.011 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion:101 Resp: 6557

Ion	Ratio	Lower	Upper
101	100		
151	105.5	78.3	117.5
85	33.1	26.7	40.1

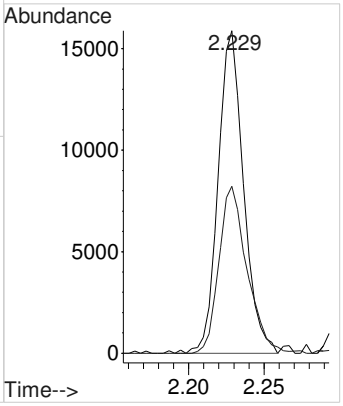


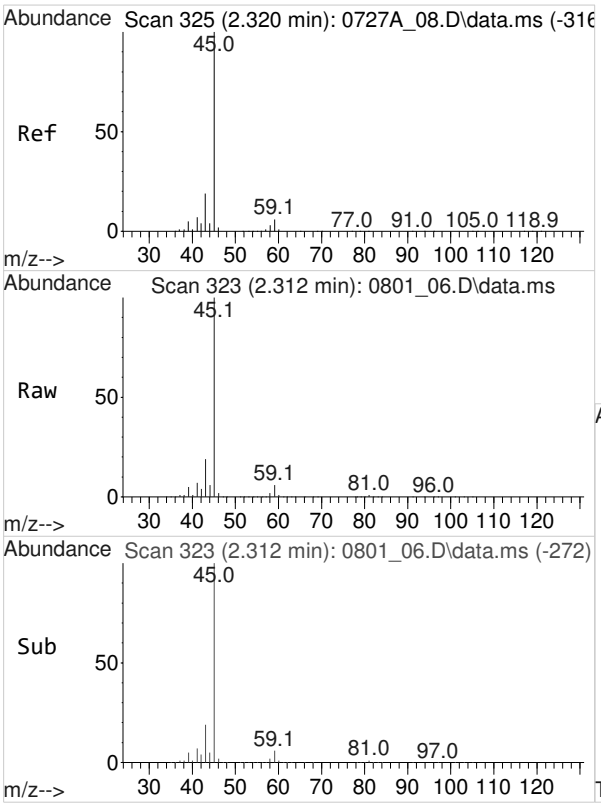


#21
Acetone
Concen: 0.7648621 ppbv
RT: 2.229 min Scan# 301
Delta R.T. -0.000 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 43 Resp: 18659

Ion	Ratio	Lower	Upper
43	100		
58	57.4	41.0	61.4

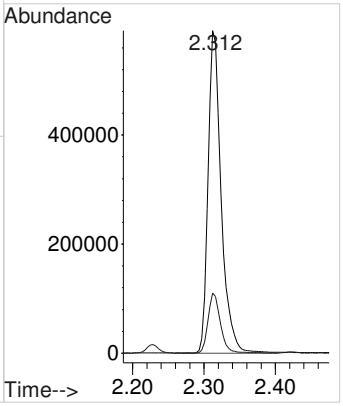


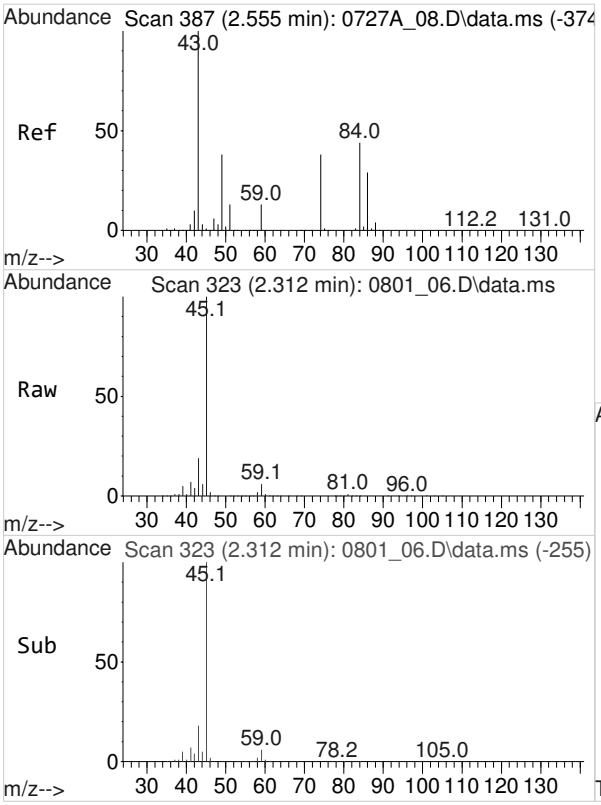


#23
2-Propanol
Concen: 25.3420634 ppbv
RT: 2.312 min Scan# 323
Delta R.T. -0.008 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 45 Resp: 752883

Ion	Ratio	Lower	Upper
45	100		
43	17.7	16.0	24.0

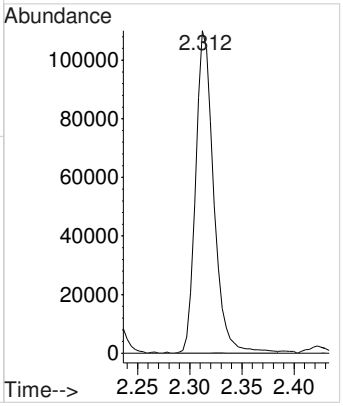


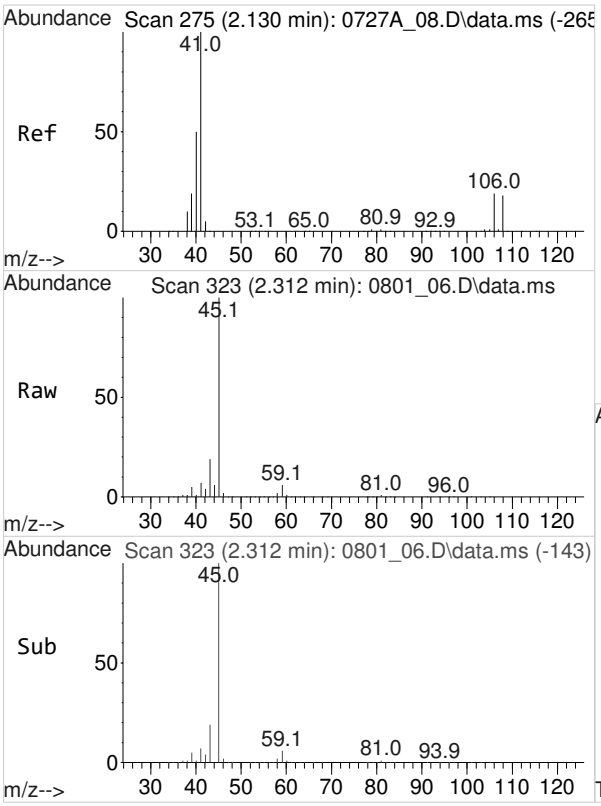


#26
METHYL ACETATE
Concen: 4.0511849 ppbv
RT: 2.312 min Scan# 323
Delta R.T. -0.243 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 43 Resp: 132900

Ion	Ratio	Lower	Upper
43	100		
74	0.0	26.6	39.8#
29	0.0	0.0	0.0

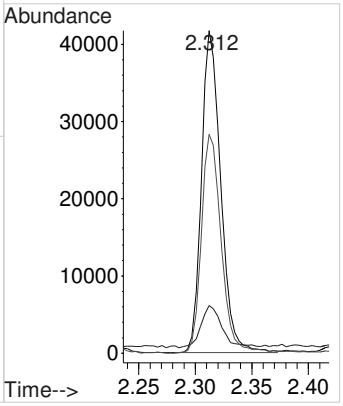


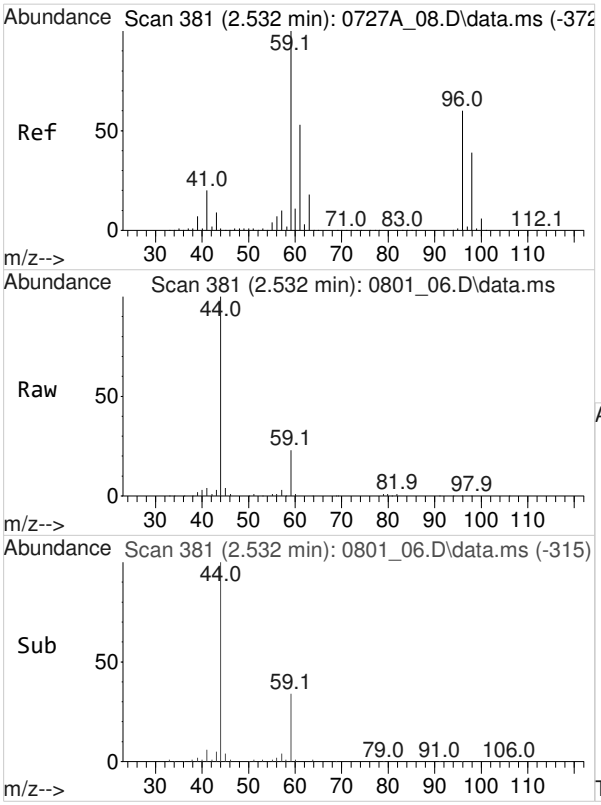


#27
ACETONITRILE
Concen: 3.5447937 ppbv
RT: 2.312 min Scan# 323
Delta R.T. 0.182 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 41 Resp: 49458

Ion	Ratio	Lower	Upper
41	100		
40	14.3	40.6	60.8#
39	69.9	14.5	21.7#

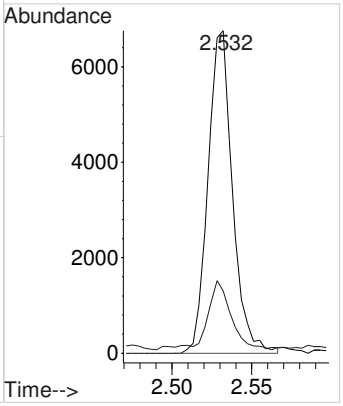


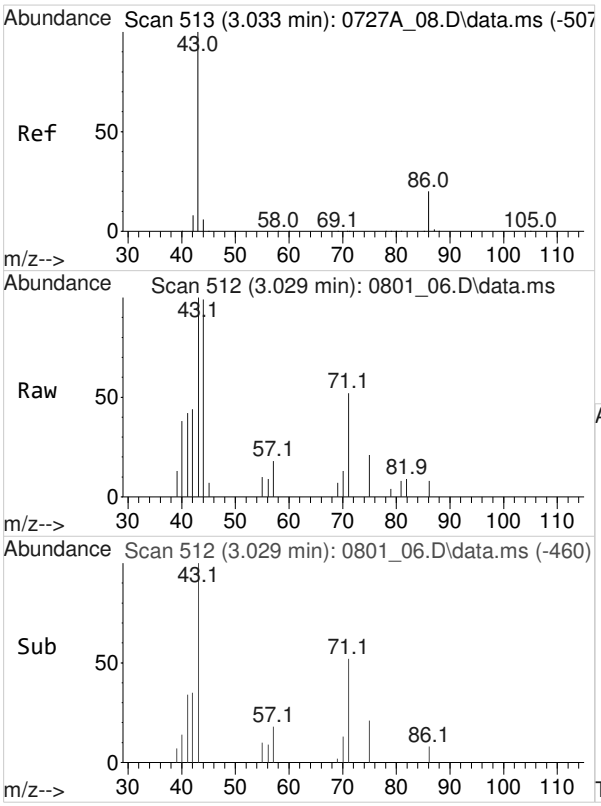


#29
TERT-BUTYL ALCOHOL
Concen: 0.1867946 ppbv
RT: 2.532 min Scan# 381
Delta R.T. 0.000 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 59 Resp: 7181

Ion	Ratio	Lower	Upper
59	100		
41	21.0	16.6	25.0

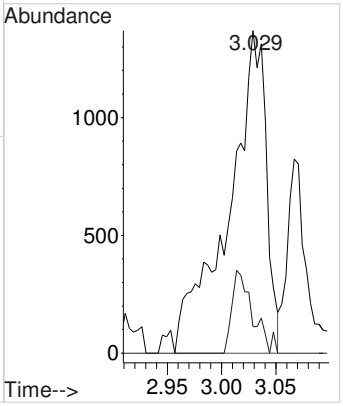


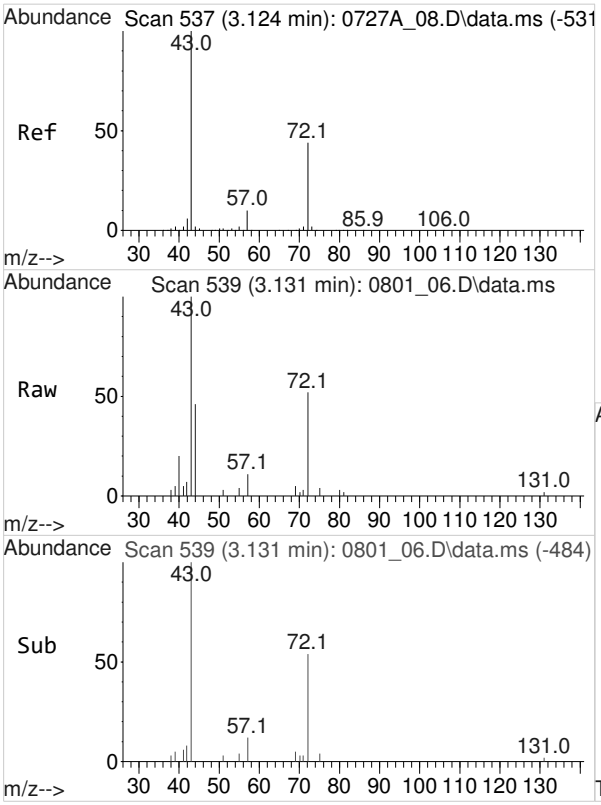


#35
Vinyl Acetate
Concen: 0.0831306 ppbv
RT: 3.029 min Scan# 512
Delta R.T. -0.004 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 43 Resp: 3310

Ion	Ratio	Lower	Upper
43	100		
86	13.5	15.4	23.0#

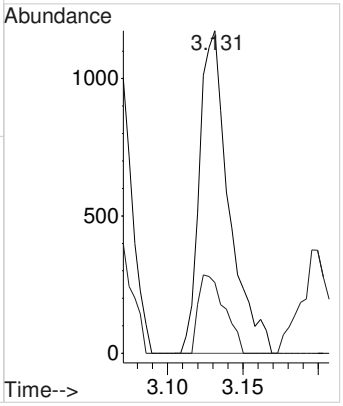


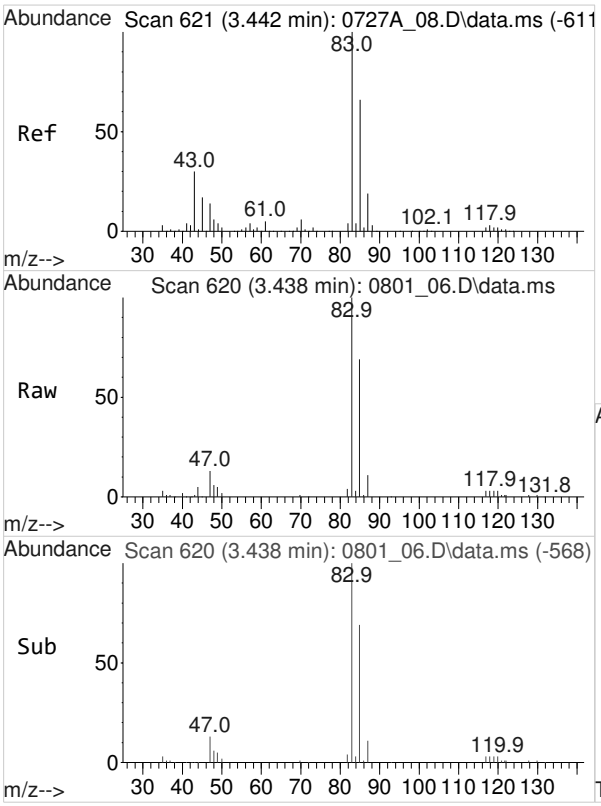


#39
2-Butanone (MEK)
Concen: 0.1040314 ppbv
RT: 3.131 min Scan# 539
Delta R.T. 0.007 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 72 Resp: 1589

Ion	Ratio	Lower	Upper
72	100		
57	21.8	18.6	27.8

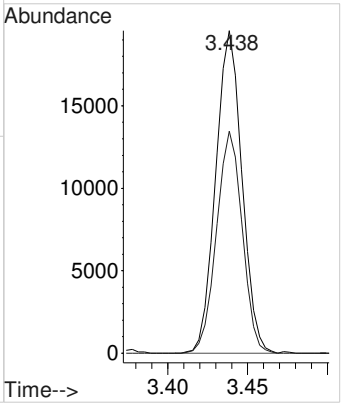


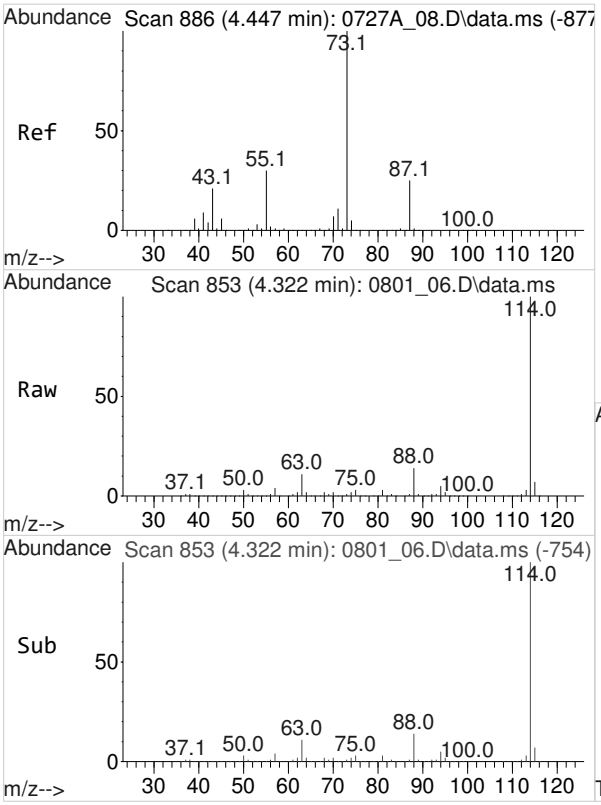


#42
Chloroform
Concen: 0.3893858 ppbv
RT: 3.438 min Scan# 620
Delta R.T. -0.004 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 83 Resp: 22247

Ion	Ratio	Lower	Upper
83	100		
85	67.6	53.4	80.2

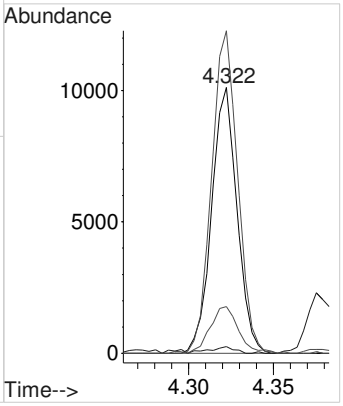


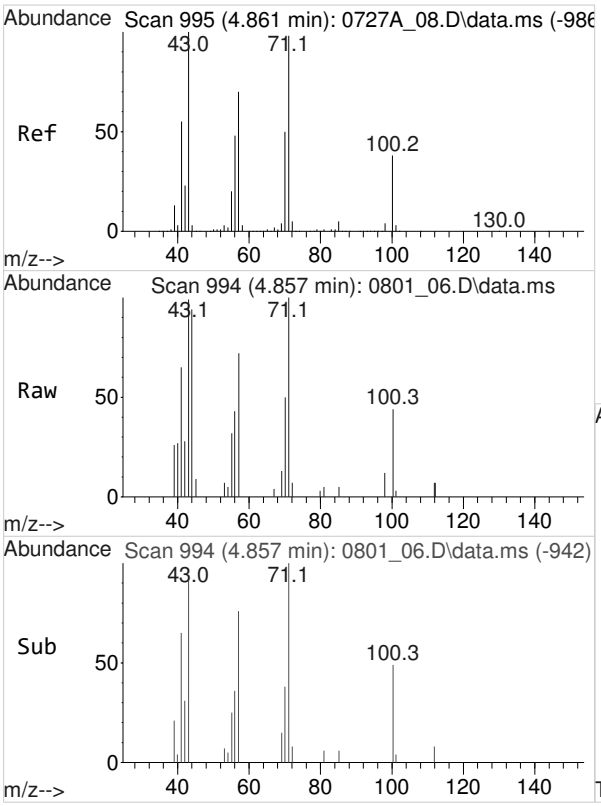


#49
TERT-AMYL METHYL ETHER
Concen: 0.1433578 ppbv
RT: 4.322 min Scan# 853
Delta R.T. -0.125 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 73 Resp: 10477

Ion	Ratio	Lower	Upper
73	100		
43	2.4	16.6	24.8#
55	19.9	23.8	35.8#
87	124.2	20.2	30.4#

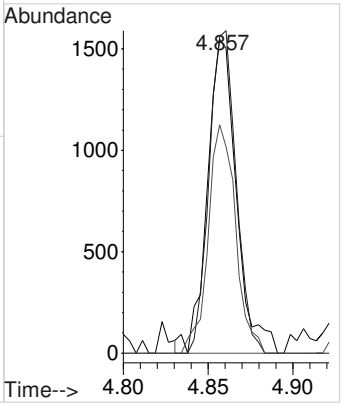


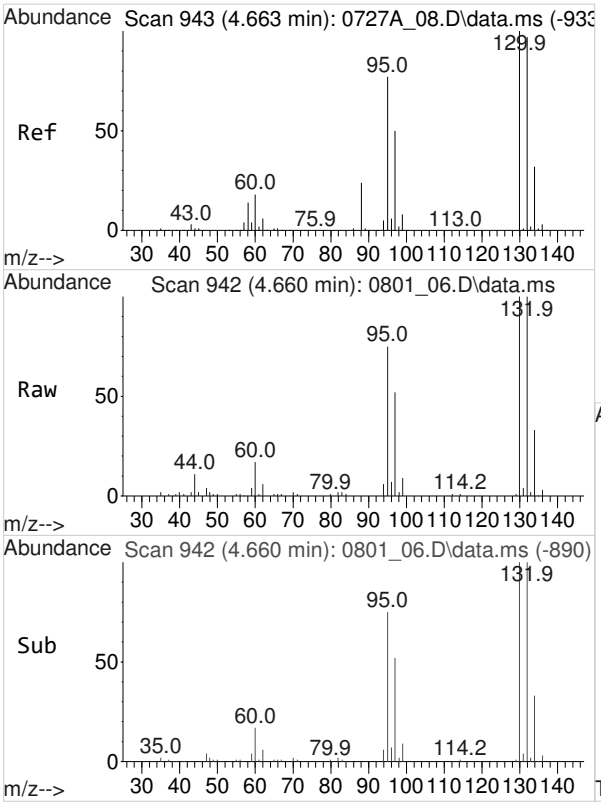


#51
Heptane
Concen: 0.0605475 ppbv
RT: 4.857 min Scan# 994
Delta R.T. -0.004 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 43 Resp: 1841

Ion	Ratio	Lower	Upper
43	100		
71	95.1	77.8	116.8
57	68.4	55.8	83.8

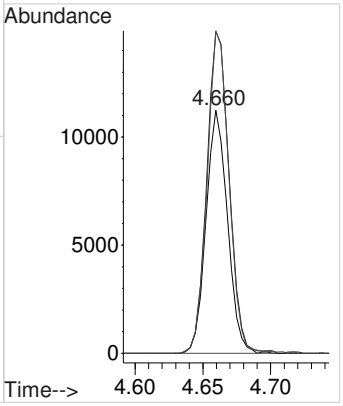


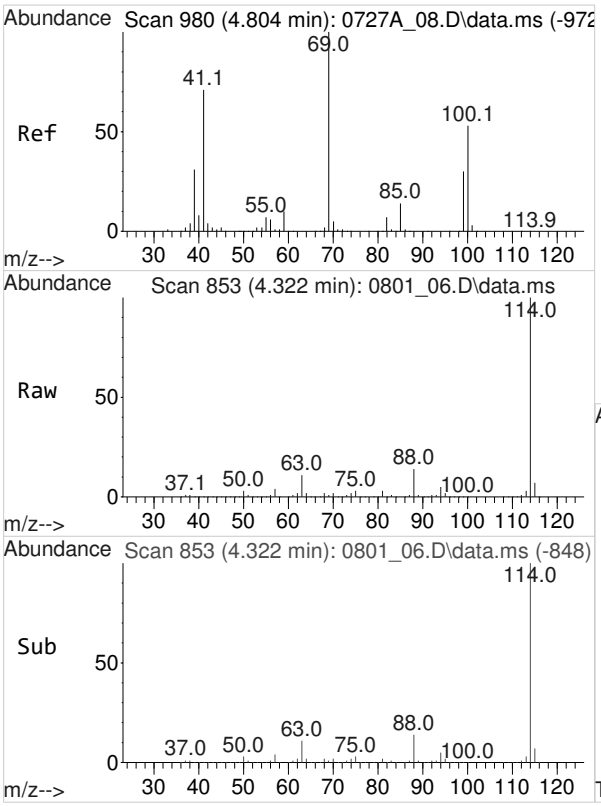


#52
Trichloroethene
Concen: 0.2777128 ppbv
RT: 4.660 min Scan# 942
Delta R.T. -0.003 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 95 Resp: 12338

Ion	Ratio	Lower	Upper
95	100		
130	137.5	103.8	155.6
132	134.6	100.6	150.8

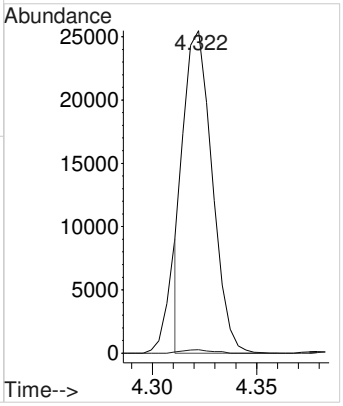


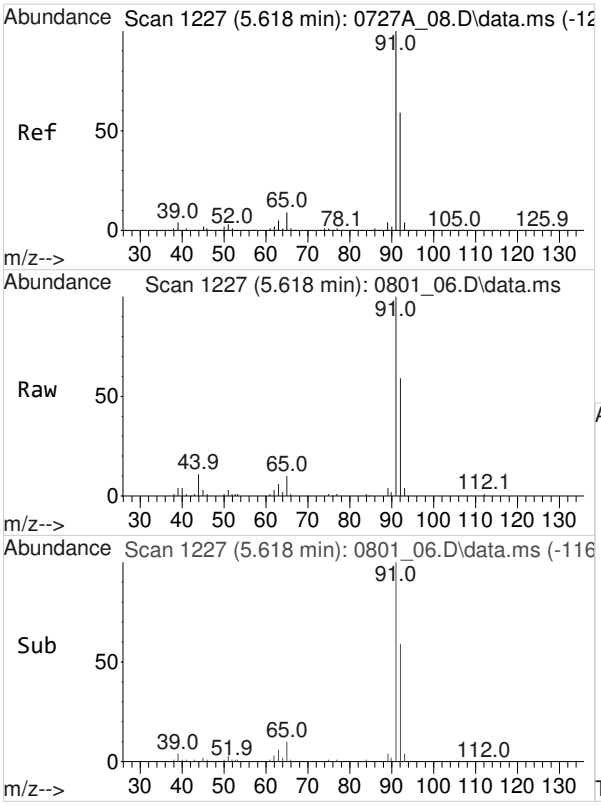


#56
Methyl Methacrylate
Concen: 0.8335228 ppbv
RT: 4.322 min Scan# 853
Delta R.T. -0.482 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 69 Resp: 24404

Ion	Ratio	Lower	Upper
69	100		
100	1.0	2.1	3.1#

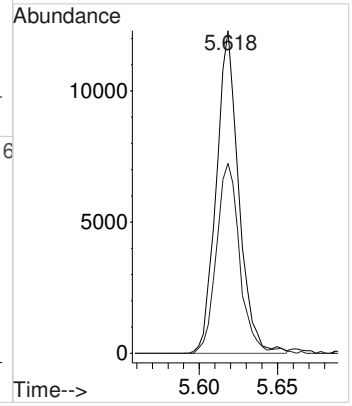


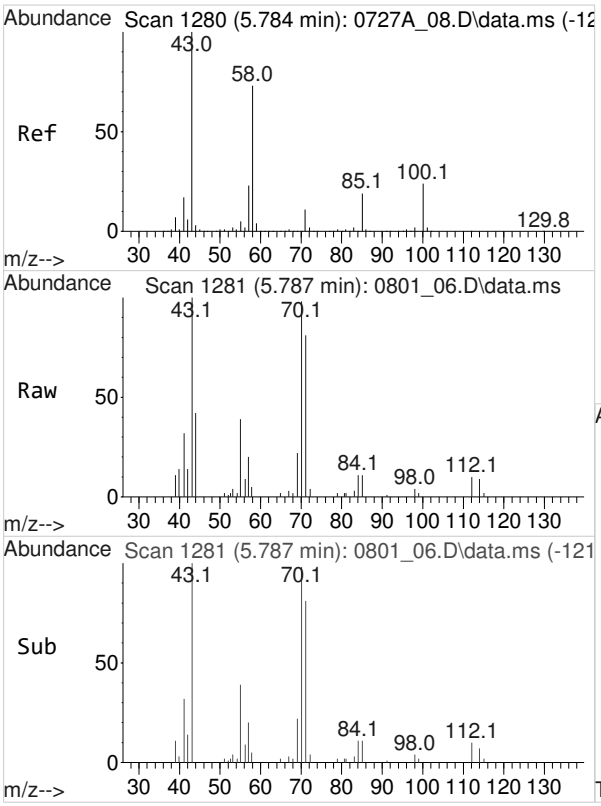


#62
Toluene
Concen: 0.1103580 ppbv
RT: 5.618 min Scan# 1227
Delta R.T. 0.000 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 91 Resp: 12256

Ion	Ratio	Lower	Upper
91	100		
92	60.5	48.1	72.1

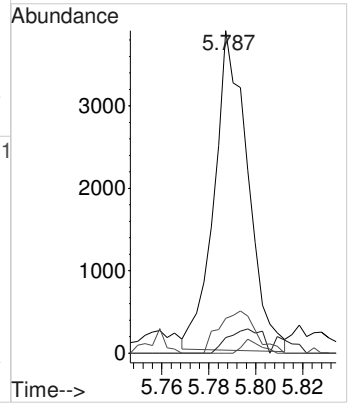


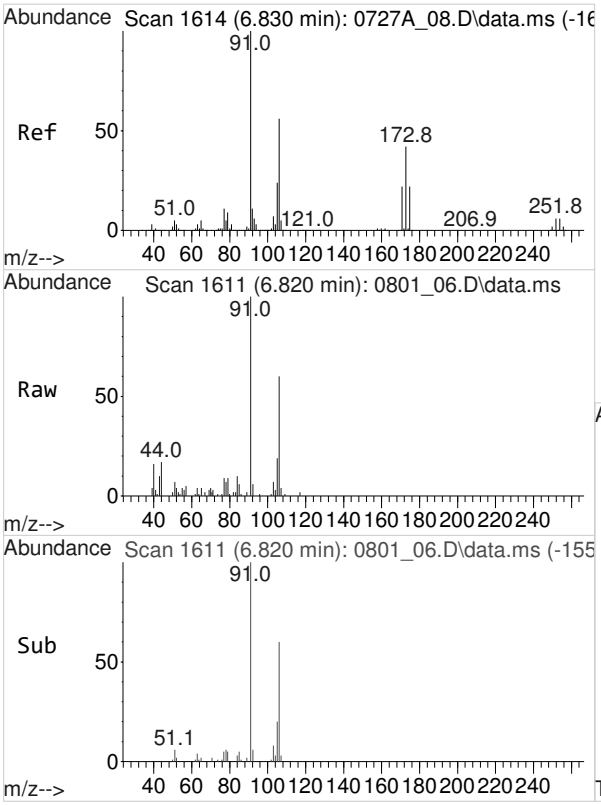


#66
Methyl Butyl Ketone
Concen: 0.1181546 ppbv
RT: 5.787 min Scan# 1281
Delta R.T. 0.003 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 43 Resp: 3868

Ion	Ratio	Lower	Upper
43	100		
58	7.6	58.2	87.4#
85	14.5	15.5	23.3#
100	2.3	19.0	28.6#

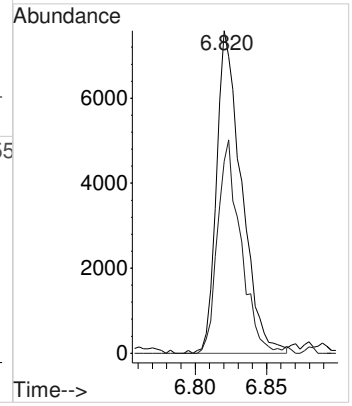


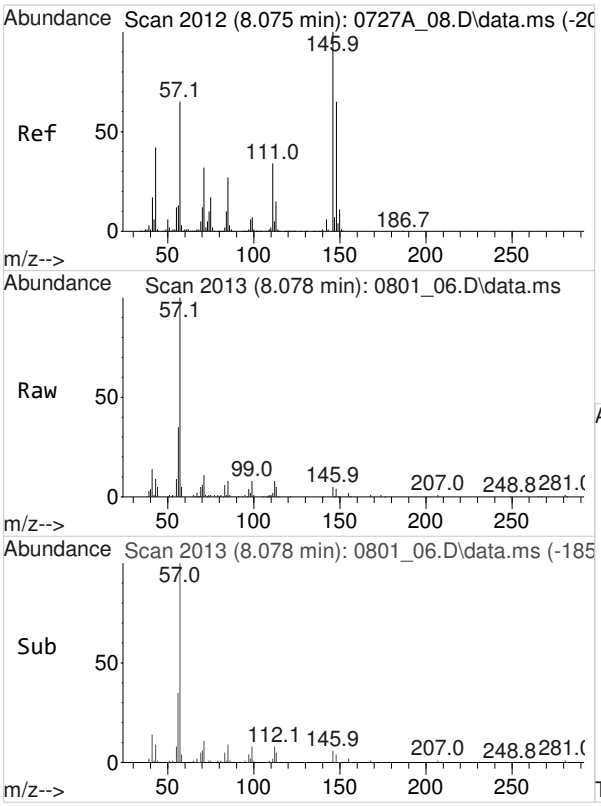


#73
M&P-Xylene
Concen: 0.0846797 ppbv
RT: 6.820 min Scan# 1611
Delta R.T. -0.010 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 91 Resp: 9287

Ion	Ratio	Lower	Upper
91	100		
106	61.3	44.4	66.6

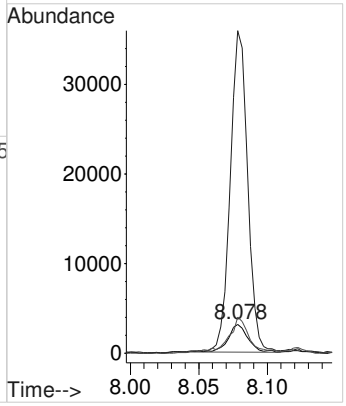


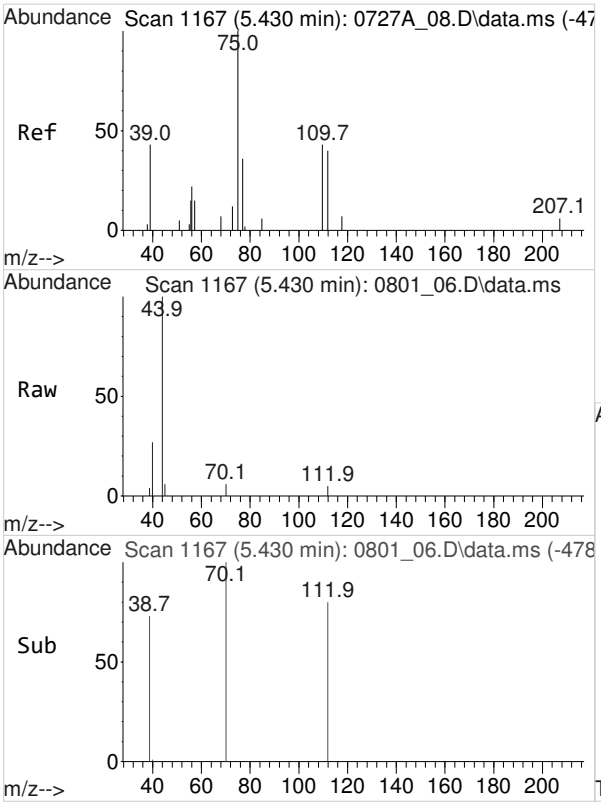


#80
n-DECANE
Concen: 0.0734400 ppbv
RT: 8.078 min Scan# 2013
Delta R.T. 0.003 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion: 43 Resp: 3211

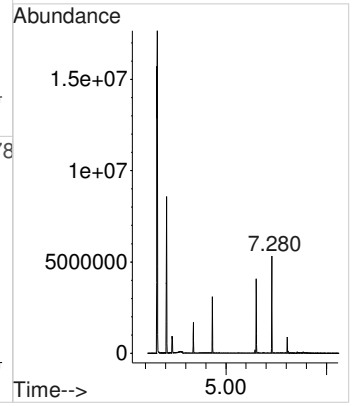
Ion	Ratio	Lower	Upper
43	100		
57	982.0	123.8	185.8#
71	135.2	61.4	92.2#

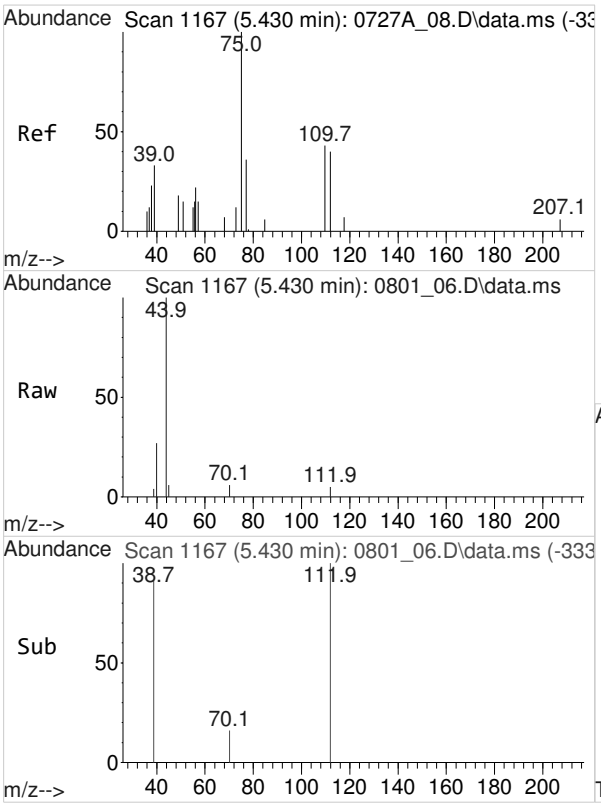




#101
TPH (GC/MS) Low Fraction
Concen: 5.5428718 ppbv m
RT: 5.430 min Scan# 1167
Delta R.T. 0.000 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

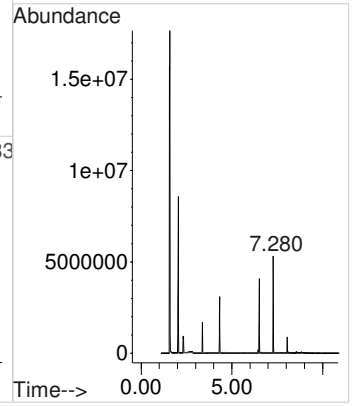
Tgt Ion:TIC Resp: 1281257





#102
TPH-GRO (C5-C10)
Concen: Below Cal m
RT: 5.430 min Scan# 1167
Delta R.T. 0.000 min
Lab File: 0801_06.D
Acq: 01 Aug 2022 12:44 pm

Tgt Ion:TIC Resp: -874339



SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-VMP04-0220722

Lab Sample ID:	L1518164-06	**SDG:**	L1518164
Client Sample ID:	CRCA-VMP04-0220722	**Collected Date/Time:**	07/22/22 12:55
Lab File ID:	0726_11	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 14:57
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 14:57
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
Acetone	67-64-1	0	2.85	U	1.39	2.85	5.70
Allyl Chloride	107-05-1	0	0.783	U	0.357	0.783	1.57
Benzene	71-43-2	7.81	0.247	J	0.228	0.479	0.958
Benzyl Chloride	100-44-7	0	0.675	U	0.311	0.675	1.56
Bromodichloromethane	75-27-4	0	1.01	U	0.471	1.01	2.01
Bromoform	75-25-2	0	3.21	U	0.757	3.21	6.21
Bromomethane	74-83-9	0	0.776	U	0.381	0.776	1.55
1,3-Butadiene	106-99-0	0	1.39	U	0.230	1.39	4.43
Carbon disulfide	75-15-0	0	0.778	U	0.317	0.778	1.56
Carbon tetrachloride	56-23-5	0	0.945	U	0.461	0.945	1.89
Chlorobenzene	108-90-7	0	0.924	U	0.385	0.924	1.85
Chloroethane	75-00-3	0	0.528	U	0.263	0.528	1.06
Chloroform	67-66-3	7.28	11.6		0.349	0.730	1.46
Chloromethane	74-87-3	0	0.516	U	0.213	0.516	1.03
2-Chlorotoluene	95-49-8	0	1.03	U	0.427	1.03	2.06
Cyclohexane	110-82-7	0	0.689	U	0.259	0.689	1.38
Dibromochloromethane	124-48-1	0	1.28	U	0.618	1.28	2.55
1,2-Dibromoethane	106-93-4	0	1.15	U	0.554	1.15	2.31
1,2-Dichlorobenzene	95-50-1	0	1.80	U	0.770	1.80	3.61
1,3-Dichlorobenzene	541-73-1	0	2.40	U	1.09	2.40	4.81
1,4-Dichlorobenzene	106-46-7	0	0.782	U	0.335	0.782	1.80
1,2-Dichloroethane	107-06-2	0	0.607	U	0.283	0.607	1.21
1,1-Dichloroethane	75-34-3	0	0.601	U	0.290	0.601	1.20
1,1-Dichloroethene	75-35-4	0	0.793	U	0.302	0.793	1.59
cis-1,2-Dichloroethene	156-59-2	0	0.793	U	0.311	0.793	1.59
trans-1,2-Dichloroethene	156-60-5	6.15	1.30		0.267	0.594	1.19
1,2-Dichloropropane	78-87-5	0	0.924	U	0.351	0.924	1.85
cis-1,3-Dichloropropene	10061-01-5	0	0.681	U	0.313	0.681	1.36
trans-1,3-Dichloropropene	10061-02-6	0	0.681	U	0.331	0.681	1.36
1,4-Dioxane	123-91-1	0	0.721	U	0.300	0.721	1.44
Ethanol	64-17-5	5.15	33.0		0.500	1.19	2.45
Ethylbenzene	100-41-4	0	0.867	U	0.362	0.867	1.73
4-Ethyltoluene	622-96-8	0	0.982	U	0.384	0.982	1.96
Trichlorofluoromethane	75-69-4	4.99	0.877	J	0.460	0.983	1.97
Dichlorodifluoromethane	75-71-8	3.90	1.18	J	0.678	1.48	2.97
1,1,2-Trichlorotrifluoroethane	76-13-1	5.42	41.0		0.608	1.53	3.07
1,2-Dichlorotetrafluoroethane	76-14-2	0	1.40	U	0.622	1.40	2.80
Heptane	142-82-5	7.83	1.10	J	0.425	1.02	2.04
Hexachloro-1,3-butadiene	87-68-3	0	2.67	U	1.12	2.67	6.73
n-Hexane	110-54-3	0	1.76	U	0.726	1.76	3.53
Isopropylbenzene	98-82-8	0	0.983	U	0.382	0.983	1.97
Methylene Chloride	75-09-2	0	0.694	U	0.340	0.694	1.39
Methyl Butyl Ketone	591-78-6	10.26	2.62	J	0.544	1.23	5.11

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-VMP04-0220722

Lab Sample ID:	L1518164-06	**SDG:**	L1518164
Client Sample ID:	CRCA-VMP04-0220722	**Collected Date/Time:**	07/22/22 12:55
Lab File ID:	0726_11	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 14:57
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 14:57
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
2-Butanone (MEK)	78-93-3	7.03	1.75	J	0.240	0.560	3.69
4-Methyl-2-pentanone (MIBK)	108-10-1	0	0.778	U	0.313	0.778	5.12
Methyl Methacrylate	80-62-6	0	0.819	U	0.359	0.819	1.64
MTBE	1634-04-4	0	0.468	U	0.233	0.468	1.08
Naphthalene	91-20-3	16.22	3.66	U	1.83	3.66	7.33
Propene	115-07-1	0	1.08	U	0.160	1.08	2.15
Styrene	100-42-5	0	0.851	U	0.335	0.851	1.70
1,1,2,2-Tetrachloroethane	79-34-5	0	1.03	U	0.511	1.03	2.06
Tetrachloroethylene	127-18-4	0	1.36	U	0.553	1.36	2.72
Tetrahydrofuran	109-99-9	0	0.442	U	0.216	0.442	0.885
Toluene	108-88-3	0	0.942	U	0.328	0.942	1.88
1,2,4-Trichlorobenzene	120-82-1	0	2.29	U	1.10	2.29	4.66
1,1,1-Trichloroethane	71-55-6	0	0.816	U	0.400	0.816	1.63
1,1,2-Trichloroethane	79-00-5	0	1.09	U	0.422	1.09	2.18
Trichloroethylene	79-01-6	8.37	12.8		0.364	0.804	1.61
1,2,4-Trimethylbenzene	95-63-6	0	0.982	U	0.375	0.982	1.96
1,3,5-Trimethylbenzene	108-67-8	0	0.982	U	0.382	0.982	1.96
2,2,4-Trimethylpentane	540-84-1	0	1.40	U	0.621	1.40	2.80
Vinyl chloride	75-01-4	0	0.511	U	0.243	0.511	1.02
Vinyl Bromide	593-60-2	0	0.875	U	0.373	0.875	1.75
Vinyl acetate	108-05-4	0	0.880	U	0.408	0.880	1.76
m&p-Xylene	1330-20-7	11.34	0.611	J	0.585	1.30	2.60
o-Xylene	95-47-6	11.82	0.759	U	0.359	0.759	1.52

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_11.D
Acq On : 26 Jul 2022 2:57 pm
Operator :
Sample : L1518164-06 1x WG1900825
Misc :
ALS Vial : 11 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 14:04:44 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

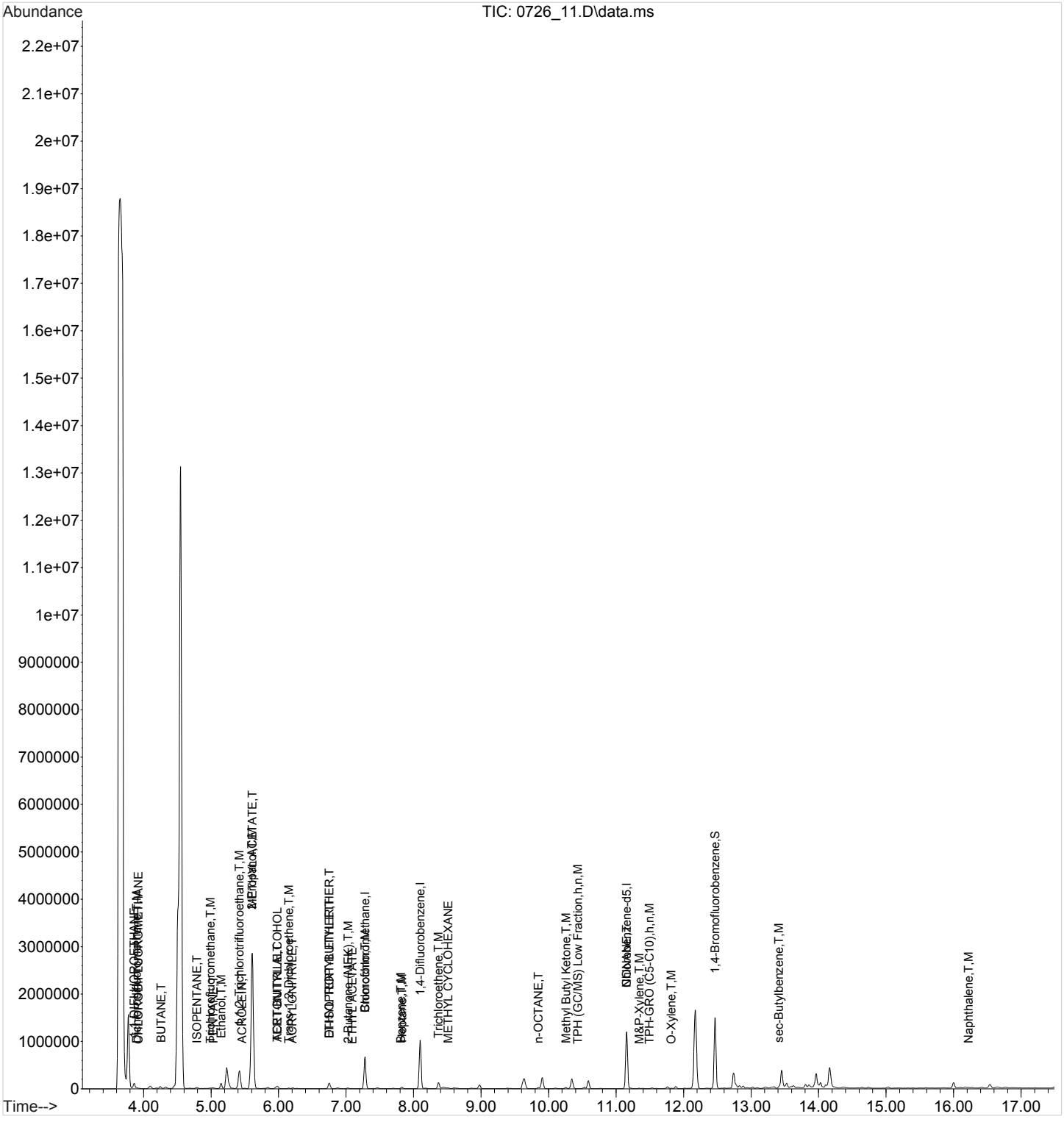
Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.281	130	200878	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	834439	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.152	117	766278	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	552753	3.9291796	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 98.23%				
Target Compounds						Qvalue	
3) BUTANE	4.257	43	12654	0.3184469	ppbv		97
4) 1,1-DIFLUOROETHANE	3.861	65	3087	0.3250350	ppbv	#	1
5) Dichlorodifluoromethane	3.898	85	8406	0.2388081	ppbv		99
6) CHLORODIFLUOROMETHANE	3.922	67	714	0.1671740	ppbv	#	1
13) ISOPENTANE	4.788	43	9596	0.5777831	ppbv	#	96
15) Trichlorofluoromethane	4.989	101	7101	0.1554685	ppbv		97
16) PENTANE	5.031	43	12332	0.4805025	ppbv		97
17) Ethanol	5.147	45	119303	17.4943706	ppbv		100
18) ACROLEIN	5.458	56	1379	0.2021135	ppbv		91
19) 1,1,2-Trichlorotrifluo...	5.416	101	176354	5.3509024	ppbv		99
23) 2-Propanol	5.605	45	4324860	155.6405312	ppbv	#	90
26) METHYL ACETATE	5.611	43	1045659	33.5982522	ppbv	#	57
27) ACETONITRILE	5.983	41	15685	1.2224889	ppbv	#	44
28) Methylene Chloride	5.952	49	5766	Below Cal	#	90	
29) TERT-BUTYL ALCOHOL	5.983	59	64901	2.1038371	ppbv		94
31) Trans-1,2-Dichloroethene	6.153	61	7887	0.3267233	ppbv		97
32) ACRYLONITRILE	6.202	53	1531	0.1163072	ppbv	#	62
36) DI-ISOPROPYL ETHER	6.751	45	28178	0.6253345	ppbv	#	59
37) ETHYL TERT-BUTYL ETHER	6.751	59	9299	0.2023001	ppbv	#	70
38) ETHYL ACETATE	7.092	45	1749	0.3429714	ppbv	#	1
39) 2-Butanone (MEK)	7.031	72	4348	0.5934509	ppbv		98
42) Chloroform	7.281	83	75053	2.3767591	ppbv		93
48) Benzene	7.811	78	3566	0.0772790	ppbv	#	82
51) Heptane	7.830	43	11756	0.2696414	ppbv	#	81
52) Trichloroethene	8.366	95	48326	2.3792169	ppbv		95
54) METHYL CYCLOHEXANE	8.513	83	4174	0.1495712	ppbv	#	76
61) n-OCTANE	9.848	43	14078	0.3414509	ppbv	#	70
66) Methyl Butyl Ketone	10.256	43	21106	0.6411350	ppbv	#	97
70) NONANE	11.152	43	4233	0.0933054	ppbv	#	77
73) M&P-Xylene	11.341	91	7508	0.1409305	ppbv		98
74) O-Xylene	11.817	91	3882	0.0747021	ppbv		96
89) sec-Butylbenzene	13.408	105	6798	0.0648399	ppbv	#	63
100) Naphthalene	16.218	128	8230	0.0795981	ppbv	#	93
101) TPH (GC/MS) Low Fraction	10.430	TIC	11318740m	95.0284552	ppbv		
102) TPH-GRO (C5-C10)	11.493	TIC	21046607m	216.7708257	ppbv		

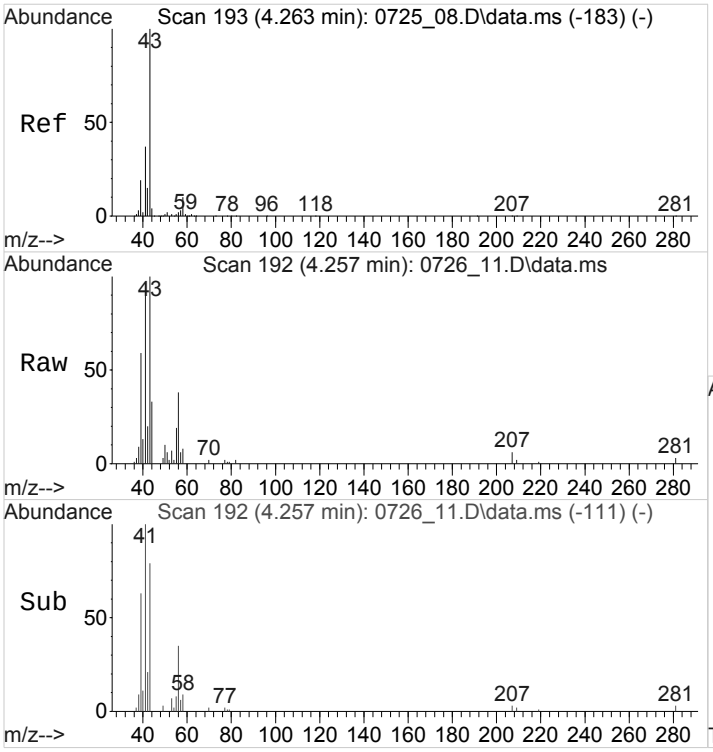
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_11.D
Acq On : 26 Jul 2022 2:57 pm
Operator :
Sample : L1518164-06 1x WG1900825
Misc :
ALS Vial : 11 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 14:04:44 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

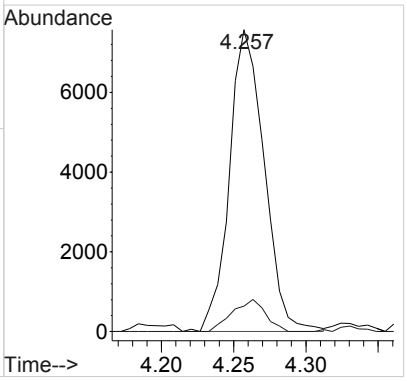


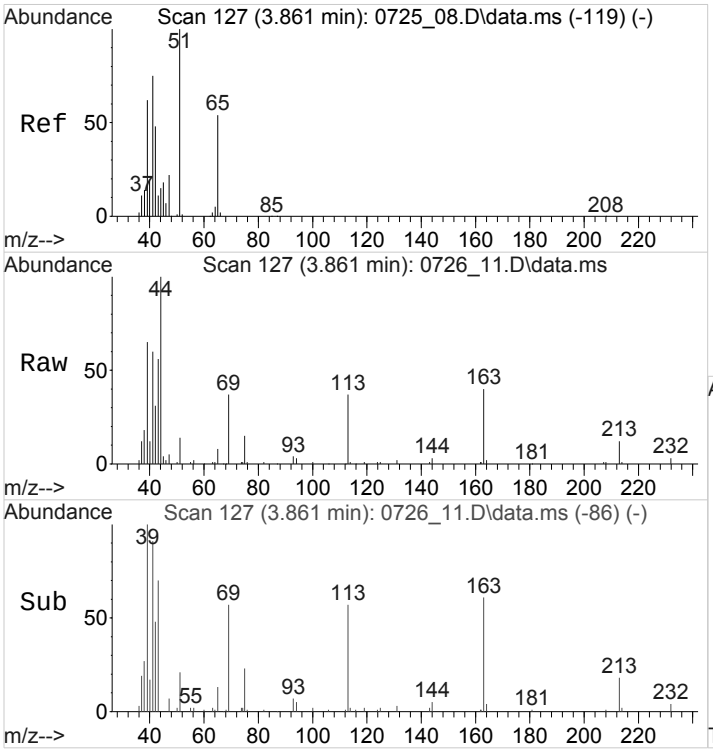


#3
BUTANE
Concen: 0.3184469 ppbv
RT: 4.257 min Scan# 192
Delta R.T. -0.006 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 43 Resp: 12654

Ion	Ratio	Lower	Upper
43	100		
58	10.1	9.0	13.4

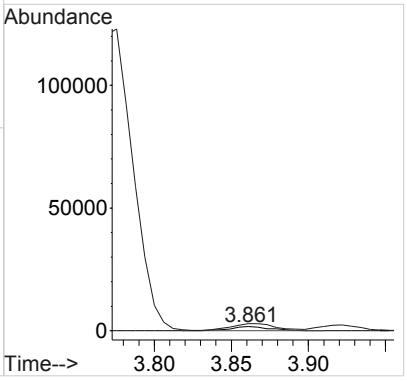




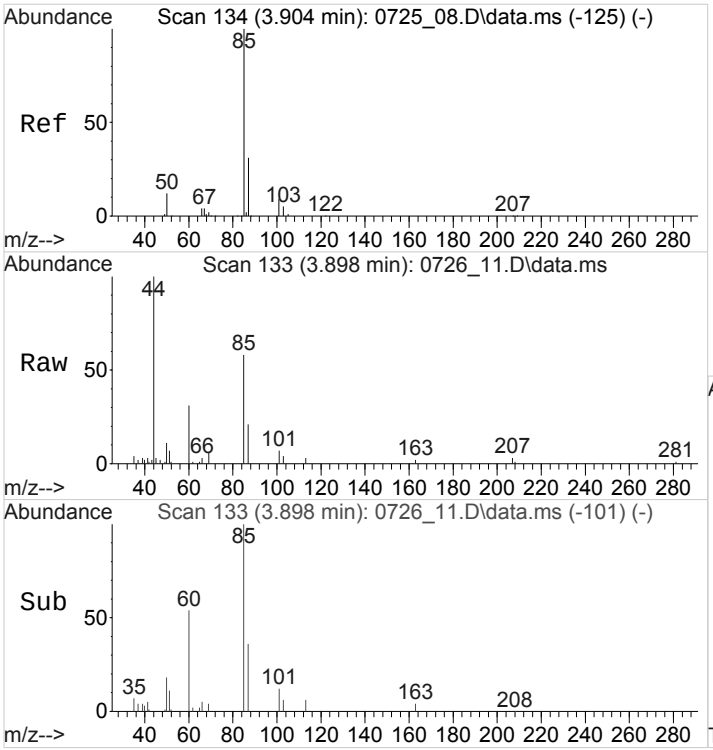
#4
1,1-DIFLUOROETHANE
Concen: 0.3250350 ppbv
RT: 3.861 min Scan# 127
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 65 Resp: 3087

Ion	Ratio	Lower	Upper
65	100		
51	7124.8	151.1	226.7#



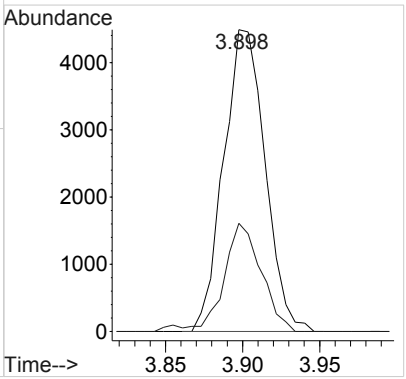
ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	151 of 377

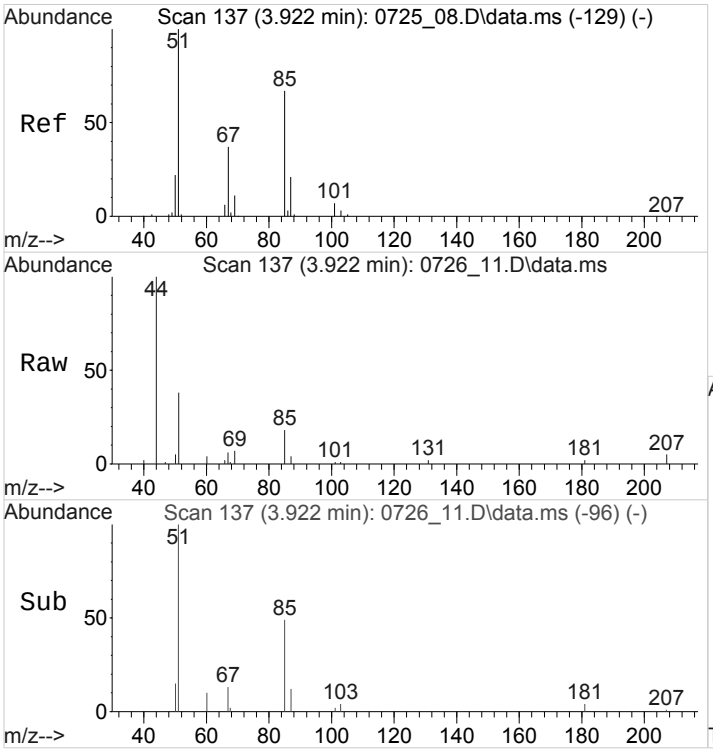


#5
Dichlorodifluoromethane
Concen: 0.2388081 ppbv
RT: 3.898 min Scan# 133
Delta R.T. -0.006 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 85 Resp: 8406

Ion	Ratio	Lower	Upper
85	100		
87	31.7	25.8	38.8

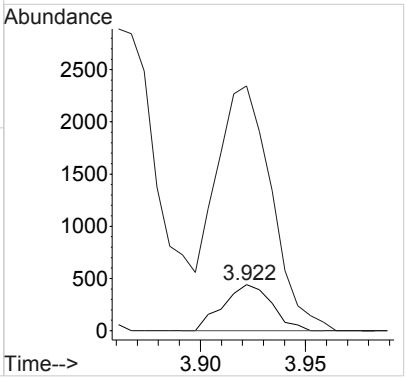




#6
CHLORODIFLUOROMETHANE
Concen: 0.1671740 ppbv
RT: 3.922 min Scan# 137
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 67 Resp: 714

Ion	Ratio	Lower	Upper
67	100		
51	0.0	463.4	695.0#



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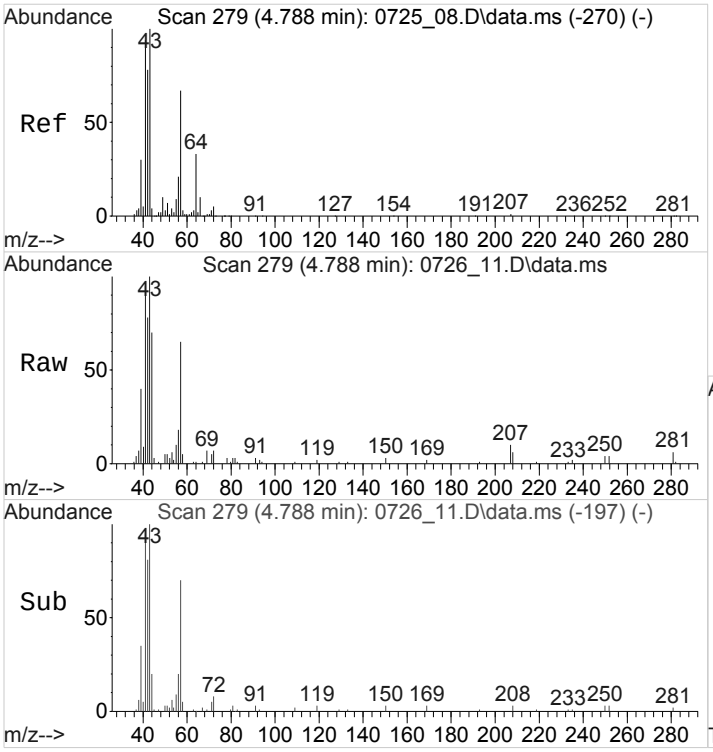
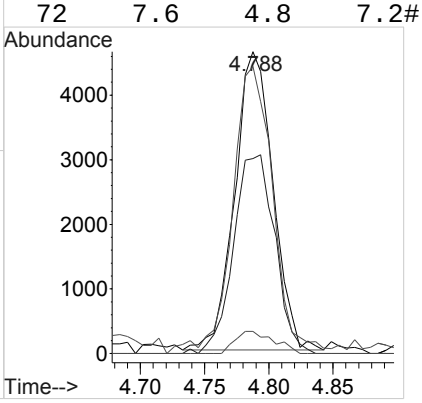
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	152 of 377

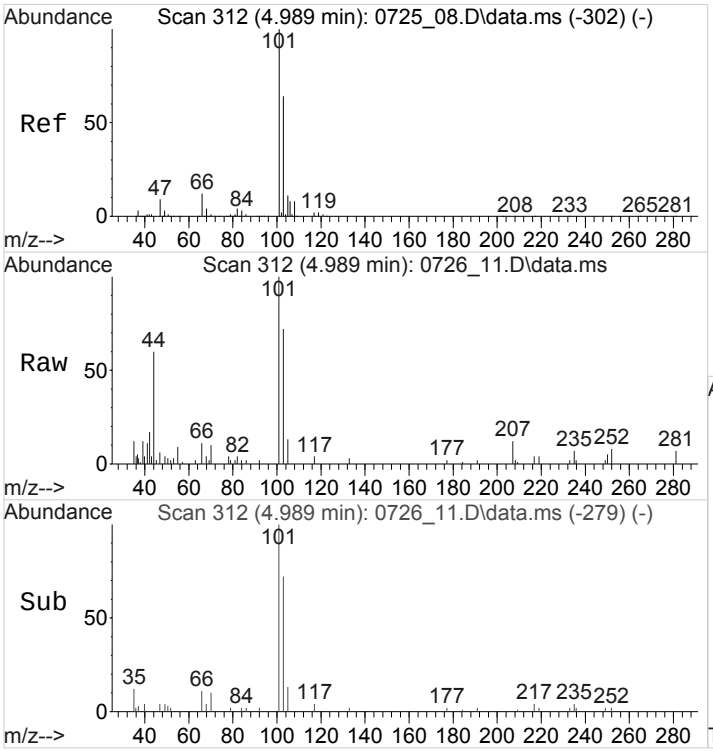


#13
ISOPENTANE
Concen: 0.5777831 ppbv
RT: 4.788 min Scan# 279
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 43 Resp: 9596

Ion	Ratio	Lower	Upper
43	100		
57	71.8	56.3	84.5
41	101.6	77.0	115.4
72	7.6	4.8	7.2#

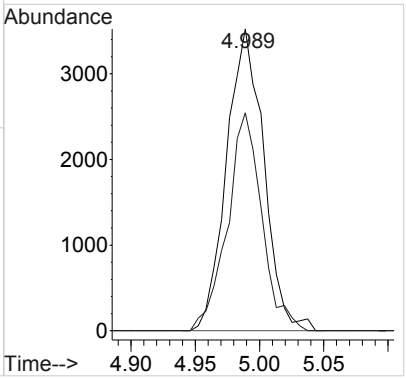




#15
Trichlorofluoromethane
Concen: 0.1554685 ppbv
RT: 4.989 min Scan# 312
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion:101 Resp: 7101

Ion	Ratio	Lower	Upper
101	100		
103	66.8	51.7	77.5



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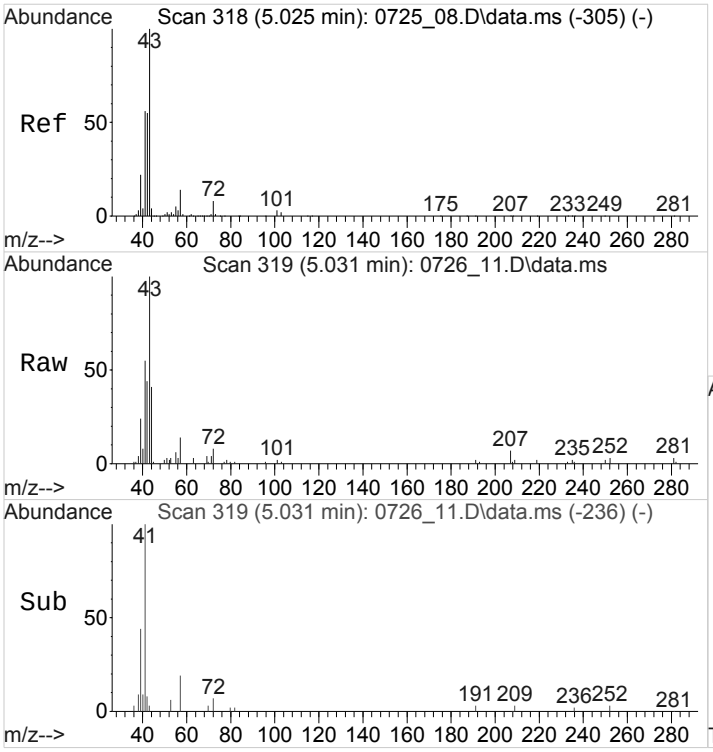
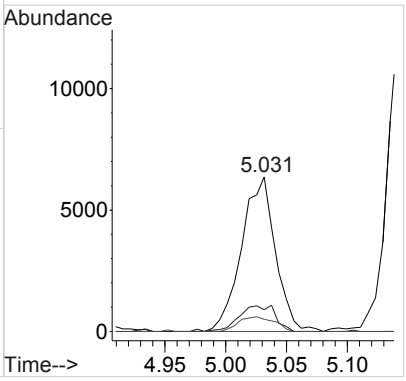
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	153 of 377

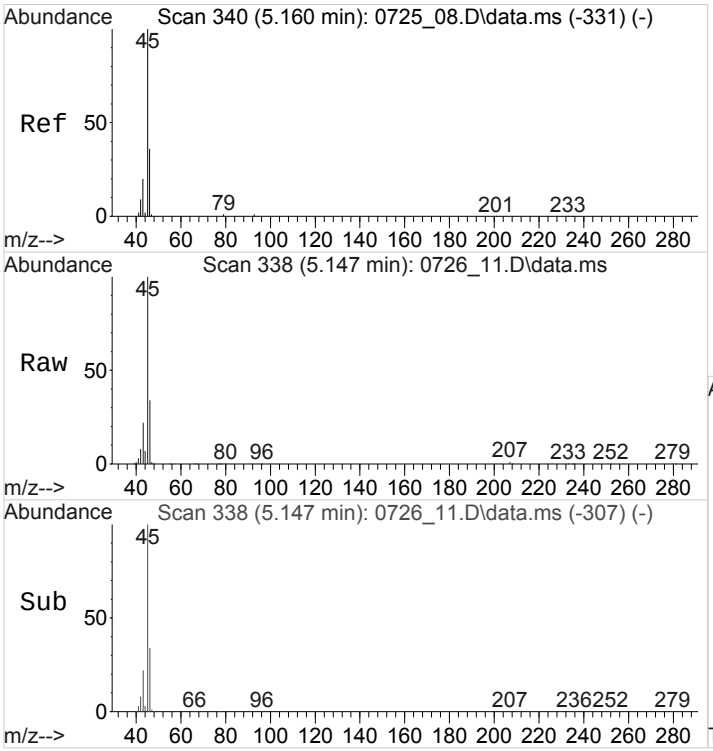


#16
PENTANE
Concen: 0.4805025 ppbv
RT: 5.031 min Scan# 319
Delta R.T. 0.006 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 43 Resp: 12332

Ion	Ratio	Lower	Upper
43	100		
57	17.9	12.7	19.1
72	10.2	7.8	11.8

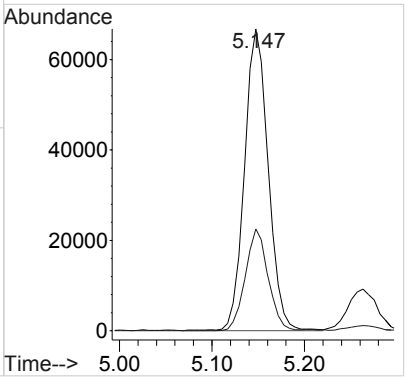




#17
Ethanol
Concen: 17.4943706 ppbv
RT: 5.147 min Scan# 338
Delta R.T. -0.012 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 45 Resp: 119303

Ion	Ratio	Lower	Upper
45	100		
46	32.6	26.3	39.5



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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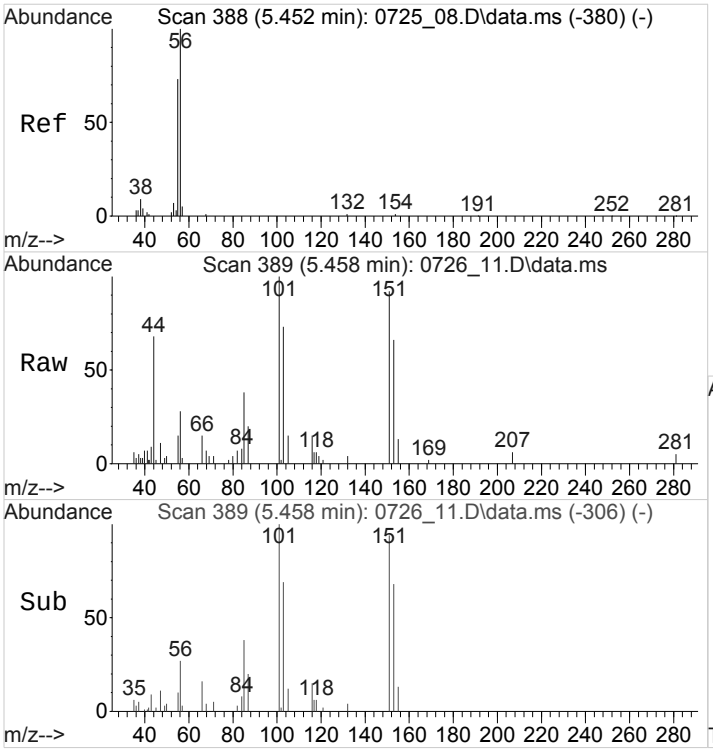
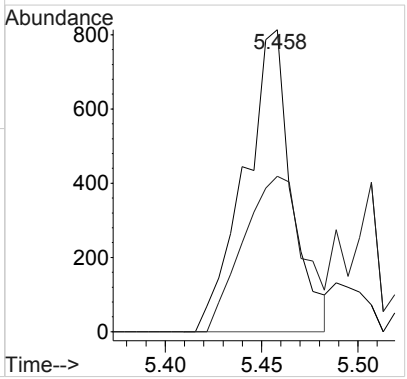
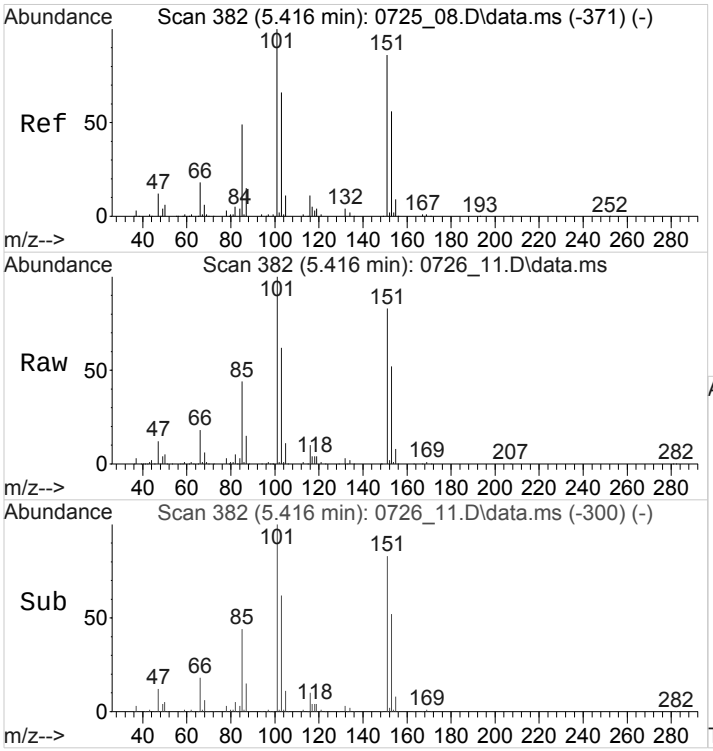


#18
ACROLEIN
Concen: 0.2021135 ppbv
RT: 5.458 min Scan# 389
Delta R.T. 0.006 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 56 Resp: 1379

Ion	Ratio	Lower	Upper
56	100		
55	66.4	59.5	89.3

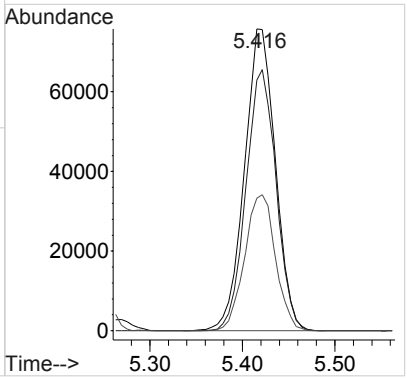




#19
1,1,2-Trichlorotrifluoroethane
Concen: 5.3509024 ppbv
RT: 5.416 min Scan# 382
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion:101 Resp: 176354

Ion	Ratio	Lower	Upper
101	100		
151	84.3	67.9	101.9
85	44.9	37.1	55.7



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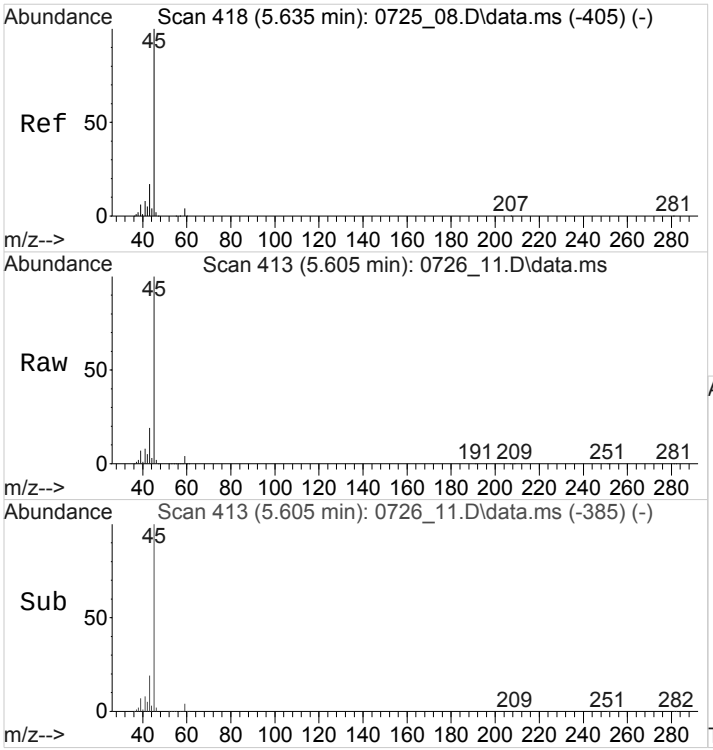
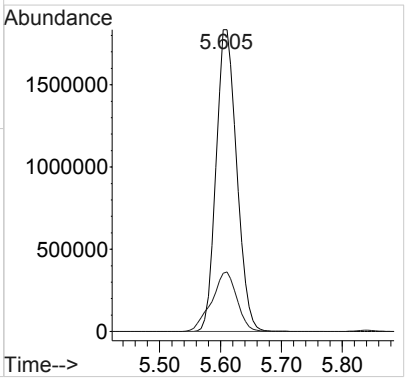
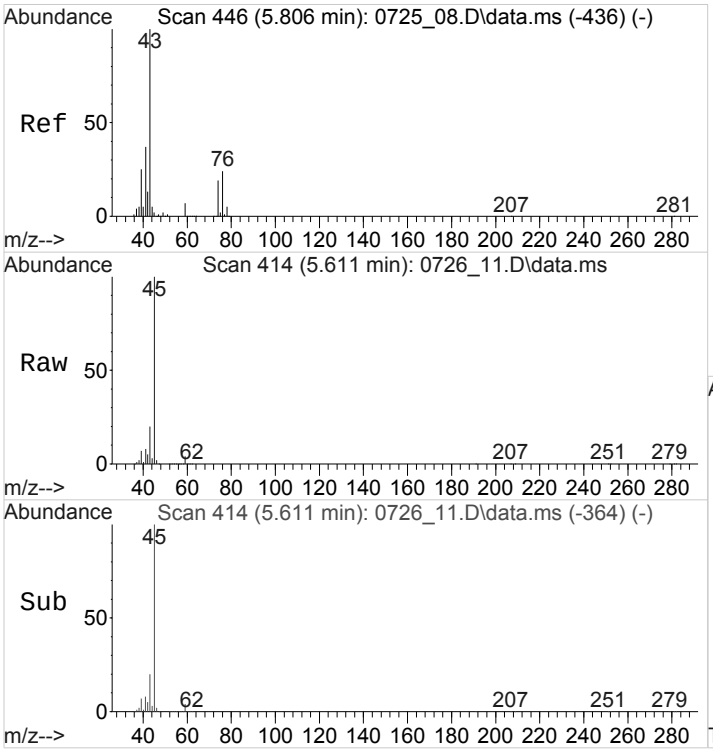


#23
2-Propanol
Concen: 155.6405312 ppbv
RT: 5.605 min Scan# 413
Delta R.T. -0.031 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 45 Resp: 4324860

Ion	Ratio	Lower	Upper
45	100		
43	24.2	15.6	23.4#

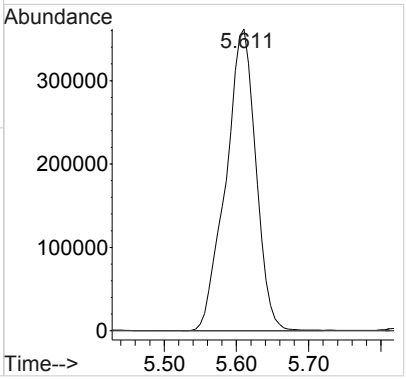




#26
METHYL ACETATE
Concen: 33.5982522 ppbv
RT: 5.611 min Scan# 414
Delta R.T. -0.195 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 43 Resp: 1045659

Ion	Ratio	Lower	Upper
43	100		
74	0.0	15.7	23.5#
29	0.0	0.0	0.0



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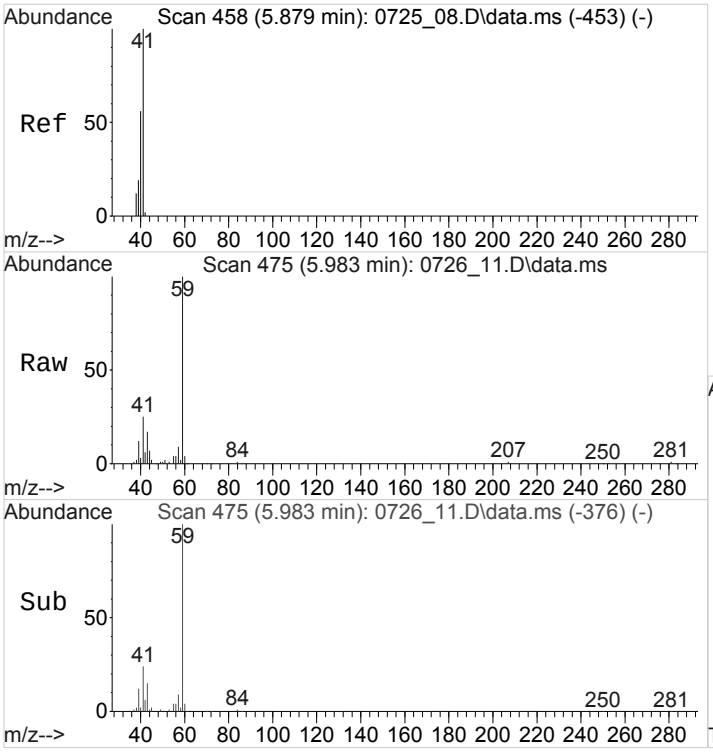
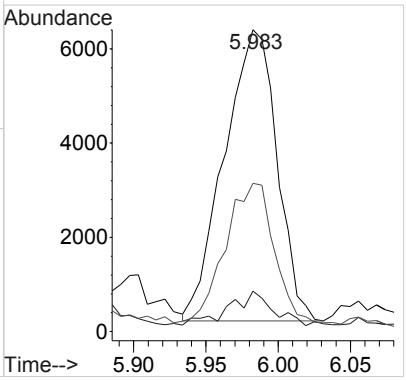
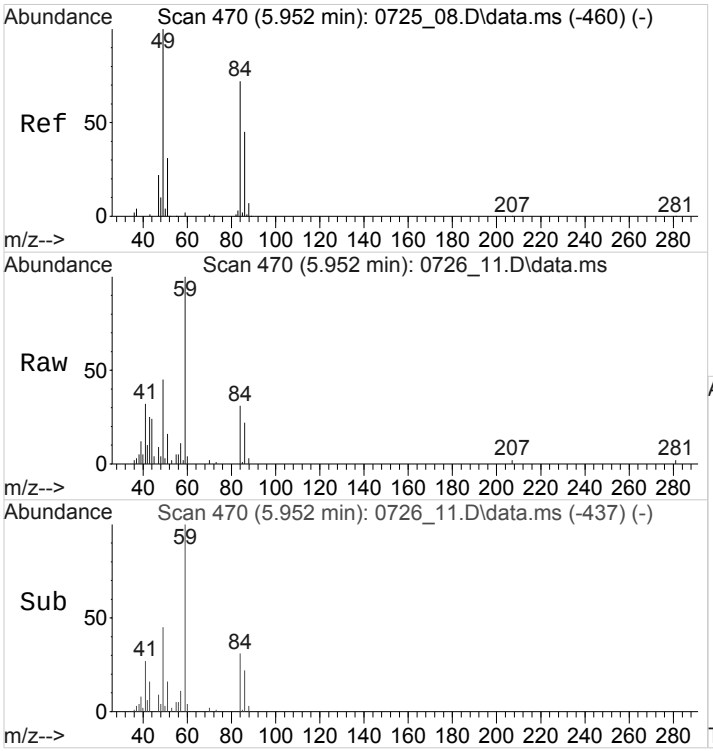


#27
ACETONITRILE
Concen: 1.2224889 ppbv
RT: 5.983 min Scan# 475
Delta R.T. 0.104 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 41 Resp: 15685

Ion	Ratio	Lower	Upper
41	100		
40	9.6	41.5	62.3#
39	0.0	15.7	23.5#

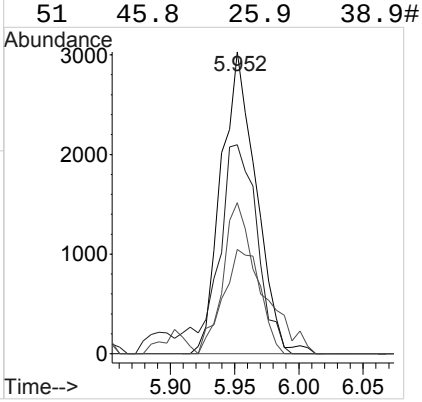




#28
Methylene Chloride
Concen: Below Cal
RT: 5.952 min Scan# 470
Delta R.T. 0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 49 Resp: 5766

Ion	Ratio	Lower	Upper
49	100		
84	76.8	55.8	83.8
86	45.2	36.6	55.0
51	45.8	25.9	38.9#



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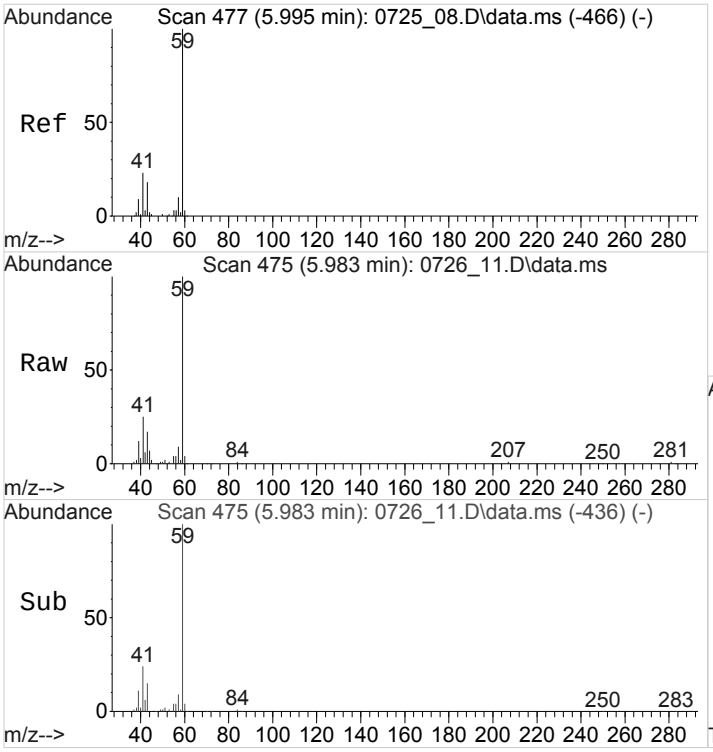
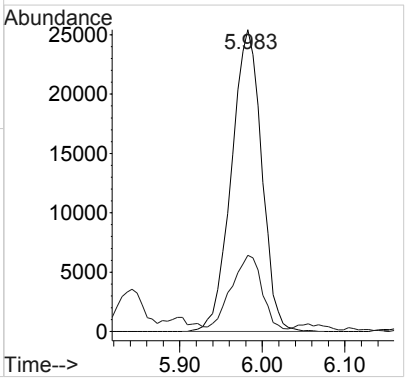
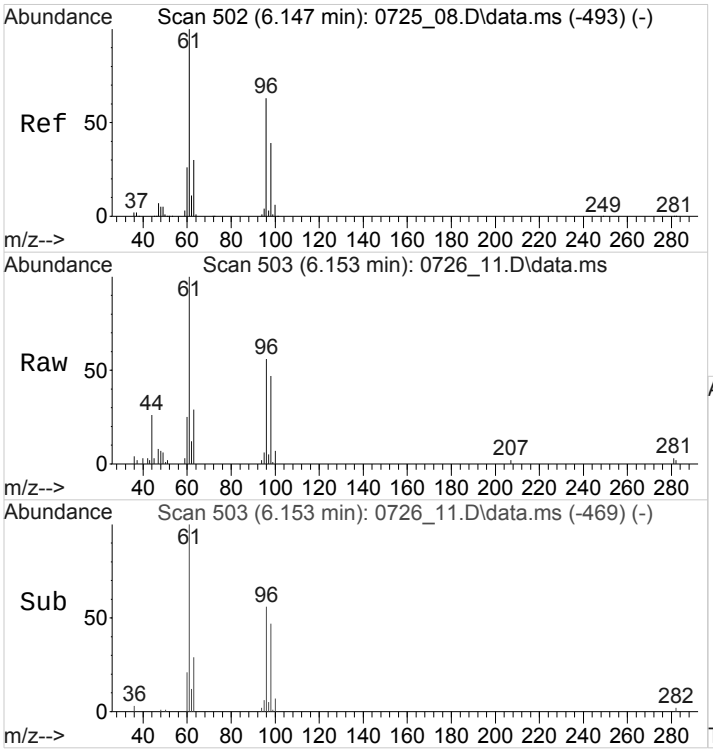


#29
TERT-BUTYL ALCOHOL
Concen: 2.1038371 ppbv
RT: 5.983 min Scan# 475
Delta R.T. -0.012 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 59 Resp: 64901

Ion	Ratio	Lower	Upper
59	100		
41	24.2	22.0	33.0

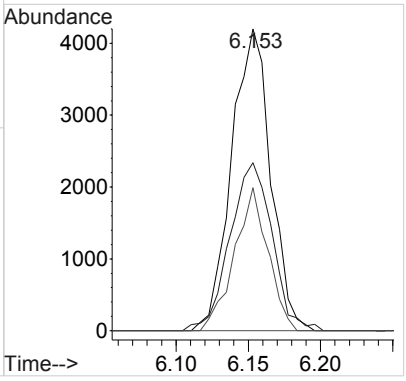


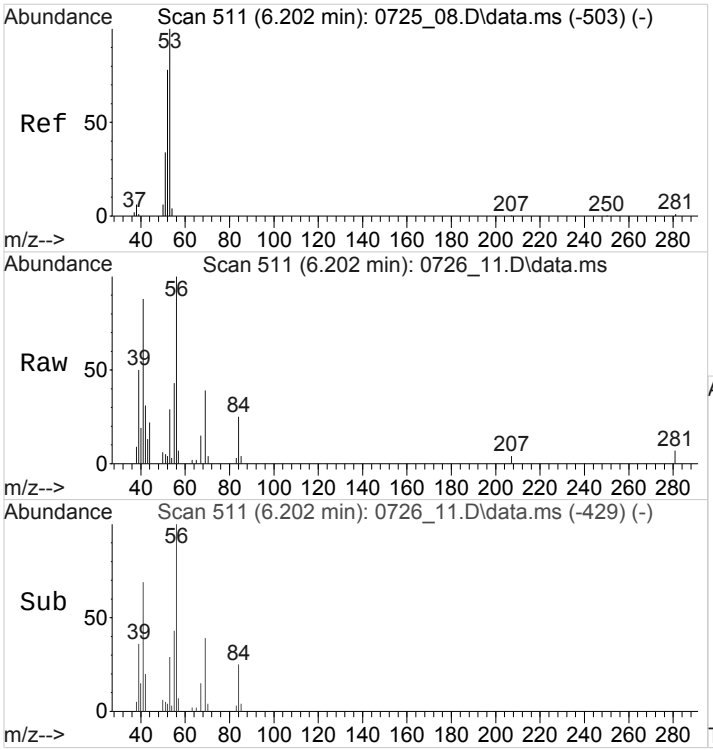


#31
Trans-1,2-Dichloroethene
Concen: 0.3267233 ppbv
RT: 6.153 min Scan# 503
Delta R.T. 0.006 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 61 Resp: 7887

Ion	Ratio	Lower	Upper
61	100		
96	60.1	49.8	74.6
98	40.7	30.5	45.7

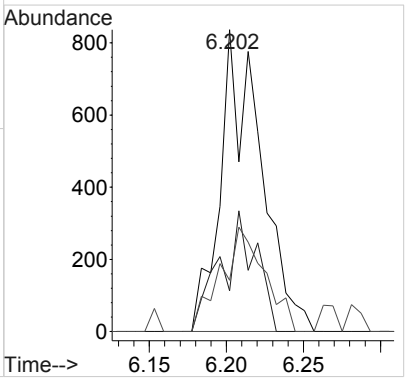


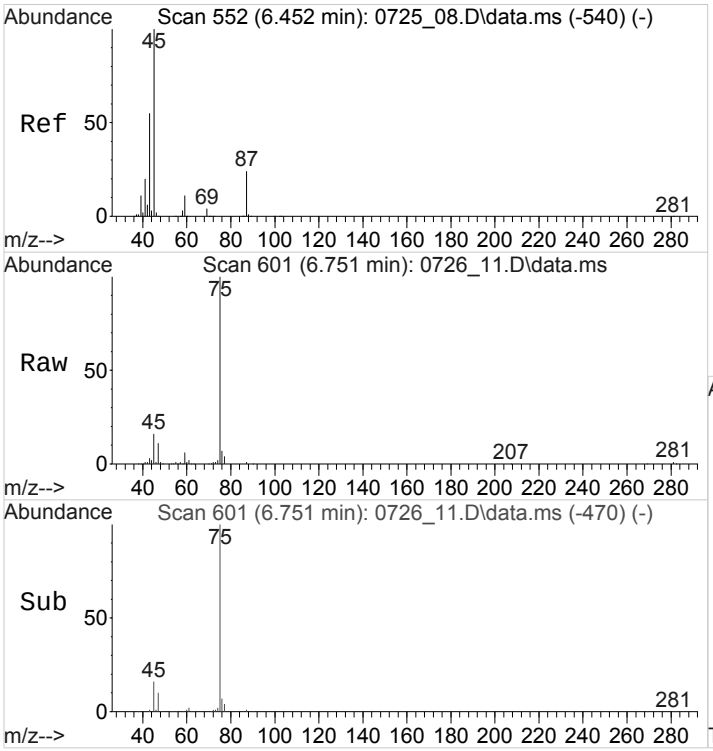


#32
ACRYLONITRILE
Concen: 0.1163072 ppbv
RT: 6.202 min Scan# 511
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 53 Resp: 1531

Ion	Ratio	Lower	Upper
53	100		
52	34.7	66.7	100.1#
51	37.5	28.8	43.2

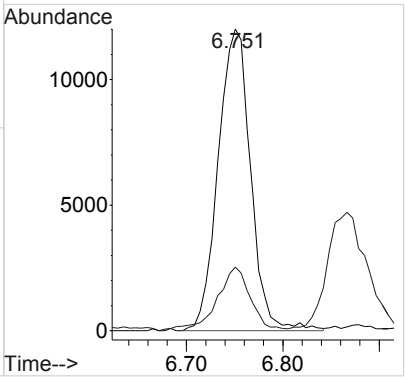




#36
DI-ISOPROPYL ETHER
Concen: 0.6253345 ppbv
RT: 6.751 min Scan# 601
Delta R.T. 0.299 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 45 Resp: 28178

Ion	Ratio	Lower	Upper
45	100		
43	21.9	39.9	59.9#



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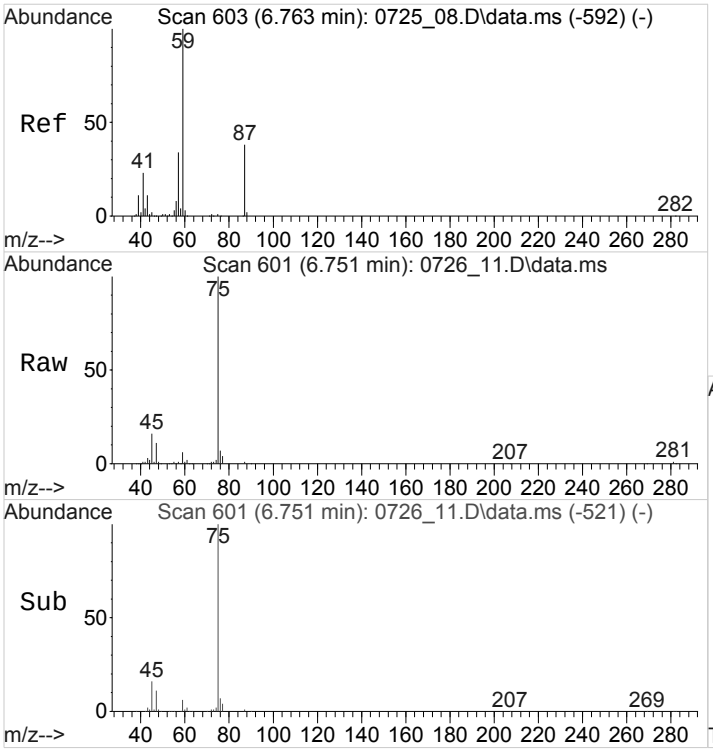
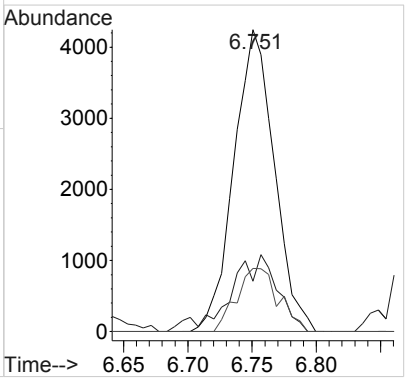
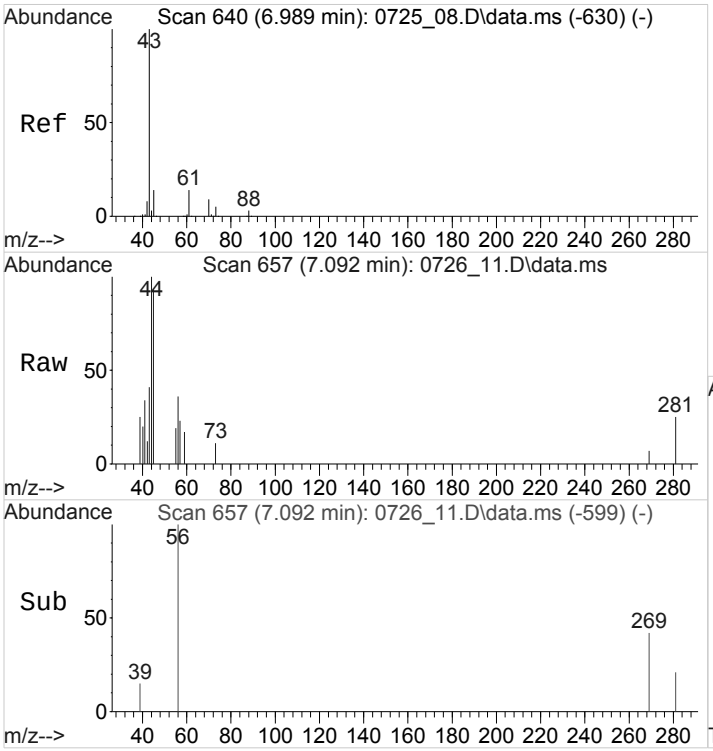


#37
ETHYL TERT-BUTYL ETHER
Concen: 0.2023001 ppbv
RT: 6.751 min Scan# 601
Delta R.T. -0.012 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 59 Resp: 9299

Ion	Ratio	Lower	Upper
59	100		
57	14.5	27.3	40.9#
87	21.8	30.5	45.7#

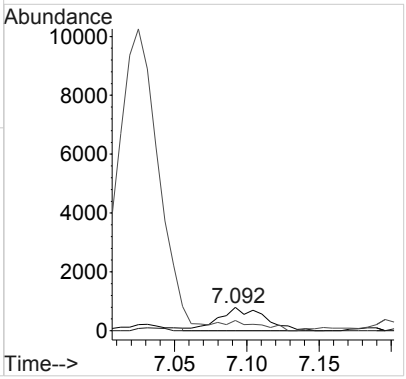




#38
ETHYL ACETATE
Concen: 0.3429714 ppbv
RT: 7.092 min Scan# 657
Delta R.T. 0.104 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 45 Resp: 1749

Ion	Ratio	Lower	Upper
45	100		
70	0.0	52.4	78.6#
43	37.2	566.5	849.7#



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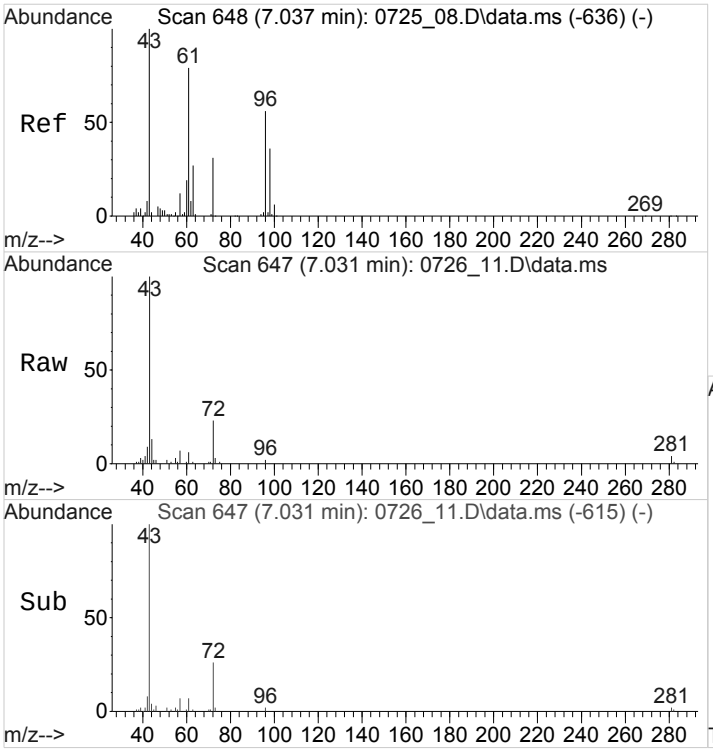
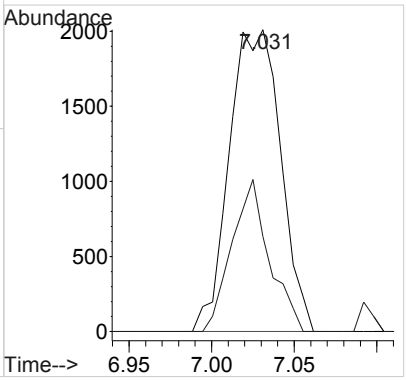
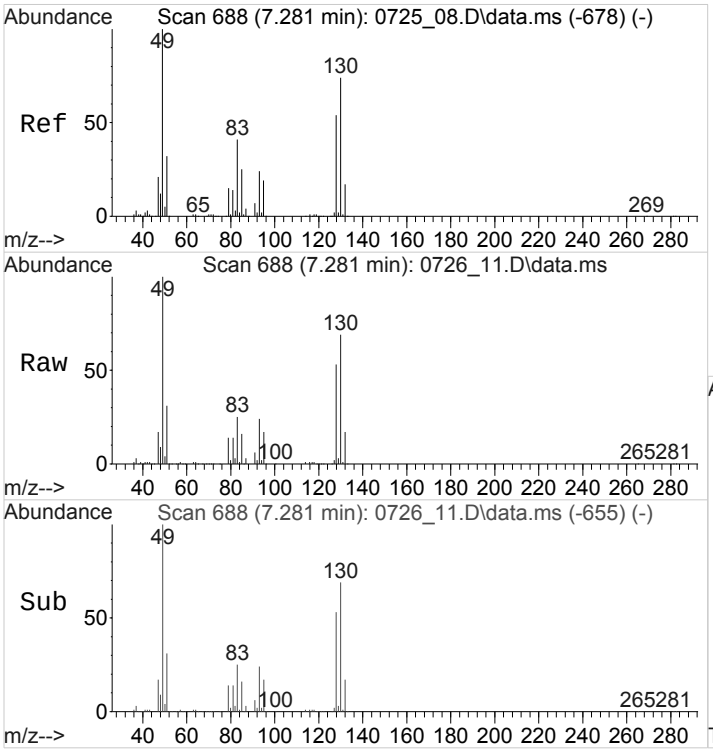


#39
2-Butanone (MEK)
Concen: 0.5934509 ppbv
RT: 7.031 min Scan# 647
Delta R.T. -0.006 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 72 Resp: 4348

Ion	Ratio	Lower	Upper
72	100		
57	36.7	28.6	42.8

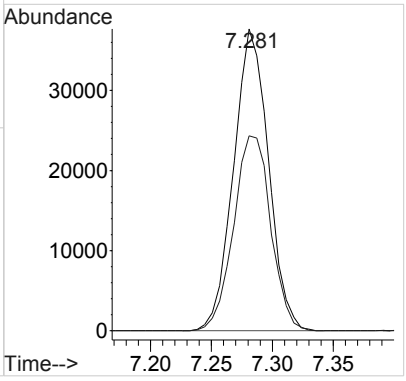




#42
Chloroform
Concen: 2.3767591 ppbv
RT: 7.281 min Scan# 688
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 83 Resp: 75053

Ion	Ratio	Lower	Upper
83	100		
85	68.8	50.4	75.6



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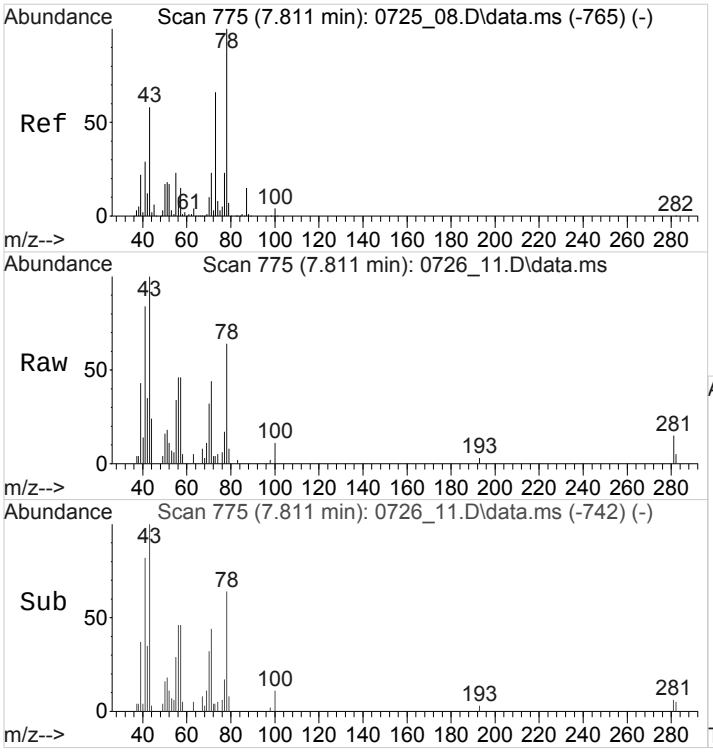
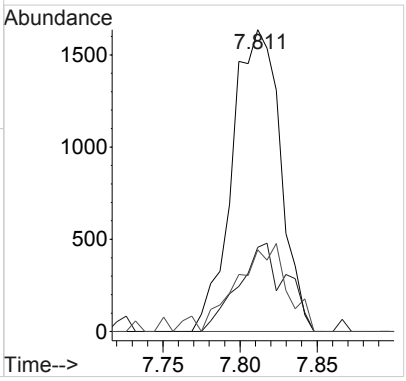
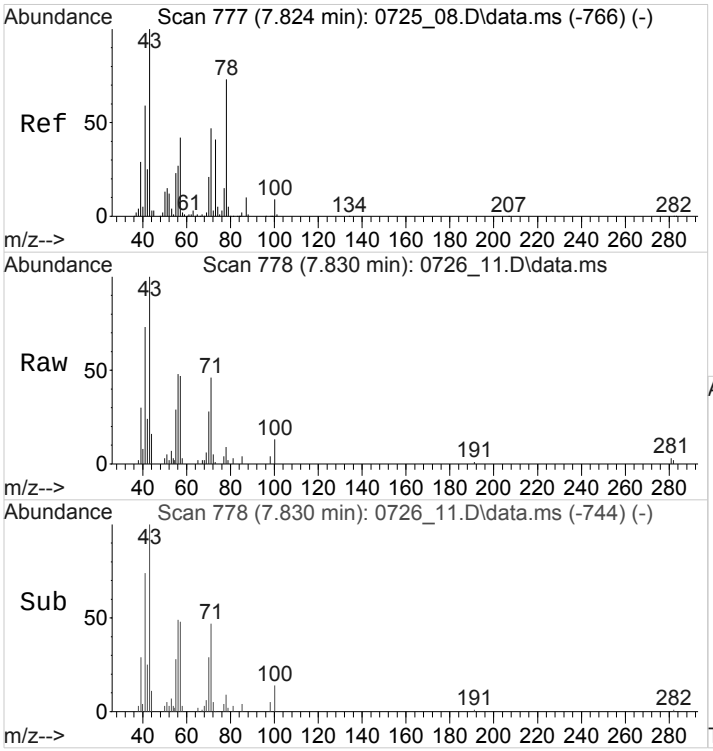


#48
Benzene
Concen: 0.0772790 ppbv
RT: 7.811 min Scan# 775
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 78 Resp: 3566

Ion	Ratio	Lower	Upper
78	100		
51	28.8	16.3	24.5#
77	31.4	18.4	27.6#

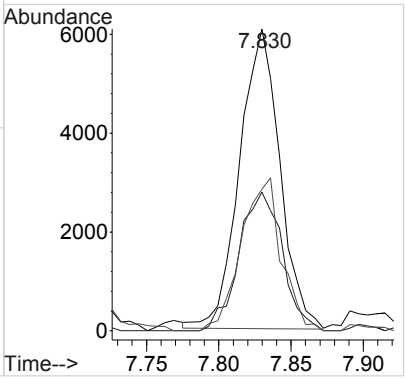




#51
Heptane
Concen: 0.2696414 ppbv
RT: 7.830 min Scan# 778
Delta R.T. 0.006 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 43 Resp: 11756

Ion	Ratio	Lower	Upper
43	100		
71	49.7	34.2	51.2
57	50.5	26.7	40.1#



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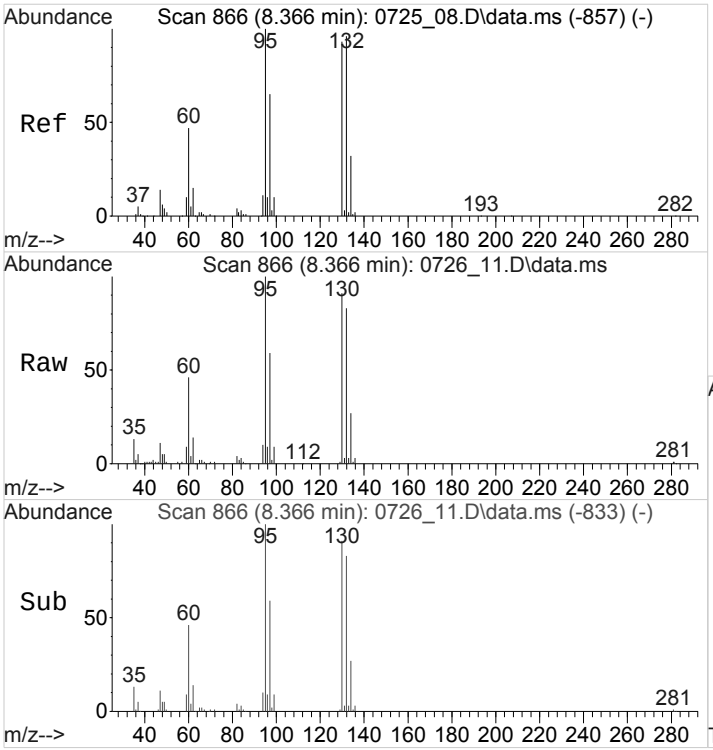
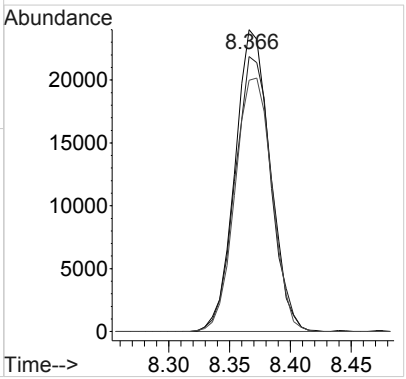
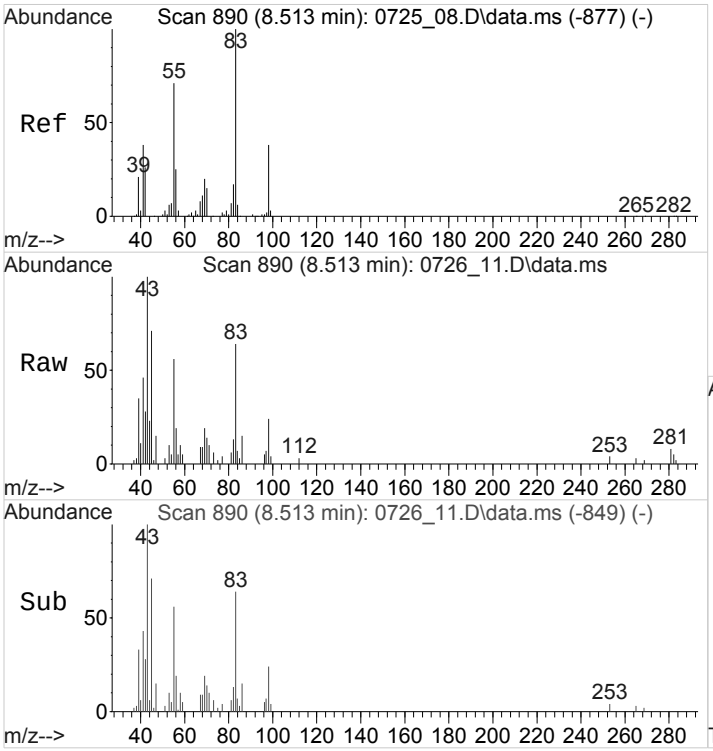


#52
Trichloroethene
Concen: 2.3792169 ppbv
RT: 8.366 min Scan# 866
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 95 Resp: 48326

Ion	Ratio	Lower	Upper
95	100		
130	93.0	78.1	117.1
132	88.0	74.8	112.2

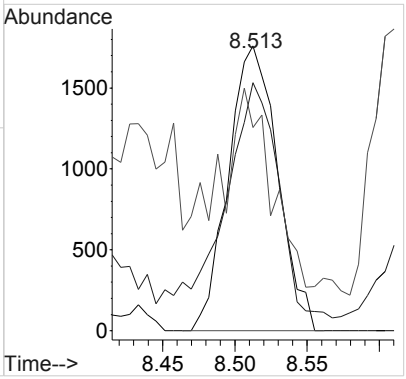




#54
METHYL CYCLOHEXANE
Concen: 0.1495712 ppbv
RT: 8.513 min Scan# 890
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 83 Resp: 4174

Ion	Ratio	Lower	Upper
83	100		
55	88.5	69.5	104.3
41	93.7	40.7	61.1#



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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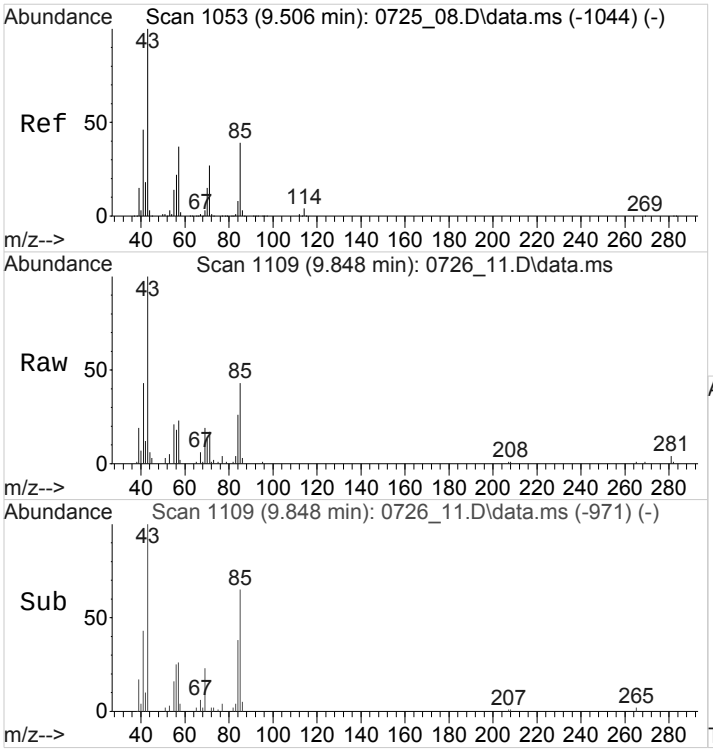
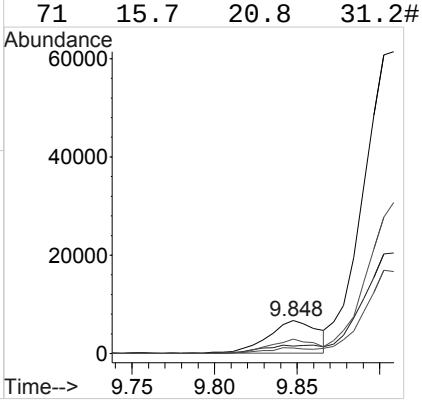
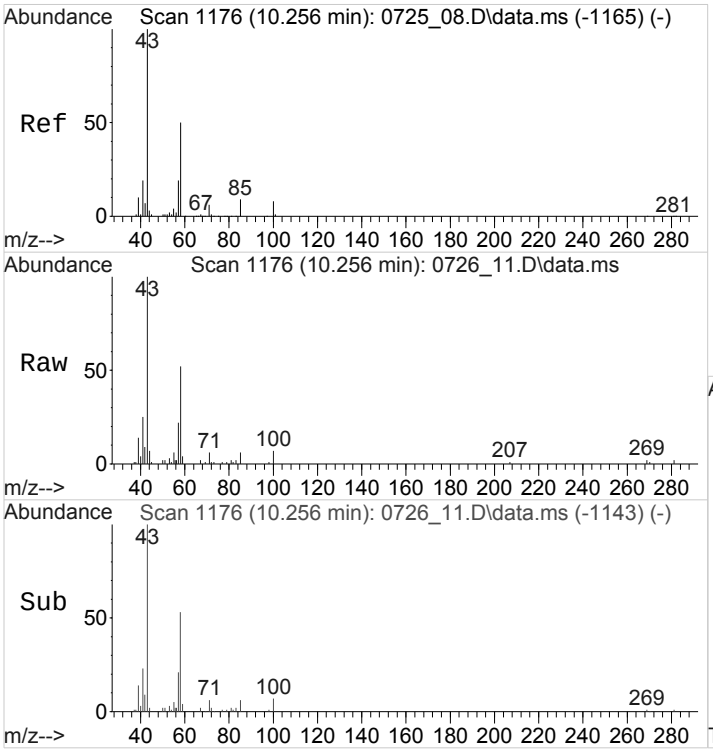


#61
n-OCTANE
Concen: 0.3414509 ppbv
RT: 9.848 min Scan# 1109
Delta R.T. 0.341 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 43 Resp: 14078

Ion	Ratio	Lower	Upper
43	100		
57	0.0	30.2	45.4#
85	40.3	30.3	45.5
71	15.7	20.8	31.2#

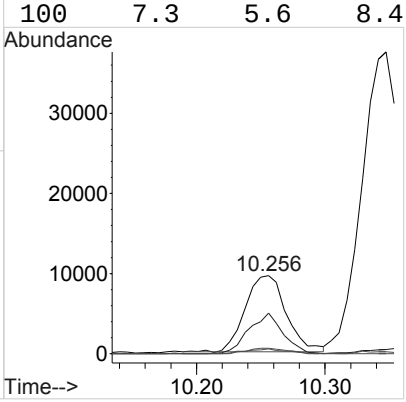




#66
Methyl Butyl Ketone
Concen: 0.6411350 ppbv
RT: 10.256 min Scan# 1176
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 43 Resp: 21106

Ion	Ratio	Lower	Upper
43	100		
58	44.4	37.0	55.6
85	5.9	6.4	9.6#
100	7.3	5.6	8.4



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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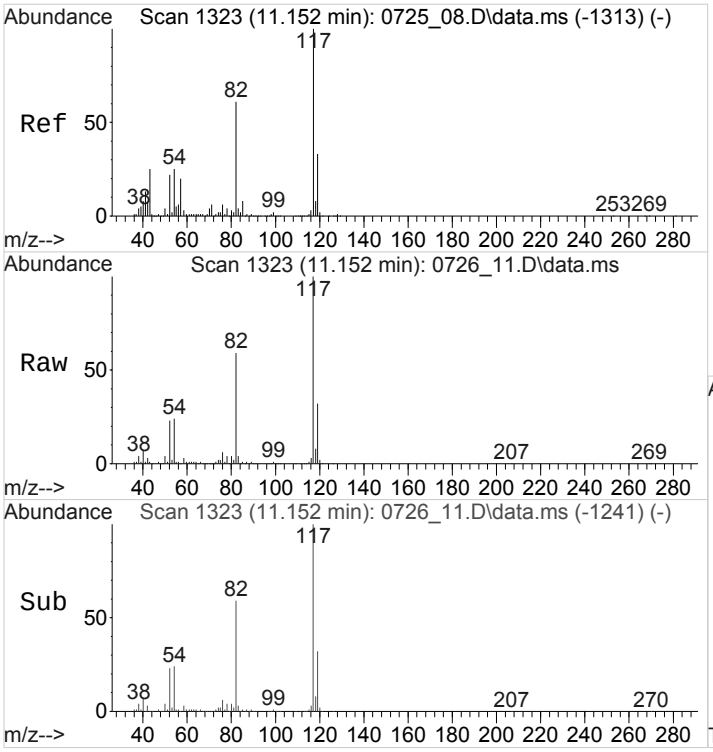
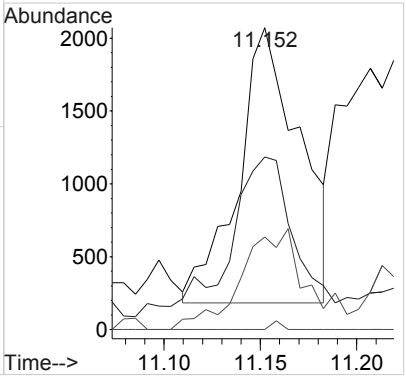
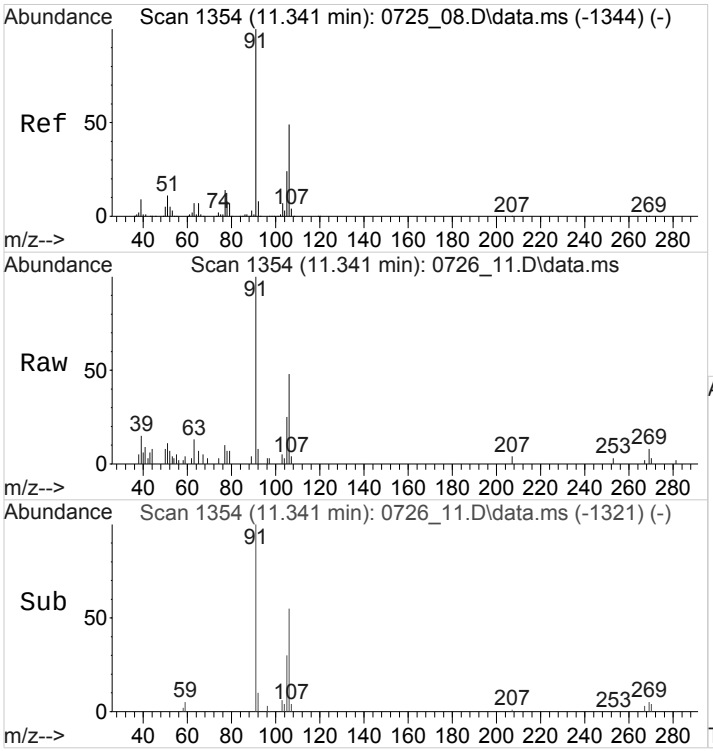


#70
NONANE
Concen: 0.0933054 ppbv
RT: 11.152 min Scan# 1323
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 43 Resp: 4233

Ion	Ratio	Lower	Upper
43	100		
57	63.2	65.4	98.0#
71	38.6	18.3	27.5#
128	0.5	2.5	3.7#

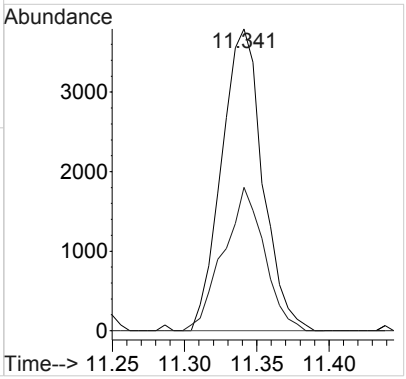




#73
M&P-Xylene
Concen: 0.1409305 ppbv
RT: 11.341 min Scan# 1354
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 91 Resp: 7508

Ion	Ratio	Lower	Upper
91	100		
106	47.2	38.6	58.0



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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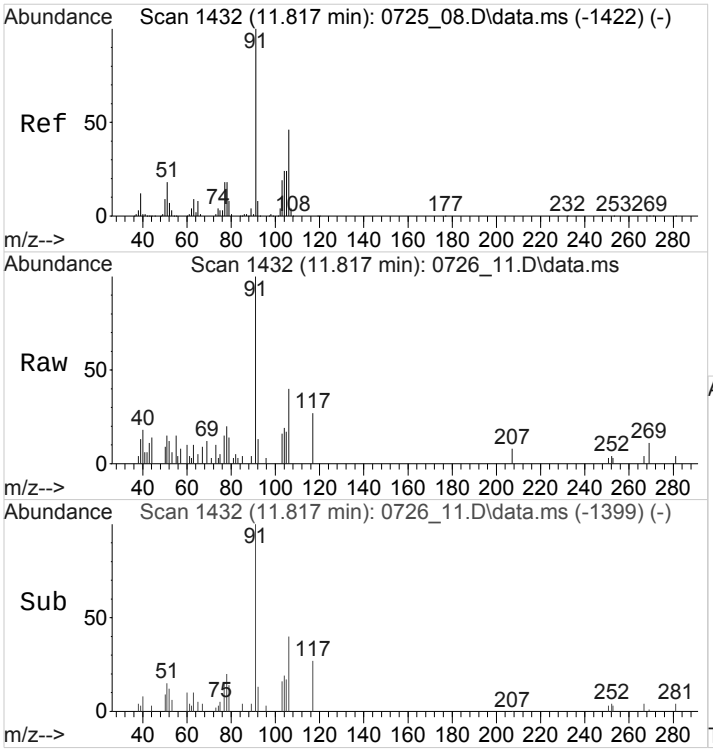
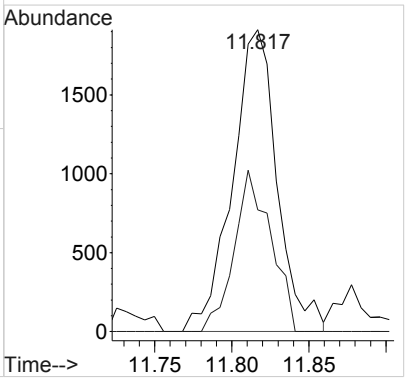
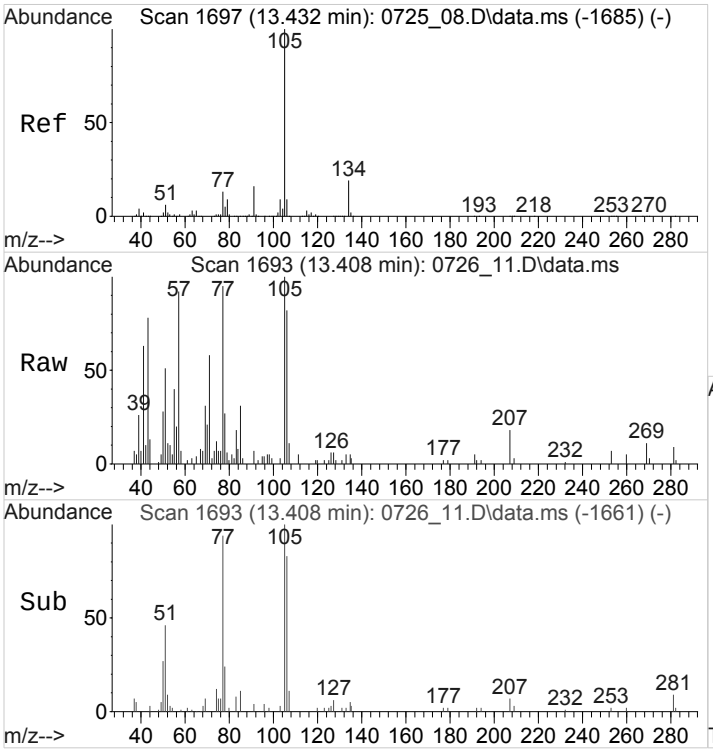


#74
O-Xylene
Concen: 0.0747021 ppbv
RT: 11.817 min Scan# 1432
Delta R.T. -0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion: 91 Resp: 3882

Ion	Ratio	Lower	Upper
91	100		
106	43.6	36.9	55.3

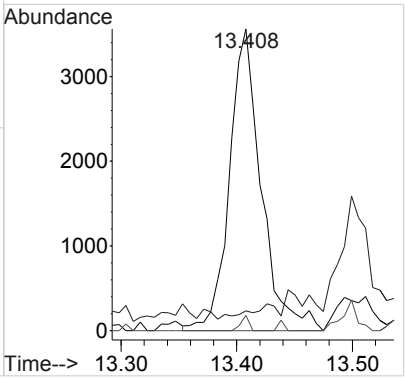


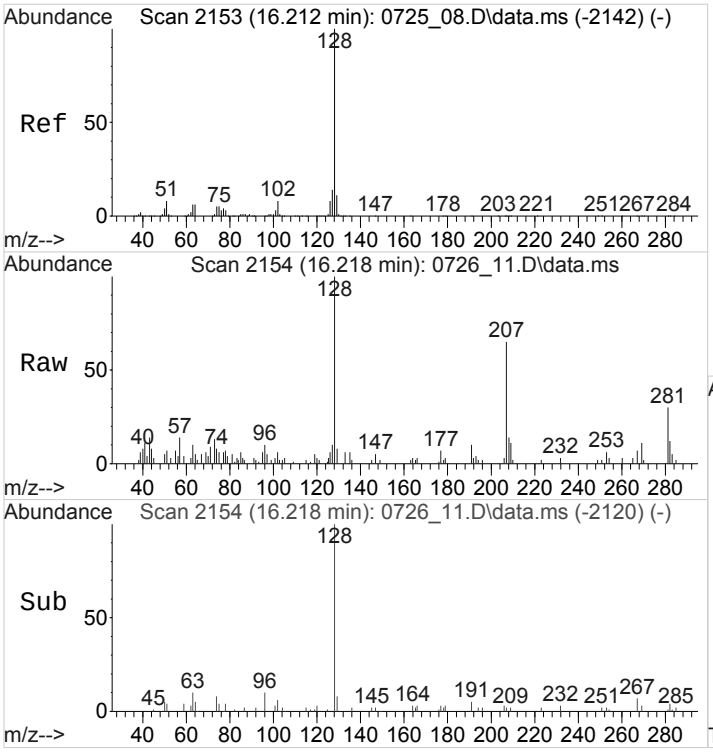


#89
sec-Butylbenzene
Concen: 0.0648399 ppbv
RT: 13.408 min Scan# 1693
Delta R.T. -0.024 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion:105 Resp: 6798

Ion	Ratio	Lower	Upper
105	100		
91	1.3	13.4	20.2#
134	1.3	14.9	22.3#

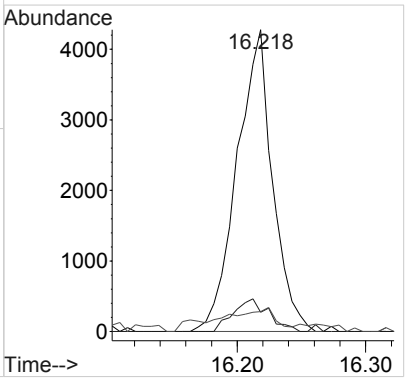


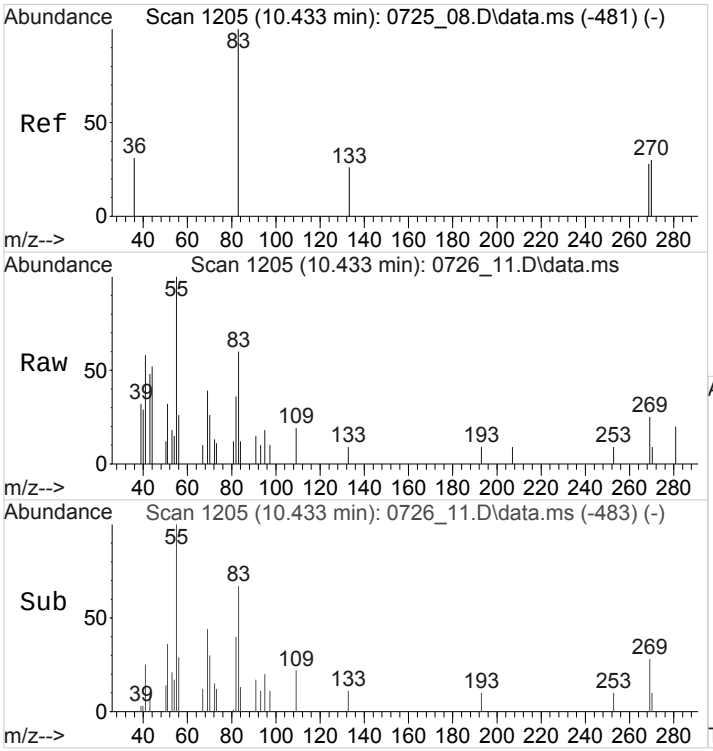


#100
Naphthalene
Concen: 0.0795981 ppbv
RT: 16.218 min Scan# 2154
Delta R.T. 0.006 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion:128 Resp: 8230

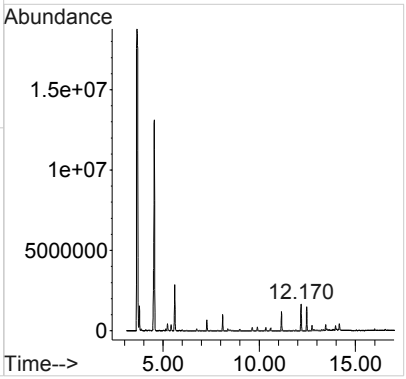
Ion	Ratio	Lower	Upper
128	100		
102	10.8	6.8	10.2#
51	10.0	6.0	9.0#





#101
TPH (GC/MS) Low Fraction
Concen: 95.0284552 ppbv m
RT: 10.430 min Scan# 1205
Delta R.T. 0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion:TIC Resp:11318740



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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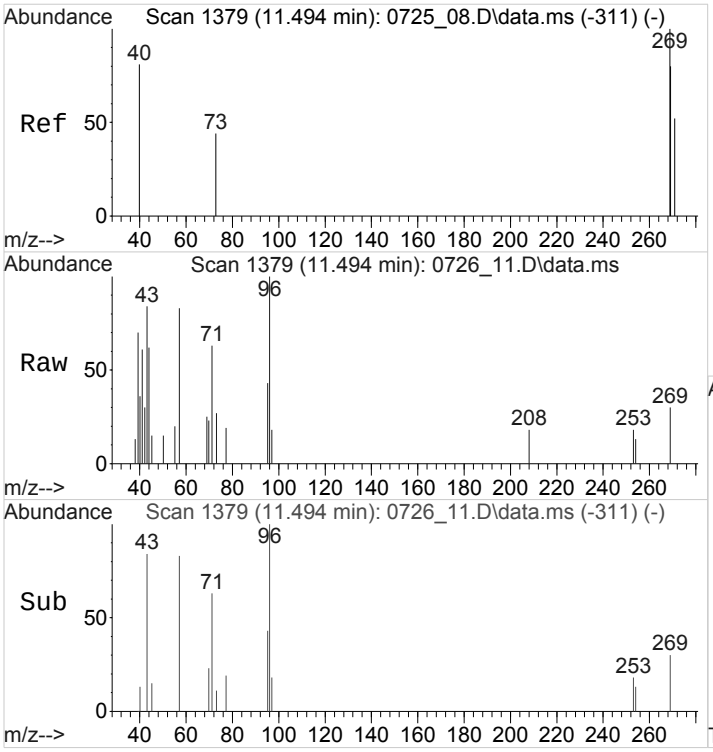
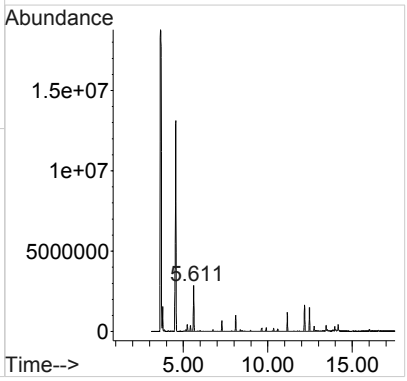


#102
TPH-GRO (C5-C10)
Concen: 216.7708257 ppbv m
RT: 11.493 min Scan# 1379
Delta R.T. 0.000 min
Lab File: 0726_11.D
Acq: 26 Jul 2022 2:57 pm

Tgt Ion:TIC Resp:21046607



ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
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SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

SAMPLE NO.:
CRCA-VMP04-0220722

Lab Sample ID:	L1518164-06	**SDG:**	L1518164
Client Sample ID:	CRCA-VMP04-0220722	**Collected Date/Time:**	07/22/22 12:55
Lab File ID:	0801_07	**Received Date/Time:**	07/23/22 09:00
Instrument ID:	AIRMS9	**Preparation Date/Time:**	08/01/22 13:10
Analytical Batch:	WG1903843	**Analysis Date/Time:**	08/01/22 13:10
Dilution Factor:	10	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	20 mL
Matrix:	Air	**Initial Wt/Vol:**	_____
Total Solids (%):	_____	**Final Wt/Vol:**	_____

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ug/m3		*ug/m3*	*ug/m3*	*ug/m3*
2-Propanol	67-63-0	2.32	347		6.49	15.4	30.7

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_07.D
Acq On : 01 Aug 2022 01:10 pm
Operator :
Sample : L1518164-06 10x WG1903843
Misc :
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Aug 01 13:32:37 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

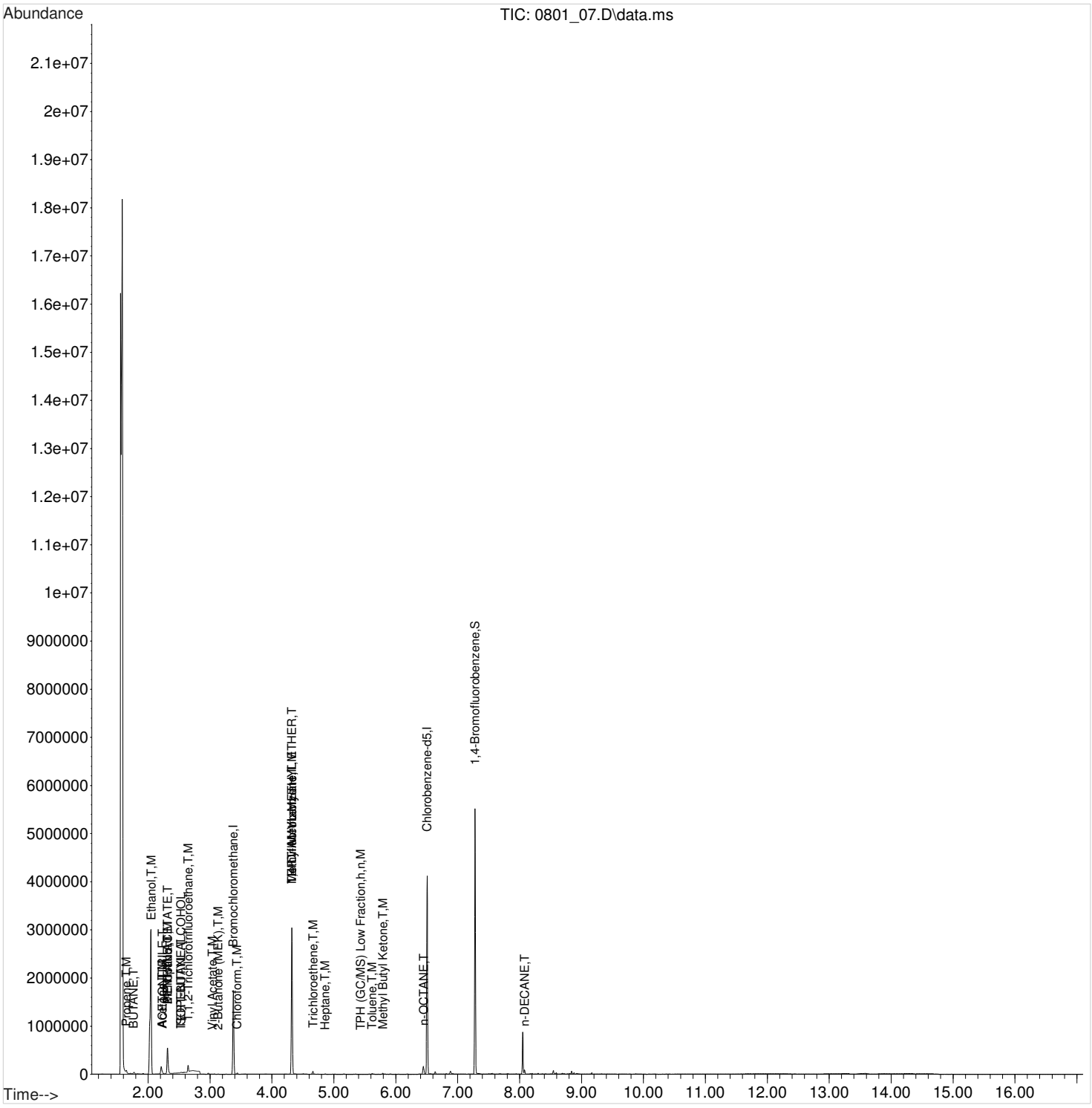
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.378	130	566827	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	1845825	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	1703887	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1034658	3.5796913	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 89.49%			
Target Compounds						Qvalue
2) Propene	1.648	41	5222	0.2856104	ppbv #	79
3) BUTANE	1.766	43	8922	0.2372803	ppbv #	57
13) ISOPENTANE	2.532	41	1380	0.0996987	ppbv #	1
16) PENTANE	2.316	43	80792	2.7978360	ppbv #	59
17) Ethanol	2.050	45	13981	1.8701059	ppbv	97
19) 1,1,2-Trichlorotrifluo...	2.646	101	31353	0.5921017	ppbv	95
21) Acetone	2.229	43	23823	0.9721943	ppbv #	85
23) 2-Propanol	2.316	45	419452	14.0558975	ppbv	98
26) METHYL ACETATE	2.316	43	80792	2.4518126	ppbv #	41
27) ACETONITRILE	2.232	41	1466	0.1046045	ppbv #	13
29) TERT-BUTYL ALCOHOL	2.532	59	7274	0.1883712	ppbv	96
35) Vinyl Acetate	3.036	43	2861	0.0715341	ppbv	100
39) 2-Butanone (MEK)	3.131	72	1666	0.1085869	ppbv	94
42) Chloroform	3.438	83	14584	0.2541248	ppbv	99
49) TERT-AMYL METHYL ETHER	4.322	73	10341	0.1424768	ppbv #	14
51) Heptane	4.857	43	1529	0.0506346	ppbv	91
52) Trichloroethene	4.663	95	11298	0.2560648	ppbv	96
56) Methyl Methacrylate	4.322	69	25111	0.8636102	ppbv #	95
61) n-OCTANE	6.454	43	9934	0.2550723	ppbv	89
62) Toluene	5.618	91	8739	0.0792345	ppbv	99
66) Methyl Butyl Ketone	5.793	43	4936	0.1518226	ppbv #	61
80) n-DECANE	8.081	43	2765	0.0636380	ppbv #	1
101) TPH (GC/MS) Low Fraction	5.430	TIC	1045412m	4.5510876	ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	-609783m	Below Cal		

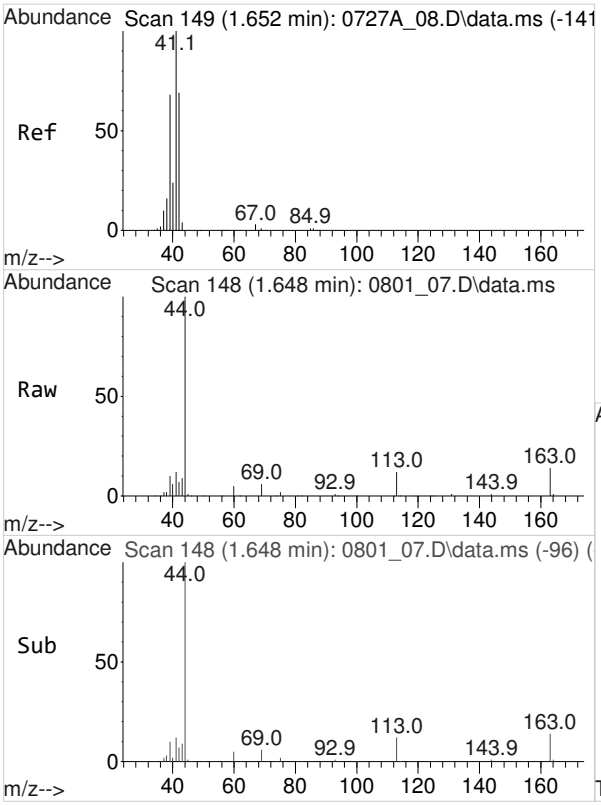
(#) = qualifier out of range (m) = manual integration (+) = signals summed

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_07.D
Acq On : 01 Aug 2022 01:10 pm
Operator :
Sample : L1518164-06 10x WG1903843
Misc :
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Aug 01 13:32:37 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

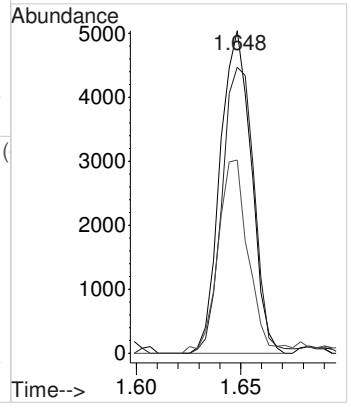


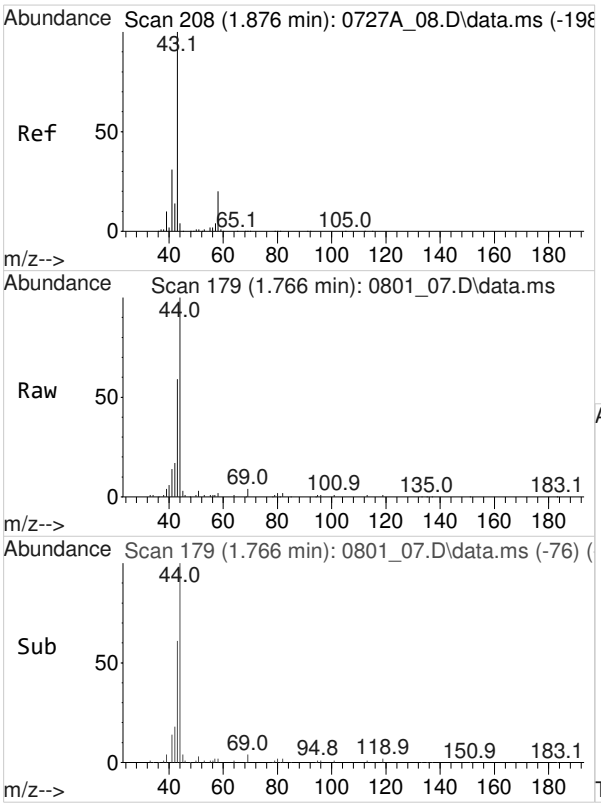


#2
Propene
Concen: 0.2856104 ppbv
RT: 1.648 min Scan# 148
Delta R.T. -0.004 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 41 Resp: 5222

Ion	Ratio	Lower	Upper
41	100		
39	91.4	54.9	82.3#
42	57.7	55.3	82.9

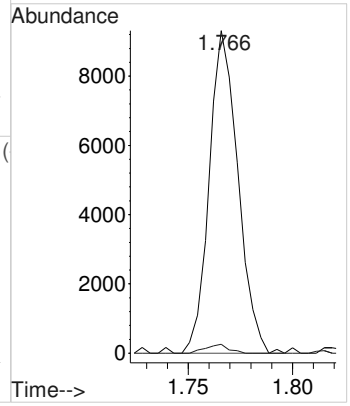


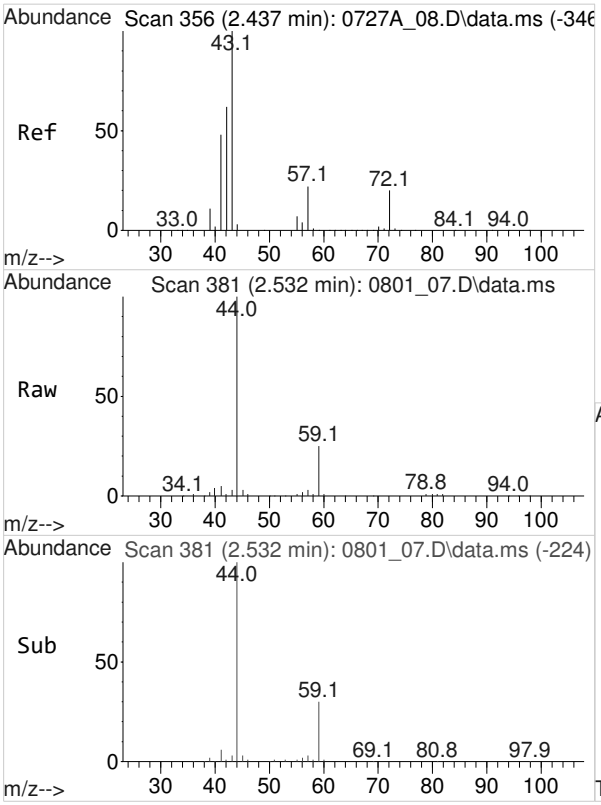


#3
BUTANE
Concen: 0.2372803 ppbv
RT: 1.766 min Scan# 179
Delta R.T. -0.110 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 43 Resp: 8922

Ion	Ratio	Lower	Upper
43	100		
58	0.0	15.6	23.4#

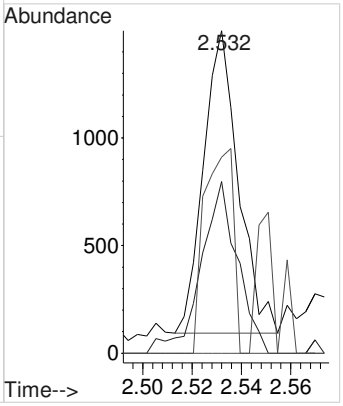


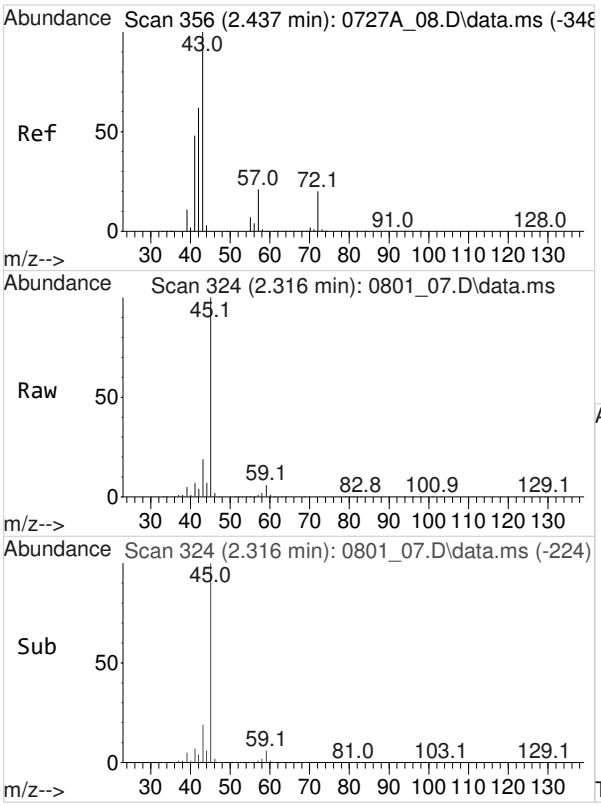


#13
ISOPENTANE
Concen: 0.0996987 ppbv
RT: 2.532 min Scan# 381
Delta R.T. 0.095 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 41 Resp: 1380

Ion	Ratio	Lower	Upper
41	100		
57	59.4	35.0	52.4#
43	0.0	166.8	250.2#
72	0.0	31.8	47.6#

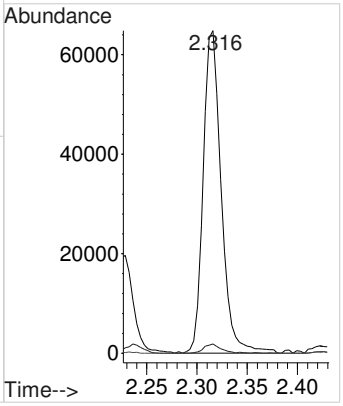


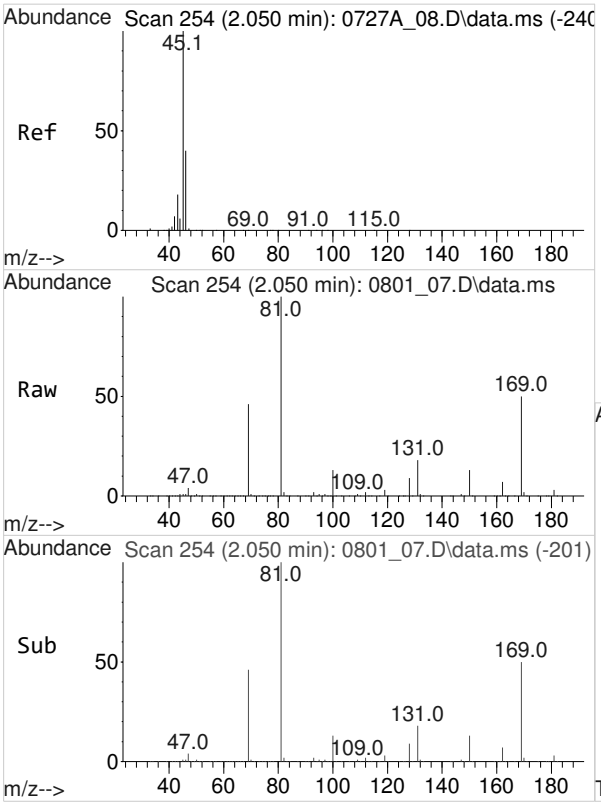


#16
PENTANE
Concen: 2.7978360 ppbv
RT: 2.316 min Scan# 324
Delta R.T. -0.121 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 43 Resp: 80792

Ion	Ratio	Lower	Upper
43	100		
57	2.7	16.8	25.2#
72	0.0	15.3	22.9#

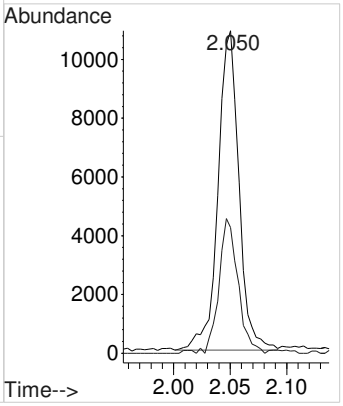


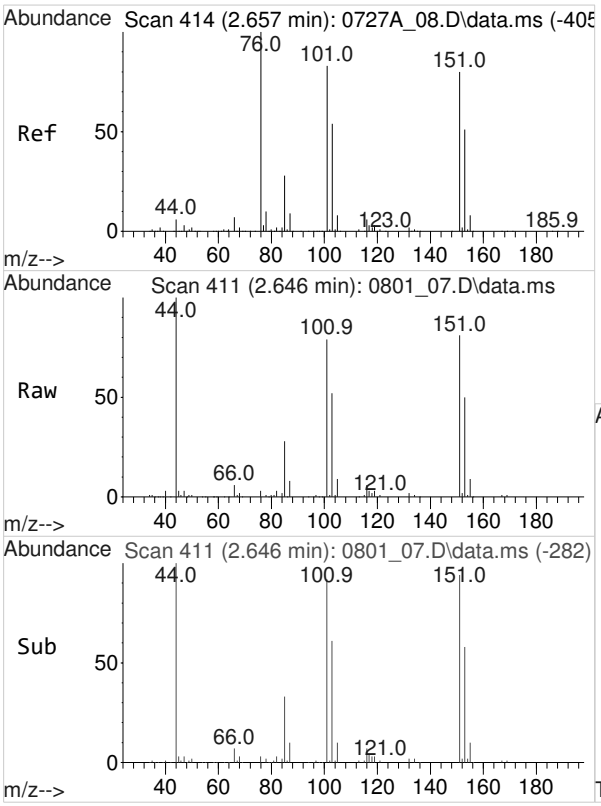


#17
Ethanol
Concen: 1.8701059 ppbv
RT: 2.050 min Scan# 254
Delta R.T. 0.000 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 45 Resp: 13981

Ion	Ratio	Lower	Upper
45	100		
46	38.4	32.0	48.0

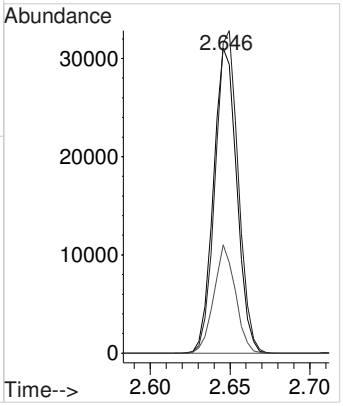


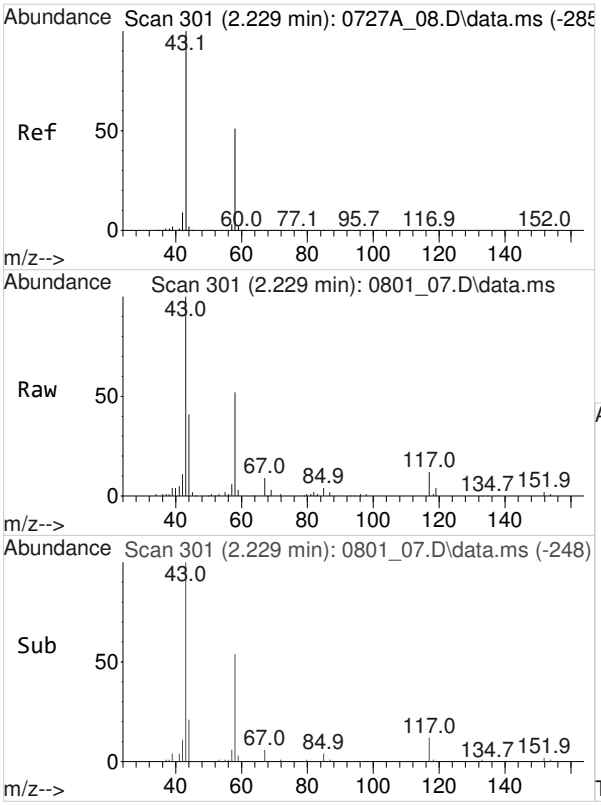


#19
1,1,2-Trichlorotrifluoroethane
Concen: 0.5921017 ppbv
RT: 2.646 min Scan# 411
Delta R.T. -0.011 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion:101 Resp: 31353

Ion	Ratio	Lower	Upper
101	100		
151	103.9	78.3	117.5
85	32.8	26.7	40.1

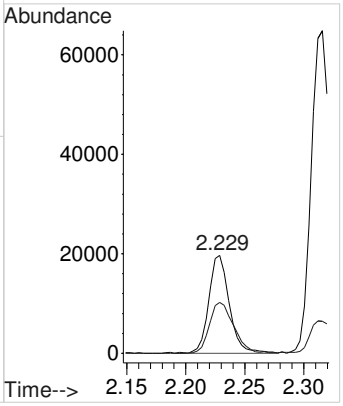


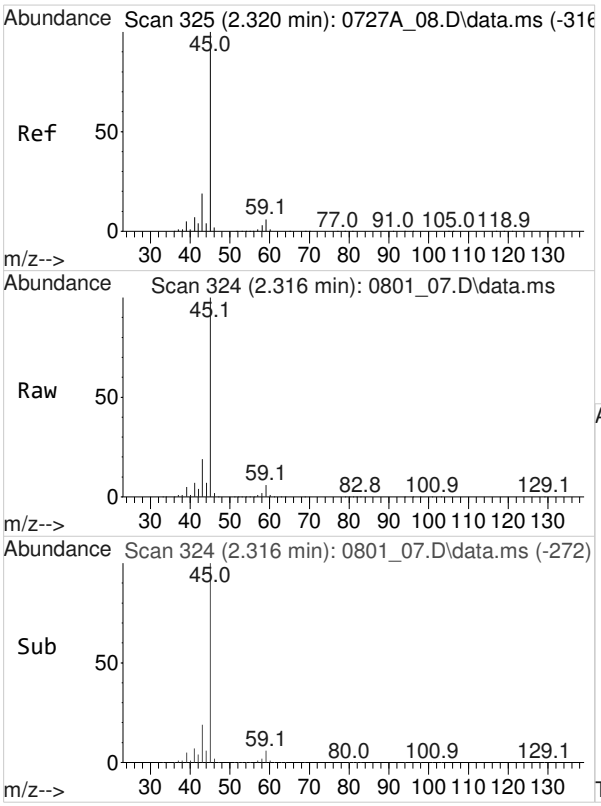


#21
Acetone
Concen: 0.9721943 ppbv
RT: 2.229 min Scan# 301
Delta R.T. -0.000 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 43 Resp: 23823

Ion	Ratio	Lower	Upper
43	100		
58	61.6	41.0	61.4#

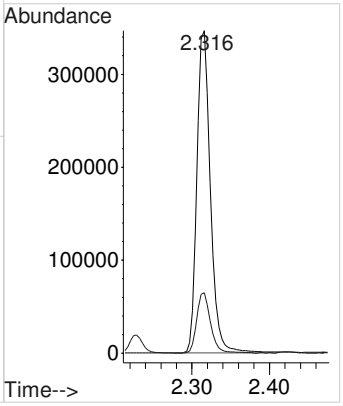


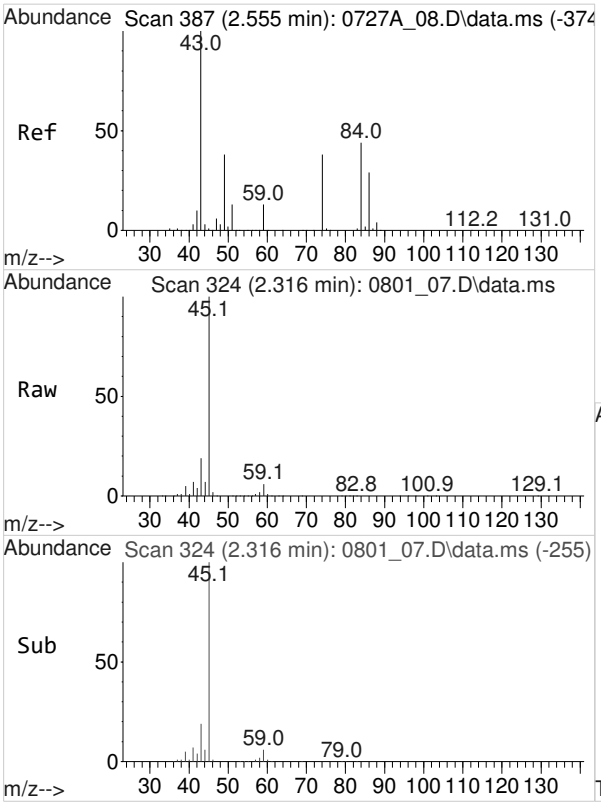


#23
2-Propanol
Concen: 14.0558975 ppbv
RT: 2.316 min Scan# 324
Delta R.T. -0.004 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 45 Resp: 419452

Ion	Ratio	Lower	Upper
45	100		
43	19.3	16.0	24.0

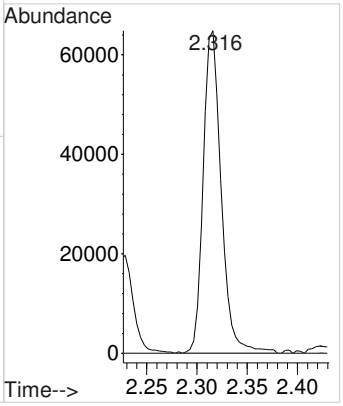


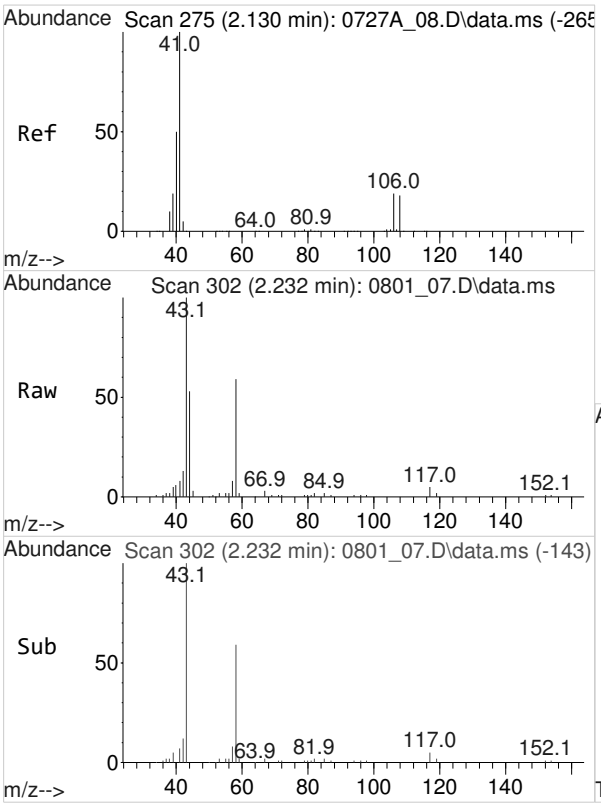


#26
METHYL ACETATE
Concen: 2.4518126 ppbv
RT: 2.316 min Scan# 324
Delta R.T. -0.239 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 43 Resp: 80792

Ion	Ratio	Lower	Upper
43	100		
74	0.0	26.6	39.8#
29	0.0	0.0	0.0

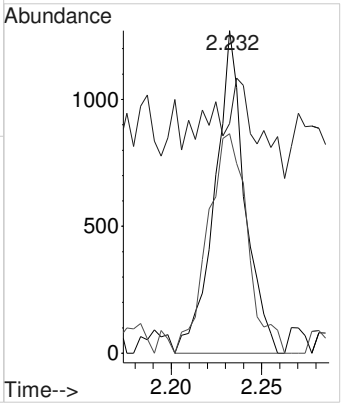


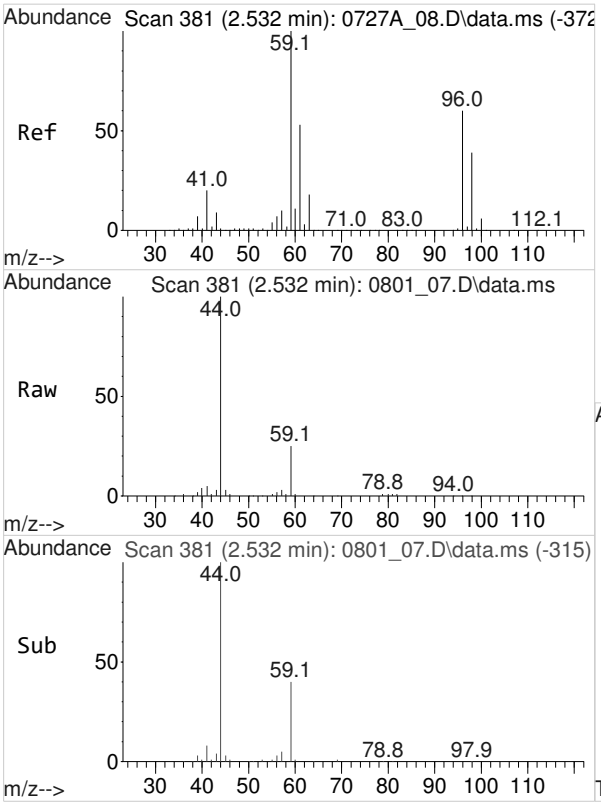


#27
ACETONITRILE
Concen: 0.1046045 ppbv
RT: 2.232 min Scan# 302
Delta R.T. 0.102 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 41 Resp: 1466

Ion	Ratio	Lower	Upper
41	100		
40	9.5	40.6	60.8#
39	90.3	14.5	21.7#

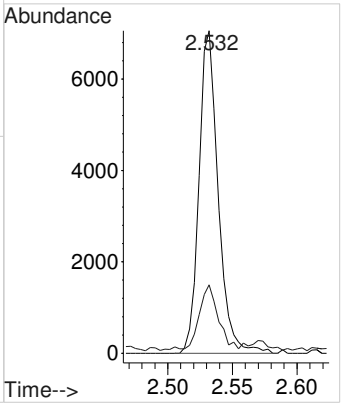


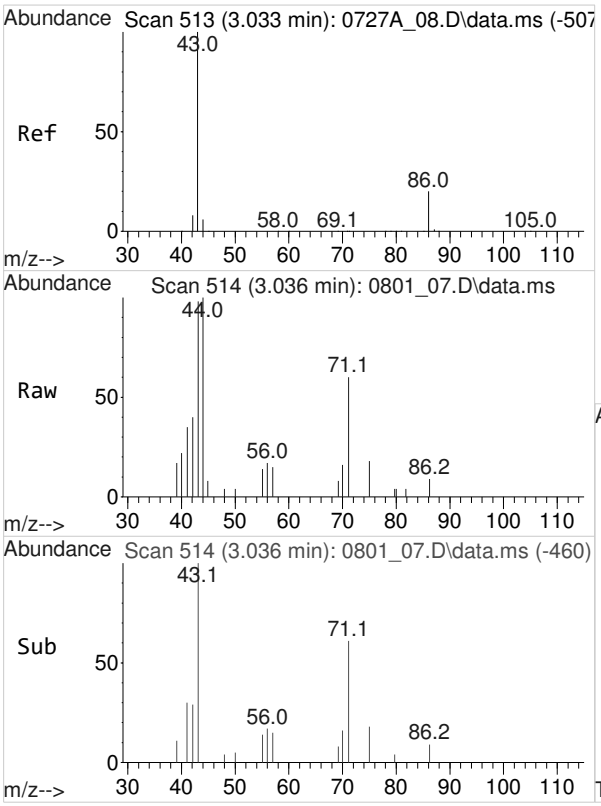


#29
TERT-BUTYL ALCOHOL
Concen: 0.1883712 ppbv
RT: 2.532 min Scan# 381
Delta R.T. -0.000 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 59 Resp: 7274

Ion	Ratio	Lower	Upper
59	100		
41	19.0	16.6	25.0

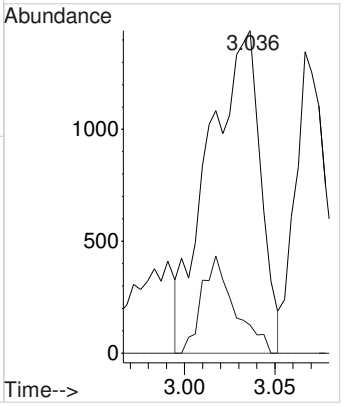


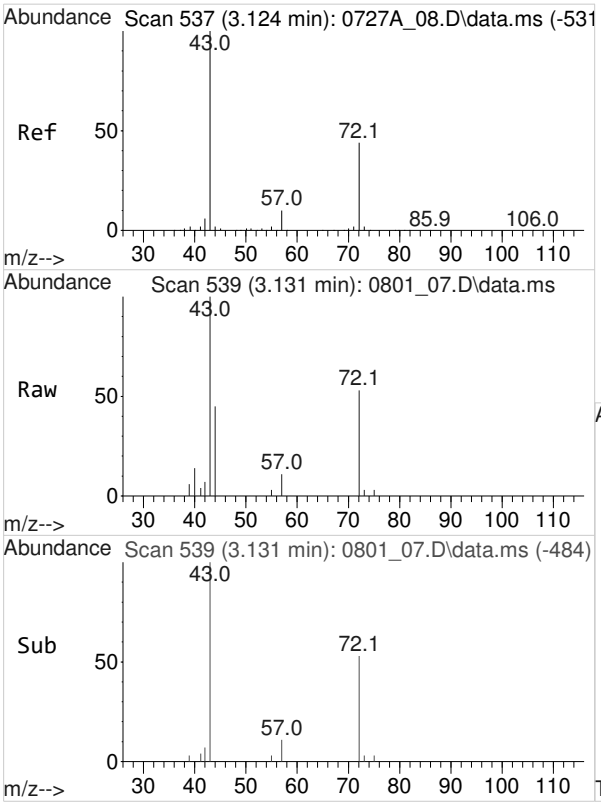


#35
Vinyl Acetate
Concen: 0.0715341 ppbv
RT: 3.036 min Scan# 514
Delta R.T. 0.003 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 43 Resp: 2861

Ion	Ratio	Lower	Upper
43	100		
86	19.2	15.4	23.0

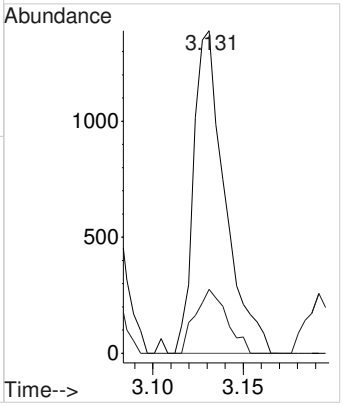


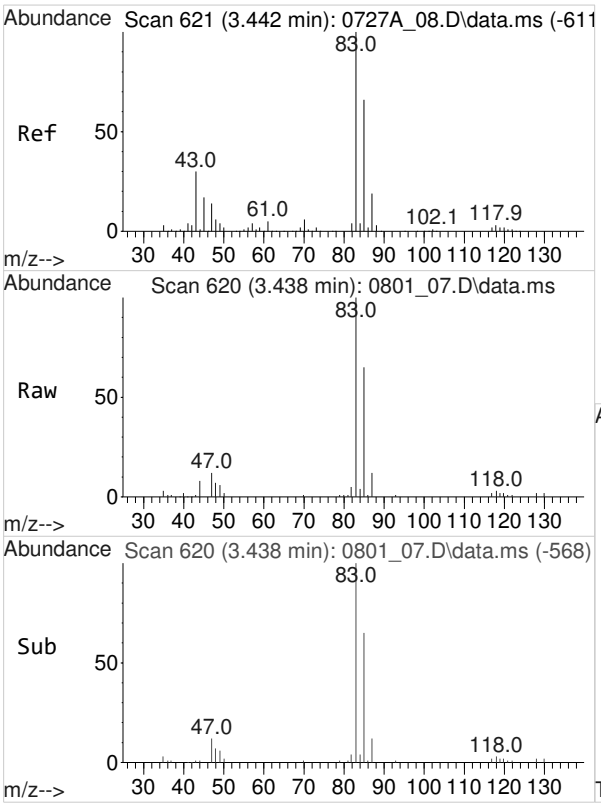


#39
2-Butanone (MEK)
Concen: 0.1085869 ppbv
RT: 3.131 min Scan# 539
Delta R.T. 0.007 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 72 Resp: 1666

Ion	Ratio	Lower	Upper
72	100		
57	20.2	18.6	27.8

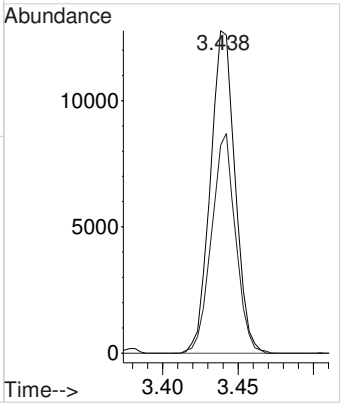


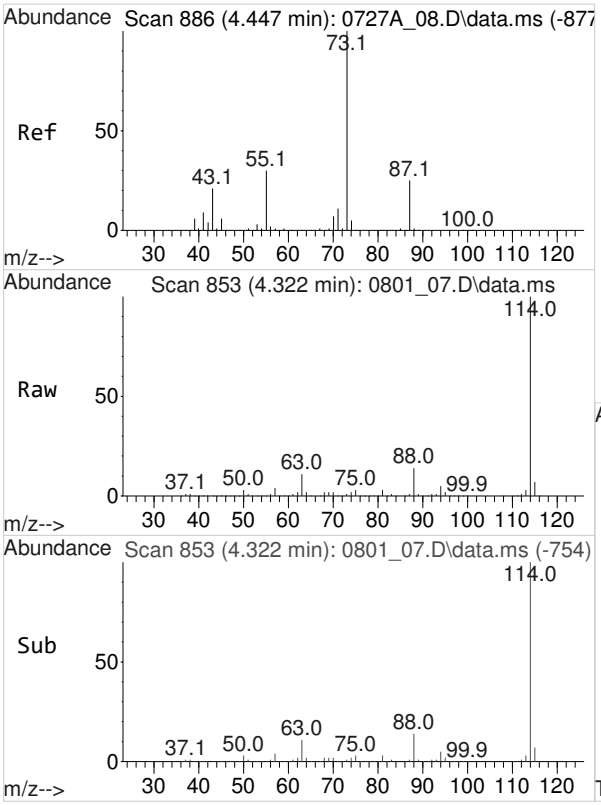


#42
Chloroform
Concen: 0.2541248 ppbv
RT: 3.438 min Scan# 620
Delta R.T. -0.004 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 83 Resp: 14584

Ion	Ratio	Lower	Upper
83	100		
85	66.2	53.4	80.2

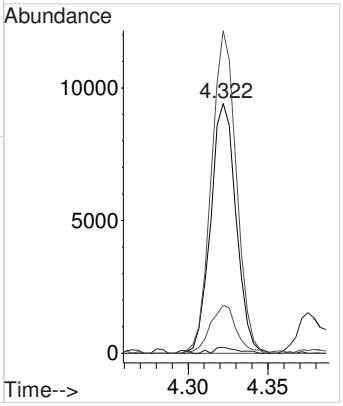


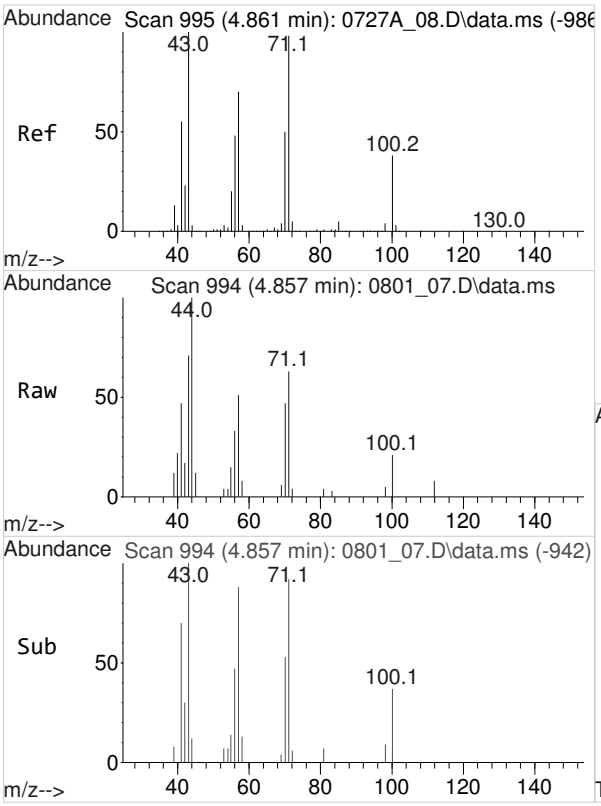


#49
TERT-AMYL METHYL ETHER
Concen: 0.1424768 ppbv
RT: 4.322 min Scan# 853
Delta R.T. -0.125 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 73 Resp: 10341

Ion	Ratio	Lower	Upper
73	100		
43	2.3	16.6	24.8#
55	19.7	23.8	35.8#
87	127.6	20.2	30.4#

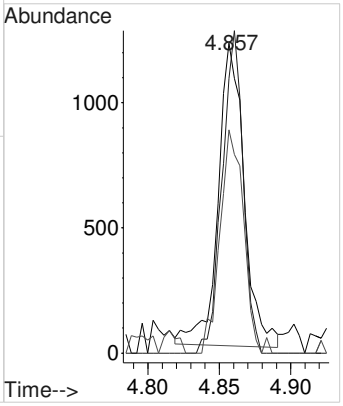


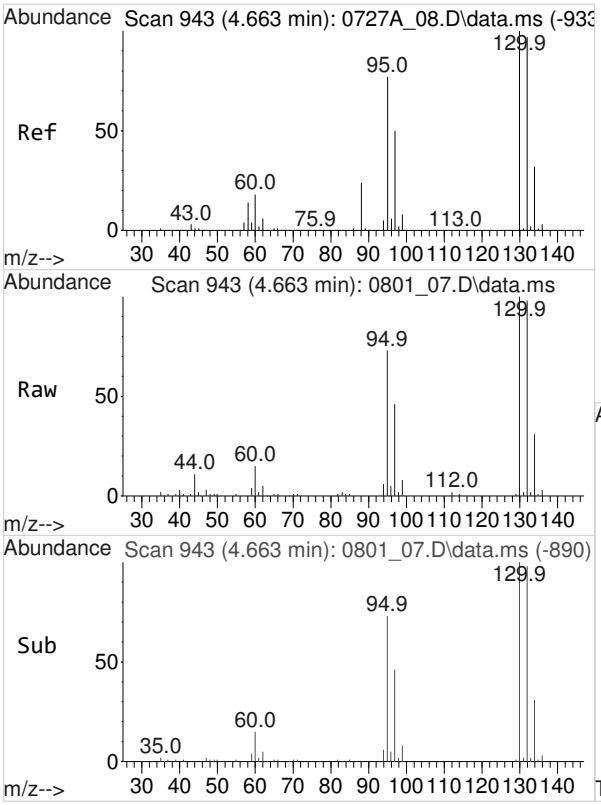


#51
Heptane
Concen: 0.0506346 ppbv
RT: 4.857 min Scan# 994
Delta R.T. -0.004 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 43 Resp: 1529

Ion	Ratio	Lower	Upper
43	100		
71	86.1	77.8	116.8
57	65.9	55.8	83.8

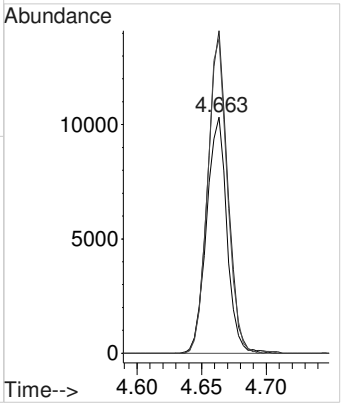


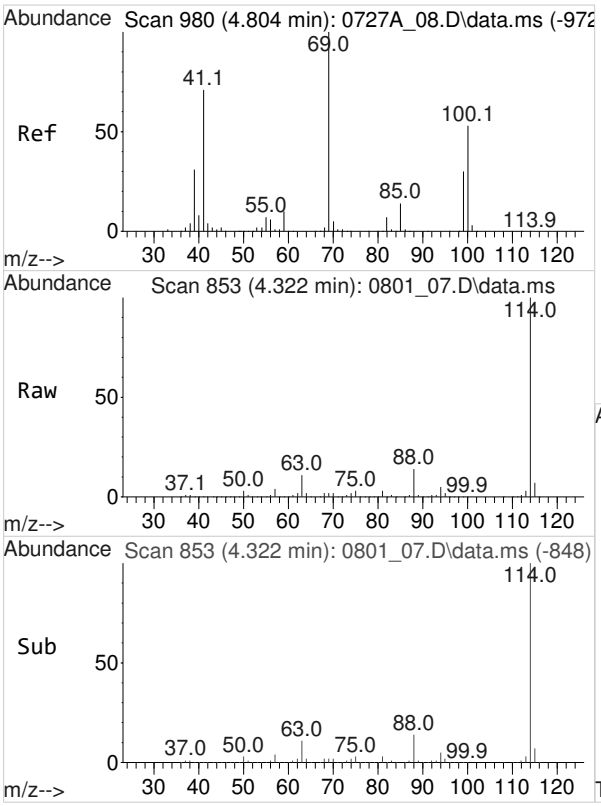


#52
Trichloroethene
Concen: 0.2560648 ppbv
RT: 4.663 min Scan# 943
Delta R.T. 0.000 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 95 Resp: 11298

Ion	Ratio	Lower	Upper
95	100		
130	133.8	103.8	155.6
132	130.0	100.6	150.8

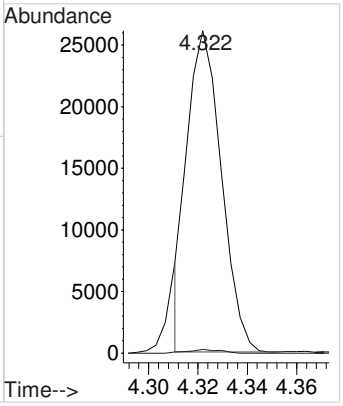


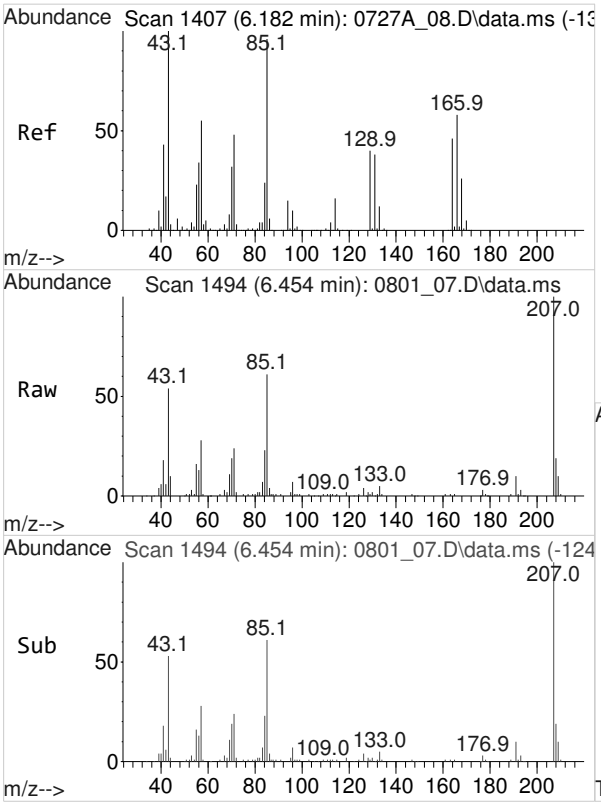


#56
Methyl Methacrylate
Concen: 0.8636102 ppbv
RT: 4.322 min Scan# 853
Delta R.T. -0.482 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 69 Resp: 25111

Ion	Ratio	Lower	Upper
69	100		
100	1.0	2.1	3.1#

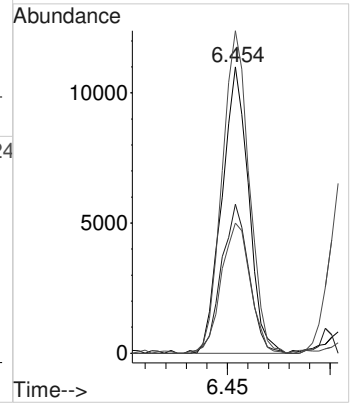


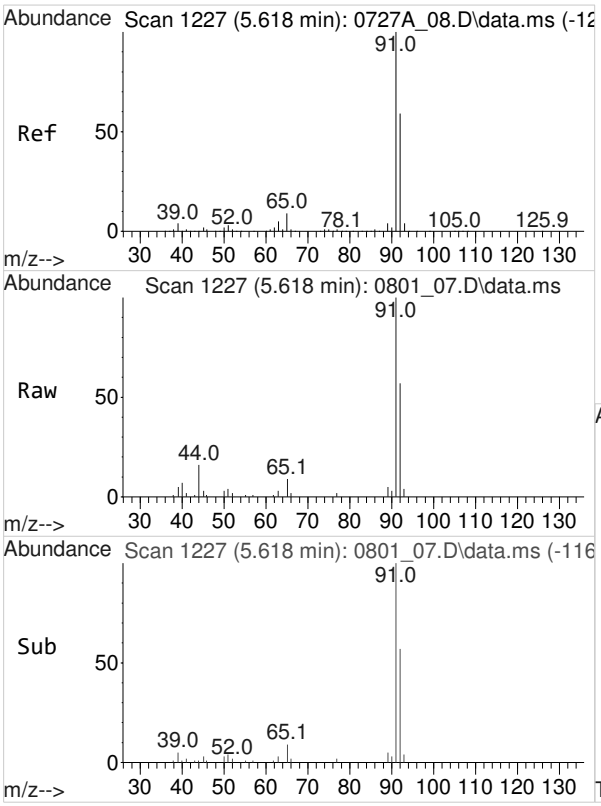


#61
n-OCTANE
Concen: 0.2550723 ppbv
RT: 6.454 min Scan# 1494
Delta R.T. 0.272 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 43 Resp: 9934

Ion	Ratio	Lower	Upper
43	100		
57	52.9	44.5	66.7
85	113.8	76.5	114.7
71	49.0	37.8	56.6

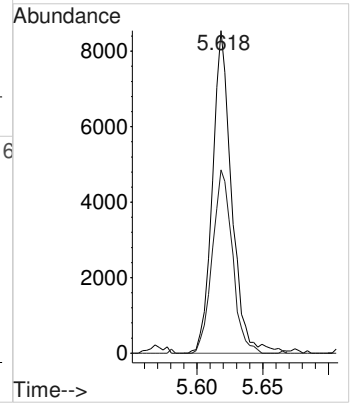


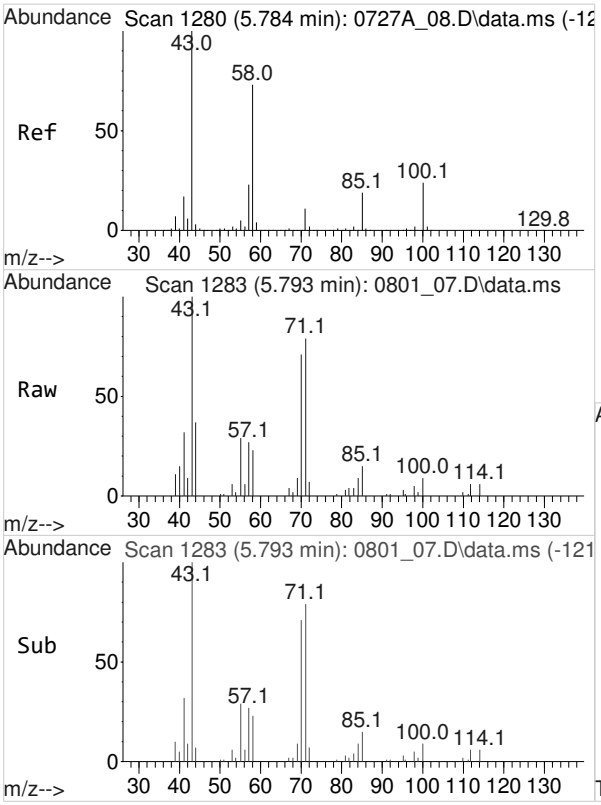


#62
Toluene
Concen: 0.0792345 ppbv
RT: 5.618 min Scan# 1227
Delta R.T. 0.000 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 91 Resp: 8739

Ion	Ratio	Lower	Upper
91	100		
92	59.0	48.1	72.1

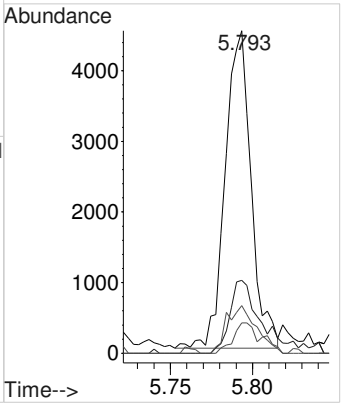


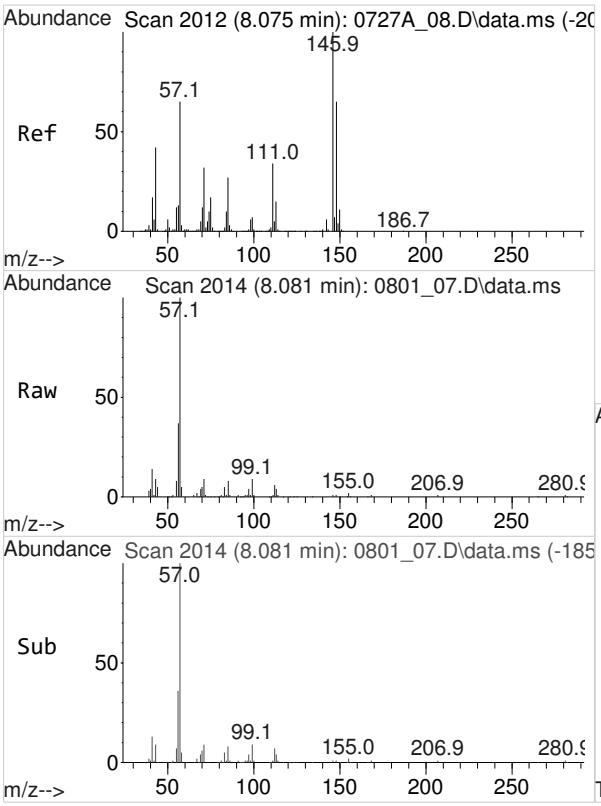


#66
Methyl Butyl Ketone
Concen: 0.1518226 ppbv
RT: 5.793 min Scan# 1283
Delta R.T. 0.009 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 43 Resp: 4936

Ion	Ratio	Lower	Upper
43	100		
58	29.0	58.2	87.4#
85	17.1	15.5	23.3
100	10.4	19.0	28.6#

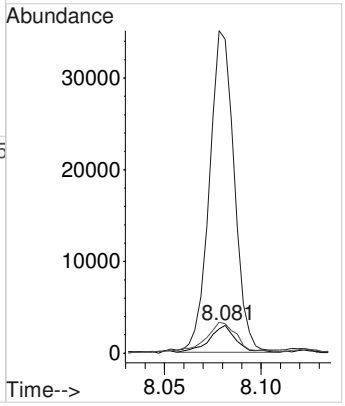


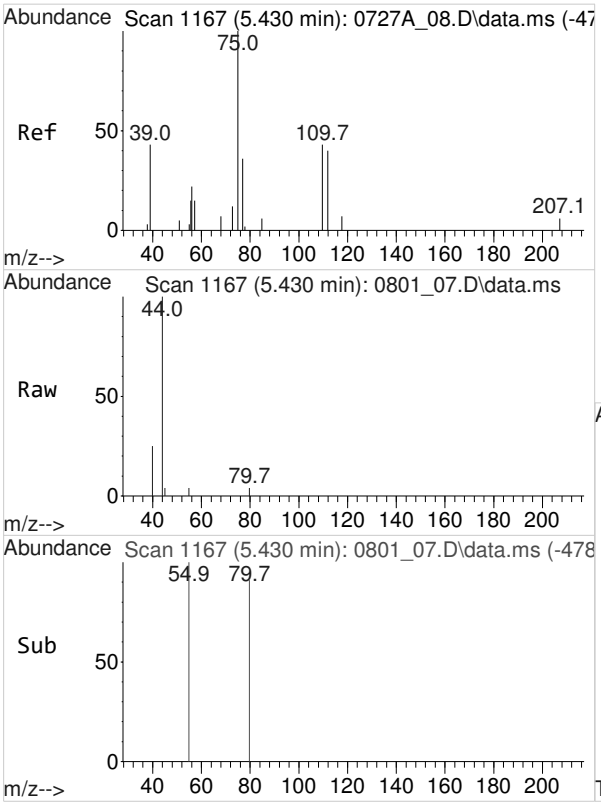


#80
n-DECANE
Concen: 0.0636380 ppbv
RT: 8.081 min Scan# 2014
Delta R.T. 0.006 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion: 43 Resp: 2765

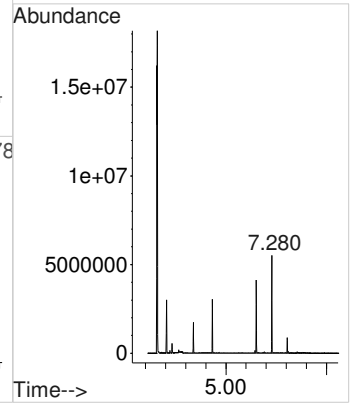
Ion	Ratio	Lower	Upper
43	100		
57	1134.0	123.8	185.8#
71	152.3	61.4	92.2#

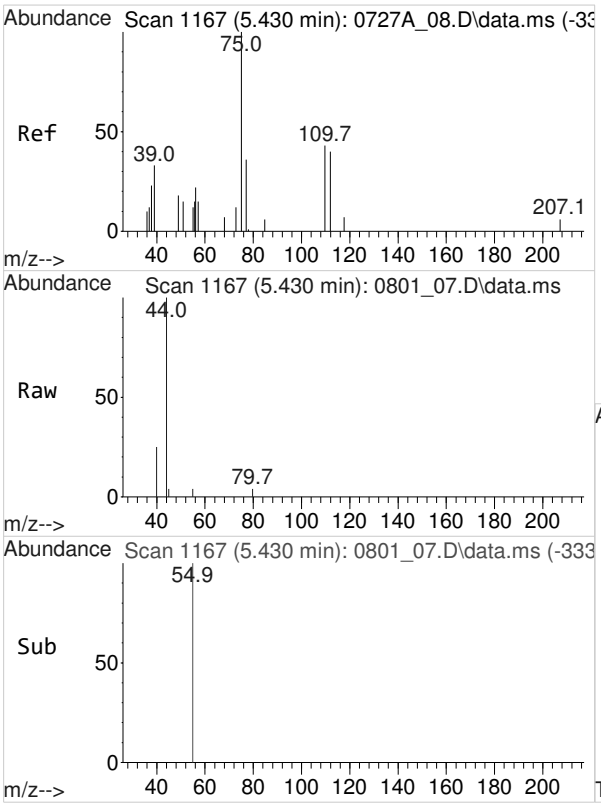




#101
TPH (GC/MS) Low Fraction
Concen: 4.5510876 ppbv m
RT: 5.430 min Scan# 1167
Delta R.T. 0.000 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

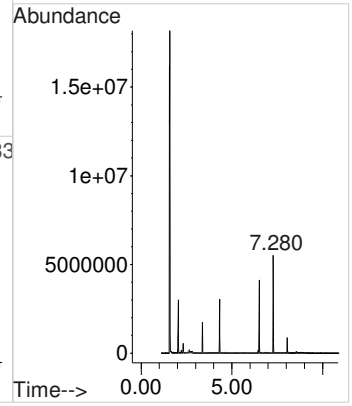
Tgt Ion:TIC Resp: 1045412





#102
TPH-GRO (C5-C10)
Concen: Below Cal m
RT: 5.430 min Scan# 1167
Delta R.T. 0.000 min
Lab File: 0801_07.D
Acq: 01 Aug 2022 01:10 pm

Tgt Ion:TIC Resp: -609783



6A-OR

GC/MS INITIAL CALIBRATION DATA

SDG: L1518164 **Analytical Method:** TO-15

Instrument ID: AIRMS7

Analyte	RRF: 0.19	RRF: 0.31	RRF: 0.63	RRF: 1.25	RRF: 2.5	RRF: 3.75	RRF: 10.0	RRF: 25	RRF: 50	RRF: 100
Analysis date/time	07/25/22 10:08	07/25/22 10:46	07/25/22 11:24	07/25/22 12:01	07/25/22 12:40	07/25/22 13:20	07/25/22 13:57	07/25/22 14:35	07/25/22 15:17	07/25/22 16:02
PROPENE	0.3310	0.2820	0.28	0.2650	0.26	0.2590	0.2480	0.2710	0.2690	0.2330
DICHLORODIFLUOROMETHANE	0.8540	0.7570	0.7740	0.7380	0.6730	0.63	0.7440	0.7530	0.6370	0.45
1,2-DICHLOROTETRAFLUOROETHANE	0.9310	0.7580	0.80	0.7560	0.7570	0.7550	0.7850	0.8560	0.8070	0.5350
CHLOROMETHANE	0.3070	0.2670	0.2940	0.2740	0.2740	0.2810	0.2890	0.3030	0.2910	0.2570
VINYL CHLORIDE	0.34	0.3050	0.3180	0.31	0.3140	0.3180	0.3270	0.3530	0.3580	0.3150
1,3-BUTADIENE	0.3740	0.3060	0.2510	0.24	0.2360	0.2450	0.2480	0.2640	0.2630	0.23
BROMOMETHANE	0.3610	0.3410	0.3120	0.2990	0.2870	0.2940	0.2940	0.3110	0.3250	0.2940
CHLOROETHANE	0.1790	0.1590	0.1510	0.1440	0.1410	0.1450	0.14	0.15	0.1540	0.1420
VINYL BROMIDE	0.3460	0.3310	0.3120	0.3030	0.3050	0.30	0.3010	0.3110	0.3210	0.2980
TRICHLOROFLUOROMETHANE	1.0380	0.9230	0.9440	0.8930	0.8920	0.8910	0.8810	0.9070	0.9090	0.8170
1,1,2-TRICHLOROTRIFLUOROETHANE	0.7740	0.67	0.6480	0.6550	0.6330	0.6310	0.6320	0.6430	0.6480	0.6290
1,1-DICHLOROETHENE	0.6030	0.5170	0.5350	0.5130	0.5270	0.5190	0.5280	0.5370	0.5330	0.4930
ACETONE	0.86	0.5990	0.5840	0.5390	0.5270	0.5120	0.4830	0.5070	0.5780	0.5280
2-PROPANOL	0.6430	0.5680	0.5310	0.5190	0.5250	0.5240	0.5520	0.5720	0.5690	0.5290
CARBON DISULFIDE	1.1540	1	1.0380	1.0190	1.0180	0.9980	1.0270	1.0490	1.0420	1.0120
ALLYL CHLORIDE	0.5190	0.4650	0.4570	0.4460	0.4470	0.4620	0.50	0.4830	0.4770	0.4630
METHYLENE CHLORIDE	0.8850	0.6610	0.4950	0.4130	0.3720	0.3610	0.3490	0.3340	0.3250	0.3080
METHYL TERT-BUTYL ETHER	0.8030	0.7470	0.75	0.7180	0.7330	0.7610	0.7920	0.8220	0.8030	0.7940
TRANS-1,2-DICHLOROETHENE	0.5370	0.4630	0.4850	0.4750	0.4770	0.4820	0.4770	0.4850	0.4680	0.4560
N-HEXANE	0.4280	0.3760	0.4170	0.4060	0.4160	0.4250	0.4490	0.4530	0.4550	0.4460
1,1-DICHLOROETHANE	0.6870	0.5890	0.5920	0.60	0.5980	0.5820	0.5850	0.5810	0.5650	0.5510
VINYL ACETATE	1.2270	1.1320	1.1480	1.1250	1.1680	1.1840	1.2840	1.3160	1.3090	1.2630
2-BUTANONE (MEK)	0.1560	0.1460	0.1490	0.1360	0.1470	0.1440	0.1460	0.1470	0.1450	0.1440
CIS-1,2-DICHLOROETHENE	0.4630	0.4130	0.4610	0.4360	0.4390	0.4350	0.45	0.4470	0.4430	0.4330
TETRAHYDROFURAN	0.3140	0.2970	0.3170	0.30	0.3080	0.3170	0.3330	0.3370	0.3320	0.3160
CHLOROFORM	0.7370	0.6610	0.6430	0.63	0.6160	0.6090	0.6050	0.6110	0.5950	0.5820
CYCLOHEXANE	0.2990	0.2730	0.3050	0.3050	0.3140	0.3210	0.3420	0.3540	0.36	0.3620
1,1,1-TRICHLOROETHANE	0.80	0.6980	0.6940	0.6880	0.6830	0.6710	0.6580	0.6670	0.6620	0.6410
CARBON TETRACHLORIDE	0.8130	0.69	0.7010	0.6850	0.6950	0.6810	0.6920	0.71	0.6910	0.6670
2,2,4-TRIMETHYLPENTANE	1.3310	1.1580	1.2630	1.2670	1.3180	1.3370	1.4240	1.4710	1.48	1.48
BENZENE	0.2560	0.2280	0.2160	0.2150	0.2180	0.2160	0.2150	0.2130	0.2150	0.2190
1,2-DICHLOROETHANE	0.1260	0.1110	0.1090	0.1090	0.1050	0.1050	0.1050	0.1050	0.1030	0.0980
HEPTANE	0.2030	0.1810	0.1960	0.20	0.21	0.2130	0.2240	0.2250	0.2220	0.2160
TRICHLOROETHENE	0.1090	0.0940	0.0990	0.0950	0.0950	0.0940	0.0960	0.0980	0.0960	0.0980
1,2-DICHLOROPROPANE	0.10	0.0880	0.0860	0.0840	0.0850	0.0860	0.0850	0.0840	0.0840	0.0840
METHYL METHACRYLATE	0.08	0.0750	0.0810	0.0770	0.0780	0.08	0.0860	0.0870	0.0880	0.0880
1,4-DIOXANE	0.0420	0.0380	0.0410	0.0370	0.0380	0.0390	0.0460	0.0470	0.0480	0.0490
BROMODICHLOROMETHANE	0.2080	0.1730	0.1740	0.1670	0.1690	0.1650	0.1670	0.1710	0.1670	0.1650
CIS-1,3-DICHLOROPROPENE	0.1350	0.1210	0.1240	0.1220	0.1260	0.1280	0.1360	0.1410	0.1410	0.1420
4-METHYL-2-PENTANONE (MIBK)	0.1750	0.1570	0.1660	0.1530	0.1660	0.1650	0.1790	0.1820	0.1790	0.1740
TOLUENE	0.29	0.2470	0.2620	0.2550	0.2640	0.2610	0.2650	0.2710	0.2760	0.2810
TRANS-1,3-DICHLOROPROPENE	0.1280	0.1210	0.1260	0.1190	0.1220	0.1240	0.13	0.1350	0.1370	0.1350
1,1,2-TRICHLOROETHANE	0.1040	0.0940	0.10	0.0940	0.0940	0.0920	0.0930	0.0940	0.0940	0.0950
TETRACHLOROETHENE	0.1520	0.1320	0.13	0.1270	0.1280	0.1260	0.1290	0.1320	0.1340	0.1360
METHYL BUTYL KETONE	0.1560	0.1330	0.1430	0.14	0.1490	0.15	0.1750	0.1780	0.1790	0.1750
CHLORODIBROMOMETHANE	0.1910	0.1670	0.1740	0.1630	0.1670	0.1660	0.1690	0.1760	0.1780	0.18
1,2-DIBROMOETHANE	0.1640	0.1350	0.1490	0.1380	0.1440	0.1450	0.1470	0.1510	0.1530	0.1550
CHLOROBENZENE	0.2450	0.2080	0.2150	0.2050	0.2030	0.2020	0.2060	0.2130	0.2160	0.22
ETHYLBENZENE	0.3870	0.3480	0.3550	0.3510	0.3550	0.3540	0.37	0.3750	0.3760	0.3790
M&P-XYLENE	0.28	0.2470	0.26	0.2650	0.2720	0.2780	0.2910	0.3030	0.3070	

GC/MS INITIAL CALIBRATION DATA

SDG: L1518164 **Analytical Method:** TO-15

Instrument ID: AIRMS7

Analyte	**RRF: 0.19**	**RRF: 0.31**	**RRF: 0.63**	**RRF: 1.25**	**RRF: 2.5**	**RRF: 3.75**	**RRF: 10.0**	**RRF: 25**	**RRF: 50**	**RRF: 100**
Analysis date/time	07/25/22 10:08	07/25/22 10:46	07/25/22 11:24	07/25/22 12:01	07/25/22 12:40	07/25/22 13:20	07/25/22 13:57	07/25/22 14:35	07/25/22 15:17	07/25/22 16:02
O-XYLENE	0.2610	0.2370	0.2370	0.2420	0.2510	0.2650	0.29	0.3080	0.3130	0.3080
STYRENE	0.2110	0.19	0.20	0.2150	0.2350	0.2410	0.2540	0.2660	0.2690	0.2640
BROMOFORM	0.2010	0.18	0.1730	0.1760	0.1720	0.1760	0.1810	0.1940	0.2010	0.1970
ISOPROPYLBENZENE	0.3070	0.3030	0.3280	0.3350	0.3620	0.38	0.4220	0.4470	0.4530	0.4440
1,1,2,2-TETRACHLOROETHANE	0.2760	0.2390	0.2490	0.2340	0.2320	0.2330	0.2380	0.2490	0.2510	0.2410
4-ETHYLTOLUENE	0.39	0.3570	0.4060	0.4150	0.4340	0.4450	0.4780	0.5110	0.5270	0.5090
2-CHLOROTOLUENE	0.3680	0.3450	0.3670	0.3730	0.3770	0.3790	0.3970	0.42	0.4260	0.4140
1,3,5-TRIMETHYLBENZENE	0.3590	0.3170	0.3680	0.3650	0.3820	0.3890	0.4160	0.4450	0.4430	0.4350
1,2,4-TRIMETHYLBENZENE	0.3150	0.2730	0.3240	0.3590	0.3830	0.3910	0.4260	0.4570	0.4610	0.4370
1,3-DICHLOROBENZENE	0.2680	0.2260	0.2590	0.2590	0.2650	0.2690	0.2870	0.3110	0.3140	0.2960
1,4-DICHLOROBENZENE	0.25	0.2210	0.2510	0.2520	0.2650	0.2720	0.2920	0.3190	0.3230	0.3070
BENZYL CHLORIDE	0.2940	0.2460	0.2950	0.3020	0.3180	0.3360	0.3890	0.43	0.4390	0.4170
1,2-DICHLOROBENZENE	0.2360	0.2240	0.25	0.2480	0.2590	0.2660	0.2830	0.3080	0.3080	0.2860
HEXACHLORO-1,3-BUTADIENE	0.2890	0.2430	0.2660	0.2620	0.2630	0.2660	0.2820	0.3070	0.3110	0.2880
1,4-BROMOFLUOROBENZENE	0.71	0.7150	0.7150	0.7290	0.7280	0.7310	0.7470	0.7760	0.7690	0.7240
ETHANOL			0.1990	0.1350	0.1250	0.13	0.1290	0.1260	0.1250	0.1170
1,2,4-TRICHLOROBENZENE			0.1720	0.18	0.2090	0.2280	0.2620	0.3090	0.32	0.2980
NAPHTHALENE			0.3620	0.3940	0.4490	0.4960	0.6170	0.7160	0.7450	
File ID:	0725_03	0725_04	0725_05	0725_06	0725_07	0725_08	0725_09	0725_10	0725_11	0725_12

GC/MS INITIAL CALIBRATION DATA

SDG: L1518164 **Analytical Method:** TO-15

Instrument ID: AIRMS7

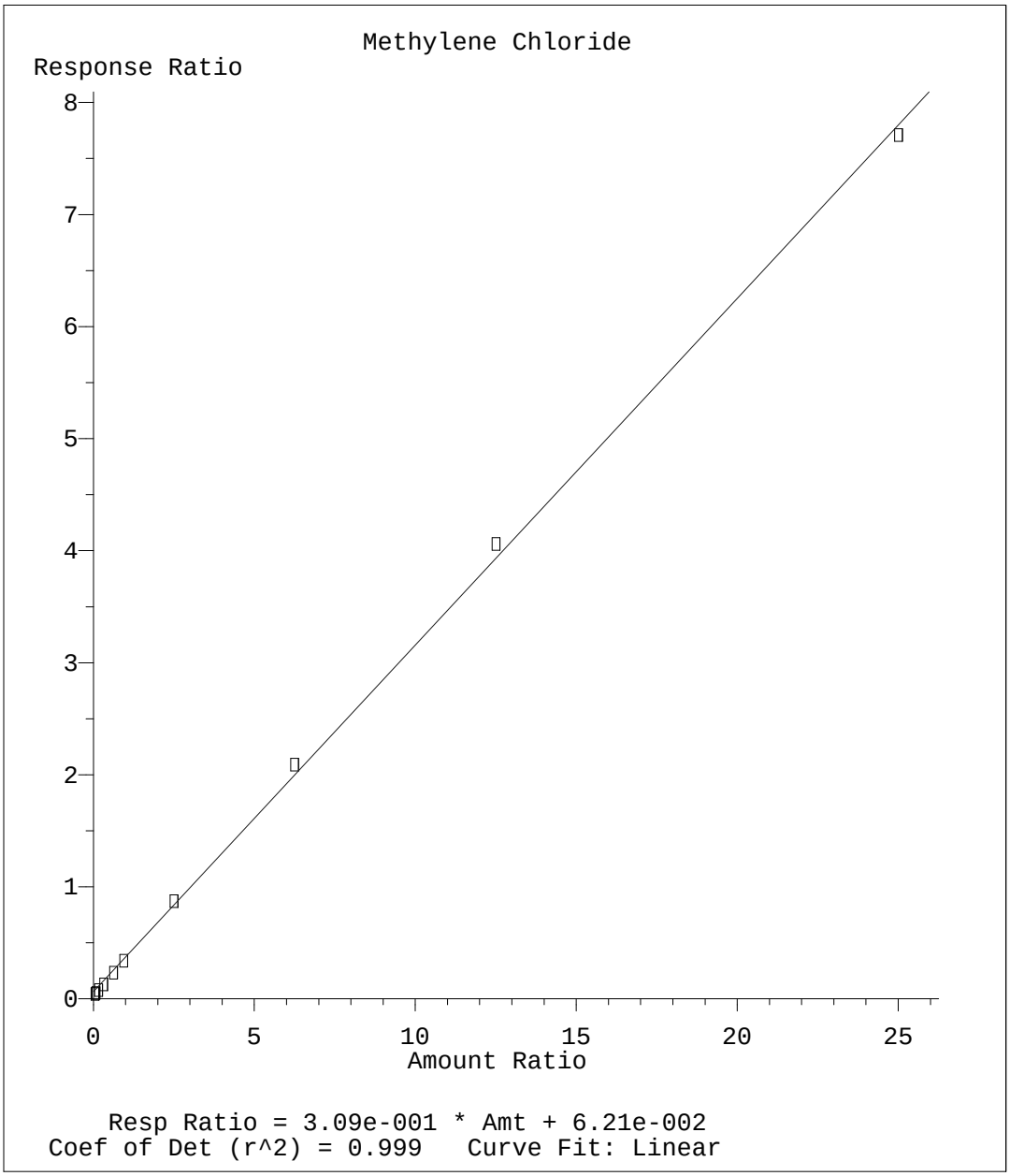
Analyte Analysis date/time	RRF. Avg	%RSD	COD
PROPENE	0.269724	9.68	
DICHLORODIFLUOROMETHANE	0.700919	15.82	
1,2-DICHLOROTETRAFLUOROETHANE	0.774136	13.03	
CHLOROMETHANE	0.283807	5.7	
VINYL CHLORIDE	0.325837	5.61	
1,3-BUTADIENE	0.265591	16.46	
BROMOMETHANE	0.311779	7.65	
CHLOROETHANE	0.150367	7.75	
VINYL BROMIDE	0.312773	4.99	
TRICHLOROFLUOROMETHANE	0.909504	6.14	
1,1,2-TRICHLOROTRIFLUOROETHANE	0.656275	6.59	
1,1-DICHLOROETHENE	0.53057	5.41	
ACETONE	0.571761	18.87	
2-PROPANOL	0.553321	6.82	
CARBON DISULFIDE	1.035843	4.32	
ALLYL CHLORIDE	0.47168	4.93	
METHYLENE CHLORIDE	0.450387	41.25	0.999
METHYL TERT-BUTYL ETHER	0.772231	4.53	
TRANS-1,2-DICHLOROETHENE	0.480684	4.56	
N-HEXANE	0.427211	5.83	
1,1-DICHLOROETHANE	0.593062	6.13	
VINYL ACETATE	1.215757	6.06	
2-BUTANONE (MEK)	0.145892	3.4	
CIS-1,2-DICHLOROETHENE	0.442166	3.28	
TETRAHYDROFURAN	0.316931	4.29	
CHLOROFORM	0.628797	7.04	
CYCLOHEXANE	0.323583	9.23	
1,1,1-TRICHLOROETHANE	0.686117	6.37	
CARBON TETRACHLORIDE	0.702284	5.76	
2,2,4-TRIMETHYLPENTANE	1.352775	8.05	
BENZENE	0.2212	5.74	
1,2-DICHLOROETHANE	0.10763	7.04	
HEPTANE	0.208996	6.69	
TRICHLOROETHENE	0.097367	4.46	
1,2-DICHLOROPROPANE	0.086578	5.59	
METHYL METHACRYLATE	0.081787	5.88	
1,4-DIOXANE	0.042456	10.62	
BROMODICHLOROMETHANE	0.172547	7.45	
CIS-1,3-DICHLOROPROPENE	0.131697	6.35	
4-METHYL-2-PENTANONE (MIBK)	0.169329	5.76	
TOLUENE	0.267335	4.74	
TRANS-1,3-DICHLOROPROPENE	0.127827	5.17	
1,1,2-TRICHLOROETHANE	0.095459	3.9	
TETRACHLOROETHENE	0.13243	5.63	
METHYL BUTYL KETONE	0.157805	11.1	
CHLORODIBROMOMETHANE	0.173356	4.87	
1,2-DIBROMOETHANE	0.148182	5.75	
CHLOROBENZENE	0.213492	5.92	
ETHYLBENZENE	0.364889	3.76	
M&P-XYLENE	0.278095	7.14	
O-XYLENE	0.271267	11.36	

GC/MS INITIAL CALIBRATION DATA

SDG: L1518164 **Analytical Method:** TO-15

Instrument ID: AIRMS7

Analyte Analysis date/time	RRF. Avg	%RSD	COD
STYRENE	0.234686	12.35	
BROMOFORM	0.184988	6.34	
ISOPROPYLBENZENE	0.378028	15.73	
1,1,2,2-TETRACHLOROETHANE	0.244284	5.47	
4-ETHYLTOLUENE	0.447065	12.85	
2-CHLOROTOLUENE	0.386562	6.85	
1,3,5-TRIMETHYLBENZENE	0.391991	10.74	
1,2,4-TRIMETHYLBENZENE	0.382461	16.77	
1,3-DICHLOROBENZENE	0.275366	9.78	
1,4-DICHLOROBENZENE	0.275371	12.29	
BENZYL CHLORIDE	0.346502	19.4	
1,2-DICHLOROBENZENE	0.266765	10.78	
HEXACHLORO-1,3-BUTADIENE	0.277881	7.73	
1,4-BROMOFLUOROBENZENE	0.73435	3.08	
ETHANOL	0.135794	19.14	
1,2,4-TRICHLOROBENZENE	0.247324	23.66	
NAPHTHALENE	0.539723	28.57	



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Response Factor Report AIRMS7

Method Path : C:\msdchem\1\methods\
Method File : TOAIRMS7G25V.M
Title :
Last Update : Mon Jul 25 16:35:00 2022
Response Via : Initial Calibration

Calibration Files
0.19=0725_03.D 0.31=0725_04.D 0.63=0725_05.D 1.25=0725_06.D 2.5 =0725_07.D 3.75=0725_08.D 10.0=0725_09.D
25 =0725_10.D 50 =0725_11.D 100 =0725_12.D

		Compound	0.19	0.31	0.63	1.25	2.5	3.75	10.0	25	50	100	Avg	%RSD
1)	I	Bromochloromethane	----------ISTD----------											
2)	T,M	Propene	0.331	0.282	0.280	0.265	0.260	0.259	0.248	0.271	0.269	0.233	0.270	9.68
3)	T	BUTANE	1.070	0.945	0.940	0.893	0.884	0.907	0.472	0.504	0.507		0.791	28.99
4)		1,1-DIFLUOROET...			0.236	0.199	0.186	0.179	0.174	0.189	0.188	0.164	0.189	11.42
5)	T,M	Dichlorodifluo...	0.854	0.757	0.774	0.738	0.673	0.630	0.744	0.753	0.637	0.450	0.701	15.82
6)		CHLORODIFLUORO...	0.095	0.085	0.086	0.083	0.084	0.081	0.084	0.089	0.087	0.075	0.085	6.05
7)	T,M	1,2-Dichlorote...	0.931	0.758	0.800	0.756	0.757	0.755	0.785	0.856	0.807	0.535	0.774	13.03
8)	T,M	Chloromethane	0.307	0.267	0.294	0.274	0.274	0.281	0.289	0.303	0.291	0.257	0.284	5.70
9)	T,M	Vinyl Chloride	0.340	0.305	0.318	0.310	0.314	0.318	0.327	0.353	0.358	0.315	0.326	5.61
10)	T,M	1,3-Butadiene	0.374	0.306	0.251	0.240	0.236	0.245	0.248	0.264	0.263	0.230	0.266	16.46
11)	T,M	Bromomethane	0.361	0.341	0.312	0.299	0.287	0.294	0.294	0.311	0.325	0.294	0.312	7.65
12)	T,M	Chloroethane	0.179	0.159	0.151	0.144	0.141	0.145	0.140	0.150	0.154	0.142	0.150	7.75
13)	T	ISOPENTANE	0.410	0.374	0.323	0.309	0.314	0.318	0.314	0.319	0.330	0.296	0.331	10.50
14)	T,M	Vinyl Bromide	0.346	0.331	0.312	0.303	0.305	0.300	0.301	0.311	0.321	0.298	0.313	4.99
15)	T,M	Trichlorofluor...	1.038	0.923	0.944	0.893	0.892	0.891	0.881	0.907	0.909	0.817	0.910	6.14
16)	T	PENTANE	0.668	0.548	0.514	0.493	0.489	0.482	0.470	0.488	0.498	0.462	0.511	11.78
17)	T,M	Ethanol			0.199	0.135	0.125	0.130	0.129	0.126	0.125	0.117	0.136	19.14
18)	T	ACROLEIN	0.145	0.134	0.135	0.129	0.128	0.132	0.137	0.143	0.142	0.133	0.136	4.39
19)	T,M	1,1,2-Trichlor...	0.774	0.670	0.648	0.655	0.633	0.631	0.632	0.643	0.648	0.629	0.656	6.59
20)	T,M	1,1-Dichloroet...	0.603	0.517	0.535	0.513	0.527	0.519	0.528	0.537	0.533	0.493	0.531	5.41
21)	T,M	Acetone	0.860	0.599	0.584	0.539	0.527	0.512	0.483	0.507	0.578	0.528	0.572	18.87
22)	T	BROMOETHANE	0.292	0.268	0.266	0.249	0.241	0.248	0.245	0.254	0.252	0.242	0.256	6.18
23)	T,M	2-Propanol	0.643	0.568	0.531	0.519	0.525	0.524	0.552	0.572	0.569	0.529	0.553	6.82
24)	T,M	Carbon Disulfide	1.154	1.000	1.038	1.019	1.018	0.998	1.027	1.049	1.042	1.012	1.036	4.32
25)	T,M	Allyl Chloride	0.519	0.465	0.457	0.446	0.447	0.462	0.500	0.483	0.477	0.463	0.472	4.93
26)	T	METHYL ACETATE	0.695	0.587	0.644	0.619	0.608	0.603	0.627	0.631	0.610	0.573	0.620	5.42
27)	T	ACETONITRILE	0.289	0.247	0.269	0.259	0.255	0.255	0.249	0.250	0.247	0.236	0.255	5.74
28)	T,M	Methylene Chlo...	0.885	0.661	0.495	0.413	0.372	0.361	0.349	0.334	0.325	0.308	0.450	41.25
29)		TERT-BUTYL ALC...	0.631	0.572	0.594	0.578	0.589	0.600	0.645	0.660	0.645	0.628	0.614	5.09
30)	T,M	Methyl Tert-Bu...	0.803	0.747	0.750	0.718	0.733	0.761	0.792	0.822	0.803	0.794	0.772	4.53
31)	T,M	Trans-1,2-Dich...	0.537	0.463	0.485	0.475	0.477	0.482	0.477	0.485	0.468	0.456	0.481	4.56
32)	T	ACRYLONITRILE	0.304	0.252	0.260	0.259	0.259	0.256	0.262	0.260	0.256	0.252	0.262	5.76
33)	T,M	n-Hexane	0.428	0.376	0.417	0.406	0.416	0.425	0.449	0.453	0.455	0.446	0.427	5.83
34)	T,M	1,1-Dichloroet...	0.687	0.589	0.592	0.600	0.598	0.582	0.585	0.581	0.565	0.551	0.593	6.13
35)	T,M	Vinyl Acetate	1.227	1.132	1.148	1.125	1.168	1.184	1.284	1.316	1.309	1.263	1.216	6.06
36)	T	DI-ISOPROPYL E...	0.878	0.775	0.858	0.843	0.875	0.906	0.960	0.977	0.961	0.939	0.897	7.11
37)	T	ETHYL TERT-BUT...	0.908	0.797	0.861	0.825	0.858	0.897	0.983	1.010	1.010	1.004	0.915	8.87
38)		ETHYL ACETATE	0.104	0.095	0.109	0.095	0.103	0.099	0.106	0.106	0.102	0.098	0.102	4.76
39)	T,M	2-Butanone (MEK)	0.156	0.146	0.149	0.136	0.147	0.144	0.146	0.147	0.145	0.144	0.146	3.40
40)	T,M	cis-1,2-Dichlo...	0.463	0.413	0.461	0.436	0.439	0.435	0.450	0.447	0.443	0.433	0.442	3.28

Method Path : C:\msdchem\1\methods\
Method File : TOAIRMS7G25V.M
Title :

41)	T,M	Tetrahydrofuran	0.314	0.297	0.317	0.300	0.308	0.317	0.333	0.337	0.332	0.316	0.317	4.29
42)	T,M	Chloroform	0.737	0.661	0.643	0.630	0.616	0.609	0.605	0.611	0.595	0.582	0.629	7.04
43)	T,M	Cyclohexane	0.299	0.273	0.305	0.305	0.314	0.321	0.342	0.354	0.360	0.362	0.324	9.23
44)	T,M	1,1,1-Trichlor...	0.800	0.698	0.694	0.688	0.683	0.671	0.658	0.667	0.662	0.641	0.686	6.37
45)	T,M	Carbon Tetrach...	0.813	0.690	0.701	0.685	0.695	0.681	0.692	0.710	0.691	0.667	0.702	5.76
46)	T,M	2,2,4-Trimethy...	1.331	1.158	1.263	1.267	1.318	1.337	1.424	1.471	1.480	1.480	1.353	8.05
47)	I	1,4-Difluorobenzene	----------ISTD----------											
48)	T,M	Benzene	0.256	0.228	0.216	0.215	0.218	0.216	0.215	0.213	0.215	0.219	0.221	5.74
49)	T	TERT-AMYL METH...	0.203	0.181	0.187	0.188	0.199	0.199	0.219	0.224	0.226	0.229	0.206	8.74
50)	T,M	1,2-Dichloroet...	0.126	0.111	0.109	0.109	0.105	0.105	0.105	0.105	0.103	0.098	0.108	7.04
51)	T,M	Heptane	0.203	0.181	0.196	0.200	0.210	0.213	0.224	0.225	0.222	0.216	0.209	6.69
52)	T,M	Trichloroethene	0.109	0.094	0.099	0.095	0.095	0.094	0.096	0.098	0.096	0.098	0.097	4.46
53)		TERT-AMYL ETHY...	0.075	0.065	0.062	0.059	0.060	0.063	0.070	0.072	0.073	0.073	0.067	9.04
54)		METHYL CYCLOHE...	0.127	0.128	0.125	0.127	0.132	0.136	0.137	0.139	0.141	0.145	0.134	5.14
55)	T,M	1,2-Dichloropr...	0.100	0.088	0.086	0.084	0.085	0.086	0.085	0.084	0.084	0.084	0.087	5.59
56)	T,M	Methyl Methacr...	0.080	0.075	0.081	0.077	0.078	0.080	0.086	0.087	0.088	0.088	0.082	5.88
57)	T,M	1,4-Dioxane	0.042	0.038	0.041	0.037	0.038	0.039	0.046	0.047	0.048	0.049	0.042	10.62
58)	T,M	Bromodichlorom...	0.208	0.173	0.174	0.167	0.169	0.165	0.167	0.171	0.167	0.165	0.173	7.45
59)	T,M	cis-1,3-Dichlo...	0.135	0.121	0.124	0.122	0.126	0.128	0.136	0.141	0.141	0.142	0.132	6.35
60)	T,M	4-Methyl-2-Pen...	0.175	0.157	0.166	0.153	0.166	0.165	0.179	0.182	0.179	0.174	0.169	5.76
61)	T	n-OCTANE	0.190	0.167	0.176	0.185	0.201	0.206	0.212	0.216	0.215	0.208	0.198	8.60
62)	T,M	Toluene	0.290	0.247	0.262	0.255	0.264	0.261	0.265	0.271	0.276	0.281	0.267	4.74
63)	T,M	trans-1,3-Dich...	0.128	0.121	0.126	0.119	0.122	0.124	0.130	0.135	0.137	0.135	0.128	5.17
64)	T,M	1,1,2-Trichlor...	0.104	0.094	0.100	0.094	0.094	0.092	0.093	0.094	0.094	0.095	0.095	3.90
65)	T,M	Tetrachloroethene	0.152	0.132	0.130	0.127	0.128	0.126	0.129	0.132	0.134	0.136	0.132	5.63
66)	T,M	Methyl Butyl K...	0.156	0.133	0.143	0.140	0.149	0.150	0.175	0.178	0.179	0.175	0.158	11.10
67)	T,M	Chlorodibromom...	0.191	0.167	0.174	0.163	0.167	0.166	0.169	0.176	0.178	0.180	0.173	4.87
68)	T,M	1,2-Dibromoethane	0.164	0.135	0.149	0.138	0.144	0.145	0.147	0.151	0.153	0.155	0.148	5.75
69)	T,M	Chlorobenzene	0.245	0.208	0.215	0.205	0.203	0.202	0.206	0.213	0.216	0.220	0.213	5.92
70)	T	NONANE	0.236	0.204	0.201	0.193	0.210	0.218	0.226	0.234	0.232	0.221	0.217	6.90
71)	I	Chlorobenzene-d5	----------ISTD----------											
72)	T,M	Ethylbenzene	0.387	0.348	0.355	0.351	0.355	0.354	0.370	0.375	0.376	0.379	0.365	3.76
73)	T,M	M&P-Xylene	0.280	0.247	0.260	0.265	0.272	0.278	0.291	0.303	0.307		0.278	7.14
74)	T,M	O-Xylene	0.261	0.237	0.237	0.242	0.251	0.265	0.290	0.308	0.313	0.308	0.271	11.36
75)		TOTAL XYLENES											0.000	-1.00
76)		XYLENES, TOTAL											0.000	-1.00
77)	T,M	Styrene	0.211	0.190	0.200	0.215	0.235	0.241	0.254	0.266	0.269	0.264	0.235	12.35
78)	T,M	Bromoform	0.201	0.180	0.173	0.176	0.172	0.176	0.181	0.194	0.201	0.197	0.185	6.34
79)	T,M	Isopropylbenzene	0.307	0.303	0.328	0.335	0.362	0.380	0.422	0.447	0.453	0.444	0.378	15.73
80)	T	n-DECANE	0.231	0.220	0.241	0.253	0.261	0.267	0.280	0.287	0.273	0.240	0.255	8.64
81)	T,M	1,1,2,2-Tetrac...	0.276	0.239	0.249	0.234	0.232	0.233	0.238	0.249	0.251	0.241	0.244	5.47
82)	T,M	n-Propylbenzene	0.532	0.489	0.524	0.539	0.552	0.558	0.581	0.617	0.626		0.558	7.92
83)	T,M	4-Ethyltoluene	0.390	0.357	0.406	0.415	0.434	0.445	0.478	0.511	0.527	0.509	0.447	12.85
84)	T,M	2-Chlorotoluene	0.368	0.345	0.367	0.373	0.377	0.379	0.397	0.420	0.426	0.414	0.387	6.85
85)	S	1,4-Bromofluor...	0.710	0.715	0.715	0.729	0.728	0.731	0.747	0.776	0.769	0.724	0.734	3.08
86)	T,M	1,3,5-Trimethy...	0.359	0.317	0.368	0.365	0.382	0.389	0.416	0.445	0.443	0.435	0.392	10.74
87)	T,M	tert-Butylbenzene	0.301	0.275	0.298	0.313	0.334	0.349	0.388	0.421	0.424	0.404	0.351	15.69
88)	T,M	1,2,4-Trimethy...	0.315	0.273	0.324	0.359	0.383	0.391	0.426	0.457	0.461	0.437	0.382	16.77

Method Path : C:\msdchem\1\methods\
Method File : TOAIRMS7G25V.M
Title :

89)	T,M	sec-Butylbenzene	0.461	0.420	0.496	0.513	0.539	0.559	0.612	0.660	0.665	0.547	15.64
90)	T,M	1,3-Dichlorobe...	0.268	0.226	0.259	0.259	0.265	0.269	0.287	0.311	0.314	0.296	0.275	9.78
91)	T	P-ISOPROPYLTOL...	0.379	0.338	0.401	0.426	0.457	0.475	0.525	0.569	0.575	0.535	0.468	17.53
92)	T,M	1,4-Dichlorobe...	0.250	0.221	0.251	0.252	0.265	0.272	0.292	0.319	0.323	0.307	0.275	12.29
93)		1,2,3-TRIMETHY...	0.338	0.286	0.353	0.354	0.382	0.395	0.439	0.476	0.483	0.462	0.397	16.66
94)	T,M	Benzyl Chloride	0.294	0.246	0.295	0.302	0.318	0.336	0.389	0.430	0.439	0.417	0.347	19.40
95)	T,M	n-Butylbenzene	0.381	0.326	0.408	0.424	0.460	0.482	0.532	0.575	0.573	0.522	0.468	17.85
96)	T,M	1,2-Dichlorobe...	0.236	0.224	0.250	0.248	0.259	0.266	0.283	0.308	0.308	0.286	0.267	10.78
97)	T	1,2-DIBROMO-3-...	0.122	0.113	0.120	0.116	0.122	0.129	0.140	0.160	0.163	0.150	0.133	13.86
98)	T,M	1,2,4-Trichlor...			0.172	0.180	0.209	0.228	0.262	0.309	0.320	0.298	0.247	23.66
99)	T,M	Hexachloro-1,3...	0.289	0.243	0.266	0.262	0.263	0.266	0.282	0.307	0.311	0.288	0.278	7.73
100)	T,M	Naphthalene			0.362	0.394	0.449	0.496	0.617	0.716	0.745	0.540	28.57	
101)	h,n,	MTPH (GC/MS) Lo...			0.663	0.633	0.616	0.616	0.620	0.625	0.611	0.589	0.622	3.35
102)	h,n,	MTPH-GRO (C5-C10)			0.547	0.521	0.505	0.503	0.505	0.507	0.493	0.474	0.507	4.17

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_03.D
Acq On : 25 Jul 2022 10:08 am
Operator :
Sample : STD AMS 0.19 ppbv 22G12761
Misc : 22G13913
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:38:51 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:36:50 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.275	130	199540	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	811292	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.158	117	744994	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	529090	3.8839607	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 97.10%				
Target Compounds							Qvalue
2) Propene	3.861	41	3139	0.2433248	ppbv		99
3) BUTANE	4.263	43	10142	0.2242741	ppbv		98
4) 1,1-DIFLUOROETHANE	3.867	65	3960	0.4443972	ppbv		99
5) Dichlorodifluoromethane	3.904	85	8091	0.2574895	ppbv		96
6) CHLORODIFLUOROMETHANE	3.934	67	899	0.2221540	ppbv		97
7) 1,2-Dichlorotetrafluor...	4.056	85	8825	0.2343483	ppbv		95
8) Chloromethane	4.178	50	2914	0.2075481	ppbv		91
9) Vinyl Chloride	4.300	62	3226	0.2031510	ppbv	#	82
10) 1,3-Butadiene	4.330	39	3548	0.2906752	ppbv	#	73
11) Bromomethane	4.690	94	3418	0.2327834	ppbv		95
12) Chloroethane	4.782	64	1692	0.2345195	ppbv	#	84
13) ISOPENTANE	4.794	43	3889	0.2453339	ppbv		95
14) Vinyl Bromide	4.971	106	3279	0.2190276	ppbv		99
15) Trichlorofluoromethane	4.989	101	9838	0.2213076	ppbv		99
16) PENTANE	5.025	43	6335	0.2635846	ppbv		98
17) Ethanol	5.178	45	3281	0.5068694	ppbv		95
18) ACROLEIN	5.458	56	1378	0.2097045	ppbv		90
19) 1,1,2-Trichlorotrifluo...	5.416	101	7335	0.2329184	ppbv		98
20) 1,1-Dichloroethene	5.507	61	5719	0.2209364	ppbv		98
21) Acetone	5.605	43	8154	0.3191971	ppbv		90
22) BROMOETHANE	5.696	108	2772	0.2237845	ppbv		96
23) 2-Propanol	5.647	45	6096	0.2333470	ppbv	#	1
24) Carbon Disulfide	5.781	76	10937	0.2195936	ppbv		97
25) Allyl Chloride	5.818	41	4915	0.2133594	ppbv		96
26) METHYL ACETATE	5.818	43	6585	0.2188804	ppbv	#	98
27) ACETONITRILE	5.885	41	13692	1.0772957	ppbv		97
28) Methylene Chloride	5.952	49	8387	0.4650958	ppbv		96
29) TERT-BUTYL ALCOHOL	6.007	59	5984	0.2000849	ppbv		96
30) Methyl Tert-Butyl Ether	6.141	73	7611	0.2006074	ppbv		100
31) Trans-1,2-Dichloroethene	6.147	61	5091	0.2115597	ppbv		94
32) ACRYLONITRILE	6.202	53	2882	0.2254791	ppbv		98
33) n-Hexane	6.263	57	4061	0.1913524	ppbv		87
34) 1,1-Dichloroethane	6.550	63	6515	0.2244486	ppbv		100
35) Vinyl Acetate	6.495	43	11629	0.3185774	ppbv	#	87
36) DI-ISOPROPYL ETHER	6.476	45	8325	0.1841105	ppbv	#	1
37) ETHYL TERT-BUTYL ETHER	6.781	59	8610	0.1925047	ppbv		96
38) ETHYL ACETATE	6.995	45	982	0.1983759	ppbv		91
39) 2-Butanone (MEK)	7.043	72	1475	0.2048467	ppbv		92
40) cis-1,2-Dichloroethene	7.043	61	4390	0.2022903	ppbv		99
41) Tetrahydrofuran	7.312	42	2977	0.1884690	ppbv		92
42) Chloroform	7.281	83	6982	0.2298976	ppbv		98
43) Cyclohexane	7.488	84	2838	0.1770397	ppbv		87
44) 1,1,1-Trichloroethane	7.476	97	7582	0.2266035	ppbv		97
45) Carbon Tetrachloride	7.604	117	7704	0.2267424	ppbv		100
46) 2,2,4-Trimethylpentane	7.702	57	12615	0.1891887	ppbv		95

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_03.D
Acq On : 25 Jul 2022 10:08 am
Operator :
Sample : STD AMS 0.19 ppbv 22G12761
Misc : 22G13913
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:38:51 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:36:50 2022
Response via : Initial Calibration

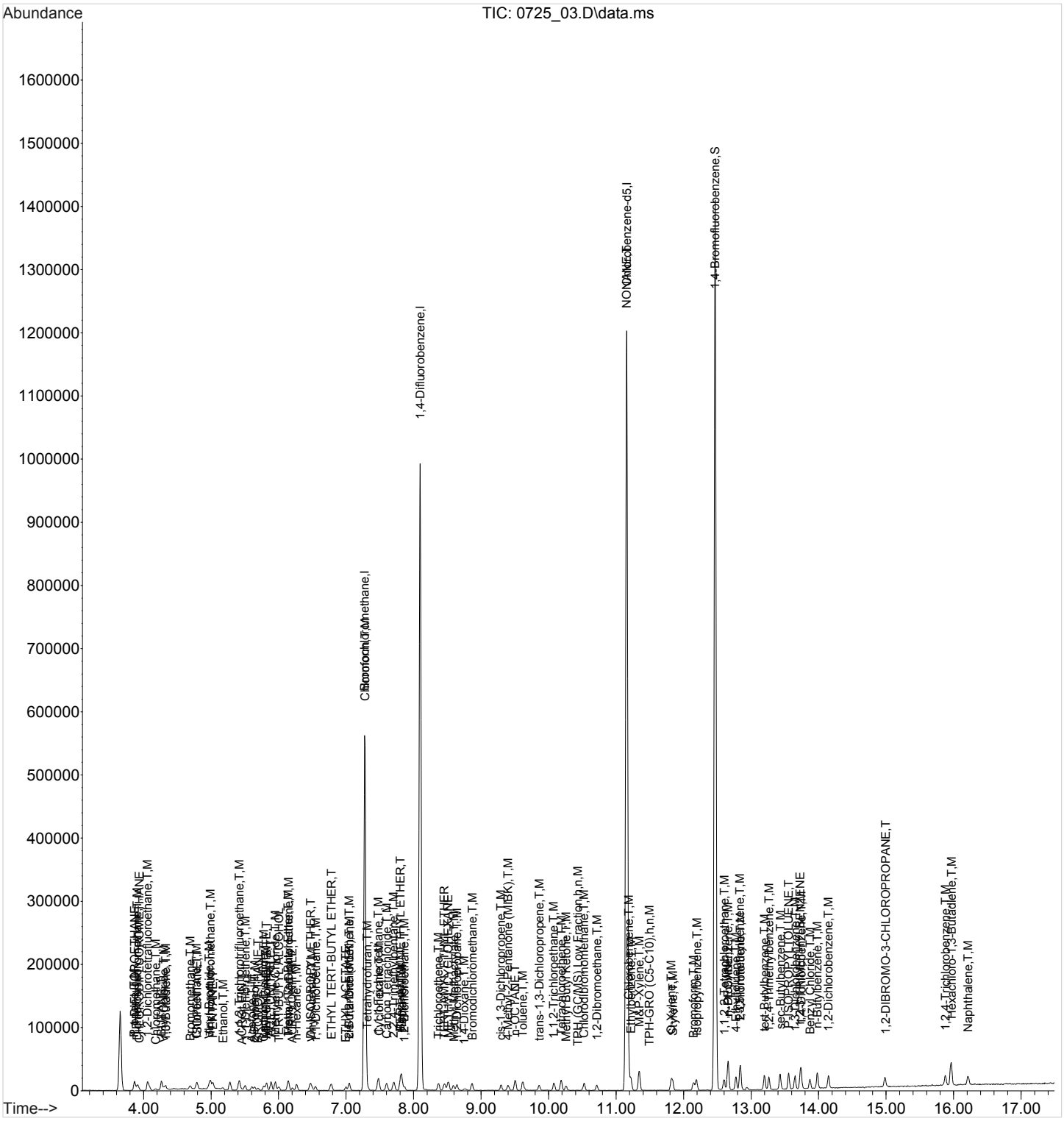
	Compound	R.T.	QIon	Response	Conc Units		Dev(Min)
48)	Benzene	7.805	78	9848	0.2244766	ppbv	95
49)	TERT-AMYL METHYL ETHER	7.805	73	7824	0.1936382	ppbv #	90
50)	1,2-Dichloroethane	7.860	62	4867	0.2287418	ppbv	97
51)	Heptane	7.830	43	7808	0.1805626	ppbv	99
52)	Trichloroethene	8.366	95	4193	0.2209799	ppbv	98
53)	TERT-AMYL ETHYL ETHER	8.452	73	2878m	0.2252225	ppbv	
54)	METHYL CYCLOHEXANE	8.513	83	4889	0.1767345	ppbv	87
55)	1,2-Dichloropropane	8.641	63	3855	0.2221597	ppbv	94
56)	Methyl Methacrylate	8.598	69	3069	0.1896641	ppbv	97
57)	1,4-Dioxane	8.750	88	1607	0.2009931	ppbv	93
58)	Bromodichloromethane	8.872	83	8020	0.2396671	ppbv	95
59)	cis-1,3-Dichloropropene	9.293	75	5213	0.2005820	ppbv	99
60)	4-Methyl-2-Pentanone (...	9.397	43	6730	0.2012907	ppbv	95
61)	n-OCTANE	9.500	43	7314	0.1750966	ppbv	96
62)	Toluene	9.616	91	11185	0.2112870	ppbv	92
63)	trans-1,3-Dichloropropene	9.860	75	4943	0.1970486	ppbv	97
64)	1,1,2-Trichloroethane	10.073	97	4007	0.2156205	ppbv	98
65)	Tetrachloroethene	10.189	166	5844	0.2294593	ppbv	95
66)	Methyl Butyl Ketone	10.256	43	6015	0.1974978	ppbv #	93
67)	Chlorodibromomethane	10.524	129	7376	0.2188306	ppbv	99
68)	1,2-Dibromoethane	10.713	107	6335	0.2157513	ppbv	99
69)	Chlorobenzene	11.189	112	9446	0.2301606	ppbv #	9
70)	NONANE	11.152	43	9094	0.2054928	ppbv	95
72)	Ethylbenzene	11.219	91	13684	0.2077549	ppbv	98
73)	M&P-Xylene	11.341	91	19829	0.3836495	ppbv	95
74)	O-Xylene	11.817	91	9240	0.1874435	ppbv	98
77)	Styrene	11.841	104	7479	0.1666322	ppbv	99
78)	Bromoform	12.146	173	7112	0.2173488	ppbv	97
79)	Isopropylbenzene	12.195	105	10850	0.1531667	ppbv	94
80)	n-DECANE	12.658	43	8178	0.1644048	ppbv	99
81)	1,1,2,2-Tetrachloroethane	12.603	83	9781	0.2257980	ppbv	98
82)	n-Propylbenzene	12.658	91	18809	0.1810518	ppbv	98
83)	4-Ethyltoluene	12.774	105	13791	0.1664849	ppbv	98
84)	2-Chlorotoluene	12.841	91	13006	0.1843056	ppbv	99
86)	1,3,5-Trimethylbenzene	12.835	105	12693	0.1750743	ppbv	99
87)	tert-Butylbenzene	13.201	119	10639	0.1635724	ppbv	96
88)	1,2,4-Trimethylbenzene	13.262	105	11140	0.1530016	ppbv	100
89)	sec-Butylbenzene	13.432	105	16312	0.1568139	ppbv #	93
90)	1,3-Dichlorobenzene	13.652	146	9499	0.1894121	ppbv	93
91)	P-ISOPROPYLTOLUENE	13.554	119	13407	0.1514287	ppbv #	93
92)	1,4-Dichlorobenzene	13.743	146	8858	0.1747263	ppbv	96
93)	1,2,3-TRIMETHYLBENZENE	13.725	105	11973	0.1626295	ppbv	91
94)	Benzyl Chloride	13.871	91	10387	0.1661139	ppbv	98
95)	n-Butylbenzene	13.981	91	13483	0.1502198	ppbv	97
96)	1,2-Dichlorobenzene	14.146	146	8362	0.1685876	ppbv	94
97)	1,2-DIBROMO-3-CHLOROPR...	14.993	157	4317	0.1794684	ppbv	87
98)	1,2,4-Trichlorobenzene	15.877	180	5916	0.1394515	ppbv	94
99)	Hexachloro-1,3-Butadiene	15.968	225	10215	0.2062183	ppbv	98
100)	Naphthalene	16.212	128	13015	0.1409651	ppbv #	98
101)	TPH (GC/MS) Low Fraction	10.430	TIC	1670533m	14.5523066	ppbv	
102)	TPH-GRO (C5-C10)	11.493	TIC	1990752m	21.2455363	ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_03.D
Acq On : 25 Jul 2022 10:08 am
Operator :
Sample : STD AMS 0.19 ppbv 22G12761
Misc : 22G13913
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

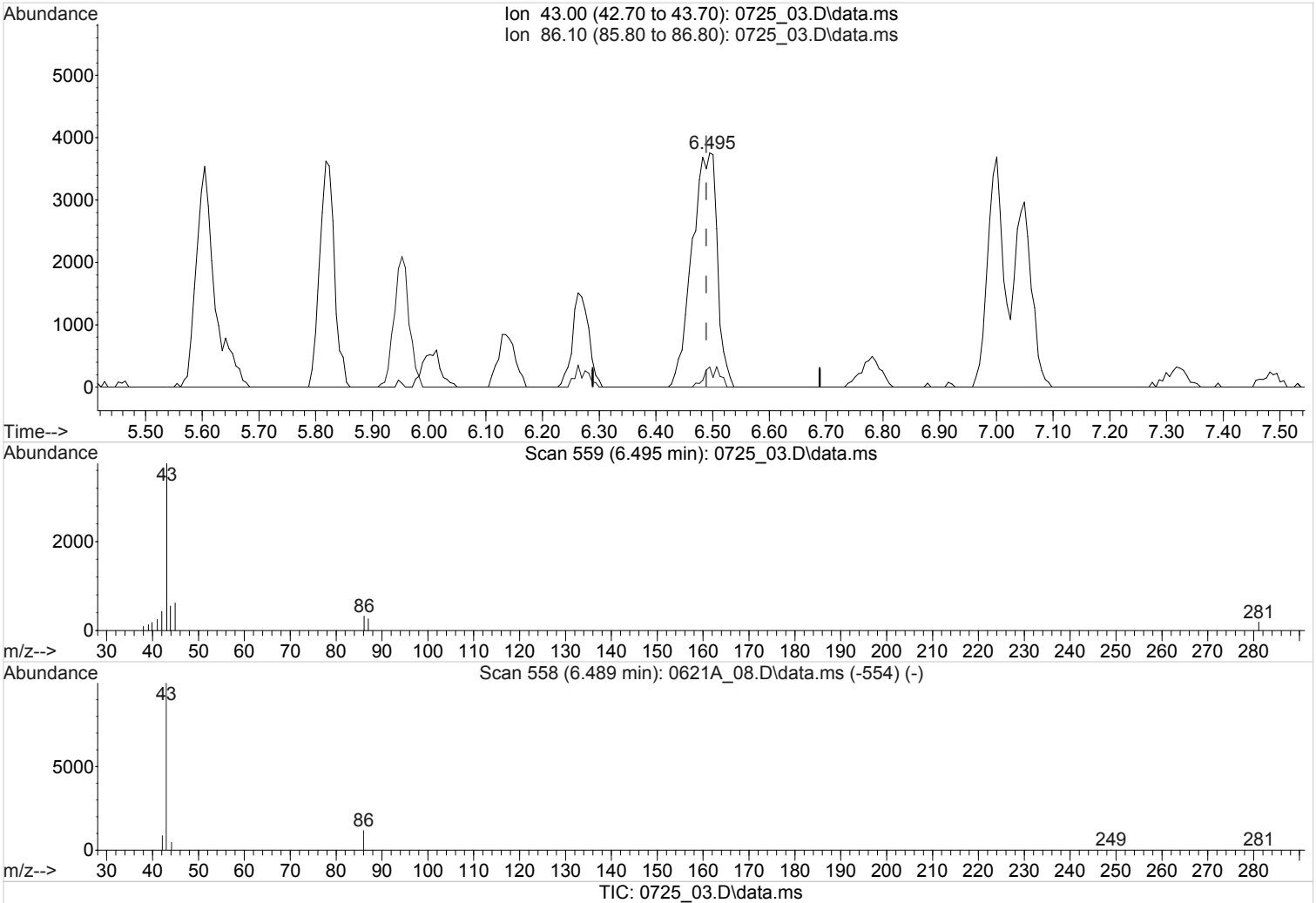
Quant Time: Jul 25 14:38:51 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:36:50 2022
Response via : Initial Calibration



Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_03.D
Acq On : 25 Jul 2022 10:08 am
Operator :
Sample : STD AMS 0.19 ppbv 22G12761
Misc : 22G13913
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:37:09 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:36:50 2022
Response via : Initial Calibration



TIC: 0725_03.D\data.ms

(35) Vinyl Acetate (T,M)

6.495min (+0.006) 0.3185774 ppbv

Qvalue = 87

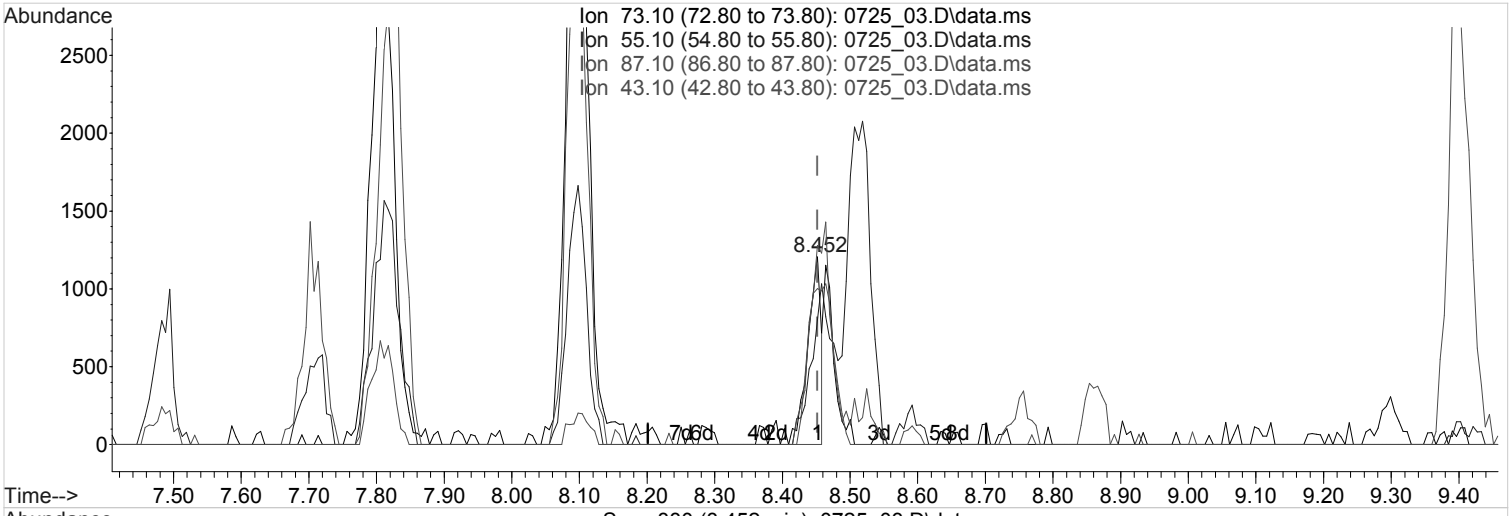
response 11629

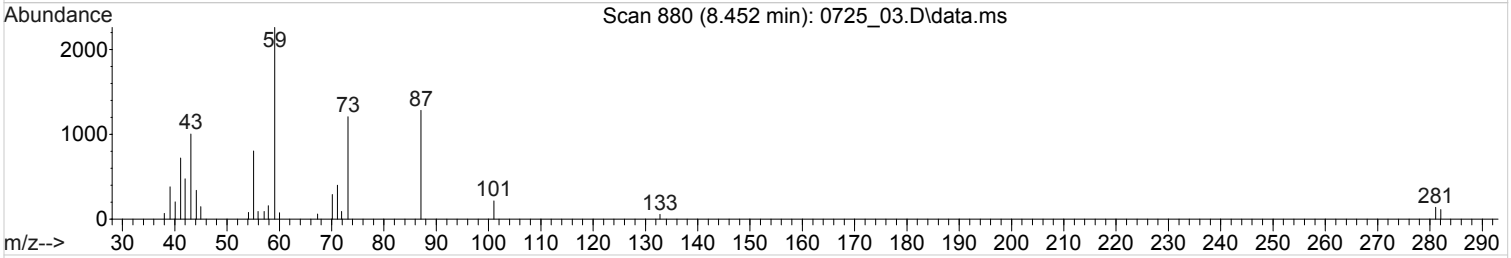
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	3.10#
0.00	0.00	0.00
0.00	0.00	0.00

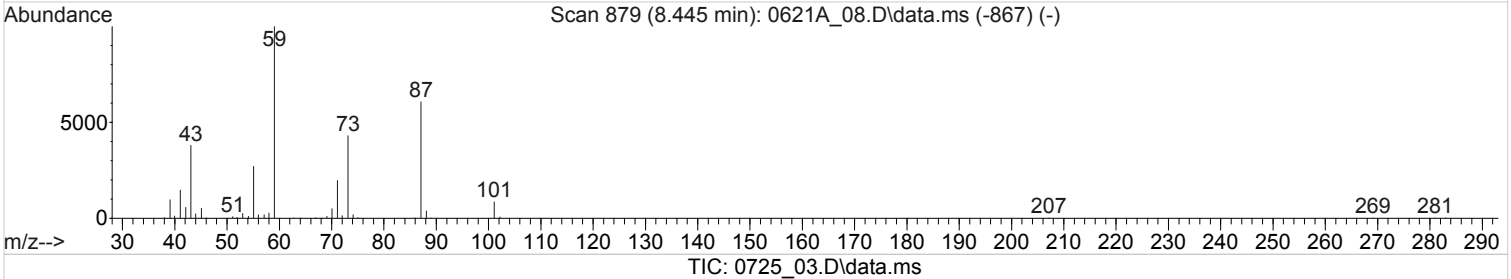
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_03.D
Acq On : 25 Jul 2022 10:08 am
Operator :
Sample : STD AMS 0.19 ppbv 22G12761
Misc : 22G13913
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:37:45 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:36:50 2022
Response via : Initial Calibration







TIC: 0725_03.D\data.ms

(53) TERT-AMYL ETHYL ETHER

8.452min (-0.000) 0.1288104 ppbv

Qvalue = 40

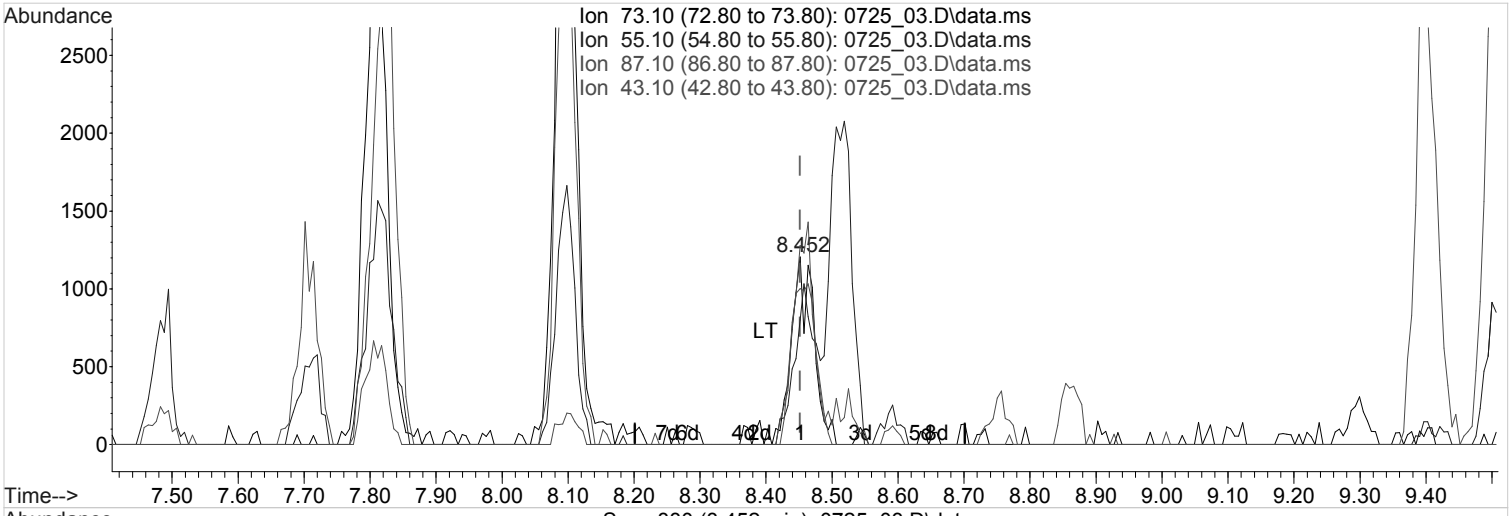
response 1646

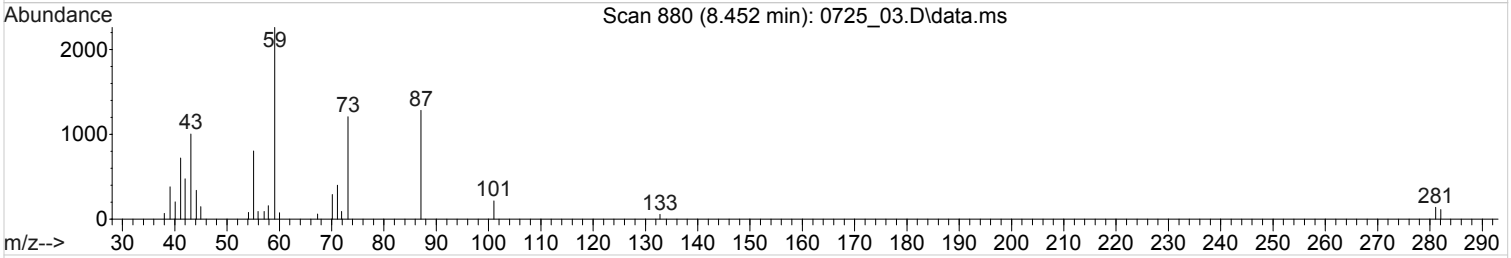
Ion	Exp%	Act%
73.10	100	100
55.10	69.30	136.63#
87.10	138.30	189.13#
43.10	99.80	169.81#

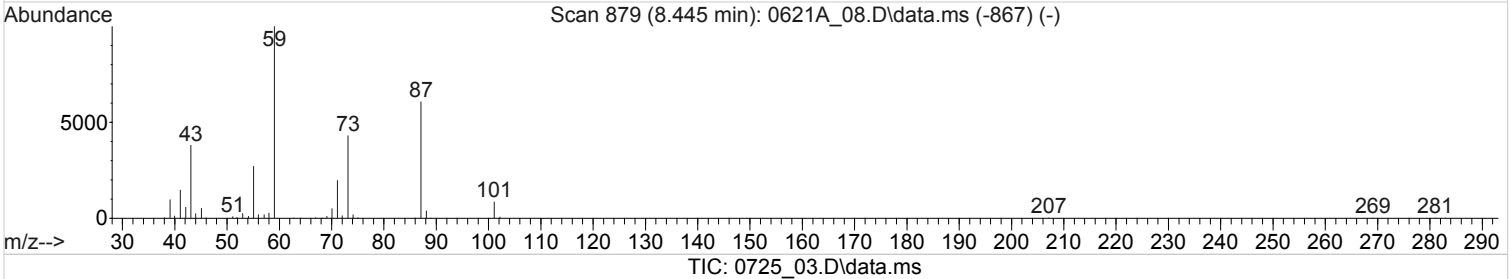
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_03.D
Acq On : 25 Jul 2022 10:08 am
Operator :
Sample : STD AMS 0.19 ppbv 22G12761
Misc : 22G13913
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:37:45 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:36:50 2022
Response via : Initial Calibration







TIC: 0725_03.D\data.ms

(53) TERT-AMYL ETHYL ETHER

8.452min (-0.000) 0.2252225 ppbv m

response 2878

Ion	Exp%	Act%
73.10	100	100
55.10	69.30	78.14
87.10	138.30	108.17#
43.10	99.80	97.12

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_04.D
Acq On : 25 Jul 2022 10:46 am
Operator :
Sample : STD AMS 0.31 ppbv 22G12761
Misc : 22G13913
ALS Vial : 4 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:39:57 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:39:00 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	7.275	130	196568	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	8.098	114	809899	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	11.158	117	747108	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	12.469	95	534313	3.9687701	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 99.22%			
Target Compounds						Qvalue
2) Propene	3.861	41	4301	0.2967917	ppbv	95
3) BUTANE	4.263	43	14394	0.2963807	ppbv	98
4) 1,1-DIFLUOROETHANE	3.867	65	4752	0.3242590	ppbv	97
5) Dichlorodifluoromethane	3.904	85	11526	0.3161941	ppbv	99
6) CHLORODIFLUOROMETHANE	3.922	67	1299	0.3004311	ppbv	94
7) 1,2-Dichlorotetrafluor...	4.056	85	11548	0.2787611	ppbv	95
8) Chloromethane	4.172	50	4063	0.2807935	ppbv	97
9) Vinyl Chloride	4.294	62	4647	0.2871234	ppbv	93
10) 1,3-Butadiene	4.318	39	4656	0.3061162	ppbv #	76
11) Bromomethane	4.690	94	5195	0.3228110	ppbv	92
12) Chloroethane	4.775	64	2418	0.3045356	ppbv	95
13) ISOPENTANE	4.788	43	5703	0.3187875	ppbv	96
14) Vinyl Bromide	4.964	106	5038	0.3173684	ppbv	94
15) Trichlorofluoromethane	4.983	101	14057	0.2965624	ppbv	100
16) PENTANE	5.025	43	8347	0.2953563	ppbv	97
17) Ethanol	5.172	45	3710	0.3172584	ppbv	94
18) ACROLEIN	5.452	56	2042	0.2998996	ppbv	89
19) 1,1,2-Trichlorotrifluo...	5.416	101	10203	0.2955124	ppbv	96
20) 1,1-Dichloroethene	5.501	61	7879	0.2857225	ppbv	99
21) Acetone	5.605	43	9130	0.2707533	ppbv	95
22) BROMOETHANE	5.690	108	4079	0.3069849	ppbv	100
23) 2-Propanol	5.641	45	8660	0.3020504	ppbv #	1
24) Carbon Disulfide	5.781	76	15236	0.2880978	ppbv	95
25) Allyl Chloride	5.824	41	7079	0.2938791	ppbv	99
26) METHYL ACETATE	5.824	43	8938	0.2802824	ppbv #	96
27) ACETONITRILE	5.885	41	18800	1.4072768	ppbv	93
28) Methylene Chloride	5.952	49	10074	0.3289528	ppbv	97
29) TERT-BUTYL ALCOHOL	6.001	59	8719	0.2882910	ppbv	100
30) Methyl Tert-Butyl Ether	6.141	73	11375	0.2960853	ppbv	99
31) Trans-1,2-Dichloroethene	6.147	61	7059	0.2817888	ppbv	98
32) ACRYLONITRILE	6.208	53	3841	0.2790025	ppbv	99
33) n-Hexane	6.263	57	5724	0.2728191	ppbv	89
34) 1,1-Dichloroethane	6.549	63	8966	0.2874957	ppbv	95
35) Vinyl Acetate	6.489	43	17252	0.3584724	ppbv #	92
36) DI-ISOPROPYL ETHER	6.470	45	11800	0.2690773	ppbv #	1
37) ETHYL TERT-BUTYL ETHER	6.775	59	12134	0.2735937	ppbv	95
38) ETHYL ACETATE	6.995	45	1443	0.2895291	ppbv	97
39) 2-Butanone (MEK)	7.043	72	2225	0.3018833	ppbv	93
40) cis-1,2-Dichloroethene	7.049	61	6297	0.2853234	ppbv	99
41) Tetrahydrofuran	7.324	42	4522	0.2917844	ppbv	94
42) Chloroform	7.281	83	10073	0.3046988	ppbv	99
43) Cyclohexane	7.482	84	4154	0.2723407	ppbv	93
44) 1,1,1-Trichloroethane	7.476	97	10636	0.2943330	ppbv	97
45) Carbon Tetrachloride	7.598	117	10509	0.2862931	ppbv	99
46) 2,2,4-Trimethylpentane	7.708	57	17643	0.2691694	ppbv #	93

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_04.D
Acq On : 25 Jul 2022 10:46 am
Operator :
Sample : STD AMS 0.31 ppbv 22G12761
Misc : 22G13913
ALS Vial : 4 Sample Multiplier: 1
InstName : AIRMS7

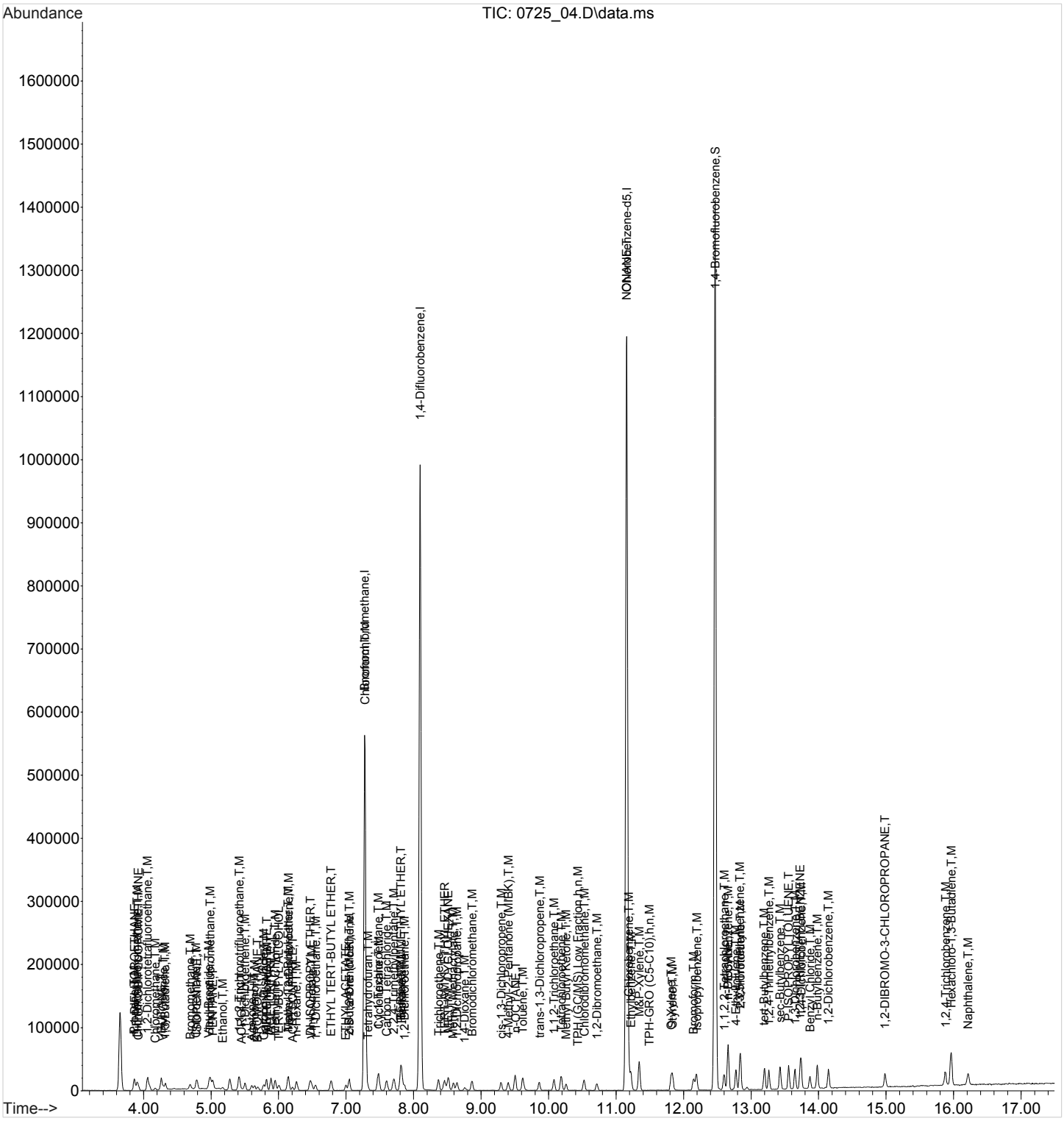
Quant Time: Jul 25 14:39:57 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:39:00 2022
Response via : Initial Calibration

	Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
48)	Benzene	7.811	78	14280	0.2989380	ppbv		97
49)	TERT-AMYL METHYL ETHER	7.811	73	11342	0.2785223	ppbv	#	92
50)	1,2-Dichloroethane	7.866	62	6996	0.2988943	ppbv		96
51)	Heptane	7.824	43	11374	0.2701901	ppbv		96
52)	Trichloroethene	8.372	95	5926	0.2892670	ppbv		93
53)	TERT-AMYL ETHYL ETHER	8.458	73	4074	0.2922746	ppbv		88
54)	METHYL CYCLOHEXANE	8.513	83	8028	0.3012221	ppbv		95
55)	1,2-Dichloropropane	8.641	63	5497	0.2925708	ppbv		94
56)	Methyl Methacrylate	8.586	69	4696	0.2909690	ppbv		99
57)	1,4-Dioxane	8.756	88	2381	0.2899249	ppbv	#	96
58)	Bromodichloromethane	8.866	83	10871	0.2878070	ppbv		97
59)	cis-1,3-Dichloropropene	9.299	75	7591	0.2846564	ppbv		98
60)	4-Methyl-2-Pentanone (...	9.403	43	9826	0.2859011	ppbv		96
61)	n-OCTANE	9.512	43	10509	0.2623048	ppbv		98
62)	Toluene	9.616	91	15506	0.2778506	ppbv		98
63)	trans-1,3-Dichloropropene	9.866	75	7572	0.2968642	ppbv		99
64)	1,1,2-Trichloroethane	10.079	97	5906	0.2982457	ppbv		98
65)	Tetrachloroethene	10.189	166	8260	0.2943172	ppbv		99
66)	Methyl Butyl Ketone	10.256	43	8350	0.2693232	ppbv		92
67)	Chlorodibromomethane	10.530	129	10501	0.2900710	ppbv		100
68)	1,2-Dibromoethane	10.713	107	8451	0.2700132	ppbv		96
69)	Chlorobenzene	11.189	112	13059	0.2882754	ppbv	#	70
70)	NONANE	11.152	43	12821	0.2788399	ppbv	#	94
72)	Ethylbenzene	11.219	91	20166	0.2916725	ppbv		99
73)	M&P-Xylene	11.341	91	28646	0.5500304	ppbv		98
74)	O-Xylene	11.817	91	13747	0.2799673	ppbv		99
77)	Styrene	11.835	104	10996	0.2603051	ppbv		95
78)	Bromoform	12.146	173	10404	0.2957688	ppbv		100
79)	Isopropylbenzene	12.195	105	17564	0.2737826	ppbv		93
80)	n-DECANE	12.658	43	12755	0.2741582	ppbv		95
81)	1,1,2,2-Tetrachloroethane	12.603	83	13814	0.2906209	ppbv		99
82)	n-Propylbenzene	12.658	91	28341	0.2785933	ppbv		98
83)	4-Ethyltoluene	12.774	105	20655	0.2650429	ppbv		99
84)	2-Chlorotoluene	12.841	91	19998	0.2868851	ppbv		97
86)	1,3,5-Trimethylbenzene	12.835	105	18369	0.2629755	ppbv		98
87)	tert-Butylbenzene	13.195	119	15902	0.2620207	ppbv		93
88)	1,2,4-Trimethylbenzene	13.262	105	15826	0.2401257	ppbv		96
89)	sec-Butylbenzene	13.426	105	24316	0.2554030	ppbv	#	95
90)	1,3-Dichlorobenzene	13.652	146	13079	0.2604631	ppbv		96
91)	P-ISOPROPYLTOLUENE	13.554	119	19567	0.2452753	ppbv		94
92)	1,4-Dichlorobenzene	13.743	146	12801	0.2623327	ppbv		98
93)	1,2,3-TRIMETHYLBENZENE	13.725	105	16539	0.2414015	ppbv		99
94)	Benzyl Chloride	13.871	91	14239	0.2423034	ppbv		99
95)	n-Butylbenzene	13.981	91	18902	0.2345534	ppbv		97
96)	1,2-Dichlorobenzene	14.146	146	12998	0.2769171	ppbv		98
97)	1,2-DIBROMO-3-CHLOROPR...	14.981	157	6524	0.2781606	ppbv		96
98)	1,2,4-Trichlorobenzene	15.883	180	8959	0.2428935	ppbv		96
99)	Hexachloro-1,3-Butadiene	15.962	225	14093	0.2720889	ppbv		95
100)	Naphthalene	16.212	128	17214	0.2134617	ppbv	#	96
101)	TPH (GC/MS) Low Fraction	10.430	TIC	2214721m	14.2817606	ppbv		
102)	TPH-GRO (C5-C10)	11.493	TIC	2619259m	21.1220955	ppbv		

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

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_04.D
Acq On : 25 Jul 2022 10:46 am
Operator :
Sample : STD AMS 0.31 ppbv 22G12761
Misc : 22G13913
ALS Vial : 4 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:39:57 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:39:00 2022
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_05.D
Acq On : 25 Jul 2022 11:24 am
Operator :
Sample : STD AMS 0.63 ppbv 22G12761
Misc : 22G13913
ALS Vial : 5 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:41:02 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:40:06 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	7.275	130	193546	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	8.098	114	808154	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	11.158	117	742195	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	12.469	95	530403	3.9761545	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 99.40%			
Target Compounds						Qvalue
2) Propene	3.855	41	8532	0.6065604	ppbv	97
3) BUTANE	4.263	43	28642	0.6078654	ppbv	99
4) 1,1-DIFLUOROETHANE	3.861	65	7185	0.4904139	ppbv	96
5) Dichlorodifluoromethane	3.904	85	23603	0.6532630	ppbv	100
6) CHLORODIFLUOROMETHANE	3.928	67	2622	0.6222841	ppbv	99
7) 1,2-Dichlorotetrafluor...	4.056	85	24386	0.6186332	ppbv	99
8) Chloromethane	4.166	50	8970	0.6500085	ppbv	94
9) Vinyl Chloride	4.294	62	9699	0.6239763	ppbv	95
10) 1,3-Butadiene	4.318	39	7643	0.5124876	ppbv	97
11) Bromomethane	4.684	94	9512	0.5921361	ppbv	98
12) Chloroethane	4.775	64	4611	0.5932870	ppbv	96
13) ISOPENTANE	4.788	43	9833	0.5530039	ppbv	91
14) Vinyl Bromide	4.971	106	9519	0.6042242	ppbv	99
15) Trichlorofluoromethane	4.983	101	28781	0.6257184	ppbv	98
16) PENTANE	5.025	43	15658	0.5717070	ppbv	98
17) Ethanol	5.166	45	6065	0.5226636	ppbv	96
18) ACROLEIN	5.452	56	4125	0.6220357	ppbv	99
19) 1,1,2-Trichlorotrifluo...	5.416	101	19741	0.5898809	ppbv	96
20) 1,1-Dichloroethene	5.501	61	16310	0.6167990	ppbv	98
21) Acetone	5.598	43	17805	0.5598854	ppbv	99
22) BROMOETHANE	5.690	108	8102	0.6212901	ppbv	99
23) 2-Propanol	5.647	45	16188	0.5783778	ppbv #	91
24) Carbon Disulfide	5.781	76	31655	0.6225730	ppbv	97
25) Allyl Chloride	5.824	41	13916	0.5970821	ppbv	93
26) METHYL ACETATE	5.818	43	19637	0.6460460	ppbv #	98
27) ACETONITRILE	5.885	41	41065	3.2207785	ppbv	97
28) Methylene Chloride	5.952	49	15102	0.4908323	ppbv	98
29) TERT-BUTYL ALCOHOL	6.001	59	18109	0.6226520	ppbv	95
30) Methyl Tert-Butyl Ether	6.135	73	22856	0.6133966	ppbv	100
31) Trans-1,2-Dichloroethene	6.147	61	14777	0.6178364	ppbv	97
32) ACRYLONITRILE	6.202	53	7931	0.6052607	ppbv	95
33) n-Hexane	6.269	57	12715	0.6411205	ppbv	95
34) 1,1-Dichloroethane	6.543	63	18060	0.6027224	ppbv	100
35) Vinyl Acetate	6.495	43	35002	0.7020566	ppbv #	91
36) DI-ISOPROPYL ETHER	6.470	45	26166	0.6338763	ppbv #	1
37) ETHYL TERT-BUTYL ETHER	6.781	59	26235	0.6252514	ppbv	97
38) ETHYL ACETATE	6.995	45	3311	0.6898903	ppbv	90
39) 2-Butanone (MEK)	7.043	72	4533	0.6301304	ppbv	97
40) cis-1,2-Dichloroethene	7.043	61	14064	0.6648449	ppbv	98
41) Tetrahydrofuran	7.312	42	9650	0.6450275	ppbv	98
42) Chloroform	7.281	83	19586	0.6051582	ppbv	98
43) Cyclohexane	7.488	84	9311	0.6461349	ppbv	95
44) 1,1,1-Trichloroethane	7.470	97	21162	0.6049571	ppbv	97
45) Carbon Tetrachloride	7.598	117	21361	0.6064765	ppbv	97
46) 2,2,4-Trimethylpentane	7.708	57	38486	0.6237105	ppbv	95

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_05.D
Acq On : 25 Jul 2022 11:24 am
Operator :
Sample : STD AMS 0.63 ppbv 22G12761
Misc : 22G13913
ALS Vial : 5 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:41:02 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:40:06 2022
Response via : Initial Calibration

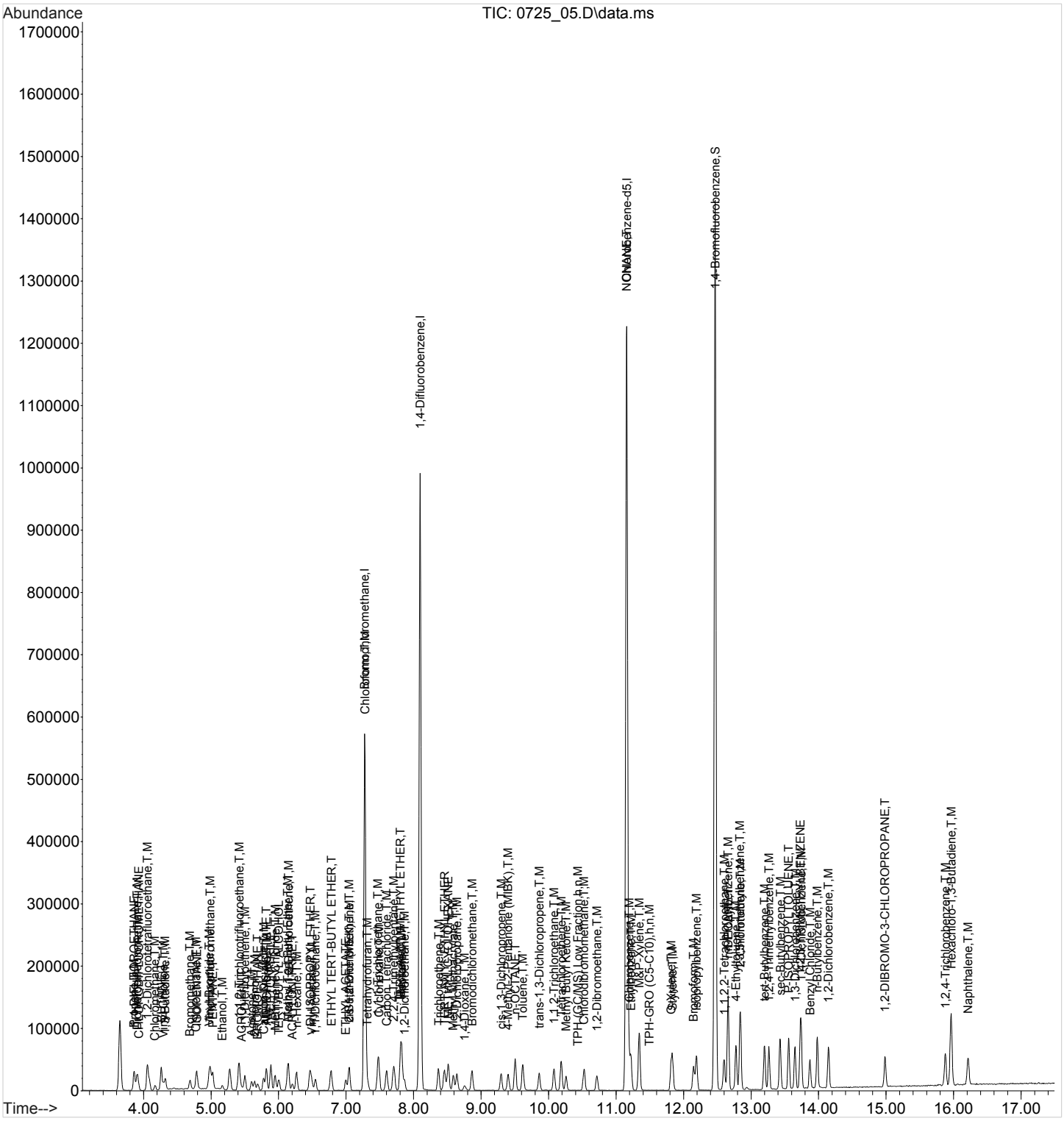
	Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
48)	Benzene	7.811	78	27540	0.5847232	ppbv		94
49)	TERT-AMYL METHYL ETHER	7.805	73	23782	0.6057725	ppbv	#	95
50)	1,2-Dichloroethane	7.866	62	13851	0.6002098	ppbv		96
51)	Heptane	7.824	43	25003	0.6218495	ppbv		98
52)	Trichloroethene	8.372	95	12565	0.6286777	ppbv		99
53)	TERT-AMYL ETHYL ETHER	8.458	73	7942	0.5820952	ppbv		92
54)	METHYL CYCLOHEXANE	8.513	83	15879	0.6027788	ppbv		99
55)	1,2-Dichloropropane	8.641	63	10890	0.5919517	ppbv		92
56)	Methyl Methacrylate	8.586	69	10284	0.6519237	ppbv		97
57)	1,4-Dioxane	8.756	88	5171	0.6449333	ppbv		93
58)	Bromodichloromethane	8.866	83	22091	0.6004452	ppbv		99
59)	cis-1,3-Dichloropropene	9.299	75	15775	0.6094349	ppbv		95
60)	4-Methyl-2-Pentanone (...	9.397	43	21097	0.6315368	ppbv		96
61)	n-OCTANE	9.506	43	22443	0.5917344	ppbv		98
62)	Toluene	9.616	91	33353	0.6203862	ppbv		97
63)	trans-1,3-Dichloropropene	9.860	75	16055	0.6398411	ppbv		98
64)	1,1,2-Trichloroethane	10.079	97	12769	0.6544830	ppbv		96
65)	Tetrachloroethene	10.189	166	16544	0.6008954	ppbv		98
66)	Methyl Butyl Ketone	10.256	43	18199	0.6151697	ppbv		96
67)	Chlorodibromomethane	10.524	129	22143	0.6264040	ppbv		100
68)	1,2-Dibromoethane	10.713	107	18921	0.6330590	ppbv		98
69)	Chlorobenzene	11.195	112	27325	0.6189563	ppbv	#	81
70)	NONANE	11.152	43	25599	0.5772891	ppbv		98
72)	Ethylbenzene	11.219	91	41461	0.6157791	ppbv		99
73)	M&P-Xylene	11.341	91	60211	1.2092510	ppbv		99
74)	O-Xylene	11.817	91	27680	0.5863907	ppbv		98
77)	Styrene	11.835	104	23411	0.5893631	ppbv		100
78)	Bromoform	12.146	173	20227	0.5878222	ppbv		100
79)	Isopropylbenzene	12.189	105	38346	0.6260643	ppbv		98
80)	n-DECANE	12.664	43	28175	0.6340429	ppbv		98
81)	1,1,2,2-Tetrachloroethane	12.603	83	29161	0.6306966	ppbv		96
82)	n-Propylbenzene	12.658	91	61259	0.6273510	ppbv		100
83)	4-Ethyltoluene	12.774	105	47408	0.6434674	ppbv		99
84)	2-Chlorotoluene	12.841	91	42898	0.6352644	ppbv		97
86)	1,3,5-Trimethylbenzene	12.835	105	43031	0.6531470	ppbv		98
87)	tert-Butylbenzene	13.201	119	34874	0.6098951	ppbv		98
88)	1,2,4-Trimethylbenzene	13.262	105	37867	0.6253380	ppbv		98
89)	sec-Butylbenzene	13.432	105	57993	0.6514029	ppbv		97
90)	1,3-Dichlorobenzene	13.652	146	30218	0.6398446	ppbv		97
91)	P-ISOPROPYLTOLUENE	13.554	119	46865	0.6355828	ppbv		97
92)	1,4-Dichlorobenzene	13.743	146	29354	0.6382514	ppbv		98
93)	1,2,3-TRIMETHYLBENZENE	13.731	105	41256	0.6544260	ppbv		100
94)	Benzyl Chloride	13.871	91	34536	0.6380287	ppbv		98
95)	n-Butylbenzene	13.981	91	47703	0.6484683	ppbv		98
96)	1,2-Dichlorobenzene	14.146	146	29220	0.6497547	ppbv		98
97)	1,2-DIBROMO-3-CHLOROPR...	14.981	157	13992	0.6218072	ppbv		97
98)	1,2,4-Trichlorobenzene	15.877	180	20122	0.5918596	ppbv		98
99)	Hexachloro-1,3-Butadiene	15.962	225	31152	0.6311512	ppbv		98
100)	Naphthalene	16.212	128	42259	0.5885997	ppbv		97
101)	TPH (GC/MS) Low Fraction	10.430	TIC	4226627m	29.0757788	ppbv		
102)	TPH-GRO (C5-C10)	11.493	TIC	4962886m	42.1331135	ppbv		

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_05.D
Acq On : 25 Jul 2022 11:24 am
Operator :
Sample : STD AMS 0.63 ppbv 22G12761
Misc : 22G13913
ALS Vial : 5 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:41:02 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:40:06 2022
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_06.D
Acq On : 25 Jul 2022 12:01 pm
Operator :
Sample : STD AMS 1.25 ppbv 22G12761
Misc : 22G13913
ALS Vial : 6 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:42:08 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:41:10 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	7.281	130	196673	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	8.098	114	819680	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	11.158	117	751124	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	12.463	95	547197	4.0593370	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 101.48%			
Target Compounds						Qvalue
2) Propene	3.861	41	16276	1.1493936	ppbv	99
3) BUTANE	4.263	43	54892	1.1566025	ppbv	99
4) 1,1-DIFLUOROETHANE	3.867	65	12214	0.8685233	ppbv	100
5) Dichlorodifluoromethane	3.904	85	45363	1.2242534	ppbv	100
6) CHLORODIFLUOROMETHANE	3.928	67	5125	1.2006630	ppbv	97
7) 1,2-Dichlorotetrafluor...	4.056	85	46475	1.1655071	ppbv	96
8) Chloromethane	4.172	50	16823	1.1902409	ppbv	100
9) Vinyl Chloride	4.294	62	19068	1.2101107	ppbv	96
10) 1,3-Butadiene	4.324	39	14769	1.0222318	ppbv	98
11) Bromomethane	4.690	94	18400	1.1444107	ppbv	100
12) Chloroethane	4.782	64	8842	1.1361437	ppbv	98
13) ISOPENTANE	4.788	43	19021	1.0859038	ppbv	94
14) Vinyl Bromide	4.971	106	18621	1.1752069	ppbv	95
15) Trichlorofluoromethane	4.989	101	54871	1.1759636	ppbv	100
16) PENTANE	5.026	43	30273	1.1135157	ppbv	97
17) Ethanol	5.166	45	8267	0.7322892	ppbv	100
18) ACROLEIN	5.452	56	7952	1.1838097	ppbv	98
19) 1,1,2-Trichlorotrifluo...	5.416	101	40280	1.2036323	ppbv	100
20) 1,1-Dichloroethene	5.507	61	31559	1.1806833	ppbv	99
21) Acetone	5.599	43	33119	1.0542136	ppbv	99
22) BROMOETHANE	5.690	108	15288	1.1576999	ppbv	100
23) 2-Propanol	5.635	45	31912	1.1455151	ppbv	95
24) Carbon Disulfide	5.775	76	62607	1.2153243	ppbv	99
25) Allyl Chloride	5.818	41	27393	1.1719500	ppbv	92
26) METHYL ACETATE	5.812	43	38026	1.2233531	ppbv #	99
27) ACETONITRILE	5.885	41	79465	6.0991824	ppbv	99
28) Methylene Chloride	5.952	49	25391	0.8595866	ppbv	98
29) TERT-BUTYL ALCOHOL	5.995	59	35531	1.2057743	ppbv	96
30) Methyl Tert-Butyl Ether	6.129	73	44122	1.1730233	ppbv	96
31) Trans-1,2-Dichloroethene	6.147	61	29221	1.2081562	ppbv	99
32) ACRYLONITRILE	6.202	53	15939	1.2089258	ppbv	98
33) n-Hexane	6.269	57	24967	1.2334366	ppbv	95
34) 1,1-Dichloroethane	6.550	63	36875	1.2243277	ppbv	99
35) Vinyl Acetate	6.495	43	69137	1.3267384	ppbv #	91
36) DI-ISOPROPYL ETHER	6.458	45	51799	1.2329926	ppbv #	1
37) ETHYL TERT-BUTYL ETHER	6.769	59	50720	1.1918221	ppbv	100
38) ETHYL ACETATE	6.989	45	5828	1.1672911	ppbv	95
39) 2-Butanone (MEK)	7.037	72	8328	1.1392064	ppbv	94
40) cis-1,2-Dichloroethene	7.043	61	26812	1.2303146	ppbv	97
41) Tetrahydrofuran	7.312	42	18426	1.2048675	ppbv	98
42) Chloroform	7.281	83	38701	1.1884674	ppbv	99
43) Cyclohexane	7.488	84	18750	1.2723184	ppbv	99
44) 1,1,1-Trichloroethane	7.476	97	42271	1.2011225	ppbv	99
45) Carbon Tetrachloride	7.598	117	42075	1.1866675	ppbv	99
46) 2,2,4-Trimethylpentane	7.708	57	77861	1.2448729	ppbv	97

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_06.D
Acq On : 25 Jul 2022 12:01 pm
Operator :
Sample : STD AMS 1.25 ppbv 22G12761
Misc : 22G13913
ALS Vial : 6 Sample Multiplier: 1
InstName : AIRMS7

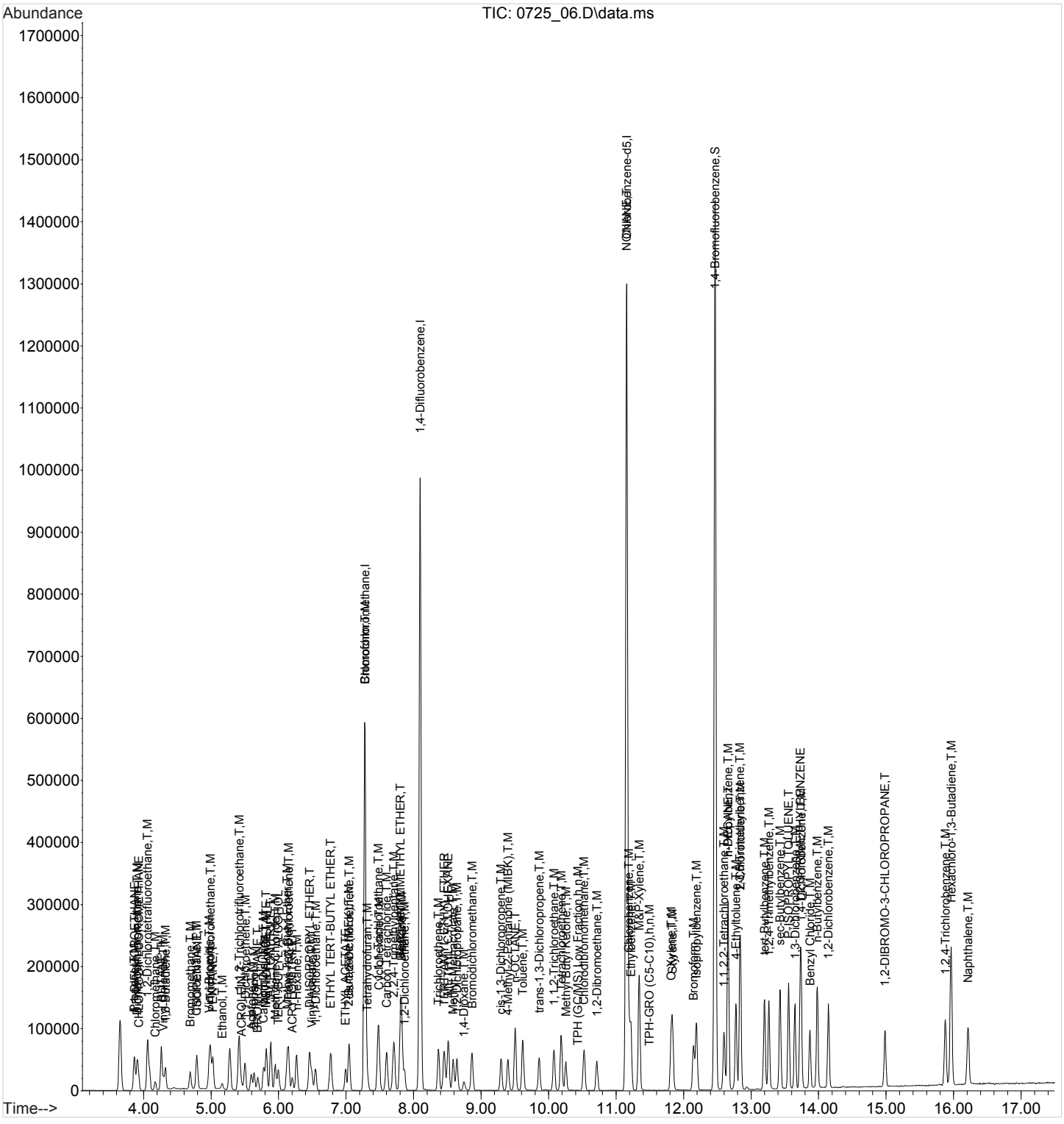
Quant Time: Jul 25 14:42:08 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:41:10 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
48) Benzene	7.805	78	55181	1.1762501 ppbv	98
49) TERT-AMYL METHYL ETHER	7.805	73	48057	1.2186055 ppbv	97
50) 1,2-Dichloroethane	7.866	62	28048	1.2126577 ppbv	99
51) Heptane	7.824	43	51214	1.2599073 ppbv	99
52) Trichloroethene	8.366	95	24339	1.2012849 ppbv	100
53) TERT-AMYL ETHYL ETHER	8.452	73	15013	1.1059023 ppbv	97
54) METHYL CYCLOHEXANE	8.513	83	32618	1.2341238 ppbv	98
55) 1,2-Dichloropropane	8.641	63	21578	1.1741581 ppbv	95
56) Methyl Methacrylate	8.586	69	19780	1.2256002 ppbv	99
57) 1,4-Dioxane	8.744	88	9472	1.1578859 ppbv	96
58) Bromodichloromethane	8.866	83	42786	1.1602005 ppbv	99
59) cis-1,3-Dichloropropene	9.293	75	31300	1.2020175 ppbv	98
60) 4-Methyl-2-Pentanone (...	9.397	43	39173	1.1554464 ppbv	100
61) n-OCTANE	9.506	43	47456	1.2526567 ppbv	98
62) Toluene	9.616	91	65417	1.2042804 ppbv	97
63) trans-1,3-Dichloropropene	9.860	75	30506	1.1939996 ppbv	98
64) 1,1,2-Trichloroethane	10.079	97	24059	1.2041202 ppbv	97
65) Tetrachloroethene	10.189	166	32433	1.1750066 ppbv	99
66) Methyl Butyl Ketone	10.256	43	35805	1.2003400 ppbv	97
67) Chlorodibromomethane	10.524	129	41820	1.1680786 ppbv	98
68) 1,2-Dibromoethane	10.713	107	35473	1.1687482 ppbv	98
69) Chlorobenzene	11.189	112	52581	1.1794672 ppbv	89
70) NONANE	11.152	43	49312	1.1198330 ppbv	98
72) Ethylbenzene	11.219	91	82496	1.2175371 ppbv	99
73) M&P-Xylene	11.341	91	124266	2.4862984 ppbv	99
74) O-Xylene	11.817	91	56818	1.2103046 ppbv	99
77) Styrene	11.835	104	50576	1.2787165 ppbv	99
78) Bromoform	12.146	173	41339	1.2072891 ppbv	97
79) Isopropylbenzene	12.189	105	78633	1.2705416 ppbv	99
80) n-DECANE	12.658	43	59315	1.3168291 ppbv	98
81) 1,1,2,2-Tetrachloroethane	12.597	83	54952	1.1740537 ppbv	98
82) n-Propylbenzene	12.658	91	126512	1.2815500 ppbv	98
83) 4-Ethyltoluene	12.774	105	97332	1.2984409 ppbv	99
84) 2-Chlorotoluene	12.841	91	87547	1.2783766 ppbv	99
86) 1,3,5-Trimethylbenzene	12.835	105	85691	1.2735036 ppbv	100
87) tert-Butylbenzene	13.201	119	73392	1.2784604 ppbv	97
88) 1,2,4-Trimethylbenzene	13.262	105	84219	1.3768118 ppbv	98
89) sec-Butylbenzene	13.426	105	120425	1.3253305 ppbv	99
90) 1,3-Dichlorobenzene	13.652	146	60678	1.2645998 ppbv	99
91) P-ISOPROPYLTOLUENE	13.554	119	100071	1.3380646 ppbv	99
92) 1,4-Dichlorobenzene	13.743	146	59191	1.2675551 ppbv	99
93) 1,2,3-TRIMETHYLBENZENE	13.731	105	83111	1.2901762 ppbv	98
94) Benzyl Chloride	13.871	91	70815	1.2886007 ppbv	98
95) n-Butylbenzene	13.981	91	99438	1.3259607 ppbv	99
96) 1,2-Dichlorobenzene	14.146	146	58148	1.2677078 ppbv	98
97) 1,2-DIBROMO-3-CHLOROPR...	14.981	157	27292	1.2023528 ppbv	97
98) 1,2,4-Trichlorobenzene	15.877	180	42246	1.2467025 ppbv	98
99) Hexachloro-1,3-Butadiene	15.962	225	61587	1.2323798 ppbv	97
100) Naphthalene	16.212	128	92421	1.2932188 ppbv	99
101) TPH (GC/MS) Low Fraction	10.430	TIC	8170798m	57.7684741 ppbv	
102) TPH-GRO (C5-C10)	11.493	TIC	9535326m	82.8442601 ppbv	

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

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_06.D
Acq On : 25 Jul 2022 12:01 pm
Operator :
Sample : STD AMS 1.25 ppbv 22G12761
Misc : 22G13913
ALS Vial : 6 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:42:08 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:41:10 2022
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_07.D
Acq On : 25 Jul 2022 12:40 pm
Operator :
Sample : STD AMS 2.5 ppbv 22G12761
Misc : 22G13913
ALS Vial : 7 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:43:22 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:42:16 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.281	130	195181	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	812545	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.158	117	759627	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.469	95	553129	4.0454095	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 101.14%				
Target Compounds						Qvalue	
2) Propene	3.867	41	31690	2.2919138	ppbv		98
3) BUTANE	4.263	43	107885	2.3253174	ppbv		99
4) 1,1-DIFLUOROETHANE	3.867	65	22642	1.7278130	ppbv		97
5) Dichlorodifluoromethane	3.904	85	82065	2.2409259	ppbv		100
6) CHLORODIFLUOROMETHANE	3.928	67	10207	2.4287032	ppbv		94
7) 1,2-Dichlorotetrafluor...	4.062	85	92377	2.3663435	ppbv		98
8) Chloromethane	4.172	50	33388	2.4032641	ppbv		99
9) Vinyl Chloride	4.294	62	38320	2.4662286	ppbv		98
10) 1,3-Butadiene	4.324	39	28767	2.0822009	ppbv		97
11) Bromomethane	4.690	94	34972	2.2294182	ppbv		97
12) Chloroethane	4.782	64	17211	2.2697633	ppbv		99
13) ISOPENTANE	4.794	43	38298	2.2625398	ppbv		98
14) Vinyl Bromide	4.971	106	37196	2.3941054	ppbv		100
15) Trichlorofluoromethane	4.989	101	108817	2.3781007	ppbv		100
16) PENTANE	5.025	43	59613	2.2588014	ppbv		98
17) Ethanol	5.160	45	15267	1.4857560	ppbv		99
18) ACROLEIN	5.452	56	15554	2.3581896	ppbv		98
19) 1,1,2-Trichlorotrifluo...	5.416	101	77161	2.3406873	ppbv		98
20) 1,1-Dichloroethene	5.501	61	64279	2.4503608	ppbv		99
21) Acetone	5.592	43	64234	2.1268940	ppbv		100
22) BROMOETHANE	5.696	108	29339	2.2722669	ppbv		96
23) 2-Propanol	5.635	45	64073	2.3569523	ppbv		99
24) Carbon Disulfide	5.781	76	124230	2.4435385	ppbv		99
25) Allyl Chloride	5.818	41	54535	2.3807272	ppbv		93
26) METHYL ACETATE	5.812	43	74225	2.4164853	ppbv	#	99
27) ACETONITRILE	5.885	41	155617	12.0937511	ppbv		98
28) Methylene Chloride	5.952	49	45328	1.6492885	ppbv		98
29) TERT-BUTYL ALCOHOL	5.995	59	71859	2.4747481	ppbv		98
30) Methyl Tert-Butyl Ether	6.123	73	89435	2.4257625	ppbv		99
31) Trans-1,2-Dichloroethene	6.147	61	58189	2.4405826	ppbv		98
32) ACRYLONITRILE	6.202	53	31593	2.4305256	ppbv		98
33) n-Hexane	6.269	57	50761	2.5336132	ppbv		98
34) 1,1-Dichloroethane	6.543	63	72993	2.4521196	ppbv		100
35) Vinyl Acetate	6.495	43	142509m	2.7222275	ppbv		
36) DI-ISOPROPYL ETHER	6.458	45	106742	2.5672315	ppbv		90
37) ETHYL TERT-BUTYL ETHER	6.769	59	104685	2.5019890	ppbv		98
38) ETHYL ACETATE	6.988	45	12569	2.5707102	ppbv		85
39) 2-Butanone (MEK)	7.043	72	17925	2.5153352	ppbv		99
40) cis-1,2-Dichloroethene	7.049	61	53603	2.4862987	ppbv		99
41) Tetrahydrofuran	7.312	42	37542	2.4916116	ppbv		98
42) Chloroform	7.281	83	75088	2.3466037	ppbv		98
43) Cyclohexane	7.488	84	38260	2.6067454	ppbv		99
44) 1,1,1-Trichloroethane	7.476	97	83268	2.4029228	ppbv		99
45) Carbon Tetrachloride	7.604	117	84735	2.4327540	ppbv		99
46) 2,2,4-Trimethylpentane	7.708	57	160749	2.5918922	ppbv		98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_07.D
Acq On : 25 Jul 2022 12:40 pm
Operator :
Sample : STD AMS 2.5 ppbv 22G12761
Misc : 22G13913
ALS Vial : 7 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:43:22 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:42:16 2022
Response via : Initial Calibration

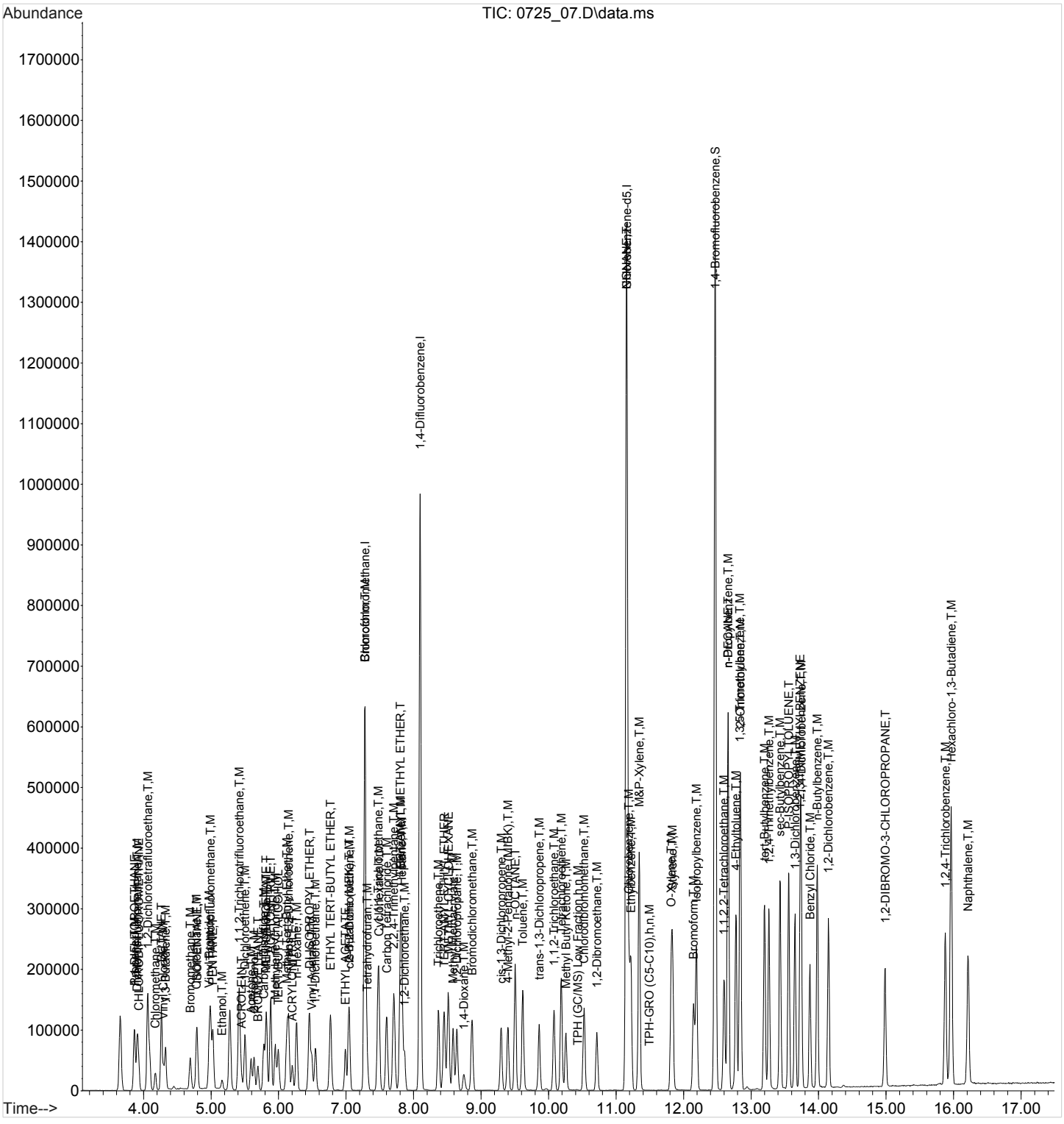
	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48)	Benzene	7.811	78	110885	2.4128757	ppbv	98
49)	TERT-AMYL METHYL ETHER	7.805	73	101018	2.5971030	ppbv	98
50)	1,2-Dichloroethane	7.866	62	53200	2.3342506	ppbv	98
51)	Heptane	7.824	43	106619	2.6417611	ppbv	98
52)	Trichloroethene	8.366	95	48320	2.4247415	ppbv	98
53)	TERT-AMYL ETHYL ETHER	8.452	73	30476	2.3181116	ppbv	97
54)	METHYL CYCLOHEXANE	8.519	83	67193	2.5711473	ppbv	99
55)	1,2-Dichloropropane	8.641	63	43311	2.4066492	ppbv	98
56)	Methyl Methacrylate	8.586	69	39397	2.4721874	ppbv	98
57)	1,4-Dioxane	8.744	88	19437	2.4327563	ppbv	98
58)	Bromodichloromethane	8.866	83	85665	2.3774800	ppbv	100
59)	cis-1,3-Dichloropropene	9.299	75	64016	2.4991881	ppbv	98
60)	4-Methyl-2-Pentanone (...	9.397	43	84078	2.5401696	ppbv	98
61)	n-OCTANE	9.506	43	102110	2.7178255	ppbv	98
62)	Toluene	9.616	91	134226	2.5110720	ppbv	97
63)	trans-1,3-Dichloropropene	9.860	75	61993	2.4698316	ppbv	99
64)	1,1,2-Trichloroethane	10.079	97	47738	2.4280254	ppbv	98
65)	Tetrachloroethene	10.189	166	65226	2.4127562	ppbv	99
66)	Methyl Butyl Ketone	10.256	43	75546	2.5753336	ppbv	99
67)	Chlorodibromomethane	10.524	129	85047	2.4281419	ppbv	100
68)	1,2-Dibromoethane	10.713	107	73279	2.4676437	ppbv	99
69)	Chlorobenzene	11.189	112	103288	2.3639202	ppbv	95
70)	NONANE	11.152	43	106518	2.4920744	ppbv	100
72)	Ethylbenzene	11.219	91	168598	2.4732875	ppbv	100
73)	M&P-Xylene	11.341	91	258483	5.1194165	ppbv	100
74)	O-Xylene	11.817	91	119269	2.5282190	ppbv	98
77)	Styrene	11.835	104	111718	2.7801826	ppbv	98
78)	Bromoform	12.146	173	81726	2.3762976	ppbv	99
79)	Isopropylbenzene	12.189	105	171928	2.7378955	ppbv	99
80)	n-DECANE	12.658	43	123776	2.6883974	ppbv	99
81)	1,1,2,2-Tetrachloroethane	12.597	83	109956	2.3514960	ppbv	98
82)	n-Propylbenzene	12.658	91	262141	2.6125417	ppbv	100
83)	4-Ethyltoluene	12.774	105	205965	2.6959893	ppbv	98
84)	2-Chlorotoluene	12.841	91	178932	2.5718726	ppbv	99
86)	1,3,5-Trimethylbenzene	12.835	105	181523	2.6575272	ppbv	99
87)	tert-Butylbenzene	13.201	119	158773	2.7224086	ppbv	99
88)	1,2,4-Trimethylbenzene	13.262	105	181667	2.8782479	ppbv	99
89)	sec-Butylbenzene	13.426	105	255875	2.7513347	ppbv	100
90)	1,3-Dichlorobenzene	13.652	146	125874	2.5879496	ppbv	99
91)	P-ISOPROPYLTOLUENE	13.560	119	216926	2.8282322	ppbv	99
92)	1,4-Dichlorobenzene	13.743	146	125829	2.6569599	ppbv	99
93)	1,2,3-TRIMETHYLBENZENE	13.725	105	181203	2.7636583	ppbv	99
94)	Benzyl Chloride	13.871	91	151104	2.7021304	ppbv	100
95)	n-Butylbenzene	13.981	91	218622	2.8479798	ppbv	99
96)	1,2-Dichlorobenzene	14.146	146	122728	2.6382173	ppbv	99
97)	1,2-DIBROMO-3-CHLOROPR...	14.987	157	58042	2.5478493	ppbv	96
98)	1,2,4-Trichlorobenzene	15.877	180	99232	2.8971397	ppbv	99
99)	Hexachloro-1,3-Butadiene	15.962	225	124810	2.4765224	ppbv	99
100)	Naphthalene	16.212	128	213081	2.9279558	ppbv	99
101)	TPH (GC/MS) Low Fraction	10.430	TIC	16096455m	116.2434294	ppbv	
102)	TPH-GRO (C5-C10)	11.493	TIC	18691928m	165.5574391	ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_07.D
Acq On : 25 Jul 2022 12:40 pm
Operator :
Sample : STD AMS 2.5 ppbv 22G12761
Misc : 22G13913
ALS Vial : 7 Sample Multiplier: 1
InstName : AIRMS7

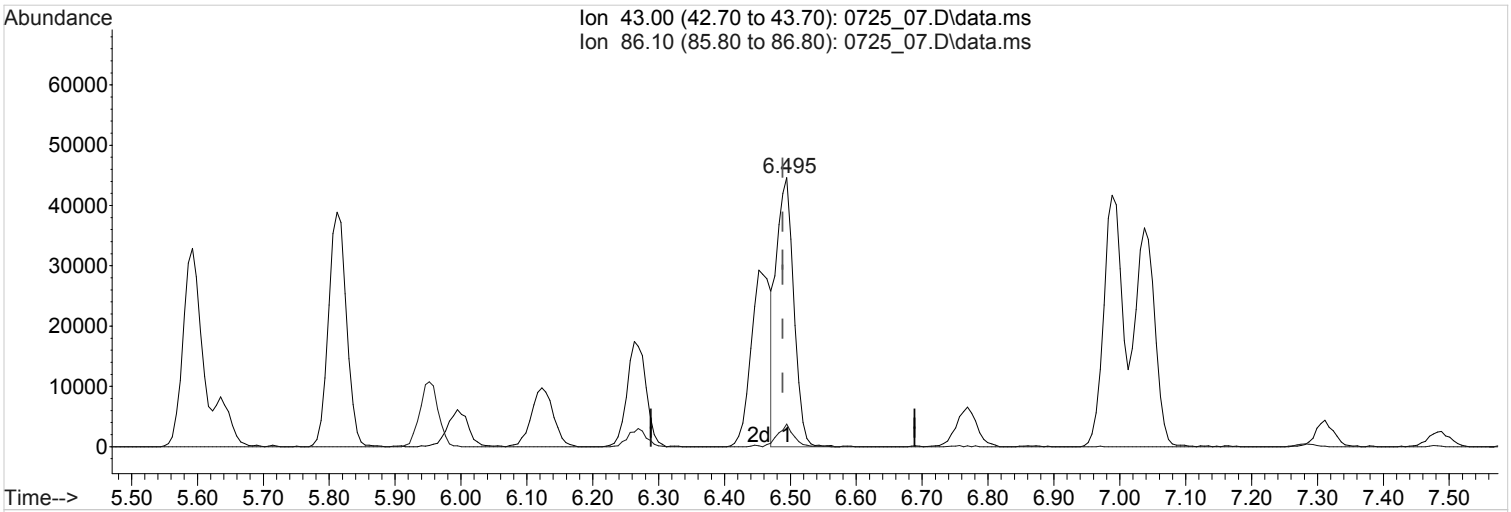
Quant Time: Jul 25 14:43:22 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:42:16 2022
Response via : Initial Calibration

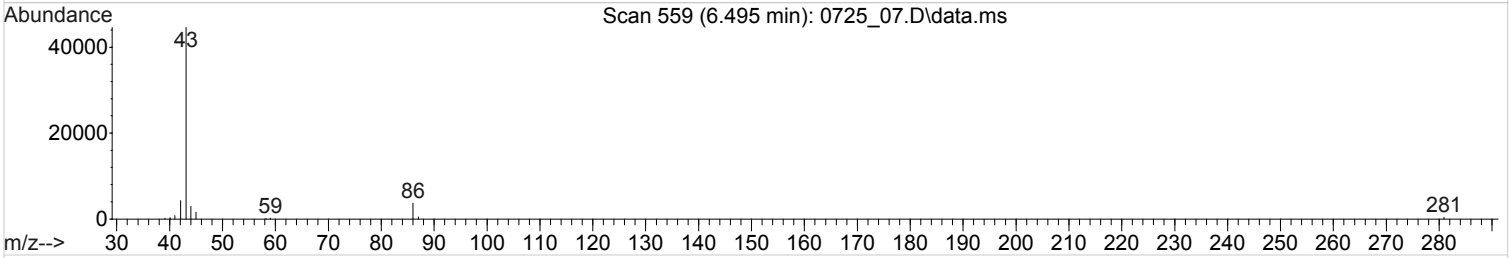


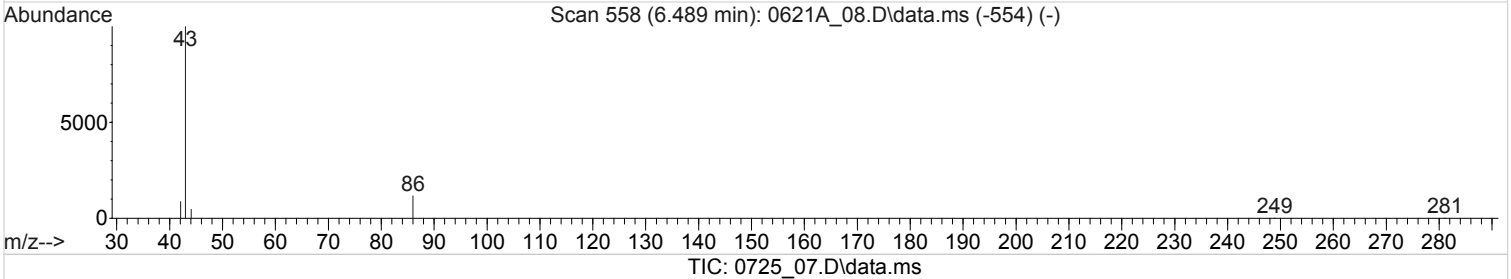
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_07.D
Acq On : 25 Jul 2022 12:40 pm
Operator :
Sample : STD AMS 2.5 ppbv 22G12761
Misc : 22G13913
ALS Vial : 7 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:42:20 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:42:16 2022
Response via : Initial Calibration







TIC: 0725_07.D\data.ms

(35) Vinyl Acetate (T,M)

6.495min (+0.006) 1.5623071 ppbv

Qvalue = 100

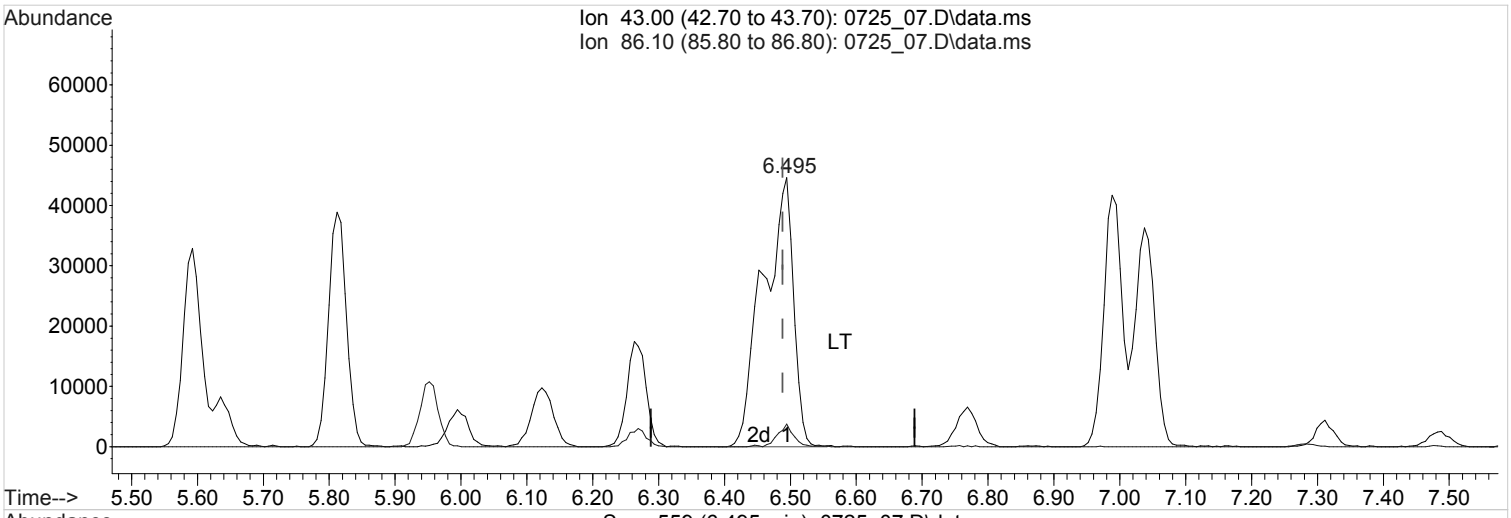
response 81787

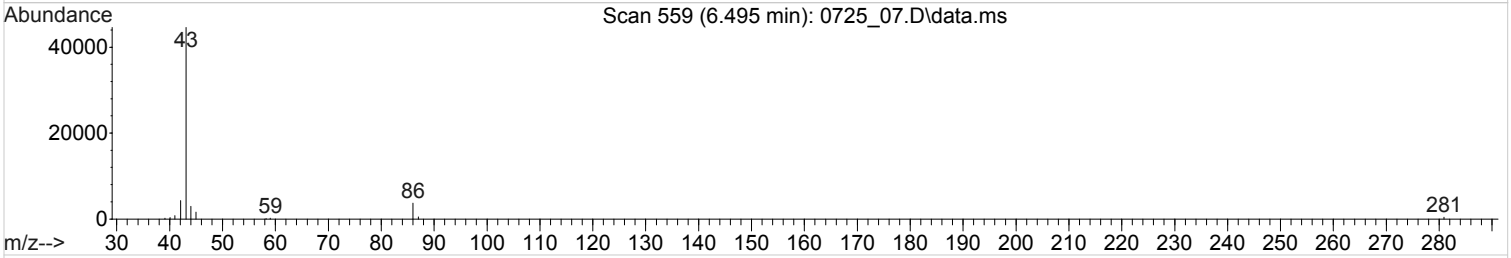
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	7.57
0.00	0.00	0.00
0.00	0.00	0.00

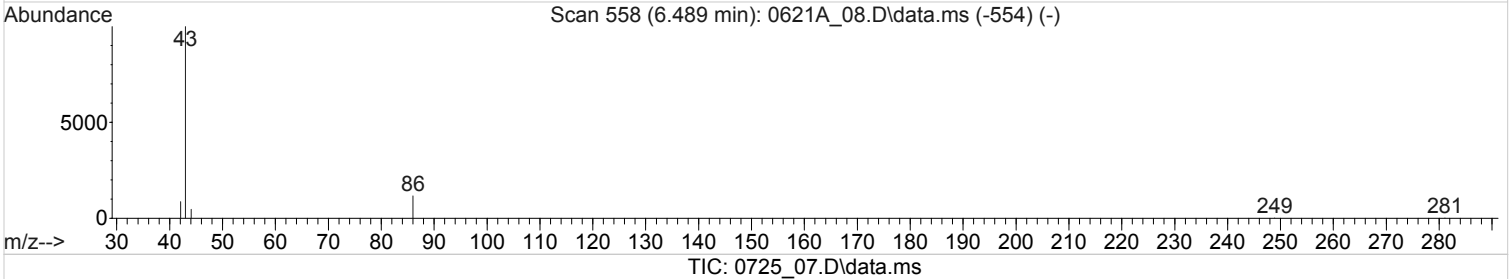
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_07.D
Acq On : 25 Jul 2022 12:40 pm
Operator :
Sample : STD AMS 2.5 ppbv 22G12761
Misc : 22G13913
ALS Vial : 7 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:42:20 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:42:16 2022
Response via : Initial Calibration







TIC: 0725_07.D\data.ms

(35) Vinyl Acetate (T,M)

6.495min (+0.006) 2.7222275 ppbv m

response 142509

Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.34#
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_08.D
Acq On : 25 Jul 2022 1:20 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G12761
Misc : 22G13913
ALS Vial : 8 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:44:43 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:43:38 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.281	130	198011	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	825001	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.158	117	768120	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.469	95	561812	4.0558087	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 101.40%				
Target Compounds						Qvalue	
2) Propene	3.861	41	48006	3.4704570	ppbv		100
3) BUTANE	4.263	43	168281	3.6173600	ppbv		100
4) 1,1-DIFLUOROETHANE	3.861	65	33160	2.6296491	ppbv		100
5) Dichlorodifluoromethane	3.904	85	116932	3.2027100	ppbv		100
6) CHLORODIFLUOROMETHANE	3.922	67	15059	3.5488682	ppbv		100
7) 1,2-Dichlorotetrafluor...	4.056	85	140134	3.5702018	ppbv		100
8) Chloromethane	4.172	50	52247	3.7310454	ppbv		100
9) Vinyl Chloride	4.294	62	59093	3.7572577	ppbv		100
10) 1,3-Butadiene	4.324	39	45422	3.3335788	ppbv		100
11) Bromomethane	4.690	94	54640	3.4965171	ppbv		100
12) Chloroethane	4.776	64	26848	3.5444785	ppbv		100
13) ISOPENTANE	4.788	43	58989	3.4903547	ppbv		100
14) Vinyl Bromide	4.965	106	55710	3.5596332	ppbv		100
15) Trichlorofluoromethane	4.989	101	165425	3.5927469	ppbv		100
16) PENTANE	5.025	43	89437	3.3950227	ppbv		100
17) Ethanol	5.160	45	24088	2.4782669	ppbv		100
18) ACROLEIN	5.452	56	24453	3.6892863	ppbv		100
19) 1,1,2-Trichlorotrifluo...	5.416	101	117189	3.5417497	ppbv		100
20) 1,1-Dichloroethene	5.501	61	96326	3.6315519	ppbv		100
21) Acetone	5.586	43	95061	3.1817835	ppbv		100
22) BROMOETHANE	5.696	108	46095	3.5732235	ppbv		100
23) 2-Propanol	5.635	45	97215	3.5589245	ppbv		100
24) Carbon Disulfide	5.781	76	185340	3.6070146	ppbv		100
25) Allyl Chloride	5.818	41	85724	3.7183654	ppbv		100
26) METHYL ACETATE	5.806	43	111954	3.6128218	ppbv	#	100
27) ACETONITRILE	5.879	41	236479	18.2139276	ppbv		100
28) Methylene Chloride	5.952	49	67105	2.5514663	ppbv		100
29) TERT-BUTYL ALCOHOL	5.995	59	111293	3.7844052	ppbv		100
30) Methyl Tert-Butyl Ether	6.117	73	141184	3.7934049	ppbv		100
31) Trans-1,2-Dichloroethene	6.147	61	89549	3.7169378	ppbv		100
32) ACRYLONITRILE	6.202	53	47564	3.6236987	ppbv		100
33) n-Hexane	6.269	57	78975	3.8768222	ppbv		100
34) 1,1-Dichloroethane	6.543	63	108016	3.5882710	ppbv		100
35) Vinyl Acetate	6.489	43	219856m	4.0792631	ppbv		
36) DI-ISOPROPYL ETHER	6.452	45	168266	3.9712945	ppbv		100
37) ETHYL TERT-BUTYL ETHER	6.763	59	166438	3.9205236	ppbv		100
38) ETHYL ACETATE	6.989	45	18421	3.6963353	ppbv		100
39) 2-Butanone (MEK)	7.037	72	26795	3.7024987	ppbv		100
40) cis-1,2-Dichloroethene	7.043	61	80757	3.6956384	ppbv		100
41) Tetrahydrofuran	7.312	42	58780	3.8475448	ppbv		100
42) Chloroform	7.281	83	113015	3.5173668	ppbv		100
43) Cyclohexane	7.482	84	59653	3.9779060	ppbv		100
44) 1,1,1-Trichloroethane	7.476	97	124511	3.5648186	ppbv		100
45) Carbon Tetrachloride	7.604	117	126437	3.5942569	ppbv		100
46) 2,2,4-Trimethylpentane	7.708	57	248132	3.9196494	ppbv		100

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_08.D
Acq On : 25 Jul 2022 1:20 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G12761
Misc : 22G13913
ALS Vial : 8 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:44:43 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:43:38 2022
Response via : Initial Calibration

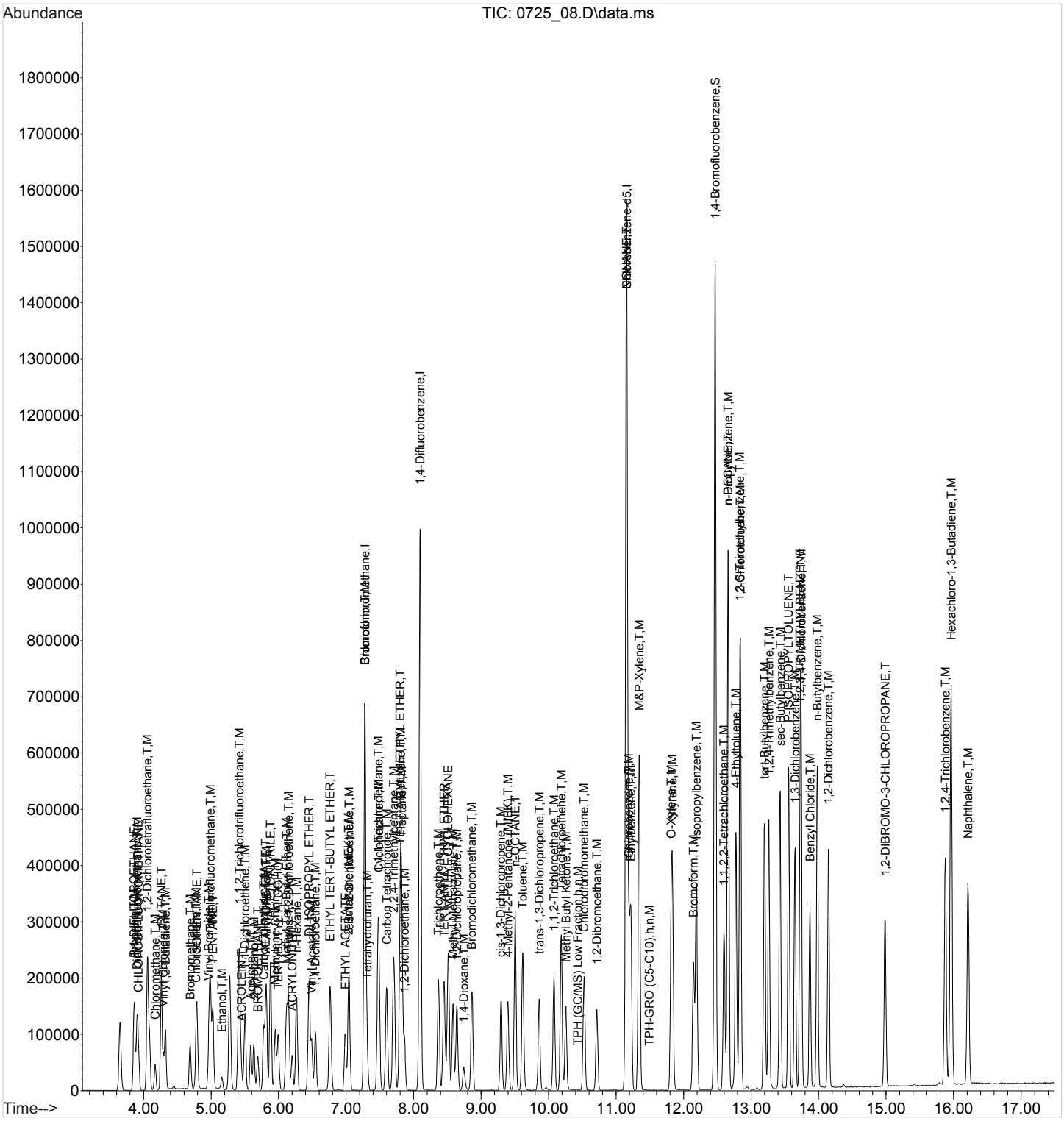
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48) Benzene	7.811	78	167296	3.6063720	ppbv	100
49) TERT-AMYL METHYL ETHER	7.799	73	154080	3.8763883	ppbv	100
50) 1,2-Dichloroethane	7.866	62	81138	3.5455102	ppbv	100
51) Heptane	7.824	43	164900	3.9864599	ppbv	100
52) Trichloroethene	8.366	95	72357	3.5941522	ppbv	100
53) TERT-AMYL ETHYL ETHER	8.452	73	48729	3.6953469	ppbv	100
54) METHYL CYCLOHEXANE	8.513	83	105489	3.9568354	ppbv	100
55) 1,2-Dichloropropane	8.641	63	66171	3.6440678	ppbv	100
56) Methyl Methacrylate	8.586	69	61705	3.8206525	ppbv	100
57) 1,4-Dioxane	8.744	88	30489	3.7753461	ppbv	100
58) Bromodichloromethane	8.860	83	127607	3.5167604	ppbv	100
59) cis-1,3-Dichloropropene	9.293	75	99107	3.8109319	ppbv	100
60) 4-Methyl-2-Pentanone (...	9.397	43	127497	3.7836572	ppbv	100
61) n-OCTANE	9.506	43	159289	4.1159557	ppbv	100
62) Toluene	9.616	91	201870	3.7167795	ppbv	100
63) trans-1,3-Dichloropropene	9.860	75	95659	3.7611254	ppbv	100
64) 1,1,2-Trichloroethane	10.079	97	70866	3.5670464	ppbv	100
65) Tetrachloroethene	10.189	166	97121	3.5590339	ppbv	100
66) Methyl Butyl Ketone	10.256	43	116140	3.8799052	ppbv	100
67) Chlorodibromomethane	10.524	129	128535	3.6317415	ppbv	100
68) 1,2-Dibromoethane	10.713	107	111970	3.7216486	ppbv	100
69) Chlorobenzene	11.189	112	156504	3.5600756	ppbv	100
70) NONANE	11.152	43	168759	3.8906970	ppbv	100
72) Ethylbenzene	11.219	91	254665	3.7011515	ppbv	100
73) M&P-Xylene	11.341	91	399672	7.7971919	ppbv	100
74) O-Xylene	11.817	91	190594	3.9879655	ppbv	100
77) Styrene	11.835	104	173537	4.1925311	ppbv	100
78) Bromoform	12.146	173	126515	3.6681774	ppbv	100
79) Isopropylbenzene	12.189	105	273888	4.2460084	ppbv	100
80) n-DECANE	12.658	43	192327	4.0798849	ppbv	100
81) 1,1,2,2-Tetrachloroethane	12.597	83	167483	3.5775723	ppbv	100
82) n-Propylbenzene	12.658	91	401671	3.9293781	ppbv	100
83) 4-Ethyltoluene	12.774	105	320279	4.0924823	ppbv	100
84) 2-Chlorotoluene	12.841	91	272843	3.8598428	ppbv	100
86) 1,3,5-Trimethylbenzene	12.835	105	280317	4.0163331	ppbv	100
87) tert-Butylbenzene	13.201	119	251477	4.2019814	ppbv	100
88) 1,2,4-Trimethylbenzene	13.262	105	281512	4.3023406	ppbv	100
89) sec-Butylbenzene	13.432	105	402189	4.2063024	ppbv	100
90) 1,3-Dichlorobenzene	13.652	146	193900	3.9194935	ppbv	100
91) P-ISOPROPYLTOLUENE	13.554	119	342319	4.3192164	ppbv	100
92) 1,4-Dichlorobenzene	13.743	146	196013	4.0507889	ppbv	100
93) 1,2,3-TRIMETHYLBENZENE	13.725	105	284650	4.2192387	ppbv	100
94) Benzyl Chloride	13.871	91	241764	4.2187142	ppbv	100
95) n-Butylbenzene	13.981	91	347030	4.3693961	ppbv	100
96) 1,2-Dichlorobenzene	14.146	146	191775	4.0396780	ppbv	100
97) 1,2-DIBROMO-3-CHLOROPR...	14.987	157	93004	4.0245853	ppbv	100
98) 1,2,4-Trichlorobenzene	15.877	180	164026	4.6137378	ppbv	100
99) Hexachloro-1,3-Butadiene	15.962	225	191522	3.7641173	ppbv	100
100) Naphthalene	16.212	128	356977	4.7164389	ppbv	100
101) TPH (GC/MS) Low Fraction	10.430	TIC	24411440m	178.9531746	ppbv	
102) TPH-GRO (C5-C10)	11.493	TIC	28258660m	253.9137304	ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_08.D
Acq On : 25 Jul 2022 1:20 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G12761
Misc : 22G13913
ALS Vial : 8 Sample Multiplier: 1
InstName : AIRMS7

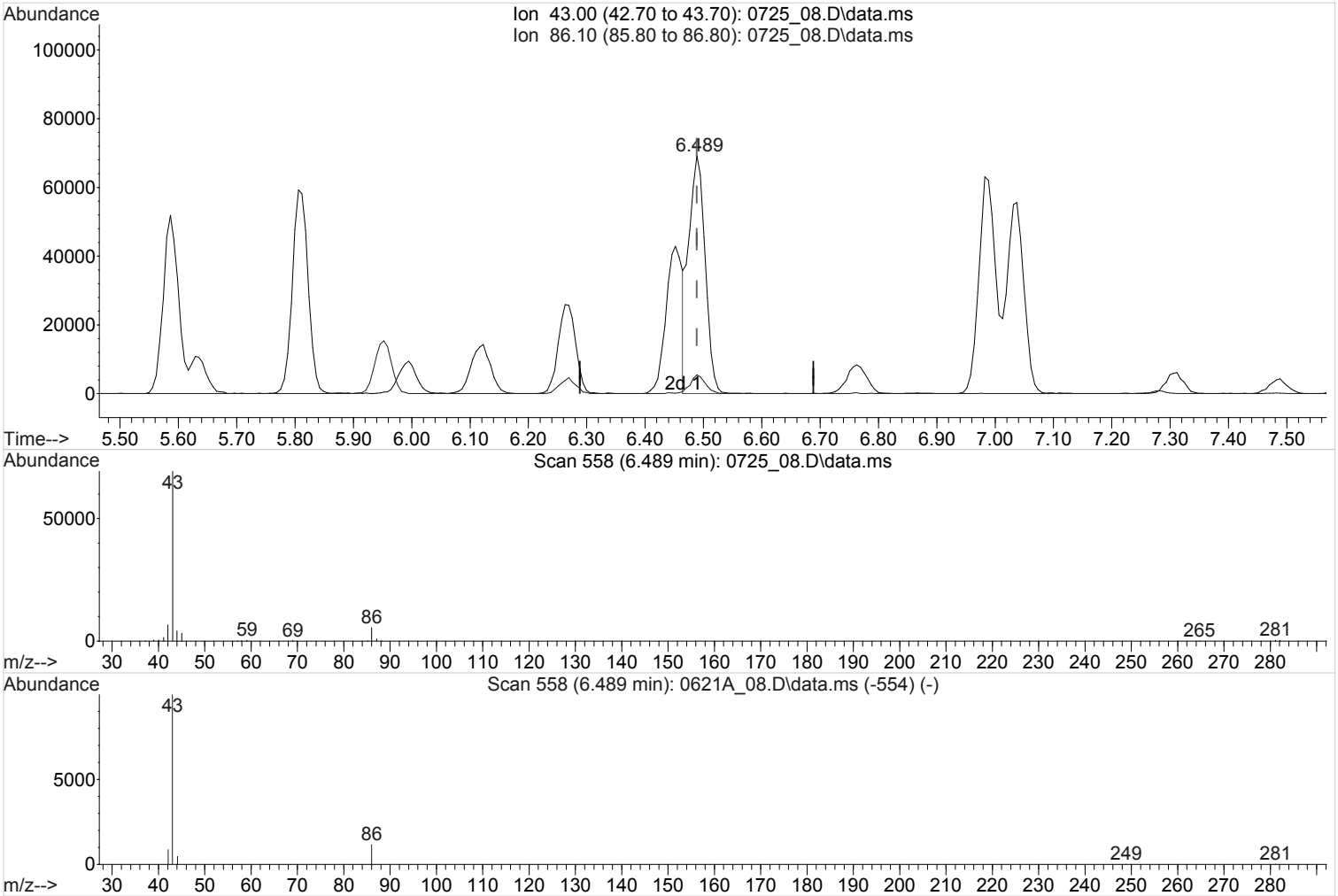
Quant Time: Jul 25 14:44:43 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:43:38 2022
Response via : Initial Calibration



Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_08.D
Acq On : 25 Jul 2022 1:20 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G12761
Misc : 22G13913
ALS Vial : 8 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:43:42 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:43:38 2022
Response via : Initial Calibration



TIC: 0725_08.D\data.ms

(35) Vinyl Acetate (T,M)

6.489min (0.000) 2.5203536 ppbv

Qvalue = 100

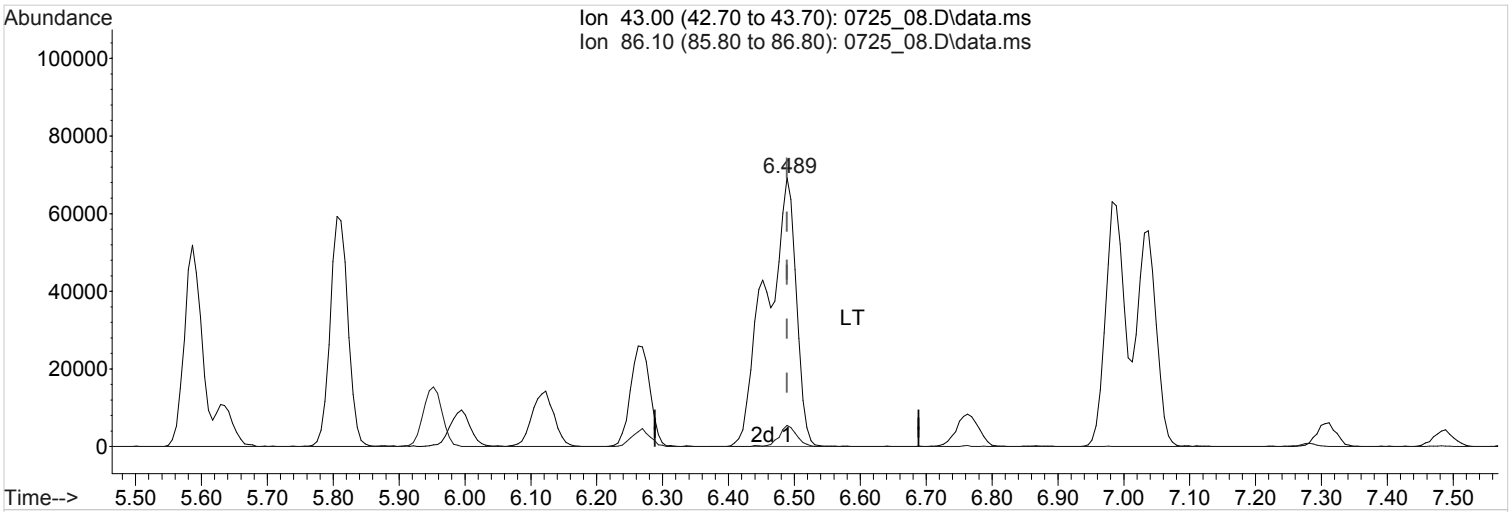
response 135837

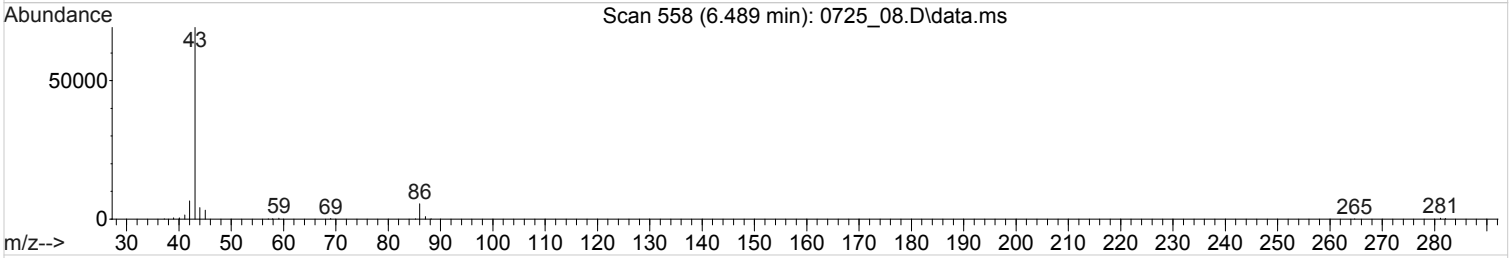
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	7.52
0.00	0.00	0.00
0.00	0.00	0.00

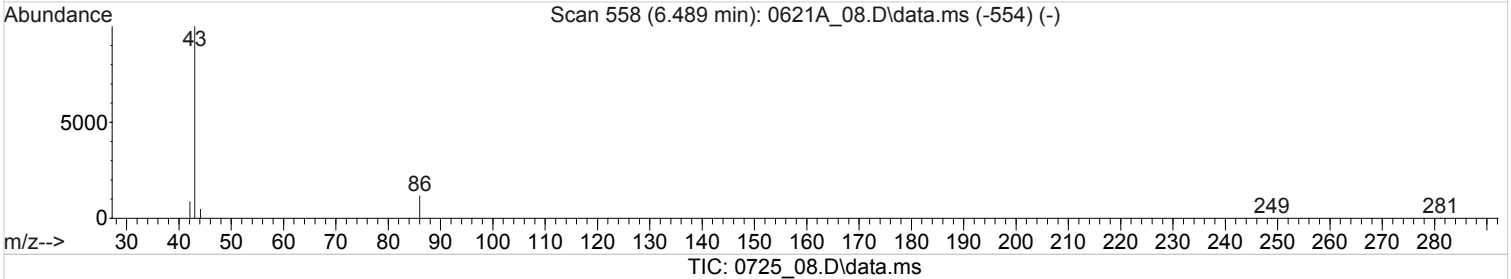
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_08.D
Acq On : 25 Jul 2022 1:20 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G12761
Misc : 22G13913
ALS Vial : 8 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:43:42 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:43:38 2022
Response via : Initial Calibration







TIC: 0725_08.D\data.ms

(35) Vinyl Acetate (T,M)

6.489min (0.000) 4.0792631 ppbv m

response 219856

Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.64#
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_09.D
Acq On : 25 Jul 2022 1:57 pm
Operator :
Sample : STD AMS 10.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 9 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:46:00 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:44:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.281	130	197571	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	828672	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.159	117	778807	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.469	95	581640	4.1413310	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 103.53%				
Target Compounds						Qvalue	
2) Propene	3.861	41	122516	8.8766701	ppbv		96
3) BUTANE	4.263	43	233111	5.0221021	ppbv		100
4) 1,1-DIFLUOROETHANE	3.867	65	85720	6.8128928	ppbv		93
5) Dichlorodifluoromethane	3.904	85	367665	10.0925904	ppbv		99
6) CHLORODIFLUOROMETHANE	3.928	67	41701	9.8493217	ppbv		96
7) 1,2-Dichlorotetrafluor...	4.062	85	387930	9.9053251	ppbv		99
8) Chloromethane	4.172	50	142974	10.2327501	ppbv		99
9) Vinyl Chloride	4.294	62	161526	10.2930362	ppbv		100
10) 1,3-Butadiene	4.324	39	122619	9.0192071	ppbv		99
11) Bromomethane	4.690	94	145408	9.3256559	ppbv		100
12) Chloroethane	4.782	64	69143	9.1486023	ppbv		98
13) ISOPENTANE	4.794	43	154938	9.1880340	ppbv		98
14) Vinyl Bromide	4.971	106	148451	9.5065149	ppbv		100
15) Trichlorofluoromethane	4.989	101	435349	9.4760894	ppbv		99
16) PENTANE	5.026	43	232291	8.8373887	ppbv		98
17) Ethanol	5.147	45	63804	6.5790222	ppbv		100
18) ACROLEIN	5.446	56	67574	10.2177662	ppbv		100
19) 1,1,2-Trichlorotrifluo...	5.416	101	312406	9.4627311	ppbv		100
20) 1,1-Dichloroethene	5.501	61	260711	9.8508612	ppbv		99
21) Acetone	5.574	43	238740	8.0086543	ppbv		100
22) BROMOETHANE	5.690	108	121252	9.4202276	ppbv		99
23) 2-Propanol	5.623	45	272806	10.0093420	ppbv		98
24) Carbon Disulfide	5.782	76	507423	9.8972606	ppbv		98
25) Allyl Chloride	5.824	41	246838	10.7306932	ppbv		93
26) METHYL ACETATE	5.800	43	309576	10.0124494	ppbv	#	100
27) ACETONITRILE	5.879	41	615009	47.4743049	ppbv		98
28) Methylene Chloride	5.952	49	172351	6.5677238	ppbv		99
29) TERT-BUTYL ALCOHOL	5.983	59	318781	10.8639643	ppbv		97
30) Methyl Tert-Butyl Ether	6.105	73	391224	10.5350190	ppbv		99
31) Trans-1,2-Dichloroethene	6.153	61	235832	9.8105513	ppbv		99
32) ACRYLONITRILE	6.202	53	129187	9.8641268	ppbv		100
33) n-Hexane	6.269	57	221611	10.9029416	ppbv		98
34) 1,1-Dichloroethane	6.550	63	288917	9.6191426	ppbv		100
35) Vinyl Acetate	6.489	43	634393m	11.0325136	ppbv		
36) DI-ISOPROPYL ETHER	6.440	45	474386	11.2210553	ppbv		93
37) ETHYL TERT-BUTYL ETHER	6.751	59	485380	11.4588115	ppbv		99
38) ETHYL ACETATE	6.982	45	52447	10.5473881	ppbv		85
39) 2-Butanone (MEK)	7.025	72	71918	9.9596682	ppbv		99
40) cis-1,2-Dichloroethene	7.050	61	222080	10.1855589	ppbv		99
41) Tetrahydrofuran	7.300	42	164353	10.7819635	ppbv		98
42) Chloroform	7.281	83	298922	9.3240710	ppbv		98
43) Cyclohexane	7.488	84	168904	11.2882932	ppbv		98
44) 1,1,1-Trichloroethane	7.476	97	325068	9.3276029	ppbv		98
45) Carbon Tetrachloride	7.598	117	341574	9.7316360	ppbv		99
46) 2,2,4-Trimethylpentane	7.708	57	703106	11.1314404	ppbv		98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_09.D
Acq On : 25 Jul 2022 1:57 pm
Operator :
Sample : STD AMS 10.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 9 Sample Multiplier: 1
InstName : AIRMS7

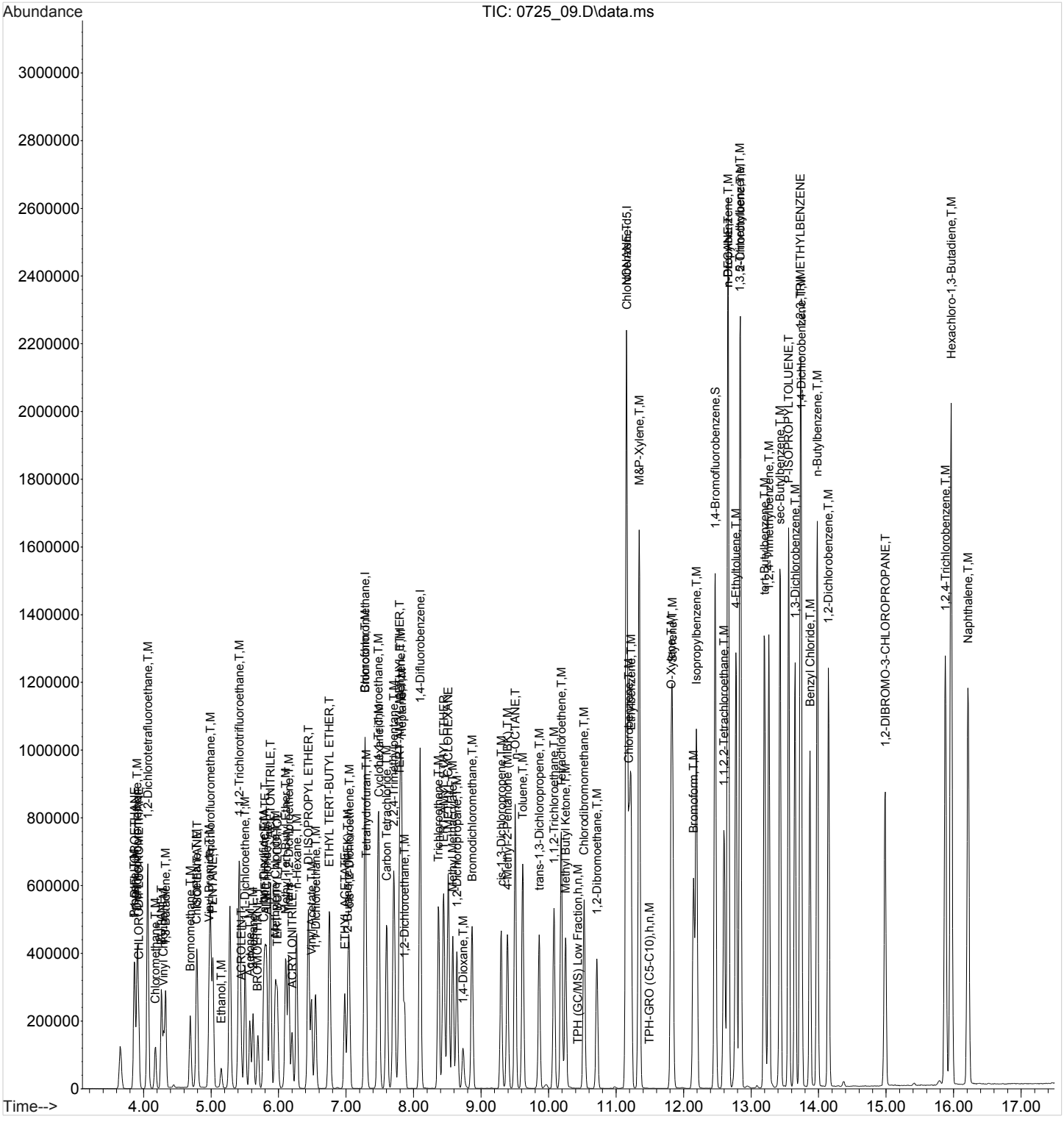
Quant Time: Jul 25 14:46:00 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:44:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48) Benzene	7.812	78	446224	9.5765636	ppbv	99
49) TERT-AMYL METHYL ETHER	7.793	73	453970	11.3705105	ppbv	96
50) 1,2-Dichloroethane	7.866	62	217701	9.4708003	ppbv	98
51) Heptane	7.824	43	463653	11.1591632	ppbv	99
52) Trichloroethene	8.366	95	199500	9.8657618	ppbv	99
53) TERT-AMYL ETHYL ETHER	8.446	73	145605	10.9929896	ppbv	97
54) METHYL CYCLOHEXANE	8.513	83	284335	10.6180055	ppbv	98
55) 1,2-Dichloropropane	8.641	63	175989	9.6488618	ppbv	98
56) Methyl Methacrylate	8.580	69	178335	10.9932368	ppbv	98
57) 1,4-Dioxane	8.732	88	95252	11.7424713	ppbv	95
58) Bromodichloromethane	8.866	83	346764	9.5142398	ppbv	99
59) cis-1,3-Dichloropropene	9.299	75	281681	10.7834127	ppbv	98
60) 4-Methyl-2-Pentanone (...	9.391	43	370639	10.9505199	ppbv	99
61) n-OCTANE	9.506	43	439526	11.3068410	ppbv	99
62) Toluene	9.616	91	549157	10.0661488	ppbv	99
63) trans-1,3-Dichloropropene	9.860	75	269794	10.5607819	ppbv	98
64) 1,1,2-Trichloroethane	10.079	97	193397	9.6915309	ppbv	97
65) Tetrachloroethene	10.189	166	266676	9.7291461	ppbv	100
66) Methyl Butyl Ketone	10.250	43	361749	12.0314630	ppbv	98
67) Chlorodibromomethane	10.524	129	351098	9.8762867	ppbv	100
68) 1,2-Dibromoethane	10.713	107	304475	10.0752802	ppbv	99
69) Chlorobenzene	11.189	112	427090	9.6721939	ppbv	97
70) NONANE	11.152	43	468842	10.7611527	ppbv	99
72) Ethylbenzene	11.219	91	719754	10.3169403	ppbv	100
73) M&P-Xylene	11.341	91	1132109	21.7832144	ppbv	99
74) O-Xylene	11.817	91	565174	11.6633571	ppbv	100
77) Styrene	11.835	104	495425	11.8048738	ppbv	99
78) Bromoform	12.146	173	352272	10.0736224	ppbv	99
79) Isopropylbenzene	12.189	105	820977	12.5527262	ppbv	99
80) n-DECANE	12.658	43	545743	11.4181319	ppbv	100
81) 1,1,2,2-Tetrachloroethane	12.597	83	464350	9.7827818	ppbv	98
82) n-Propylbenzene	12.658	91	1131913	10.9210807	ppbv	100
83) 4-Ethyltoluene	12.774	105	931102	11.7342363	ppbv	99
84) 2-Chlorotoluene	12.841	91	773065	10.7862888	ppbv	100
86) 1,3,5-Trimethylbenzene	12.835	105	809297	11.4363501	ppbv	100
87) tert-Butylbenzene	13.201	119	755121	12.4443332	ppbv	98
88) 1,2,4-Trimethylbenzene	13.262	105	828497	12.4881482	ppbv	100
89) sec-Butylbenzene	13.426	105	1192176	12.2973038	ppbv	99
90) 1,3-Dichlorobenzene	13.652	146	558401	11.1326244	ppbv	99
91) P-ISOPROPYLTOLUENE	13.554	119	1022210	12.7207675	ppbv	100
92) 1,4-Dichlorobenzene	13.743	146	569047	11.5985073	ppbv	99
93) 1,2,3-TRIMETHYLBENZENE	13.731	105	853813	12.4820206	ppbv	99
94) Benzyl Chloride	13.871	91	756768	13.0241821	ppbv	100
95) n-Butylbenzene	13.981	91	1035161	12.8546876	ppbv	100
96) 1,2-Dichlorobenzene	14.146	146	550245	11.4316807	ppbv	99
97) 1,2-DIBROMO-3-CHLOROPR...	14.987	157	272076	11.6120521	ppbv	98
98) 1,2,4-Trichlorobenzene	15.877	180	510463	14.1613192	ppbv	99
99) Hexachloro-1,3-Butadiene	15.962	225	549697	10.6553342	ppbv	99
100) Naphthalene	16.212	128	1200567	15.6444251	ppbv	100
101) TPH (GC/MS) Low Fraction	10.430	TIC	66430416m	480.2995826	ppbv	
102) TPH-GRO (C5-C10)	11.493	TIC	76672601m	679.4758826	ppbv	

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

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_09.D
Acq On : 25 Jul 2022 1:57 pm
Operator :
Sample : STD AMS 10.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 9 Sample Multiplier: 1
InstName : AIRMS7

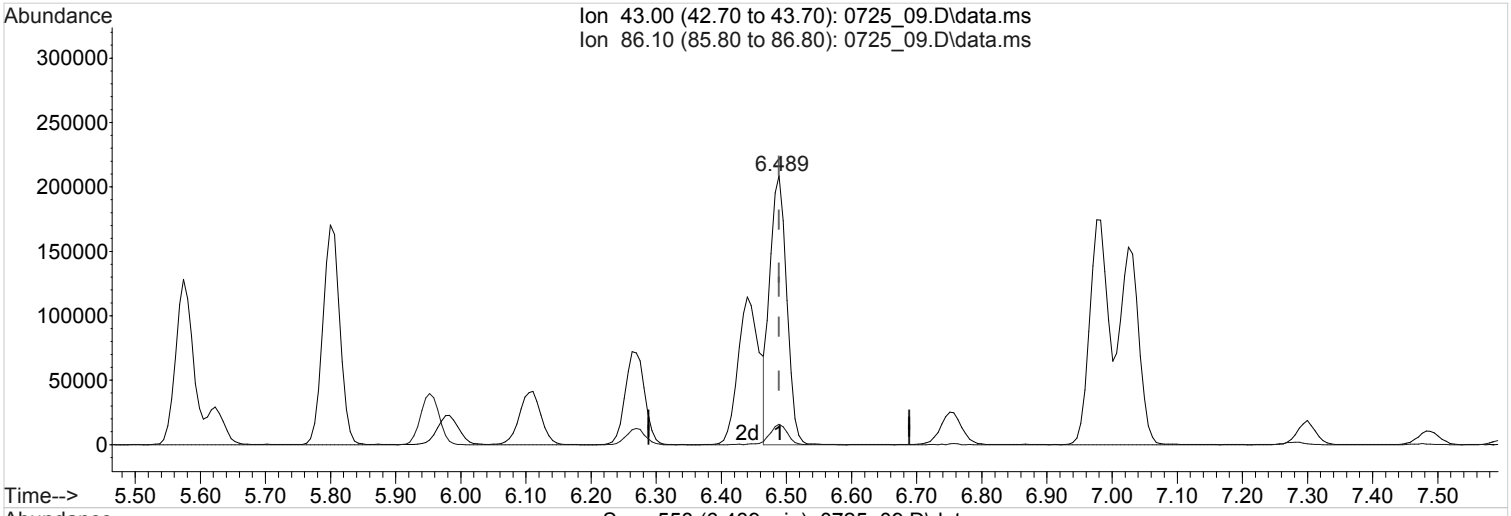
Quant Time: Jul 25 14:46:00 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:44:52 2022
Response via : Initial Calibration

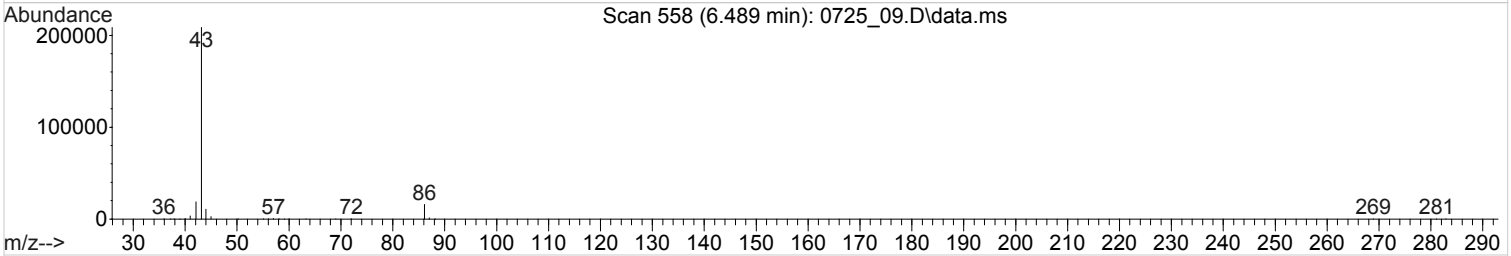


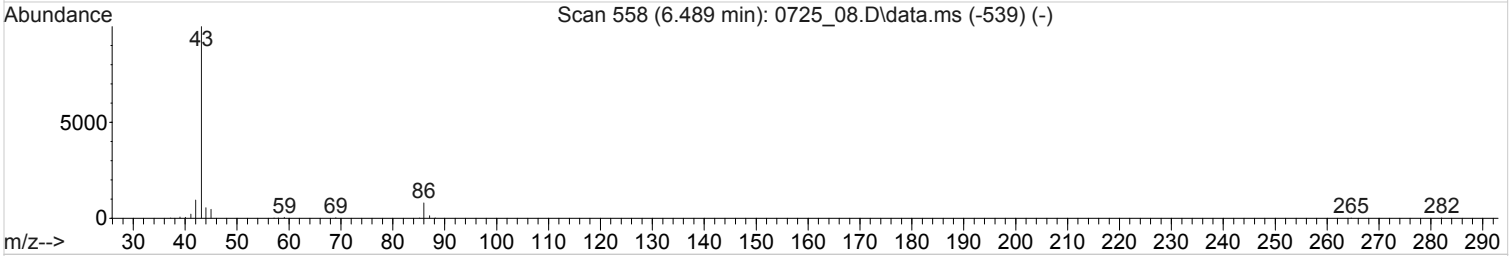
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_09.D
Acq On : 25 Jul 2022 1:57 pm
Operator :
Sample : STD AMS 10.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 9 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:45:01 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:44:52 2022
Response via : Initial Calibration







TIC: 0725_09.D\data.ms

(35) Vinyl Acetate (T,M)

6.489min (+0.000) 6.5018812 ppbv

Qvalue = 99

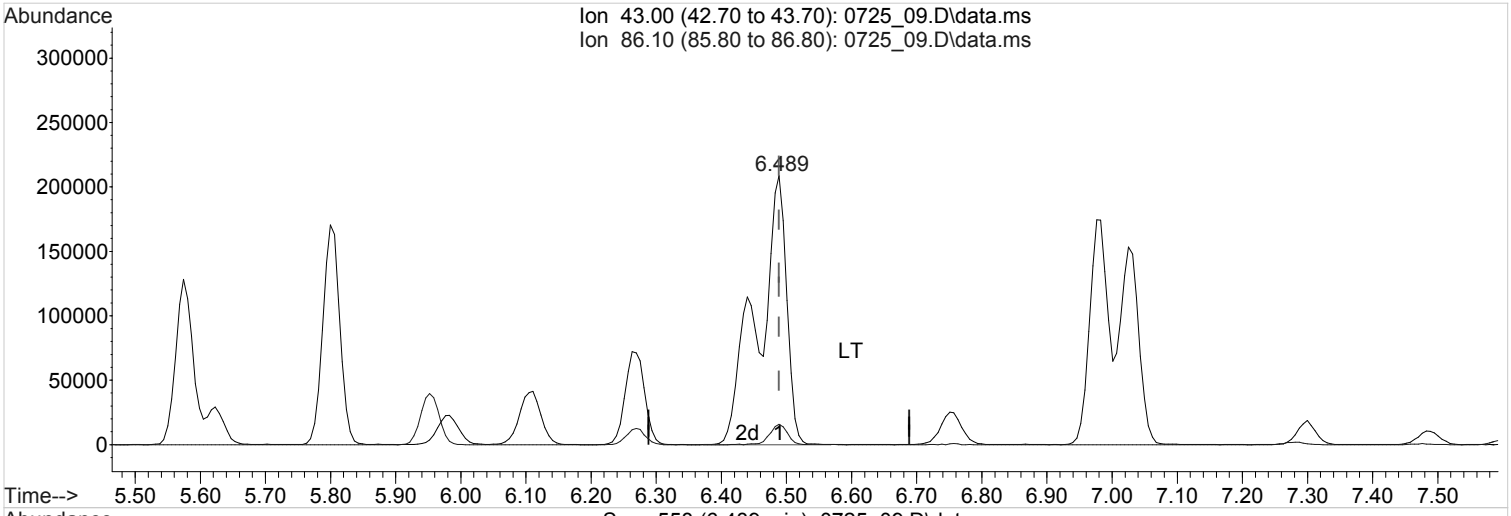
response 373872

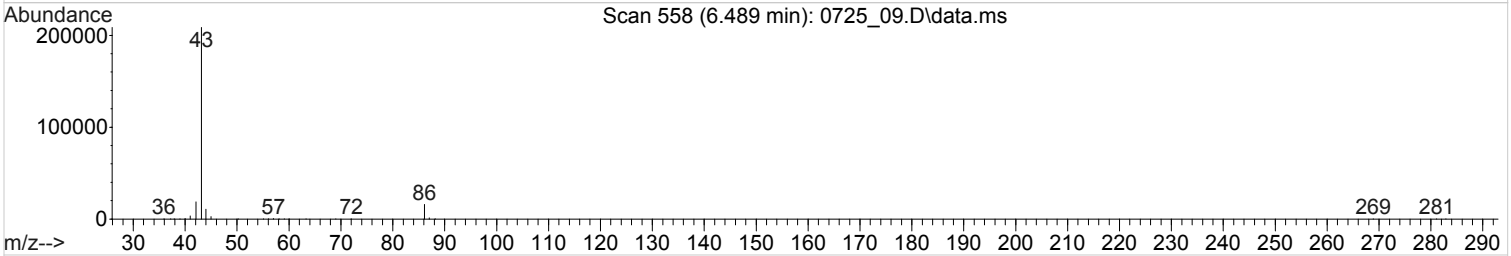
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	7.90
0.00	0.00	0.00
0.00	0.00	0.00

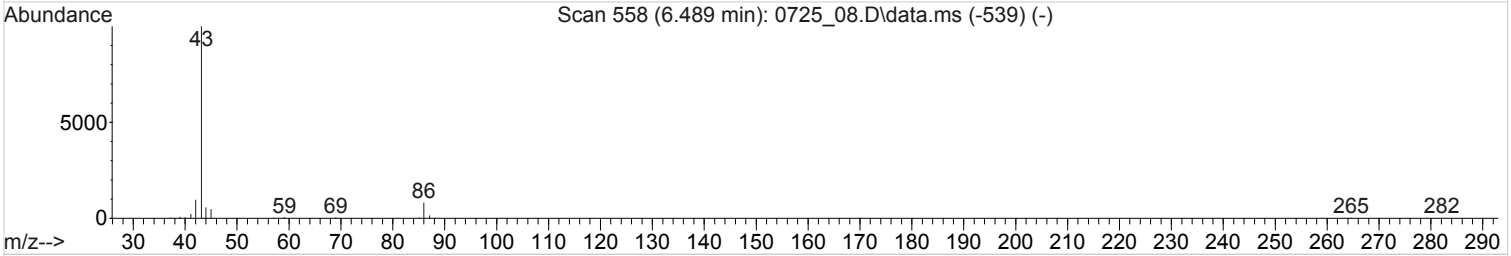
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_09.D
Acq On : 25 Jul 2022 1:57 pm
Operator :
Sample : STD AMS 10.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 9 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 14:45:01 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:44:52 2022
Response via : Initial Calibration







TIC: 0725_09.D\data.ms

(35) Vinyl Acetate (T,M)

6.489min (+0.000) 11.0325136 ppbv m

response 634393

Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.66#
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_10.D
Acq On : 25 Jul 2022 2:35 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 10 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:48:31 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:46:09 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	7.281	130	200061	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	8.098	114	844817	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	11.158	117	808844	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	12.469	95	627449	4.2799883	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 107.00%			
Target Compounds						Qvalue
2) Propene	3.861	41	338907	24.6447529	ppbv	94
3) BUTANE	4.263	43	630002	14.4298726	ppbv	100
4) 1,1-DIFLUOROETHANE	3.867	65	235939	19.4020516	ppbv	100
5) Dichlorodifluoromethane	3.904	85	940929	25.4738099	ppbv	100
6) CHLORODIFLUOROMETHANE	3.922	67	111715	26.1136725	ppbv	100
7) 1,2-Dichlorotetrafluor...	4.056	85	1070108	27.0203842	ppbv	99
8) Chloromethane	4.172	50	379201	26.7130761	ppbv	99
9) Vinyl Chloride	4.294	62	441303	27.6556863	ppbv	100
10) 1,3-Butadiene	4.324	39	329528	24.2768171	ppbv	99
11) Bromomethane	4.690	94	388725	24.8598426	ppbv	100
12) Chloroethane	4.782	64	187605	24.8156888	ppbv	99
13) ISOPENTANE	4.788	43	398335	23.6015719	ppbv	97
14) Vinyl Bromide	4.971	106	389316	24.7955501	ppbv	99
15) Trichlorofluoromethane	4.989	101	1133988	24.5597246	ppbv	100
16) PENTANE	5.025	43	610048	23.3071943	ppbv	99
17) Ethanol	5.141	45	158105	16.9270175	ppbv	98
18) ACROLEIN	5.446	56	179347	26.6982161	ppbv	98
19) 1,1,2-Trichlorotrifluo...	5.416	101	803777	24.2292323	ppbv	99
20) 1,1-Dichloroethene	5.501	61	671598	25.1137333	ppbv	100
21) Acetone	5.568	43	633934	21.6158853	ppbv	97
22) BROMOETHANE	5.690	108	317324	24.5498121	ppbv	100
23) 2-Propanol	5.611	45	715526	25.9226762	ppbv #	1
24) Carbon Disulfide	5.781	76	1311895	25.3071117	ppbv	98
25) Allyl Chloride	5.824	41	603572	25.6445883	ppbv	99
26) METHYL ACETATE	5.794	43	789457	25.2107090	ppbv #	100
27) ACETONITRILE	5.873	41	1560789	119.8470785	ppbv	99
28) Methylene Chloride	5.952	49	417836	16.5349172	ppbv	99
29) TERT-BUTYL ALCOHOL	5.964	59	825265	27.4361196	ppbv	95
30) Methyl Tert-Butyl Ether	6.098	73	1027229	27.1101000	ppbv	100
31) Trans-1,2-Dichloroethene	6.147	61	606051	24.9653458	ppbv	99
32) ACRYLONITRILE	6.196	53	325363	24.5817367	ppbv	100
33) n-Hexane	6.269	57	566380	27.1678224	ppbv	97
34) 1,1-Dichloroethane	6.543	63	726549	24.0191874	ppbv	99
35) Vinyl Acetate	6.482	43	1645801m	27.8544784	ppbv	
36) DI-ISOPROPYL ETHER	6.434	45	1221654	28.0479070	ppbv	97
37) ETHYL TERT-BUTYL ETHER	6.745	59	1263370	28.8530197	ppbv	99
38) ETHYL ACETATE	6.976	45	132444	26.0996346	ppbv	88
39) 2-Butanone (MEK)	7.025	72	184037	25.1839284	ppbv	97
40) cis-1,2-Dichloroethene	7.043	61	559227	25.2623988	ppbv	99
41) Tetrahydrofuran	7.293	42	421449	27.0023427	ppbv	97
42) Chloroform	7.281	83	764503	23.7794404	ppbv	98
43) Cyclohexane	7.488	84	442402	28.6712095	ppbv	97
44) 1,1,1-Trichloroethane	7.476	97	833912	23.8599028	ppbv	99
45) Carbon Tetrachloride	7.604	117	887457	25.0655545	ppbv	100
46) 2,2,4-Trimethylpentane	7.708	57	1839542	28.3033257	ppbv	96

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_10.D
Acq On : 25 Jul 2022 2:35 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 10 Sample Multiplier: 1
InstName : AIRMS7

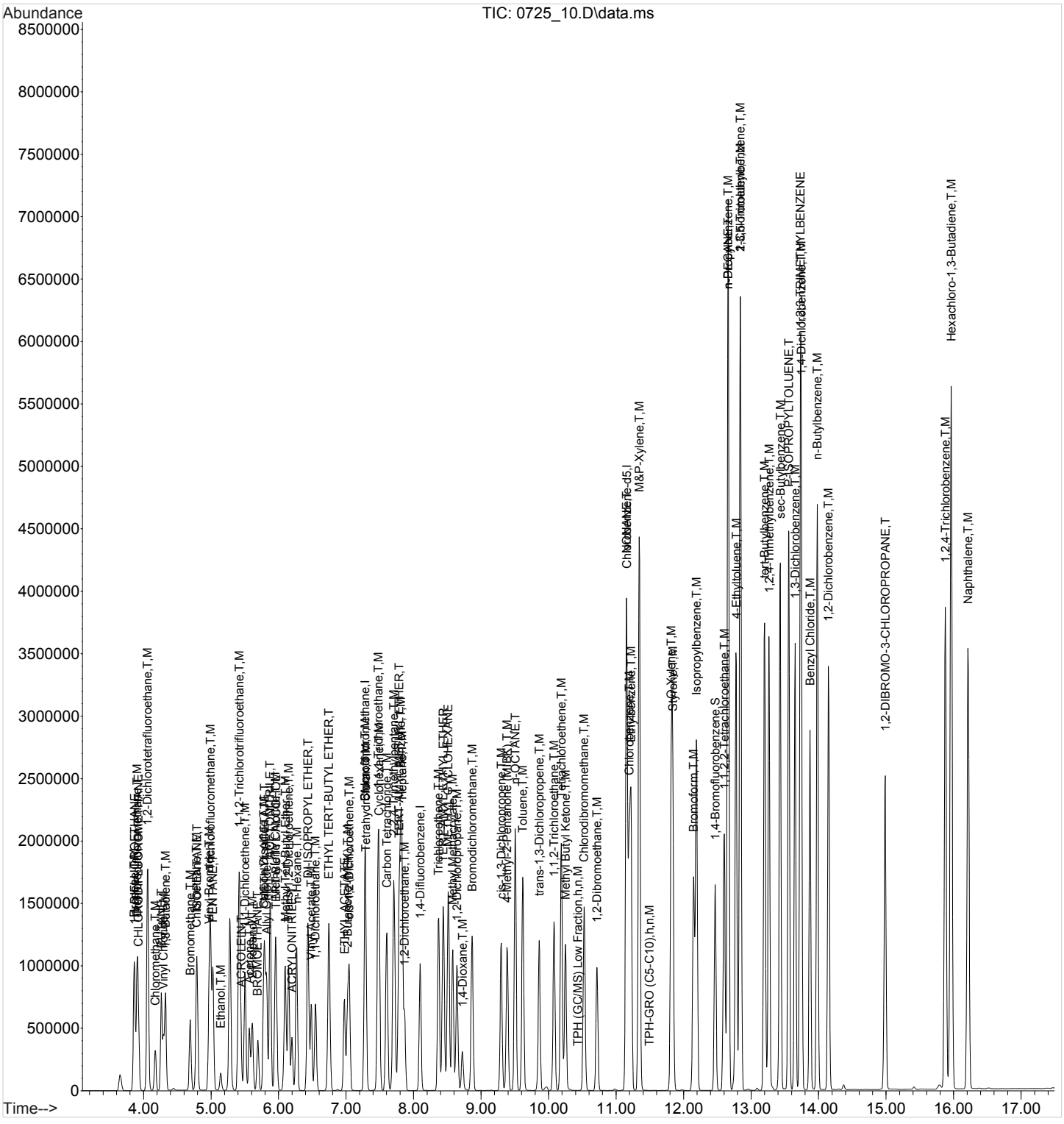
Quant Time: Jul 25 15:48:31 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:46:09 2022
Response via : Initial Calibration

	Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
48)	Benzene	7.811	78	1124689	23.8201398	ppbv		99
49)	TERT-AMYL METHYL ETHER	7.787	73	1184179	28.5344446	ppbv	#	55
50)	1,2-Dichloroethane	7.866	62	552298	23.7473681	ppbv		98
51)	Heptane	7.830	43	1187776m	27.5841960	ppbv		
52)	Trichloroethene	8.366	95	516330	25.0939336	ppbv		99
53)	TERT-AMYL ETHYL ETHER	8.439	73	380977	27.8189594	ppbv		95
54)	METHYL CYCLOHEXANE	8.513	83	735959	26.7219936	ppbv		97
55)	1,2-Dichloropropane	8.641	63	443618	23.9774922	ppbv		99
56)	Methyl Methacrylate	8.580	69	457004	27.2464597	ppbv		98
57)	1,4-Dioxane	8.726	88	248715	29.3446619	ppbv		93
58)	Bromodichloromethane	8.866	83	900487	24.4040451	ppbv		99
59)	cis-1,3-Dichloropropene	9.299	75	745548	27.6860401	ppbv		98
60)	4-Methyl-2-Pentanone (...	9.384	43	958793	27.4139082	ppbv		99
61)	n-OCTANE	9.506	43	1138650	28.2055015	ppbv		99
62)	Toluene	9.616	91	1430100	25.6887542	ppbv		100
63)	trans-1,3-Dichloropropene	9.860	75	714591	27.2192406	ppbv		99
64)	1,1,2-Trichloroethane	10.079	97	498762	24.6248767	ppbv		97
65)	Tetrachloroethene	10.189	166	697682	25.0640949	ppbv		100
66)	Methyl Butyl Ketone	10.250	43	941385	29.8451799	ppbv		97
67)	Chlorodibromomethane	10.524	129	930305	25.7145501	ppbv		100
68)	1,2-Dibromoethane	10.713	107	798006	25.8740771	ppbv		100
69)	Chlorobenzene	11.195	112	1125108	25.1106744	ppbv		94
70)	NONANE	11.152	43	1234177	27.4873513	ppbv		98
72)	Ethylbenzene	11.219	91	1894937	26.0354302	ppbv		99
73)	M&P-Xylene	11.341	91	3066014	56.0888006	ppbv		99
74)	O-Xylene	11.817	91	1555718	30.1952231	ppbv		99
77)	Styrene	11.841	104	1345840	30.1013558	ppbv		99
78)	Bromoform	12.146	173	979134	26.9313561	ppbv		99
79)	Isopropylbenzene	12.189	105	2257264	32.0626050	ppbv		99
80)	n-DECANE	12.658	43	1450428	28.6389894	ppbv		97
81)	1,1,2,2-Tetrachloroethane	12.603	83	1260966	25.6587286	ppbv		99
82)	n-Propylbenzene	12.658	91	3119753	28.6062251	ppbv		100
83)	4-Ethyltoluene	12.780	105	2585587	30.6163465	ppbv		100
84)	2-Chlorotoluene	12.841	91	2123093	28.2058392	ppbv		99
86)	1,3,5-Trimethylbenzene	12.841	105	2250423	30.0045786	ppbv		99
87)	tert-Butylbenzene	13.201	119	2127244	32.6160293	ppbv		98
88)	1,2,4-Trimethylbenzene	13.268	105	2310645	32.3844439	ppbv		99
89)	sec-Butylbenzene	13.432	105	3338124	32.1005896	ppbv		99
90)	1,3-Dichlorobenzene	13.652	146	1573961	29.7330610	ppbv		99
91)	P-ISOPROPYLTOLUENE	13.560	119	2874243	33.1513589	ppbv		99
92)	1,4-Dichlorobenzene	13.743	146	1610619	30.9033763	ppbv		98
93)	1,2,3-TRIMETHYLBENZENE	13.731	105	2404028	32.6809355	ppbv		99
94)	Benzyl Chloride	13.871	91	2176204	34.5687537	ppbv		100
95)	n-Butylbenzene	13.981	91	2908667	33.4159065	ppbv		99
96)	1,2-Dichlorobenzene	14.146	146	1557942	30.5405966	ppbv		99
97)	1,2-DIBROMO-3-CHLOROPR...	14.987	157	810661	32.5637956	ppbv		96
98)	1,2,4-Trichlorobenzene	15.877	180	1561258	39.3640514	ppbv		99
99)	Hexachloro-1,3-Butadiene	15.962	225	1554418	28.7428408	ppbv		99
100)	Naphthalene	16.212	128	3621937	42.0533202	ppbv		99
101)	TPH (GC/MS) Low Fraction	10.430	TIC	173811819m	1232.3218029	ppbv		
102)	TPH-GRO (C5-C10)	11.493	TIC	199722537m	1736.1863010	ppbv		

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

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_10.D
Acq On : 25 Jul 2022 2:35 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 10 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:48:31 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:46:09 2022
Response via : Initial Calibration

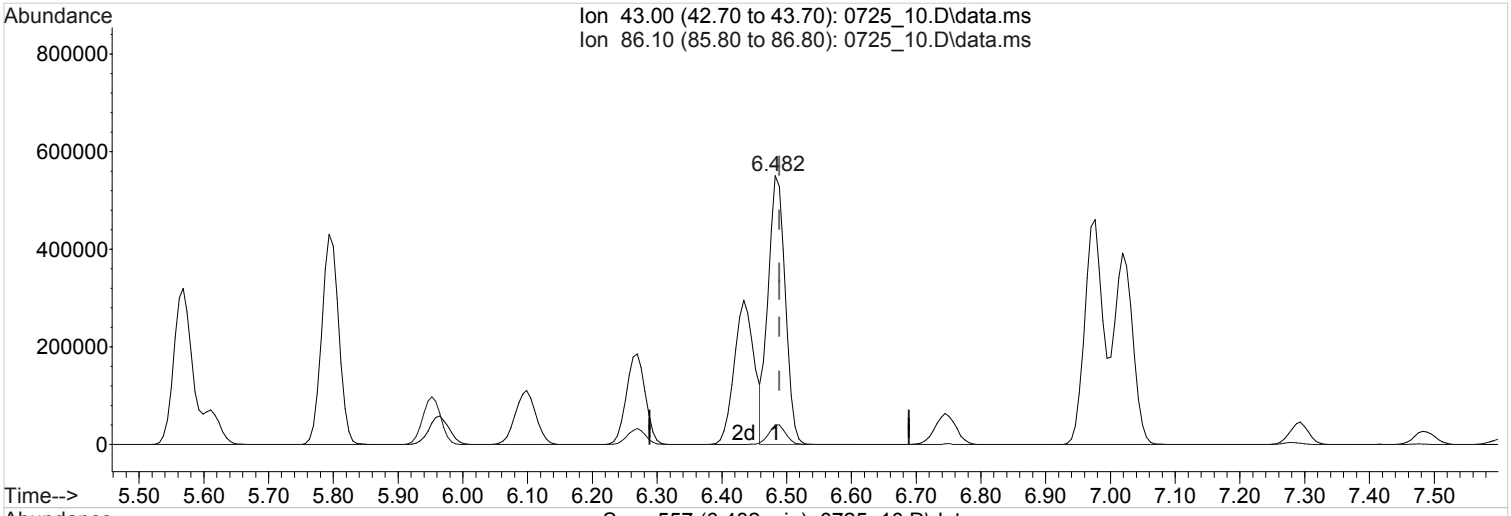


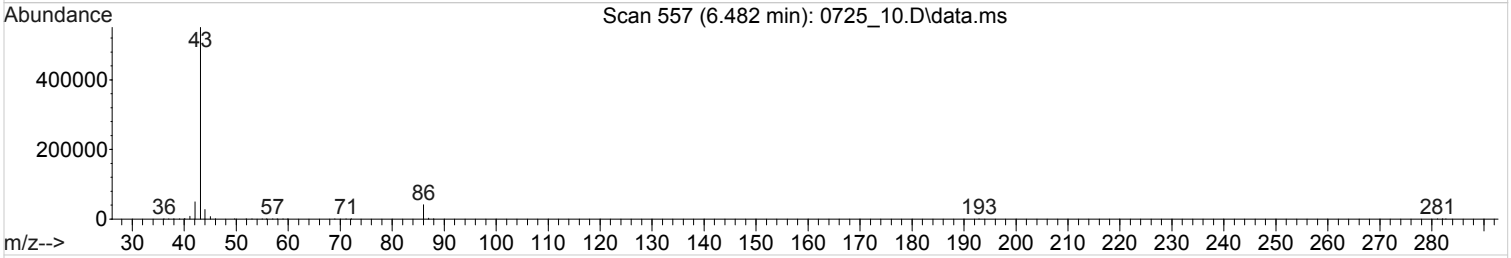
ACCOUNT:	PROJECT:	SDG:	DATE/TIME:	PAGE:
Pace Analytical - West Columbia, SC	XG26033	L1518164	04/12/23 06:34	224 of 377

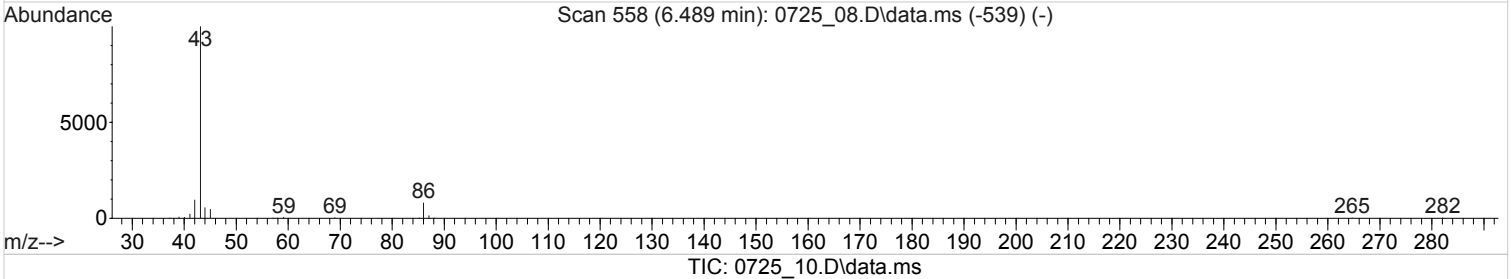
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_10.D
Acq On : 25 Jul 2022 2:35 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 10 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:45:30 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:46:09 2022
Response via : Initial Calibration







TIC: 0725_10.D\data.ms

(35) Vinyl Acetate (T,M)

6.482min (-0.006) 17.0650973 ppbv

Qvalue = 100

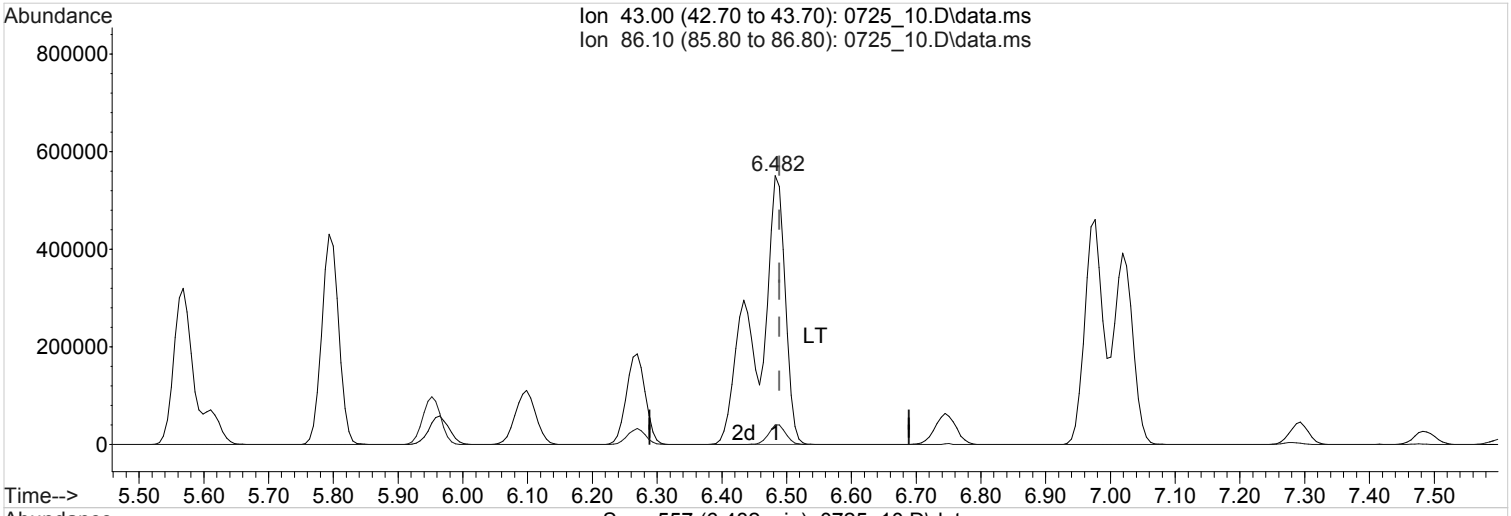
response 1008303

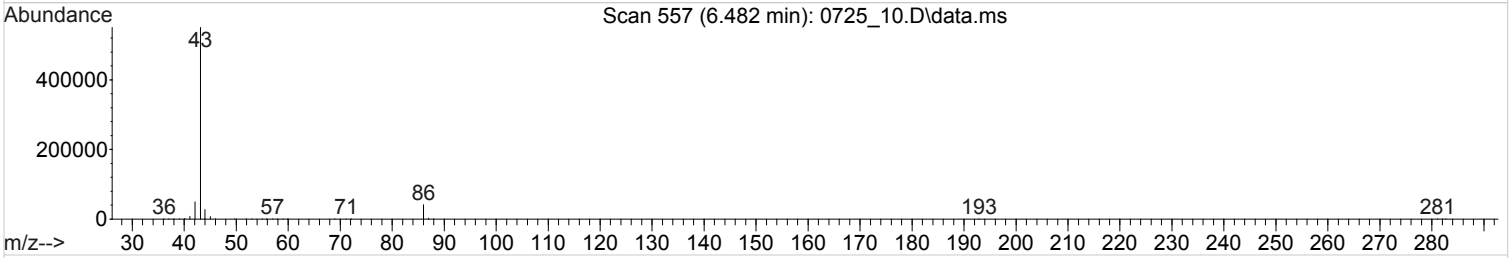
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	7.54
0.00	0.00	0.00
0.00	0.00	0.00

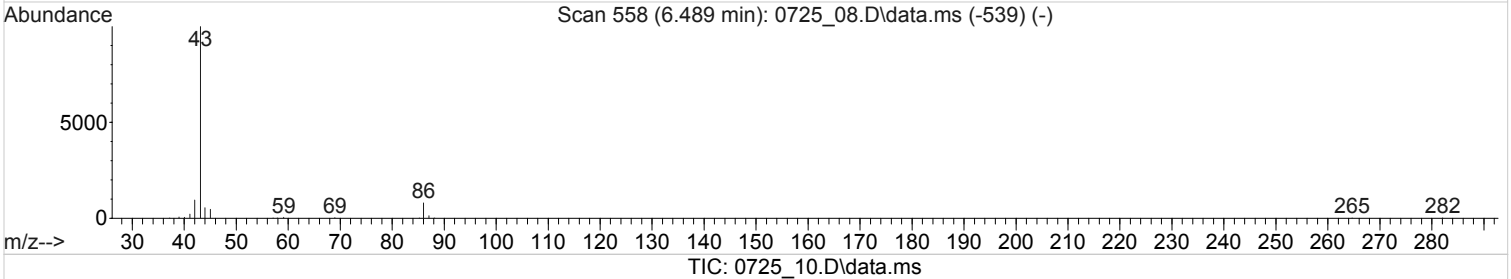
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_10.D
Acq On : 25 Jul 2022 2:35 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 10 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:45:30 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:46:09 2022
Response via : Initial Calibration







TIC: 0725_10.D\data.ms

(35) Vinyl Acetate (T,M)

6.482min (-0.006) 27.8544784 ppbv m

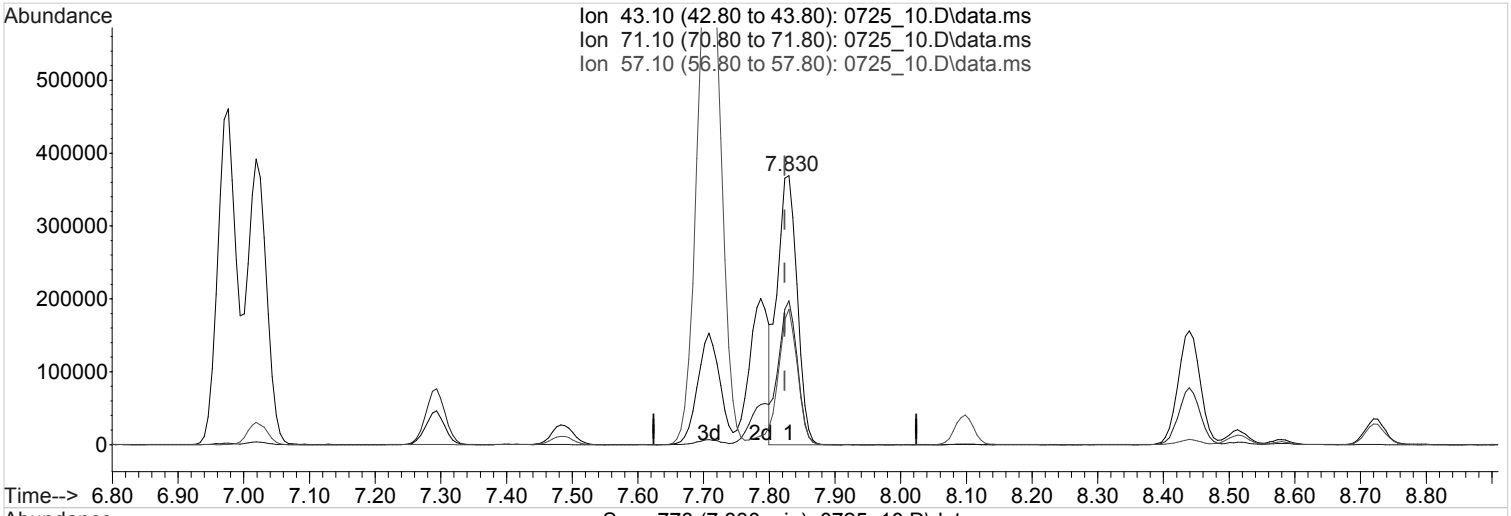
response 1645801

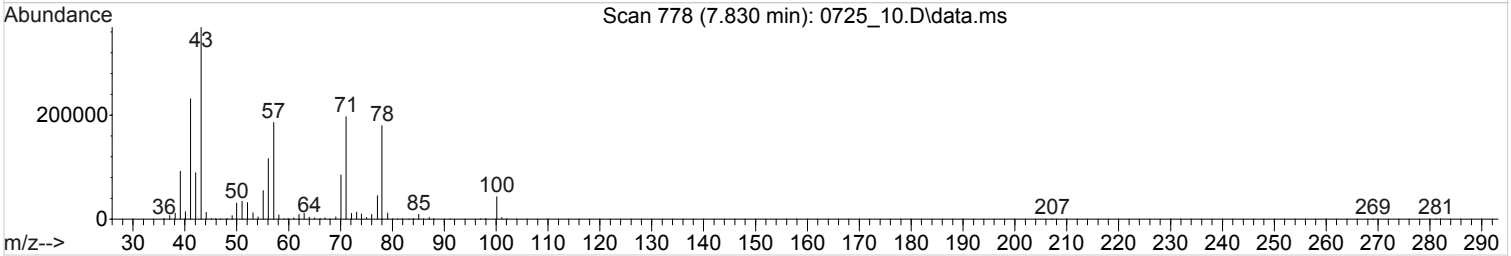
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.62#
0.00	0.00	0.00
0.00	0.00	0.00

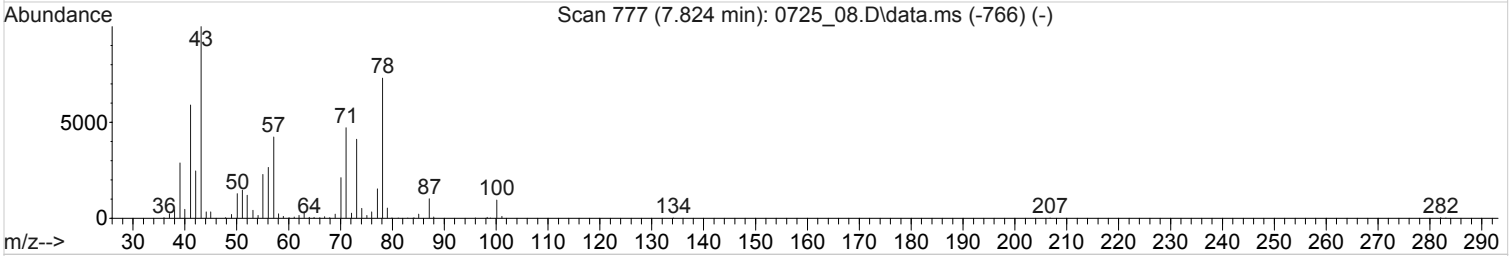
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_10.D
Acq On : 25 Jul 2022 2:35 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 10 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:45:30 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:46:09 2022
Response via : Initial Calibration







TIC: 0725_10.D\data.ms

(51) Heptane (T,M)

7.830min (+0.006) 18.1049851 ppbv

Qvalue = 67

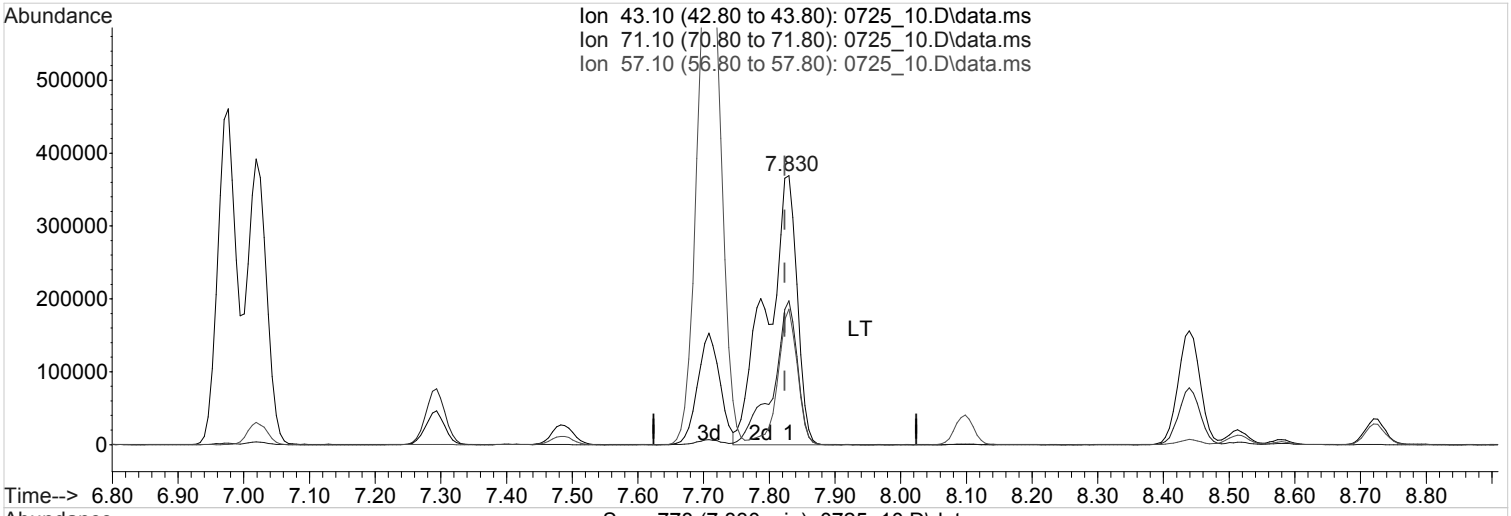
response 779601

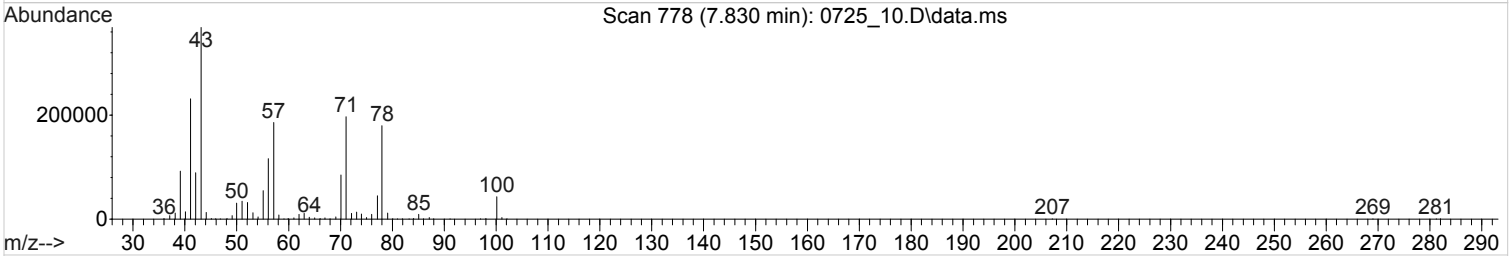
Ion	Exp%	Act%
43.10	100	100
71.10	42.70	65.80#
57.10	33.40	49.31#
0.00	0.00	0.00

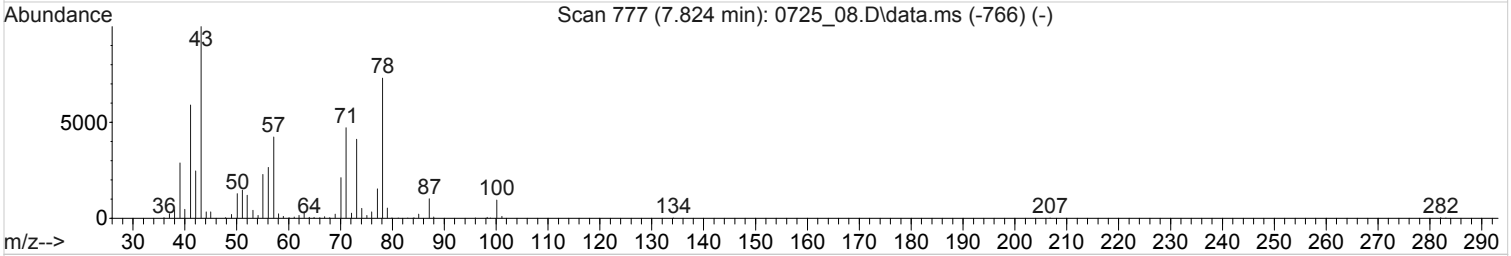
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_10.D
Acq On : 25 Jul 2022 2:35 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 10 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:45:30 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 14:46:09 2022
Response via : Initial Calibration







TIC: 0725_10.D\data.ms

(51) Heptane (T,M)

7.830min (+0.006) 27.5841960 ppbv m

response 1187776

Ion	Exp%	Act%
43.10	100	100
71.10	42.70	43.19
57.10	33.40	32.37
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_11.D
Acq On : 25 Jul 2022 3:17 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 11 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:50:17 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:48:40 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	7.275	130	215687	4.0000000	ppbv	# 0.00
47) 1,4-Difluorobenzene	8.098	114	916757	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	11.158	117	899856	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	12.469	95	691906	4.2055191	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 105.14%			
Target Compounds						Qvalue
2) Propene	3.855	41	724979	48.9868954	ppbv	93
3) BUTANE	4.263	43	1366927	30.6609695	ppbv	99
4) 1,1-DIFLUOROETHANE	3.861	65	507399	39.8166892	ppbv	100
5) Dichlorodifluoromethane	3.904	85	1717572	43.0291551	ppbv	100
6) CHLORODIFLUOROMETHANE	3.922	67	235140	50.7002197	ppbv	99
7) 1,2-Dichlorotetrafluor...	4.056	85	2176969	50.4765220	ppbv	98
8) Chloromethane	4.172	50	784815	50.8459225	ppbv	100
9) Vinyl Chloride	4.294	62	963889	55.2947949	ppbv	100
10) 1,3-Butadiene	4.324	39	708577	48.5957354	ppbv	97
11) Bromomethane	4.690	94	875285	51.9575074	ppbv	100
12) Chloroethane	4.775	64	415109	50.9780187	ppbv	98
13) ISOPENTANE	4.788	43	890907	49.3072307	ppbv	97
14) Vinyl Bromide	4.964	106	866106	51.2183038	ppbv	100
15) Trichlorofluoromethane	4.989	101	2449711	49.3202707	ppbv	100
16) PENTANE	5.025	43	1341768	47.9549464	ppbv	98
17) Ethanol	5.135	45	336610	34.8332661	ppbv	99
18) ACROLEIN	5.440	56	381647	52.2536201	ppbv	98
19) 1,1,2-Trichlorotrifluo...	5.416	101	1747103	49.0385916	ppbv	99
20) 1,1-Dichloroethene	5.501	61	1436296	49.7894583	ppbv	99
21) Acetone	5.562	43	1557845	50.1190793	ppbv	89
22) BROMOETHANE	5.690	108	680108	48.9147991	ppbv	100
23) 2-Propanol	5.598	45	1533406	51.2921710	ppbv #	1
24) Carbon Disulfide	5.781	76	2808224	50.1703747	ppbv	97
25) Allyl Chloride	5.818	41	1285583	50.5019071	ppbv	99
26) METHYL ACETATE	5.794	43	1643919	48.6427537	ppbv #	99
27) ACETONITRILE	5.873	41	3325622	238.0884222	ppbv	99
28) Methylene Chloride	5.952	49	875325	33.5494963	ppbv	99
29) TERT-BUTYL ALCOHOL	5.952	59	1738322	52.9590205	ppbv	94
30) Methyl Tert-Butyl Ether	6.092	73	2165750	52.4629389	ppbv	100
31) Trans-1,2-Dichloroethene	6.147	61	1262063	48.2306562	ppbv	99
32) ACRYLONITRILE	6.196	53	690411	48.4841476	ppbv	99
33) n-Hexane	6.269	57	1227061	54.0094185	ppbv	95
34) 1,1-Dichloroethane	6.543	63	1523999	46.9625418	ppbv	100
35) Vinyl Acetate	6.482	43	3528316m	54.6096061	ppbv	
36) DI-ISOPROPYL ETHER	6.434	45	2589601	54.3194089	ppbv	95
37) ETHYL TERT-BUTYL ETHER	6.739	59	2723535	56.6037215	ppbv	99
38) ETHYL ACETATE	6.970	45	274367	49.8759513	ppbv	97
39) 2-Butanone (MEK)	7.019	72	392063	49.7179762	ppbv	97
40) cis-1,2-Dichloroethene	7.043	61	1194693	49.9933020	ppbv	100
41) Tetrahydrofuran	7.287	42	894454	52.6291653	ppbv	96
42) Chloroform	7.281	83	1603966	46.5601738	ppbv	98
43) Cyclohexane	7.482	84	971738	57.3610294	ppbv	95
44) 1,1,1-Trichloroethane	7.476	97	1784308	47.6254956	ppbv	99
45) Carbon Tetrachloride	7.604	117	1862543	48.7789497	ppbv	99
46) 2,2,4-Trimethylpentane	7.708	57	3990185	56.0202150	ppbv	95

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_11.D
Acq On : 25 Jul 2022 3:17 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 11 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:50:17 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:48:40 2022
Response via : Initial Calibration

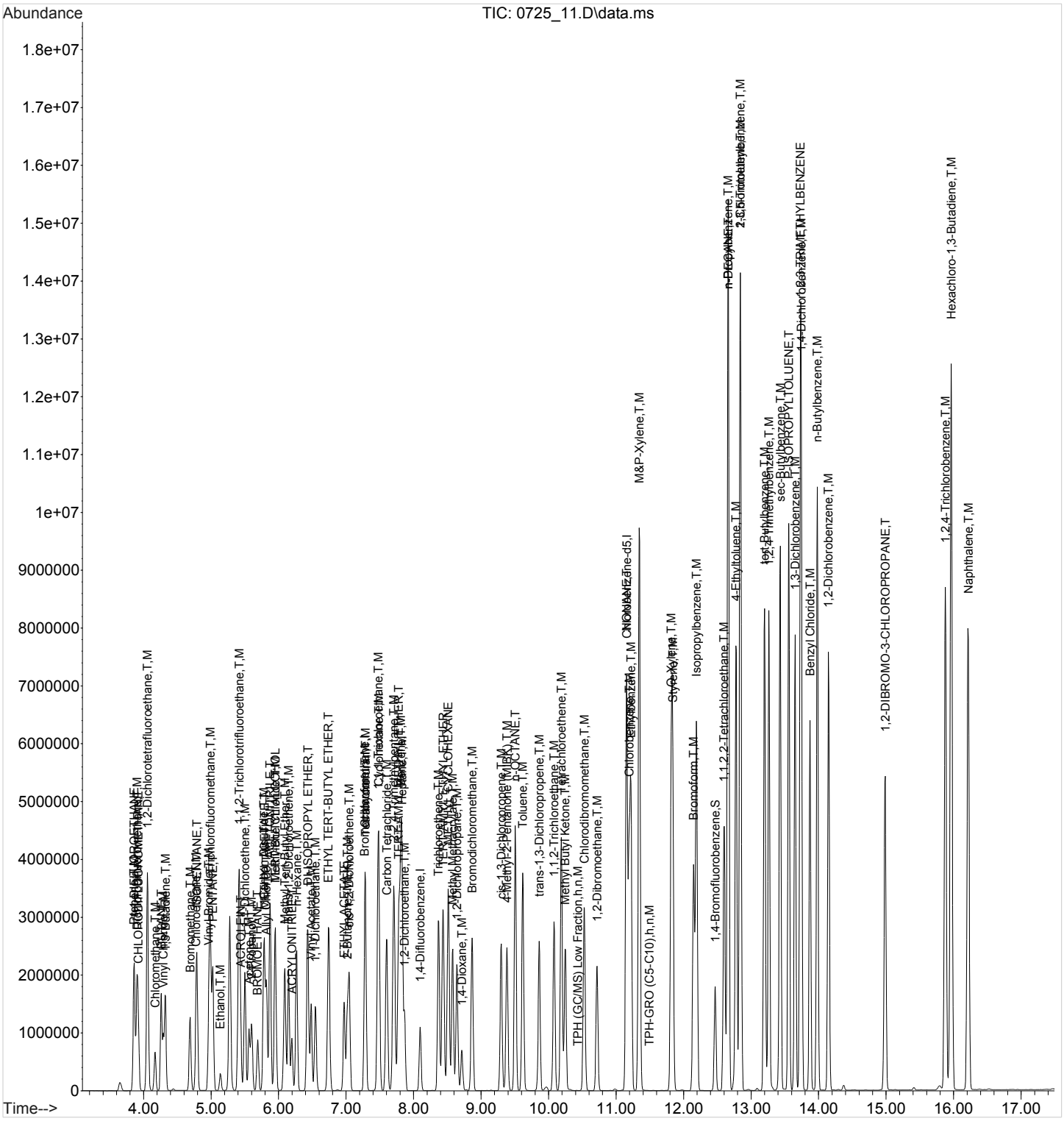
	Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
48)	Benzene	7.811	78	2463186	48.3600896	ppbv		98
49)	TERT-AMYL METHYL ETHER	7.781	73	2590798	56.5309274	ppbv	#	52
50)	1,2-Dichloroethane	7.866	62	1180628	47.0751933	ppbv		98
51)	Heptane	7.830	43	2541062m	53.6875875	ppbv		
52)	Trichloroethene	8.366	95	1101375	49.3038783	ppbv		100
53)	TERT-AMYL ETHYL ETHER	8.439	73	835568	55.4439008	ppbv		93
54)	METHYL CYCLOHEXANE	8.513	83	1615578	53.5954991	ppbv		96
55)	1,2-Dichloropropane	8.641	63	967017	48.4131299	ppbv		99
56)	Methyl Methacrylate	8.580	69	1005391	54.6238804	ppbv		99
57)	1,4-Dioxane	8.714	88	549239	58.4471862	ppbv		92
58)	Bromodichloromethane	8.866	83	1909868	47.8401096	ppbv		99
59)	cis-1,3-Dichloropropene	9.299	75	1616701	54.5920633	ppbv		98
60)	4-Methyl-2-Pentanone (...	9.384	43	2046880	53.2888733	ppbv		98
61)	n-OCTANE	9.506	43	2461536	55.3035120	ppbv		98
62)	Toluene	9.616	91	3164950	52.2106210	ppbv		100
63)	trans-1,3-Dichloropropene	9.860	75	1573907	54.6403483	ppbv		97
64)	1,1,2-Trichloroethane	10.079	97	1078792	49.1747510	ppbv		96
65)	Tetrachloroethene	10.189	166	1532539	50.7195386	ppbv		99
66)	Methyl Butyl Ketone	10.244	43	2050548	58.4910641	ppbv		96
67)	Chlorodibromomethane	10.530	129	2043321	51.8620551	ppbv		100
68)	1,2-Dibromoethane	10.719	107	1756605	52.2573445	ppbv		100
69)	Chlorobenzene	11.195	112	2479204	50.9617788	ppbv		93
70)	NONANE	11.152	43	2653819	53.7981385	ppbv		97
72)	Ethylbenzene	11.219	91	4225775	51.9189016	ppbv		100
73)	M&P-Xylene	11.341	91	6913140	111.9716562	ppbv		100
74)	O-Xylene	11.817	91	3520255	59.8599006	ppbv		100
77)	Styrene	11.841	104	3021922	59.2419154	ppbv		97
78)	Bromoform	12.146	173	2257032	55.2677510	ppbv		98
79)	Isopropylbenzene	12.189	105	5095698	62.8405828	ppbv		98
80)	n-DECANE	12.664	43	3076246	53.6220470	ppbv		93
81)	1,1,2,2-Tetrachloroethane	12.597	83	2822285	51.4512956	ppbv		99
82)	n-Propylbenzene	12.658	91	7040624	57.0009623	ppbv		100
83)	4-Ethyltoluene	12.774	105	5927945	61.3708988	ppbv		98
84)	2-Chlorotoluene	12.841	91	4787664	56.2703005	ppbv		99
86)	1,3,5-Trimethylbenzene	12.841	105	4985234	58.2863834	ppbv		99
87)	tert-Butylbenzene	13.201	119	4767854	63.2991088	ppbv		97
88)	1,2,4-Trimethylbenzene	13.262	105	5180147	62.9348023	ppbv		99
89)	sec-Butylbenzene	13.432	105	7484496	62.4760433	ppbv		98
90)	1,3-Dichlorobenzene	13.652	146	3528644	58.5311783	ppbv		98
91)	P-ISOPROPYLTOLUENE	13.560	119	6466221	64.4126094	ppbv		98
92)	1,4-Dichlorobenzene	13.743	146	3638546	60.9535861	ppbv		97
93)	1,2,3-TRIMETHYLBENZENE	13.731	105	5429007	63.8852318	ppbv		99
94)	Benzyl Chloride	13.871	91	4933230	67.2218868	ppbv		100
95)	n-Butylbenzene	13.981	91	6442092	63.8376736	ppbv		99
96)	1,2-Dichlorobenzene	14.146	146	3463062	59.3759584	ppbv		99
97)	1,2-DIBROMO-3-CHLOROPR...	14.987	157	1828394	63.6115049	ppbv		95
98)	1,2,4-Trichlorobenzene	15.877	180	3602650	76.1757917	ppbv		99
99)	Hexachloro-1,3-Butadiene	15.962	225	3500931	57.1195548	ppbv		98
100)	Naphthalene	16.218	128	8382015	80.6052159	ppbv		99
101)	TPH (GC/MS) Low Fraction	10.430	TIC	378091273m	2441.1991377	ppbv		
102)	TPH-GRO (C5-C10)	11.493	TIC	432929219m	3429.8214543	ppbv		

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_11.D
Acq On : 25 Jul 2022 3:17 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 11 Sample Multiplier: 1
InstName : AIRMS7

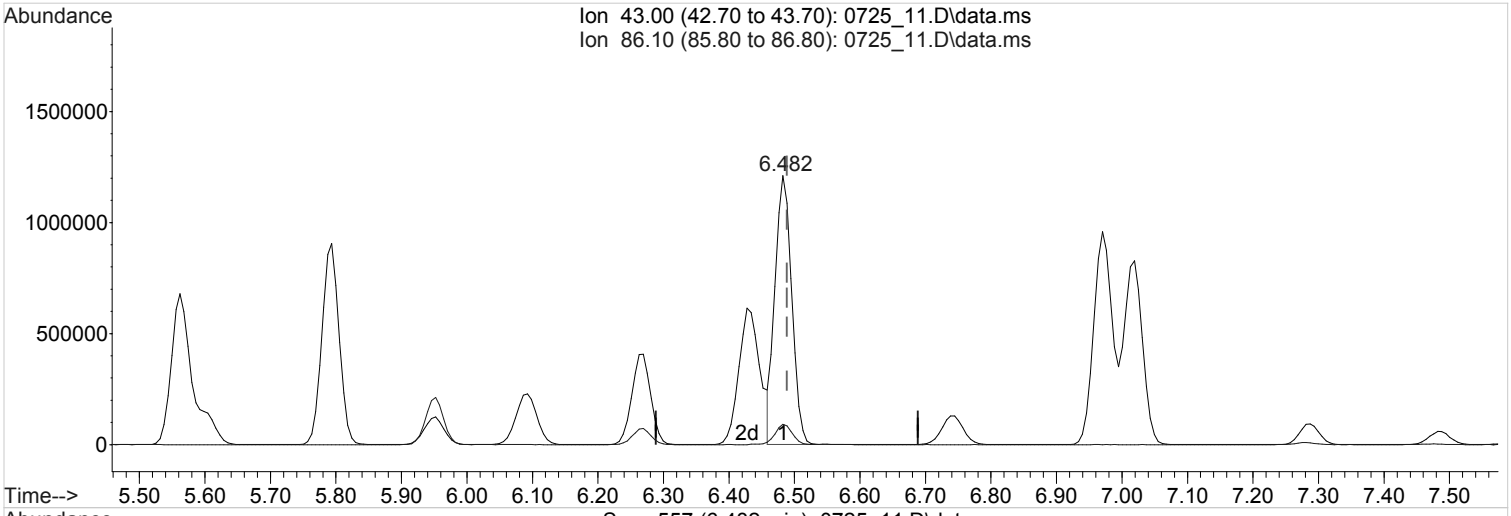
Quant Time: Jul 25 15:50:17 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:48:40 2022
Response via : Initial Calibration

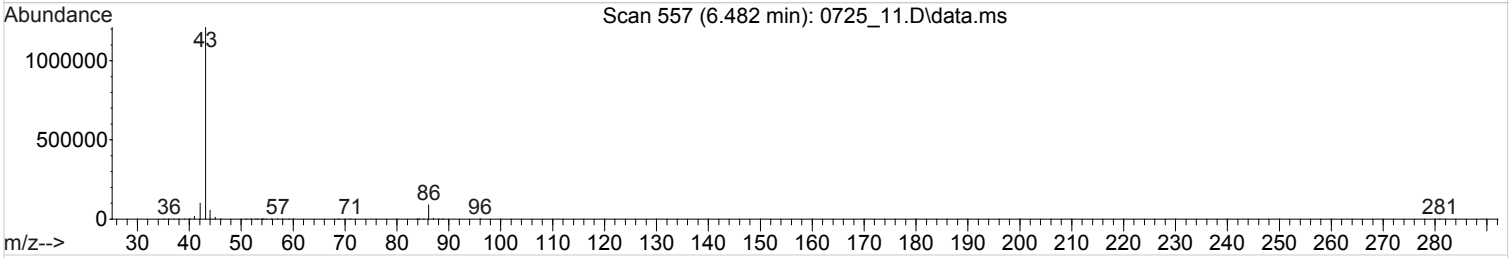


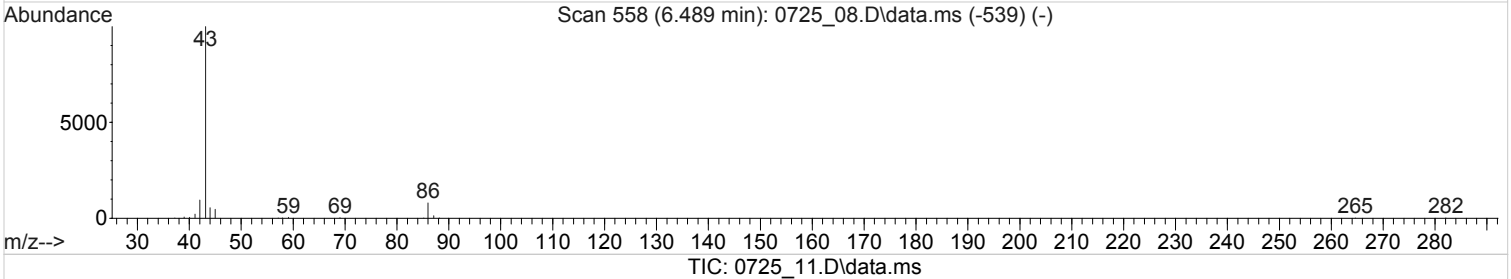
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_11.D
Acq On : 25 Jul 2022 3:17 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 11 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:48:44 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:48:40 2022
Response via : Initial Calibration







TIC: 0725_11.D\data.ms

(35) Vinyl Acetate (T,M)

6.482min (-0.006) 33.2947608 ppbv

Qvalue = 99

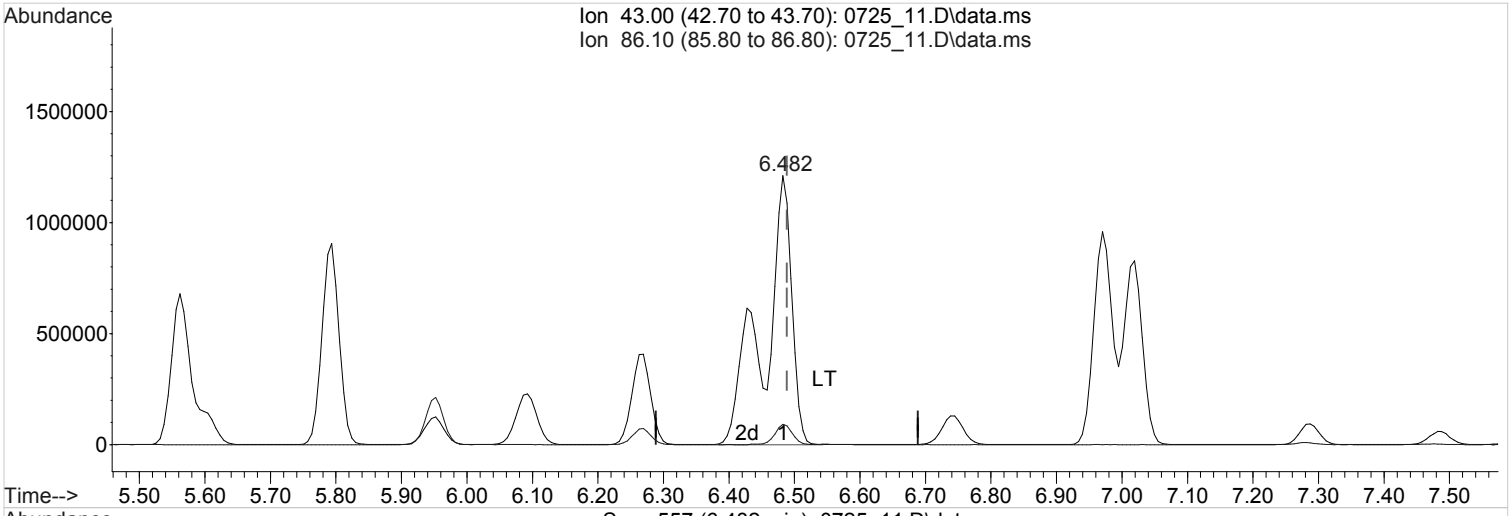
response 2151168

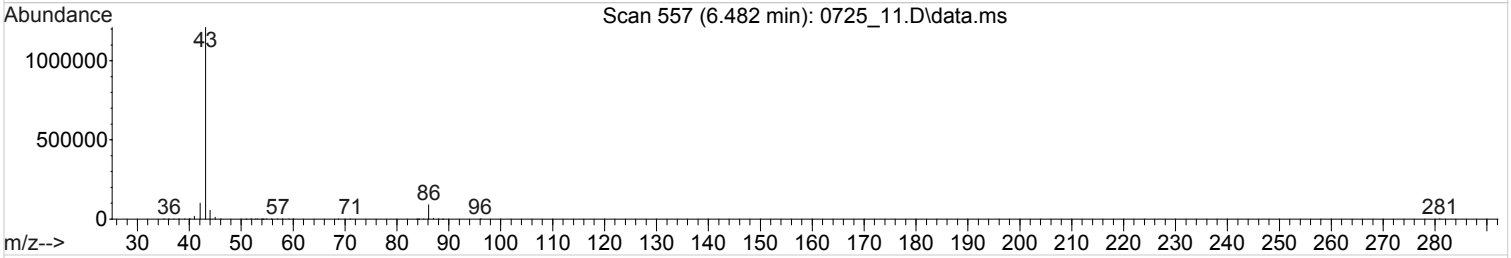
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	7.87
0.00	0.00	0.00
0.00	0.00	0.00

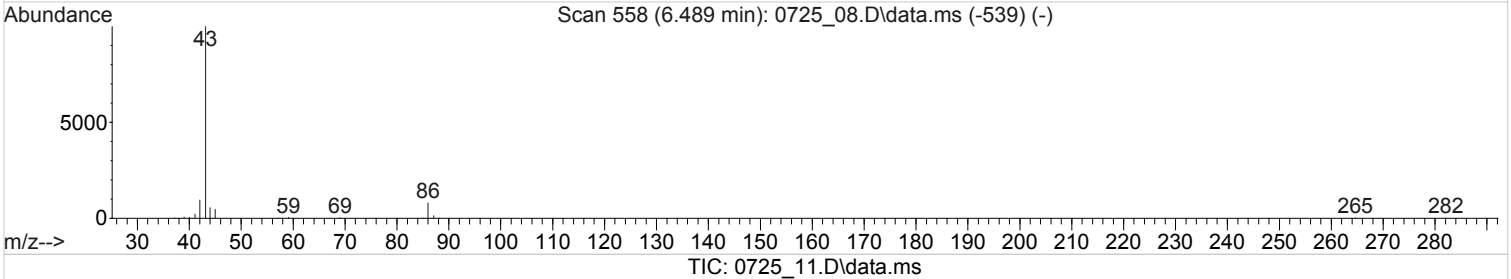
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_11.D
Acq On : 25 Jul 2022 3:17 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 11 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:48:44 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:48:40 2022
Response via : Initial Calibration







TIC: 0725_11.D\data.ms

(35) Vinyl Acetate (T,M)

6.482min (-0.006) 54.6096061 ppbv m

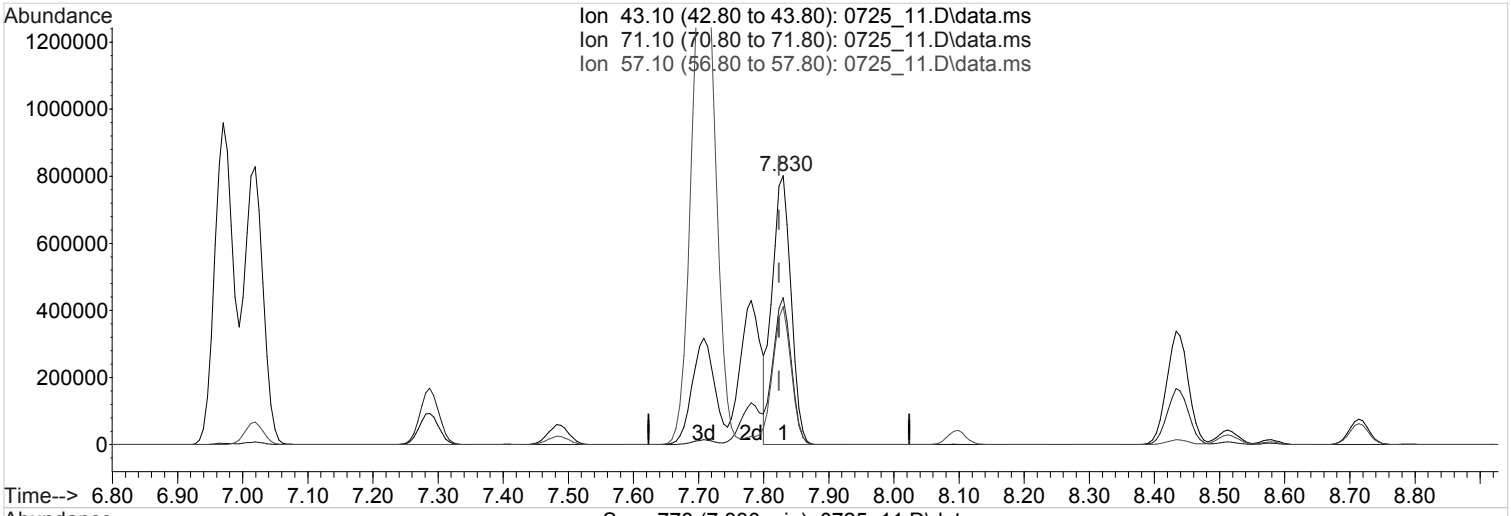
response 3528316

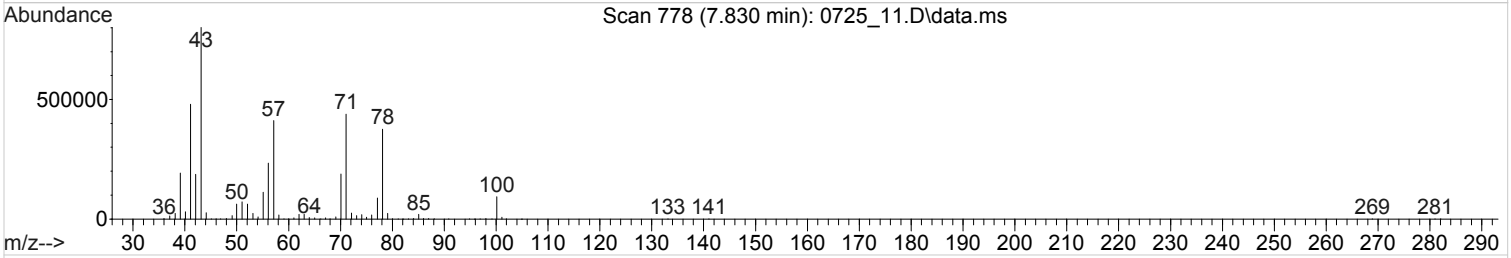
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.80#
0.00	0.00	0.00
0.00	0.00	0.00

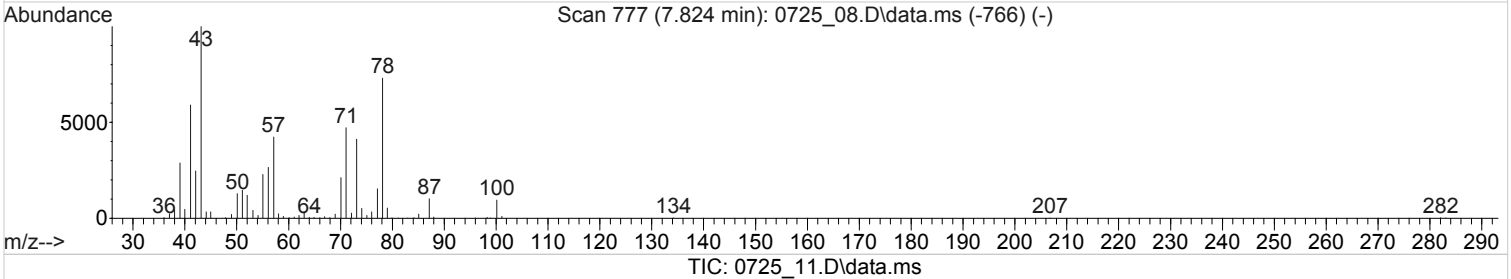
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_11.D
Acq On : 25 Jul 2022 3:17 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 11 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:48:44 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:48:40 2022
Response via : Initial Calibration







TIC: 0725_11.D\data.ms

(51) Heptane (T,M)

7.830min (+0.006) 33.9931114 ppbv

Qvalue = 76

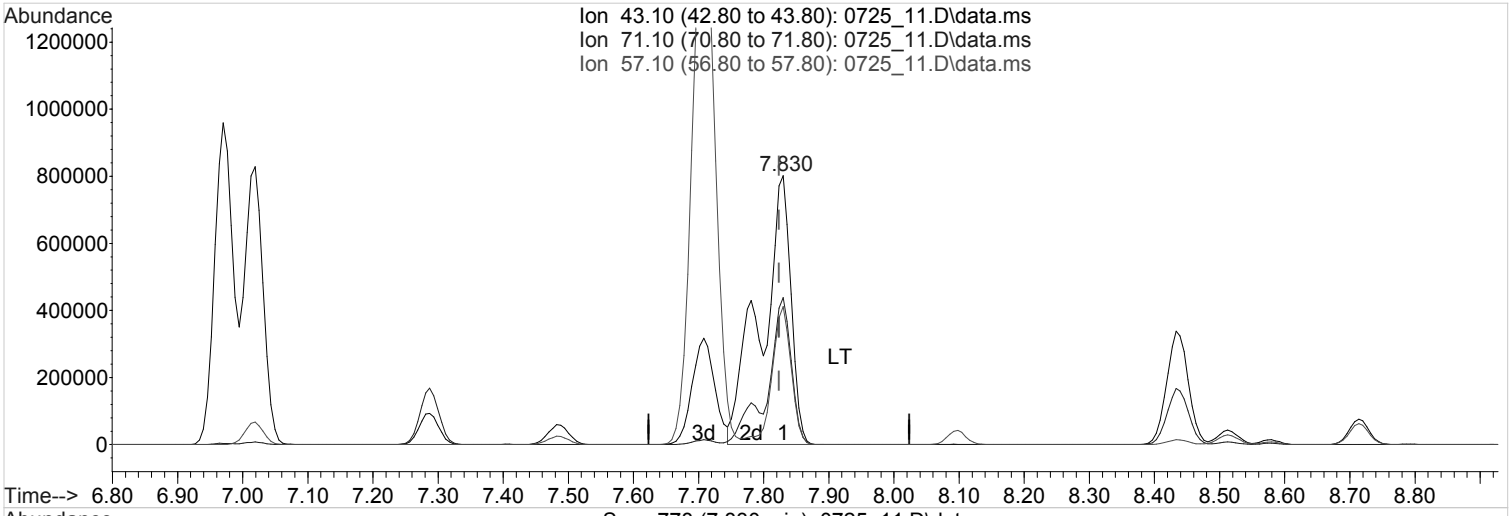
response 1608912

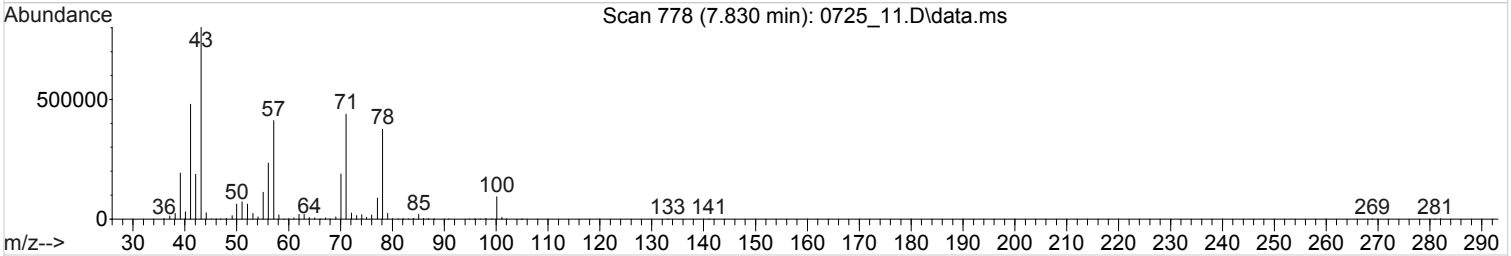
Ion	Exp%	Act%
43.10	100	100
71.10	42.70	53.15#
57.10	33.40	52.20#
0.00	0.00	0.00

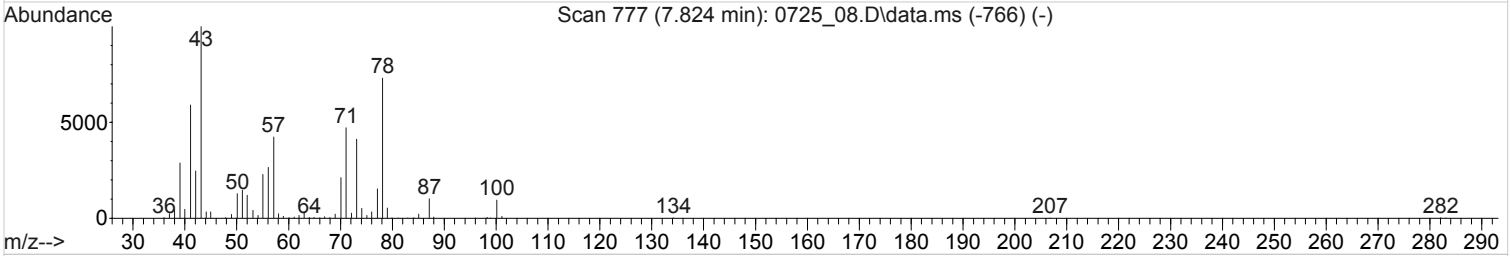
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_11.D
Acq On : 25 Jul 2022 3:17 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 11 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 15:48:44 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:48:40 2022
Response via : Initial Calibration







TIC: 0725_11.D\data.ms

(51) Heptane (T,M)

7.830min (+0.006) 53.6875875 ppbv m

response 2541062

Ion	Exp%	Act%
43.10	100	100
71.10	42.70	33.66#
57.10	33.40	33.05
0.00	0.00	0.00

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_12.D
Acq On : 25 Jul 2022 4:02 pm
Operator :
Sample : STD AMS 100.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 12 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 16:28:18 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:50:25 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	7.275	130	265953	4.0000000	ppbv	# 0.00
47) 1,4-Difluorobenzene	8.098	114	1119844	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	11.158	117	1106377	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	12.469	95	800944	3.9370621	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 98.43%			
Target Compounds						Qvalue
2) Propene	3.849	41	1546810	84.9550862	ppbv	93
3) BUTANE	4.257	43	2917352	55.4530542	ppbv	99
4) 1,1-DIFLUOROETHANE	3.855	65	1089341	70.9315210	ppbv	99
5) Dichlorodifluoromethane	3.898	85	2991956	61.7450792	ppbv	100
6) CHLORODIFLUOROMETHANE	3.916	67	499758	87.2543129	ppbv	98
7) 1,2-Dichlorotetrafluor...	4.050	85	3558743	66.8487410	ppbv	98
8) Chloromethane	4.166	50	1708555	89.6027304	ppbv	100
9) Vinyl Chloride	4.288	62	2091835	96.1885897	ppbv	99
10) 1,3-Butadiene	4.318	39	1527911	85.2482779	ppbv	97
11) Bromomethane	4.684	94	1953331	93.6286259	ppbv	100
12) Chloroethane	4.769	64	941442	93.5600807	ppbv	97
13) ISOPENTANE	4.782	43	1968062	88.4718683	ppbv	97
14) Vinyl Bromide	4.964	106	1979047	94.6575227	ppbv	99
15) Trichlorofluoromethane	4.983	101	5434141	88.8622039	ppbv	99
16) PENTANE	5.019	43	3069677	89.3811450	ppbv	98
17) Ethanol	5.135	45	781221	67.8500109	ppbv	100
18) ACROLEIN	5.440	56	887310	98.0346144	ppbv	99
19) 1,1,2-Trichlorotrifluo...	5.409	101	4182028	95.4013100	ppbv	99
20) 1,1-Dichloroethene	5.495	61	3278406	92.2101022	ppbv	97
21) Acetone	5.556	43	3512211	91.6143715	ppbv	91
22) BROMOETHANE	5.690	108	1606816	93.9498748	ppbv	99
23) 2-Propanol	5.592	45	3517644	95.1523675	ppbv #	1
24) Carbon Disulfide	5.775	76	6731232	97.4910698	ppbv	95
25) Allyl Chloride	5.818	41	3079830	98.0097675	ppbv	98
26) METHYL ACETATE	5.787	43	3813038	91.7782566	ppbv #	98
27) ACETONITRILE	5.873	41	7839717	457.6043371	ppbv	99
28) Methylene Chloride	5.946	49	2050033	66.1409499	ppbv	96
29) TERT-BUTYL ALCOHOL	5.940	59	4176740	102.5226531	ppbv	91
30) Methyl Tert-Butyl Ether	6.086	73	5281580	103.1945432	ppbv	100
31) Trans-1,2-Dichloroethene	6.147	61	3035012	94.4349124	ppbv	97
32) ACRYLONITRILE	6.196	53	1678272	95.9044822	ppbv	100
33) n-Hexane	6.263	57	2967139	104.9803383	ppbv	93
34) 1,1-Dichloroethane	6.543	63	3661994	92.1393201	ppbv	100
35) Vinyl Acetate	6.482	43	8398647m	104.3527455	ppbv	
36) DI-ISOPROPYL ETHER	6.428	45	6244845	105.2238394	ppbv	99
37) ETHYL TERT-BUTYL ETHER	6.738	59	6677367	110.9198859	ppbv	99
38) ETHYL ACETATE	6.970	45	648550	95.6404462	ppbv	98
39) 2-Butanone (MEK)	7.019	72	954444	98.2198753	ppbv	97
40) cis-1,2-Dichloroethene	7.043	61	2879560	97.7253368	ppbv	98
41) Tetrahydrofuran	7.281	42	2101429	99.6947408	ppbv	94
42) Chloroform	7.281	83	3869875	91.8053463	ppbv	98
43) Cyclohexane	7.482	84	2407012	113.3752974	ppbv	91
44) 1,1,1-Trichloroethane	7.476	97	4261051	92.7263560	ppbv	99
45) Carbon Tetrachloride	7.598	117	4434827	94.4499934	ppbv	99
46) 2,2,4-Trimethylpentane	7.708	57	9841674	110.5778673	ppbv	94

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_12.D
Acq On : 25 Jul 2022 4:02 pm
Operator :
Sample : STD AMS 100.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 12 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 16:28:18 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:50:25 2022
Response via : Initial Calibration

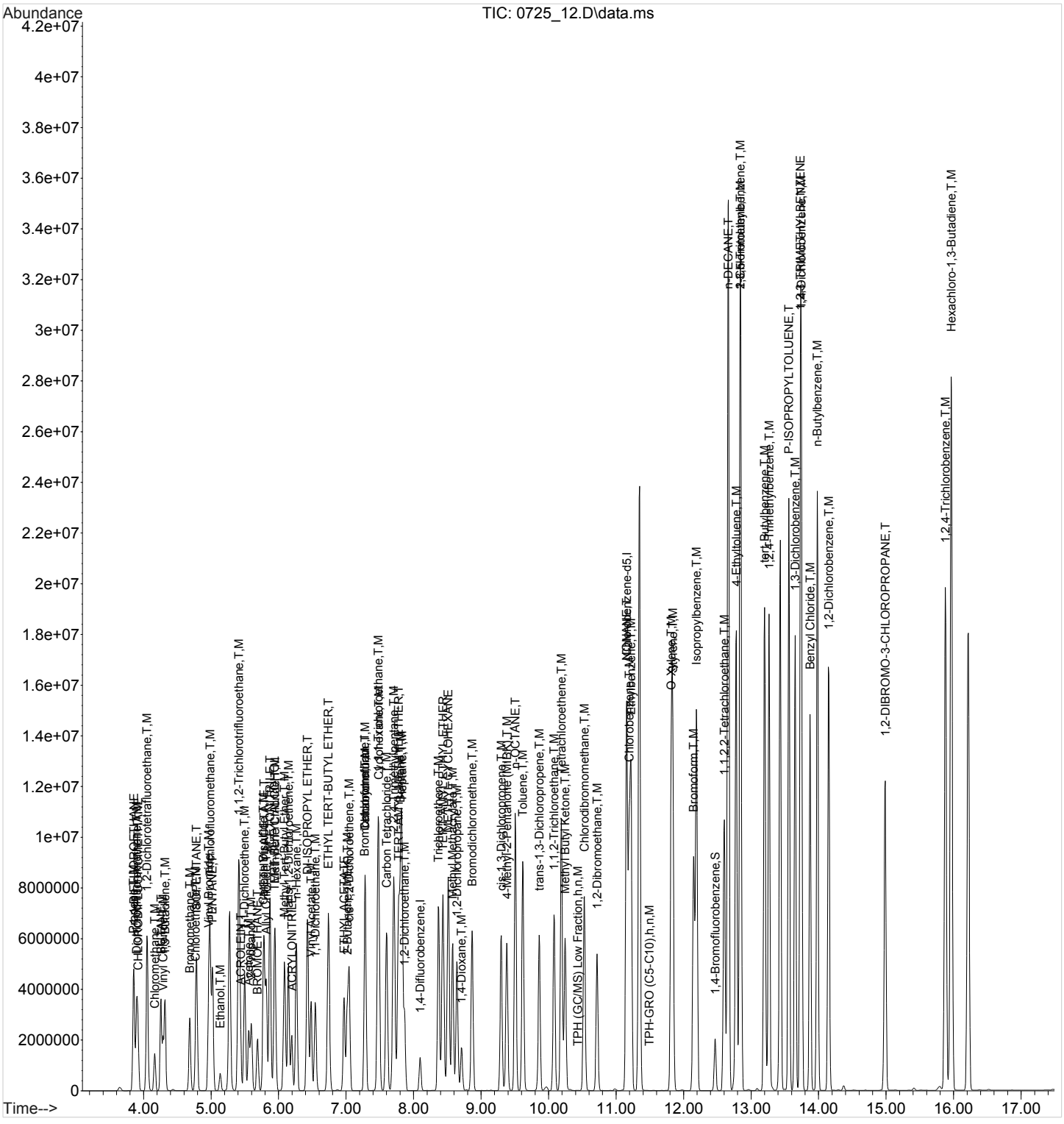
	Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
48)	Benzene	7.805	78	6135633	98.9763736	ppbv		97
49)	TERT-AMYL METHYL ETHER	7.775	73	6421315	113.0617099	ppbv	#	51
50)	1,2-Dichloroethane	7.866	62	2739380	90.0036168	ppbv		99
51)	Heptane	7.830	43	6050398m	103.7994123	ppbv		
52)	Trichloroethene	8.366	95	2738587	100.5174504	ppbv		100
53)	TERT-AMYL ETHYL ETHER	8.433	73	2055309	110.3121713	ppbv	#	91
54)	METHYL CYCLOHEXANE	8.512	83	4047095	109.0396058	ppbv		92
55)	1,2-Dichloropropane	8.641	63	2356718	96.9320886	ppbv		95
56)	Methyl Methacrylate	8.580	69	2454526	108.0617929	ppbv		100
57)	1,4-Dioxane	8.708	88	1361189	116.3966767	ppbv		90
58)	Bromodichloromethane	8.866	83	4627947	95.3593811	ppbv		99
59)	cis-1,3-Dichloropropene	9.299	75	3980599	108.9270151	ppbv		94
60)	4-Methyl-2-Pentanone (...	9.384	43	4868815	103.0152665	ppbv		97
61)	n-OCTANE	9.506	43	5822490	105.8433292	ppbv		96
62)	Toluene	9.616	91	7873190	105.8062203	ppbv		99
63)	trans-1,3-Dichloropropene	9.860	75	3792720	106.6906644	ppbv		95
64)	1,1,2-Trichloroethane	10.079	97	2650987	99.1073663	ppbv		94
65)	Tetrachloroethene	10.189	166	3803447	102.8830815	ppbv		98
66)	Methyl Butyl Ketone	10.244	43	4910833	112.5519681	ppbv		94
67)	Chlorodibromomethane	10.530	129	5039362	104.2778405	ppbv		99
68)	1,2-Dibromoethane	10.719	107	4344941	105.2884417	ppbv		100
69)	Chlorobenzene	11.195	112	6172332	103.6456498	ppbv		90
70)	NONANE	11.152	43	6195143	101.9515414	ppbv		93
72)	Ethylbenzene	11.219	91	10477738	104.2577976	ppbv		99
74)	O-Xylene	11.817	91	8530507	115.4499002	ppbv		99
77)	Styrene	11.841	104	7308459	114.1859129	ppbv		96
78)	Bromoform	12.146	173	5447916	107.2457232	ppbv		98
79)	Isopropylbenzene	12.189	105	12270388	119.6591128	ppbv		98
80)	n-DECANE	12.664	43	6638127	93.3589851	ppbv	#	88
81)	1,1,2,2-Tetrachloroethane	12.603	83	6673364	98.6306170	ppbv		98
83)	4-Ethyltoluene	12.780	105	14070283	115.5562248	ppbv		99
84)	2-Chlorotoluene	12.841	91	11459556	108.0397457	ppbv		98
86)	1,3,5-Trimethylbenzene	12.841	105	12035995	112.3851674	ppbv		98
87)	tert-Butylbenzene	13.201	119	11178860	117.2446655	ppbv		96
88)	1,2,4-Trimethylbenzene	13.268	105	12088453	116.1133285	ppbv		98
90)	1,3-Dichlorobenzene	13.652	146	8189730	108.4332629	ppbv		98
91)	P-ISOPROPYLTOLUENE	13.560	119	14798543	116.1763418	ppbv		99
92)	1,4-Dichlorobenzene	13.743	146	8503949	113.1142271	ppbv		96
93)	1,2,3-TRIMETHYLBENZENE	13.731	105	12772489	118.5843715	ppbv		98
94)	Benzyl Chloride	13.871	91	11525598	123.0274478	ppbv		100
95)	n-Butylbenzene	13.981	91	14450492	112.9923744	ppbv		98
96)	1,2-Dichlorobenzene	14.152	146	7902079	107.9458281	ppbv		99
97)	1,2-DIBROMO-3-CHLOROPR...	14.987	157	4154438	114.1054405	ppbv		94
98)	1,2,4-Trichlorobenzene	15.877	180	8253195	134.1319042	ppbv		99
99)	Hexachloro-1,3-Butadiene	15.962	225	7965247	104.0526395	ppbv		99
101)	TPH (GC/MS) Low Fraction	10.430	TIC	896223024m	4765.9032644	ppbv		
102)	TPH-GRO (C5-C10)	11.493	TIC	1022135353m	6675.5917039	ppbv		

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_12.D
Acq On : 25 Jul 2022 4:02 pm
Operator :
Sample : STD AMS 100.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 12 Sample Multiplier: 1
InstName : AIRMS7

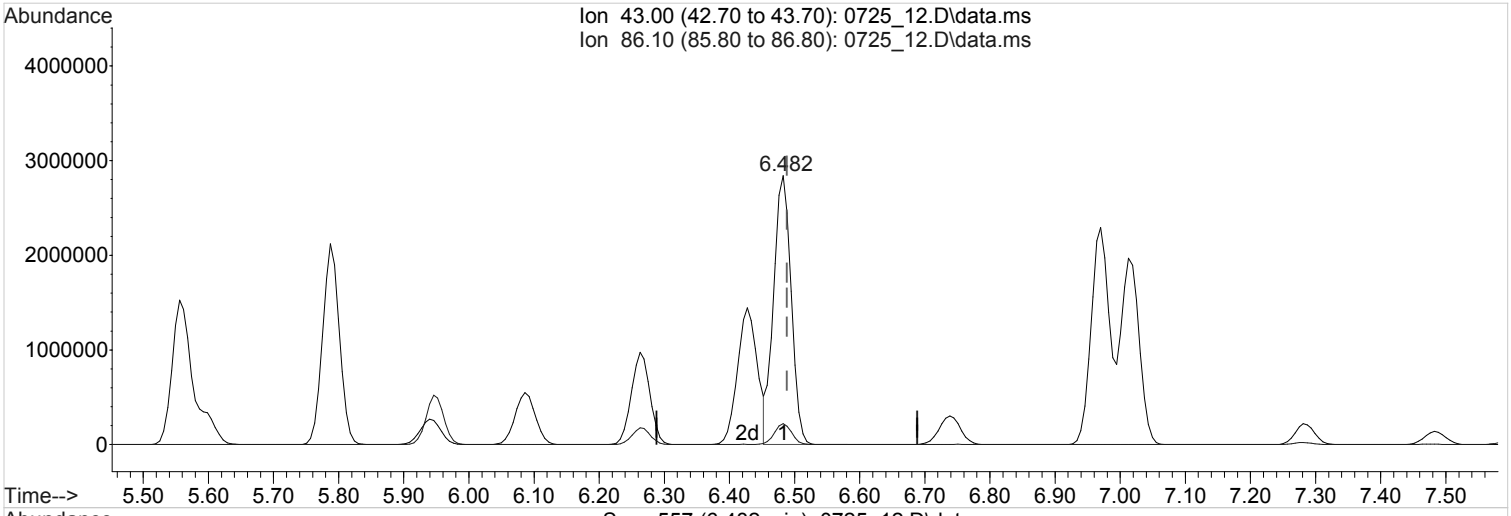
Quant Time: Jul 25 16:28:18 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:50:25 2022
Response via : Initial Calibration

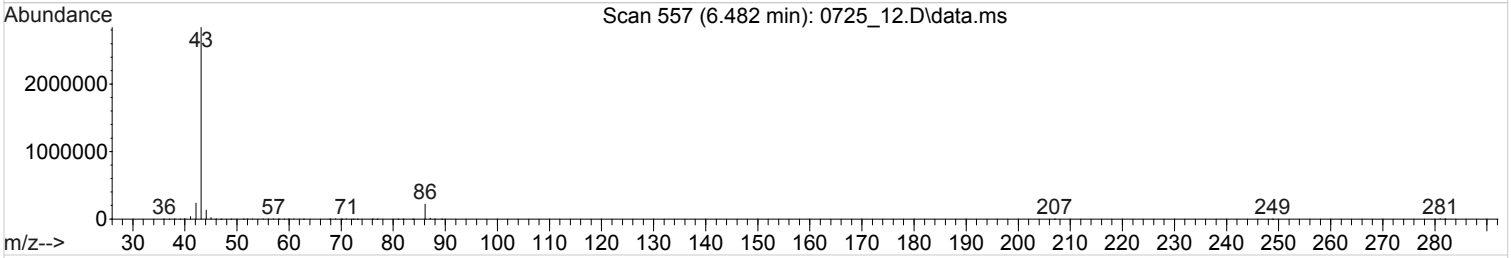


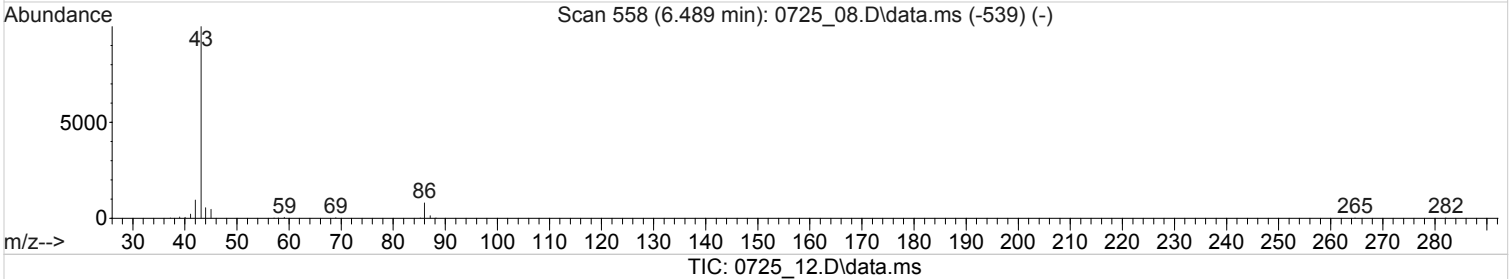
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_12.D
Acq On : 25 Jul 2022 4:02 pm
Operator :
Sample : STD AMS 100.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 12 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 16:20:33 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:50:25 2022
Response via : Initial Calibration







TIC: 0725_12.D\data.ms

(35) Vinyl Acetate (T,M)

6.482min (-0.006) 66.1236431 ppbv

Qvalue = 99

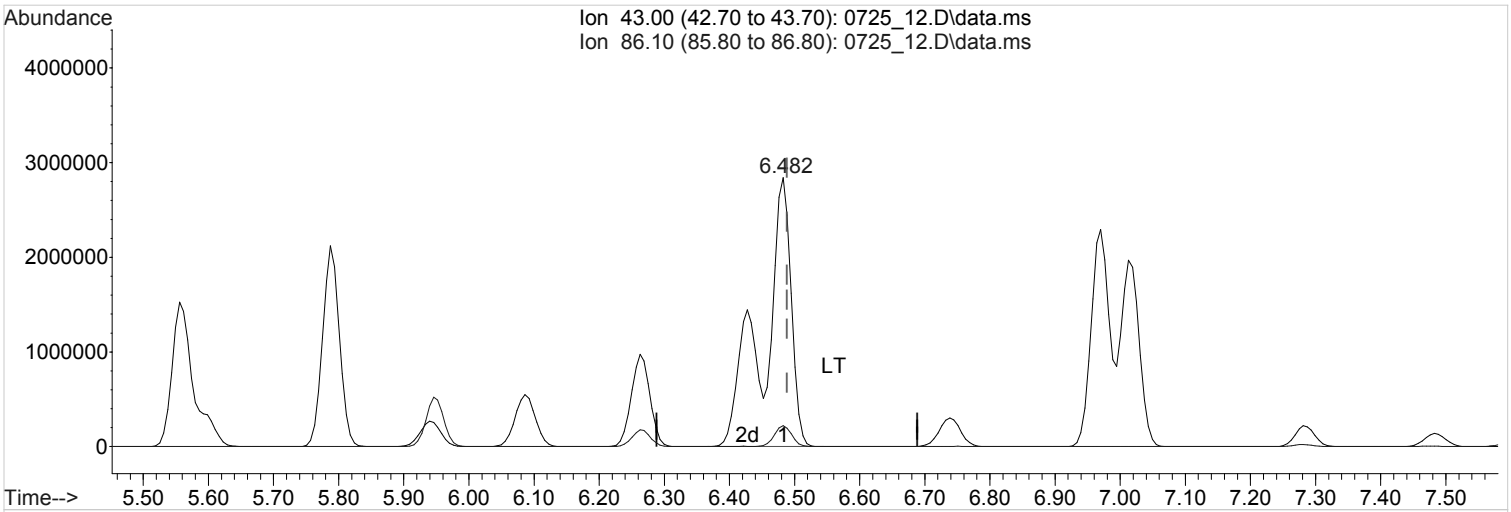
response 5321845

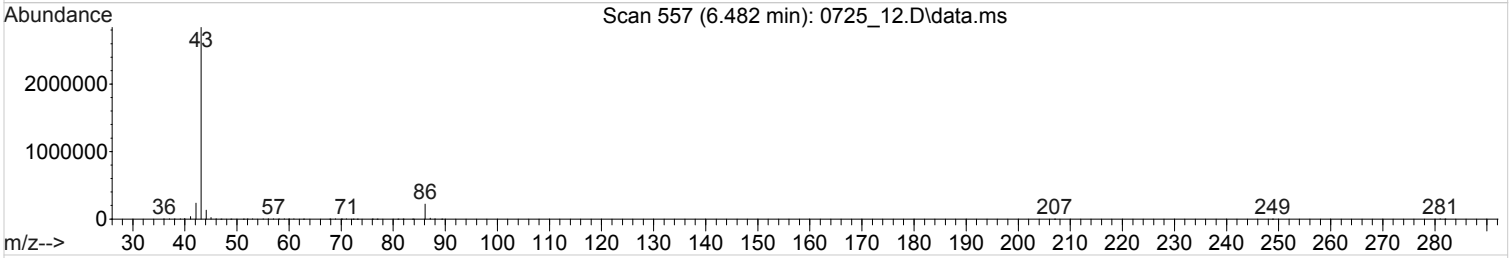
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	7.74
0.00	0.00	0.00
0.00	0.00	0.00

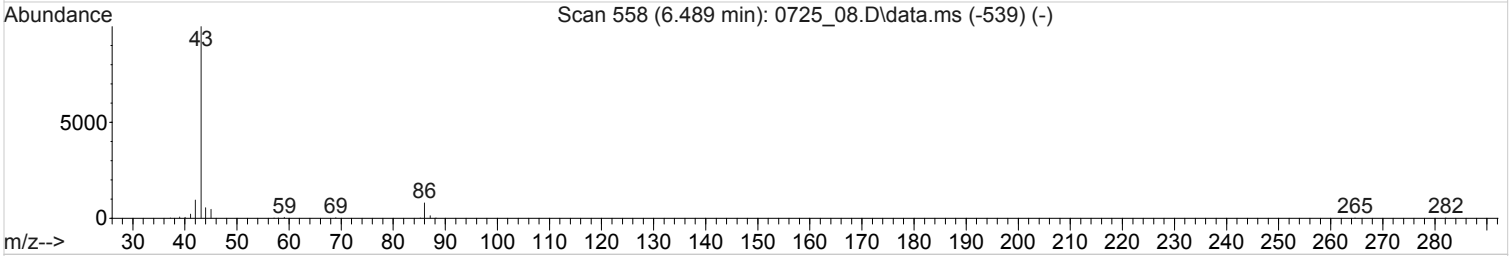
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_12.D
Acq On : 25 Jul 2022 4:02 pm
Operator :
Sample : STD AMS 100.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 12 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 16:20:33 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:50:25 2022
Response via : Initial Calibration







TIC: 0725_12.D\data.ms

(35) Vinyl Acetate (T,M)

6.482min (-0.006) 104.3527455 ppbv m

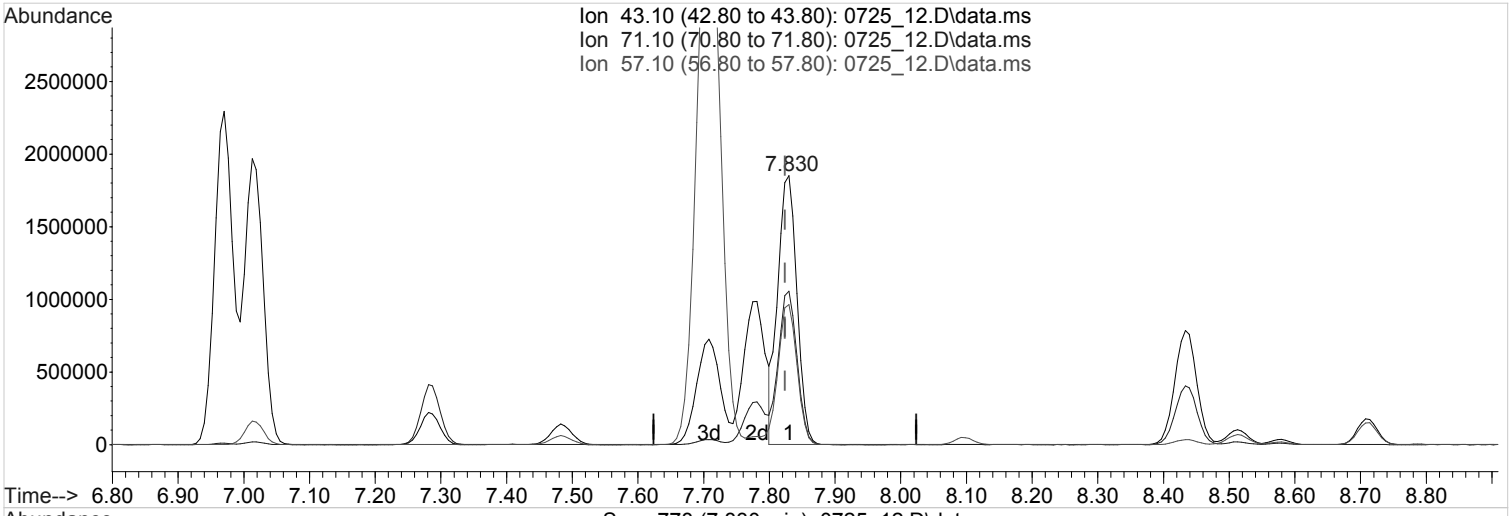
response 8398647

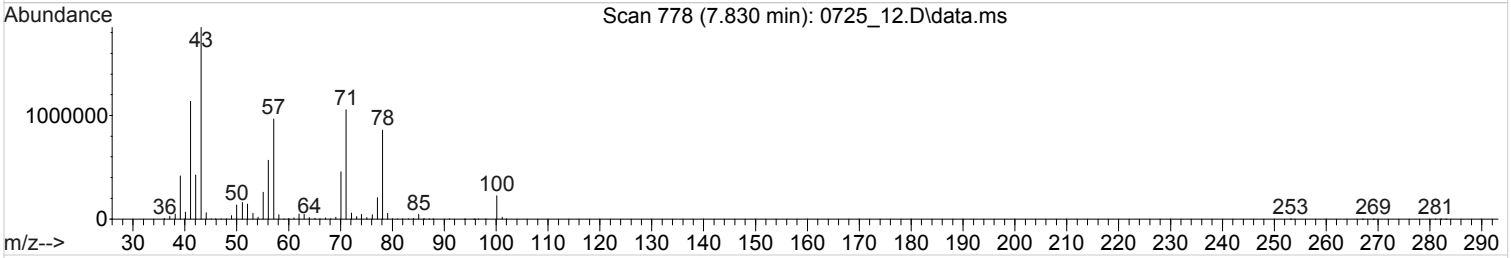
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.91#
0.00	0.00	0.00
0.00	0.00	0.00

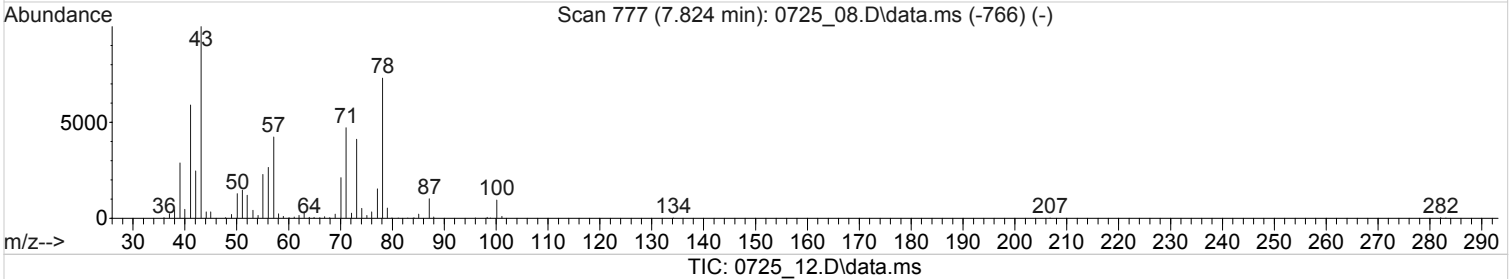
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_12.D
Acq On : 25 Jul 2022 4:02 pm
Operator :
Sample : STD AMS 100.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 12 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 16:20:33 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:50:25 2022
Response via : Initial Calibration







TIC: 0725_12.D\data.ms

(51) Heptane (T,M)

7.830min (+0.006) 64.4043622 ppbv

Qvalue = 73

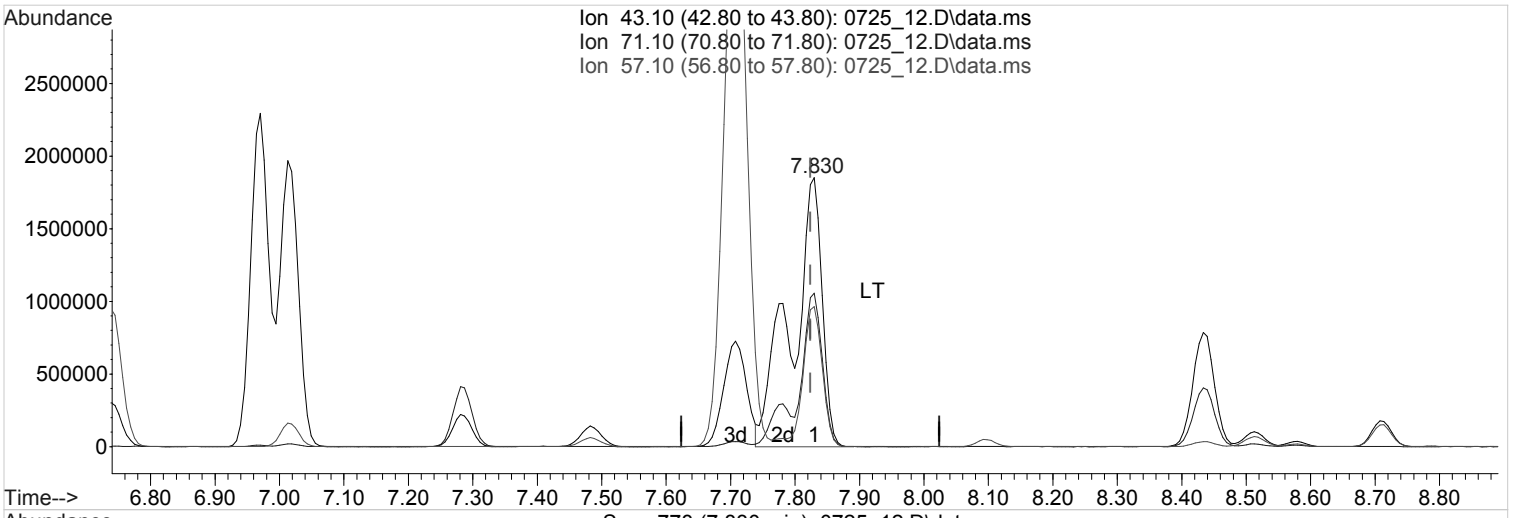
response 3754087

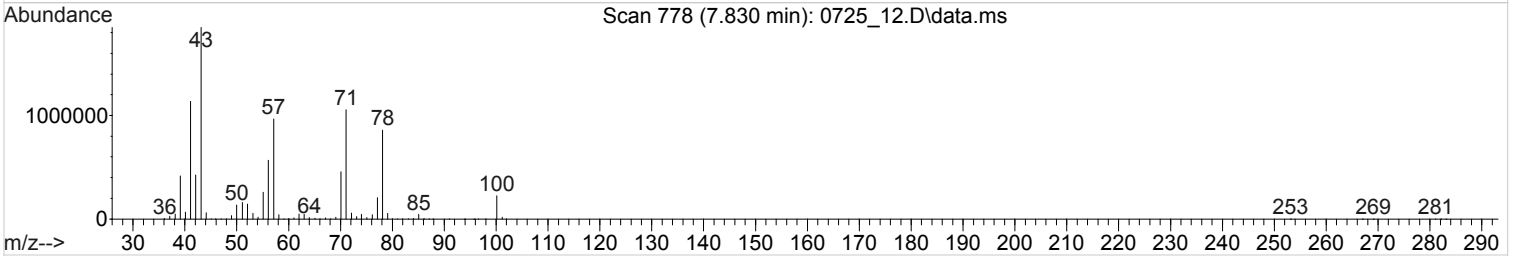
Ion	Exp%	Act%
43.10	100	100
71.10	42.70	55.79#
57.10	33.40	53.94#
0.00	0.00	0.00

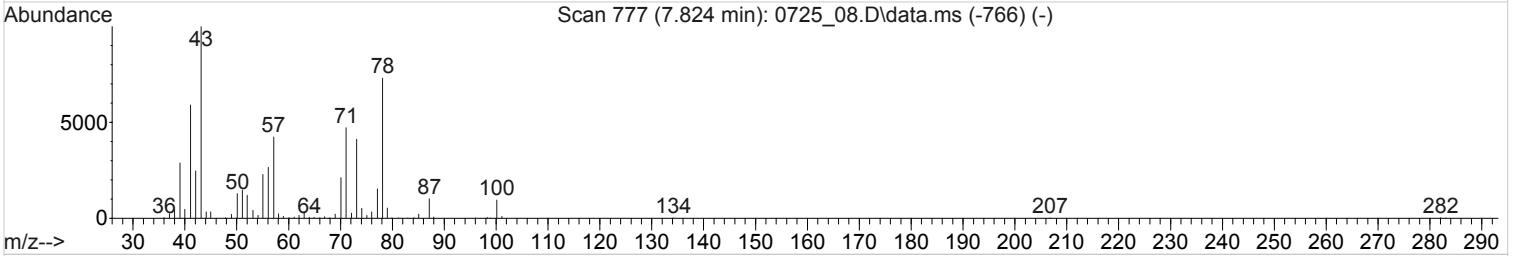
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_12.D
Acq On : 25 Jul 2022 4:02 pm
Operator :
Sample : STD AMS 100.0 ppbv 22G13975
Misc : 22G13913
ALS Vial : 12 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 25 16:20:33 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 15:50:25 2022
Response via : Initial Calibration







TIC: 0725_12.D\data.ms

(51) Heptane (T,M)

7.830min (+0.006) 103.7994123 ppbv m

response 6050398

Ion	Exp%	Act%
43.10	100	100
71.10	42.70	34.62
57.10	33.40	33.47
0.00	0.00	0.00

6A-OR

GC/MS INITIAL CALIBRATION DATA

SDG: L1518164 **Analytical Method:** TO-15

Instrument ID: AIRMS9

Analyte	**RRF: 0.31**	**RRF: 0.63**	**RRF: 1.25**	**RRF: 2.5**	**RRF: 3.75**	**RRF: 10.0**	**RRF: 25**	**RRF: 50**	**RRF: 100**	**RRF: 0.19**
Analysis date/time	07/27/22 13:27	07/27/22 13:52	07/27/22 14:18	07/27/22 14:45	07/27/22 15:15	07/27/22 15:41	07/27/22 16:08	07/27/22 16:40	07/27/22 17:18	07/27/22 13:02
2-PROPANOL	0.2250	0.2370	0.2130	0.2120	0.2160	0.2150	0.2080	0.1950	0.1760	
1,4-BROMOFLUOROBENZENE	0.6580	0.68	0.6830	0.6880	0.6820	0.6820	0.6820	0.6820	0.6810	0.6660
File ID:	0727A_04	0727A_05	0727A_06	0727A_07	0727A_08	0727A_09	0727A_10	0727A_11	0727A_12	0727A_03

6A-OR

GC/MS INITIAL CALIBRATION DATA

SDG: L1518164 **Analytical Method:** TO-15

Instrument ID: AIRMS9

Analyte	RRF. Avg	%RSD	COD
Analysis date/time			
2-PROPANOL	0.210588	8.27	
1,4-BROMOFLUOROBENZENE	0.678532	1.35	

Response Factor Report AIRMS9

Method Path : C:\GCMS\1\methods\
Method File : TOAIRMS9G27V.M
Title :
Last Update : Thu Jul 28 09:58:39 2022
Response Via : Initial Calibration

Calibration Files
0.19=0727A_03.D 0.31=0727A_04.D 0.63=0727A_05.D 1.25=0727A_06.D 2.5 =0727A_07.D 3.75=0727A_08.D 10.0=0727A_09.D 25 =0727A_10.D
50 =0727A_11.D 100 =0727A_12.D

	Compound	0.19	0.31	0.63	1.25	2.5	3.75	10.0	25	50	100	Avg	%RSD
1)	I Bromochloromethane	----------ISTD----------											
2)	T,M Propene		0.167	0.153	0.138	0.130	0.131	0.123	0.117	0.108	0.093	0.129	17.38
3)	T BUTANE	0.430	0.253	0.287	0.275	0.272	0.275	0.207	0.200	0.189		0.265	27.20
4)	1,1-DIFLUOROET...		0.136	0.148	0.142	0.141	0.141	0.135	0.130	0.122	0.110	0.134	8.82
5)	T,M Dichlorodifluo...	0.607	0.367	0.425	0.415	0.410	0.415	0.391	0.372	0.336	0.275	0.401	21.30
6)	CHLORODIFLUORO...	0.063	0.039	0.043	0.042	0.042	0.042	0.041	0.039	0.037	0.033	0.042	18.64
7)	T,M 1,2-Dichlorote...	0.740	0.456	0.514	0.505	0.496	0.502	0.473	0.441	0.388	0.307	0.482	23.03
8)	T,M Chloromethane	0.180	0.109	0.123	0.117	0.115	0.116	0.111	0.109	0.103	0.096	0.118	19.56
9)	T,M Vinyl Chloride	0.257	0.156	0.182	0.174	0.170	0.175	0.170	0.164	0.156	0.141	0.175	18.01
10)	T,M 1,3-Butadiene		0.108	0.088	0.111	0.109	0.087	0.099	0.098	0.094	0.085	0.098	10.35
11)	T,M Bromomethane	0.361	0.217	0.246	0.239	0.234	0.240	0.229	0.222	0.207	0.179	0.237	20.04
12)	T,M Chloroethane	0.158	0.096	0.106	0.101	0.099	0.100	0.097	0.094	0.090	0.082	0.102	20.28
13)	T ISOPENTANE	0.151	0.089	0.099	0.098	0.094	0.097	0.094	0.092	0.086	0.078	0.098	20.32
14)	T,M Vinyl Bromide	0.373	0.230	0.257	0.255	0.253	0.257	0.247	0.240	0.221	0.187	0.252	18.92
15)	T,M Trichlorofluor...	0.644	0.397	0.462	0.447	0.441	0.451	0.433	0.413	0.372	0.308	0.437	19.70
16)	T PENTANE	0.321	0.185	0.207	0.198	0.197	0.201	0.194	0.192	0.180	0.162	0.204	21.10
17)	T,M Ethanol		0.060	0.060	0.052	0.049	0.050	0.054	0.052	0.050	0.047	0.053	8.77
18)	T ACROLEIN	0.115	0.074	0.075	0.074	0.073	0.073	0.072	0.071	0.069	0.064	0.076	18.57
19)	T,M 1,1,2-Trichlor...	0.567	0.349	0.396	0.390	0.382	0.390	0.366	0.348	0.304	0.245	0.374	22.05
20)	T,M 1,1-Dichloroet...	0.320	0.188	0.212	0.210	0.206	0.209	0.202	0.196	0.178	0.153	0.208	20.99
21)	T,M Acetone		0.162	0.256	0.171	0.186	0.183	0.151	0.159	0.149	0.139	0.173	20.06
22)	T BROMOETHANE	0.291	0.175	0.203	0.198	0.194	0.201	0.193	0.189	0.170	0.147	0.196	19.09
23)	T,M 2-Propanol		0.225	0.237	0.213	0.212	0.216	0.215	0.208	0.195	0.176	0.211	8.27
24)	T,M Carbon Disulfide	0.700	0.412	0.480	0.470	0.465	0.474	0.458	0.446	0.401	0.325	0.463	20.63
25)	T,M Allyl Chloride	0.202	0.123	0.137	0.134	0.132	0.135	0.139	0.140	0.136	0.125	0.140	15.96
26)	T METHYL ACETATE	0.367	0.225	0.242	0.233	0.222	0.226	0.219	0.214	0.200	0.178	0.233	21.64
27)	T ACETONITRILE	0.158	0.095	0.105	0.100	0.097	0.098	0.095	0.090	0.082	0.069	0.099	23.22
28)	T,M Methylene Chlo...	0.209	0.123	0.132	0.126	0.122	0.126	0.118	0.116	0.109	0.097	0.128	23.54
29)	TERT-BUTYL ALC...	0.429	0.262	0.282	0.262	0.257	0.265	0.271	0.263	0.232	0.202	0.273	21.88
30)	T,M Methyl Tert-Bu...	0.656	0.384	0.439	0.436	0.442	0.460	0.463	0.460	0.439	0.378	0.456	16.76
31)	T,M Trans-1,2-Dich...	0.301	0.186	0.206	0.202	0.200	0.201	0.192	0.188	0.182	0.169	0.203	17.86
32)	T ACRYLONITRILE	0.206	0.123	0.141	0.135	0.133	0.130	0.128	0.128	0.121	0.113	0.136	18.91
33)	T,M n-Hexane	0.336	0.199	0.227	0.230	0.239	0.251	0.254	0.243	0.222	0.189	0.239	16.78
34)	T,M 1,1-Dichloroet...	0.509	0.307	0.352	0.340	0.343	0.346	0.335	0.325	0.305	0.267	0.343	18.58
35)	T,M Vinyl Acetate	0.392	0.227	0.259	0.263	0.255	0.265	0.286	0.300	0.300	0.274	0.282	15.74

Response Factor Report AIRMS9

Method Path : C:\GCMS\1\methods\
Method File : TOAIRMS9G27V.M
Title :

36)	T	DI-ISOPROPYL E...	0.603	0.348	0.405	0.401	0.420	0.437	0.438	0.414	0.377	0.313	0.416	18.47
37)	T	ETHYL TERT-BUT...	0.644	0.381	0.441	0.449	0.471	0.496	0.508	0.500	0.471	0.399	0.476	15.18
38)		ETHYL ACETATE	0.804	0.471	0.533	0.524	0.543	0.548	0.540	0.501	0.451	0.366	0.528	21.23
39)	T,M	2-Butanone (MEK)	0.159	0.091	0.104	0.101	0.102	0.105	0.108	0.108	0.106	0.099	0.108	17.08
40)	T,M	cis-1,2-Dichlo...	0.354	0.206	0.241	0.238	0.241	0.244	0.243	0.239	0.228	0.202	0.244	17.09
41)	T,M	Tetrahydrofuran	0.171	0.114	0.111	0.111	0.117	0.121	0.127	0.129	0.128	0.119	0.125	14.04
42)	T,M	Chloroform	0.610	0.368	0.421	0.411	0.412	0.416	0.401	0.380	0.346	0.286	0.405	20.55
43)	T,M	Cyclohexane	0.384	0.222	0.259	0.262	0.275	0.289	0.300	0.303	0.292	0.258	0.285	14.98
44)	T,M	1,1,1-Trichlor...	0.559	0.334	0.382	0.382	0.384	0.395	0.393	0.382	0.358	0.305	0.388	17.24
45)	T,M	Carbon Tetrach...	0.587	0.347	0.408	0.403	0.411	0.423	0.422	0.409	0.380	0.320	0.411	17.15
46)	T,M	2,2,4-Trimethy...	1.155	0.679	0.782	0.779	0.797	0.825	0.823	0.784	0.705	0.557	0.789	19.35
47)	I	1,4-Difluorobenzene	----------ISTD----------											
48)	T,M	Benzene	0.303	0.182	0.204	0.202	0.201	0.201	0.199	0.193	0.179	0.149	0.201	19.67
49)	T	TERT-AMYL METH...	0.225	0.133	0.152	0.150	0.152	0.157	0.159	0.159	0.153	0.132	0.157	16.36
50)	T,M	1,2-Dichloroet...	0.085	0.050	0.059	0.057	0.057	0.056	0.054	0.053	0.051	0.046	0.057	18.78
51)	T,M	Heptane	0.090	0.054	0.061	0.062	0.065	0.067	0.068	0.067	0.063	0.056	0.065	15.13
52)	T,M	Trichloroethene	0.142	0.087	0.098	0.096	0.096	0.097	0.094	0.091	0.084	0.071	0.096	19.13
53)		TERT-AMYL ETHY...	0.059	0.036	0.043	0.044	0.048	0.050	0.051	0.049	0.045	0.038	0.046	14.64
54)		METHYL CYCLOHE...	0.172	0.107	0.122	0.128	0.135	0.138	0.135	0.126	0.112	0.091	0.127	17.16
55)	T,M	1,2-Dichloropr...	0.098	0.057	0.065	0.064	0.062	0.063	0.061	0.060	0.058	0.052	0.064	19.64
56)	T,M	Methyl Methacr...	0.082	0.048	0.056	0.059	0.061	0.064	0.066	0.067	0.066	0.061	0.063	14.00
57)	T,M	1,4-Dioxane	0.068	0.042	0.046	0.044	0.046	0.048	0.051	0.049	0.046	0.040	0.048	16.10
58)	T,M	Bromodichlorom...	0.183	0.111	0.126	0.126	0.127	0.128	0.126	0.124	0.117	0.101	0.127	17.11
59)	T,M	cis-1,3-Dichlo...	0.131	0.075	0.088	0.090	0.094	0.097	0.101	0.105	0.103	0.092	0.098	14.82
60)	T,M	4-Methyl-2-Pen...	0.151	0.090	0.106	0.103	0.107	0.109	0.107	0.101	0.092	0.077	0.104	18.43
61)	T	n-OCTANE	0.109	0.066	0.076	0.080	0.086	0.090	0.094	0.091	0.083	0.070	0.084	14.73
62)	T,M	Toluene	0.336	0.202	0.234	0.237	0.244	0.252	0.253	0.244	0.218	0.170	0.239	17.87
63)	T,M	trans-1,3-Dich...	0.097	0.058	0.070	0.071	0.076	0.079	0.083	0.088	0.088	0.080	0.079	13.83
64)	T,M	1,1,2-Trichlor...	0.156	0.091	0.106	0.105	0.106	0.105	0.102	0.097	0.091	0.078	0.104	19.77
65)	T,M	Tetrachloroethene	0.247	0.157	0.178	0.181	0.180	0.183	0.174	0.159	0.137	0.103	0.170	21.66
66)	T,M	Methyl Butyl K...	0.091	0.053	0.061	0.064	0.067	0.071	0.077	0.077	0.075	0.067	0.070	14.91
67)	T,M	Chlorodibromom...	0.222	0.136	0.156	0.161	0.167	0.172	0.170	0.165	0.150	0.122	0.162	16.26
68)	T,M	1,2-Dibromoethane	0.229	0.138	0.162	0.164	0.166	0.169	0.165	0.158	0.143	0.116	0.161	18.07
69)	T,M	Chlorobenzene	0.367	0.215	0.250	0.246	0.245	0.245	0.236	0.221	0.196	0.151	0.237	23.10
70)	T	NONANE	0.108	0.063	0.078	0.087	0.096	0.101	0.103	0.098	0.091	0.077	0.090	15.52
71)	I	Chlorobenzene-d5	----------ISTD----------											
72)	T,M	Ethylbenzene	0.425	0.250	0.292	0.297	0.314	0.325	0.332	0.317	0.273		0.314	15.68
73)	T,M	M&P-Xylene	0.341	0.198	0.244	0.254	0.272	0.283	0.276	0.243	0.193		0.256	17.61
74)	T,M	O-Xylene	0.321	0.189	0.234	0.252	0.270	0.281	0.276	0.252	0.214	0.163	0.245	19.10
75)		TOTAL XYLENES											0.000	-1.00
76)		XYLENES, TOTAL											0.000	-1.00
77)	T,M	Styrene	0.271	0.158	0.195	0.207	0.227	0.240	0.254	0.249	0.221	0.172	0.219	16.63
78)	T,M	Bromoform	0.255	0.151	0.182	0.186	0.198	0.202	0.189	0.177	0.148	0.109	0.180	21.54
79)	T,M	Isopropylbenzene	0.549	0.328	0.392	0.398	0.407	0.420	0.414	0.374	0.304		0.398	17.23

Method Path : C:\GCMS\1\methods\
Method File : TOAIRMS9G27V.M
Title :

80)	T	n-DECANE	0.124	0.070	0.093	0.104	0.116	0.121	0.117	0.106	0.092	0.076	0.102	18.49
81)	T,M	1,1,2,2-Tetrac...	0.343	0.202	0.238	0.236	0.238	0.239	0.227	0.205	0.175	0.133	0.224	24.20
82)	T,M	n-Propylbenzene	0.598	0.346	0.428	0.455	0.491	0.514	0.504	0.441	0.341		0.458	17.84
83)	T,M	4-Ethyltoluene	0.494	0.296	0.359	0.400	0.441	0.460	0.460	0.411	0.330		0.406	16.31
84)	T,M	2-Chlorotoluene	0.394	0.228	0.279	0.281	0.294	0.304	0.306	0.288	0.246		0.291	15.98
85)	S	1,4-Bromofluor...	0.666	0.658	0.680	0.683	0.688	0.682	0.682	0.682	0.682	0.681	0.679	1.35
86)	T,M	1,3,5-Trimethy...	0.426	0.257	0.323	0.353	0.392	0.406	0.398	0.357	0.289		0.356	15.97
87)	T,M	tert-Butylbenzene	0.473	0.280	0.355	0.385	0.423	0.439	0.423	0.367	0.289		0.381	17.31
88)	T,M	1,2,4-Trimethy...	0.401	0.240	0.304	0.343	0.382	0.400	0.385	0.338	0.267		0.340	17.35
89)	T,M	sec-Butylbenzene	0.646	0.380	0.503	0.546	0.585	0.596	0.568	0.483	0.359		0.519	18.79
90)	T,M	1,3-Dichlorobe...	0.431	0.256	0.317	0.335	0.354	0.359	0.332	0.294	0.239	0.173	0.309	23.40
91)	T	P-ISOPROPYLTOL...	0.581	0.337	0.452	0.502	0.556	0.574	0.550	0.476	0.365		0.488	18.33
92)	T,M	1,4-Dichlorobe...	0.430	0.256	0.312	0.338	0.359	0.361	0.331	0.289	0.227	0.160	0.306	25.13
93)		1,2,3-TRIMETHY...	0.443	0.268	0.339	0.373	0.398	0.417	0.407	0.372	0.302		0.369	15.35
94)	T,M	Benzyl Chloride	0.213	0.120	0.155	0.168	0.191	0.209	0.231	0.243	0.215	0.163	0.191	20.16
95)	T,M	n-Butylbenzene	0.402	0.242	0.307	0.339	0.377	0.406	0.400	0.370	0.296		0.349	16.29
96)	T,M	1,2-Dichlorobe...	0.428	0.257	0.313	0.327	0.341	0.346	0.324	0.296	0.248		0.320	16.62
97)	T	1,2-DIBROMO-3-...	0.208	0.122	0.153	0.158	0.172	0.182	0.174	0.174	0.157		0.167	14.11
98)	T,M	1,2,4-Trichlor...	0.284	0.154	0.211	0.242	0.278	0.308	0.293	0.292	0.248	0.184	0.249	20.76
99)	T,M	Hexachloro-1,3...	0.359	0.214	0.254	0.257	0.271	0.283	0.254	0.232	0.187	0.133	0.244	24.65
100)	T,M	Naphthalene	0.455	0.247	0.352	0.421	0.524	0.604	0.580	0.523			0.463	26.02
101)	h,n,MTPH (GC/MS) Lo...						0.746	0.671	0.552	0.488	0.427	0.351	0.539	27.61
102)	h,n,MTPH-GRO (C5-C10)						0.560	0.504	0.419	0.373	0.327	0.270	0.409	26.64

(#) = Out of Range

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_04.D
Acq On : 27 Jul 2022 01:27 pm
Operator :
Sample : STD AMS 0.31 ppbv 22G26577
Misc : 22G21991
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jul 28 09:38:46 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.374	130	698623	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	2305595	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2125809	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1399417	3.9067531	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 97.67%			
Target Compounds						Qvalue
2) Propene	1.652	41	9057	0.2483540	ppbv	98
3) BUTANE	1.876	43	13689	0.2221080	ppbv	99
4) 1,1-DIFLUOROETHANE	1.626	65	7388	0.2262221	ppbv	95
5) Dichlorodifluoromethane	1.675	85	19889	0.2227502	ppbv	99
6) CHLORODIFLUOROMETHANE	1.641	67	2126	0.2327589	ppbv	99
7) 1,2-Dichlorotetrafluor...	1.766	85	24705	0.2277536	ppbv	97
8) Chloromethane	1.732	50	5902	0.2283500	ppbv	96
9) Vinyl Chloride	1.808	62	8452	0.2239570	ppbv	99
10) 1,3-Butadiene	1.853	39	5851	0.2496562	ppbv #	68
11) Bromomethane	1.948	94	11734	0.2235158	ppbv	99
12) Chloroethane	2.013	64	5179	0.2292830	ppbv	99
13) ISOPENTANE	2.430	41	4818	0.2225252	ppbv	99
14) Vinyl Bromide	2.138	106	12462	0.2268177	ppbv	97
15) Trichlorofluoromethane	2.301	101	21475	0.2246578	ppbv	100
16) PENTANE	2.430	43	10023	0.2198488	ppbv	98
17) Ethanol	2.050	45	3258	0.2425364	ppbv	99
18) ACROLEIN	2.179	56	3985	0.2421507	ppbv	97
19) 1,1,2-Trichlorotrifluo...	2.650	101	18883	0.2261257	ppbv	99
20) 1,1-Dichloroethene	2.517	61	10185	0.2204355	ppbv	99
21) Acetone	2.233	43	8772m	0.2195053	ppbv	
22) BROMOETHANE	2.506	108	9491	0.2211126	ppbv	98
23) 2-Propanol	2.320	45	12159	0.2359542	ppbv	100
24) Carbon Disulfide	2.650	76	22323m	0.2178089	ppbv	
25) Allyl Chloride	2.597	41	6677	0.2270526	ppbv	99
26) METHYL ACETATE	2.547	43	12156	0.2350230	ppbv #	97
27) ACETONITRILE	2.130	41	25711	1.1544047	ppbv	99
28) Methylene Chloride	2.555	49	6638	0.2273952	ppbv	96
29) TERT-BUTYL ALCOHOL	2.532	59	14172	0.2337087	ppbv	97
30) Methyl Tert-Butyl Ether	2.991	73	20800	0.2135004	ppbv	98
31) Trans-1,2-Dichloroethene	2.877	61	10071	0.2297998	ppbv	99
32) ACRYLONITRILE	2.399	53	6666	0.2275505	ppbv	99
33) n-Hexane	3.420	57	10780	0.2103012	ppbv	89
34) 1,1-Dichloroethane	2.953	63	16604	0.2225052	ppbv	100
35) Vinyl Acetate	3.025	43	12305	0.2144639	ppbv	98
36) DI-ISOPROPYL ETHER	3.427	45	18847	0.2075463	ppbv	91
37) ETHYL TERT-BUTYL ETHER	3.674	59	20630	0.2072985	ppbv	97
38) ETHYL ACETATE	3.427	43	25491	0.2158965	ppbv	94
39) 2-Butanone (MEK)	3.128	72	4952	0.2146656	ppbv	98
40) cis-1,2-Dichloroethene	3.306	61	11132	0.2132050	ppbv	98
41) Tetrahydrofuran	3.636	42	6175	0.2421935	ppbv #	85

Quantitation Report (QT Reviewed)

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Data File : 0727A_04.D
Acq On : 27 Jul 2022 01:27 pm
Operator :
Sample : STD AMS 0.31 ppbv 22G26577
Misc : 22G21991
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jul 28 09:38:46 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
42) Chloroform	3.439	83	19907	0.2222435 ppbv	100
43) Cyclohexane	4.258	84	12038	0.2049777 ppbv	94
44) 1,1,1-Trichloroethane	3.897	97	18060	0.2166997 ppbv	99
45) Carbon Tetrachloride	4.193	117	18769	0.2128765 ppbv	99
46) 2,2,4-Trimethylpentane	4.705	57	36769	0.2126180 ppbv #	97
48) Benzene	4.117	78	32458	0.2231582 ppbv	99
49) TERT-AMYL METHYL ETHER	4.451	73	23844	0.2164642 ppbv	97
50) 1,2-Dichloroethane	3.772	62	9011	0.2212525 ppbv	96
51) Heptane	4.857	43	9582	0.2110750 ppbv	96
52) Trichloroethene	4.660	95	15534	0.2253145 ppbv	96
53) TERT-AMYL ETHYL ETHER	5.155	73	6412	0.2035313 ppbv	83
54) METHYL CYCLOHEXANE	5.158	83	19040	0.2129936 ppbv	92
55) 1,2-Dichloropropane	4.531	63	10246	0.2206534 ppbv	98
56) Methyl Methacrylate	4.804	69	8595	0.2039006 ppbv #	1
57) 1,4-Dioxane	4.690	88	7521	0.2254157 ppbv #	34
58) Bromodichloromethane	4.629	83	19774	0.2201480 ppbv	100
59) cis-1,3-Dichloropropene	5.114	75	13429	0.2047535 ppbv	96
60) 4-Methyl-2-Pentanone (...	5.158	43	16102	0.2148360 ppbv	94
61) n-OCTANE	6.179	43	11823	0.2062444 ppbv	94
62) Toluene	5.618	91	36056	0.2128347 ppbv	100
63) trans-1,3-Dichloropropene	5.396	75	10443	0.2061902 ppbv	97
64) 1,1,2-Trichloroethane	5.468	97	16292	0.2169813 ppbv	96
65) Tetrachloroethene	6.191	166	28077	0.2268238 ppbv	99
66) Methyl Butyl Ketone	5.790	43	9512	0.2027362 ppbv	94
67) Chlorodibromomethane	5.812	129	24350	0.2144603 ppbv	100
68) 1,2-Dibromoethane	5.934	107	24594	0.2146574 ppbv	99
69) Chlorobenzene	6.526	112	38475	0.2183513 ppbv	99
70) NONANE	7.221	43	11259	0.1869478 ppbv	97
72) Ethylbenzene	6.733	91	41253	0.2068791 ppbv	98
73) M&P-Xylene	6.826	91	65175	0.3934429 ppbv	98
74) O-Xylene	7.052	91	31190	0.1950153 ppbv	98
77) Styrene	7.002	104	26034	0.1918963 ppbv	99
78) Bromoform	6.823	173	24891	0.2049495 ppbv	99
79) Isopropylbenzene	7.362	105	54061	0.2100778 ppbv	99
80) n-DECANE	8.075	43	11476	0.1760612 ppbv	98
81) 1,1,2,2-Tetrachloroethane	7.046	83	33357	0.2158206 ppbv	98
82) n-Propylbenzene	7.628	91	57062	0.1930749 ppbv	99
83) 4-Ethyltoluene	7.709	105	48791	0.1924410 ppbv	98
84) 2-Chlorotoluene	7.590	91	37593	0.2026416 ppbv	99
86) 1,3,5-Trimethylbenzene	7.756	105	42300	0.1913081 ppbv	97
87) tert-Butylbenzene	7.969	119	46102	0.1902960 ppbv	95
88) 1,2,4-Trimethylbenzene	7.972	105	39491	0.1855508 ppbv	100
89) sec-Butylbenzene	8.119	105	62684	0.1898384 ppbv	98
90) 1,3-Dichlorobenzene	8.032	146	42232	0.2011504 ppbv	98
91) P-ISOPROPYLTOLUENE	8.219	119	55475	0.1808669 ppbv	97
92) 1,4-Dichlorobenzene	8.072	146	42106	0.2003913 ppbv	99
93) 1,2,3-TRIMETHYLBENZENE	8.201	105	44101	0.1930325 ppbv	96
94) Benzyl Chloride	8.028	91	19831	0.1768493 ppbv	100
95) n-Butylbenzene	8.460	91	39890	0.1859379 ppbv	96
96) 1,2-Dichlorobenzene	8.257	146	42294	0.2057410 ppbv	99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_04.D
Acq On : 27 Jul 2022 01:27 pm
Operator :
Sample : STD AMS 0.31 ppbv 22G26577
Misc : 22G21991
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jul 28 09:38:46 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
97) 1,2-DIBROMO-3-CHLOROPR...	8.510	157	20074	0.1935283	ppbv	96
98) 1,2,4-Trichlorobenzene	9.262	180	25342	0.1610663	ppbv	99
99) Hexachloro-1,3-Butadiene	9.546	225	35205	0.2061995	ppbv	98
100) Naphthalene	9.315	128	40682	0.1444696	ppbv	99
101) TPH (GC/MS) Low Fraction	5.430	TIC	22604924m	14.9703043	ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	23321797m	22.3131660	ppbv	

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

Data Path : C:\GCMS\1\data\072722A\
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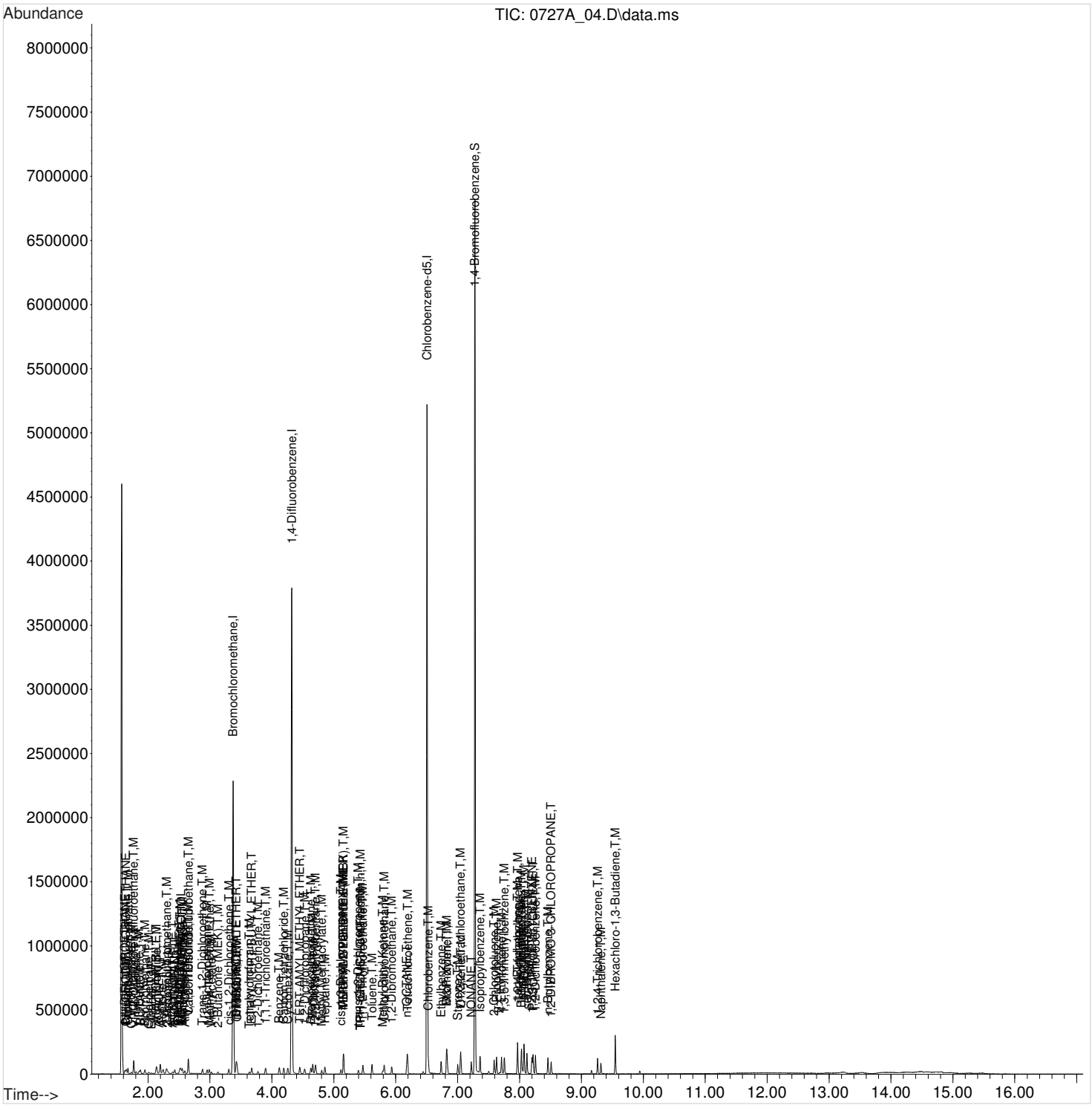
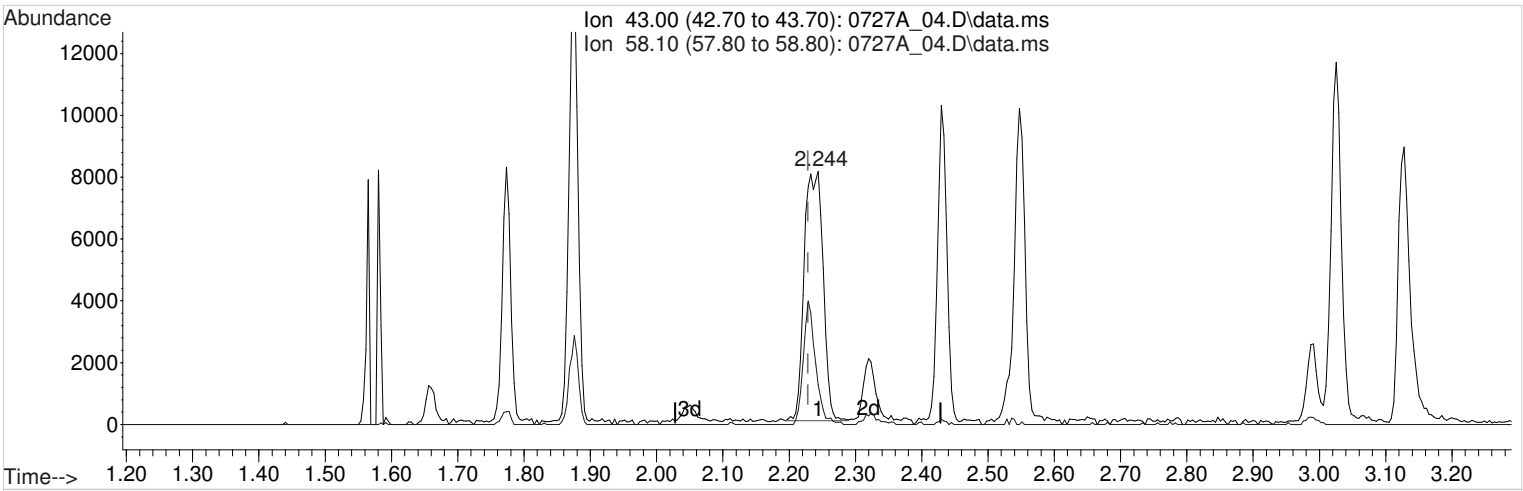
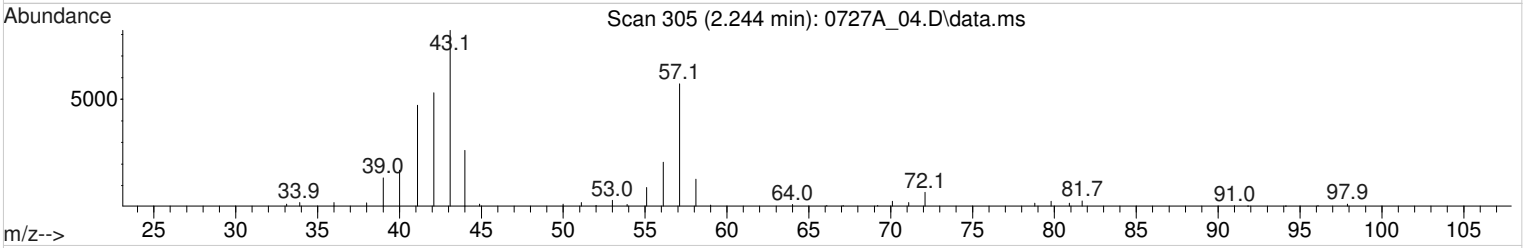


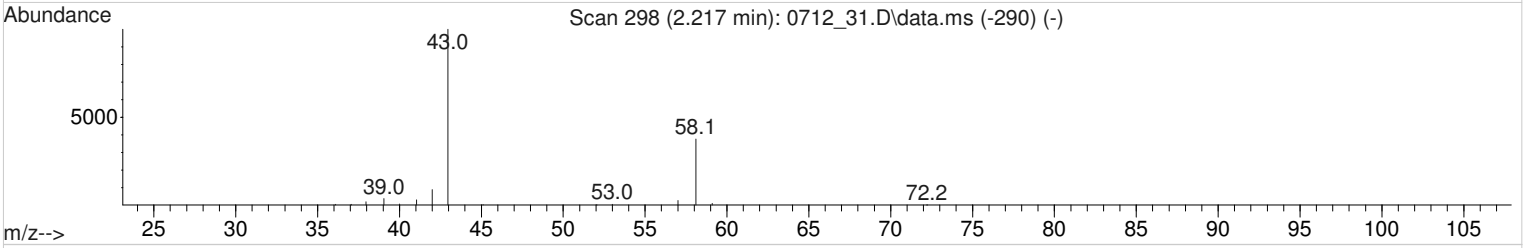
Quantitation Report (Qedit)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_04.D
Acq On : 27 Jul 2022 01:27 pm
Operator :
Sample : STD AMS 0.31 ppbv 22G26577
Misc : 22G21991
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jul 28 09:38:46 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration







TIC: 0727A_04.D\data.ms

(21) Acetone (T,M)

2.244min (+ 0.015) 0.3974467 ppbv

Qvalue = 73

response 15883

Ion	Exp%	Act%
43.00	100.00	100.00
58.10	51.20	32.36#
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (Qedit)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_04.D
Acq On : 27 Jul 2022 01:27 pm
Operator :
Sample : STD AMS 0.31 ppbv 22G26577
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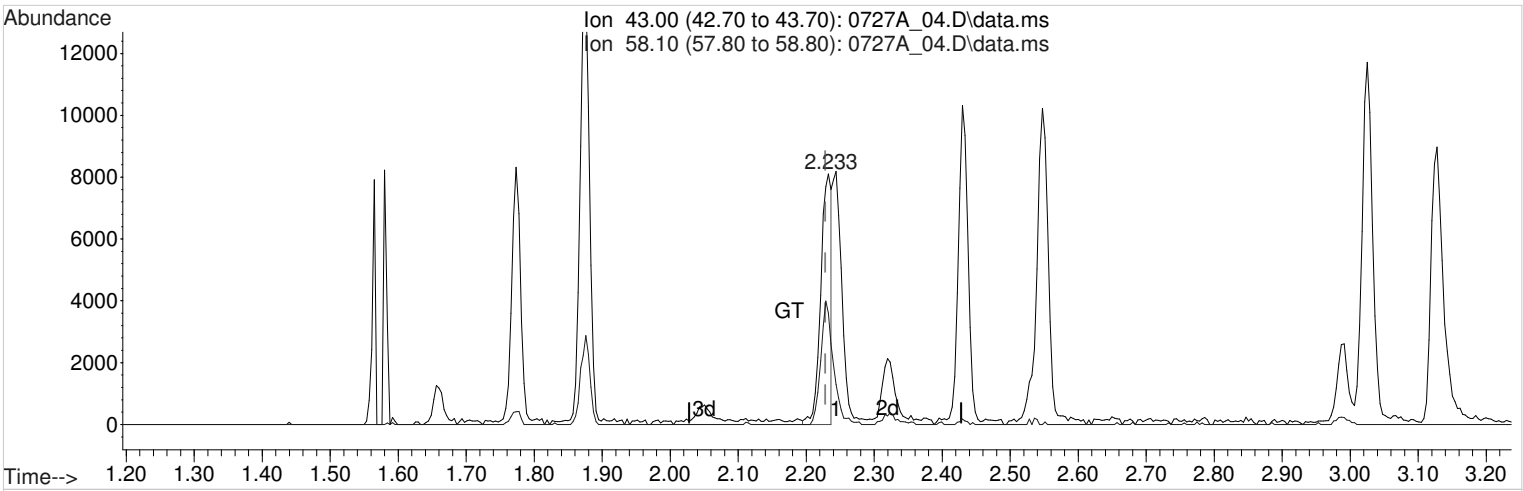
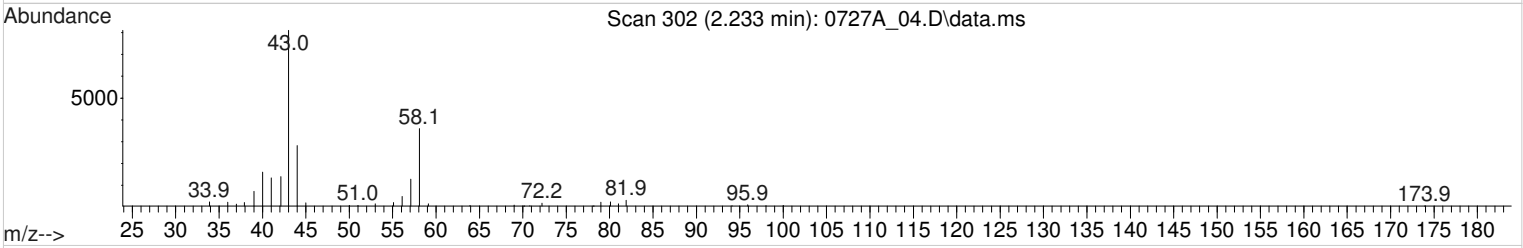
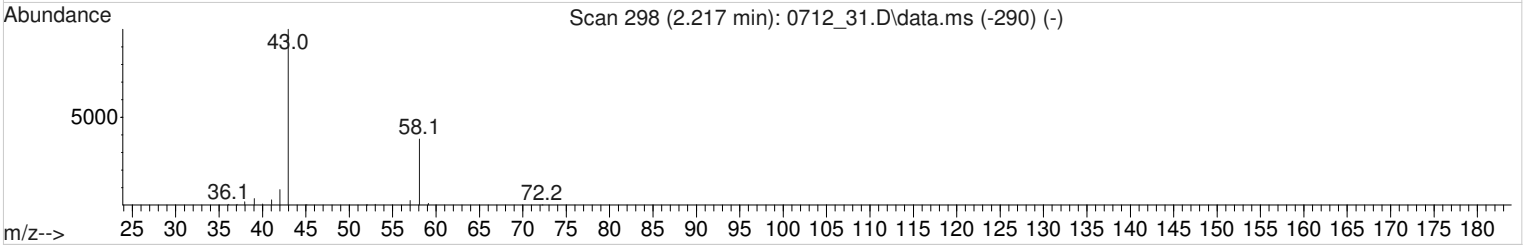
Response via : Initial Calibration







TIC: 0727A_04.D\data.ms

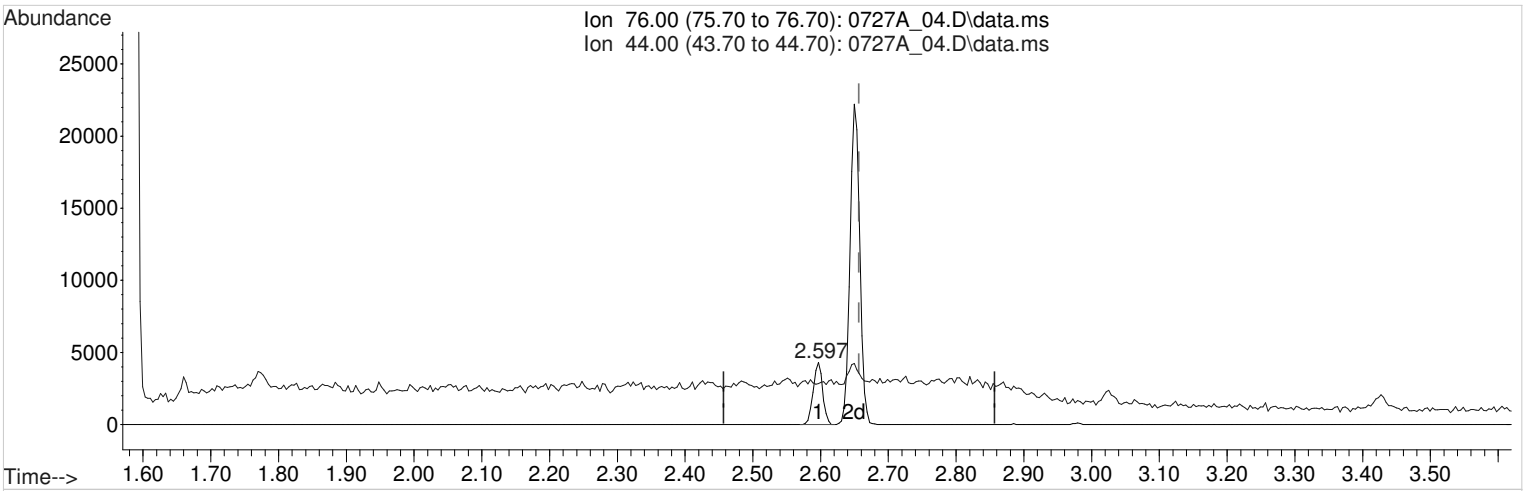
(21) Acetone (T,M)

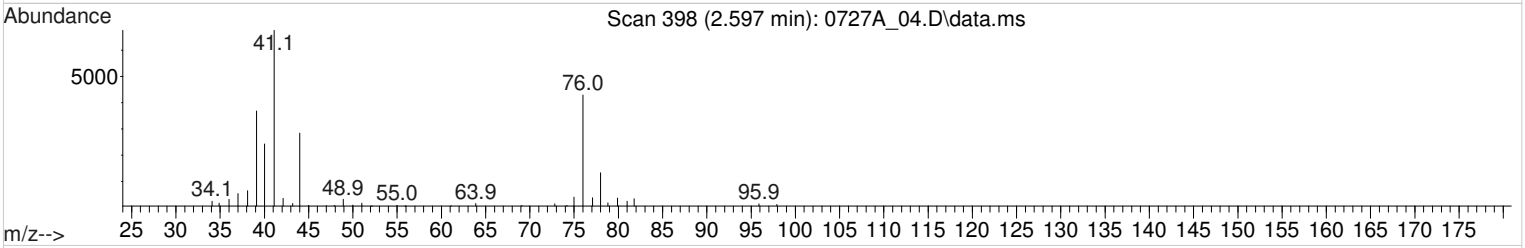
2.233min (+ 0.004) 0.2195053 ppbv m

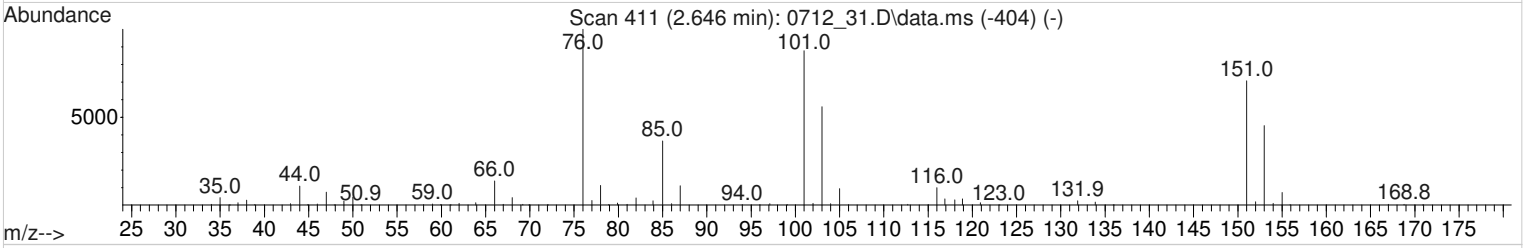
response	8772	
Ion	Exp%	Act%
43.00	100.00	100.00
58.10	51.20	58.58
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_04.D
Acq On : 27 Jul 2022 01:27 pm
Operator :
Sample : STD AMS 0.31 ppbv 22G26577
Misc : 22G21991
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jul 28 09:38:46 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration







TIC: 0727A_04.D\data.ms

(24) Carbon Disulfide (T,M)

2.597min (-0.061) 0.0397311 ppbv

Qvalue = 97

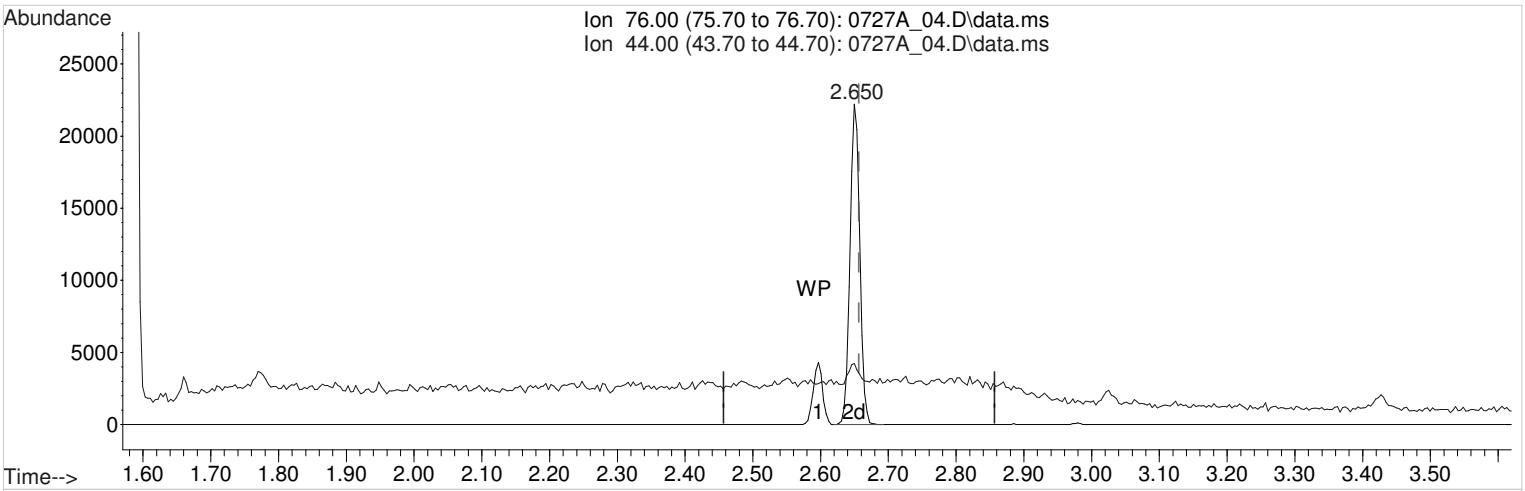
response 4072

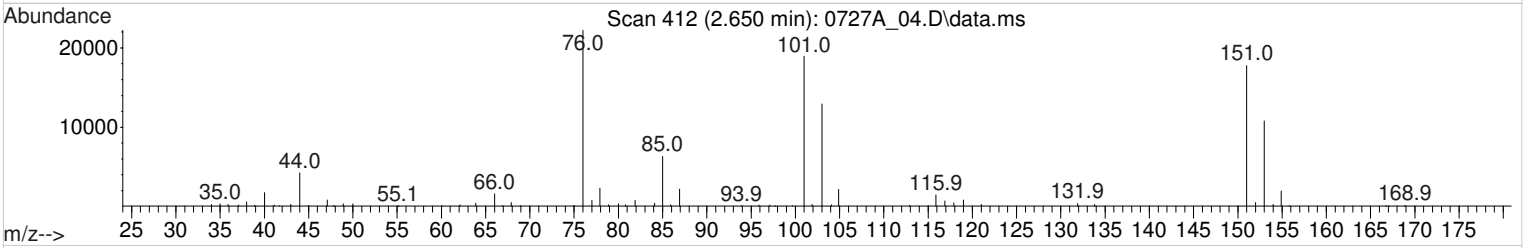
Ion	Exp%	Act%
76.00	100.00	100.00
44.00	6.00	4.96
0.00	0.00	0.00
0.00	0.00	0.00

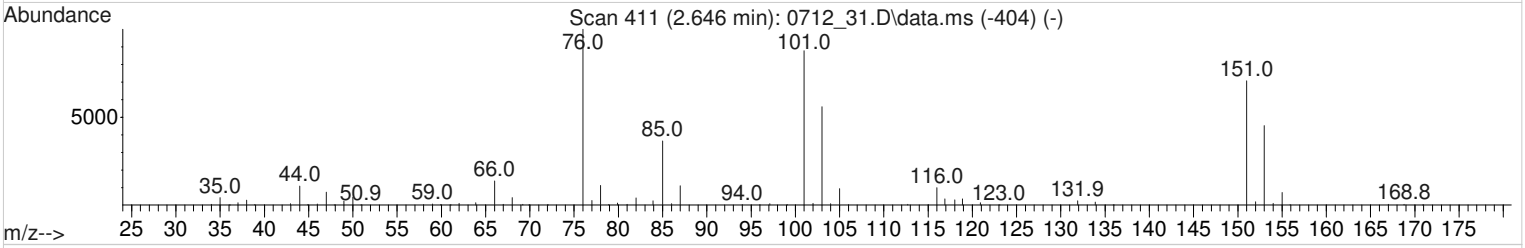
Quantitation Report (Qedit)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_04.D
Acq On : 27 Jul 2022 01:27 pm
Operator :
Sample : STD AMS 0.31 ppbv 22G26577
Misc : 22G21991
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Jul 28 09:38:46 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration







TIC: 0727A_04.D\data.ms

(24) Carbon Disulfide (T,M)

2.650min (-0.008) 0.2178089 ppbv m

response	**22323**	
Ion	**Exp%**	**Act%**
76.00	**100.00**	**100.00**
44.00	**6.00**	**0.90#**
0.00	**0.00**	**0.00**
0.00	**0.00**	**0.00**

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_05.D
Acq On : 27 Jul 2022 01:52 pm
Operator :
Sample : STD AMS 0.63 ppbv 22G26577
Misc : 22G21991
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Jul 28 09:40:21 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.378	130	694206	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	2309205	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2121656	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1443524	4.0693964	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 101.73%			
Target Compounds						Qvalue
2) Propene	1.648	41	16744	0.4948650	ppbv	99
3) BUTANE	1.872	43	31333	0.5650205	ppbv	99
4) 1,1-DIFLUOROETHANE	1.622	65	16167	0.5475082	ppbv	99
5) Dichlorodifluoromethane	1.671	85	46462	0.5778852	ppbv	99
6) CHLORODIFLUOROMETHANE	1.637	67	4747	0.5703920	ppbv	98
7) 1,2-Dichlorotetrafluor...	1.762	85	56219	0.5721782	ppbv	98
8) Chloromethane	1.728	50	13430	0.5732450	ppbv	100
9) Vinyl Chloride	1.804	62	19915	0.5851977	ppbv	99
10) 1,3-Butadiene	1.853	39	9627	0.4420721	ppbv	99
11) Bromomethane	1.948	94	26951	0.5696148	ppbv	99
12) Chloroethane	2.009	64	11551	0.5635475	ppbv	99
13) ISOPENTANE	2.434	41	10831	0.5556938	ppbv	100
14) Vinyl Bromide	2.138	106	28089	0.5650319	ppbv	100
15) Trichlorofluoromethane	2.297	101	50530	0.5857258	ppbv	98
16) PENTANE	2.434	43	22600	0.5524222	ppbv	100
17) Ethanol	2.047	45	6583	0.5317527	ppbv	99
18) ACROLEIN	2.176	56	8228	0.5427577	ppbv	95
19) 1,1,2-Trichlorotrifluo...	2.653	101	43271	0.5731634	ppbv	99
20) 1,1-Dichloroethene	2.521	61	23218	0.5596010	ppbv	99
21) Acetone	2.229	43	27940m	0.7794473	ppbv	
22) BROMOETHANE	2.509	108	22239	0.5765010	ppbv	100
23) 2-Propanol	2.320	45	25903	0.5496254	ppbv	99
24) Carbon Disulfide	2.653	76	52447	0.5716579	ppbv	99
25) Allyl Chloride	2.597	41	14949	0.5616740	ppbv	97
26) METHYL ACETATE	2.547	43	26485	0.5605048	ppbv #	99
27) ACETONITRILE	2.130	41	57496	2.8395232	ppbv	99
28) Methylene Chloride	2.555	49	14483	0.5479665	ppbv	99
29) TERT-BUTYL ALCOHOL	2.532	59	30863	0.5579684	ppbv	98
30) Methyl Tert-Butyl Ether	2.991	73	48050	0.5538096	ppbv	98
31) Trans-1,2-Dichloroethene	2.881	61	22556	0.5668393	ppbv	99
32) ACRYLONITRILE	2.399	53	15387	0.5800138	ppbv	94
33) n-Hexane	3.423	57	24819	0.5457693	ppbv	90
34) 1,1-Dichloroethane	2.957	63	38532	0.5736062	ppbv	100
35) Vinyl Acetate	3.025	43	28314	0.5534823	ppbv	99
36) DI-ISOPROPYL ETHER	3.427	45	44227	0.5508146	ppbv	94
37) ETHYL TERT-BUTYL ETHER	3.674	59	48260	0.5486046	ppbv	98
38) ETHYL ACETATE	3.427	43	58325	0.5530934	ppbv	96
39) 2-Butanone (MEK)	3.124	72	11364	0.5523801	ppbv	99
40) cis-1,2-Dichloroethene	3.306	61	26394	0.5678256	ppbv	97
41) Tetrahydrofuran	3.628	42	12169	0.5180994	ppbv	98

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_05.D
Acq On : 27 Jul 2022 01:52 pm
Operator :
Sample : STD AMS 0.63 ppbv 22G26577
Misc : 22G21991
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Jul 28 09:40:21 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
42) Chloroform	3.438	83	46011	0.5708010 ppbv	100
43) Cyclohexane	4.258	84	28370	0.5480332 ppbv	98
44) 1,1,1-Trichloroethane	3.901	97	41784	0.5608134 ppbv	98
45) Carbon Tetrachloride	4.197	117	44570	0.5680493 ppbv	100
46) 2,2,4-Trimethylpentane	4.705	57	85510	0.5558106 ppbv	98
48) Benzene	4.121	78	74298	0.5625519 ppbv	100
49) TERT-AMYL METHYL ETHER	4.451	73	55185	0.5561399 ppbv	97
50) 1,2-Dichloroethane	3.776	62	21442	0.5811089 ppbv	99
51) Heptane	4.857	43	22293	0.5486715 ppbv	97
52) Trichloroethene	4.660	95	35780	0.5700742 ppbv	98
53) TERT-AMYL ETHYL ETHER	5.155	73	15616	0.5588958 ppbv	87
54) METHYL CYCLOHEXANE	5.158	83	44495	0.5548463 ppbv	92
55) 1,2-Dichloropropane	4.531	63	23534	0.5598072 ppbv	99
56) Methyl Methacrylate	4.804	69	20258	0.5416240 ppbv #	1
57) 1,4-Dioxane	4.682	88	16640	0.5477660 ppbv #	67
58) Bromodichloromethane	4.629	83	45945	0.5653354 ppbv	100
59) cis-1,3-Dichloropropene	5.114	75	32060	0.5503392 ppbv	99
60) 4-Methyl-2-Pentanone (...	5.155	43	38687	0.5741093 ppbv	95
61) n-OCTANE	6.179	43	27642	0.5418997 ppbv	96
62) Toluene	5.618	91	85086	0.5599737 ppbv	99
63) trans-1,3-Dichloropropene	5.396	75	25426	0.5642144 ppbv	97
64) 1,1,2-Trichloroethane	5.471	97	38479	0.5685378 ppbv	100
65) Tetrachloroethene	6.191	166	64603	0.5722701 ppbv	98
66) Methyl Butyl Ketone	5.787	43	22328	0.5370963 ppbv	96
67) Chlorodibromomethane	5.815	129	56853	0.5571847 ppbv	98
68) 1,2-Dibromoethane	5.934	107	58945	0.5723462 ppbv	100
69) Chlorobenzene	6.526	112	90810	0.5708057 ppbv #	88
70) NONANE	7.221	43	28520	0.5449142 ppbv	99
72) Ethylbenzene	6.733	91	97722	0.5522601 ppbv	99
73) M&P-Xylene	6.823	91	161820	1.1145285 ppbv	98
74) O-Xylene	7.055	91	78178	0.5588617 ppbv	99
77) Styrene	7.002	104	65002	0.5499005 ppbv	100
78) Bromoform	6.823	173	60933	0.5667114 ppbv	99
79) Isopropylbenzene	7.362	105	131126	0.5720030 ppbv	99
80) n-DECANE	8.075	43	30968	0.5561245 ppbv	95
81) 1,1,2,2-Tetrachloroethane	7.046	83	79525	0.5736259 ppbv	100
82) n-Propylbenzene	7.628	91	143040	0.5546742 ppbv	100
83) 4-Ethyltoluene	7.709	105	120032	0.5429943 ppbv	99
84) 2-Chlorotoluene	7.590	91	93187	0.5689820 ppbv	99
86) 1,3,5-Trimethylbenzene	7.756	105	108036	0.5611873 ppbv	99
87) tert-Butylbenzene	7.969	119	118586	0.5629007 ppbv	99
88) 1,2,4-Trimethylbenzene	7.969	105	101677	0.5526200 ppbv	100
89) sec-Butylbenzene	8.119	105	168126	0.5858630 ppbv	99
90) 1,3-Dichlorobenzene	8.031	146	105966	0.5727371 ppbv	99
91) P-ISOPROPYLTOLUENE	8.216	119	151101	0.5731932 ppbv	98
92) 1,4-Dichlorobenzene	8.072	146	104341	0.5640285 ppbv	99
93) 1,2,3-TRIMETHYLBENZENE	8.201	105	113426	0.5690087 ppbv	99
94) Benzyl Chloride	8.028	91	51634	0.5384563 ppbv	98
95) n-Butylbenzene	8.460	91	102666	0.5533005 ppbv	99
96) 1,2-Dichlorobenzene	8.257	146	104470	0.5734850 ppbv	99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_05.D
Acq On : 27 Jul 2022 01:52 pm
Operator :
Sample : STD AMS 0.63 ppbv 22G26577
Misc : 22G21991
ALS Vial : 5 Sample Multiplier: 1

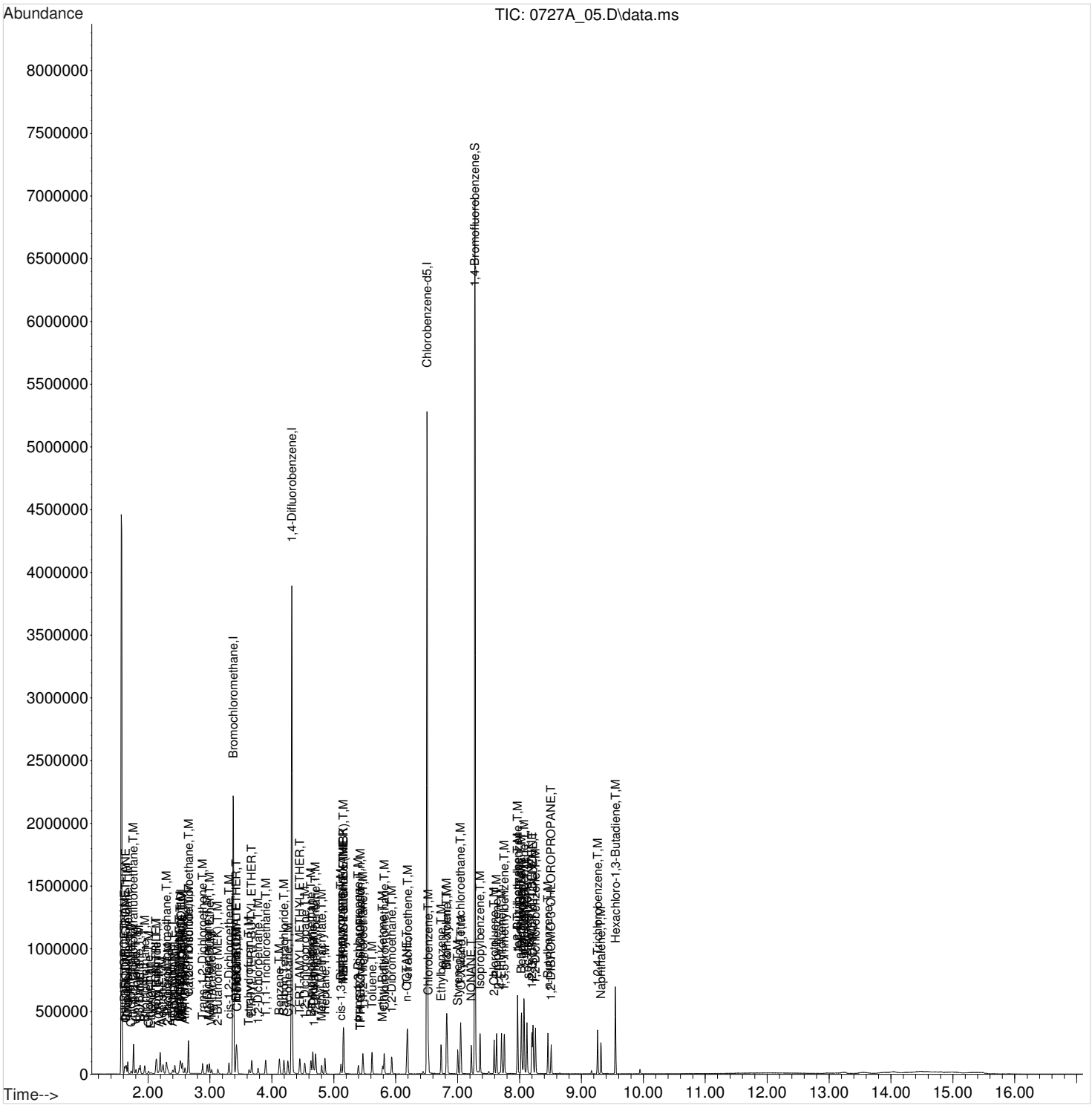
Quant Time: Jul 28 09:40:21 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
97)	1,2-DIBROMO-3-CHLOROPR...	8.510	157	51245	0.5658764	ppbv	98
98)	1,2,4-Trichlorobenzene	9.262	180	70641	0.5356300	ppbv	99
99)	Hexachloro-1,3-Butadiene	9.550	225	84998	0.5614865	ppbv	99
100)	Naphthalene	9.315	128	117567	0.5088990	ppbv	100
101)	TPH (GC/MS) Low Fraction	5.430	TIC	27577239m	19.1220711	ppbv	
102)	TPH-GRO (C5-C10)	5.430	TIC	28726076m	28.3163850	ppbv	

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

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_05.D
Acq On : 27 Jul 2022 01:52 pm
Operator :
Sample : STD AMS 0.63 ppbv 22G26577
Misc : 22G21991
ALS Vial : 5 Sample Multiplier: 1

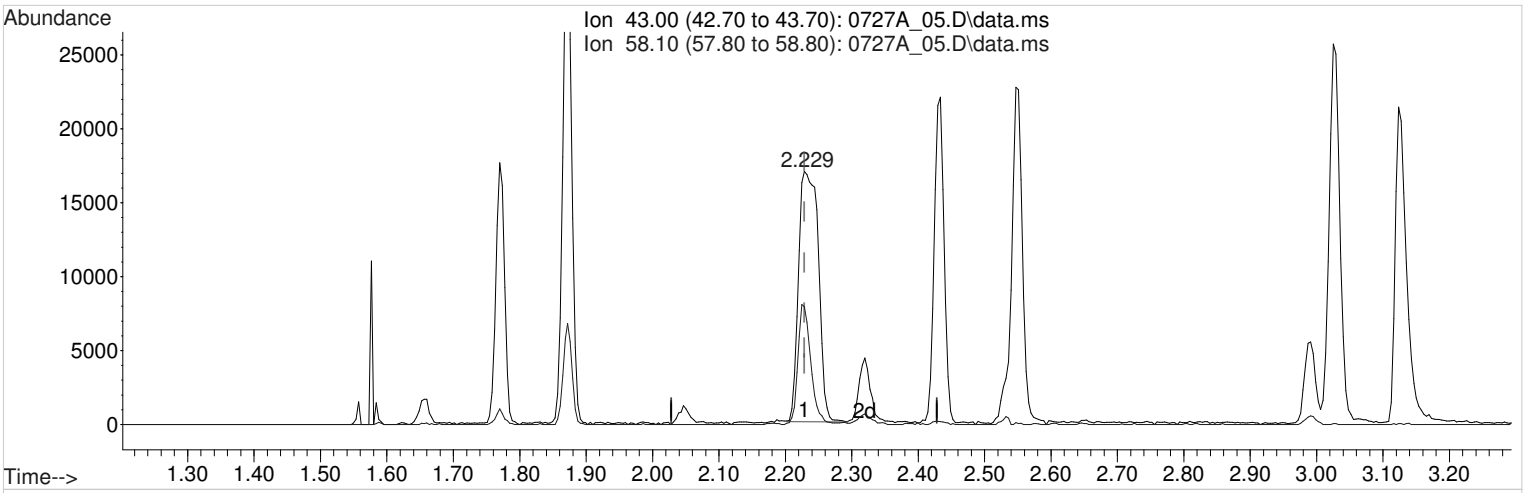
Quant Time: Jul 28 09:40:21 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

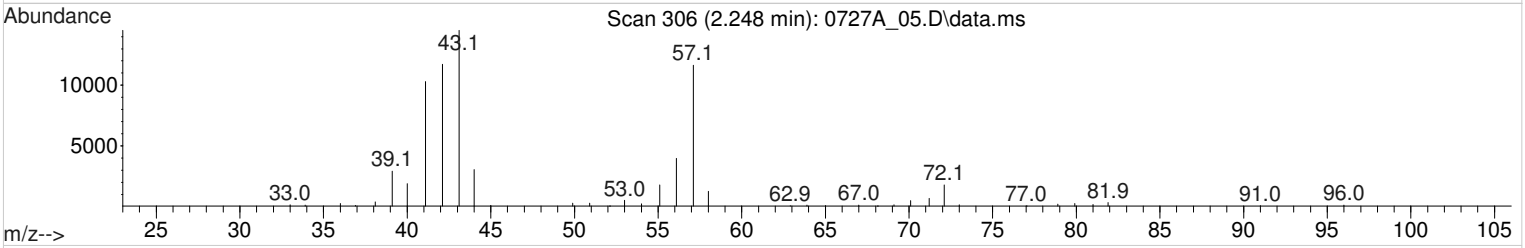


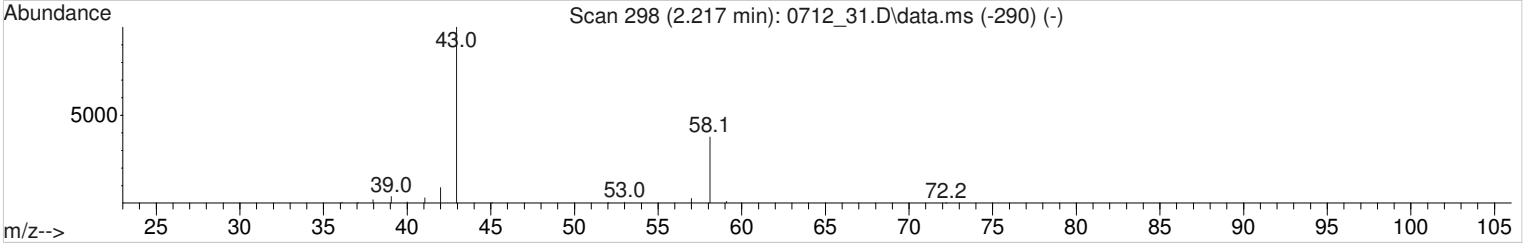
Quantitation Report (Qedit)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_05.D
Acq On : 27 Jul 2022 01:52 pm
Operator :
Sample : STD AMS 0.63 ppbv 22G26577
Misc : 22G21991
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Jul 28 09:40:21 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration







TIC: 0727A_05.D\data.ms

(21) Acetone (T,M)

2.229min (+ 0.000) 0.9781031 ppbv

Qvalue = 72

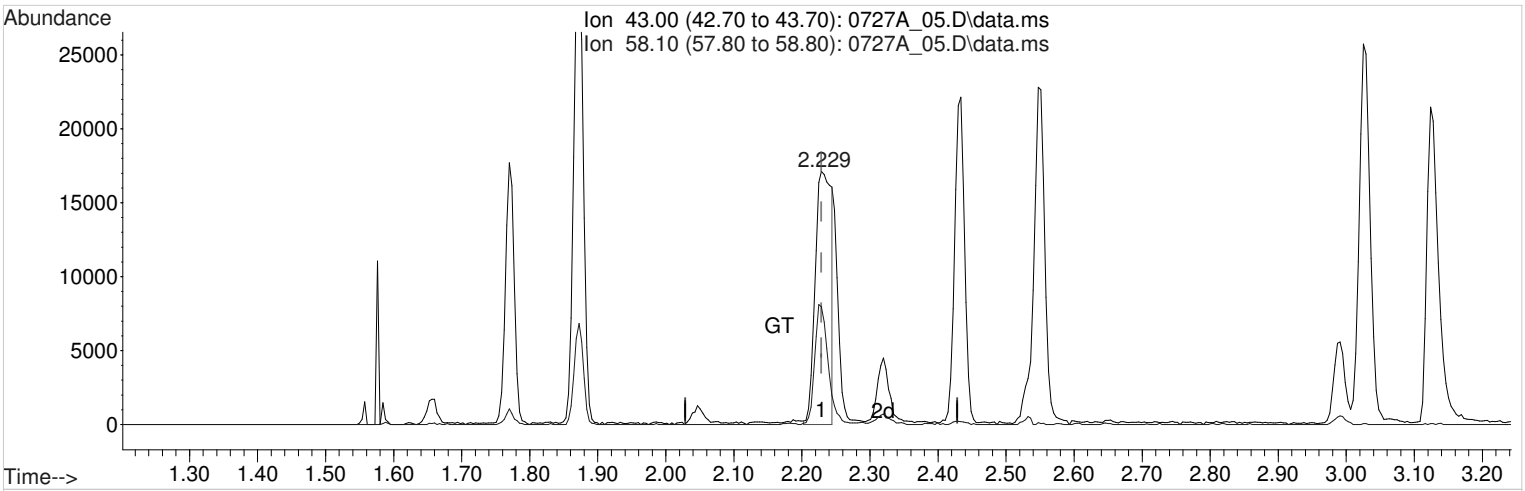
response 35061

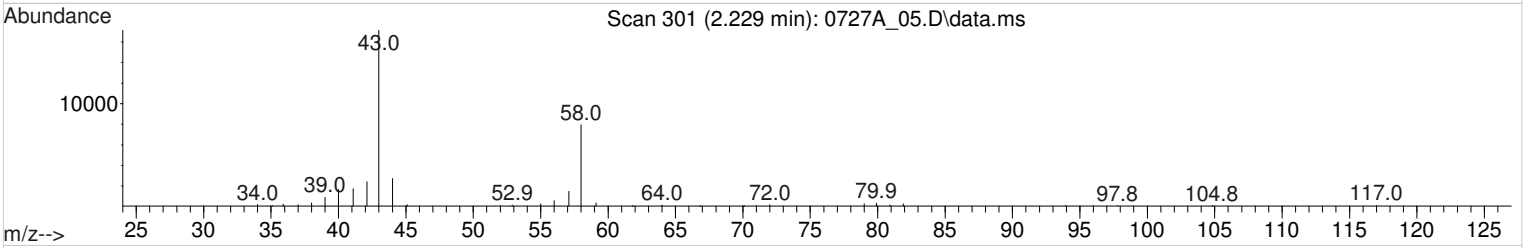
Ion	Exp%	Act%
43.00	100.00	100.00
58.10	51.20	31.36#
0.00	0.00	0.00
0.00	0.00	0.00

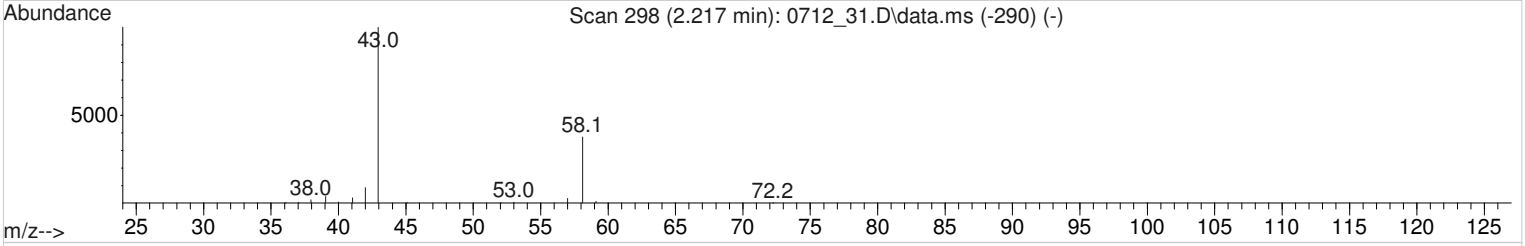
Quantitation Report (Qedit)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_05.D
Acq On : 27 Jul 2022 01:52 pm
Operator :
Sample : STD AMS 0.63 ppbv 22G26577
Misc : 22G21991
ALS Vial : 5 Sample Multiplier: 1

Quant Time: Jul 28 09:40:21 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration







TIC: 0727A_05.D\data.ms

(21) Acetone (T,M)

2.229min (+ 0.000) 0.7794473 ppbv m

response	**27940**	
Ion	**Exp%**	**Act%**
43.00	**100.00**	**100.00**
58.10	**51.20**	**39.35#**
0.00	**0.00**	**0.00**
0.00	**0.00**	**0.00**

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_06.D
Acq On : 27 Jul 2022 02:18 pm
Operator :
Sample : STD AMS 1.25 ppbv 22G26577
Misc : 22G21991
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Jul 28 09:41:59 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.378	130	698992	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.326	114	2334760	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2145608	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1465008	4.0662212	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 101.66%			
Target Compounds						Qvalue
2) Propene	1.652	41	30198	0.9366095	ppbv	99
3) BUTANE	1.876	43	60100	1.1048371	ppbv	99
4) 1,1-DIFLUOROETHANE	1.626	65	31118	1.0820404	ppbv	99
5) Dichlorodifluoromethane	1.679	85	90666	1.1436151	ppbv	99
6) CHLORODIFLUOROMETHANE	1.645	67	9209	1.1255870	ppbv	100
7) 1,2-Dichlorotetrafluor...	1.766	85	110222	1.1402857	ppbv	98
8) Chloromethane	1.732	50	25662	1.1129197	ppbv	100
9) Vinyl Chloride	1.808	62	38058	1.1307720	ppbv	100
10) 1,3-Butadiene	1.857	39	24213	1.1932336	ppbv #	74
11) Bromomethane	1.952	94	52161	1.1217650	ppbv	100
12) Chloroethane	2.013	64	22130	1.1013227	ppbv	99
13) ISOPENTANE	2.437	41	21314	1.1190425	ppbv	98
14) Vinyl Bromide	2.145	106	55804	1.1443571	ppbv	99
15) Trichlorofluoromethane	2.305	101	97702	1.1448871	ppbv	100
16) PENTANE	2.437	43	43296	1.0844422	ppbv	99
17) Ethanol	2.054	45	11292	0.9426352	ppbv	95
18) ACROLEIN	2.180	56	16086	1.0916355	ppbv	98
19) 1,1,2-Trichlorotrifluo...	2.657	101	85290	1.1478976	ppbv	100
20) 1,1-Dichloroethene	2.525	61	45872	1.1295948	ppbv	98
21) Acetone	2.233	43	37335	0.9764991	ppbv	92
22) BROMOETHANE	2.513	108	43173	1.1356185	ppbv	100
23) 2-Propanol	2.324	45	46492	1.0120187	ppbv	99
24) Carbon Disulfide	2.657	76	102745	1.1385845	ppbv	97
25) Allyl Chloride	2.600	41	29309	1.1241575	ppbv	99
26) METHYL ACETATE	2.555	43	50827	1.0985883	ppbv #	98
27) ACETONITRILE	2.134	41	109610	5.5120054	ppbv	99
28) Methylene Chloride	2.563	49	27519	1.0688507	ppbv	98
29) TERT-BUTYL ALCOHOL	2.536	59	57243	1.0580465	ppbv	98
30) Methyl Tert-Butyl Ether	2.995	73	95148	1.1230939	ppbv	99
31) Trans-1,2-Dichloroethene	2.885	61	44082	1.1284936	ppbv	100
32) ACRYLONITRILE	2.407	53	29525	1.1276948	ppbv	95
33) n-Hexane	3.427	57	50219	1.1346801	ppbv	94
34) 1,1-Dichloroethane	2.961	63	74175	1.1217479	ppbv	100
35) Vinyl Acetate	3.033	43	57553	1.1523329	ppbv	100
36) DI-ISOPROPYL ETHER	3.427	45	87680	1.1196967	ppbv	95
37) ETHYL TERT-BUTYL ETHER	3.678	59	98065	1.1440934	ppbv	99
38) ETHYL ACETATE	3.431	43	114563	1.1129220	ppbv	97
39) 2-Butanone (MEK)	3.128	72	22080	1.0997888	ppbv	97
40) cis-1,2-Dichloroethene	3.310	61	52057	1.1403930	ppbv	98
41) Tetrahydrofuran	3.628	42	24286	1.0746239	ppbv	99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_06.D
Acq On : 27 Jul 2022 02:18 pm
Operator :
Sample : STD AMS 1.25 ppbv 22G26577
Misc : 22G21991
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Jul 28 09:41:59 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
42) Chloroform	3.442	83	89813	1.1331893 ppbv	100
43) Cyclohexane	4.262	84	57144	1.1331705 ppbv	98
44) 1,1,1-Trichloroethane	3.901	97	83550	1.1451471 ppbv	99
45) Carbon Tetrachloride	4.197	117	88033	1.1423917 ppbv	99
46) 2,2,4-Trimethylpentane	4.709	57	170060	1.1311129 ppbv	99
48) Benzene	4.121	78	147275	1.1332275 ppbv	100
49) TERT-AMYL METHYL ETHER	4.451	73	109801	1.1274799 ppbv	98
50) 1,2-Dichloroethane	3.776	62	41603	1.1372234 ppbv	99
51) Heptane	4.861	43	45599	1.1470086 ppbv	99
52) Trichloroethene	4.664	95	70038	1.1305698 ppbv	99
53) TERT-AMYL ETHYL ETHER	5.158	73	32421	1.1809674 ppbv	91
54) METHYL CYCLOHEXANE	5.158	83	93261	1.1855797 ppbv	95
55) 1,2-Dichloropropane	4.535	63	46507	1.1255115 ppbv	100
56) Methyl Methacrylate	4.804	69	42871	1.1748687 ppbv #	1
57) 1,4-Dioxane	4.675	88	32396	1.0903400 ppbv	95
58) Bromodichloromethane	4.633	83	91692	1.1452738 ppbv	99
59) cis-1,3-Dichloropropene	5.118	75	65589	1.1499224 ppbv	100
60) 4-Methyl-2-Pentanone (...	5.155	43	75282	1.1300080 ppbv	99
61) n-OCTANE	6.182	43	58217	1.1696997 ppbv	97
62) Toluene	5.618	91	173246	1.1599308 ppbv	100
63) trans-1,3-Dichloropropene	5.399	75	51898	1.1695668 ppbv	98
64) 1,1,2-Trichloroethane	5.471	97	76919	1.1521608 ppbv	99
65) Tetrachloroethene	6.191	166	132134	1.1848082 ppbv	99
66) Methyl Butyl Ketone	5.787	43	46788	1.1557678 ppbv	96
67) Chlorodibromomethane	5.816	129	117787	1.1757018 ppbv	99
68) 1,2-Dibromoethane	5.938	107	119662	1.1760879 ppbv	100
69) Chlorobenzene	6.526	112	179495	1.1427480 ppbv #	94
70) NONANE	7.221	43	63195	1.2359431 ppbv	98
72) Ethylbenzene	6.733	91	198959	1.1472238 ppbv	99
73) M&P-Xylene	6.827	91	340675	2.3848061 ppbv	99
74) O-Xylene	7.055	91	168674	1.2269555 ppbv	100
77) Styrene	7.002	104	139102	1.2018321 ppbv	100
78) Bromoform	6.823	173	124820	1.1775099 ppbv	99
79) Isopropylbenzene	7.365	105	266556	1.1768862 ppbv	100
80) n-DECANE	8.075	43	69996	1.2804973 ppbv	98
81) 1,1,2,2-Tetrachloroethane	7.046	83	158498	1.1563765 ppbv	99
82) n-Propylbenzene	7.628	91	304834	1.2048916 ppbv	100
83) 4-Ethyltoluene	7.709	105	268225	1.2427435 ppbv	98
84) 2-Chlorotoluene	7.590	91	188566	1.1667461 ppbv	99
86) 1,3,5-Trimethylbenzene	7.756	105	236897	1.2509718 ppbv	99
87) tert-Butylbenzene	7.969	119	257903	1.2436550 ppbv	99
88) 1,2,4-Trimethylbenzene	7.972	105	229713	1.2736752 ppbv	99
89) sec-Butylbenzene	8.122	105	366198	1.2843272 ppbv	99
90) 1,3-Dichlorobenzene	8.032	146	224720	1.2289595 ppbv	100
91) P-ISOPROPYLTOLUENE	8.219	119	336785	1.2924480 ppbv	99
92) 1,4-Dichlorobenzene	8.072	146	226920	1.2455591 ppbv	100
93) 1,2,3-TRIMETHYLBENZENE	8.201	105	249859	1.2701832 ppbv	100
94) Benzyl Chloride	8.028	91	112977	1.2089256 ppbv	98
95) n-Butylbenzene	8.460	91	227037	1.2478987 ppbv	98
96) 1,2-Dichlorobenzene	8.257	146	219025	1.2161842 ppbv	100

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_06.D
Acq On : 27 Jul 2022 02:18 pm
Operator :
Sample : STD AMS 1.25 ppbv 22G26577
Misc : 22G21991
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Jul 28 09:41:59 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

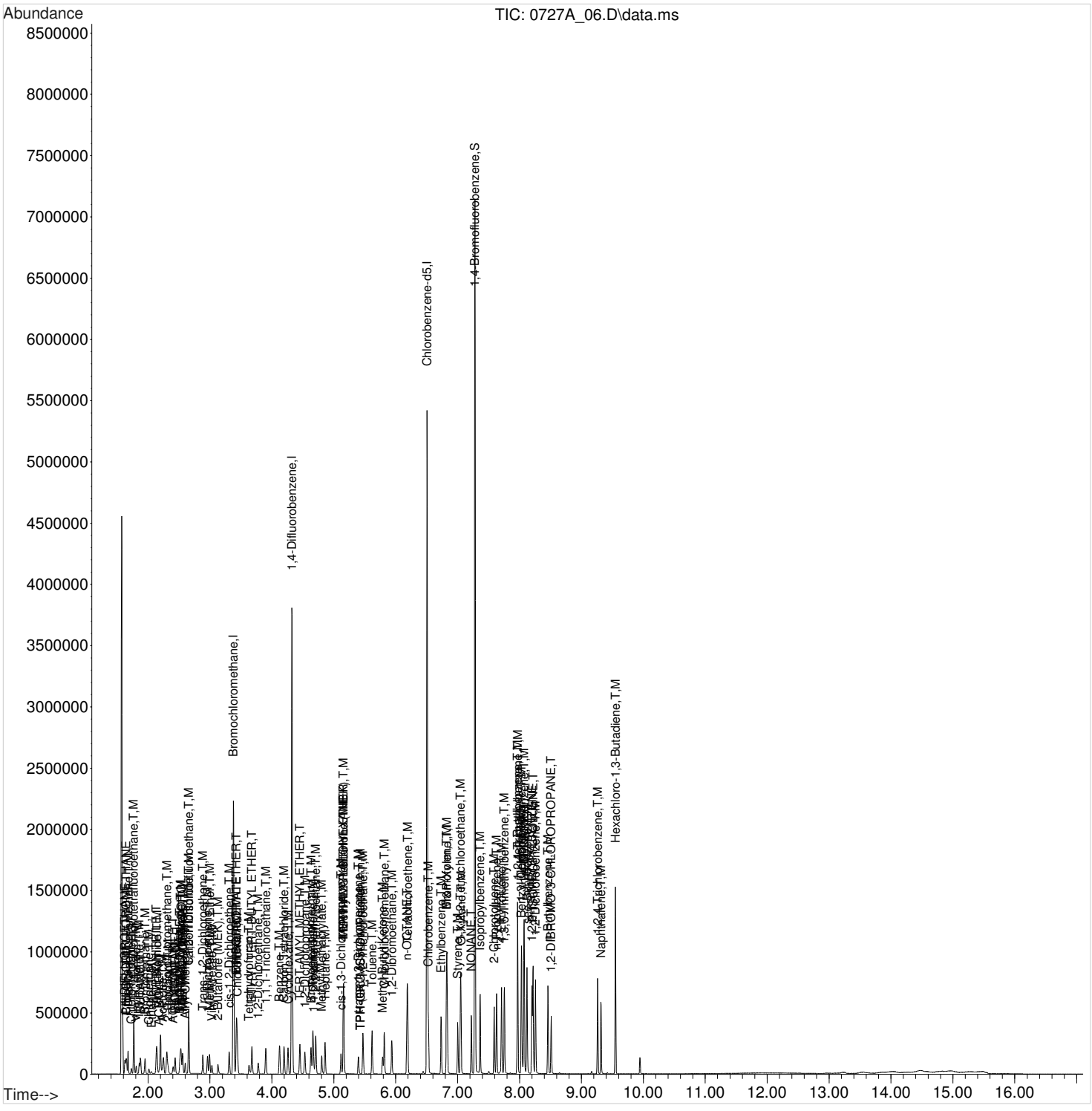
	Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
97)	1,2-DIBROMO-3-CHLOROPR...	8.510	157	106274	1.1907367 ppbv	99
98)	1,2,4-Trichlorobenzene	9.262	180	162360	1.2647004 ppbv	99
99)	Hexachloro-1,3-Butadiene	9.550	225	172418	1.1577341 ppbv	99
100)	Naphthalene	9.315	128	282568	1.2705223 ppbv	100
101)	TPH (GC/MS) Low Fraction	5.430	TIC	36627302m	28.2480049 ppbv	
102)	TPH-GRO (C5-C10)	5.430	TIC	38523606m	41.9623725 ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_06.D
Acq On : 27 Jul 2022 02:18 pm
Operator :
Sample : STD AMS 1.25 ppbv 22G26577
Misc : 22G21991
ALS Vial : 6 Sample Multiplier: 1

Quant Time: Jul 28 09:41:59 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_07.D
Acq On : 27 Jul 2022 02:45 pm
Operator :
Sample : STD AMS 2.5 ppbv 22G26577
Misc : 22G21991
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Jul 28 09:43:47 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.378	130	697159	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	2363030	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2167431	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1491864	4.0855425	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 102.14%			
Target Compounds						Qvalue
2) Propene	1.652	41	56465	1.8485944	ppbv	99
3) BUTANE	1.876	43	118605	2.2380670	ppbv	100
4) 1,1-DIFLUOROETHANE	1.626	65	61566	2.2056867	ppbv	98
5) Dichlorodifluoromethane	1.675	85	178857	2.3011120	ppbv	100
6) CHLORODIFLUOROMETHANE	1.641	67	18083	2.2610479	ppbv	99
7) 1,2-Dichlorotetrafluor...	1.766	85	215959	2.2800718	ppbv	99
8) Chloromethane	1.728	50	49943	2.2203408	ppbv	99
9) Vinyl Chloride	1.808	62	74257	2.2551307	ppbv	100
10) 1,3-Butadiene	1.853	39	47581	2.3725390	ppbv #	74
11) Bromomethane	1.952	94	102002	2.2454760	ppbv	100
12) Chloroethane	2.013	64	42919	2.1937097	ppbv	100
13) ISOPENTANE	2.434	41	40743	2.1906427	ppbv	99
14) Vinyl Bromide	2.142	106	110314	2.3071234	ppbv	99
15) Trichlorofluoromethane	2.301	101	192118	2.2957983	ppbv	100
16) PENTANE	2.434	43	85902	2.2159580	ppbv	100
17) Ethanol	2.051	45	21512	1.8936289	ppbv	100
18) ACROLEIN	2.179	56	31820	2.2213461	ppbv	98
19) 1,1,2-Trichlorotrifluo...	2.654	101	166549	2.2847612	ppbv	99
20) 1,1-Dichloroethene	2.525	61	89717	2.2585950	ppbv	99
21) Acetone	2.229	43	81232	2.2276983	ppbv	98
22) BROMOETHANE	2.509	108	84534	2.2709819	ppbv	99
23) 2-Propanol	2.320	45	92174	2.0913118	ppbv	100
24) Carbon Disulfide	2.654	76	202435	2.2900360	ppbv	100
25) Allyl Chloride	2.600	41	57488	2.2561990	ppbv	100
26) METHYL ACETATE	2.551	43	96721	2.1480893	ppbv #	99
27) ACETONITRILE	2.130	41	212130	10.9542131	ppbv	100
28) Methylene Chloride	2.559	49	53330	2.1387988	ppbv	100
29) TERT-BUTYL ALCOHOL	2.532	59	112111	2.1434748	ppbv	99
30) Methyl Tert-Butyl Ether	2.991	73	192654	2.3272547	ppbv	100
31) Trans-1,2-Dichloroethene	2.881	61	87170	2.2817680	ppbv	100
32) ACRYLONITRILE	2.399	53	57972	2.2643482	ppbv	95
33) n-Hexane	3.423	57	104269	2.4065177	ppbv	95
34) 1,1-Dichloroethane	2.957	63	149598	2.3158394	ppbv	100
35) Vinyl Acetate	3.029	43	111217	2.2680975	ppbv	100
36) DI-ISOPROPYL ETHER	3.427	45	183165	2.3951506	ppbv	97
37) ETHYL TERT-BUTYL ETHER	3.674	59	205267	2.4424696	ppbv	99
38) ETHYL ACETATE	3.427	43	236760	2.3577633	ppbv	98
39) 2-Butanone (MEK)	3.124	72	44431	2.2735364	ppbv	99
40) cis-1,2-Dichloroethene	3.310	61	104850	2.3440564	ppbv	99
41) Tetrahydrofuran	3.624	42	50837	2.3204991	ppbv	98

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_07.D
Acq On : 27 Jul 2022 02:45 pm
Operator :
Sample : STD AMS 2.5 ppbv 22G26577
Misc : 22G21991
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Jul 28 09:43:47 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
42) Chloroform	3.442	83	179591	2.3151644 ppbv	100
43) Cyclohexane	4.261	84	119847	2.4282150 ppbv	99
44) 1,1,1-Trichloroethane	3.901	97	167498	2.3410600 ppbv	99
45) Carbon Tetrachloride	4.197	117	179257	2.3731683 ppbv	99
46) 2,2,4-Trimethylpentane	4.705	57	347178	2.3601361 ppbv	99
48) Benzene	4.121	78	296603	2.2978811 ppbv	100
49) TERT-AMYL METHYL ETHER	4.447	73	224911	2.3274714 ppbv	99
50) 1,2-Dichloroethane	3.776	62	83774	2.3041540 ppbv	100
51) Heptane	4.857	43	96616	2.4414599 ppbv	99
52) Trichloroethene	4.660	95	141566	2.3018382 ppbv	99
53) TERT-AMYL ETHYL ETHER	5.155	73	70364	2.5606994 ppbv	96
54) METHYL CYCLOHEXANE	5.158	83	198791	2.5229000 ppbv	98
55) 1,2-Dichloropropane	4.531	63	91685	2.2368690 ppbv	99
56) Methyl Methacrylate	4.800	69	89870	2.4630076 ppbv #	1
57) 1,4-Dioxane	4.671	88	68349	2.3324599 ppbv	99
58) Bromodichloromethane	4.629	83	187381	2.3518803 ppbv	99
59) cis-1,3-Dichloropropene	5.114	75	138543	2.4389646 ppbv	100
60) 4-Methyl-2-Pentanone (...	5.152	43	157847	2.3868145 ppbv	99
61) n-OCTANE	6.179	43	126479	2.5435014 ppbv	99
62) Toluene	5.618	91	360259	2.4180256 ppbv	100
63) trans-1,3-Dichloropropene	5.396	75	112127	2.5291989 ppbv	99
64) 1,1,2-Trichloroethane	5.471	97	156069	2.3465049 ppbv	98
65) Tetrachloroethene	6.191	166	266489	2.3858303 ppbv	100
66) Methyl Butyl Ketone	5.784	43	98862	2.4498320 ppbv	99
67) Chlorodibromomethane	5.815	129	247027	2.4655338 ppbv	100
68) 1,2-Dibromoethane	5.934	107	245128	2.4088847 ppbv	100
69) Chlorobenzene	6.526	112	362007	2.3168899 ppbv	99
70) NONANE	7.221	43	141199	2.7346280 ppbv	100
72) Ethylbenzene	6.733	91	425575	2.4698282 ppbv	100
73) M&P-Xylene	6.826	91	736467	5.1510054 ppbv	100
74) O-Xylene	7.055	91	365927	2.6447491 ppbv	100
77) Styrene	7.002	104	307576	2.6511115 ppbv	99
78) Bromoform	6.823	173	268129	2.5333538 ppbv	100
79) Isopropylbenzene	7.365	105	550864	2.4361607 ppbv	99
80) n-DECANE	8.075	43	157703	2.8420812 ppbv	99
81) 1,1,2,2-Tetrachloroethane	7.046	83	322408	2.3639660 ppbv	100
82) n-Propylbenzene	7.628	91	665750	2.6238963 ppbv	100
83) 4-Ethyltoluene	7.709	105	597170	2.7421414 ppbv	98
84) 2-Chlorotoluene	7.590	91	398799	2.4756889 ppbv	99
86) 1,3,5-Trimethylbenzene	7.756	105	530449	2.7724848 ppbv	99
87) tert-Butylbenzene	7.969	119	572351	2.7349676 ppbv	100
88) 1,2,4-Trimethylbenzene	7.972	105	517397	2.8291770 ppbv	99
89) sec-Butylbenzene	8.119	105	792406	2.7361115 ppbv	99
90) 1,3-Dichlorobenzene	8.032	146	479927	2.6069977 ppbv	100
91) P-ISOPROPYLTOLUENE	8.219	119	753549	2.8433958 ppbv	99
92) 1,4-Dichlorobenzene	8.072	146	486074	2.6430645 ppbv	99
93) 1,2,3-TRIMETHYLBENZENE	8.201	105	538959	2.7035350 ppbv	99
94) Benzyl Chloride	8.028	91	259243	2.7643005 ppbv	99
95) n-Butylbenzene	8.460	91	510315	2.7776157 ppbv	100
96) 1,2-Dichlorobenzene	8.257	146	461569	2.5509594 ppbv	100

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_07.D
Acq On : 27 Jul 2022 02:45 pm
Operator :
Sample : STD AMS 2.5 ppbv 22G26577
Misc : 22G21991
ALS Vial : 7 Sample Multiplier: 1

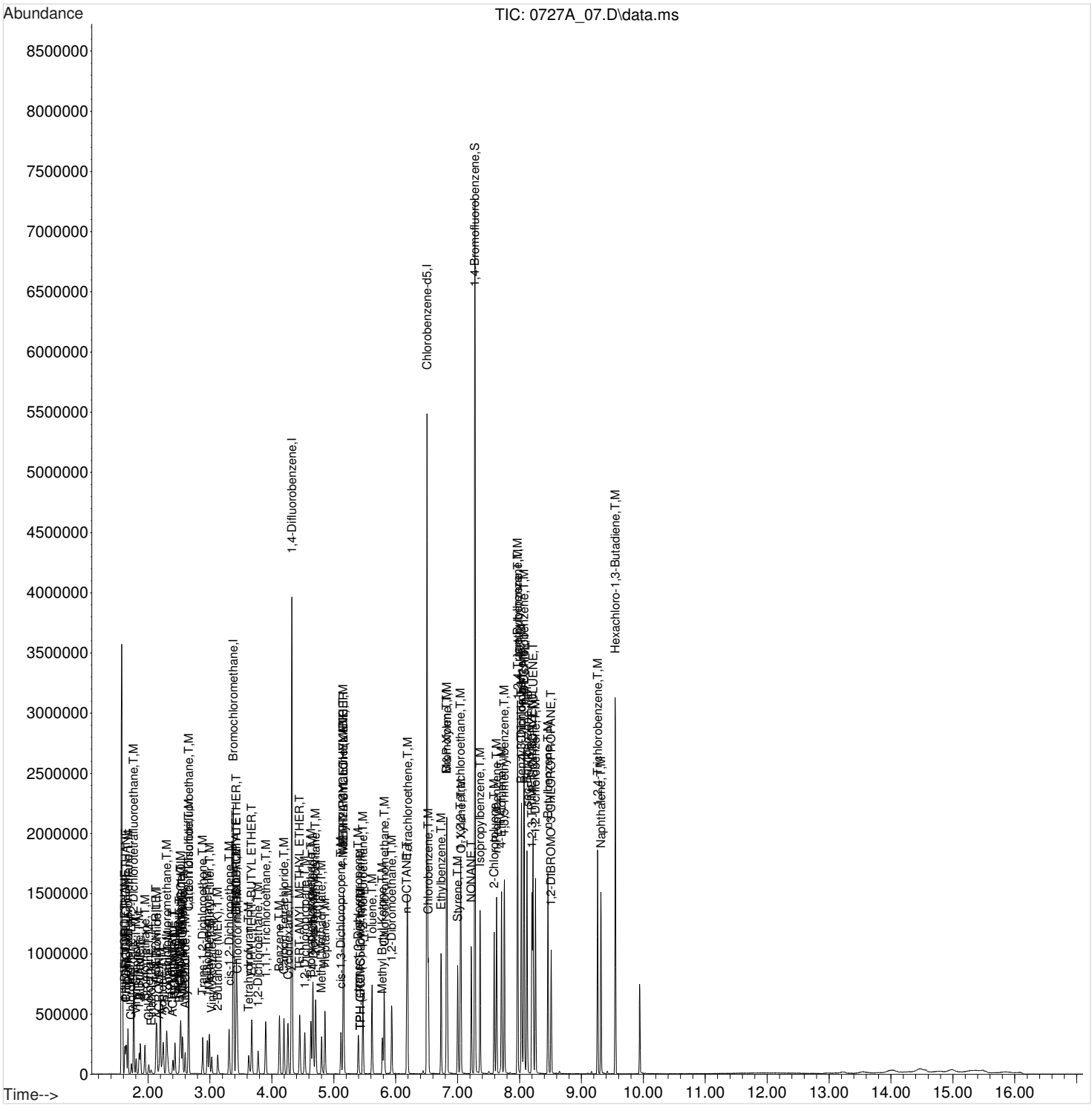
Quant Time: Jul 28 09:43:47 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
97)	1,2-DIBROMO-3-CHLOROPR...	8.510	157	233385	2.6133913	ppbv	99
98)	1,2,4-Trichlorobenzene	9.262	180	376556	2.8968299	ppbv	100
99)	Hexachloro-1,3-Butadiene	9.546	225	366925	2.4755272	ppbv	99
100)	Naphthalene	9.315	128	709638	3.1483105	ppbv	100
101)	TPH (GC/MS) Low Fraction	5.430	TIC	55579703m	48.1004263	ppbv	
102)	TPH-GRO (C5-C10)	5.430	TIC	59153602m	71.9860094	ppbv	

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

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_07.D
Acq On : 27 Jul 2022 02:45 pm
Operator :
Sample : STD AMS 2.5 ppbv 22G26577
Misc : 22G21991
ALS Vial : 7 Sample Multiplier: 1

Quant Time: Jul 28 09:43:47 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_08.D
Acq On : 27 Jul 2022 03:15 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G26577
Misc : 22G21991
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jul 28 09:44:45 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.382	130	687773	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.326	114	2363227	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2164340	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1476800	4.0356806	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 100.89%			
Target Compounds						Qvalue
2) Propene	1.652	41	84350	2.9262808	ppbv	100
3) BUTANE	1.876	43	177518	3.4558106	ppbv	100
4) 1,1-DIFLUOROETHANE	1.626	65	91029	3.3719050	ppbv	100
5) Dichlorodifluoromethane	1.675	85	267649	3.5373748	ppbv	100
6) CHLORODIFLUOROMETHANE	1.641	67	27111	3.4917698	ppbv	100
7) 1,2-Dichlorotetrafluor...	1.766	85	323622	3.5149300	ppbv	100
8) Chloromethane	1.728	50	74921	3.4403981	ppbv	100
9) Vinyl Chloride	1.808	62	112706	3.5270878	ppbv	100
10) 1,3-Butadiene	1.853	39	55999	2.8546503	ppbv	100
11) Bromomethane	1.952	94	154871	3.5155154	ppbv	100
12) Chloroethane	2.012	64	64642	3.4189351	ppbv	100
13) ISOPENTANE	2.437	41	62296	3.4666970	ppbv	100
14) Vinyl Bromide	2.141	106	165405	3.5521893	ppbv	100
15) Trichlorofluoromethane	2.305	101	290775	3.5707736	ppbv	100
16) PENTANE	2.437	43	129859	3.4611445	ppbv	100
17) Ethanol	2.050	45	32071	2.9821828	ppbv	100
18) ACROLEIN	2.179	56	47341	3.4133744	ppbv	100
19) 1,1,2-Trichlorotrifluo...	2.657	101	251159	3.5433266	ppbv	100
20) 1,1-Dichloroethene	2.524	61	134739	3.4945391	ppbv	100
21) Acetone	2.229	43	118237	3.3475396	ppbv	100
22) BROMOETHANE	2.513	108	129606	3.5840658	ppbv	100
23) 2-Propanol	2.320	45	139088	3.2883925	ppbv	100
24) Carbon Disulfide	2.657	76	305700	3.5551743	ppbv	100
25) Allyl Chloride	2.600	41	86870	3.5129623	ppbv	100
26) METHYL ACETATE	2.555	43	145574	3.3559259	ppbv #	100
27) ACETONITRILE	2.130	41	314353	16.8007230	ppbv	100
28) Methylene Chloride	2.562	49	81059	3.3765417	ppbv	100
29) TERT-BUTYL ALCOHOL	2.532	59	170889	3.3924862	ppbv	100
30) Methyl Tert-Butyl Ether	2.995	73	296405	3.6717122	ppbv	100
31) Trans-1,2-Dichloroethene	2.885	61	129769	3.4940329	ppbv	100
32) ACRYLONITRILE	2.403	53	83764	3.3693492	ppbv	100
33) n-Hexane	3.427	57	161690	3.8064382	ppbv	100
34) 1,1-Dichloroethane	2.961	63	222786	3.5393398	ppbv	100
35) Vinyl Acetate	3.033	43	170715	3.5843933	ppbv	100
36) DI-ISOPROPYL ETHER	3.427	45	281595	3.7587925	ppbv	100
37) ETHYL TERT-BUTYL ETHER	3.677	59	319859	3.8727923	ppbv	100
38) ETHYL ACETATE	3.427	43	353168	3.5991319	ppbv	100
39) 2-Butanone (MEK)	3.124	72	67802	3.5706874	ppbv	100
40) cis-1,2-Dichloroethene	3.309	61	157336	3.6029075	ppbv	100
41) Tetrahydrofuran	3.624	42	78011	3.6531918	ppbv	100

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_08.D
Acq On : 27 Jul 2022 03:15 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G26577
Misc : 22G21991
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jul 28 09:44:45 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
42) Chloroform	3.442	83	267923	3.5446941	ppbv		100
43) Cyclohexane	4.261	84	186242	3.8433301	ppbv		100
44) 1,1,1-Trichloroethane	3.905	97	254971	3.6509574	ppbv		100
45) Carbon Tetrachloride	4.197	117	272519	3.6882782	ppbv		100
46) 2,2,4-Trimethylpentane	4.709	57	532180	3.7016776	ppbv		100
48) Benzene	4.121	78	446117	3.5031304	ppbv		100
49) TERT-AMYL METHYL ETHER	4.447	73	347859	3.6413704	ppbv		100
50) 1,2-Dichloroethane	3.780	62	124139	3.4592500	ppbv		100
51) Heptane	4.861	43	148762	3.7735888	ppbv		100
52) Trichloroethene	4.663	95	215520	3.5509357	ppbv		100
53) TERT-AMYL ETHYL ETHER	5.155	73	110385	4.0006270	ppbv		100
54) METHYL CYCLOHEXANE	5.158	83	306046	3.8778526	ppbv		100
55) 1,2-Dichloropropane	4.534	63	139350	3.4601830	ppbv		100
56) Methyl Methacrylate	4.804	69	142189	3.9061882	ppbv	#	1
57) 1,4-Dioxane	4.667	88	105489	3.6402488	ppbv		100
58) Bromodichloromethane	4.633	83	284254	3.6030464	ppbv		100
59) cis-1,3-Dichloropropene	5.117	75	214539	3.7919422	ppbv		100
60) 4-Methyl-2-Pentanone (...	5.152	43	242491	3.6942922	ppbv		100
61) n-OCTANE	6.182	43	199767	4.0053772	ppbv		100
62) Toluene	5.618	91	558273	3.7673537	ppbv		100
63) trans-1,3-Dichloropropene	5.396	75	174647	3.9314534	ppbv		100
64) 1,1,2-Trichloroethane	5.471	97	231714	3.5195564	ppbv		100
65) Tetrachloroethene	6.191	166	404918	3.6526608	ppbv		100
66) Methyl Butyl Ketone	5.784	43	158252	3.9343670	ppbv		100
67) Chlorodibromomethane	5.815	129	381181	3.8129457	ppbv		100
68) 1,2-Dibromoethane	5.934	107	374072	3.6981812	ppbv		100
69) Chlorobenzene	6.529	112	542476	3.5145276	ppbv		100
70) NONANE	7.221	43	223669	4.2647702	ppbv		100
72) Ethylbenzene	6.736	91	659537	3.8408207	ppbv		100
73) M&P-Xylene	6.830	91	1146607	7.9908421	ppbv		100
74) O-Xylene	7.055	91	569310	4.0811993	ppbv		100
77) Styrene	7.002	104	486672	4.1588999	ppbv		100
78) Bromoform	6.826	173	409984	3.8705630	ppbv		100
79) Isopropylbenzene	7.365	105	852070	3.7897354	ppbv		100
80) n-DECANE	8.075	43	245163	4.3259174	ppbv		100
81) 1,1,2,2-Tetrachloroethane	7.045	83	484683	3.5914477	ppbv		100
82) n-Propylbenzene	7.631	91	1043233	4.0837973	ppbv		100
83) 4-Ethyltoluene	7.709	105	933824	4.2259267	ppbv		100
84) 2-Chlorotoluene	7.590	91	616532	3.8390332	ppbv		100
86) 1,3,5-Trimethylbenzene	7.756	105	823111	4.2314118	ppbv		100
87) tert-Butylbenzene	7.969	119	890770	4.1968635	ppbv		100
88) 1,2,4-Trimethylbenzene	7.972	105	810798	4.3445129	ppbv		100
89) sec-Butylbenzene	8.122	105	1210205	4.1198546	ppbv		100
90) 1,3-Dichlorobenzene	8.031	146	729099	3.9380829	ppbv		100
91) P-ISOPROPYLTOLUENE	8.219	119	1164068	4.3002503	ppbv		100
92) 1,4-Dichlorobenzene	8.072	146	732741	3.9523295	ppbv		100
93) 1,2,3-TRIMETHYLBENZENE	8.200	105	845527	4.1905422	ppbv		100
94) Benzyl Chloride	8.028	91	424085	4.4500539	ppbv		100
95) n-Butylbenzene	8.460	91	823238	4.4056978	ppbv		100
96) 1,2-Dichlorobenzene	8.260	146	702137	3.8728942	ppbv		100

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_08.D
Acq On : 27 Jul 2022 03:15 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G26577
Misc : 22G21991
ALS Vial : 8 Sample Multiplier: 1

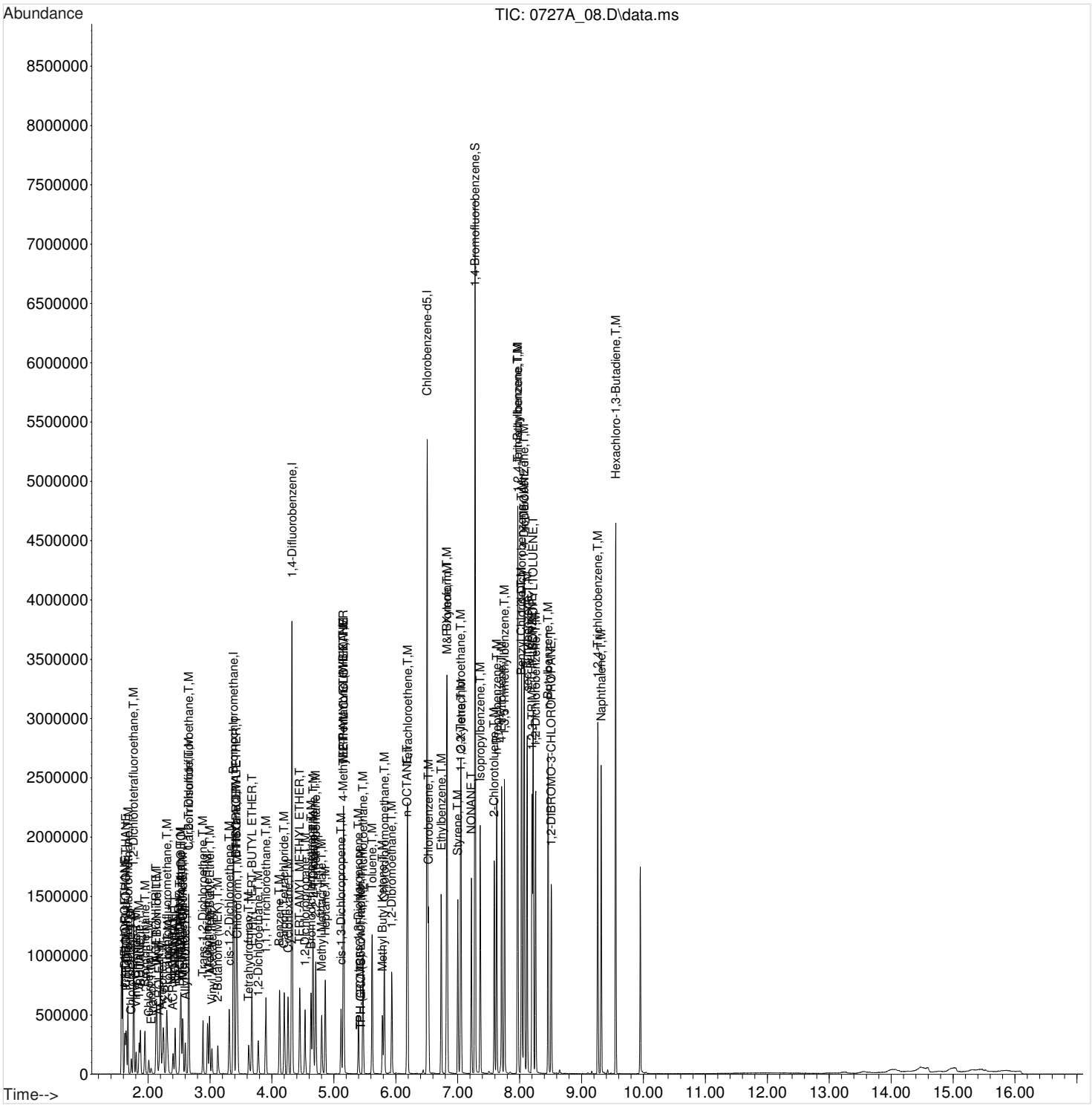
Quant Time: Jul 28 09:44:45 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

	Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
97)	1,2-DIBROMO-3-CHLOROPR...	8.513	157	370041	4.1184185 ppbv	100
98)	1,2,4-Trichlorobenzene	9.262	180	624399	4.6863569 ppbv	100
99)	Hexachloro-1,3-Butadiene	9.553	225	574320	3.8866307 ppbv	100
100)	Naphthalene	9.318	128	1226269	5.2223990 ppbv	100
101)	TPH (GC/MS) Low Fraction	5.430	TIC	74866159m	72.7696066 ppbv	
102)	TPH-GRO (C5-C10)	5.430	TIC	79806454m	108.6850217 ppbv	

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

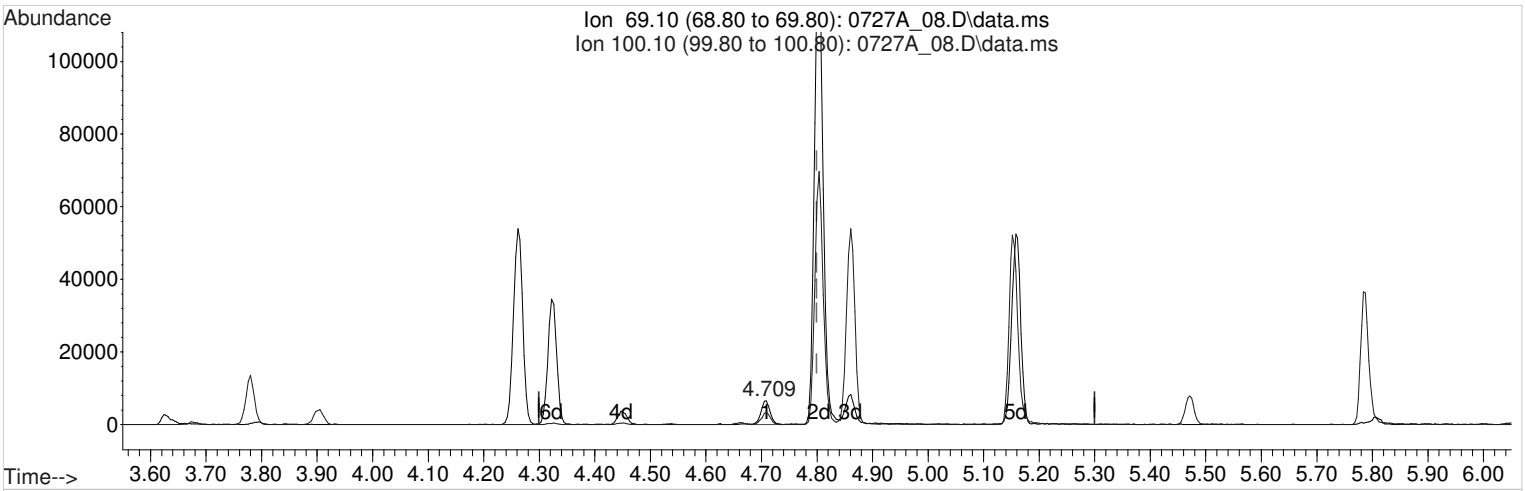
Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_08.D
Acq On : 27 Jul 2022 03:15 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G26577
Misc : 22G21991
ALS Vial : 8 Sample Multiplier: 1

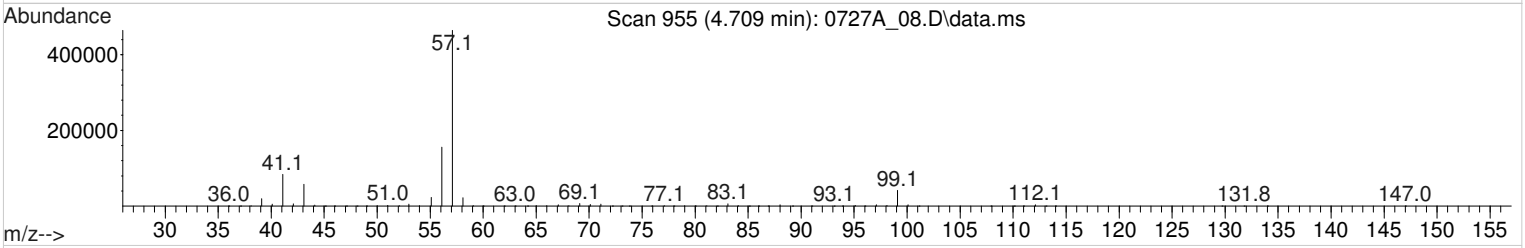
Quant Time: Jul 28 09:44:45 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

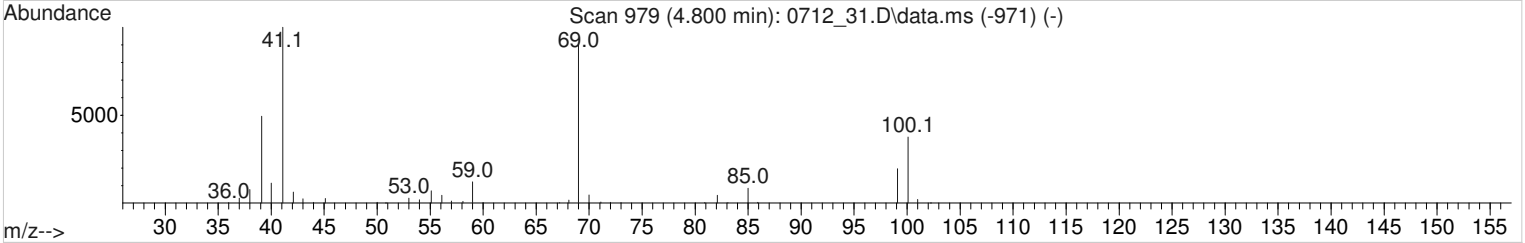


Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_08.D
Acq On : 27 Jul 2022 03:15 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G26577
Misc : 22G21991
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jul 28 09:35:17 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:35:15 2022
Response via : Initial Calibration







TIC: 0727A_08.D\data.ms

(56) Methyl Methacrylate (T,M)

4.709min (-0.091) 0.0000000 ppbv

Qvalue = 87

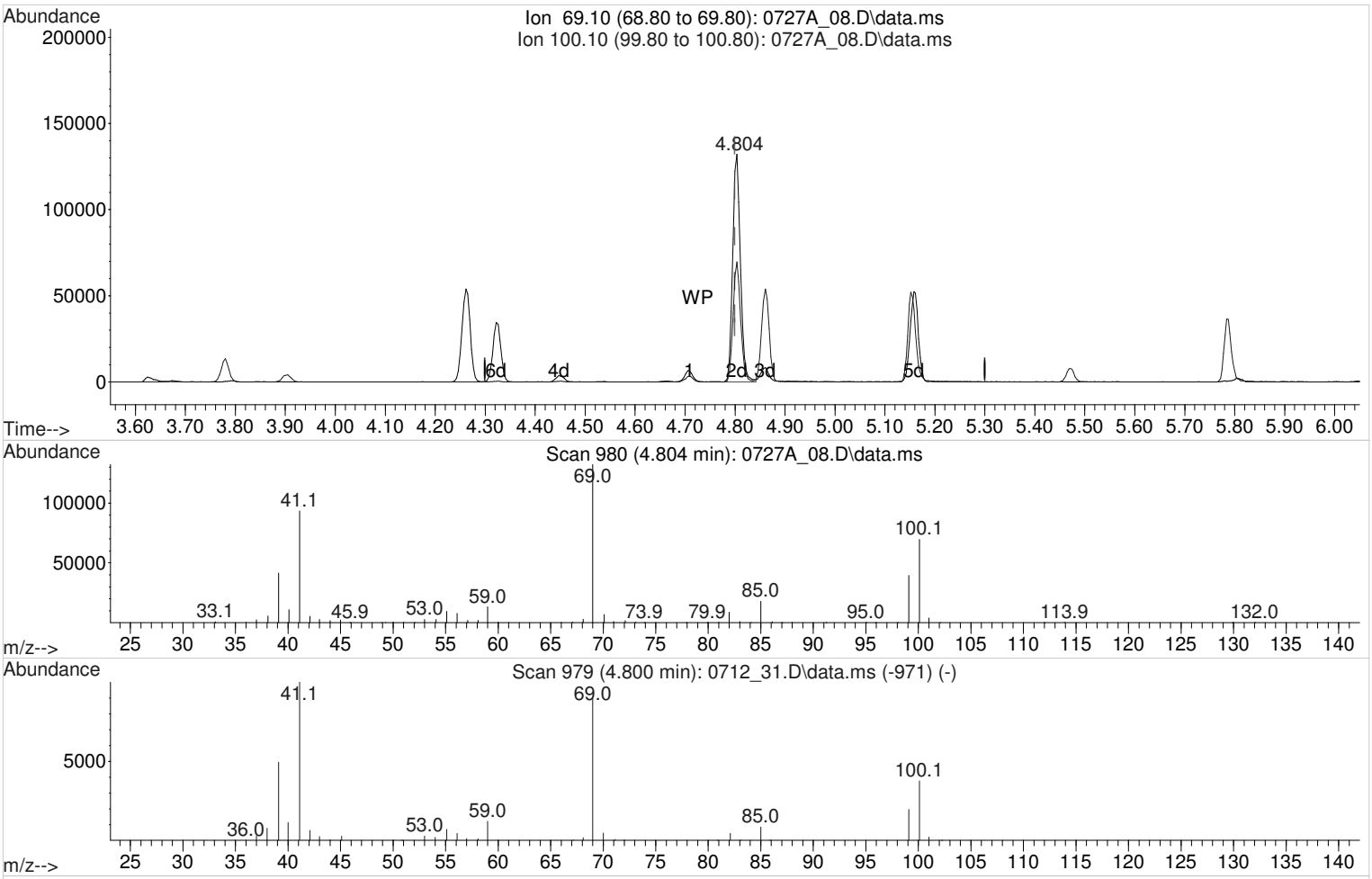
response 7565

Ion	Exp%	Act%
69.10	100.00	100.00
100.10	41.30	49.39
0.00	0.00	0.00
0.00	0.00	0.00

Quantitation Report (Qedit)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_08.D
Acq On : 27 Jul 2022 03:15 pm
Operator :
Sample : MSTD AMS 3.75 ppbv 22G26577
Misc : 22G21991
ALS Vial : 8 Sample Multiplier: 1

Quant Time: Jul 28 09:35:17 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:35:15 2022
Response via : Initial Calibration



TIC: 0727A_08.D\data.ms

(56) Methyl Methacrylate (T,M)

4.804min (+ 0.004) 0.0000000 ppbv m

response	**142451**	
Ion	**Exp%**	**Act%**
69.10	**100.00**	**100.00**
100.10	**41.30**	**2.62#**
0.00	**0.00**	**0.00**
0.00	**0.00**	**0.00**

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_09.D
Acq On : 27 Jul 2022 03:41 pm
Operator :
Sample : STD AMS 10.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jul 28 09:45:49 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:45:38 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.378	130	679400	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	2350490	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2136723	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1458284	4.0365885	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 100.91%			
Target Compounds						Qvalue
2) Propene	1.648	41	209516	7.3581339	ppbv	99
3) BUTANE	1.872	43	351078	6.9187993	ppbv	99
4) 1,1-DIFLUOROETHANE	1.622	65	230054	8.6267046	ppbv	99
5) Dichlorodifluoromethane	1.675	85	663426	8.8762089	ppbv	99
6) CHLORODIFLUOROMETHANE	1.637	67	69685	9.0857116	ppbv	95
7) 1,2-Dichlorotetrafluor...	1.762	85	804183	8.8420529	ppbv	99
8) Chloromethane	1.728	50	188880	8.7803268	ppbv	99
9) Vinyl Chloride	1.804	62	288170	9.1293020	ppbv	100
10) 1,3-Butadiene	1.853	39	168601	8.7006635	ppbv	83
11) Bromomethane	1.948	94	388991	8.9387756	ppbv	99
12) Chloroethane	2.009	64	164790	8.8232079	ppbv	100
13) ISOPENTANE	2.433	41	158921	8.9527528	ppbv	99
14) Vinyl Bromide	2.138	106	420342	9.1383930	ppbv	100
15) Trichlorofluoromethane	2.297	101	734769	9.1343080	ppbv	100
16) PENTANE	2.433	43	330130	8.9074266	ppbv	99
17) Ethanol	2.043	45	91580	8.6206889	ppbv	98
18) ACROLEIN	2.175	56	121876	8.8957849	ppbv	100
19) 1,1,2-Trichlorotrifluo...	2.653	101	622290	8.8874024	ppbv	100
20) 1,1-Dichloroethene	2.521	61	343566	9.0204112	ppbv	100
21) Acetone	2.225	43	256543	7.3527885	ppbv	90
22) BROMOETHANE	2.509	108	327095	9.1568131	ppbv	99
23) 2-Propanol	2.312	45	365117	8.7386758	ppbv	97
24) Carbon Disulfide	2.653	76	777610	9.1547581	ppbv	100
25) Allyl Chloride	2.600	41	235892	9.6568717	ppbv	100
26) METHYL ACETATE	2.547	43	372564	8.6945881	ppbv #	99
27) ACETONITRILE	2.126	41	803608	43.4784640	ppbv	100
28) Methylene Chloride	2.559	49	201038	8.4775159	ppbv	99
29) TERT-BUTYL ALCOHOL	2.528	59	460368	9.2518523	ppbv	98
30) Methyl Tert-Butyl Ether	2.987	73	786170	9.8586887	ppbv	100
31) Trans-1,2-Dichloroethene	2.881	61	325845	8.8815073	ppbv	100
32) ACRYLONITRILE	2.399	53	216729	8.8252136	ppbv	99
33) n-Hexane	3.423	57	431056	10.2728015	ppbv	96
34) 1,1-Dichloroethane	2.957	63	569365	9.1568208	ppbv	99
35) Vinyl Acetate	3.029	43	486393	10.3383413	ppbv	99
36) DI-ISOPROPYL ETHER	3.423	45	744578	10.0612790	ppbv	98
37) ETHYL TERT-BUTYL ETHER	3.674	59	862848	10.5759528	ppbv	100
38) ETHYL ACETATE	3.423	43	917156	9.4619187	ppbv	99
39) 2-Butanone (MEK)	3.120	72	183409	9.7779892	ppbv	99
40) cis-1,2-Dichloroethene	3.309	61	412858	9.5707350	ppbv	100
41) Tetrahydrofuran	3.620	42	216308	10.2543655	ppbv	99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_09.D
Acq On : 27 Jul 2022 03:41 pm
Operator :
Sample : STD AMS 10.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jul 28 09:45:49 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:45:38 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
42) Chloroform	3.442	83	680697	9.1167949	ppbv		99
43) Cyclohexane	4.261	84	510315	10.6607554	ppbv		99
44) 1,1,1-Trichloroethane	3.901	97	667644	9.6778861	ppbv		99
45) Carbon Tetrachloride	4.197	117	716144	9.8117580	ppbv		100
46) 2,2,4-Trimethylpentane	4.705	57	1397635	9.8413208	ppbv		100
48) Benzene	4.121	78	1171481	9.2488942	ppbv		100
49) TERT-AMYL METHYL ETHER	4.447	73	931616	9.8049546	ppbv		98
50) 1,2-Dichloroethane	3.776	62	319608	8.9544390	ppbv		100
51) Heptane	4.861	43	397923	10.1486586	ppbv		99
52) Trichloroethene	4.660	95	554593	9.1870619	ppbv		99
53) TERT-AMYL ETHYL ETHER	5.155	73	297904	10.8552884	ppbv		94
54) METHYL CYCLOHEXANE	5.158	83	796075	10.1415797	ppbv		97
55) 1,2-Dichloropropane	4.534	63	360207	8.9927242	ppbv		99
56) Methyl Methacrylate	4.800	69	386193	10.6703225	ppbv	#	1
57) 1,4-Dioxane	4.663	88	298628	10.3609948	ppbv		98
58) Bromodichloromethane	4.629	83	742665	9.4646217	ppbv		100
59) cis-1,3-Dichloropropene	5.114	75	594269	10.5605264	ppbv		99
60) 4-Methyl-2-Pentanone (...	5.152	43	626839	9.6014905	ppbv		98
61) n-OCTANE	6.182	43	549998	11.0873516	ppbv		99
62) Toluene	5.618	91	1487845	10.0947249	ppbv		99
63) trans-1,3-Dichloropropene	5.396	75	487725	11.0386013	ppbv		100
64) 1,1,2-Trichloroethane	5.471	97	599266	9.1517115	ppbv		99
65) Tetrachloroethene	6.191	166	1024168	9.2888188	ppbv		100
66) Methyl Butyl Ketone	5.784	43	450793	11.2680782	ppbv		97
67) Chlorodibromomethane	5.815	129	996815	10.0251521	ppbv		100
68) 1,2-Dibromoethane	5.934	107	967414	9.6159542	ppbv		100
69) Chlorobenzene	6.529	112	1386031	9.0283088	ppbv		98
70) NONANE	7.221	43	602678	11.5537297	ppbv		98
72) Ethylbenzene	6.736	91	1775048	10.4706161	ppbv		99
73) M&P-Xylene	6.826	91	2945894	20.7956423	ppbv		99
74) O-Xylene	7.055	91	1473461	10.6992885	ppbv		98
77) Styrene	7.002	104	1355576	11.7339231	ppbv		99
78) Bromoform	6.826	173	1009066	9.6494835	ppbv		100
79) Isopropylbenzene	7.365	105	2210157	9.9571259	ppbv		99
80) n-DECANE	8.075	43	623561	11.1449854	ppbv		99
81) 1,1,2,2-Tetrachloroethane	7.045	83	1210829	9.0880736	ppbv		100
82) n-Propylbenzene	7.631	91	2693310	10.6793904	ppbv		98
83) 4-Ethyltoluene	7.709	105	2459480	11.2739860	ppbv		99
84) 2-Chlorotoluene	7.590	91	1633415	10.3024389	ppbv		99
86) 1,3,5-Trimethylbenzene	7.756	105	2125626	11.0685570	ppbv		99
87) tert-Butylbenzene	7.969	119	2257655	10.7744249	ppbv		100
88) 1,2,4-Trimethylbenzene	7.972	105	2057043	11.1647513	ppbv		99
89) sec-Butylbenzene	8.122	105	3034671	10.4643396	ppbv		99
90) 1,3-Dichlorobenzene	8.031	146	1772294	9.6964192	ppbv		99
91) P-ISOPROPYLTOLUENE	8.219	119	2936482	10.9880338	ppbv		99
92) 1,4-Dichlorobenzene	8.072	146	1766556	9.6517779	ppbv		100
93) 1,2,3-TRIMETHYLBENZENE	8.200	105	2171625	10.9019662	ppbv		98
94) Benzyl Chloride	8.031	91	1235745	13.1346493	ppbv		98
95) n-Butylbenzene	8.460	91	2135502	11.5762138	ppbv		98
96) 1,2-Dichlorobenzene	8.257	146	1728764	9.6588795	ppbv		100

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_09.D
Acq On : 27 Jul 2022 03:41 pm
Operator :
Sample : STD AMS 10.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jul 28 09:45:49 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:45:38 2022
Response via : Initial Calibration

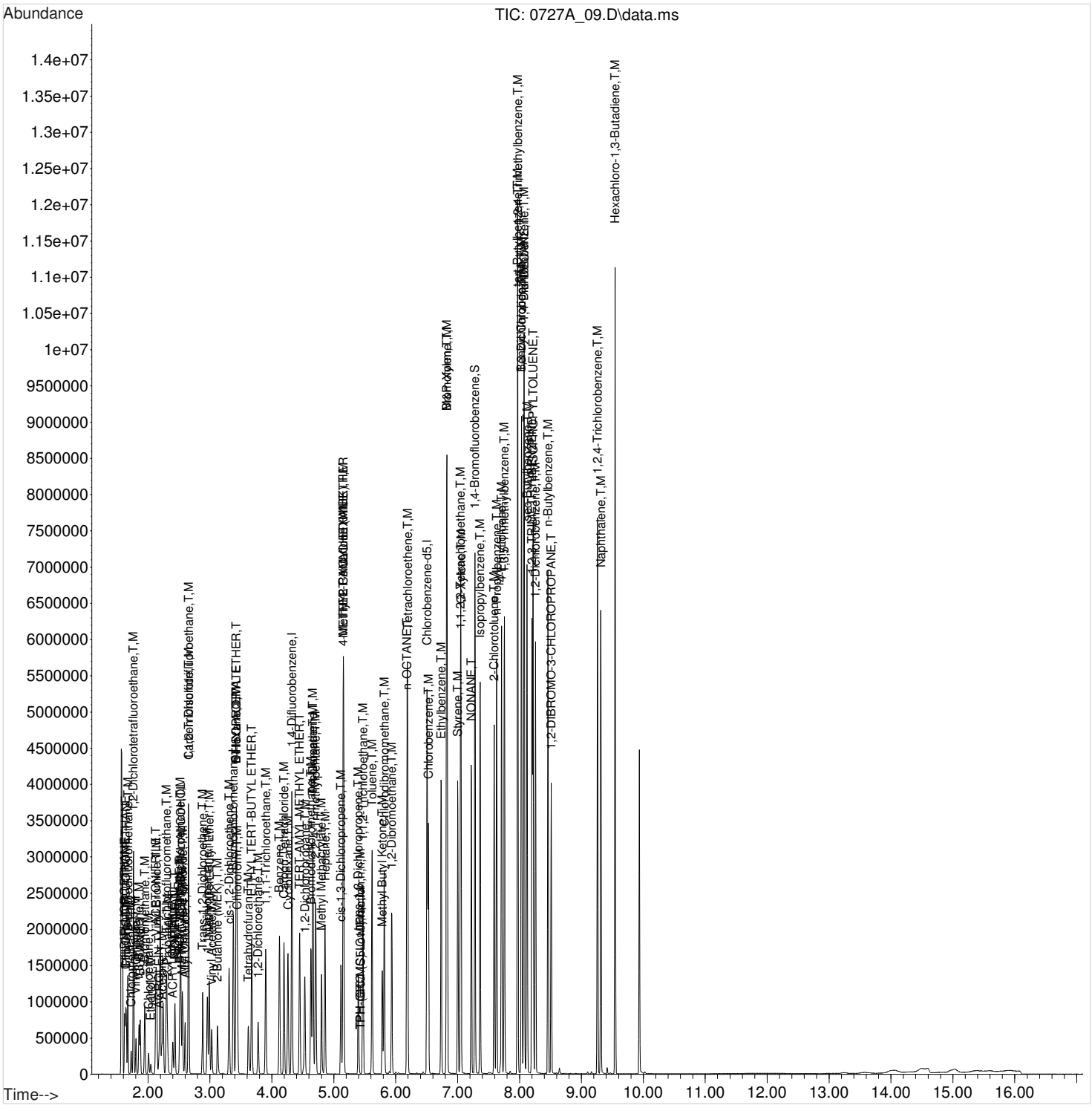
Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
97) 1,2-DIBROMO-3-CHLOROPR...	8.513	157	927627	10.4575819 ppbv	100
98) 1,2,4-Trichlorobenzene	9.258	180	1567096	11.9136827 ppbv	100
99) Hexachloro-1,3-Butadiene	9.543	225	1357302	9.3040725 ppbv	99
100) Naphthalene	9.315	128	3096608	13.3581954 ppbv	99
101) TPH (GC/MS) Low Fraction	5.430	TIC	162306198m	159.8000241 ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	174513445m	240.7342232 ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_09.D
Acq On : 27 Jul 2022 03:41 pm
Operator :
Sample : STD AMS 10.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 9 Sample Multiplier: 1

Quant Time: Jul 28 09:45:49 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:45:38 2022
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_10.D
Acq On : 27 Jul 2022 04:08 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Jul 28 09:50:35 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:50:29 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.378	130	695296	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	2394996	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2166173	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1476710	4.0267580	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 100.67%			
Target Compounds						Qvalue
2) Propene	1.648	41	509919	18.1850915	ppbv	99
3) BUTANE	1.872	43	868634	17.4972442	ppbv	100
4) 1,1-DIFLUOROETHANE	1.622	65	563656	21.0663832	ppbv	96
5) Dichlorodifluoromethane	1.671	85	1616451	21.4774239	ppbv	99
6) CHLORODIFLUOROMETHANE	1.637	67	170197	21.9703594	ppbv	91
7) 1,2-Dichlorotetrafluor...	1.762	85	1914445	20.9141950	ppbv	100
8) Chloromethane	1.728	50	473322	21.8811940	ppbv	99
9) Vinyl Chloride	1.804	62	713991	22.3806773	ppbv	100
10) 1,3-Butadiene	1.849	39	424369	21.8036298	ppbv	83
11) Bromomethane	1.948	94	965834	22.0207069	ppbv	100
12) Chloroethane	2.009	64	408704	21.7482084	ppbv	99
13) ISOPENTANE	2.434	41	400069	22.3569445	ppbv	99
14) Vinyl Bromide	2.138	106	1044293	22.4607360	ppbv	100
15) Trichlorofluoromethane	2.297	101	1793982	22.0649597	ppbv	100
16) PENTANE	2.434	43	835472	22.3762332	ppbv	99
17) Ethanol	2.043	45	227111	21.3097465	ppbv	99
18) ACROLEIN	2.172	56	309173	22.4041690	ppbv	100
19) 1,1,2-Trichlorotrifluo...	2.653	101	1510485	21.4196555	ppbv	100
20) 1,1-Dichloroethene	2.521	61	852433	22.1795495	ppbv	100
21) Acetone	2.221	43	689521	20.0695517	ppbv	96
22) BROMOETHANE	2.509	108	820106	22.7069767	ppbv	100
23) 2-Propanol	2.312	45	905844	21.5734535	ppbv	95
24) Carbon Disulfide	2.653	76	1939332	22.5823423	ppbv	100
25) Allyl Chloride	2.597	41	609051	24.4831220	ppbv	99
26) METHYL ACETATE	2.547	43	931072	21.6352899	ppbv #	99
27) ACETONITRILE	2.123	41	1949048	104.9969830	ppbv	100
28) Methylene Chloride	2.559	49	503555	21.2101248	ppbv	98
29) TERT-BUTYL ALCOHOL	2.525	59	1141791	22.6637951	ppbv	93
30) Methyl Tert-Butyl Ether	2.987	73	1998657	24.5399898	ppbv	100
31) Trans-1,2-Dichloroethene	2.881	61	816415	22.0972283	ppbv	99
32) ACRYLONITRILE	2.396	53	555579	22.4833130	ppbv	99
33) n-Hexane	3.423	57	1055105	24.4747051	ppbv	92
34) 1,1-Dichloroethane	2.957	63	1410349	22.4336208	ppbv	99
35) Vinyl Acetate	3.025	43	1303426	26.9408726	ppbv	98
36) DI-ISOPROPYL ETHER	3.423	45	1800337	23.7504909	ppbv	96
37) ETHYL TERT-BUTYL ETHER	3.674	59	2173159	25.8151000	ppbv	99
38) ETHYL ACETATE	3.423	43	2177572	22.1215523	ppbv	97
39) 2-Butanone (MEK)	3.120	72	467665	24.4398863	ppbv	100
40) cis-1,2-Dichloroethene	3.310	61	1039832	23.6992731	ppbv	99
41) Tetrahydrofuran	3.617	42	561673	25.9238974	ppbv	99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_10.D
Acq On : 27 Jul 2022 04:08 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Jul 28 09:50:35 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:50:29 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
42) Chloroform	3.442	83	1651545	21.8901642 ppbv	100
43) Cyclohexane	4.261	84	1318514	26.6630585 ppbv	99
44) 1,1,1-Trichloroethane	3.901	97	1659674	23.6165924 ppbv	99
45) Carbon Tetrachloride	4.197	117	1777540	23.8611368 ppbv	100
46) 2,2,4-Trimethylpentane	4.705	57	3407764	23.5001449 ppbv	99
48) Benzene	4.121	78	2884974	22.5961933 ppbv	99
49) TERT-AMYL METHYL ETHER	4.447	73	2386391	24.7181325 ppbv	96
50) 1,2-Dichloroethane	3.776	62	791643	22.0973168 ppbv	100
51) Heptane	4.857	43	998829	24.9478444 ppbv	99
52) Trichloroethene	4.660	95	1359351	22.3594253 ppbv	100
53) TERT-AMYL ETHYL ETHER	5.155	73	733195	25.9038258 ppbv	91
54) METHYL CYCLOHEXANE	5.158	83	1887409	23.5501543 ppbv	96
55) 1,2-Dichloropropane	4.535	63	895217	22.2543959 ppbv	98
56) Methyl Methacrylate	4.800	69	1007852	27.0697655 ppbv #	1
57) 1,4-Dioxane	4.660	88	731367	24.7757024 ppbv	97
58) Bromodichloromethane	4.629	83	1856271	23.3958950 ppbv	100
59) cis-1,3-Dichloropropene	5.114	75	1565157	27.0800987 ppbv	98
60) 4-Methyl-2-Pentanone (...	5.149	43	1510295	22.8337661 ppbv	97
61) n-OCTANE	6.182	43	1361317	26.5207193 ppbv	98
62) Toluene	5.618	91	3651051	24.2784534 ppbv	97
63) trans-1,3-Dichloropropene	5.396	75	1317534	28.8375338 ppbv	99
64) 1,1,2-Trichloroethane	5.471	97	1454489	22.0669264 ppbv	100
65) Tetrachloroethene	6.191	166	2383452	21.4330609 ppbv	100
66) Methyl Butyl Ketone	5.781	43	1157141	27.8814643 ppbv	95
67) Chlorodibromomethane	5.815	129	2471418	24.3848567 ppbv	99
68) 1,2-Dibromoethane	5.934	107	2357876	23.1283077 ppbv	100
69) Chlorobenzene	6.529	112	3312716	21.4754408 ppbv	98
70) NONANE	7.221	43	1473398	27.1191655 ppbv	98
72) Ethylbenzene	6.733	91	4289149	24.7901027 ppbv	96
73) M&P-Xylene	6.826	91	6576160	45.5325007 ppbv	96
74) O-Xylene	7.055	91	3417380	24.2352558 ppbv	96
77) Styrene	7.002	104	3372066	28.0959666 ppbv	100
78) Bromoform	6.826	173	2394680	22.7021614 ppbv	98
79) Isopropylbenzene	7.365	105	5062946	22.5131019 ppbv	96
80) n-DECANE	8.078	43	1438638	24.9551923 ppbv	98
81) 1,1,2,2-Tetrachloroethane	7.049	83	2775213	20.8178265 ppbv	98
82) n-Propylbenzene	7.631	91	5967250	23.1150419 ppbv	92
83) 4-Ethyltoluene	7.712	105	5567394	24.7234020 ppbv	95
84) 2-Chlorotoluene	7.590	91	3905875	24.1960562 ppbv	96
86) 1,3,5-Trimethylbenzene	7.756	105	4834713	24.4596635 ppbv	96
87) tert-Butylbenzene	7.969	119	4963769	23.1113260 ppbv	97
88) 1,2,4-Trimethylbenzene	7.972	105	4571489	24.0741828 ppbv	97
89) sec-Butylbenzene	8.122	105	6540703	22.1008196 ppbv	94
90) 1,3-Dichlorobenzene	8.035	146	3980485	21.5751721 ppbv	98
91) P-ISOPROPYLTOLUENE	8.219	119	6439355	23.4370524 ppbv	95
92) 1,4-Dichlorobenzene	8.072	146	3914338	21.2011372 ppbv	98
93) 1,2,3-TRIMETHYLBENZENE	8.204	105	5030303	24.5928574 ppbv	95
94) Benzyl Chloride	8.031	91	3291958	33.0349647 ppbv	95
95) n-Butylbenzene	8.460	91	5010421	26.2014413 ppbv	94
96) 1,2-Dichlorobenzene	8.260	146	4010117	22.2087812 ppbv	97

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_10.D
Acq On : 27 Jul 2022 04:08 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 10 Sample Multiplier: 1

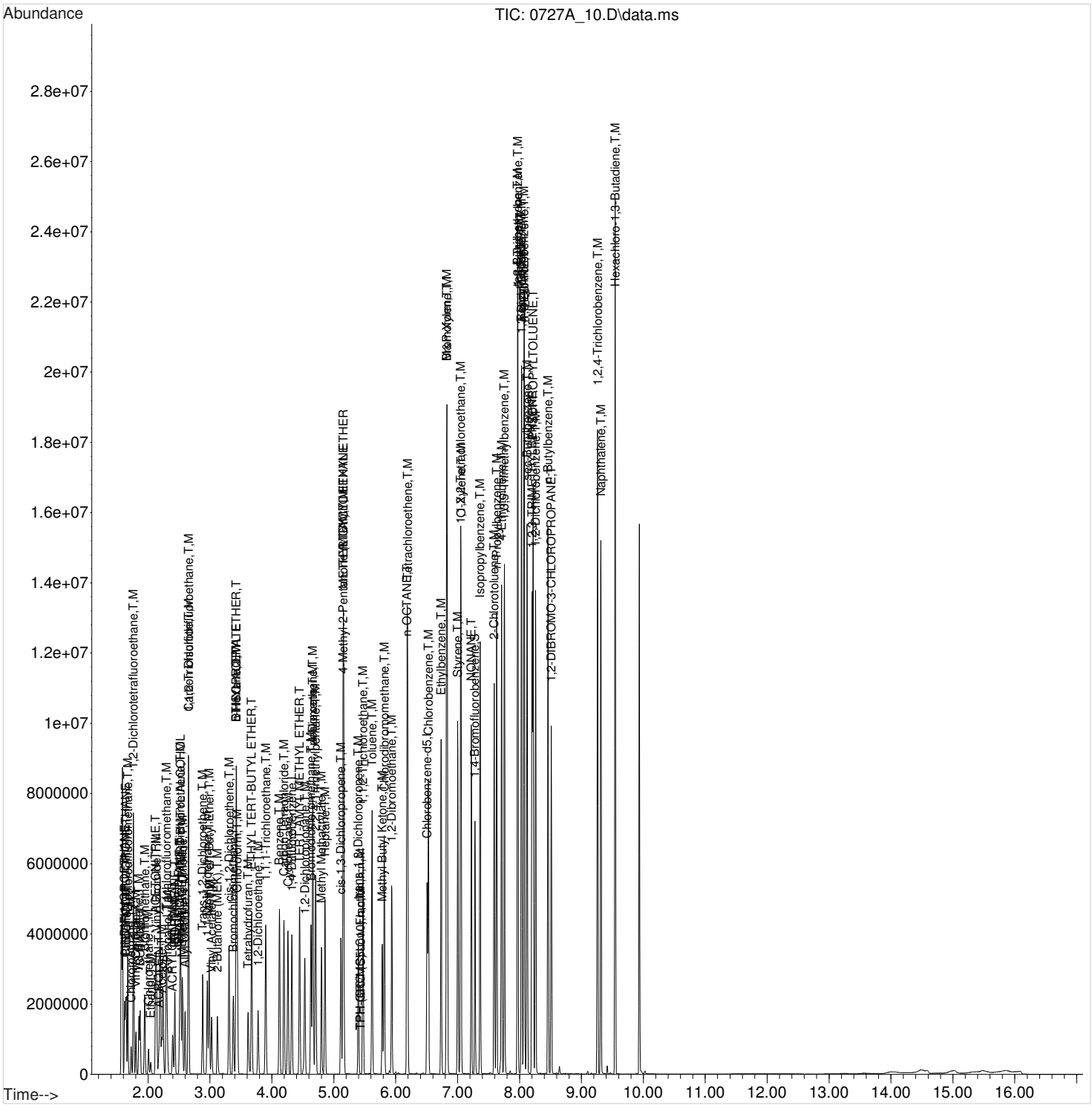
Quant Time: Jul 28 09:50:35 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:50:29 2022
Response via : Initial Calibration

	Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
97)	1,2-DIBROMO-3-CHLOROPR...	8.514	157	2353848	26.0052899 ppbv	99
98)	1,2,4-Trichlorobenzene	9.262	180	3951618	28.8447632 ppbv	99
99)	Hexachloro-1,3-Butadiene	9.546	225	3137545	21.4279651 ppbv	98
100)	Naphthalene	9.315	128	7086432	28.7735648 ppbv #	97
101)	TPH (GC/MS) Low Fraction	5.430	TIC	363444026m	392.7752279 ppbv	
102)	TPH-GRO (C5-C10)	5.430	TIC	393386143m	593.9444400 ppbv	

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

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_10.D
Acq On : 27 Jul 2022 04:08 pm
Operator :
Sample : STD AMS 25.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Jul 28 09:50:35 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:50:29 2022
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_11.D
Acq On : 27 Jul 2022 04:40 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Jul 28 09:51:39 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:51:34 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.378	130	707461	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	2421579	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2205639	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1504176	4.0248961	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 100.62%			
Target Compounds						Qvalue
2) Propene	1.652	41	958602	34.7837373	ppbv	99
3) BUTANE	1.876	43	1671511	34.3807047	ppbv	99
4) 1,1-DIFLUOROETHANE	1.626	65	1079262	40.4386657	ppbv	92
5) Dichlorodifluoromethane	1.675	85	2970100	39.4798310	ppbv	97
6) CHLORODIFLUOROMETHANE	1.641	67	322975	41.6054777	ppbv	87
7) 1,2-Dichlorotetrafluor...	1.766	85	3427103	37.5626943	ppbv	99
8) Chloromethane	1.732	50	914055	42.1870970	ppbv	100
9) Vinyl Chloride	1.808	62	1379149	43.0511013	ppbv	99
10) 1,3-Butadiene	1.857	39	827215	42.4490199	ppbv	83
11) Bromomethane	1.952	94	1828310	41.5876090	ppbv	100
12) Chloroethane	2.013	64	795780	42.3052295	ppbv	99
13) ISOPENTANE	2.434	41	762318	42.4285835	ppbv	99
14) Vinyl Bromide	2.142	106	1955835	41.8745643	ppbv	100
15) Trichlorofluoromethane	2.301	101	3291632	40.3816581	ppbv	99
16) PENTANE	2.434	43	1590965	42.4344006	ppbv	99
17) Ethanol	2.047	45	444546	41.7649707	ppbv	100
18) ACROLEIN	2.176	56	610403	44.0438060	ppbv	99
19) 1,1,2-Trichlorotrifluo...	2.653	101	2690826	38.1851024	ppbv	99
20) 1,1-Dichloroethene	2.521	61	1575455	40.8633364	ppbv	100
21) Acetone	2.225	43	1317980	38.6550938	ppbv	95
22) BROMOETHANE	2.509	108	1503534	41.3883208	ppbv	100
23) 2-Propanol	2.316	45	1722646	41.0236839	ppbv	94
24) Carbon Disulfide	2.653	76	3545735	41.0744910	ppbv	100
25) Allyl Chloride	2.597	41	1199077	47.4953700	ppbv	100
26) METHYL ACETATE	2.547	43	1767182	41.0484245	ppbv #	98
27) ACETONITRILE	2.126	41	3642007	196.7603335	ppbv	99
28) Methylene Chloride	2.555	49	959569	40.4900515	ppbv	99
29) TERT-BUTYL ALCOHOL	2.525	59	2049376	40.4517914	ppbv	92
30) Methyl Tert-Butyl Ether	2.987	73	3884054	46.9773642	ppbv	99
31) Trans-1,2-Dichloroethene	2.881	61	1609901	43.4552950	ppbv	99
32) ACRYLONITRILE	2.399	53	1073275	43.2307048	ppbv	99
33) n-Hexane	3.423	57	1960382	44.8096843	ppbv	91
34) 1,1-Dichloroethane	2.957	63	2696369	42.7000337	ppbv	99
35) Vinyl Acetate	3.025	43	2652183	53.3582723	ppbv	98
36) DI-ISOPROPYL ETHER	3.423	45	3333171	43.4875950	ppbv	95
37) ETHYL TERT-BUTYL ETHER	3.670	59	4166086	48.4408101	ppbv	98
38) ETHYL ACETATE	3.423	43	3988663	40.4048531	ppbv	96
39) 2-Butanone (MEK)	3.116	72	936351	48.2267722	ppbv	100
40) cis-1,2-Dichloroethene	3.306	61	2019313	45.5277757	ppbv	99
41) Tetrahydrofuran	3.613	42	1135449	51.2684288	ppbv	98

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_11.D
Acq On : 27 Jul 2022 04:40 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Jul 28 09:51:39 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:51:34 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
42) Chloroform	3.442	83	3057059	40.4515930 ppbv	99
43) Cyclohexane	4.261	84	2585552	50.9623410 ppbv	98
44) 1,1,1-Trichloroethane	3.901	97	3168705	44.6229162 ppbv	98
45) Carbon Tetrachloride	4.197	117	3361678	44.6041395 ppbv	99
46) 2,2,4-Trimethylpentane	4.705	57	6233470	42.5664368 ppbv	98
48) Benzene	4.121	78	5419469	42.4920502 ppbv	98
49) TERT-AMYL METHYL ETHER	4.447	73	4632734	47.5258692 ppbv	95
50) 1,2-Dichloroethane	3.776	62	1535105	43.0034884 ppbv	99
51) Heptane	4.857	43	1909727	47.1881110 ppbv	97
52) Trichloroethene	4.660	95	2532682	41.7530268 ppbv	99
53) TERT-AMYL ETHYL ETHER	5.155	73	1363766	47.4386383 ppbv	88
54) METHYL CYCLOHEXANE	5.158	83	3401572	42.2837329 ppbv	96
55) 1,2-Dichloropropane	4.531	63	1744113	43.4782008 ppbv	97
56) Methyl Methacrylate	4.800	69	2010004	52.8468934 ppbv #	1
57) 1,4-Dioxane	4.656	88	1395843	46.8188420 ppbv	96
58) Bromodichloromethane	4.629	83	3528893	44.3445486 ppbv	99
59) cis-1,3-Dichloropropene	5.117	75	3112292	52.7090601 ppbv	98
60) 4-Methyl-2-Pentanone (...	5.152	43	2781863	42.0520556 ppbv	95
61) n-OCTANE	6.182	43	2514102	48.0756723 ppbv	98
62) Toluene	5.618	91	6601321	43.5722285 ppbv	94
63) trans-1,3-Dichloropropene	5.396	75	2658754	56.4711239 ppbv	98
64) 1,1,2-Trichloroethane	5.471	97	2744247	41.7904461 ppbv	100
65) Tetrachloroethene	6.194	166	4145048	37.5343513 ppbv	98
66) Methyl Butyl Ketone	5.784	43	2279174	53.5427354 ppbv	93
67) Chlorodibromomethane	5.815	129	4536078	44.4015868 ppbv	98
68) 1,2-Dibromoethane	5.938	107	4322762	42.3324920 ppbv	99
69) Chlorobenzene	6.529	112	5922446	38.6533257 ppbv	99
70) NONANE	7.224	43	2742232	49.3956938 ppbv	98
72) Ethylbenzene	6.736	91	7515867	42.7071913 ppbv	91
73) M&P-Xylene	6.833	91	10637334	73.1506939 ppbv	92
74) O-Xylene	7.058	91	5890250	41.1822976 ppbv	93
77) Styrene	7.005	104	6092183	49.0917207 ppbv	96
78) Bromoform	6.826	173	4093783	38.5586502 ppbv	97
79) Isopropylbenzene	7.365	105	8394658	37.1216987 ppbv #	91
80) n-DECANE	8.082	43	2546744	43.3960999 ppbv	98
81) 1,1,2,2-Tetrachloroethane	7.049	83	4833371	36.3685237 ppbv	97
82) n-Propylbenzene	7.628	91	9410332	36.1407074 ppbv #	83
83) 4-Ethyltoluene	7.712	105	9084771	39.6761940 ppbv	88
84) 2-Chlorotoluene	7.593	91	6769782	41.3531783 ppbv	92
86) 1,3,5-Trimethylbenzene	7.756	105	7976832	39.7414625 ppbv	91
87) tert-Butylbenzene	7.972	119	7966569	36.7759601 ppbv	93
88) 1,2,4-Trimethylbenzene	7.975	105	7352781	38.2049175 ppbv	93
89) sec-Butylbenzene	8.122	105	9900000	33.3364551 ppbv #	84
90) 1,3-Dichlorobenzene	8.038	146	6579690	35.6355729 ppbv	94
91) P-ISOPROPYLTOLUENE	8.222	119	10062561	36.2522598 ppbv #	88
92) 1,4-Dichlorobenzene	8.075	146	6257980	33.9329943 ppbv	95
93) 1,2,3-TRIMETHYLBENZENE	8.204	105	8334591	40.0998589 ppbv	89
94) Benzyl Chloride	8.032	91	5930019	56.1859870 ppbv	91
95) n-Butylbenzene	8.460	91	8170367	41.7109558 ppbv #	87
96) 1,2-Dichlorobenzene	8.263	146	6826077	37.6531502 ppbv	93

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_11.D
Acq On : 27 Jul 2022 04:40 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 11 Sample Multiplier: 1

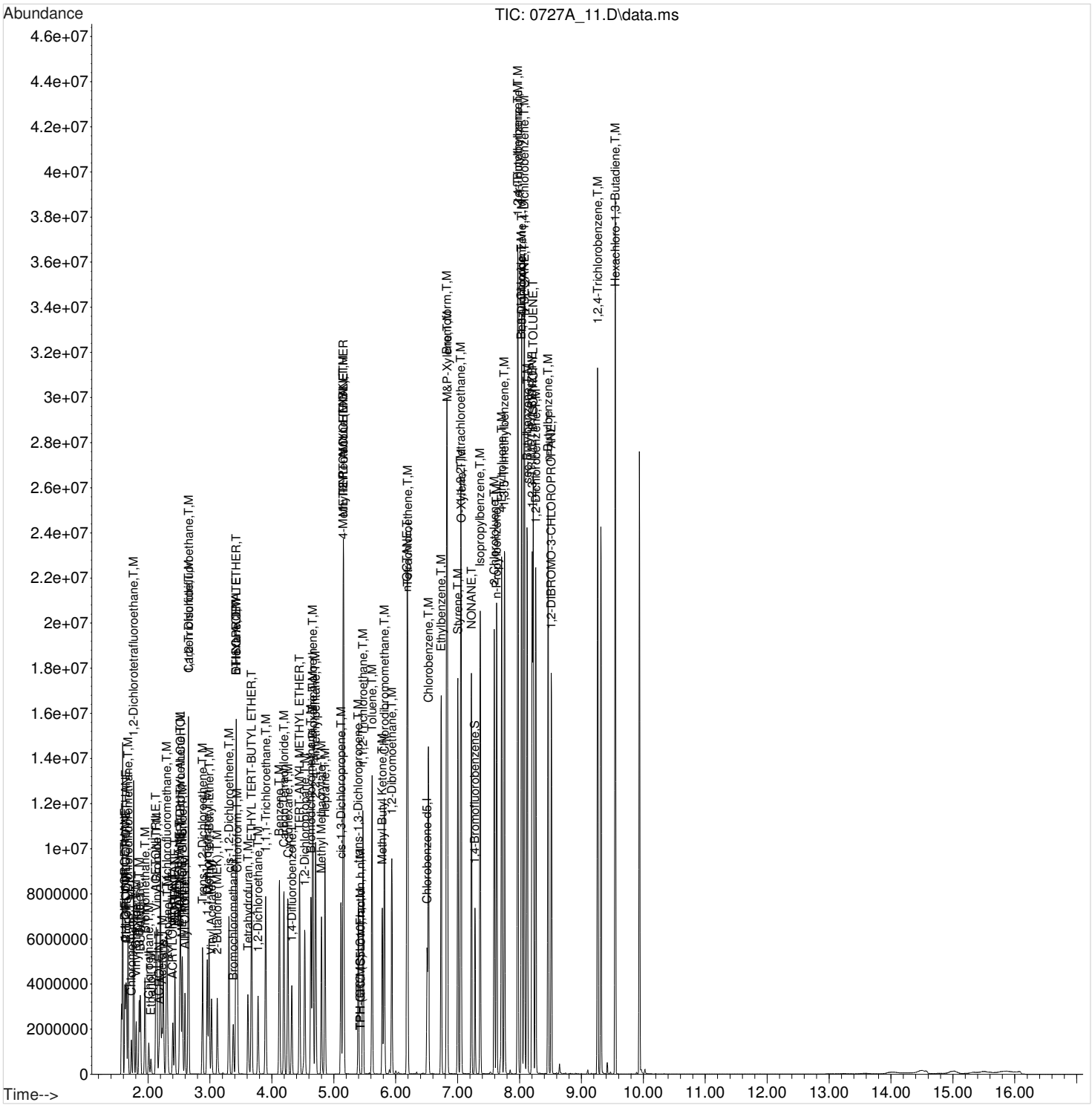
Quant Time: Jul 28 09:51:39 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:51:34 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
97) 1,2-DIBROMO-3-CHLOROPR...	8.514	157	4331691	46.7651109 ppbv	98
98) 1,2,4-Trichlorobenzene	9.262	180	6850358	48.1830663 ppbv	97
99) Hexachloro-1,3-Butadiene	9.546	225	5159979	35.2390576 ppbv	96
101) TPH (GC/MS) Low Fraction	5.430	TIC	647570343m	754.6987206 ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	702595927m	1140.9994223 ppbv	

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

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_11.D
Acq On : 27 Jul 2022 04:40 pm
Operator :
Sample : STD AMS 50.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 11 Sample Multiplier: 1

Quant Time: Jul 28 09:51:39 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:51:34 2022
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_12.D
Acq On : 27 Jul 2022 05:18 pm
Operator :
Sample : STD AMS 100.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Jul 28 09:52:55 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:52:49 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.378	130	740420	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	2483775	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2237249	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1524357	4.0184871	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 100.46%			
Target Compounds						Qvalue
2) Propene	1.656	41	1722469	61.8091699	ppbv	99
3) BUTANE	1.880	43	3087605	62.8627856	ppbv	98
4) 1,1-DIFLUOROETHANE	1.629	65	2034770	74.4280592	ppbv	83
5) Dichlorodifluoromethane	1.679	85	5092694	66.2292325	ppbv	94
6) CHLORODIFLUOROMETHANE	1.645	67	609559	76.4539235	ppbv	75
7) 1,2-Dichlorotetrafluor...	1.770	85	5675642	61.1281370	ppbv	98
8) Chloromethane	1.732	50	1768082	79.3488298	ppbv	99
9) Vinyl Chloride	1.811	62	2602966	78.8541633	ppbv	98
10) 1,3-Butadiene	1.857	39	1564806	78.0339171	ppbv	84
11) Bromomethane	1.952	94	3322431	73.5851341	ppbv	99
12) Chloroethane	2.016	64	1521320	78.6206105	ppbv	100
13) ISOPENTANE	2.437	41	1441814	77.9875533	ppbv	99
14) Vinyl Bromide	2.145	106	3454783	71.9741815	ppbv	100
15) Trichlorofluoromethane	2.304	101	5705724	68.3425668	ppbv	97
16) PENTANE	2.437	43	2998789	77.7304791	ppbv	98
17) Ethanol	2.050	45	873294	79.8548964	ppbv	99
18) ACROLEIN	2.179	56	1179778	82.4289058	ppbv	100
19) 1,1,2-Trichlorotrifluo...	2.653	101	4535745	63.1591450	ppbv	98
20) 1,1-Dichloroethene	2.524	61	2833561	71.6792215	ppbv	99
21) Acetone	2.229	43	2578141	74.1170758	ppbv	97
22) BROMOETHANE	2.513	108	2719363	72.9201874	ppbv	100
23) 2-Propanol	2.320	45	3248644	75.4250667	ppbv	93
24) Carbon Disulfide	2.657	76	6016219	67.9382706	ppbv	99
25) Allyl Chloride	2.600	41	2311599	87.9761658	ppbv	100
26) METHYL ACETATE	2.551	43	3299142	74.7079506	ppbv #	98
27) ACETONITRILE	2.130	41	6421630	339.5206981	ppbv	97
28) Methylene Chloride	2.559	49	1800206	74.1472583	ppbv	99
29) TERT-BUTYL ALCOHOL	2.532	59	3733681	71.9435424	ppbv	91
30) Methyl Tert-Butyl Ether	2.987	73	6991021	81.3383465	ppbv	96
31) Trans-1,2-Dichloroethene	2.885	61	3125100	81.7889218	ppbv	99
32) ACRYLONITRILE	2.403	53	2098095	81.9810524	ppbv	98
33) n-Hexane	3.423	57	3494706	77.2154960	ppbv	86
34) 1,1-Dichloroethane	2.961	63	4950692	76.1451281	ppbv	97
35) Vinyl Acetate	3.029	43	5075385	96.8417426	ppbv	95
36) DI-ISOPROPYL ETHER	3.427	45	5795135	73.3038447	ppbv	93
37) ETHYL TERT-BUTYL ETHER	3.674	59	7388511	82.3705259	ppbv	95
38) ETHYL ACETATE	3.427	43	6780834	67.0616262	ppbv	94
39) 2-Butanone (MEK)	3.120	72	1825226	90.1789651	ppbv	99
40) cis-1,2-Dichloroethene	3.309	61	3742244	81.4267281	ppbv	98
41) Tetrahydrofuran	3.613	42	2202843	94.7693378	ppbv	99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_12.D
Acq On : 27 Jul 2022 05:18 pm
Operator :
Sample : STD AMS 100.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 12 Sample Multiplier: 1

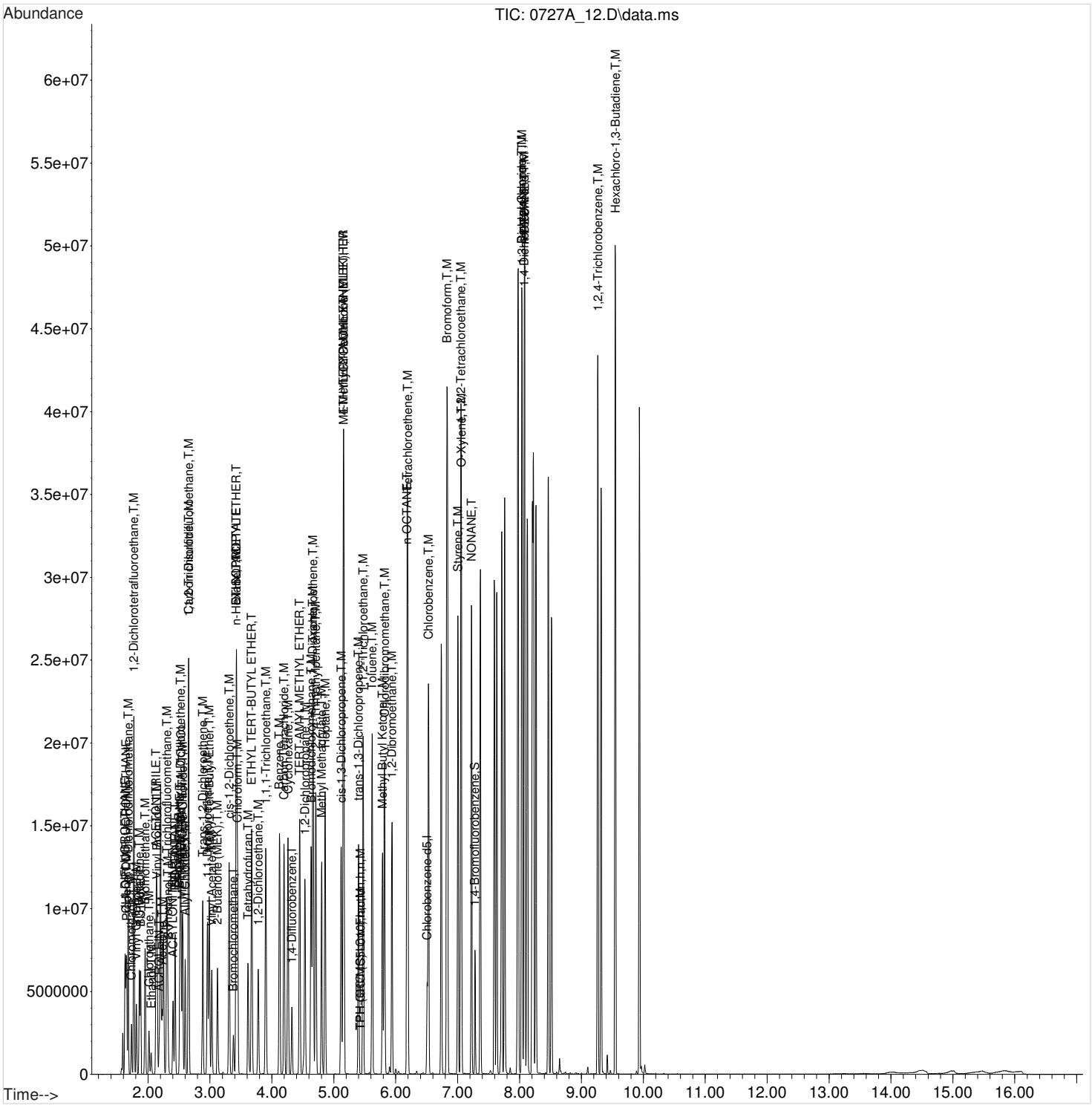
Quant Time: Jul 28 09:52:55 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:52:49 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
42) Chloroform	3.446	83	5290555	68.3394900 ppbv	97
43) Cyclohexane	4.261	84	4771994	89.6793768 ppbv	99
44) 1,1,1-Trichloroethane	3.901	97	5640693	76.8163445 ppbv	98
45) Carbon Tetrachloride	4.197	117	5923122	76.0034148 ppbv	99
46) 2,2,4-Trimethylpentane	4.709	57	10308093	68.3870946 ppbv	93
48) Benzene	4.121	78	9245842	71.8771500 ppbv	94
49) TERT-AMYL METHYL ETHER	4.447	73	8176374	82.2307425 ppbv	94
50) 1,2-Dichloroethane	3.780	62	2873230	79.7127424 ppbv	99
51) Heptane	4.861	43	3507744	85.0350262 ppbv	97
52) Trichloroethene	4.663	95	4402117	72.0755976 ppbv	97
53) TERT-AMYL ETHYL ETHER	5.158	73	2342211	79.8884125 ppbv	86
54) METHYL CYCLOHEXANE	5.161	83	5633916	69.4707453 ppbv	97
55) 1,2-Dichloropropane	4.534	63	3249661	80.1422682 ppbv	97
56) Methyl Methacrylate	4.804	69	3793883	96.6393468 ppbv #	1
57) 1,4-Dioxane	4.660	88	2486971	81.9072304 ppbv	95
58) Bromodichloromethane	4.633	83	6270855	77.8050085 ppbv	97
59) cis-1,3-Dichloropropene	5.120	75	5739889	94.2080788 ppbv	97
60) 4-Methyl-2-Pentanone (...	5.155	43	4754332	71.3290578 ppbv	95
61) n-OCTANE	6.182	43	4338580	81.2339594 ppbv	98
62) Toluene	5.618	91	10555016	68.9084328 ppbv	88
63) trans-1,3-Dichloropropene	5.399	75	4970240	101.4638248 ppbv	97
64) 1,1,2-Trichloroethane	5.474	97	4840578	73.2037984 ppbv	98
65) Tetrachloroethene	6.194	166	6409812	58.2011265 ppbv	95
66) Methyl Butyl Ketone	5.787	43	4144241	94.1778484 ppbv	91
67) Chlorodibromomethane	5.818	129	7551733	72.9773194 ppbv	96
68) 1,2-Dibromoethane	5.941	107	7204655	69.9802938 ppbv	99
69) Chlorobenzene	6.529	112	9366380	61.1413478 ppbv	92
70) NONANE	7.224	43	4756171	83.6396782 ppbv	99
74) O-Xylene	7.061	91	9105136	64.0144218 ppbv	89
77) Styrene	7.005	104	9609178	76.4925479 ppbv #	89
78) Bromoform	6.829	173	6074160	57.8746228 ppbv	95
80) n-DECANE	8.085	43	4261391	72.6536684 ppbv	95
81) 1,1,2,2-Tetrachloroethane	7.052	83	7436500	56.8883490 ppbv	94
90) 1,3-Dichlorobenzene	8.041	146	9688508	53.4372996 ppbv #	89
92) 1,4-Dichlorobenzene	8.078	146	8927303	49.4900895 ppbv #	90
94) Benzyl Chloride	8.038	91	9129751	84.1243159 ppbv #	84
98) 1,2,4-Trichlorobenzene	9.265	180	10271076	71.5112367 ppbv #	87
99) Hexachloro-1,3-Butadiene	9.549	225	7416332	51.6262139 ppbv	93
101) TPH (GC/MS) Low Fraction	5.430	TIC	1080048898m	1349.7530085 ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	1178982677m	2048.6181224 ppbv	

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

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_12.D
Acq On : 27 Jul 2022 05:18 pm
Operator :
Sample : STD AMS 100.0 ppbv 22G12764
Misc : 22G21991
ALS Vial : 12 Sample Multiplier: 1

Quant Time: Jul 28 09:52:55 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:52:49 2022
Response via : Initial Calibration



Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_03.D
Acq On : 27 Jul 2022 01:02 pm
Operator :
Sample : STD AMS 0.19 ppbv 22G26577
Misc : 22G21991
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 28 09:36:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.378	130	698423	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	2321881	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2126712	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1415729	3.9024311	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 97.56%			
Target Compounds						Qvalue
2) Propene	1.648	41	9514	0.4165201	ppbv	96
3) BUTANE	1.872	43	14280	0.2970597	ppbv	98
4) 1,1-DIFLUOROETHANE	1.622	65	7723	0.3133027	ppbv #	12
5) Dichlorodifluoromethane	1.671	85	20149	0.2780006	ppbv	99
6) CHLORODIFLUOROMETHANE	1.641	67	2075	0.2826379	ppbv #	2
7) 1,2-Dichlorotetrafluor...	1.762	85	24557	0.2802174	ppbv	96
8) Chloromethane	1.728	50	5964	0.2939625	ppbv	95
9) Vinyl Chloride	1.804	62	8538	0.2797480	ppbv	92
10) 1,3-Butadiene	1.849	39	6022	0.3971169	ppbv #	69
11) Bromomethane	1.948	94	11975	0.2855376	ppbv	98
12) Chloroethane	2.009	64	5255	0.3002035	ppbv	98
13) ISOPENTANE	2.430	41	5020	0.2975784	ppbv	98
14) Vinyl Bromide	2.134	106	12362	0.2759929	ppbv	99
15) Trichlorofluoromethane	2.297	101	21353	0.2711813	ppbv	99
16) PENTANE	2.430	43	10638	0.3025142	ppbv	99
17) Ethanol	2.047	45	3453	0.3975959	ppbv	98
18) ACROLEIN	2.176	56	3816	0.2976657	ppbv	94
19) 1,1,2-Trichlorotrifluo...	2.653	101	18801	0.2764331	ppbv	99
20) 1,1-Dichloroethene	2.521	61	10620	0.2910644	ppbv	97
21) Acetone	2.229	43	9098m	0.2841518	ppbv	
22) BROMOETHANE	2.506	108	9638	0.2746121	ppbv	100
23) 2-Propanol	2.316	45	12420	0.3297538	ppbv #	88
24) Carbon Disulfide	2.653	76	23206m	0.2803256	ppbv	
25) Allyl Chloride	2.597	41	6702	0.2849000	ppbv	98
26) METHYL ACETATE	2.547	43	12159	0.3084409	ppbv #	95
27) ACETONITRILE	2.126	41	26131	1.5348512	ppbv	99
28) Methylene Chloride	2.555	49	6919	0.3152100	ppbv	92
29) TERT-BUTYL ALCOHOL	2.532	59	14244	0.3078050	ppbv	97
30) Methyl Tert-Butyl Ether	2.991	73	21760	0.2711011	ppbv	100
31) Trans-1,2-Dichloroethene	2.881	61	9972	0.2837718	ppbv	98
32) ACRYLONITRILE	2.396	53	6819	0.3006223	ppbv	99
33) n-Hexane	3.423	57	11154	0.2547448	ppbv	86
34) 1,1-Dichloroethane	2.957	63	16886	0.2798960	ppbv	99
35) Vinyl Acetate	3.029	43	13013	0.2814904	ppbv	99
36) DI-ISOPROPYL ETHER	3.427	45	20009	0.2623967	ppbv	93
37) ETHYL TERT-BUTYL ETHER	3.677	59	21349	0.2464772	ppbv	97
38) ETHYL ACETATE	3.427	43	26683	0.2790045	ppbv	95
39) 2-Butanone (MEK)	3.128	72	5275	0.2873014	ppbv	98
40) cis-1,2-Dichloroethene	3.306	61	11740	0.2755484	ppbv	97
41) Tetrahydrofuran	3.636	42	5672	0.2684963	ppbv	94

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_03.D
Acq On : 27 Jul 2022 01:02 pm
Operator :
Sample : STD AMS 0.19 ppbv 22G26577
Misc : 22G21991
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 28 09:36:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
42) Chloroform	3.438	83	20243	0.2790119 ppbv	98
43) Cyclohexane	4.261	84	12728	0.2523716 ppbv	96
44) 1,1,1-Trichloroethane	3.901	97	18542	0.2685491 ppbv	98
45) Carbon Tetrachloride	4.197	117	19473	0.2638724 ppbv	98
46) 2,2,4-Trimethylpentane	4.705	57	38315	0.2658693 ppbv #	98
48) Benzene	4.121	78	33453	0.2862088 ppbv	100
49) TERT-AMYL METHYL ETHER	4.451	73	24837	0.2725164 ppbv	96
50) 1,2-Dichloroethane	3.776	62	9406	0.2891968 ppbv	96
51) Heptane	4.857	43	9967	0.2557227 ppbv	96
52) Trichloroethene	4.660	95	15655	0.2772441 ppbv	97
53) TERT-AMYL ETHYL ETHER	5.158	73	6561	0.2268594 ppbv #	79
54) METHYL CYCLOHEXANE	5.158	83	18974	0.2366295 ppbv	86
55) 1,2-Dichloropropane	4.531	63	10833	0.2967143 ppbv	99
56) Methyl Methacrylate	4.804	69	9040	0.2422142 ppbv #	1
57) 1,4-Dioxane	4.690	88	7517	0.2719782 ppbv #	43
58) Bromodichloromethane	4.629	83	20223	0.2715412 ppbv	99
59) cis-1,3-Dichloropropene	5.114	75	14419	0.2565226 ppbv	97
60) 4-Methyl-2-Pentanone (...	5.155	43	16611	0.2614550 ppbv	95
61) n-OCTANE	6.179	43	11993	0.2291400 ppbv	97
62) Toluene	5.615	91	37039	0.2532266 ppbv	100
63) trans-1,3-Dichloropropene	5.399	75	10688	0.2335781 ppbv	99
64) 1,1,2-Trichloroethane	5.471	97	17199	0.2833007 ppbv	98
65) Tetrachloroethene	6.191	166	27213	0.2565111 ppbv	97
66) Methyl Butyl Ketone	5.790	43	10077	0.2430406 ppbv	90
67) Chlorodibromomethane	5.815	129	24475	0.2450689 ppbv	99
68) 1,2-Dibromoethane	5.938	107	25224	0.2573686 ppbv	100
69) Chlorobenzene	6.526	112	40427	0.2844381 ppbv	98
70) NONANE	7.221	43	11913	0.2032882 ppbv	96
72) Ethylbenzene	6.733	91	42971	0.2486477 ppbv	100
73) M&P-Xylene	6.826	91	68865	0.4584184 ppbv	97
74) O-Xylene	7.055	91	32458	0.2175810 ppbv	99
77) Styrene	7.002	104	27346	0.2144399 ppbv	99
78) Bromoform	6.823	173	25759	0.2397785 ppbv	99
79) Isopropylbenzene	7.365	105	55409	0.2481722 ppbv #	98
80) n-DECANE	8.075	43	12574	0.1957341 ppbv	90
81) 1,1,2,2-Tetrachloroethane	7.046	83	34627	0.2726498 ppbv	100
82) n-Propylbenzene	7.628	91	60416	0.2210135 ppbv	98
83) 4-Ethyltoluene	7.709	105	49894	0.2039066 ppbv	99
84) 2-Chlorotoluene	7.590	91	39831	0.2465549 ppbv	99
86) 1,3,5-Trimethylbenzene	7.756	105	43078	0.1997309 ppbv	99
87) tert-Butylbenzene	7.966	119	47752	0.2045851 ppbv	97
88) 1,2,4-Trimethylbenzene	7.969	105	40544	0.1908367 ppbv	100
89) sec-Butylbenzene	8.119	105	65277	0.2058493 ppbv	99
90) 1,3-Dichlorobenzene	8.032	146	43517	0.2277826 ppbv	99
91) P-ISOPROPYLTOLUENE	8.219	119	58648	0.1922750 ppbv	98
92) 1,4-Dichlorobenzene	8.072	146	43399	0.2260358 ppbv	99
93) 1,2,3-TRIMETHYLBENZENE	8.201	105	44758	0.2020186 ppbv	97
94) Benzyl Chloride	8.028	91	21516	0.1936229 ppbv	100
95) n-Butylbenzene	8.457	91	40572	0.1880828 ppbv	98
96) 1,2-Dichlorobenzene	8.257	146	43193	0.2347684 ppbv	99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_03.D
Acq On : 27 Jul 2022 01:02 pm
Operator :
Sample : STD AMS 0.19 ppbv 22G26577
Misc : 22G21991
ALS Vial : 3 Sample Multiplier: 1

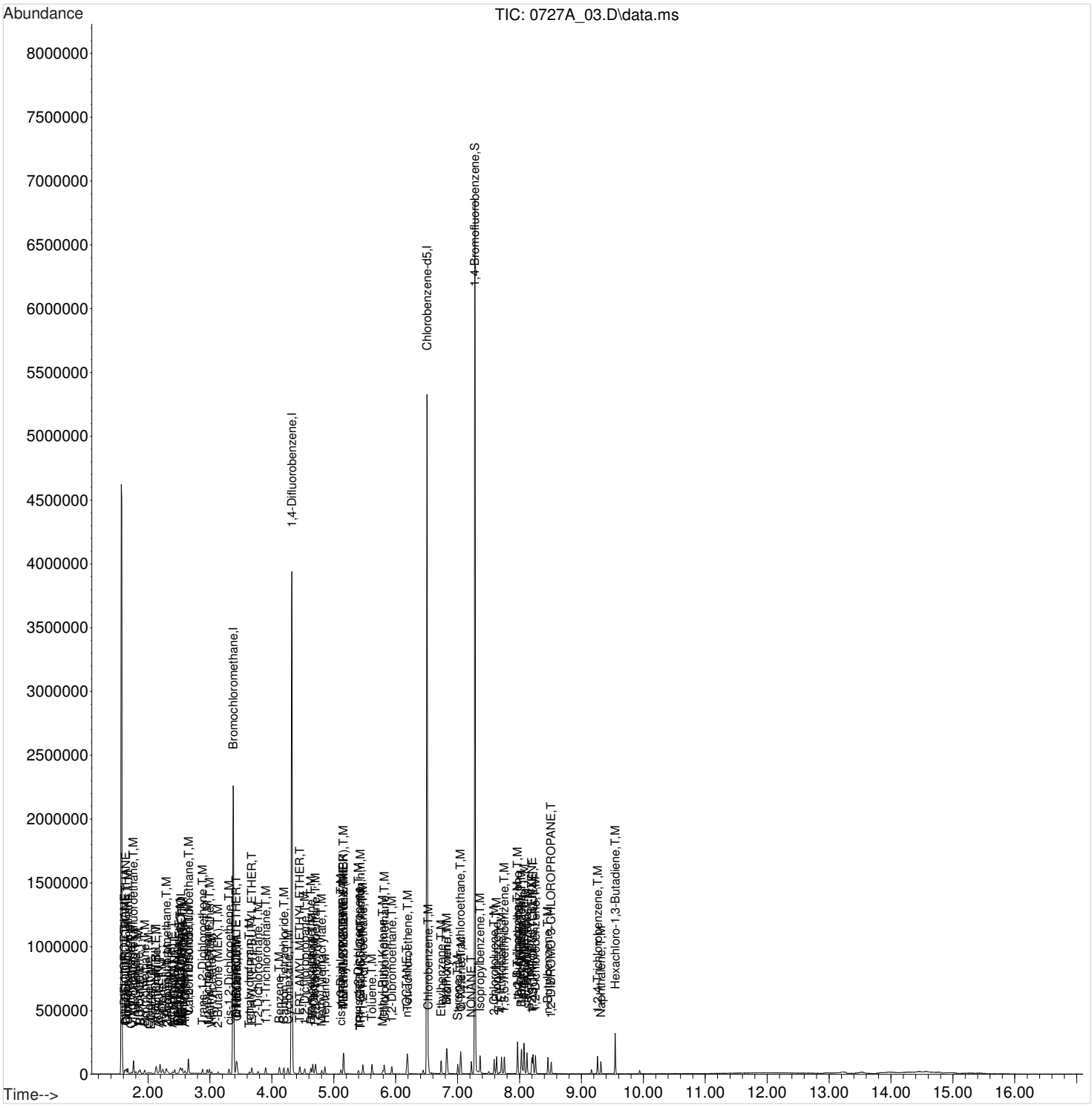
Quant Time: Jul 28 09:36:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
97) 1,2-DIBROMO-3-CHLOROPR...	8.510	157	21010	0.2166827	ppbv	96
98) 1,2,4-Trichlorobenzene	9.262	180	28728	0.1755866	ppbv	98
99) Hexachloro-1,3-Butadiene	9.546	225	36313	0.2412994	ppbv	98
100) Naphthalene	9.315	128	46001	0.1431626	ppbv	99
101) TPH (GC/MS) Low Fraction	5.430	TIC	22888696m	64.1721013	ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	23628616m	88.1338911	ppbv	

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

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_03.D
Acq On : 27 Jul 2022 01:02 pm
Operator :
Sample : STD AMS 0.19 ppbv 22G26577
Misc : 22G21991
ALS Vial : 3 Sample Multiplier: 1

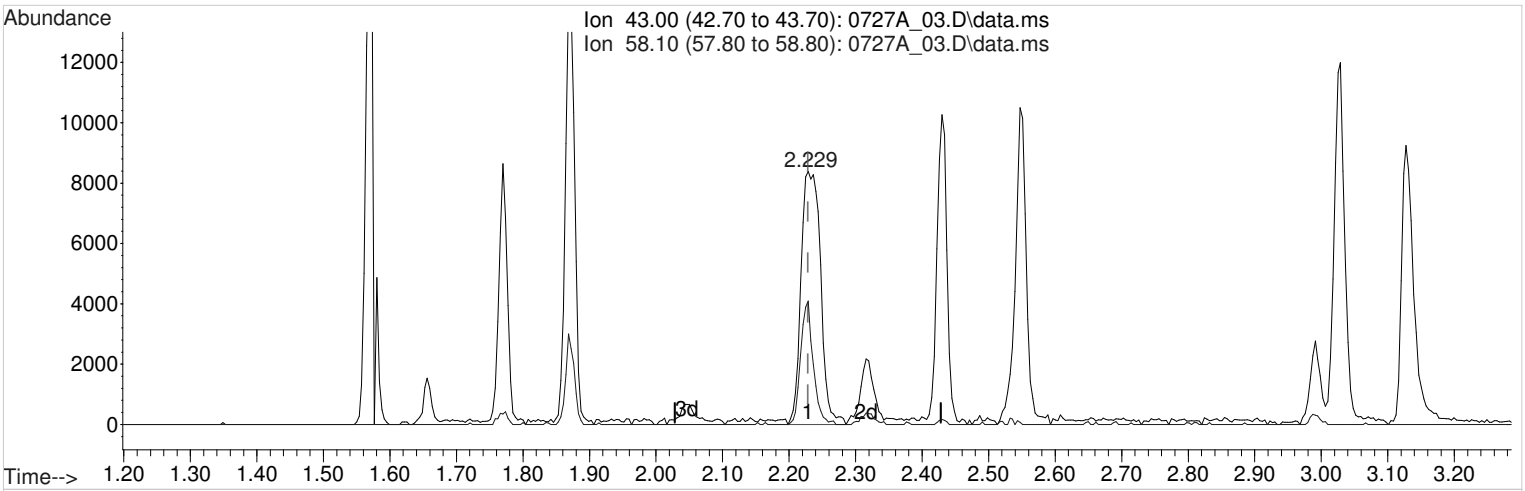
Quant Time: Jul 28 09:36:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration

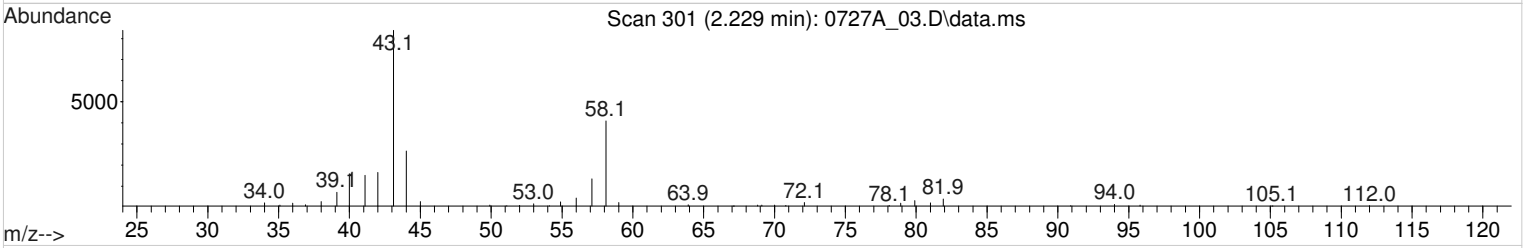


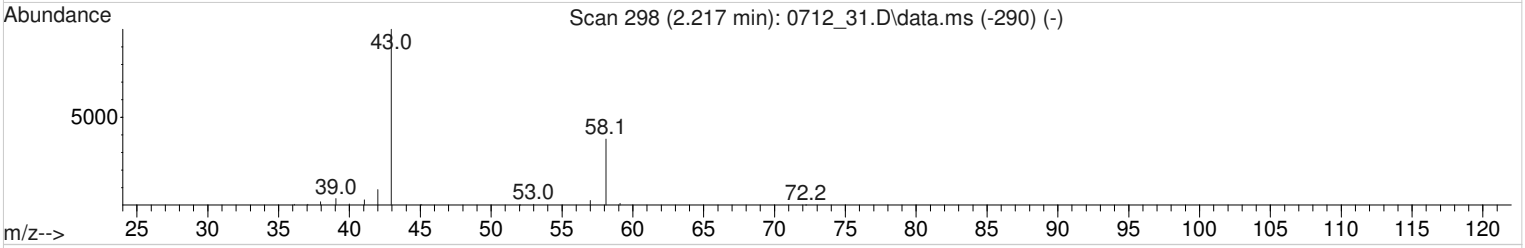
Quantitation Report (Qedit)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_03.D
Acq On : 27 Jul 2022 01:02 pm
Operator :
Sample : STD AMS 0.19 ppbv 22G26577
Misc : 22G21991
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 28 09:36:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration







TIC: 0727A_03.D\data.ms

(21) Acetone (T,M)

2.229min (+ 0.000) 0.5327924 ppbv

Qvalue = 71

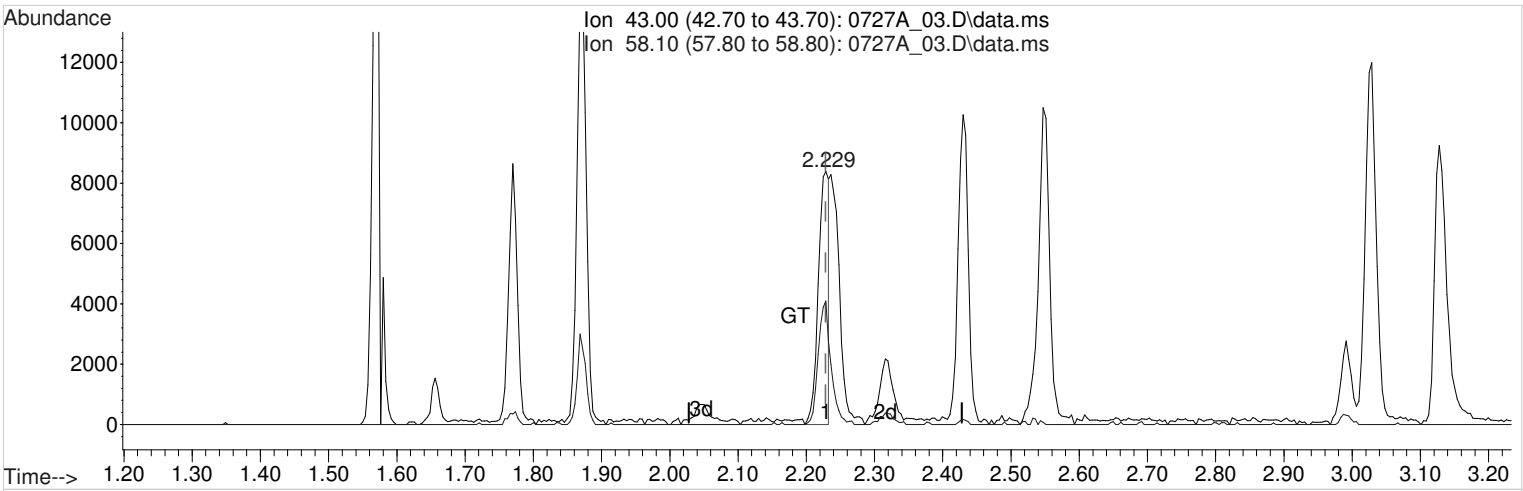
response 17059

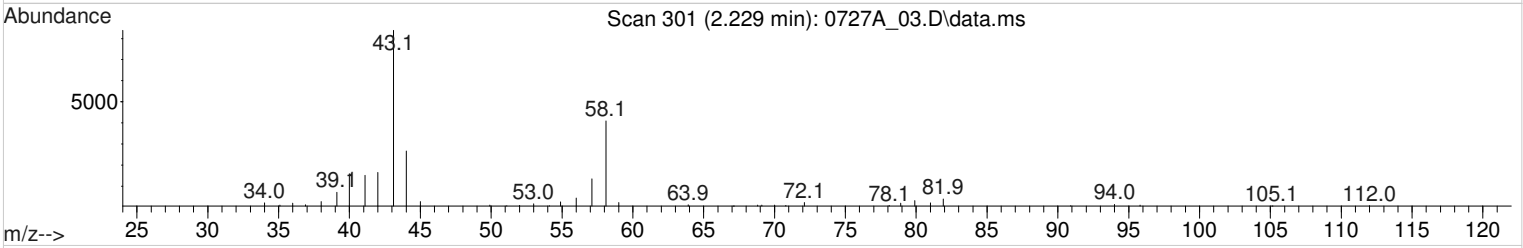
Ion	Exp%	Act%
43.00	100.00	100.00
58.10	51.20	31.26#
0.00	0.00	0.00
0.00	0.00	0.00

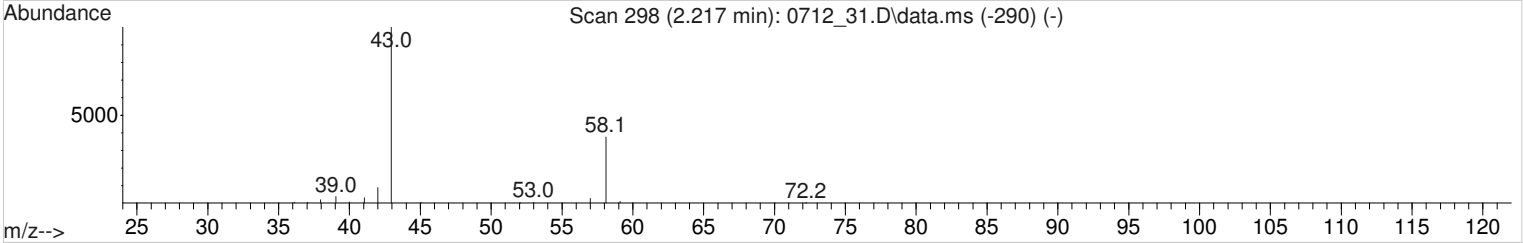
Quantitation Report (Qedit)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_03.D
Acq On : 27 Jul 2022 01:02 pm
Operator :
Sample : STD AMS 0.19 ppbv 22G26577
Misc : 22G21991
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 28 09:36:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration







TIC: 0727A_03.D\data.ms

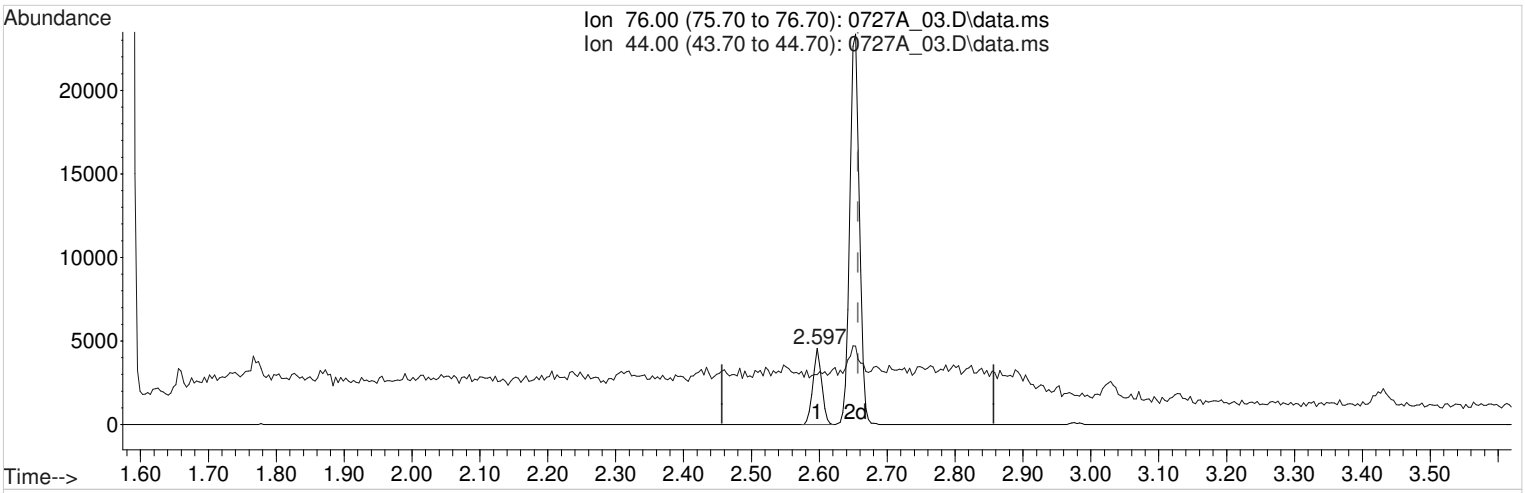
(21) Acetone (T,M)

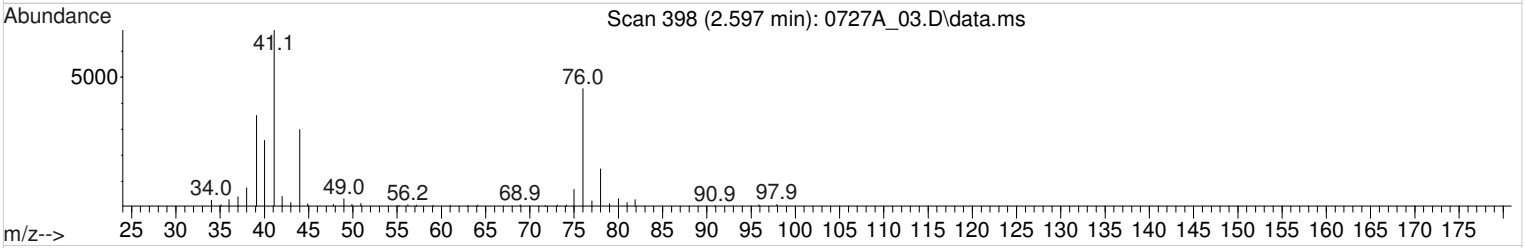
2.229min (+ 0.000) 0.2841518 ppbv m

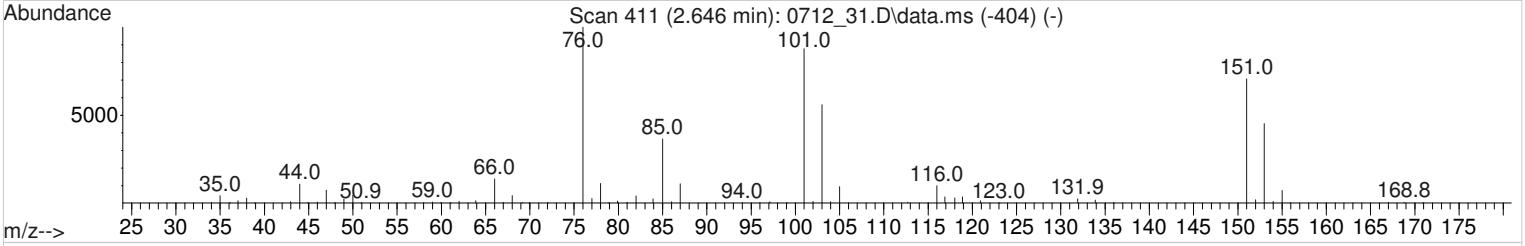
response	9098	
Ion	Exp%	Act%
43.00	100.00	100.00
58.10	51.20	58.61
0.00	0.00	0.00
0.00	0.00	0.00

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_03.D
Acq On : 27 Jul 2022 01:02 pm
Operator :
Sample : STD AMS 0.19 ppbv 22G26577
Misc : 22G21991
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 28 09:36:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration







TIC: 0727A_03.D\data.ms

(24) Carbon Disulfide (T,M)

2.597min (-0.061) 0.0485853 ppbv

Qvalue = 98

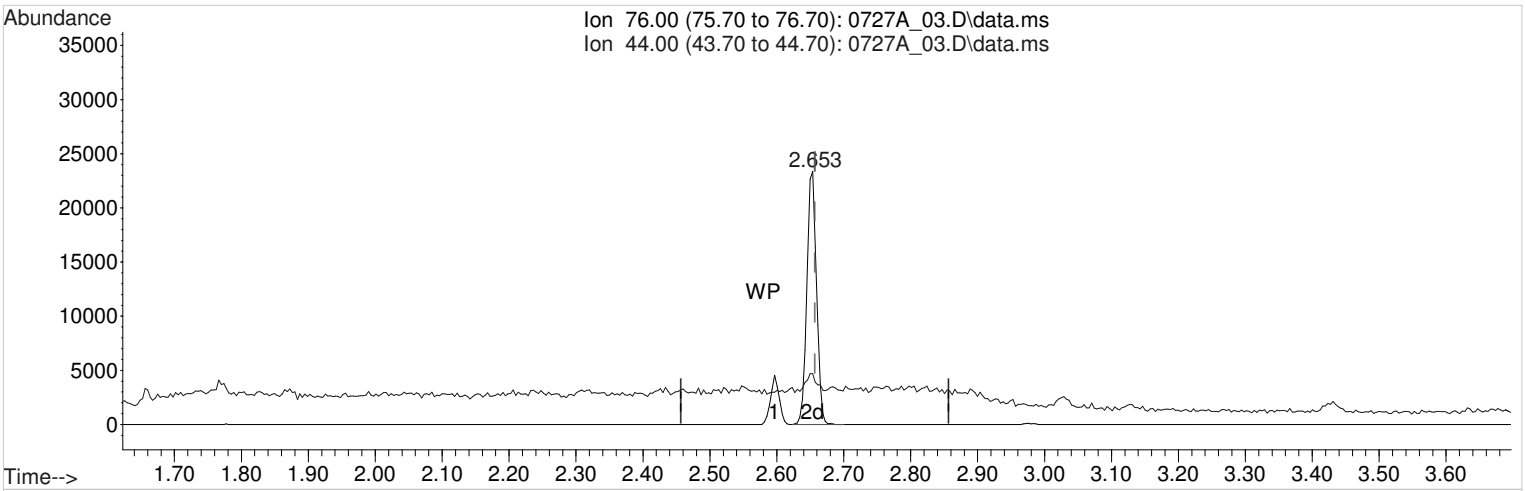
response 4022

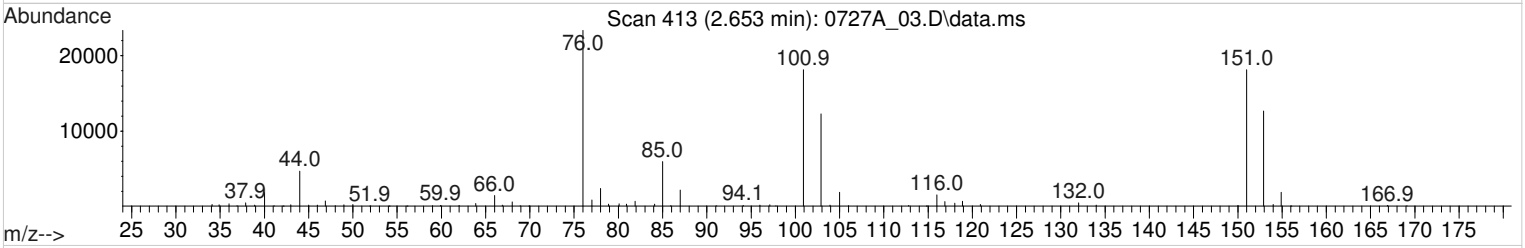
Ion	Exp%	Act%
76.00	100.00	100.00
44.00	6.00	5.40
0.00	0.00	0.00
0.00	0.00	0.00

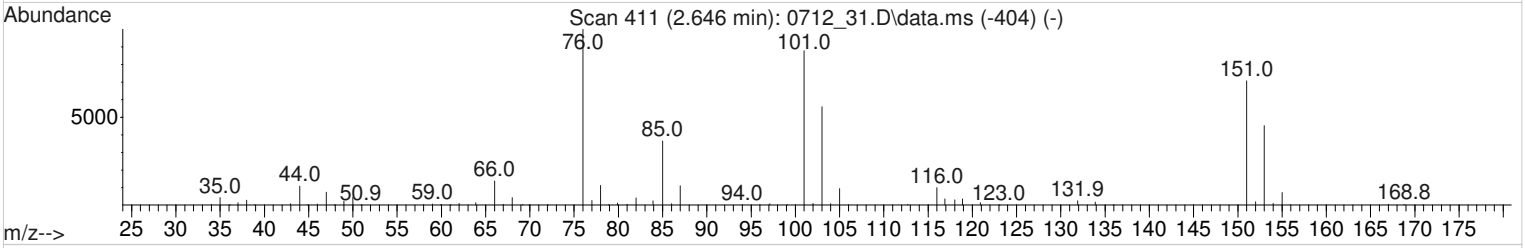
Quantitation Report (Qedit)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_03.D
Acq On : 27 Jul 2022 01:02 pm
Operator :
Sample : STD AMS 0.19 ppbv 22G26577
Misc : 22G21991
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Jul 28 09:36:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:36:52 2022
Response via : Initial Calibration







TIC: 0727A_03.D\data.ms

(24) Carbon Disulfide (T,M)

2.653min (-0.004) 0.2803256 ppbv m

response	**23206**	
Ion	**Exp%**	**Act%**
76.00	**100.00**	**100.00**
44.00	**6.00**	**0.94#**
0.00	**0.00**	**0.00**
0.00	**0.00**	**0.00**

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/25/22 10:08
Instrument ID:	AIRMS7	**Calibration (end) date/time:**	07/25/22 16:02
Lab File ID:	0725_14	**Analysis date/time:**	07/25/22 17:20
Analytical Method:	TO-15	**Sample ID:**	SSCV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
1,1,1-TRICHLOROETHANE	0.686117	0.61611430		10.20		5	4.490	89.80	60 - 140
1,1,2,2-TETRACHLOROETHANE	0.244284	0.22632350		7.35		5	4.632	92.60	60 - 140
1,1,2-TRICHLOROETHANE	0.095459	0.09200669		3.62		5	4.819	96.40	60 - 140
1,1,2-TRICHLOROTRIFLUOROETHANE	0.656275	0.61561110		6.20		5	4.690	93.80	60 - 140
1,1-DICHLOROETHANE	0.593062	0.56887280		4.08		5	4.796	95.90	60 - 140
1,1-DICHLOROETHENE	0.530570	0.51327210		3.26		5	4.837	96.70	60 - 140
1,2,4-TRICHLOROBENZENE	0.247324	0.18642530		24.60		5	3.769	75.40	60 - 140
1,2,4-TRIMETHYLBENZENE	0.382461	0.37514890		1.91		5	4.904	98.10	60 - 140
1,2-DIBROMOETHANE	0.148182	0.14055590		5.15		5	4.743	94.90	60 - 140
1,2-DICHLOROBENZENE	0.266765	0.24800640		7.03		5	4.648	93	60 - 140
1,2-DICHLOROETHANE	0.107630	0.10503610		2.41		5	4.880	97.60	60 - 140
1,2-DICHLOROPROPANE	0.086578	0.09239741		6.72		5	5.336	107	60 - 140
1,2-DICHLOROTETRAFLUOROETHANE	0.774136	0.77430250		0.0215		5	5.001	100	60 - 140
1,3,5-TRIMETHYLBENZENE	0.391991	0.37282890		4.89		5	4.756	95.10	60 - 140
1,3-BUTADIENE	0.265591	0.23544340		11.40		5	4.432	88.60	60 - 140
1,3-DICHLOROBENZENE	0.275366	0.25528870		7.29		5	4.635	92.70	60 - 140
1,4-DICHLOROBENZENE	0.275371	0.25070650		8.96		5	4.552	91	60 - 140
1,4-DIOXANE	0.042456	0.05036473		18.60		5	5.931	119	60 - 140
2,2,4-TRIMETHYLPENTANE	1.352775	1.584775		17.10		5	5.857	117	60 - 140
2-BUTANONE (MEK)	0.145892	0.14884430		2.02		5	5.101	102	60 - 140
2-CHLOROTOLUENE	0.386562	0.37068810		4.11		5	4.795	95.90	60 - 140
2-PROPANOL	0.553321	0.73518720		32.90		5	6.643	133	60 - 140
4-ETHYLTOLUENE	0.447065	0.43800210		2.03		5	4.899	98	60 - 140
4-METHYL-2-PENTANONE (MIBK)	0.169329	0.17902660		5.73		5	5.286	106	60 - 140
ACETONE	0.571761	0.54559560		4.58		5	4.771	95.40	60 - 140
ALLYL CHLORIDE	0.471680	0.42258080		10.40		5	4.480	89.60	60 - 140
BENZENE	0.2212	0.23498030		6.23		5	5.311	106	60 - 140
BENZYL CHLORIDE	0.346502	0.23220350		33		5	3.351	67	60 - 140
BROMODICHLOROMETHANE	0.172547	0.15531940		9.98		5	4.501	90	60 - 140
BROMOFORM	0.184988	0.15363340		16.90		5	4.153	83.10	60 - 140
BROMOMETHANE	0.311779	0.29168520		6.44		5	4.678	93.60	60 - 140
CARBON DISULFIDE	1.035843	0.98414340		4.99		5	4.750	95	60 - 140
CARBON TETRACHLORIDE	0.702284	0.57057840		18.80		5	4.062	81.20	60 - 140
CHLOROBENZENE	0.213492	0.21964920		2.88		5	5.144	103	60 - 140
CHLORODIBROMOMETHANE	0.173356	0.152519		12		5	4.399	88	60 - 140
CHLOROETHANE	0.150367	0.14735340		2		5	4.900	98	60 - 140
CHLOROFORM	0.628797	0.64526280		2.62		5	5.131	103	60 - 140
CHLOROMETHANE	0.283807	0.28302530		0.2750		5	4.986	99.70	60 - 140
CIS-1,2-DICHLOROETHENE	0.442166	0.43513660		1.59		5	4.921	98.40	60 - 140
CIS-1,3-DICHLOROPROPENE	0.131697	0.13061180		0.8240		5	4.959	99.20	60 - 140
CYCLOHEXANE	0.323583	0.376637		16.40		5	5.820	116	60 - 140
DICHLORODIFLUOROMETHANE	0.700919	0.68443030		2.35		5	4.882	97.60	60 - 140
ETHANOL	0.135794	0.11410650		16		5	4.201	84	60 - 140
ETHYLBENZENE	0.364889	0.39543510		8.37		5	5.419	108	60 - 140
HEPTANE	0.208996	0.22463230		7.48		5	5.374	107	60 - 140
HEXACHLORO-1,3-BUTADIENE	0.277881	0.20942450		24.60		5	3.768	75.40	60 - 140

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/25/22 10:08
Instrument ID:	AIRMS7	**Calibration (end) date/time:**	07/25/22 16:02
Lab File ID:	0725_14	**Analysis date/time:**	07/25/22 17:20
Analytical Method:	TO-15	**Sample ID:**	SSCV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
ISOPROPYLBENZENE	0.378028	0.43748860		15.70		5	5.786	116	60 - 140
M&P-XYLENE	0.278095	0.31141490		12		10	11.20	112	60 - 140
METHYL BUTYL KETONE	0.157805	0.17245570		9.28		5	5.464	109	60 - 140
METHYL METHACRYLATE	0.081787	0.08531974		4.32		5	5.216	104	60 - 140
METHYL TERT-BUTYL ETHER	0.772231	0.84538860		9.47		5	5.474	109	60 - 140
METHYLENE CHLORIDE	0.450387	0.37746830		16.20		5	5.297	106	60 - 140
N-HEXANE	0.427211	0.49386940		15.60		5	5.780	116	60 - 140
NAPHTHALENE	0.539723	0.43127590		20.10		5	3.995	79.90	60 - 140
O-XYLENE	0.271267	0.303505		11.90		5	5.594	112	60 - 140
PROPENE	0.269724	0.24089450		10.70		5	4.466	89.30	60 - 140
STYRENE	0.234686	0.23538580		0.2980		5	5.015	100	60 - 140
TETRACHLOROETHENE	0.132430	0.13881460		4.82		5	5.241	105	60 - 140
TETRAHYDROFURAN	0.316931	0.35688450		12.60		5	5.630	113	60 - 140
TOLUENE	0.267335	0.28937930		8.25		5	5.412	108	60 - 140
TRANS-1,2-DICHLOROETHENE	0.480684	0.47446050		1.29		5	4.935	98.70	60 - 140
TRANS-1,3-DICHLOROPROPENE	0.127827	0.11673770		8.68		5	4.566	91.30	60 - 140
TRICHLOROETHENE	0.097367	0.10610840		8.98		5	5.449	109	60 - 140
TRICHLOROFLUOROMETHANE	0.909504	0.81242080		10.70		5	4.466	89.30	60 - 140
VINYL ACETATE	1.215757	1.115318		8.26		5	4.587	91.70	60 - 140
VINYL BROMIDE	0.312773	0.297299		4.95		5	4.753	95.10	60 - 140
VINYL CHLORIDE	0.325837	0.32274180		0.95		5	4.953	99.10	60 - 140
1,4-BROMOFLUOROBENZENE	0.734350	0.71356780		2.83		4	3.887	97.20	60 - 140

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_14.D
Acq On : 25 Jul 2022 5:20 pm
Operator :
Sample : SSCV AMS 5.0 ppbv 22G05896
Misc :
ALS Vial : 14 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 08:27:02 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.275	130	260788	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	1089286	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.158	117	995513	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	710366	3.8868015	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 97.17%				
Target Compounds							Qvalue
2) Propene	3.855	41	78528	4.4655794	ppbv		94
3) BUTANE	4.257	43	147974	2.8683975	ppbv		100
4) 1,1-DIFLUOROETHANE	3.861	65	59830	4.8524071	ppbv		98
5) Dichlorodifluoromethane	3.898	85	223114	4.8823768	ppbv		100
6) CHLORODIFLUOROMETHANE	3.922	67	24727	4.4595068	ppbv		97
7) 1,2-Dichlorotetrafluor...	4.056	85	252411	5.0010781	ppbv		99
8) Chloromethane	4.166	50	92262	4.9862213	ppbv		99
9) Vinyl Chloride	4.288	62	105209	4.9525031	ppbv		98
10) 1,3-Butadiene	4.318	39	76751	4.4324435	ppbv		97
11) Bromomethane	4.684	94	95085	4.6777608	ppbv		99
12) Chloroethane	4.776	64	48035	4.8997957	ppbv		99
13) ISOPENTANE	4.788	43	109995	5.1014348	ppbv		98
14) Vinyl Bromide	4.965	106	96915	4.7526271	ppbv		98
15) Trichlorofluoromethane	4.989	101	264837	4.4662841	ppbv		100
16) PENTANE	5.025	43	159538	4.7881863	ppbv		98
17) Ethanol	5.154	45	37197	4.2014543	ppbv		100
18) ACROLEIN	5.446	56	29699	3.3528767	ppbv		96
19) 1,1,2-Trichlorotrifluo...	5.416	101	200680	4.6901915	ppbv		98
20) 1,1-Dichloroethene	5.501	61	167319	4.8369842	ppbv		96
21) Acetone	5.580	43	177856	4.7711822	ppbv		100
22) BROMOETHANE	5.690	108	83792	5.0267284	ppbv		99
23) 2-Propanol	5.623	45	239660	6.6434088	ppbv	#	91
24) Carbon Disulfide	5.775	76	320816	4.7504480	ppbv		95
25) Allyl Chloride	5.818	41	137755	4.4795303	ppbv		89
26) METHYL ACETATE	5.806	43	194218	4.8068532	ppbv	#	98
27) ACETONITRILE	5.879	41	429373	25.7774474	ppbv		100
28) Methylene Chloride	5.946	49	123049	5.2969722	ppbv		96
29) TERT-BUTYL ALCOHOL	5.983	59	196473	4.9057834	ppbv		96
30) Methyl Tert-Butyl Ether	6.111	73	275584	5.4736749	ppbv		99
31) Trans-1,2-Dichloroethene	6.147	61	154667	4.9352682	ppbv		98
32) ACRYLONITRILE	6.196	53	81932	4.7943498	ppbv		99
33) n-Hexane	6.263	57	160994	5.7801551	ppbv		94
34) 1,1-Dichloroethane	6.543	63	185444	4.7960620	ppbv		99
35) Vinyl Acetate	6.489	43	363577m	4.5869285	ppbv		
36) DI-ISOPROPYL ETHER	6.446	45	337369	5.7670294	ppbv		98
37) ETHYL TERT-BUTYL ETHER	6.757	59	319328	5.3510834	ppbv		98
38) ETHYL ACETATE	6.982	45	34002	5.1359094	ppbv		96
39) 2-Butanone (MEK)	7.031	72	48521	5.1011694	ppbv		98
40) cis-1,2-Dichloroethene	7.043	61	141848	4.9205149	ppbv		98
41) Tetrahydrofuran	7.299	42	116339	5.6303156	ppbv		97
42) Chloroform	7.281	83	210346	5.1309306	ppbv		98
43) Cyclohexane	7.482	84	122778	5.8197954	ppbv		97
44) 1,1,1-Trichloroethane	7.476	97	200844	4.4898627	ppbv		99
45) Carbon Tetrachloride	7.598	117	186000	4.0623051	ppbv		99
46) 2,2,4-Trimethylpentane	7.708	57	516613	5.8574970	ppbv		95

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_14.D
Acq On : 25 Jul 2022 5:20 pm
Operator :
Sample : SSCV AMS 5.0 ppbv 22G05896
Misc :
ALS Vial : 14 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 08:27:02 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

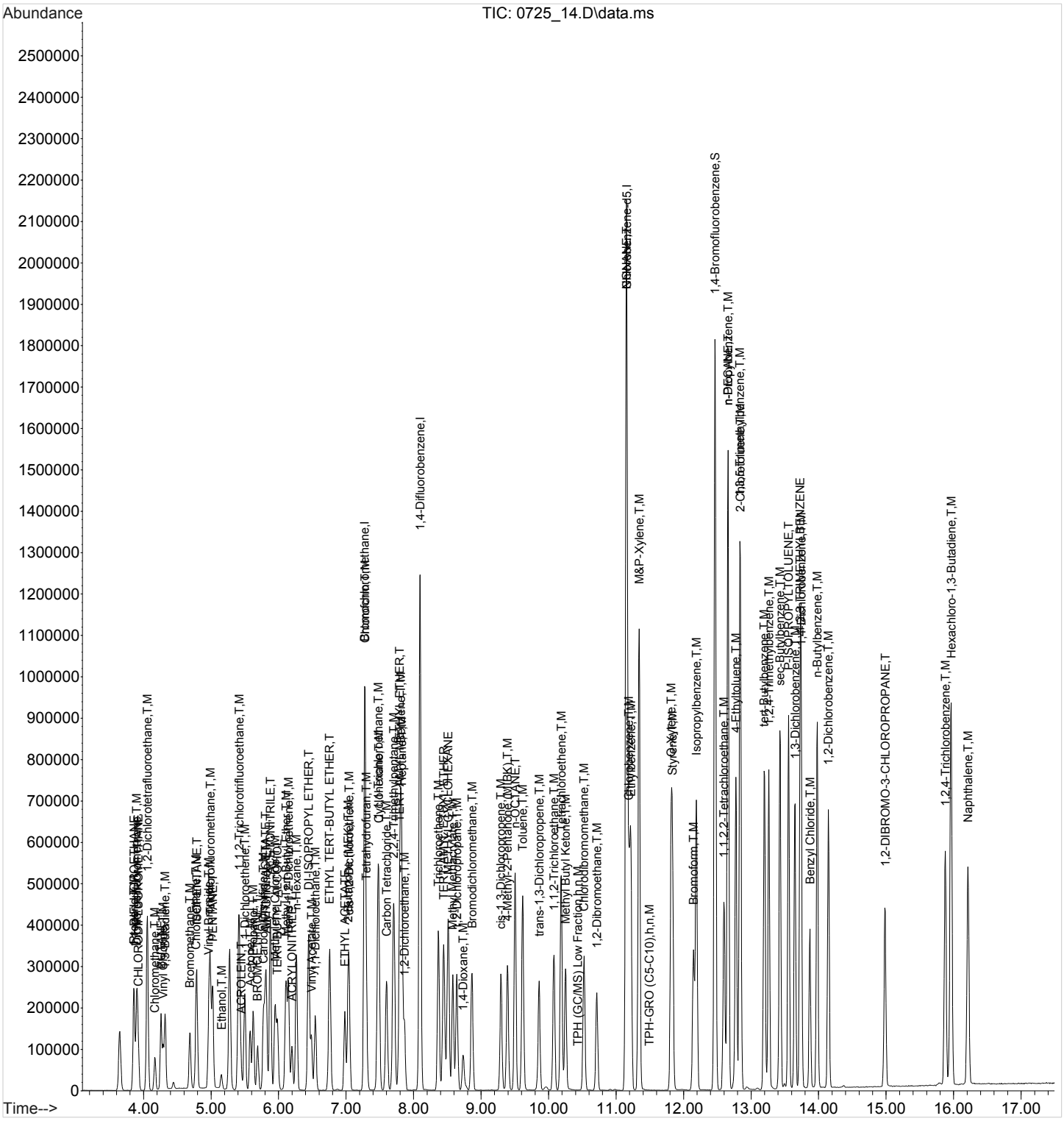
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48) Benzene	7.812	78	319951	5.3114858	ppbv	98
49) TERT-AMYL METHYL ETHER	7.793	73	286238	5.1144456	ppbv	99
50) 1,2-Dichloroethane	7.866	62	143018	4.8795212	ppbv	99
51) Heptane	7.824	43	305861	5.3740750	ppbv	96
52) Trichloroethene	8.366	95	144478	5.4488842	ppbv	99
53) TERT-AMYL ETHYL ETHER	8.446	73	90109	4.9212395	ppbv	95
54) METHYL CYCLOHEXANE	8.513	83	192341	5.2798324	ppbv	95
55) 1,2-Dichloropropane	8.641	63	125809	5.3360721	ppbv	97
56) Methyl Methacrylate	8.580	69	116172	5.2159624	ppbv	100
57) 1,4-Dioxane	8.732	88	68577	5.9313425	ppbv	94
58) Bromodichloromethane	8.866	83	211484	4.5007849	ppbv	99
59) cis-1,3-Dichloropropene	9.293	75	177842	4.9588088	ppbv	94
60) 4-Methyl-2-Pentanone (...	9.390	43	243764	5.2863504	ppbv	98
61) n-OCTANE	9.506	43	282324	5.2455110	ppbv	97
62) Toluene	9.616	91	394021	5.4122908	ppbv	100
63) trans-1,3-Dichloropropene	9.860	75	158951	4.5662372	ppbv	96
64) 1,1,2-Trichloroethane	10.079	97	125277	4.8191798	ppbv	95
65) Tetrachloroethene	10.189	166	189011	5.2410581	ppbv	98
66) Methyl Butyl Ketone	10.250	43	234817	5.4641894	ppbv	95
67) Chlorodibromomethane	10.524	129	207671	4.3990009	ppbv	100
68) 1,2-Dibromoethane	10.713	107	191382	4.7426690	ppbv	100
69) Chlorobenzene	11.189	112	299076	5.1442085	ppbv	96
70) NONANE	11.152	43	286672	4.8405713	ppbv	96
72) Ethylbenzene	11.219	91	492076	5.4185637	ppbv	100
73) M&P-Xylene	11.341	91	775044	11.1981520	ppbv	99
74) O-Xylene	11.817	91	377679	5.5942163	ppbv	100
77) Styrene	11.835	104	292912	5.0149027	ppbv	99
78) Bromoform	12.146	173	191180	4.1525303	ppbv	99
79) Isopropylbenzene	12.189	105	544407	5.7864524	ppbv	98
80) n-DECANE	12.658	43	308973	4.8616207	ppbv	97
81) 1,1,2,2-Tetrachloroethane	12.597	83	281635	4.6323876	ppbv	99
82) n-Propylbenzene	12.658	91	681247	4.9090462	ppbv	100
83) 4-Ethyltoluene	12.774	105	545046	4.8986442	ppbv	99
84) 2-Chlorotoluene	12.841	91	461281	4.7946827	ppbv	100
86) 1,3,5-Trimethylbenzene	12.835	105	463945	4.7555848	ppbv	99
87) tert-Butylbenzene	13.195	119	436396	5.0004273	ppbv	98
88) 1,2,4-Trimethylbenzene	13.262	105	466832	4.9044016	ppbv	100
89) sec-Butylbenzene	13.426	105	675944	4.9626201	ppbv	99
90) 1,3-Dichlorobenzene	13.652	146	317679	4.6354349	ppbv	99
91) P-ISOPROPYLTOLUENE	13.554	119	562241	4.8273454	ppbv	99
92) 1,4-Dichlorobenzene	13.743	146	311977	4.5521541	ppbv	98
93) 1,2,3-TRIMETHYLBENZENE	13.725	105	466353	4.7241740	ppbv	99
94) Benzyl Chloride	13.871	91	288952	3.3506817	ppbv	100
95) n-Butylbenzene	13.981	91	544801	4.6736310	ppbv	99
96) 1,2-Dichlorobenzene	14.146	146	308617	4.6483985	ppbv	99
97) 1,2-DIBROMO-3-CHLOROPR...	14.987	157	139469	4.1980233	ppbv	97
98) 1,2,4-Trichlorobenzene	15.877	180	231986	3.7688437	ppbv	99
99) Hexachloro-1,3-Butadiene	15.962	225	260606	3.7682351	ppbv	99
100) Naphthalene	16.212	128	536676	3.9953482	ppbv	99
101) TPH (GC/MS) Low Fraction	10.430	TIC	42540281m	274.9130615	ppbv	
102) TPH-GRO (C5-C10)	11.493	TIC	49190518m	389.9775110	ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_14.D
Acq On : 25 Jul 2022 5:20 pm
Operator :
Sample : SSCV AMS 5.0 ppbv 22G05896
Misc :
ALS Vial : 14 Sample Multiplier: 1
InstName : AIRMS7

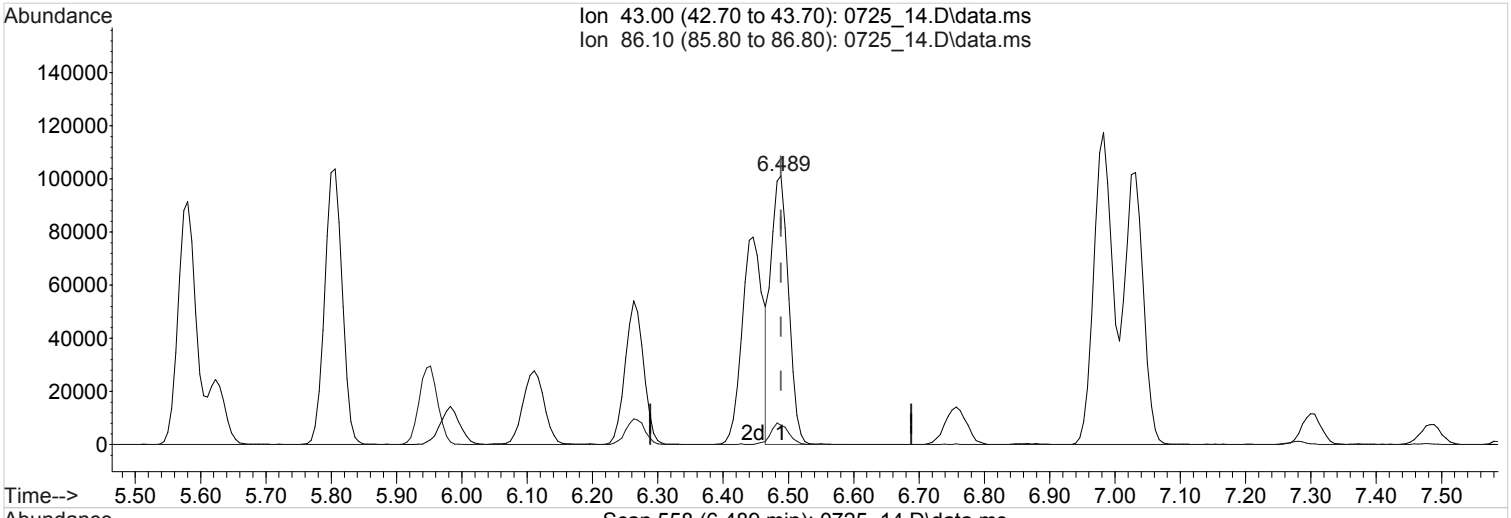
Quant Time: Jul 26 08:27:02 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

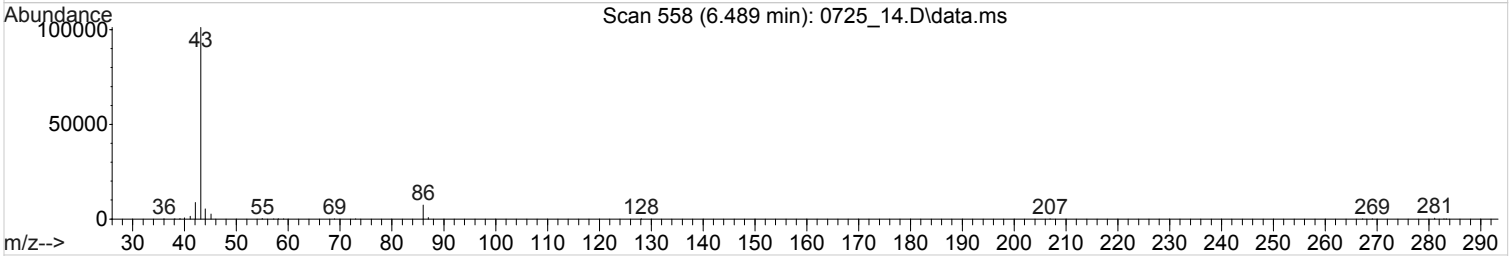


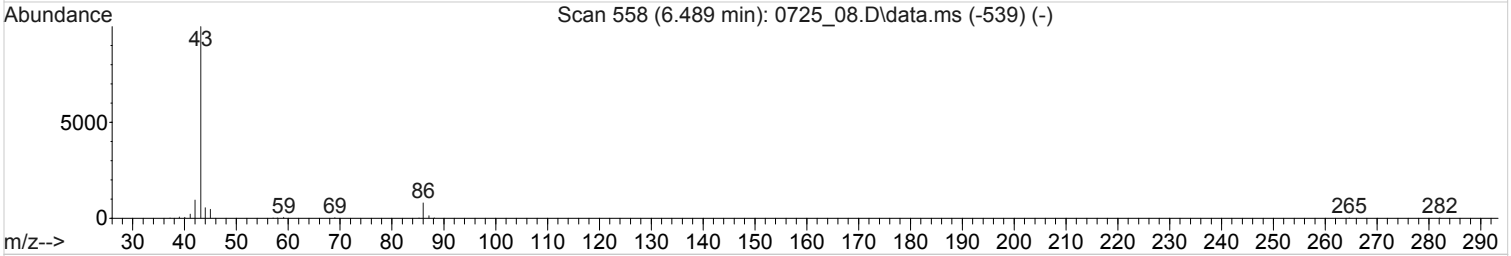
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_14.D
Acq On : 25 Jul 2022 5:20 pm
Operator :
Sample : SSCV AMS 5.0 ppbv 22G05896
Misc :
ALS Vial : 14 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 08:26:01 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration







TIC: 0725_14.D\data.ms

(35) Vinyl Acetate (T,M)

6.489min (+0.000) 2.4036723 ppbv

Qvalue = 98

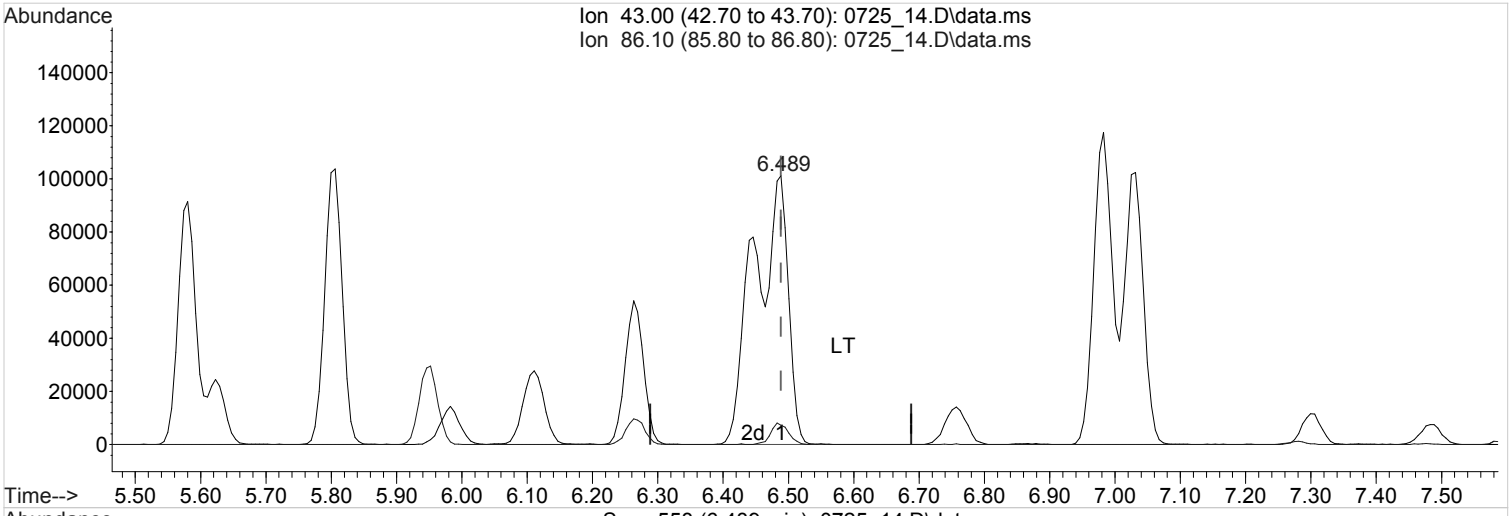
response 190524

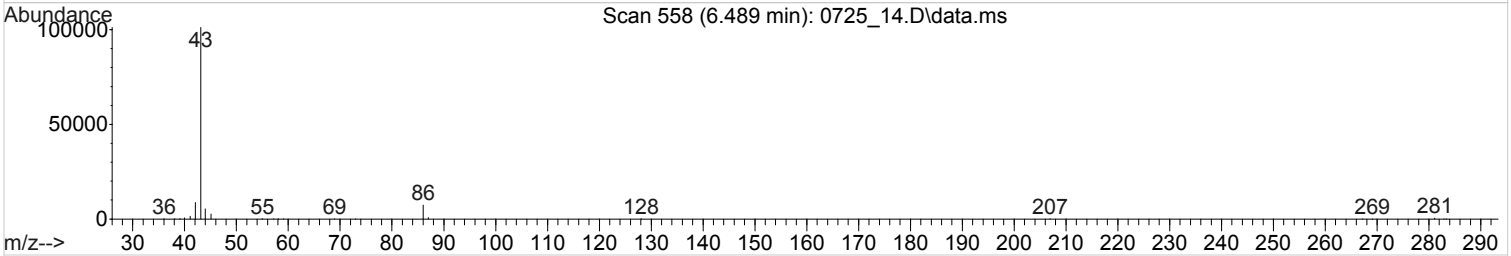
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	8.08
0.00	0.00	0.00
0.00	0.00	0.00

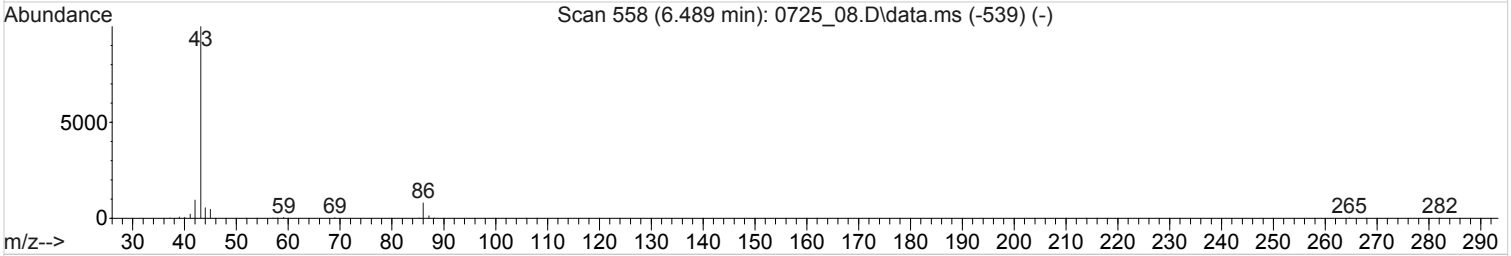
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072522\
Data File : 0725_14.D
Acq On : 25 Jul 2022 5:20 pm
Operator :
Sample : SSCV AMS 5.0 ppbv 22G05896
Misc :
ALS Vial : 14 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 08:26:01 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration







TIC: 0725_14.D\data.ms

(35) Vinyl Acetate (T,M)

6.489min (+0.000) 4.5869285 ppbv m

response 363577

Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.23#
0.00	0.00	0.00
0.00	0.00	0.00

7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/25/22 10:08
Instrument ID:	AIRMS7	**Calibration (end) date/time:**	07/25/22 16:02
Lab File ID:	0726_01	**Analysis date/time:**	07/26/22 07:45
Analytical Method:	TO-15	**Sample ID:**	ICV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
1,1,1-TRICHLOROETHANE	0.686117	0.65270020		4.87		3.75	3.567	95.10	70 - 130
1,1,2,2-TETRACHLOROETHANE	0.244284	0.23048350		5.65		3.75	3.538	94.30	70 - 130
1,1,2-TRICHLOROETHANE	0.095459	0.09068697		5		3.75	3.563	95	70 - 130
1,1,2-TRICHLOROTRIFLUOROETHANE	0.656275	0.62691370		4.47		3.75	3.582	95.50	70 - 130
1,1-DICHLOROETHANE	0.593062	0.58386830		1.55		3.75	3.692	98.50	70 - 130
1,1-DICHLOROETHENE	0.530570	0.51460950		3.01		3.75	3.637	97	70 - 130
1,2,4-TRICHLOROBENZENE	0.247324	0.23790360		3.81		3.75	3.607	96.20	70 - 130
1,2,4-TRIMETHYLBENZENE	0.382461	0.39487970		3.25		3.75	3.872	103	70 - 130
1,2-DIBROMOETHANE	0.148182	0.14356540		3.12		3.75	3.633	96.90	70 - 130
1,2-DICHLOROBENZENE	0.266765	0.26419080		0.9650		3.75	3.714	99	70 - 130
1,2-DICHLOROETHANE	0.107630	0.10040110		6.72		3.75	3.498	93.30	70 - 130
1,2-DICHLOROPROPANE	0.086578	0.08483107		2.02		3.75	3.674	98	70 - 130
1,2-DICHLOROTETRAFLUOROETHANE	0.774136	0.74450520		3.83		3.75	3.606	96.20	70 - 130
1,3,5-TRIMETHYLBENZENE	0.391991	0.38654120		1.39		3.75	3.698	98.60	70 - 130
1,3-BUTADIENE	0.265591	0.24177030		8.97		3.75	3.414	91	70 - 130
1,3-DICHLOROBENZENE	0.275366	0.27138820		1.44		3.75	3.696	98.60	70 - 130
1,4-DICHLOROBENZENE	0.275371	0.27117050		1.53		3.75	3.693	98.50	70 - 130
1,4-DIOXANE	0.042456	0.04095765		3.53		3.75	3.618	96.50	70 - 130
2,2,4-TRIMETHYLPENTANE	1.352775	1.393344		3		3.75	3.862	103	70 - 130
2-BUTANONE (MEK)	0.145892	0.14351380		1.63		3.75	3.689	98.40	70 - 130
2-CHLOROTOLUENE	0.386562	0.37833240		2.13		3.75	3.670	97.90	70 - 130
2-PROPANOL	0.553321	0.53632620		3.07		3.75	3.635	96.90	70 - 130
4-ETHYLTOLUENE	0.447065	0.45493590		1.76		3.75	3.816	102	70 - 130
4-METHYL-2-PENTANONE (MIBK)	0.169329	0.16311790		3.67		3.75	3.612	96.30	70 - 130
ACETONE	0.571761	0.53192660		6.97		3.75	3.489	93	70 - 130
ALLYL CHLORIDE	0.471680	0.46244960		1.96		3.75	3.677	98.10	70 - 130
BENZENE	0.2212	0.21281820		3.79		3.75	3.608	96.20	70 - 130
BENZYL CHLORIDE	0.346502	0.33935630		2.06		3.75	3.673	97.90	70 - 130
BROMODICHLOROMETHANE	0.172547	0.16296240		5.55		3.75	3.542	94.50	70 - 130
BROMOFORM	0.184988	0.17530740		5.23		3.75	3.554	94.80	70 - 130
BROMOMETHANE	0.311779	0.29884890		4.15		3.75	3.594	95.80	70 - 130
CARBON DISULFIDE	1.035843	1.021739		1.36		3.75	3.699	98.60	70 - 130
CARBON TETRACHLORIDE	0.702284	0.66497740		5.31		3.75	3.551	94.70	70 - 130
CHLOROBENZENE	0.213492	0.20056440		6.06		3.75	3.523	93.90	70 - 130
CHLORODIBROMOMETHANE	0.173356	0.16429720		5.23		3.75	3.554	94.80	70 - 130
CHLOROETHANE	0.150367	0.14229630		5.37		3.75	3.549	94.60	70 - 130
CHLOROFORM	0.628797	0.60029770		4.53		3.75	3.580	95.50	70 - 130
CHLOROMETHANE	0.283807	0.28749820		1.30		3.75	3.799	101	70 - 130
CIS-1,2-DICHLOROETHENE	0.442166	0.43430080		1.78		3.75	3.683	98.20	70 - 130
CIS-1,3-DICHLOROPROPENE	0.131697	0.13116170		0.4060		3.75	3.735	99.60	70 - 130
CYCLOHEXANE	0.323583	0.32873420		1.59		3.75	3.810	102	70 - 130
DICHLORODIFLUOROMETHANE	0.700919	0.58767130		16.20		3.75	3.144	83.80	70 - 130
ETHANOL	0.135794	0.111921		17.60		3.75	3.091	82.40	70 - 130
ETHYLBENZENE	0.364889	0.36095980		1.08		3.75	3.710	98.90	70 - 130
HEPTANE	0.208996	0.20863380		0.1730		3.75	3.743	99.80	70 - 130
HEXACHLORO-1,3-BUTADIENE	0.277881	0.26380330		5.07		3.75	3.560	94.90	70 - 130

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/25/22 10:08
Instrument ID:	AIRMS7	**Calibration (end) date/time:**	07/25/22 16:02
Lab File ID:	0726_01	**Analysis date/time:**	07/26/22 07:45
Analytical Method:	TO-15	**Sample ID:**	ICV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
ISOPROPYLBENZENE	0.378028	0.39217620		3.74		3.75	3.890	104	70 - 130
M&P-XYLENE	0.278095	0.28082050		0.98		7.50	7.574	101	70 - 130
METHYL BUTYL KETONE	0.157805	0.14338540		9.14		3.75	3.407	90.90	70 - 130
METHYL METHACRYLATE	0.081787	0.08045046		1.63		3.75	3.689	98.40	70 - 130
METHYL TERT-BUTYL ETHER	0.772231	0.76826890		0.5130		3.75	3.731	99.50	70 - 130
METHYLENE CHLORIDE	0.450387	0.35730510		20.70		3.75	3.528	94.10	70 - 130
N-HEXANE	0.427211	0.44739780		4.73		3.75	3.927	105	70 - 130
NAPHTHALENE	0.539723	0.52505780		2.72		3.75	3.648	97.30	70 - 130
O-XYLENE	0.271267	0.270188		0.3980		3.75	3.735	99.60	70 - 130
PROPENE	0.269724	0.26441840		1.97		3.75	3.676	98	70 - 130
STYRENE	0.234686	0.24246030		3.31		3.75	3.874	103	70 - 130
TETRACHLOROETHENE	0.132430	0.12339640		6.82		3.75	3.494	93.20	70 - 130
TETRAHYDROFURAN	0.316931	0.32203540		1.61		3.75	3.810	102	70 - 130
TOLUENE	0.267335	0.26168160		2.11		3.75	3.671	97.90	70 - 130
TRANS-1,2-DICHLOROETHENE	0.480684	0.46991490		2.24		3.75	3.666	97.80	70 - 130
TRANS-1,3-DICHLOROPROPENE	0.127827	0.12320380		3.62		3.75	3.614	96.40	70 - 130
TRICHLOROETHENE	0.097367	0.09476579		2.67		3.75	3.650	97.30	70 - 130
TRICHLOROFLUOROMETHANE	0.909504	0.85937540		5.51		3.75	3.543	94.50	70 - 130
VINYL ACETATE	1.215757	1.203836		0.9810		3.75	3.713	99	70 - 130
VINYL BROMIDE	0.312773	0.30153130		3.59		3.75	3.615	96.40	70 - 130
VINYL CHLORIDE	0.325837	0.32194320		1.20		3.75	3.705	98.80	70 - 130
1,4-BROMOFLUOROBENZENE	0.734350	0.73353270		0.1110		4	3.996	99.90	60 - 140

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_01.D
Acq On : 26 Jul 2022 7:45 am
Operator :
Sample : ICV AMS 3.75 ppbv
Misc :
ALS Vial : 1 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 08:33:11 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.275	130	219898	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.092	114	918959	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.152	117	847864	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	621936	3.9955506	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 99.89%				
Target Compounds						Qvalue	
2) Propene	3.861	41	54511	3.6762391	ppbv		97
3) BUTANE	4.257	43	181560	4.1738845	ppbv		99
4) 1,1-DIFLUOROETHANE	3.861	65	37126	3.5709413	ppbv		96
5) Dichlorodifluoromethane	3.904	85	121151	3.1441105	ppbv		99
6) CHLORODIFLUOROMETHANE	3.928	67	16963	3.6281429	ppbv		100
7) 1,2-Dichlorotetrafluor...	4.056	85	153483	3.6064670	ppbv		99
8) Chloromethane	4.172	50	59269	3.7987666	ppbv		100
9) Vinyl Chloride	4.294	62	66370	3.7051859	ppbv		99
10) 1,3-Butadiene	4.318	39	49842	3.4136654	ppbv		98
11) Bromomethane	4.684	94	61609	3.5944834	ppbv		99
12) Chloroethane	4.775	64	29335	3.5487270	ppbv		97
13) ISOPENTANE	4.788	43	64077	3.5244219	ppbv		97
14) Vinyl Bromide	4.964	106	62162	3.6152143	ppbv		99
15) Trichlorofluoromethane	4.989	101	177164	3.5433128	ppbv		100
16) PENTANE	5.025	43	99955	3.5577690	ppbv		99
17) Ethanol	5.153	45	23073	3.0907375	ppbv		100
18) ACROLEIN	5.446	56	27179	3.6389455	ppbv		98
19) 1,1,2-Trichlorotrifluo...	5.409	101	129241	3.5822271	ppbv		99
20) 1,1-Dichloroethene	5.495	61	106089	3.6371909	ppbv		99
21) Acetone	5.580	43	109659	3.4887359	ppbv		100
22) BROMOETHANE	5.690	108	50489	3.5920796	ppbv		97
23) 2-Propanol	5.623	45	110566	3.6348237	ppbv		94
24) Carbon Disulfide	5.775	76	210636	3.6989416	ppbv		99
25) Allyl Chloride	5.818	41	95336	3.6766168	ppbv		97
26) METHYL ACETATE	5.806	43	123626	3.6286704	ppbv	#	99
27) ACETONITRILE	5.873	41	262419	18.6838675	ppbv		99
28) Methylene Chloride	5.946	49	73660	3.5276812	ppbv		99
29) TERT-BUTYL ALCOHOL	5.982	59	124202	3.6779041	ppbv		99
30) Methyl Tert-Butyl Ether	6.111	73	158382	3.7307586	ppbv		100
31) Trans-1,2-Dichloroethene	6.147	61	96875	3.6659888	ppbv		99
32) ACRYLONITRILE	6.196	53	53434	3.7081746	ppbv		97
33) n-Hexane	6.263	57	92233	3.9271949	ppbv		97
34) 1,1-Dichloroethane	6.543	63	120367	3.6918646	ppbv		99
35) Vinyl Acetate	6.482	43	248176m	3.7132285	ppbv		
36) DI-ISOPROPYL ETHER	6.446	45	188822	3.8279469	ppbv		92
37) ETHYL TERT-BUTYL ETHER	6.757	59	192795	3.8314822	ppbv		99
38) ETHYL ACETATE	6.976	45	20741	3.7154285	ppbv		94
39) 2-Butanone (MEK)	7.031	72	29586	3.6888635	ppbv		96
40) cis-1,2-Dichloroethene	7.043	61	89533	3.6832975	ppbv		98
41) Tetrahydrofuran	7.299	42	66389	3.8103938	ppbv		98
42) Chloroform	7.275	83	123754	3.5800365	ppbv		100
43) Cyclohexane	7.482	84	67770	3.8097017	ppbv		98
44) 1,1,1-Trichloroethane	7.470	97	134557	3.5673590	ppbv		100
45) Carbon Tetrachloride	7.598	117	137088	3.5507930	ppbv		100
46) 2,2,4-Trimethylpentane	7.702	57	287244	3.8624603	ppbv		97

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_01.D
Acq On : 26 Jul 2022 7:45 am
Operator :
Sample : ICV AMS 3.75 ppbv
Misc :
ALS Vial : 1 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 08:33:11 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

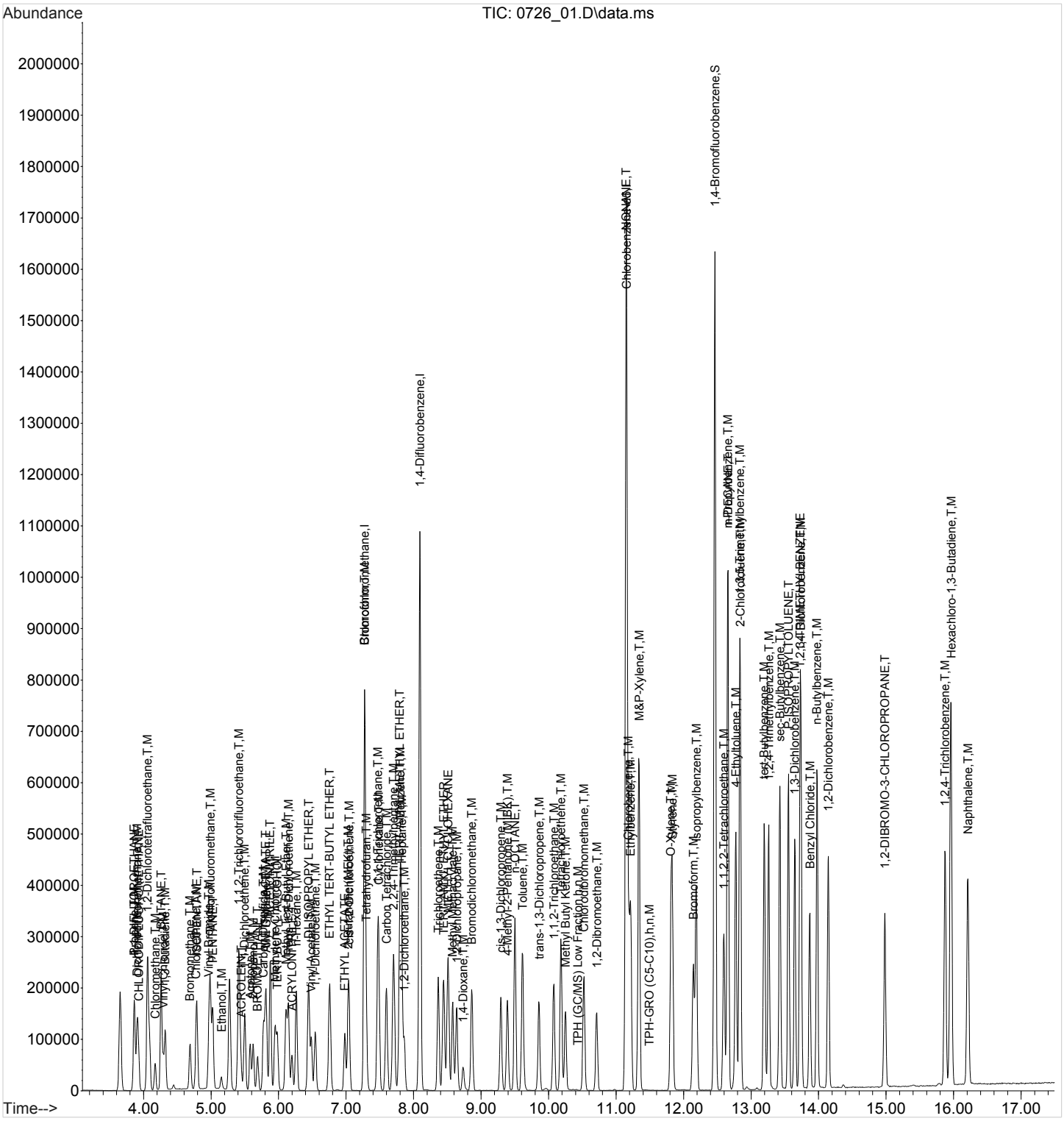
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48) Benzene	7.805	78	183348	3.6079002	ppbv	98
49) TERT-AMYL METHYL ETHER	7.793	73	174381	3.6933140	ppbv	96
50) 1,2-Dichloroethane	7.860	62	86498	3.4981494	ppbv	99
51) Heptane	7.824	43	179743	3.7434962	ppbv	98
52) Trichloroethene	8.366	95	81643	3.6498129	ppbv	100
53) TERT-AMYL ETHYL ETHER	8.445	73	54198	3.5086123	ppbv	97
54) METHYL CYCLOHEXANE	8.512	83	117057	3.8088287	ppbv	97
55) 1,2-Dichloropropane	8.641	63	73084	3.6743293	ppbv	99
56) Methyl Methacrylate	8.580	69	69310	3.6887113	ppbv	99
57) 1,4-Dioxane	8.732	88	35286	3.6176182	ppbv	95
58) Bromodichloromethane	8.860	83	140396	3.5416958	ppbv	100
59) cis-1,3-Dichloropropene	9.293	75	112999	3.7347662	ppbv	97
60) 4-Methyl-2-Pentanone (...	9.390	43	140530	3.6124447	ppbv	100
61) n-OCTANE	9.500	43	174588	3.8450340	ppbv	98
62) Toluene	9.616	91	225445	3.6706937	ppbv	98
63) trans-1,3-Dichloropropene	9.860	75	106143	3.6143678	ppbv	98
64) 1,1,2-Trichloroethane	10.079	97	78129	3.5625407	ppbv	97
65) Tetrachloroethene	10.183	166	106309	3.4941996	ppbv	99
66) Methyl Butyl Ketone	10.250	43	123530	3.4073319	ppbv	98
67) Chlorodibromomethane	10.524	129	141546	3.5540341	ppbv	99
68) 1,2-Dibromoethane	10.713	107	123685	3.6331602	ppbv	99
69) Chlorobenzene	11.183	112	172791	3.5229291	ppbv	99
70) NONANE	11.146	43	184525	3.6932810	ppbv	100
72) Ethylbenzene	11.213	91	286917	3.7096166	ppbv	99
73) M&P-Xylene	11.341	91	446433	7.5735070	ppbv	99
74) O-Xylene	11.811	91	214765	3.7350865	ppbv	99
77) Styrene	11.835	104	192725	3.8742187	ppbv	98
78) Bromoform	12.146	173	139347	3.5537651	ppbv	99
79) Isopropylbenzene	12.189	105	311730	3.8903441	ppbv	99
80) n-DECANE	12.658	43	212172	3.9198491	ppbv	99
81) 1,1,2,2-Tetrachloroethane	12.597	83	183205	3.5381507	ppbv	99
82) n-Propylbenzene	12.652	91	444998	3.7650549	ppbv	100
83) 4-Ethyltoluene	12.774	105	361616	3.8160242	ppbv	99
84) 2-Chlorotoluene	12.841	91	300726	3.6701687	ppbv	100
86) 1,3,5-Trimethylbenzene	12.835	105	307251	3.6978686	ppbv	100
87) tert-Butylbenzene	13.195	119	281162	3.7827159	ppbv	100
88) 1,2,4-Trimethylbenzene	13.262	105	313879	3.8717598	ppbv	100
89) sec-Butylbenzene	13.426	105	449363	3.8736320	ppbv	100
90) 1,3-Dichlorobenzene	13.646	146	215719	3.6958226	ppbv	99
91) P-ISOPROPYLTOLUENE	13.554	119	382224	3.8532266	ppbv	99
92) 1,4-Dichlorobenzene	13.737	146	215546	3.6927940	ppbv	99
93) 1,2,3-TRIMETHYLBENZENE	13.725	105	316269	3.7617374	ppbv	100
94) Benzyl Chloride	13.871	91	269745	3.6726675	ppbv	99
95) n-Butylbenzene	13.975	91	382767	3.8554205	ppbv	99
96) 1,2-Dichlorobenzene	14.146	146	209998	3.7138076	ppbv	99
97) 1,2-DIBROMO-3-CHLOROPR...	14.981	157	102879	3.6359226	ppbv	98
98) 1,2,4-Trichlorobenzene	15.871	180	189103	3.6071609	ppbv	100
99) Hexachloro-1,3-Butadiene	15.962	225	209690	3.5600167	ppbv	99
100) Naphthalene	16.212	128	417354	3.6481088	ppbv	99
101) TPH (GC/MS) Low Fraction	10.430	TIC	26504142m	201.1080769	ppbv	
102) TPH-GRO (C5-C10)	11.493	TIC	30721882m	285.9741166	ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_01.D
Acq On : 26 Jul 2022 7:45 am
Operator :
Sample : ICV AMS 3.75 ppbv
Misc :
ALS Vial : 1 Sample Multiplier: 1
InstName : AIRMS7

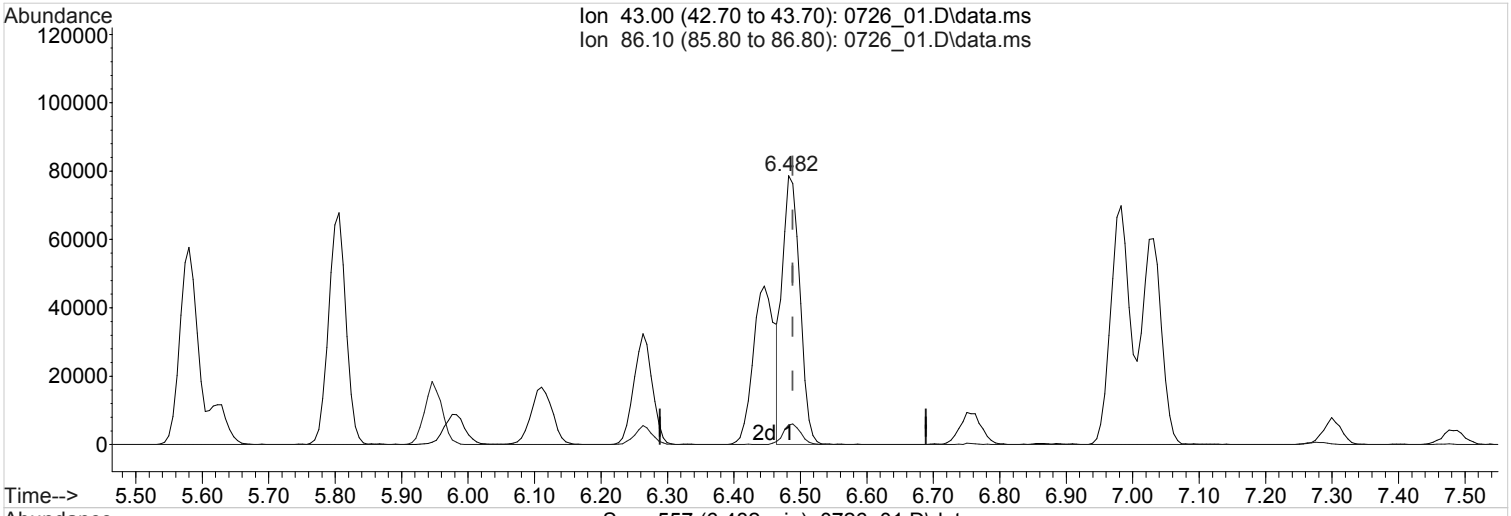
Quant Time: Jul 26 08:33:11 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

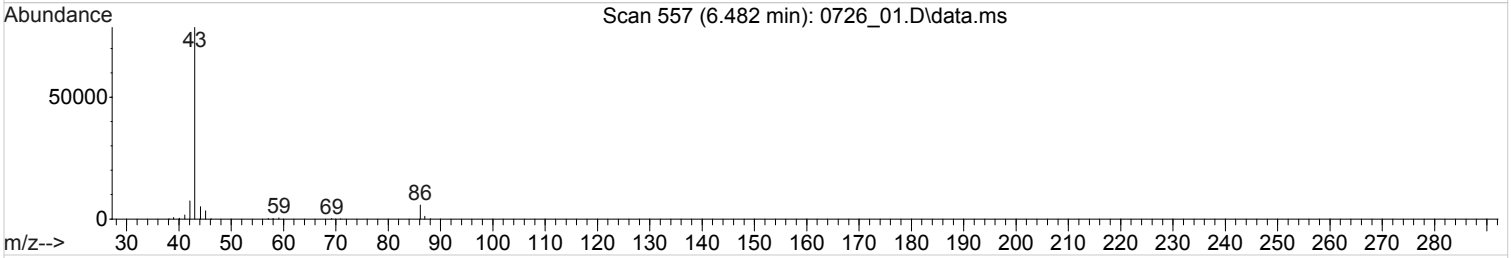


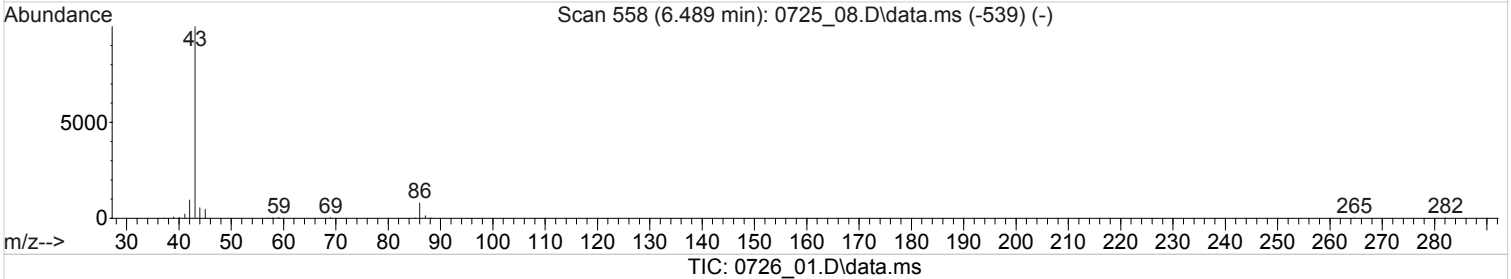
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_01.D
Acq On : 26 Jul 2022 7:45 am
Operator :
Sample : ICV AMS 3.75 ppbv
Misc :
ALS Vial : 1 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 08:32:26 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration







TIC: 0726_01.D\data.ms

(35) Vinyl Acetate (T,M)

6.482min (-0.006) 2.1416119 ppbv

Qvalue = 99

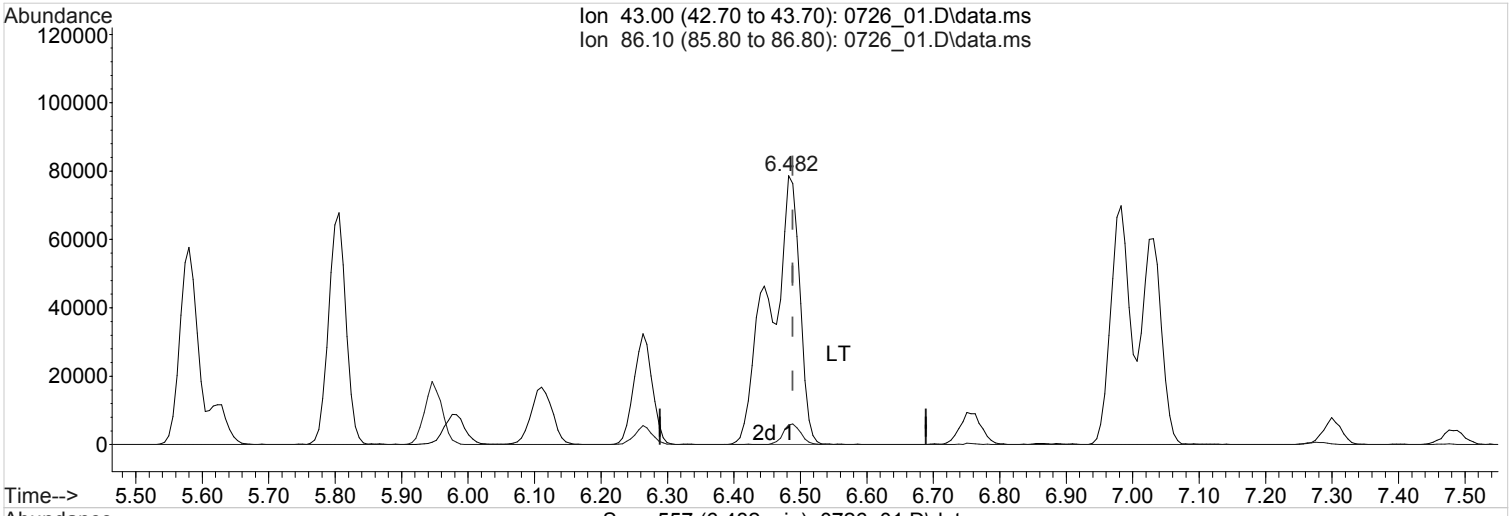
response 143136

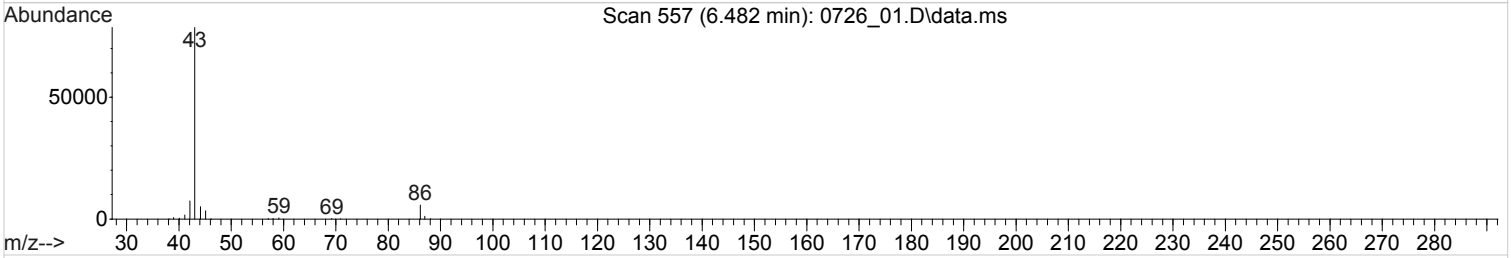
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	7.96
0.00	0.00	0.00
0.00	0.00	0.00

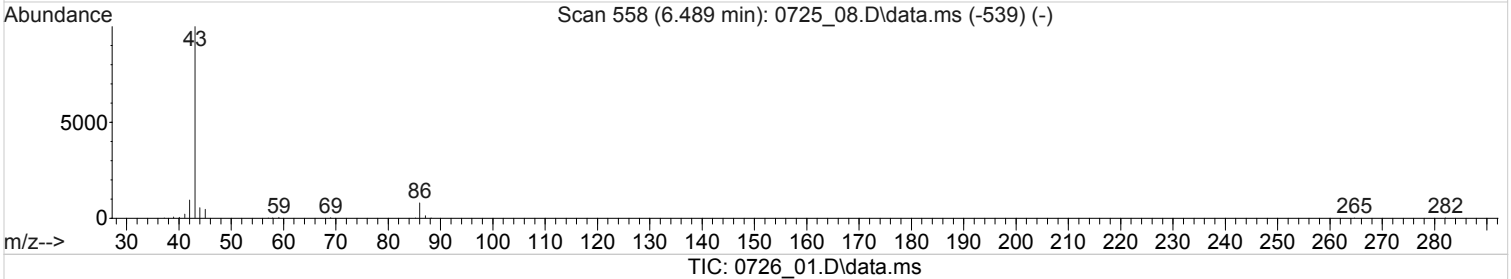
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_01.D
Acq On : 26 Jul 2022 7:45 am
Operator :
Sample : ICV AMS 3.75 ppbv
Misc :
ALS Vial : 1 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 08:32:26 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration







TIC: 0726_01.D\data.ms

(35) Vinyl Acetate (T,M)

6.482min (-0.006) 3.7132285 ppbv m

response 248176

Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.59#
0.00	0.00	0.00
0.00	0.00	0.00

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/25/22 10:08
Instrument ID:	AIRMS7	**Calibration (end) date/time:**	07/25/22 16:02
Lab File ID:	0726_26	**Analysis date/time:**	07/27/22 01:22
Analytical Method:	TO-15	**Sample ID:**	CCV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
1,1,1-TRICHLOROETHANE	0.686117	0.70523280		2.79		3.75	3.854	103	70 - 130
1,1,2,2-TETRACHLOROETHANE	0.244284	0.24707950		1.14		3.75	3.793	101	70 - 130
1,1,2-TRICHLOROETHANE	0.095459	0.10169430		6.53		3.75	3.995	107	70 - 130
1,1,2-TRICHLOROTRIFLUOROETHANE	0.656275	0.672249		2.43		3.75	3.841	102	70 - 130
1,1-DICHLOROETHANE	0.593062	0.61897120		4.37		3.75	3.914	104	70 - 130
1,1-DICHLOROETHENE	0.530570	0.55117450		3.88		3.75	3.896	104	70 - 130
1,2,4-TRICHLOROBENZENE	0.247324	0.24304830		1.73		3.75	3.685	98.30	70 - 130
1,2,4-TRIMETHYLBENZENE	0.382461	0.41848580		9.42		3.75	4.103	109	70 - 130
1,2-DIBROMOETHANE	0.148182	0.15624450		5.44		3.75	3.954	105	70 - 130
1,2-DICHLOROBENZENE	0.266765	0.28070290		5.22		3.75	3.946	105	70 - 130
1,2-DICHLOROETHANE	0.107630	0.11401630		5.93		3.75	3.973	106	70 - 130
1,2-DICHLOROPROPANE	0.086578	0.09180637		6.04		3.75	3.976	106	70 - 130
1,2-DICHLOROTETRAFLUOROETHANE	0.774136	0.75712750		2.20		3.75	3.668	97.80	70 - 130
1,3,5-TRIMETHYLBENZENE	0.391991	0.41591280		6.10		3.75	3.979	106	70 - 130
1,3-BUTADIENE	0.265591	0.25782520		2.92		3.75	3.640	97.10	70 - 130
1,3-DICHLOROBENZENE	0.275366	0.28727330		4.32		3.75	3.912	104	70 - 130
1,4-DICHLOROBENZENE	0.275371	0.28534990		3.62		3.75	3.886	104	70 - 130
1,4-DIOXANE	0.042456	0.04229804		0.3720		3.75	3.736	99.60	70 - 130
2,2,4-TRIMETHYLPENTANE	1.352775	1.445177		6.83		3.75	4.006	107	70 - 130
2-BUTANONE (MEK)	0.145892	0.15308740		4.93		3.75	3.935	105	70 - 130
2-CHLOROTOLUENE	0.386562	0.40662320		5.19		3.75	3.945	105	70 - 130
2-PROPANOL	0.553321	0.56532650		2.17		3.75	3.831	102	70 - 130
4-ETHYLTOLUENE	0.447065	0.47104240		5.36		3.75	3.951	105	70 - 130
4-METHYL-2-PENTANONE (MIBK)	0.169329	0.18014650		6.39		3.75	3.990	106	70 - 130
ACETONE	0.571761	0.56254350		1.61		3.75	3.690	98.40	70 - 130
ALLYL CHLORIDE	0.471680	0.50144740		6.31		3.75	3.987	106	70 - 130
BENZENE	0.2212	0.23326620		5.45		3.75	3.955	105	70 - 130
BENZYL CHLORIDE	0.346502	0.35726990		3.11		3.75	3.867	103	70 - 130
BROMODICHLOROMETHANE	0.172547	0.17886660		3.66		3.75	3.887	104	70 - 130
BROMOFORM	0.184988	0.18525080		0.1420		3.75	3.755	100	70 - 130
BROMOMETHANE	0.311779	0.31082070		0.3070		3.75	3.738	99.70	70 - 130
CARBON DISULFIDE	1.035843	1.080429		4.30		3.75	3.911	104	70 - 130
CARBON TETRACHLORIDE	0.702284	0.73417480		4.54		3.75	3.920	105	70 - 130
CHLOROBENZENE	0.213492	0.216224		1.28		3.75	3.798	101	70 - 130
CHLORODIBROMOMETHANE	0.173356	0.18056410		4.16		3.75	3.906	104	70 - 130
CHLOROETHANE	0.150367	0.15005040		0.2110		3.75	3.742	99.80	70 - 130
CHLOROFORM	0.628797	0.64927360		3.26		3.75	3.872	103	70 - 130
CHLOROMETHANE	0.283807	0.29610410		4.33		3.75	3.912	104	70 - 130
CIS-1,2-DICHLOROETHENE	0.442166	0.47170380		6.68		3.75	4.001	107	70 - 130
CIS-1,3-DICHLOROPROPENE	0.131697	0.13969390		6.07		3.75	3.978	106	70 - 130
CYCLOHEXANE	0.323583	0.35390350		9.37		3.75	4.101	109	70 - 130
DICHLORODIFLUOROMETHANE	0.700919	0.63286360		9.71		3.75	3.386	90.30	70 - 130
ETHANOL	0.135794	0.119968		11.70		3.75	3.313	88.30	70 - 130
ETHYLBENZENE	0.364889	0.38284980		4.92		3.75	3.935	105	70 - 130
HEPTANE	0.208996	0.22907170		9.61		3.75	4.110	110	70 - 130
HEXACHLORO-1,3-BUTADIENE	0.277881	0.28296420		1.83		3.75	3.819	102	70 - 130

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/25/22 10:08
Instrument ID:	AIRMS7	**Calibration (end) date/time:**	07/25/22 16:02
Lab File ID:	0726_26	**Analysis date/time:**	07/27/22 01:22
Analytical Method:	TO-15	**Sample ID:**	CCV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
ISOPROPYLBENZENE	0.378028	0.40598250		7.39		3.75	4.027	107	70 - 130
M&P-XYLENE	0.278095	0.30183610		8.54		7.50	8.140	109	70 - 130
METHYL BUTYL KETONE	0.157805	0.16382860		3.82		3.75	3.893	104	70 - 130
METHYL METHACRYLATE	0.081787	0.08539965		4.42		3.75	3.916	104	70 - 130
METHYL TERT-BUTYL ETHER	0.772231	0.80627870		4.41		3.75	3.915	104	70 - 130
METHYLENE CHLORIDE	0.450387	0.38561160		14.40		3.75	3.871	103	70 - 130
N-HEXANE	0.427211	0.456005		6.74		3.75	4.003	107	70 - 130
NAPHTHALENE	0.539723	0.52440490		2.84		3.75	3.644	97.20	70 - 130
O-XYLENE	0.271267	0.28850780		6.36		3.75	3.988	106	70 - 130
PROPENE	0.269724	0.27117570		0.5380		3.75	3.770	101	70 - 130
STYRENE	0.234686	0.26314010		12.10		3.75	4.205	112	70 - 130
TETRACHLOROETHENE	0.132430	0.137238		3.63		3.75	3.886	104	70 - 130
TETRAHYDROFURAN	0.316931	0.33929980		7.06		3.75	4.015	107	70 - 130
TOLUENE	0.267335	0.28262260		5.72		3.75	3.964	106	70 - 130
TRANS-1,2-DICHLOROETHENE	0.480684	0.51249470		6.62		3.75	3.998	107	70 - 130
TRANS-1,3-DICHLOROPROPENE	0.127827	0.134370		5.12		3.75	3.942	105	70 - 130
TRICHLOROETHENE	0.097367	0.10129460		4.03		3.75	3.901	104	70 - 130
TRICHLOROFLUOROMETHANE	0.909504	0.93258610		2.54		3.75	3.845	103	70 - 130
VINYL ACETATE	1.215757	0.80822060		33.50		3.75	2.493	66.50	70 - 130
VINYL BROMIDE	0.312773	0.30923440		1.13		3.75	3.708	98.90	70 - 130
VINYL CHLORIDE	0.325837	0.33038060		1.39		3.75	3.802	101	70 - 130
1,4-BROMOFLUOROBENZENE	0.734350	0.72678820		1.03		4	3.959	99	60 - 140

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_26.D
Acq On : 27 Jul 2022 1:22 am
Operator :
Sample : CCV AMS 3.75 ppbv
Misc :
ALS Vial : 26 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 14:27:56 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.281	130	188957	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	779182	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.158	117	729240	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	530003	3.9588129	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 98.97%				
Target Compounds							Qvalue
2) Propene	3.861	41	48038	3.7701863	ppbv		99
3) BUTANE	4.263	43	164904	4.4117382	ppbv		99
4) 1,1-DIFLUOROETHANE	3.867	65	32176	3.6015952	ppbv		92
5) Dichlorodifluoromethane	3.904	85	112110	3.3858946	ppbv		100
6) CHLORODIFLUOROMETHANE	3.928	67	15043	3.7443331	ppbv		96
7) 1,2-Dichlorotetrafluor...	4.062	85	134123	3.6676108	ppbv		99
8) Chloromethane	4.178	50	52454	3.9124781	ppbv		100
9) Vinyl Chloride	4.294	62	58526	3.8022907	ppbv		98
10) 1,3-Butadiene	4.324	39	45673	3.6403515	ppbv		97
11) Bromomethane	4.696	94	55061	3.7384770	ppbv		100
12) Chloroethane	4.782	64	26581	3.7421062	ppbv		100
13) ISOPENTANE	4.794	43	59718	3.8225156	ppbv		99
14) Vinyl Bromide	4.971	106	54780	3.7075703	ppbv		94
15) Trichlorofluoromethane	4.989	101	165205	3.8451696	ppbv		100
16) PENTANE	5.025	43	91033	3.7707728	ppbv		98
17) Ethanol	5.160	45	21252	3.3129597	ppbv		99
18) ACROLEIN	5.452	56	23977	3.7358998	ppbv		95
19) 1,1,2-Trichlorotrifluo...	5.416	101	119087	3.8412755	ppbv		100
20) 1,1-Dichloroethene	5.501	61	97639	3.8956269	ppbv		98
21) Acetone	5.586	43	99653	3.6895422	ppbv		98
22) BROMOETHANE	5.690	108	47589	3.9401619	ppbv		98
23) 2-Propanol	5.629	45	100146	3.8313661	ppbv		98
24) Carbon Disulfide	5.781	76	191395	3.9114137	ppbv		99
25) Allyl Chloride	5.824	41	88830	3.9866618	ppbv		100
26) METHYL ACETATE	5.806	43	117208	4.0036237	ppbv	#	100
27) ACETONITRILE	5.885	41	241921	20.0448756	ppbv		98
28) Methylene Chloride	5.952	49	68310	3.8707444	ppbv		99
29) TERT-BUTYL ALCOHOL	5.989	59	113384	3.9073461	ppbv		99
30) Methyl Tert-Butyl Ether	6.117	73	142830	3.9153361	ppbv		99
31) Trans-1,2-Dichloroethene	6.153	61	90787	3.9981711	ppbv		99
32) ACRYLONITRILE	6.202	53	49250	3.9774709	ppbv		99
33) n-Hexane	6.269	57	80780	4.0027482	ppbv		98
34) 1,1-Dichloroethane	6.550	63	109649	3.9138240	ppbv		100
35) Vinyl Acetate	6.489	43	143174	2.4929545	ppbv		100
36) DI-ISOPROPYL ETHER	6.452	45	171472	4.0454312	ppbv		97
37) ETHYL TERT-BUTYL ETHER	6.763	59	171505	3.9664878	ppbv		99
38) ETHYL ACETATE	6.982	45	19483	4.0615643	ppbv		94
39) 2-Butanone (MEK)	7.037	72	27119	3.9349416	ppbv		97
40) cis-1,2-Dichloroethene	7.049	61	83561	4.0005120	ppbv		99
41) Tetrahydrofuran	7.306	42	60106	4.0146700	ppbv		98
42) Chloroform	7.281	83	115017	3.8721176	ppbv		97
43) Cyclohexane	7.488	84	62693	4.1013878	ppbv		97
44) 1,1,1-Trichloroethane	7.476	97	124930	3.8544779	ppbv		99
45) Carbon Tetrachloride	7.598	117	130057	3.9202877	ppbv		99
46) 2,2,4-Trimethylpentane	7.708	57	256009	4.0061443	ppbv		100

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_26.D
Acq On : 27 Jul 2022 1:22 am
Operator :
Sample : CCV AMS 3.75 ppbv
Misc :
ALS Vial : 26 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 14:27:56 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

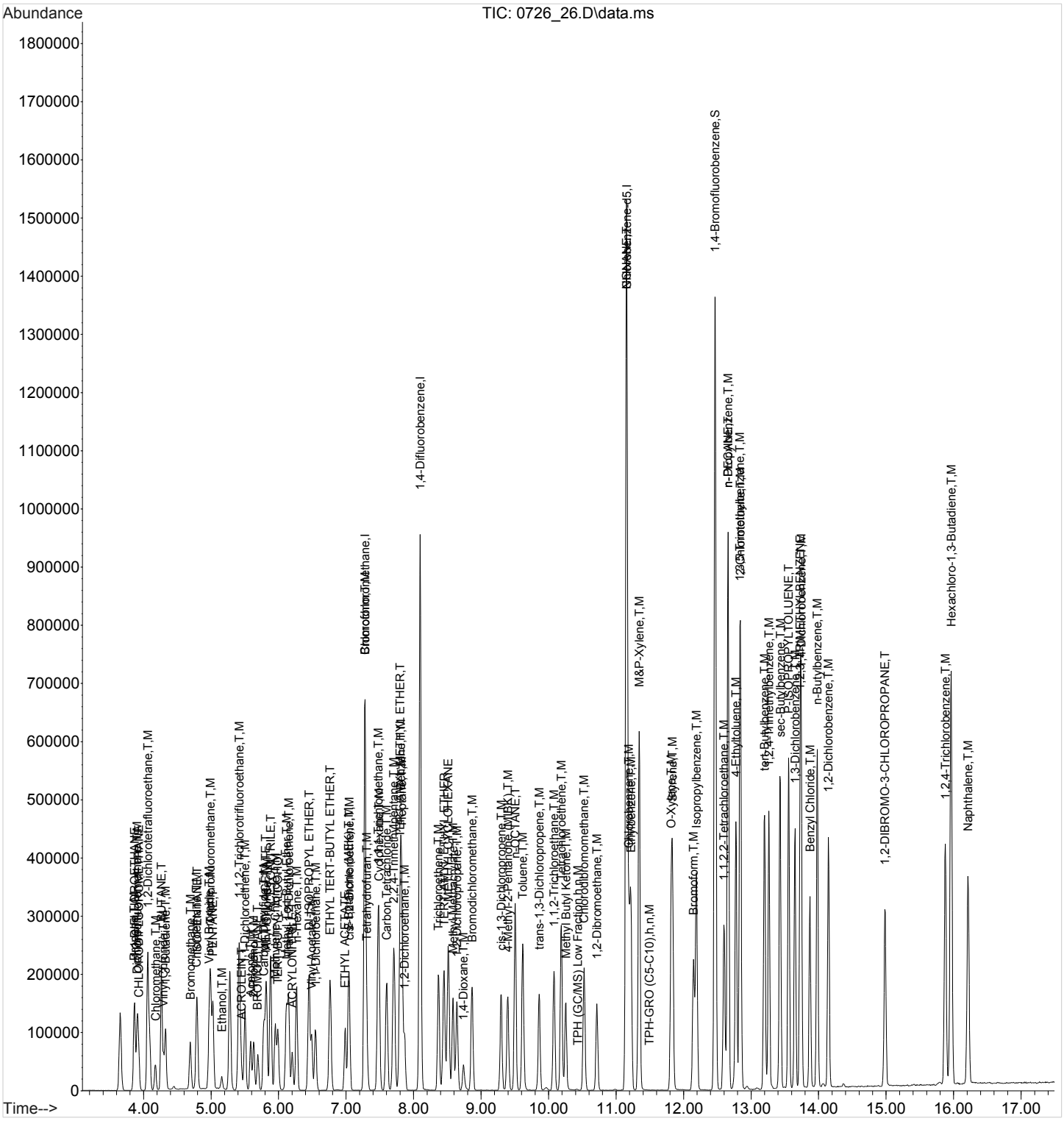
	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48)	Benzene	7.812	78	170397	3.9545540	ppbv	98
49)	TERT-AMYL METHYL ETHER	7.799	73	159088	3.9738522	ppbv	99
50)	1,2-Dichloroethane	7.866	62	83287	3.9725259	ppbv	98
51)	Heptane	7.824	43	167333	4.1102120	ppbv	99
52)	Trichloroethene	8.366	95	73994	3.9012643	ppbv	99
53)	TERT-AMYL ETHYL ETHER	8.452	73	50405	3.8484244	ppbv	99
54)	METHYL CYCLOHEXANE	8.513	83	106549	4.0888451	ppbv	99
55)	1,2-Dichloropropane	8.641	63	67063	3.9764541	ppbv	99
56)	Methyl Methacrylate	8.586	69	62383	3.9156354	ppbv	99
57)	1,4-Dioxane	8.738	88	30898	3.7360089	ppbv	97
58)	Bromodichloromethane	8.866	83	130659	3.8873449	ppbv	100
59)	cis-1,3-Dichloropropene	9.299	75	102044	3.9777136	ppbv	100
60)	4-Methyl-2-Pentanone (...	9.397	43	131594	3.9895644	ppbv	99
61)	n-OCTANE	9.506	43	163122	4.2369716	ppbv	98
62)	Toluene	9.616	91	206451	3.9644392	ppbv	100
63)	trans-1,3-Dichloropropene	9.860	75	98155	3.9419457	ppbv	100
64)	1,1,2-Trichloroethane	10.079	97	74286	3.9949538	ppbv	98
65)	Tetrachloroethene	10.189	166	100250	3.8861476	ppbv	99
66)	Methyl Butyl Ketone	10.256	43	119674	3.8931311	ppbv	100
67)	Chlorodibromomethane	10.524	129	131899	3.9059143	ppbv	99
68)	1,2-Dibromoethane	10.713	107	114134	3.9540284	ppbv	99
69)	Chlorobenzene	11.189	112	157948	3.7979928	ppbv	99
70)	NONANE	11.152	43	173038	4.0846594	ppbv	99
72)	Ethylbenzene	11.219	91	261740	3.9345816	ppbv	100
73)	M&P-Xylene	11.341	91	412708	8.1402799	ppbv	99
74)	O-Xylene	11.817	91	197242	3.9883409	ppbv	100
77)	Styrene	11.835	104	179899	4.2046567	ppbv	98
78)	Bromoform	12.146	173	126649	3.7553340	ppbv	99
79)	Isopropylbenzene	12.189	105	277555	4.0273019	ppbv	99
80)	n-DECANE	12.658	43	194933	4.1871871	ppbv	100
81)	1,1,2,2-Tetrachloroethane	12.597	83	168919	3.7929159	ppbv	100
82)	n-Propylbenzene	12.658	91	404300	3.9771568	ppbv	99
83)	4-Ethyltoluene	12.774	105	322034	3.9511264	ppbv	99
84)	2-Chlorotoluene	12.841	91	277993	3.9446150	ppbv	99
86)	1,3,5-Trimethylbenzene	12.835	105	284344	3.9788535	ppbv	100
87)	tert-Butylbenzene	13.201	119	256346	4.0098613	ppbv	99
88)	1,2,4-Trimethylbenzene	13.262	105	286103	4.1032150	ppbv	99
89)	sec-Butylbenzene	13.432	105	407556	4.0847366	ppbv	100
90)	1,3-Dichlorobenzene	13.652	146	196398	3.9121500	ppbv	99
91)	P-ISOPROPYLTOLUENE	13.554	119	344744	4.0407226	ppbv	99
92)	1,4-Dichlorobenzene	13.743	146	195083	3.8858878	ppbv	99
93)	1,2,3-TRIMETHYLBENZENE	13.725	105	289180	3.9990407	ppbv	98
94)	Benzyl Chloride	13.871	91	244252	3.8665359	ppbv	99
95)	n-Butylbenzene	13.981	91	350621	4.1061131	ppbv	100
96)	1,2-Dichlorobenzene	14.146	146	191906	3.9459222	ppbv	99
97)	1,2-DIBROMO-3-CHLOROPR...	14.981	157	94028	3.8636770	ppbv	100
98)	1,2,4-Trichlorobenzene	15.877	180	166163	3.6851666	ppbv	99
99)	Hexachloro-1,3-Butadiene	15.962	225	193452	3.8185919	ppbv	99
100)	Naphthalene	16.212	128	358516	3.6435728	ppbv	100
101)	TPH (GC/MS) Low Fraction	10.430	TIC	24997077m	220.5264628	ppbv	
102)	TPH-GRO (C5-C10)	11.493	TIC	28774884m	311.4212266	ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_26.D
Acq On : 27 Jul 2022 1:22 am
Operator :
Sample : CCV AMS 3.75 ppbv
Misc :
ALS Vial : 26 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 27 14:27:56 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration



7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/27/22 13:02
Instrument ID:	AIRMS9	**Calibration (end) date/time:**	07/27/22 17:18
Lab File ID:	0727A_14	**Analysis date/time:**	07/27/22 18:14
Analytical Method:	TO-15	**Sample ID:**	SSCV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
1,1,1-TRICHLOROETHANE	0.387502	0.39451160		1.81		5	5.090	102	60 - 140
1,1,2,2-TETRACHLOROETHANE	0.223641	0.228909		2.36		5	5.118	102	60 - 140
1,1,2-TRICHLOROETHANE	0.103637	0.10287290		0.7370		5	4.963	99.30	60 - 140
1,1,2-TRICHLOROTRIFLUOROETHANE	0.373673	0.36795660		1.53		5	4.924	98.50	60 - 140
1,1-DICHLOROETHANE	0.342863	0.33556260		2.13		5	4.894	97.90	60 - 140
1,1-DICHLOROETHENE	0.207512	0.20370440		1.83		5	4.908	98.20	60 - 140
1,2,4-TRICHLOROBENZENE	0.249480	0.27319940		9.51		5	5.475	110	60 - 140
1,2,4-TRIMETHYLBENZENE	0.339878	0.38955580		14.60		5	5.731	115	60 - 140
1,2-DIBROMOETHANE	0.160823	0.16467510		2.40		5	5.120	102	60 - 140
1,2-DICHLOROBENZENE	0.319752	0.33407850		4.48		5	5.224	104	60 - 140
1,2-DICHLOROETHANE	0.056871	0.05887876		3.53		5	5.177	104	60 - 140
1,2-DICHLOROPROPANE	0.064005	0.06753462		5.51		5	5.276	106	60 - 140
1,2-DICHLOROTETRAFLUOROETHANE	0.4821	0.47454560		1.57		5	4.922	98.40	60 - 140
1,3,5-TRIMETHYLBENZENE	0.355711	0.39782860		11.80		5	5.592	112	60 - 140
1,3-BUTADIENE	0.097556	0.09442701		3.21		5	4.840	96.80	60 - 140
1,3-DICHLOROBENZENE	0.309065	0.34967420		13.10		5	5.657	113	60 - 140
1,4-DICHLOROBENZENE	0.306223	0.34346730		12.20		5	5.608	112	60 - 140
1,4-DIOXANE	0.048014	0.05663965		18		5	5.898	118	60 - 140
2,2,4-TRIMETHYLPENTANE	0.788560	0.92982730		17.90		5	5.896	118	60 - 140
2-BUTANONE (MEK)	0.108270	0.11456440		5.81		5	5.291	106	60 - 140
2-CHLOROTOLUENE	0.291182	0.31797850		9.20		5	5.460	109	60 - 140
2-PROPANOL	0.210588	0.28447360		35.10		5	6.754	135	60 - 140
4-ETHYLTOLUENE	0.405723	0.462043		13.90		5	5.694	114	60 - 140
4-METHYL-2-PENTANONE (MIBK)	0.104265	0.11023110		5.72		5	5.286	106	60 - 140
ACETONE	0.172923	0.174114		0.6890		5	5.034	101	60 - 140
ALLYL CHLORIDE	0.140241	0.12685990		9.54		5	4.523	90.50	60 - 140
BENZENE	0.201333	0.22035850		9.45		5	5.472	109	60 - 140
BENZYL CHLORIDE	0.190956	0.14801280		22.50		5	3.876	77.50	60 - 140
BROMODICHLOROMETHANE	0.126917	0.12167190		4.13		5	4.793	95.90	60 - 140
BROMOFORM	0.179743	0.178575		0.65		5	4.968	99.40	60 - 140
BROMOMETHANE	0.237477	0.22147250		6.74		5	4.663	93.30	60 - 140
CARBON DISULFIDE	0.463061	0.439610		5.06		5	4.747	94.90	60 - 140
CARBON TETRACHLORIDE	0.410914	0.37263330		9.32		5	4.534	90.70	60 - 140
CHLOROBENZENE	0.237122	0.26930930		13.60		5	5.679	114	60 - 140
CHLORODIBROMOMETHANE	0.162147	0.16180760		0.2090		5	4.990	99.80	60 - 140
CHLOROETHANE	0.102301	0.09564624		6.51		5	4.675	93.50	60 - 140
CHLOROFORM	0.404985	0.45272560		11.80		5	5.589	112	60 - 140
CHLOROMETHANE	0.117891	0.10974930		6.91		5	4.655	93.10	60 - 140
CIS-1,2-DICHLOROETHENE	0.243672	0.24577470		0.8630		5	5.043	101	60 - 140
CIS-1,3-DICHLOROPROPENE	0.097553	0.09758482		0.0326		5	5.002	100	60 - 140
CYCLOHEXANE	0.284501	0.33777780		18.70		5	5.936	119	60 - 140
DICHLORODIFLUOROMETHANE	0.401384	0.39575030		1.40		5	4.930	98.60	60 - 140
ETHANOL	0.052757	0.04682347		11.20		5	4.438	88.80	60 - 140
ETHYLBENZENE	0.313984	0.37539880		19.60		5	5.978	120	60 - 140
HEPTANE	0.065438	0.07450967		13.90		5	5.693	114	60 - 140
HEXACHLORO-1,3-BUTADIENE	0.244417	0.23520370		3.77		5	4.812	96.20	60 - 140

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/27/22 13:02
Instrument ID:	AIRMS9	**Calibration (end) date/time:**	07/27/22 17:18
Lab File ID:	0727A_14	**Analysis date/time:**	07/27/22 18:14
Analytical Method:	TO-15	**Sample ID:**	SSCV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
ISOPROPYLBENZENE	0.398374	0.47044630		18.10		5	5.905	118	60 - 140
M&P-XYLENE	0.255851	0.31535120		23.30		10	12.33	123	60 - 140
METHYL BUTYL KETONE	0.070454	0.07857193		11.50		5	5.576	112	60 - 140
METHYL METHACRYLATE	0.063011	0.06555843		4.04		5	5.202	104	60 - 140
METHYL TERT-BUTYL ETHER	0.455665	0.52449540		15.10		5	5.755	115	60 - 140
METHYLENE CHLORIDE	0.127771	0.12907270		1.02		5	5.051	101	60 - 140
N-HEXANE	0.238934	0.28107310		17.60		5	5.882	118	60 - 140
NAPHTHALENE	0.463360	0.52719820		13.80		5	5.689	114	60 - 140
O-XYLENE	0.245153	0.31003490		26.50		5	6.323	126	60 - 140
PROPENE	0.129025	0.12122950		6.04		5	4.698	94	60 - 140
STYRENE	0.219322	0.24826420		13.20		5	5.660	113	60 - 140
TETRACHLOROETHENE	0.169949	0.20291480		19.40		5	5.970	119	60 - 140
TETRAHYDROFURAN	0.124917	0.14010040		12.20		5	5.608	112	60 - 140
TOLUENE	0.239011	0.28230550		18.10		5	5.906	118	60 - 140
TRANS-1,2-DICHLOROETHENE	0.202661	0.19724910		2.67		5	4.866	97.30	60 - 140
TRANS-1,3-DICHLOROPROPENE	0.079004	0.07588541		3.95		5	4.803	96.10	60 - 140
TRICHLOROETHENE	0.095614	0.10739430		12.30		5	5.616	112	60 - 140
TRICHLOROFLUOROMETHANE	0.436747	0.43220840		1.04		5	4.948	99	60 - 140
VINYL ACETATE	0.282237	0.23246260		17.60		5	4.118	82.40	60 - 140
VINYL BROMIDE	0.252046	0.24796930		1.62		5	4.919	98.40	60 - 140
VINYL CHLORIDE	0.174560	0.16741250		4.09		5	4.795	95.90	60 - 140
1,4-BROMOFLUOROBENZENE	0.678532	0.66845210		1.49		4	3.941	98.50	60 - 140

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_14.D
Acq On : 27 Jul 2022 06:14 pm
Operator :
Sample : SSCV AMS 5.0 ppbv 22G05896
Misc :
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jul 28 10:00:54 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.378	130	659430	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.322	114	2315565	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	2096889	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1401670	3.9405775	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 98.51%			
Target Compounds						Qvalue
2) Propene	1.652	41	99928	4.6979256	ppbv	99
3) BUTANE	1.876	43	142121	3.2489242	ppbv	100
4) 1,1-DIFLUOROETHANE	1.626	65	110901	5.0186761	ppbv	97
5) Dichlorodifluoromethane	1.675	85	326212	4.9298232	ppbv	100
6) CHLORODIFLUOROMETHANE	1.641	67	32345	4.6649702	ppbv	99
7) 1,2-Dichlorotetrafluor...	1.766	85	391162	4.9216528	ppbv	99
8) Chloromethane	1.728	50	90465	4.6546898	ppbv	100
9) Vinyl Chloride	1.808	62	137996	4.7952812	ppbv	99
10) 1,3-Butadiene	1.853	39	77835	4.8396126	ppbv	86
11) Bromomethane	1.952	94	182557	4.6630290	ppbv	100
12) Chloroethane	2.013	64	78840	4.6747408	ppbv	99
13) ISOPENTANE	2.434	41	77003	4.7818926	ppbv	98
14) Vinyl Bromide	2.142	106	204398	4.9191188	ppbv	99
15) Trichlorofluoromethane	2.301	101	356264	4.9480364	ppbv	100
16) PENTANE	2.434	43	163200	4.8579817	ppbv	99
17) Ethanol	2.047	45	38596	4.4376401	ppbv	96
18) ACROLEIN	2.176	56	40672	3.2477536	ppbv	99
19) 1,1,2-Trichlorotrifluo...	2.654	101	303302	4.9235038	ppbv	99
20) 1,1-Dichloroethene	2.521	61	167911	4.9082467	ppbv	99
21) Acetone	2.225	43	143520	5.0344366	ppbv	93
22) BROMOETHANE	2.509	108	160745	4.9745098	ppbv	100
23) 2-Propanol	2.316	45	234488	6.7542754	ppbv	96
24) Carbon Disulfide	2.654	76	362365	4.7467775	ppbv	100
25) Allyl Chloride	2.600	41	104569	4.5229154	ppbv	100
26) METHYL ACETATE	2.551	43	175723	4.5838390	ppbv #	99
27) ACETONITRILE	2.126	41	401737	24.6399545	ppbv	100
28) Methylene Chloride	2.559	49	106393	5.0509233	ppbv	98
29) TERT-BUTYL ALCOHOL	2.528	59	209277	4.6584830	ppbv	98
30) Methyl Tert-Butyl Ether	2.987	73	432335	5.7552713	ppbv	99
31) Trans-1,2-Dichloroethene	2.881	61	162590	4.8664886	ppbv	98
32) ACRYLONITRILE	2.399	53	103276	4.6141752	ppbv	96
33) n-Hexane	3.423	57	231685	5.8818078	ppbv	95
34) 1,1-Dichloroethane	2.957	63	276600	4.8935433	ppbv	100
35) Vinyl Acetate	3.029	43	191616	4.1182110	ppbv	99
36) DI-ISOPROPYL ETHER	3.423	45	407649	5.9485426	ppbv	95
37) ETHYL TERT-BUTYL ETHER	3.674	59	435469	5.5488920	ppbv	99
38) ETHYL ACETATE	3.423	43	489635	5.6223608	ppbv	96
39) 2-Butanone (MEK)	3.120	72	94434	5.2906951	ppbv	100
40) cis-1,2-Dichloroethene	3.310	61	202589	5.0431548	ppbv	98
41) Tetrahydrofuran	3.621	42	115483	5.6077599	ppbv	99

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_14.D
Acq On : 27 Jul 2022 06:14 pm
Operator :
Sample : SSCV AMS 5.0 ppbv 22G05896
Misc :
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jul 28 10:00:54 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
42) Chloroform	3.439	83	373176	5.5894104	ppbv		99
43) Cyclohexane	4.261	84	278426	5.9363213	ppbv		98
44) 1,1,1-Trichloroethane	3.901	97	325191	5.0904504	ppbv		99
45) Carbon Tetrachloride	4.197	117	307157	4.5342029	ppbv		100
46) 2,2,4-Trimethylpentane	4.705	57	766445	5.8957257	ppbv		99
48) Benzene	4.121	78	637818	5.4724910	ppbv		99
49) TERT-AMYL METHYL ETHER	4.447	73	451748	4.9614824	ppbv		97
50) 1,2-Dichloroethane	3.776	62	170422	5.1765395	ppbv		100
51) Heptane	4.857	43	215665	5.6931579	ppbv		99
52) Trichloroethene	4.660	95	310848	5.6160373	ppbv		98
53) TERT-AMYL ETHYL ETHER	5.155	73	144555	5.3972129	ppbv		96
54) METHYL CYCLOHEXANE	5.158	83	405141	5.5273677	ppbv		95
55) 1,2-Dichloropropane	4.531	63	195476	5.2757374	ppbv		97
56) Methyl Methacrylate	4.800	69	189756	5.2021493	ppbv	#	1
57) 1,4-Dioxane	4.663	88	163941	5.8982601	ppbv		99
58) Bromodichloromethane	4.629	83	352174	4.7933717	ppbv		100
59) cis-1,3-Dichloropropene	5.117	75	282455	5.0016340	ppbv		99
60) 4-Methyl-2-Pentanone (...	5.152	43	319059	5.2861183	ppbv		97
61) n-OCTANE	6.179	43	272937	5.5864399	ppbv		98
62) Toluene	5.618	91	817121	5.9057137	ppbv		99
63) trans-1,3-Dichloropropene	5.396	75	219647	4.8026303	ppbv		100
64) 1,1,2-Trichloroethane	5.471	97	297761	4.9631304	ppbv		99
65) Tetrachloroethene	6.191	166	587328	5.9698773	ppbv		99
66) Methyl Butyl Ketone	5.784	43	227423	5.5760844	ppbv		97
67) Chlorodibromomethane	5.815	129	468345	4.9895310	ppbv		100
68) 1,2-Dibromoethane	5.934	107	476645	5.1197644	ppbv		100
69) Chlorobenzene	6.529	112	779504	5.6787088	ppbv		97
70) NONANE	7.221	43	291697	5.5937891	ppbv		98
72) Ethylbenzene	6.733	91	983962	5.9779899	ppbv		100
73) M&P-Xylene	6.830	91	1653141	12.3255937	ppbv		98
74) O-Xylene	7.055	91	812636	6.3232856	ppbv		98
77) Styrene	7.002	104	650728	5.6598162	ppbv		99
78) Bromoform	6.823	173	468065	4.9675052	ppbv		100
79) Isopropylbenzene	7.365	105	1233092	5.9045860	ppbv		100
80) n-DECANE	8.075	43	294190	5.5019257	ppbv		99
81) 1,1,2,2-Tetrachloroethane	7.046	83	599996	5.1177694	ppbv		100
82) n-Propylbenzene	7.628	91	1362052	5.6771487	ppbv		98
83) 4-Ethyltoluene	7.709	105	1211066	5.6940645	ppbv		100
84) 2-Chlorotoluene	7.590	91	833457	5.4601259	ppbv		99
86) 1,3,5-Trimethylbenzene	7.756	105	1042753	5.5920228	ppbv		99
87) tert-Butylbenzene	7.969	119	1165141	5.8288645	ppbv		98
88) 1,2,4-Trimethylbenzene	7.972	105	1021069	5.7308228	ppbv		99
89) sec-Butylbenzene	8.119	105	1519039	5.5872670	ppbv		99
90) 1,3-Dichlorobenzene	8.032	146	916535	5.6569638	ppbv		99
91) P-ISOPROPYLTOLUENE	8.219	119	1452469	5.6776321	ppbv		99
92) 1,4-Dichlorobenzene	8.072	146	900266	5.6081195	ppbv		99
93) 1,2,3-TRIMETHYLBENZENE	8.201	105	1060740	5.4889310	ppbv		99
94) Benzyl Chloride	8.028	91	387958	3.8755759	ppbv		100
95) n-Butylbenzene	8.460	91	1002926	5.4866948	ppbv		98
96) 1,2-Dichlorobenzene	8.257	146	875657	5.2240293	ppbv		100

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_14.D
Acq On : 27 Jul 2022 06:14 pm
Operator :
Sample : SSCV AMS 5.0 ppbv 22G05896
Misc :
ALS Vial : 14 Sample Multiplier: 1

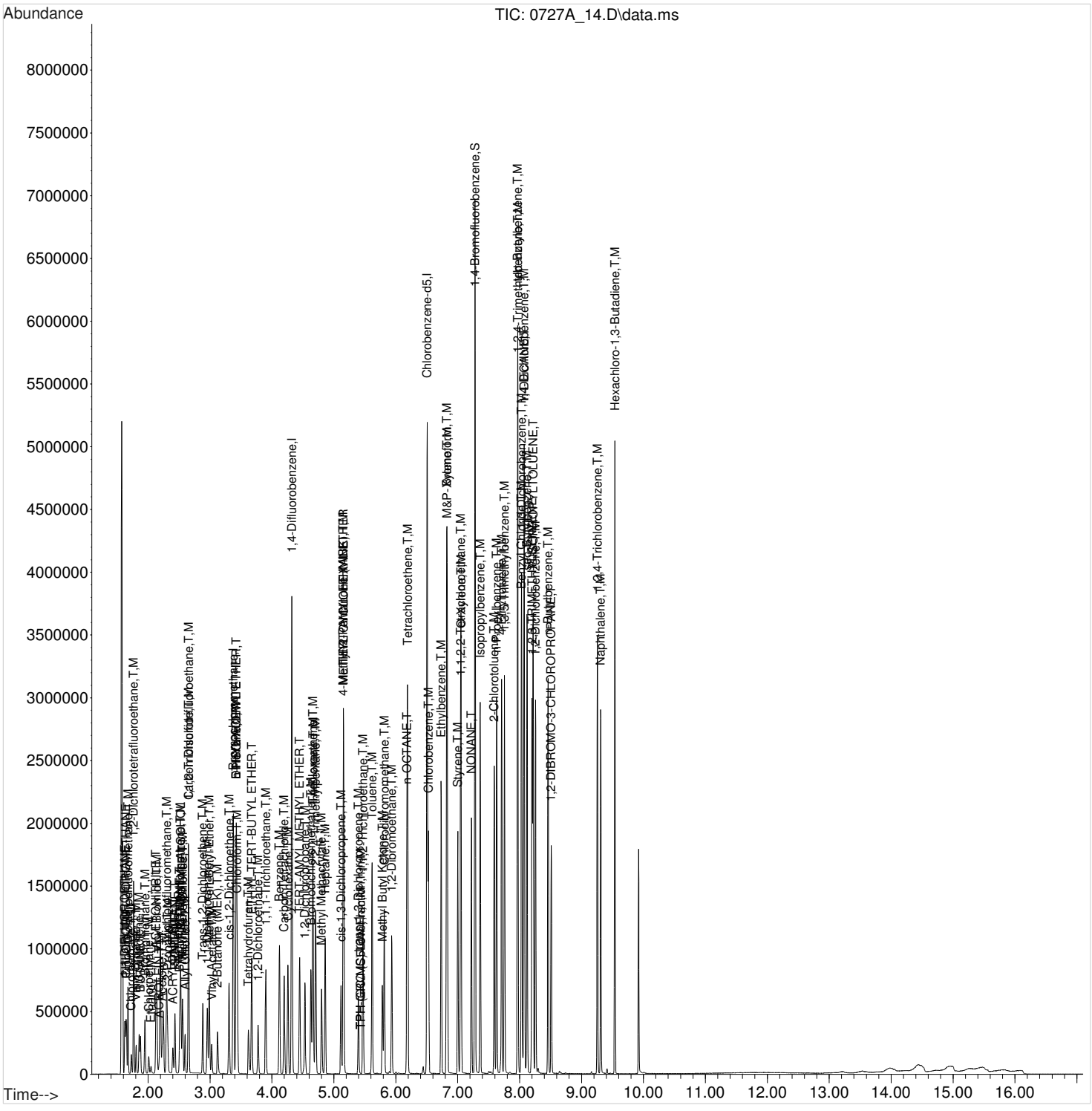
Quant Time: Jul 28 10:00:54 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
97) 1,2-DIBROMO-3-CHLOROPR...	8.510	157	424066	4.8505413 ppbv	99
98) 1,2,4-Trichlorobenzene	9.255	180	716086	5.4753840 ppbv	100
99) Hexachloro-1,3-Butadiene	9.540	225	616495	4.8115295 ppbv	99
100) Naphthalene	9.309	128	1381845	5.6888598 ppbv	100
101) TPH (GC/MS) Low Fraction	5.430	TIC	91764363m	324.6137815 ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	98030594m	457.5147968 ppbv	

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

Data Path : C:\GCMS\1\data\072722A\
Data File : 0727A_14.D
Acq On : 27 Jul 2022 06:14 pm
Operator :
Sample : SSCV AMS 5.0 ppbv 22G05896
Misc :
ALS Vial : 14 Sample Multiplier: 1

Quant Time: Jul 28 10:00:54 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration



7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/27/22 13:02
Instrument ID:	AIRMS9	**Calibration (end) date/time:**	07/27/22 17:18
Lab File ID:	0801_01	**Analysis date/time:**	08/01/22 08:39
Analytical Method:	TO-15	**Sample ID:**	ICV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
1,1,1-TRICHLOROETHANE	0.387502	0.39327470		1.49		3.75	3.806	101	70 - 130
1,1,2,2-TETRACHLOROETHANE	0.223641	0.21979150		1.72		3.75	3.685	98.30	70 - 130
1,1,2-TRICHLOROETHANE	0.103637	0.09986306		3.64		3.75	3.613	96.30	70 - 130
1,1,2-TRICHLOROTRIFLUOROETHANE	0.373673	0.37278980		0.2360		3.75	3.741	99.80	70 - 130
1,1-DICHLOROETHANE	0.342863	0.30339040		11.50		3.75	3.318	88.50	70 - 130
1,1-DICHLOROETHENE	0.207512	0.18672850		10		3.75	3.374	90	70 - 130
1,2,4-TRICHLOROBENZENE	0.249480	0.35142410		40.90		3.75	5.282	141	70 - 130
1,2,4-TRIMETHYLBENZENE	0.339878	0.39737440		16.90		3.75	4.384	117	70 - 130
1,2-DIBROMOETHANE	0.160823	0.16720070		3.97		3.75	3.899	104	70 - 130
1,2-DICHLOROBENZENE	0.319752	0.35789160		11.90		3.75	4.197	112	70 - 130
1,2-DICHLOROETHANE	0.056871	0.05225881		8.11		3.75	3.446	91.90	70 - 130
1,2-DICHLOROPROPANE	0.064005	0.05537826		13.50		3.75	3.245	86.50	70 - 130
1,2-DICHLOROTETRAFLUOROETHANE	0.4821	0.44833070		7		3.75	3.487	93	70 - 130
1,3,5-TRIMETHYLBENZENE	0.355711	0.40225590		13.10		3.75	4.241	113	70 - 130
1,3-BUTADIENE	0.097556	0.07228585		25.90		3.75	2.779	74.10	70 - 130
1,3-DICHLOROBENZENE	0.309065	0.37491590		21.30		3.75	4.549	121	70 - 130
1,4-DICHLOROBENZENE	0.306223	0.37746160		23.30		3.75	4.622	123	70 - 130
1,4-DIOXANE	0.048014	0.04473646		6.83		3.75	3.494	93.20	70 - 130
2,2,4-TRIMETHYLPENTANE	0.788560	0.71349410		9.52		3.75	3.393	90.50	70 - 130
2-BUTANONE (MEK)	0.108270	0.09548326		11.80		3.75	3.307	88.20	70 - 130
2-CHLOROTOLUENE	0.291182	0.29696260		1.99		3.75	3.824	102	70 - 130
2-PROPANOL	0.210588	0.18170040		13.70		3.75	3.236	86.30	70 - 130
4-ETHYLTOLUENE	0.405723	0.46086450		13.60		3.75	4.260	114	70 - 130
4-METHYL-2-PENTANONE (MIBK)	0.104265	0.09513244		8.76		3.75	3.422	91.30	70 - 130
ACETONE	0.172923	0.14448660		16.40		3.75	3.133	83.50	70 - 130
ALLYL CHLORIDE	0.140241	0.11573370		17.50		3.75	3.095	82.50	70 - 130
BENZENE	0.201333	0.18794120		6.65		3.75	3.501	93.40	70 - 130
BENZYL CHLORIDE	0.190956	0.21400470		12.10		3.75	4.203	112	70 - 130
BROMODICHLOROMETHANE	0.126917	0.12550760		1.11		3.75	3.708	98.90	70 - 130
BROMOFORM	0.179743	0.22800890		26.90		3.75	4.757	127	70 - 130
BROMOMETHANE	0.237477	0.21638880		8.88		3.75	3.417	91.10	70 - 130
CARBON DISULFIDE	0.463061	0.46880050		1.24		3.75	3.796	101	70 - 130
CARBON TETRACHLORIDE	0.410914	0.431116		4.92		3.75	3.934	105	70 - 130
CHLOROBENZENE	0.237122	0.24295820		2.46		3.75	3.842	102	70 - 130
CHLORODIBROMOMETHANE	0.162147	0.18198590		12.20		3.75	4.209	112	70 - 130
CHLOROETHANE	0.102301	0.08387322		18		3.75	3.074	82	70 - 130
CHLOROFORM	0.404985	0.38750180		4.32		3.75	3.588	95.70	70 - 130
CHLOROMETHANE	0.117891	0.09374043		20.50		3.75	2.982	79.50	70 - 130
CIS-1,2-DICHLOROETHENE	0.243672	0.217695		10.70		3.75	3.350	89.30	70 - 130
CIS-1,3-DICHLOROPROPENE	0.097553	0.09408946		3.55		3.75	3.617	96.50	70 - 130
CYCLOHEXANE	0.284501	0.273061		4.02		3.75	3.599	96	70 - 130
DICHLORODIFLUOROMETHANE	0.401384	0.378179		5.78		3.75	3.533	94.20	70 - 130
ETHANOL	0.052757	0.04143285		21.50		3.75	2.945	78.50	70 - 130
ETHYLBENZENE	0.313984	0.31785230		1.23		3.75	3.796	101	70 - 130
HEPTANE	0.065438	0.05786911		11.60		3.75	3.316	88.40	70 - 130
HEXACHLORO-1,3-BUTADIENE	0.244417	0.31845890		30.30		3.75	4.886	130	70 - 130

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/27/22 13:02
Instrument ID:	AIRMS9	**Calibration (end) date/time:**	07/27/22 17:18
Lab File ID:	0801_01	**Analysis date/time:**	08/01/22 08:39
Analytical Method:	TO-15	**Sample ID:**	ICV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
ISOPROPYLBENZENE	0.398374	0.41678840		4.62		3.75	3.923	105	70 - 130
M&P-XYLENE	0.255851	0.27540590		7.64		7.50	8.073	108	70 - 130
METHYL BUTYL KETONE	0.070454	0.06294758		10.70		3.75	3.350	89.30	70 - 130
METHYL METHACRYLATE	0.063011	0.05826338		7.53		3.75	3.467	92.50	70 - 130
METHYL TERT-BUTYL ETHER	0.455665	0.43616110		4.28		3.75	3.589	95.70	70 - 130
METHYLENE CHLORIDE	0.127771	0.10444880		18.30		3.75	3.065	81.70	70 - 130
N-HEXANE	0.238934	0.21689920		9.22		3.75	3.404	90.80	70 - 130
NAPHTHALENE	0.463360	0.65405960		41.20		3.75	5.293	141	70 - 130
O-XYLENE	0.245153	0.27006080		10.20		3.75	4.131	110	70 - 130
PROPENE	0.129025	0.11179060		13.40		3.75	3.249	86.60	70 - 130
STYRENE	0.219322	0.24472410		11.60		3.75	4.184	112	70 - 130
TETRACHLOROETHENE	0.169949	0.19276860		13.40		3.75	4.254	113	70 - 130
TETRAHYDROFURAN	0.124917	0.10501020		15.90		3.75	3.152	84.10	70 - 130
TOLUENE	0.239011	0.24445360		2.28		3.75	3.835	102	70 - 130
TRANS-1,2-DICHLOROETHENE	0.202661	0.17990840		11.20		3.75	3.329	88.80	70 - 130
TRANS-1,3-DICHLOROPROPENE	0.079004	0.07818522		1.04		3.75	3.711	99	70 - 130
TRICHLOROETHENE	0.095614	0.09427178		1.40		3.75	3.697	98.60	70 - 130
TRICHLOROFLUOROMETHANE	0.436747	0.42956790		1.64		3.75	3.688	98.30	70 - 130
VINYL ACETATE	0.282237	0.24401320		13.50		3.75	3.242	86.50	70 - 130
VINYL BROMIDE	0.252046	0.24313230		3.54		3.75	3.617	96.50	70 - 130
VINYL CHLORIDE	0.174560	0.14842410		15		3.75	3.189	85	70 - 130
1,4-BROMOFLUOROBENZENE	0.678532	0.64708180		4.64		4	3.815	95.40	60 - 140

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_01.D
Acq On : 01 Aug 2022 08:39 am
Operator :
Sample : ICV AMS 3.75 PPBV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 01 10:44:17 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.370	130	564293	4.0000000	ppbv	-0.01
47) 1,4-Difluorobenzene	4.318	114	1907348	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.504	117	1742636	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.277	95	1127628	3.8145974	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 95.36%			
Target Compounds						Qvalue
2) Propene	1.648	41	59140	3.2491092	ppbv	98
3) BUTANE	1.868	43	116997	3.1255042	ppbv	99
4) 1,1-DIFLUOROETHANE	1.622	65	64515	3.4117598	ppbv	98
5) Dichlorodifluoromethane	1.671	85	200066	3.5332042	ppbv	99
6) CHLORODIFLUOROMETHANE	1.637	67	21027	3.5439131	ppbv	77
7) 1,2-Dichlorotetrafluor...	1.762	85	237178	3.4873277	ppbv	95
8) Chloromethane	1.728	50	49591	2.9817900	ppbv	100
9) Vinyl Chloride	1.804	62	78520	3.1885403	ppbv	100
10) 1,3-Butadiene	1.849	39	38241	2.7786187	ppbv	100
11) Bromomethane	1.944	94	114475	3.4169948	ppbv	99
12) Chloroethane	2.005	64	44371	3.0744977	ppbv	98
13) ISOPENTANE	2.426	41	42749	3.1022884	ppbv	97
14) Vinyl Bromide	2.134	106	128623	3.6173734	ppbv	100
15) Trichlorofluoromethane	2.293	101	227252	3.6883548	ppbv	100
16) PENTANE	2.426	43	87029	3.0273578	ppbv	97
17) Ethanol	2.043	45	21919	2.9450628	ppbv	99
18) ACROLEIN	2.172	56	32488	3.0316186	ppbv	98
19) 1,1,2-Trichlorotrifluo...	2.646	101	197215	3.7411316	ppbv	96
20) 1,1-Dichloroethene	2.513	61	98784	3.3744103	ppbv	94
21) Acetone	2.221	43	76437	3.1333299	ppbv	91
22) BROMOETHANE	2.502	108	101999	3.6886952	ppbv	100
23) 2-Propanol	2.308	45	96124	3.2355939	ppbv	98
24) Carbon Disulfide	2.646	76	248007	3.7964755	ppbv	99
25) Allyl Chloride	2.593	41	61226	3.0946777	ppbv	91
26) METHYL ACETATE	2.543	43	99725	3.0399667	ppbv #	95
27) ACETONITRILE	2.123	41	203800	14.6071768	ppbv	99
28) Methylene Chloride	2.551	49	55256	3.0654992	ppbv	89
29) TERT-BUTYL ALCOHOL	2.525	59	120701	3.1397706	ppbv	94
30) Methyl Tert-Butyl Ether	2.983	73	230740	3.5894865	ppbv	97
31) Trans-1,2-Dichloroethene	2.877	61	95176	3.3289967	ppbv	92
32) ACRYLONITRILE	2.392	53	57876	3.0217409	ppbv	99
33) n-Hexane	3.416	57	114745	3.4041660	ppbv	98
34) 1,1-Dichloroethane	2.949	63	160501	3.3182801	ppbv	98
35) Vinyl Acetate	3.021	43	129089	3.2421276	ppbv	95
36) DI-ISOPROPYL ETHER	3.420	45	198052	3.3772831	ppbv	99
37) ETHYL TERT-BUTYL ETHER	3.670	59	239640	3.5683905	ppbv	97
38) ETHYL ACETATE	3.420	43	246906	3.3131564	ppbv	99
39) 2-Butanone (MEK)	3.116	72	50513	3.3071321	ppbv	99
40) cis-1,2-Dichloroethene	3.302	61	115166	3.3502311	ppbv	92
41) Tetrahydrofuran	3.617	42	55553	3.1524115	ppbv	97

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_01.D
Acq On : 01 Aug 2022 08:39 am
Operator :
Sample : ICV AMS 3.75 PPBV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 01 10:44:17 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
42) Chloroform	3.435	83	204998	3.5881117	ppbv		100
43) Cyclohexane	4.254	84	144456	3.5992104	ppbv		94
44) 1,1,1-Trichloroethane	3.897	97	208052	3.8058672	ppbv		98
45) Carbon Tetrachloride	4.193	117	228071	3.9343649	ppbv		99
46) 2,2,4-Trimethylpentane	4.701	57	377456	3.3930217	ppbv		99
48) Benzene	4.114	78	336065	3.5005687	ppbv		99
49) TERT-AMYL METHYL ETHER	4.443	73	269314	3.5908824	ppbv		96
50) 1,2-Dichloroethane	3.768	62	93446	3.4458918	ppbv		98
51) Heptane	4.853	43	103478	3.3162604	ppbv		96
52) Trichloroethene	4.656	95	168571	3.6973606	ppbv		94
53) TERT-AMYL ETHYL ETHER	5.152	73	86219	3.9081070	ppbv		89
54) METHYL CYCLOHEXANE	5.155	83	231180	3.8290360	ppbv		93
55) 1,2-Dichloropropane	4.527	63	99024	3.2445706	ppbv		97
56) Methyl Methacrylate	4.796	69	104183	3.4674579	ppbv	#	1
57) 1,4-Dioxane	4.663	88	79995	3.4940267	ppbv		94
58) Bromodichloromethane	4.626	83	224425	3.7083617	ppbv		99
59) cis-1,3-Dichloropropene	5.111	75	168245	3.6168612	ppbv		96
60) 4-Methyl-2-Pentanone (...	5.149	43	170110	3.4215490	ppbv		97
61) n-OCTANE	6.179	43	140592	3.4934969	ppbv		94
62) Toluene	5.615	91	437117	3.8354008	ppbv		100
63) trans-1,3-Dichloropropene	5.393	75	139806	3.7111348	ppbv		98
64) 1,1,2-Trichloroethane	5.468	97	178569	3.6134411	ppbv		97
65) Tetrachloroethene	6.188	166	344697	4.2535274	ppbv		97
66) Methyl Butyl Ketone	5.781	43	112559	3.3504429	ppbv		96
67) Chlorodibromomethane	5.812	129	325416	4.2088144	ppbv		100
68) 1,2-Dibromoethane	5.931	107	298978	3.8987125	ppbv		100
69) Chlorobenzene	6.526	112	434443	3.8422984	ppbv		95
70) NONANE	7.221	43	157504	3.6668467	ppbv		98
72) Ethylbenzene	6.733	91	519282	3.7961982	ppbv		99
73) M&P-Xylene	6.826	91	899873	8.0732413	ppbv		98
74) O-Xylene	7.052	91	441204	4.1309976	ppbv		97
77) Styrene	7.002	104	399811	4.1843339	ppbv		96
78) Bromoform	6.823	173	372503	4.7569731	ppbv		99
79) Isopropylbenzene	7.362	105	680916	3.9233429	ppbv		99
80) n-DECANE	8.075	43	168477	3.7913702	ppbv		96
81) 1,1,2,2-Tetrachloroethane	7.046	83	359078	3.6854449	ppbv		100
82) n-Propylbenzene	7.628	91	804742	4.0361009	ppbv		96
83) 4-Ethyltoluene	7.709	105	752924	4.2596555	ppbv		99
84) 2-Chlorotoluene	7.590	91	485154	3.8244398	ppbv		95
86) 1,3,5-Trimethylbenzene	7.756	105	657174	4.2406909	ppbv		99
87) tert-Butylbenzene	7.969	119	732511	4.4094902	ppbv		97
88) 1,2,4-Trimethylbenzene	7.972	105	649199	4.3843831	ppbv		98
89) sec-Butylbenzene	8.119	105	967759	4.2831815	ppbv		98
90) 1,3-Dichlorobenzene	8.031	146	612508	4.5489888	ppbv		97
91) P-ISOPROPYLTOLUENE	8.219	119	958273	4.5073199	ppbv	#	93
92) 1,4-Dichlorobenzene	8.072	146	616667	4.6223825	ppbv		97
93) 1,2,3-TRIMETHYLBENZENE	8.200	105	678250	4.2231586	ppbv		98
94) Benzyl Chloride	8.028	91	349624	4.2026336	ppbv		95
95) n-Butylbenzene	8.460	91	641642	4.2238011	ppbv		98
96) 1,2-Dichlorobenzene	8.257	146	584695	4.1972972	ppbv		99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_01.D
Acq On : 01 Aug 2022 08:39 am
Operator :
Sample : ICV AMS 3.75 PPBV
Misc :
ALS Vial : 1 Sample Multiplier: 1

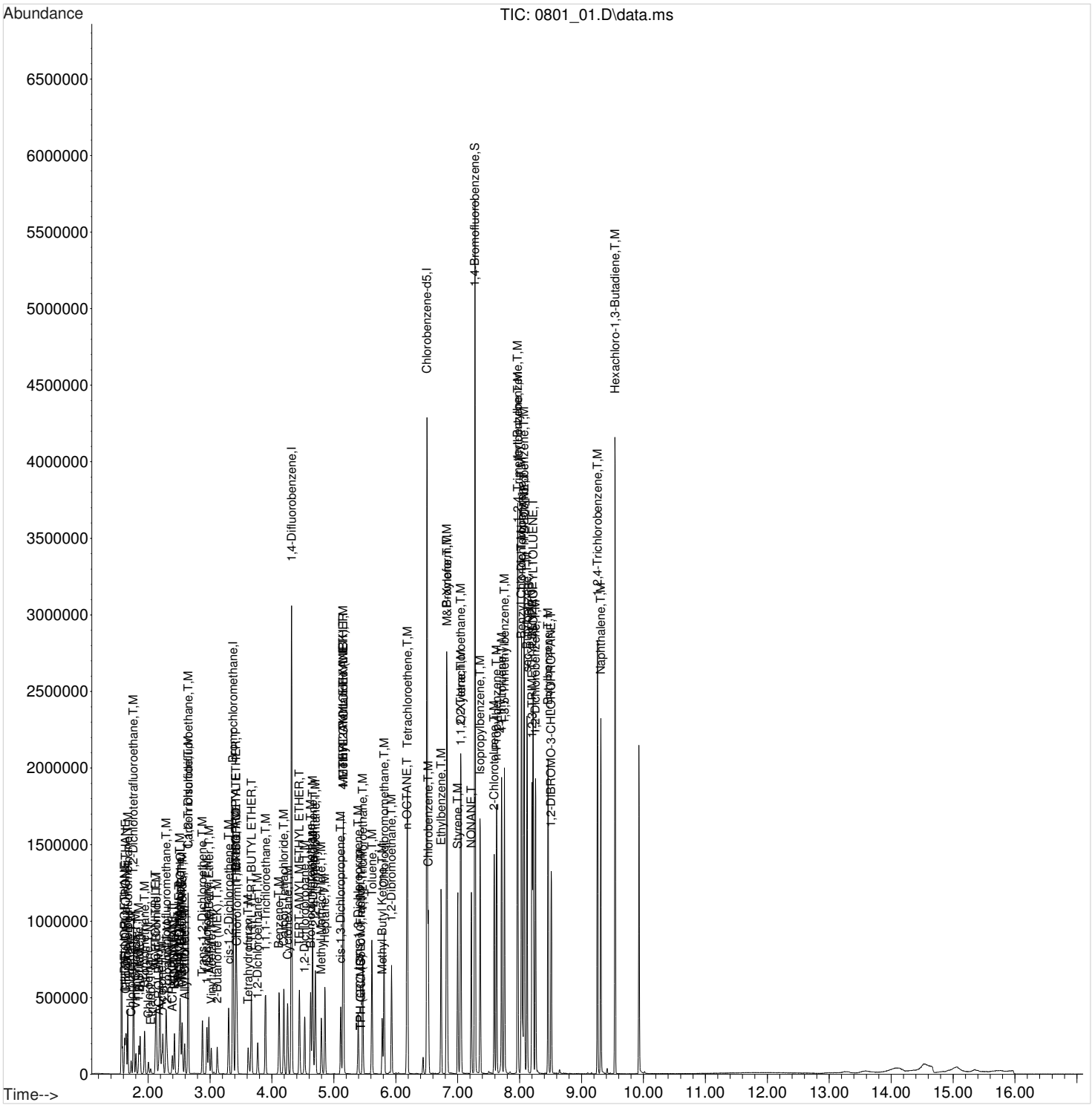
Quant Time: Aug 01 10:44:17 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
97) 1,2-DIBROMO-3-CHLOROPR...	8.510	157	317440	4.3690515 ppbv	97
98) 1,2,4-Trichlorobenzene	9.258	180	574129	5.2823557 ppbv	99
99) Hexachloro-1,3-Butadiene	9.540	225	520273	4.8860021 ppbv	98
100) Naphthalene	9.312	128	1068551	5.2933415 ppbv	99
101) TPH (GC/MS) Low Fraction	5.430	TIC	58199658m	247.7319905 ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	61961237m	347.9624256 ppbv	

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

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_01.D
Acq On : 01 Aug 2022 08:39 am
Operator :
Sample : ICV AMS 3.75 PPBV
Misc :
ALS Vial : 1 Sample Multiplier: 1

Quant Time: Aug 01 10:44:17 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration



7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/27/22 13:02
Instrument ID:	AIRMS9	**Calibration (end) date/time:**	07/27/22 17:18
Lab File ID:	0801_10	**Analysis date/time:**	08/01/22 15:08
Analytical Method:	TO-15	**Sample ID:**	CCV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
1,1,1-TRICHLOROETHANE	0.387502	0.39389550		1.65		3.75	3.812	102	70 - 130
1,1,2,2-TETRACHLOROETHANE	0.223641	0.222325		0.5880		3.75	3.728	99.40	70 - 130
1,1,2-TRICHLOROETHANE	0.103637	0.10267430		0.9290		3.75	3.715	99.10	70 - 130
1,1,2-TRICHLOROTRIFLUOROETHANE	0.373673	0.37731970		0.9760		3.75	3.787	101	70 - 130
1,1-DICHLOROETHANE	0.342863	0.30608520		10.70		3.75	3.348	89.30	70 - 130
1,1-DICHLOROETHENE	0.207512	0.18853520		9.14		3.75	3.407	90.90	70 - 130
1,2,4-TRICHLOROBENZENE	0.249480	0.350325		40.40		3.75	5.266	140	70 - 130
1,2,4-TRIMETHYLBENZENE	0.339878	0.40573260		19.40		3.75	4.477	119	70 - 130
1,2-DIBROMOETHANE	0.160823	0.16765730		4.25		3.75	3.909	104	70 - 130
1,2-DICHLOROBENZENE	0.319752	0.36719370		14.80		3.75	4.306	115	70 - 130
1,2-DICHLOROETHANE	0.056871	0.05380198		5.40		3.75	3.548	94.60	70 - 130
1,2-DICHLOROPROPANE	0.064005	0.05559161		13.10		3.75	3.257	86.90	70 - 130
1,2-DICHLOROTETRAFLUOROETHANE	0.4821	0.46055250		4.47		3.75	3.582	95.50	70 - 130
1,3,5-TRIMETHYLBENZENE	0.355711	0.41454730		16.50		3.75	4.370	117	70 - 130
1,3-BUTADIENE	0.097556	0.07259144		25.60		3.75	2.790	74.40	70 - 130
1,3-DICHLOROBENZENE	0.309065	0.38318280		24		3.75	4.649	124	70 - 130
1,4-DICHLOROBENZENE	0.306223	0.38700040		26.40		3.75	4.739	126	70 - 130
1,4-DIOXANE	0.048014	0.04565296		4.92		3.75	3.566	95.10	70 - 130
2,2,4-TRIMETHYLPENTANE	0.788560	0.71839090		8.90		3.75	3.416	91.10	70 - 130
2-BUTANONE (MEK)	0.108270	0.09451017		12.70		3.75	3.273	87.30	70 - 130
2-CHLOROTOLUENE	0.291182	0.299355		2.81		3.75	3.855	103	70 - 130
2-PROPANOL	0.210588	0.17532090		16.70		3.75	3.122	83.30	70 - 130
4-ETHYLTOLUENE	0.405723	0.47489980		17.10		3.75	4.389	117	70 - 130
4-METHYL-2-PENTANONE (MIBK)	0.104265	0.09484262		9.04		3.75	3.411	91	70 - 130
ACETONE	0.172923	0.14244380		17.60		3.75	3.089	82.40	70 - 130
ALLYL CHLORIDE	0.140241	0.11441470		18.40		3.75	3.059	81.60	70 - 130
BENZENE	0.201333	0.19135590		4.96		3.75	3.564	95	70 - 130
BENZYL CHLORIDE	0.190956	0.20572860		7.74		3.75	4.040	108	70 - 130
BROMODICHLOROMETHANE	0.126917	0.124251		2.10		3.75	3.671	97.90	70 - 130
BROMOFORM	0.179743	0.22095440		22.90		3.75	4.610	123	70 - 130
BROMOMETHANE	0.237477	0.22238850		6.35		3.75	3.512	93.70	70 - 130
CARBON DISULFIDE	0.463061	0.44501860		3.90		3.75	3.604	96.10	70 - 130
CARBON TETRACHLORIDE	0.410914	0.43336620		5.46		3.75	3.955	105	70 - 130
CHLOROBENZENE	0.237122	0.24903370		5.02		3.75	3.938	105	70 - 130
CHLORODIBROMOMETHANE	0.162147	0.18038640		11.20		3.75	4.172	111	70 - 130
CHLOROETHANE	0.102301	0.08681474		15.10		3.75	3.182	84.90	70 - 130
CHLOROFORM	0.404985	0.39368480		2.79		3.75	3.645	97.20	70 - 130
CHLOROMETHANE	0.117891	0.09505142		19.40		3.75	3.023	80.60	70 - 130
CIS-1,2-DICHLOROETHENE	0.243672	0.21888970		10.20		3.75	3.369	89.80	70 - 130
CIS-1,3-DICHLOROPROPENE	0.097553	0.09166579		6.03		3.75	3.524	94	70 - 130
CYCLOHEXANE	0.284501	0.272893		4.08		3.75	3.597	95.90	70 - 130
DICHLORODIFLUOROMETHANE	0.401384	0.38922910		3.03		3.75	3.636	97	70 - 130
ETHANOL	0.052757	0.03874971		26.60		3.75	2.754	73.40	70 - 130
ETHYLBENZENE	0.313984	0.32259510		2.74		3.75	3.853	103	70 - 130
HEPTANE	0.065438	0.05846490		10.70		3.75	3.350	89.30	70 - 130
HEXACHLORO-1,3-BUTADIENE	0.244417	0.32094220		31.30		3.75	4.924	131	70 - 130

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

7A-OR

GC/MS CONTINUING CALIBRATION VERIFICATION

SDG:	L1518164	**Calibration (begin) date/time:**	07/27/22 13:02
Instrument ID:	AIRMS9	**Calibration (end) date/time:**	07/27/22 17:18
Lab File ID:	0801_10	**Analysis date/time:**	08/01/22 15:08
Analytical Method:	TO-15	**Sample ID:**	CCV

Analyte	Avg. RRF	RRF	Min. RRF	Diff.	Max Diff.	True Value	Result	Result	Limits
				%	%	mg/l	mg/l	% Rec.	%
ISOPROPYLBENZENE	0.398374	0.422114		5.96		3.75	3.973	106	70 - 130
M&P-XYLENE	0.255851	0.278663		8.92		7.50	8.169	109	70 - 130
METHYL BUTYL KETONE	0.070454	0.06177050		12.30		3.75	3.288	87.70	70 - 130
METHYL METHACRYLATE	0.063011	0.05825046		7.56		3.75	3.467	92.50	70 - 130
METHYL TERT-BUTYL ETHER	0.455665	0.43348410		4.87		3.75	3.567	95.10	70 - 130
METHYLENE CHLORIDE	0.127771	0.10710590		16.20		3.75	3.143	83.80	70 - 130
N-HEXANE	0.238934	0.217842		8.83		3.75	3.419	91.20	70 - 130
NAPHTHALENE	0.463360	0.65144230		40.60		3.75	5.272	141	70 - 130
O-XYLENE	0.245153	0.27534590		12.30		3.75	4.212	112	70 - 130
PROPENE	0.129025	0.11211050		13.10		3.75	3.258	86.90	70 - 130
STYRENE	0.219322	0.24685780		12.60		3.75	4.221	113	70 - 130
TETRACHLOROETHENE	0.169949	0.19750370		16.20		3.75	4.358	116	70 - 130
TETRAHYDROFURAN	0.124917	0.10282610		17.70		3.75	3.087	82.30	70 - 130
TOLUENE	0.239011	0.24620410		3.01		3.75	3.863	103	70 - 130
TRANS-1,2-DICHLOROETHENE	0.202661	0.17767340		12.30		3.75	3.288	87.70	70 - 130
TRANS-1,3-DICHLOROPROPENE	0.079004	0.07604668		3.74		3.75	3.610	96.30	70 - 130
TRICHLOROETHENE	0.095614	0.09641206		0.8350		3.75	3.781	101	70 - 130
TRICHLOROFLUOROMETHANE	0.436747	0.44058610		0.8790		3.75	3.783	101	70 - 130
VINYL ACETATE	0.282237	0.23612850		16.30		3.75	3.137	83.70	70 - 130
VINYL BROMIDE	0.252046	0.24569710		2.52		3.75	3.656	97.50	70 - 130
VINYL CHLORIDE	0.174560	0.14875130		14.80		3.75	3.196	85.20	70 - 130
1,4-BROMOFLUOROBENZENE	0.678532	0.639618		5.74		4	3.771	94.30	60 - 140

D: Surrogate recovery cannot be used for control limit evaluation due to dilution.

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_10.D
Acq On : 01 Aug 2022 03:08 pm
Operator :
Sample : CCV AMS 3.75 ppbv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 01 15:30:41 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.370	130	551808	4.0000000	ppbv	-0.01
47) 1,4-Difluorobenzene	4.318	114	1855436	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.504	117	1696558	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1085149	3.7705978	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 94.26%			
Target Compounds						Qvalue
2) Propene	1.648	41	57997	3.2584059	ppbv	99
3) BUTANE	1.868	43	116075	3.1710328	ppbv	98
4) 1,1-DIFLUOROETHANE	1.622	65	63602	3.4395782	ppbv	98
5) Dichlorodifluoromethane	1.671	85	201356	3.6364422	ppbv	100
6) CHLORODIFLUOROMETHANE	1.637	67	20793	3.5837654	ppbv	77
7) 1,2-Dichlorotetrafluor...	1.762	85	238253	3.5823944	ppbv	94
8) Chloromethane	1.724	50	49172	3.0234914	ppbv	100
9) Vinyl Chloride	1.800	62	76952	3.1955690	ppbv	100
10) 1,3-Butadiene	1.849	39	37553	2.7903650	ppbv	100
11) Bromomethane	1.944	94	115046	3.5117359	ppbv	100
12) Chloroethane	2.005	64	44911	3.1823237	ppbv	99
13) ISOPENTANE	2.426	41	42093	3.1237967	ppbv	98
14) Vinyl Bromide	2.134	106	127104	3.6555321	ppbv	100
15) Trichlorofluoromethane	2.293	101	227924	3.7829597	ppbv	100
16) PENTANE	2.426	43	86719	3.0848261	ppbv	98
17) Ethanol	2.043	45	20046	2.7543442	ppbv	99
18) ACROLEIN	2.172	56	31602	3.0156631	ppbv	99
19) 1,1,2-Trichlorotrifluo...	2.646	101	195195	3.7865910	ppbv	96
20) 1,1-Dichloroethene	2.517	61	97533	3.4070580	ppbv	92
21) Acetone	2.217	43	73689	3.0890279	ppbv	95
22) BROMOETHANE	2.502	108	101983	3.7715625	ppbv	100
23) 2-Propanol	2.308	45	90697	3.1219919	ppbv	99
24) Carbon Disulfide	2.650	76	230217	3.6038834	ppbv	99
25) Allyl Chloride	2.593	41	59189	3.0594067	ppbv	93
26) METHYL ACETATE	2.543	43	97411	3.0366131	ppbv #	93
27) ACETONITRILE	2.122	41	199774	14.6425846	ppbv	100
28) Methylene Chloride	2.551	49	55408	3.1434815	ppbv	90
29) TERT-BUTYL ALCOHOL	2.524	59	116203	3.0911570	ppbv	95
30) Methyl Tert-Butyl Ether	2.983	73	224250	3.5674555	ppbv	98
31) Trans-1,2-Dichloroethene	2.877	61	91914	3.2876400	ppbv	92
32) ACRYLONITRILE	2.392	53	57010	3.0438723	ppbv	99
33) n-Hexane	3.419	57	112694	3.4189631	ppbv	97
34) 1,1-Dichloroethane	2.953	63	158344	3.3477543	ppbv	98
35) Vinyl Acetate	3.021	43	122154	3.1373663	ppbv	95
36) DI-ISOPROPYL ETHER	3.419	45	193340	3.3715268	ppbv	99
37) ETHYL TERT-BUTYL ETHER	3.670	59	231446	3.5243531	ppbv	96
38) ETHYL ACETATE	3.419	43	240273	3.2970986	ppbv	99
39) 2-Butanone (MEK)	3.116	72	48892	3.2734285	ppbv	99
40) cis-1,2-Dichloroethene	3.302	61	113236	3.3686173	ppbv	92
41) Tetrahydrofuran	3.617	42	53194	3.0868442	ppbv	96

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_10.D
Acq On : 01 Aug 2022 03:08 pm
Operator :
Sample : CCV AMS 3.75 ppbv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 01 15:30:41 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
42) Chloroform	3.435	83	203661	3.6453638	ppbv		100
43) Cyclohexane	4.258	84	141173	3.5969961	ppbv		93
44) 1,1,1-Trichloroethane	3.897	97	203770	3.8118750	ppbv		98
45) Carbon Tetrachloride	4.193	117	224189	3.9549003	ppbv		100
46) 2,2,4-Trimethylpentane	4.701	57	371638	3.4163086	ppbv		99
48) Benzene	4.117	78	332858	3.5641689	ppbv		99
49) TERT-AMYL METHYL ETHER	4.443	73	260646	3.5725415	ppbv		96
50) 1,2-Dichloroethane	3.772	62	93587	3.5476470	ppbv		97
51) Heptane	4.857	43	101698	3.3504024	ppbv		96
52) Trichloroethene	4.660	95	167706	3.7813032	ppbv		93
53) TERT-AMYL ETHYL ETHER	5.152	73	82636	3.8504963	ppbv		90
54) METHYL CYCLOHEXANE	5.155	83	226858	3.8625779	ppbv		93
55) 1,2-Dichloropropane	4.527	63	96700	3.2570708	ppbv		97
56) Methyl Methacrylate	4.800	69	101325	3.4666892	ppbv	#	1
57) 1,4-Dioxane	4.663	88	79412	3.5656070	ppbv		94
58) Bromodichloromethane	4.625	83	216131	3.6712324	ppbv		100
59) cis-1,3-Dichloropropene	5.114	75	159450	3.5236938	ppbv		96
60) 4-Methyl-2-Pentanone (...	5.149	43	164976	3.4111251	ppbv		97
61) n-OCTANE	6.178	43	137254	3.5059743	ppbv		94
62) Toluene	5.615	91	428265	3.8628656	ppbv		100
63) trans-1,3-Dichloropropene	5.393	75	132281	3.6096272	ppbv		96
64) 1,1,2-Trichloroethane	5.468	97	178599	3.7151632	ppbv		96
65) Tetrachloroethene	6.191	166	343552	4.3580095	ppbv		97
66) Methyl Butyl Ketone	5.781	43	107448	3.2877916	ppbv		96
67) Chlorodibromomethane	5.812	129	313777	4.1718237	ppbv		99
68) 1,2-Dibromoethane	5.934	107	291635	3.9093592	ppbv		99
69) Chlorobenzene	6.526	112	433187	3.9383804	ppbv		95
70) NONANE	7.221	43	151433	3.6241457	ppbv	#	96
72) Ethylbenzene	6.732	91	513095	3.8528435	ppbv		99
73) M&P-Xylene	6.826	91	886440	8.1687203	ppbv		98
74) O-Xylene	7.055	91	437944	4.2118418	ppbv		97
77) Styrene	7.002	104	392633	4.2208155	ppbv		96
78) Bromoform	6.823	173	351433	4.6097931	ppbv		100
79) Isopropylbenzene	7.365	105	671382	3.9734742	ppbv		98
80) n-DECANE	8.075	43	164306	3.7979301	ppbv		96
81) 1,1,2,2-Tetrachloroethane	7.045	83	353613	3.7279263	ppbv		100
82) n-Propylbenzene	7.628	91	800590	4.1243306	ppbv		96
83) 4-Ethyltoluene	7.709	105	755339	4.3893803	ppbv		100
84) 2-Chlorotoluene	7.590	91	476131	3.8552509	ppbv		96
86) 1,3,5-Trimethylbenzene	7.756	105	659347	4.3702698	ppbv		98
87) tert-Butylbenzene	7.969	119	733329	4.5343085	ppbv		97
88) 1,2,4-Trimethylbenzene	7.972	105	645327	4.4766017	ppbv		98
89) sec-Butylbenzene	8.122	105	957490	4.3528277	ppbv		98
90) 1,3-Dichlorobenzene	8.031	146	609461	4.6492938	ppbv		96
91) P-ISOPROPYLTOLUENE	8.219	119	944560	4.5634853	ppbv		99
92) 1,4-Dichlorobenzene	8.072	146	615533	4.7391939	ppbv		96
93) 1,2,3-TRIMETHYLBENZENE	8.200	105	672457	4.3008082	ppbv		98
94) Benzyl Chloride	8.028	91	327216	4.0401063	ppbv		96
95) n-Butylbenzene	8.460	91	632847	4.2790500	ppbv		98
96) 1,2-Dichlorobenzene	8.257	146	584030	4.3063911	ppbv		99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_10.D
Acq On : 01 Aug 2022 03:08 pm
Operator :
Sample : CCV AMS 3.75 ppbv
Misc :
ALS Vial : 10 Sample Multiplier: 1

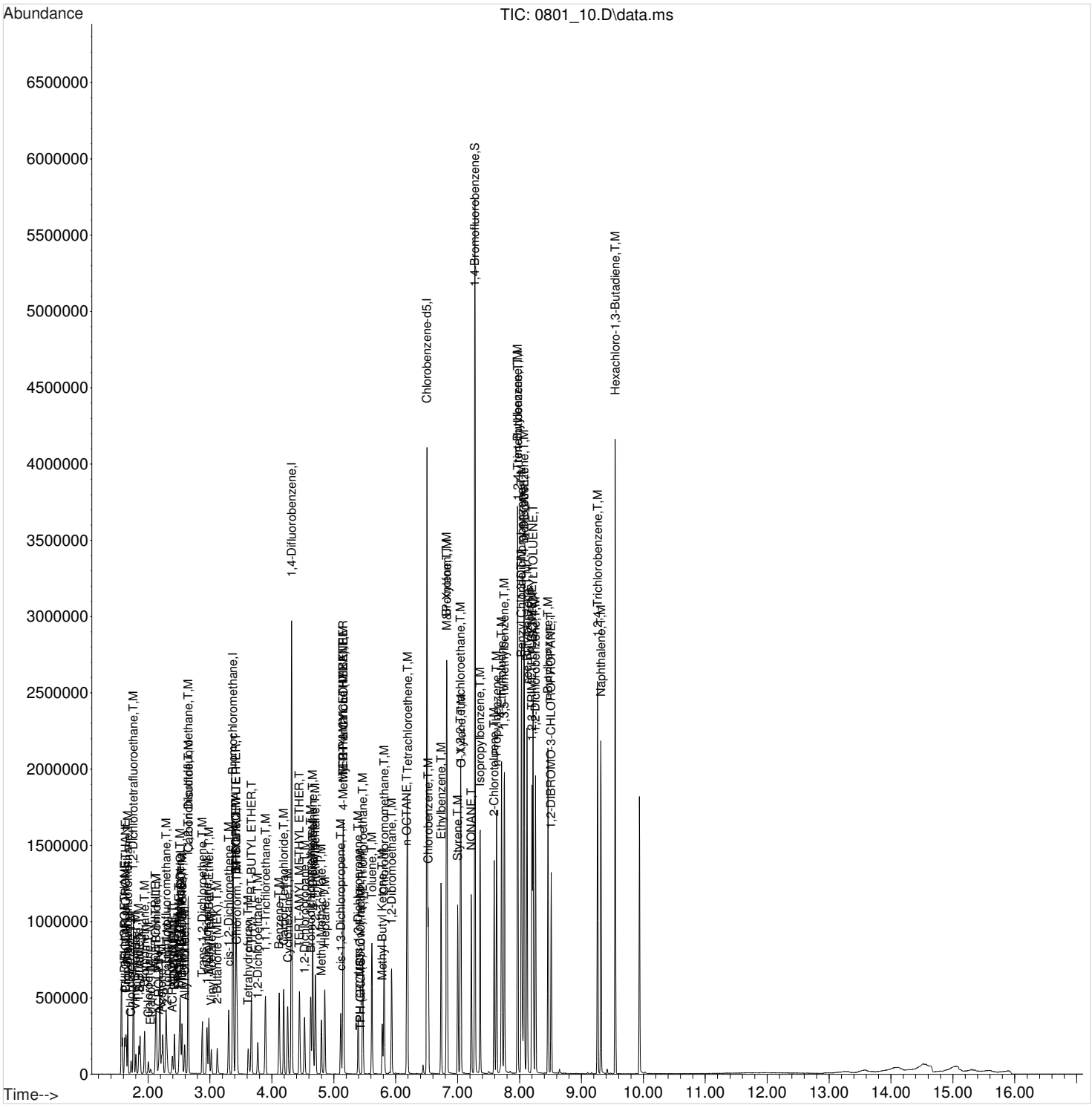
Quant Time: Aug 01 15:30:41 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
97) 1,2-DIBROMO-3-CHLOROPR...	8.510	157	309298	4.3726085 ppbv	97
98) 1,2,4-Trichlorobenzene	9.261	180	557200	5.2658349 ppbv	99
99) Hexachloro-1,3-Butadiene	9.546	225	510466	4.9241032 ppbv	98
100) Naphthalene	9.315	128	1036134	5.2721596 ppbv	99
101) TPH (GC/MS) Low Fraction	5.430	TIC	57446499m	251.1673573 ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	61140688m	352.6797804 ppbv	

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

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_10.D
Acq On : 01 Aug 2022 03:08 pm
Operator :
Sample : CCV AMS 3.75 ppbv
Misc :
ALS Vial : 10 Sample Multiplier: 1

Quant Time: Aug 01 15:30:41 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration



ANALYTICAL SEQUENCE

SDG:	L1518164	**Analytical Method:**	TO-15
Instrument ID:	AIRMS7	**Calibration Start Date:**	07/25/22 10:08
		Calibration End Date:	07/25/22 16:02

Client Sample ID	Lab Sample ID	File ID	Analysis Date Time	Dilution	Batch
TUNE	AIRMS70725220725_01589475	0725_01	07/25/22 08:52		
CAL	0.19	0725_03	07/25/22 10:08		
CAL	0.31	0725_04	07/25/22 10:46		
CAL	0.63	0725_05	07/25/22 11:24		
CAL	1.25	0725_06	07/25/22 12:01		
CAL	2.5	0725_07	07/25/22 12:40		
CAL	3.75	0725_08	07/25/22 13:20		
CAL	10.0	0725_09	07/25/22 13:57		
CAL	25	0725_10	07/25/22 14:35		
CAL	50	0725_11	07/25/22 15:17		
CAL	100	0725_12	07/25/22 16:02		
SSCV	AIRMS70725220725_14589475	0725_14	07/25/22 17:20		
ICV	AIRMS70726220726_01589475	0726_01	07/26/22 07:45		
TUNE	AIRMS70726220726_01T589475	0726_01T	07/26/22 07:45		
LCS	R3819755-1	0726_02	07/26/22 08:25	1	WG1900825
LCSD	R3819755-2	0726_03	07/26/22 09:05	1	WG1900825
BLANK	R3819755-3	0726_04	07/26/22 09:45	1	WG1900825
L1518170-01	L1518170-01	0726_05	07/26/22 10:57	1	WG1900825
CRCA-AMB01-0220722	L1518164-01	0726_06	07/26/22 11:37	1	WG1900825
CRCA-AMB02-0220722	L1518164-02	0726_07	07/26/22 12:18	1	WG1900825
CRCA-VMP01-0220722	L1518164-03	0726_08	07/26/22 12:58	1	WG1900825
CRCA-VMP02-0220722	L1518164-04	0726_09	07/26/22 13:38	1	WG1900825
CRCA-VMP03-0220722	L1518164-05	0726_10	07/26/22 14:17	1	WG1900825
CRCA-VMP04-0220722	L1518164-06	0726_11	07/26/22 14:57	1	WG1900825
L1518140-01	L1518140-01	0726_12	07/26/22 16:02	1	WG1900825
L1518140-02	L1518140-02	0726_13	07/26/22 16:44	1	WG1900825
L1518140-03	L1518140-03	0726_14	07/26/22 17:24	1	WG1900825
L1518140-04	L1518140-04	0726_15	07/26/22 18:05	1	WG1900825
L1518140-05	L1518140-05	0726_16	07/26/22 18:45	1	WG1900825
L1518140-06	L1518140-06	0726_17	07/26/22 19:25	1	WG1900825
L1518140-08	L1518140-08	0726_18	07/26/22 20:06	1	WG1900825
L1518363-01	L1518363-01	0726_19	07/26/22 20:45	1	WG1900825
L1518363-02	L1518363-02	0726_20	07/26/22 21:26	1	WG1900825
L1518363-03	L1518363-03	0726_21	07/26/22 22:06	1	WG1900825
L1518363-04	L1518363-04	0726_22	07/26/22 22:45	1	WG1900825
L1518140-07	L1518140-07	0726_23	07/26/22 23:24	10	WG1900825
L1518439-01	L1518439-01	0726_24	07/27/22 00:02	2000	WG1900825
CCV	AIRMS70726220726_26589475	0726_26	07/27/22 01:22		

ANALYTICAL SEQUENCE

SDG:	L1518164	**Analytical Method:**	TO-15
Instrument ID:	AIRMS9	**Calibration Start Date:**	07/27/22 13:02
		Calibration End Date:	07/27/22 17:18

Client Sample ID	Lab Sample ID	File ID	Analysis Date Time	Dilution	Batch
TUNE	AIRMS9072722A0727A_01589824	0727A_01	07/27/22 12:09		
CAL	0.19	0727A_03	07/27/22 13:02		
CAL	0.31	0727A_04	07/27/22 13:27		
CAL	0.63	0727A_05	07/27/22 13:52		
CAL	1.25	0727A_06	07/27/22 14:18		
CAL	2.5	0727A_07	07/27/22 14:45		
CAL	3.75	0727A_08	07/27/22 15:15		
CAL	10.0	0727A_09	07/27/22 15:41		
CAL	25	0727A_10	07/27/22 16:08		
CAL	50	0727A_11	07/27/22 16:40		
CAL	100	0727A_12	07/27/22 17:18		
SSCV	AIRMS9072722A0727A_14589824	0727A_14	07/27/22 18:14		
ICV	AIRMS90801220801_01589824	0801_01	08/01/22 08:39		
TUNE	AIRMS90801220801_01T589824	0801_01T	08/01/22 08:39		
LCS	R3821343-1	0801_02	08/01/22 09:09	1	WG1903843
LCSD	R3821343-2	0801_03	08/01/22 09:39	1	WG1903843
BLANK	R3821343-3	0801_04	08/01/22 10:08	1	WG1903843
L1518140-07	L1518140-07	0801_05	08/01/22 12:17	20	WG1903843
CRCA-VMP03-0220722	L1518164-05	0801_06	08/01/22 12:44	10	WG1903843
CRCA-VMP04-0220722	L1518164-06	0801_07	08/01/22 13:10	10	WG1903843
L1518170-01	L1518170-01	0801_09	08/01/22 14:22	100	WG1903843
CCV	AIRMS90801220801_10589824	0801_10	08/01/22 15:08		

DETECTION LIMIT SUMMARY

Lab Sample IDs: L1518164-01,02,03,04,05,06 **Analytical Method:** TO-15
Matrix: Air **Prep Method:** TO-15

Analyte	CAS	MDL	RDL
		ppbv	*ppbv*
Carbon disulfide	75-15-0	0.1020	0.50
Carbon tetrachloride	56-23-5	0.0732	0.30
Chlorobenzene	108-90-7	0.0832	0.40
Chloroethane	75-00-3	0.0996	0.40
Chloroform	67-66-3	0.0717	0.30
Chloromethane	74-87-3	0.1030	0.50
2-Chlorotoluene	95-49-8	0.0828	0.40
Cyclohexane	110-82-7	0.0753	0.40
Dibromochloromethane	124-48-1	0.0727	0.30
1,2-Dibromoethane	106-93-4	0.0721	0.30
Acetone	67-64-1	0.5840	2.40
1,2-Dichlorobenzene	95-50-1	0.1280	0.60
1,3-Dichlorobenzene	541-73-1	0.1820	0.80
1,4-Dichlorobenzene	106-46-7	0.0557	0.30
1,2-Dichloroethane	107-06-2	0.07	0.30
1,1-Dichloroethane	75-34-3	0.0723	0.30
1,1-Dichloroethene	75-35-4	0.0762	0.40
cis-1,2-Dichloroethene	156-59-2	0.0784	0.40
trans-1,2-Dichloroethene	156-60-5	0.0673	0.30
1,2-Dichloropropane	78-87-5	0.0760	0.40
cis-1,3-Dichloropropene	10061-01-5	0.0689	0.30
Allyl Chloride	107-05-1	0.1140	0.50
trans-1,3-Dichloropropene	10061-02-6	0.0728	0.30
1,4-Dioxane	123-91-1	0.0833	0.40
Ethanol	64-17-5	0.2650	1.30
Ethylbenzene	100-41-4	0.0835	0.40
4-Ethyltoluene	622-96-8	0.0783	0.40
Trichlorofluoromethane	75-69-4	0.0819	0.35
Dichlorodifluoromethane	75-71-8	0.1370	0.60
1,1,2-Trichlorotrifluoroethane	76-13-1	0.0793	0.40
1,2-Dichlorotetrafluoroethane	76-14-2	0.0890	0.40
Heptane	142-82-5	0.1040	0.50
Hexachloro-1,3-butadiene	87-68-3	0.1050	0.63
Benzene	71-43-2	0.0715	0.30
n-Hexane	110-54-3	0.2060	1
Isopropylbenzene	98-82-8	0.0777	0.40
Methylene Chloride	75-09-2	0.0979	0.40
Methyl Butyl Ketone	591-78-6	0.1330	1.25
2-Butanone (MEK)	78-93-3	0.0814	1.25
4-Methyl-2-pentanone (MIBK)	108-10-1	0.0765	1.25
Methyl Methacrylate	80-62-6	0.0876	0.40
MTBE	1634-04-4	0.0647	0.30
Naphthalene	91-20-3	0.35	1.40
2-Propanol	67-63-0	0.2640	1.25
Benzyl Chloride	100-44-7	0.0598	0.30
Propene	115-07-1	0.0932	1.25
Styrene	100-42-5	0.0788	0.40
1,1,2,2-Tetrachloroethane	79-34-5	0.0743	0.30
Tetrachloroethylene	127-18-4	0.0814	0.40
Tetrahydrofuran	109-99-9	0.0734	0.30
Toluene	108-88-3	0.0870	0.50

DETECTION LIMIT SUMMARY

Lab Sample IDs: L1518164-01,02,03,04,05,06 **Analytical Method:** TO-15
Matrix: Air **Prep Method:** TO-15

Analyte	CAS	MDL	RDL
		ppbv	*ppbv*
1,2,4-Trichlorobenzene	120-82-1	0.1480	0.63
1,1,1-Trichloroethane	71-55-6	0.0736	0.30
1,1,2-Trichloroethane	79-00-5	0.0775	0.40
Trichloroethylene	79-01-6	0.0680	0.30
Bromodichloromethane	75-27-4	0.0702	0.30
1,2,4-Trimethylbenzene	95-63-6	0.0764	0.40
1,3,5-Trimethylbenzene	108-67-8	0.0779	0.40
2,2,4-Trimethylpentane	540-84-1	0.1330	0.60
Vinyl chloride	75-01-4	0.0949	0.40
Vinyl Bromide	593-60-2	0.0852	0.40
Vinyl acetate	108-05-4	0.1160	0.50
m&p-Xylene	1330-20-7	0.1350	0.60
o-Xylene	95-47-6	0.0828	0.35
Bromoform	75-25-2	0.0732	0.60
Bromomethane	74-83-9	0.0982	0.40
1,3-Butadiene	106-99-0	0.1040	2

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

Lab Sample ID:	R3819755-3	**SDG:**	L1518164
Client Sample ID:	BLANK	**Collected Date/Time:**	
Lab File ID:	0726_04	**Received Date/Time:**	
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 09:45
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 09:45
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ppbv		*ppbv*	*ppbv*	*ppbv*
Acetone	67-64-1	5.60	U		0.584	1.20	2.40
Allyl Chloride	107-05-1	0	U		0.114	0.250	0.500
Benzene	71-43-2	0	U		0.0715	0.150	0.300
Benzyl Chloride	100-44-7	0	U		0.0598	0.130	0.300
Bromodichloromethane	75-27-4	0	U		0.0702	0.150	0.300
Bromoform	75-25-2	0	U		0.0732	0.310	0.600
Bromomethane	74-83-9	0	U		0.0982	0.200	0.400
1,3-Butadiene	106-99-0	0	U		0.104	0.630	2.00
Carbon disulfide	75-15-0	0	U		0.102	0.250	0.500
Carbon tetrachloride	56-23-5	0	U		0.0732	0.150	0.300
Chlorobenzene	108-90-7	0	U		0.0832	0.200	0.400
Chloroethane	75-00-3	0	U		0.0996	0.200	0.400
Chloroform	67-66-3	0	U		0.0717	0.150	0.300
Chloromethane	74-87-3	0	U		0.103	0.250	0.500
2-Chlorotoluene	95-49-8	0	U		0.0828	0.200	0.400
Cyclohexane	110-82-7	0	U		0.0753	0.200	0.400
Dibromochloromethane	124-48-1	0	U		0.0727	0.150	0.300
1,2-Dibromoethane	106-93-4	0	U		0.0721	0.150	0.300
1,2-Dichlorobenzene	95-50-1	0	U		0.128	0.300	0.600
1,3-Dichlorobenzene	541-73-1	0	U		0.182	0.400	0.800
1,4-Dichlorobenzene	106-46-7	0	U		0.0557	0.130	0.300
1,2-Dichloroethane	107-06-2	0	U		0.0700	0.150	0.300
1,1-Dichloroethane	75-34-3	0	U		0.0723	0.150	0.300
1,1-Dichloroethene	75-35-4	0	U		0.0762	0.200	0.400
cis-1,2-Dichloroethene	156-59-2	0	U		0.0784	0.200	0.400
trans-1,2-Dichloroethene	156-60-5	0	U		0.0673	0.150	0.300
1,2-Dichloropropane	78-87-5	0	U		0.0760	0.200	0.400
cis-1,3-Dichloropropene	10061-01-5	0	U		0.0689	0.150	0.300
trans-1,3-Dichloropropene	10061-02-6	0	U		0.0728	0.150	0.300
1,4-Dioxane	123-91-1	0	U		0.0833	0.200	0.400
Ethanol	64-17-5	5.17	0.397	J	0.265	0.630	1.30
Ethylbenzene	100-41-4	0	U		0.0835	0.200	0.400
4-Ethyltoluene	622-96-8	0	U		0.0783	0.200	0.400
Trichlorofluoromethane	75-69-4	0	U		0.0819	0.175	0.350
Dichlorodifluoromethane	75-71-8	0	U		0.137	0.300	0.600
1,1,2-Trichlorotrifluoroethane	76-13-1	0	U		0.0793	0.200	0.400
1,2-Dichlorotetrafluoroethane	76-14-2	0	U		0.0890	0.200	0.400
Heptane	142-82-5	0	U		0.104	0.250	0.500
Hexachloro-1,3-butadiene	87-68-3	0	U		0.105	0.250	0.630
n-Hexane	110-54-3	0	U		0.206	0.500	1.00
Isopropylbenzene	98-82-8	0	U		0.0777	0.200	0.400
Methylene Chloride	75-09-2	0	U		0.0979	0.200	0.400
Methyl Butyl Ketone	591-78-6	0	U		0.133	0.300	1.25

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

Lab Sample ID:	R3819755-3	**SDG:**	L1518164
Client Sample ID:	BLANK	**Collected Date/Time:**	
Lab File ID:	0726_04	**Received Date/Time:**	
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 09:45
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 09:45
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ppbv		*ppbv*	*ppbv*	*ppbv*
2-Butanone (MEK)	78-93-3	0	U		0.0814	0.190	1.25
4-Methyl-2-pentanone (MIBK)	108-10-1	9.41	U		0.0765	0.190	1.25
Methyl Methacrylate	80-62-6	0	U		0.0876	0.200	0.400
MTBE	1634-04-4	0	U		0.0647	0.130	0.300
Naphthalene	91-20-3	0	U		0.350	0.700	1.40
2-Propanol	67-63-0	5.64	U		0.264	0.625	1.25
Propene	115-07-1	3.86	U		0.0932	0.625	1.25
Styrene	100-42-5	0	U		0.0788	0.200	0.400
1,1,2,2-Tetrachloroethane	79-34-5	0	U		0.0743	0.150	0.300
Tetrachloroethylene	127-18-4	0	U		0.0814	0.200	0.400
Tetrahydrofuran	109-99-9	0	U		0.0734	0.150	0.300
Toluene	108-88-3	0	U		0.0870	0.250	0.500
1,2,4-Trichlorobenzene	120-82-1	0	U		0.148	0.310	0.630
1,1,1-Trichloroethane	71-55-6	0	U		0.0736	0.150	0.300
1,1,2-Trichloroethane	79-00-5	0	U		0.0775	0.200	0.400
Trichloroethylene	79-01-6	0	U		0.0680	0.150	0.300
1,2,4-Trimethylbenzene	95-63-6	0	U		0.0764	0.200	0.400
1,3,5-Trimethylbenzene	108-67-8	0	U		0.0779	0.200	0.400
2,2,4-Trimethylpentane	540-84-1	0	U		0.133	0.300	0.600
Vinyl chloride	75-01-4	0	U		0.0949	0.200	0.400
Vinyl Bromide	593-60-2	0	U		0.0852	0.200	0.400
Vinyl acetate	108-05-4	0	U		0.116	0.250	0.500
m&p-Xylene	1330-20-7	0	U		0.135	0.300	0.600
o-Xylene	95-47-6	0	U		0.0828	0.175	0.350

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_04.D
Acq On : 26 Jul 2022 9:45 am
Operator :
Sample : BLANK 1x WG1900825
Misc :
ALS Vial : 4 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 10:10:24 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

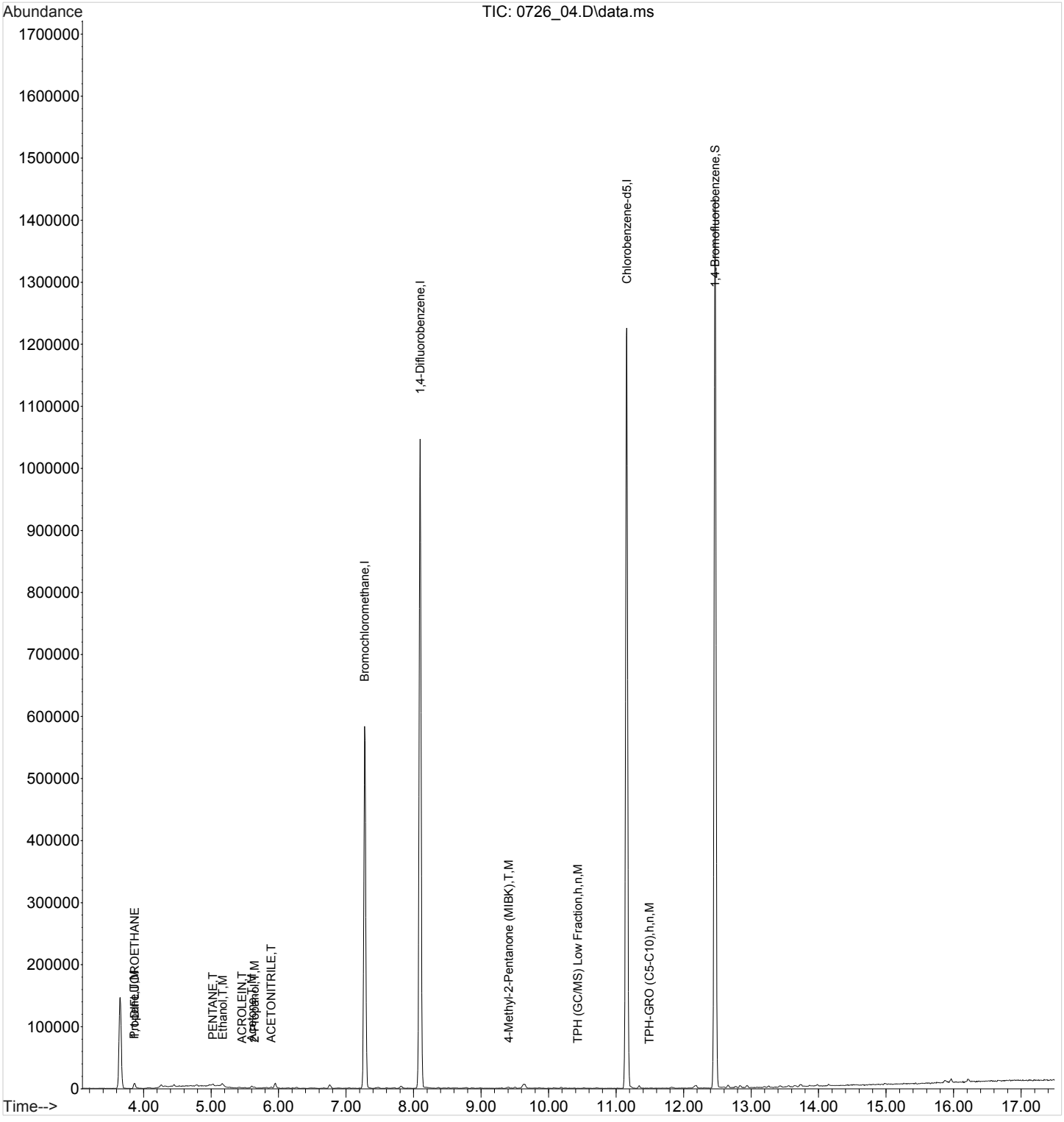
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	7.275	130	212224	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	8.098	114	874638	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	11.159	117	794061	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	12.463	95	554885	3.8063283	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 95.16%			
Target Compounds						Qvalue
2) Propene	3.861	41	1264	0.0883270	ppbv #	87
4) 1,1-DIFLUOROETHANE	3.867	65	2795	0.2785564	ppbv	93
16) PENTANE	5.026	43	1882	0.0694096	ppbv #	89
17) Ethanol	5.172	45	2861	0.3971026	ppbv	98
18) ACROLEIN	5.458	56	379	0.0525785	ppbv #	67
21) Acetone	5.605	43	4021	0.1325515	ppbv	100
23) 2-Propanol	5.641	45	2211	0.0753143	ppbv #	1
27) ACETONITRILE	5.891	41	1694	0.1249717	ppbv #	73
28) Methylene Chloride	5.952	49	4977	Below Cal		96
60) 4-Methyl-2-Pentanone (...	9.409	43	1871	0.0505328	ppbv #	96
101) TPH (GC/MS) Low Fraction	10.430	TIC	440570m	3.5694604	ppbv	
102) TPH-GRO (C5-C10)	11.493	TIC	593882m	5.9027049	ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_04.D
Acq On : 26 Jul 2022 9:45 am
Operator :
Sample : BLANK 1x WG1900825
Misc :
ALS Vial : 4 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 10:10:24 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration



SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

Lab Sample ID:	R3821343-3	**SDG:**	L1518164
Client Sample ID:	BLANK	**Collected Date/Time:**	
Lab File ID:	0801_04	**Received Date/Time:**	
Instrument ID:	AIRMS9	**Preparation Date/Time:**	08/01/22 10:08
Analytical Batch:	WG1903843	**Analysis Date/Time:**	08/01/22 10:08
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	200 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ppbv		*ppbv*	*ppbv*	*ppbv*
2-Propanol	67-63-0	0	U		0.264	0.625	1.25

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_04.D
Acq On : 01 Aug 2022 10:08 am
Operator :
Sample : BLANK 1x WG1903843
Misc :
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Aug 01 10:45:58 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

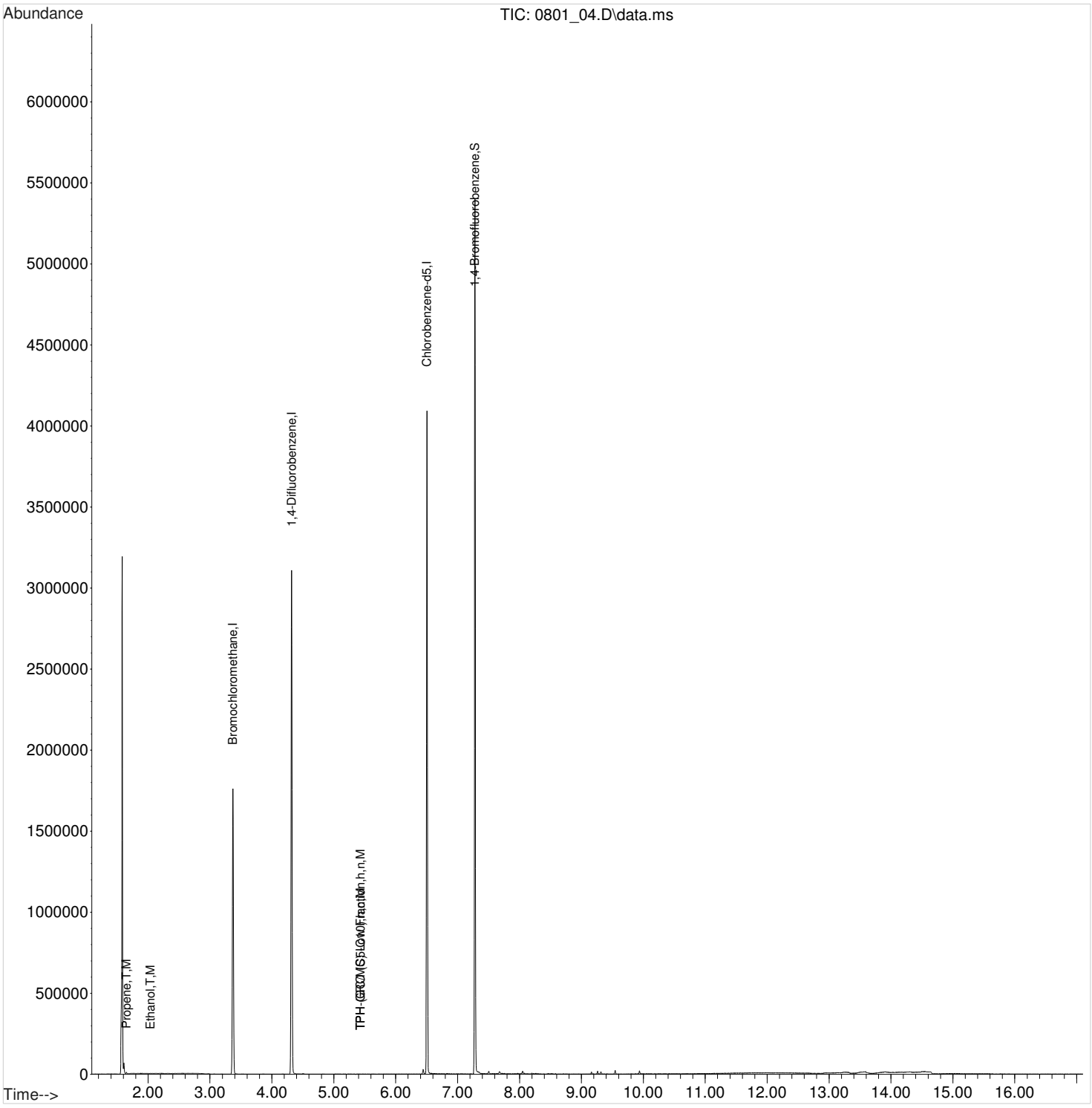
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.370	130	570271	4.0000000	ppbv	-0.01
47) 1,4-Difluorobenzene	4.318	114	1895163	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.504	117	1716421	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1060519	3.6423710	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 91.06%			
Target Compounds						Qvalue
2) Propene	1.649	41	2257	0.1226981	ppbv	94
17) Ethanol	2.039	45	801	0.1064951	ppbv	90
101) TPH (GC/MS) Low Fraction	5.430	TIC	15017574m	64.8999411	ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	15330686m	87.4091146	ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_04.D
Acq On : 01 Aug 2022 10:08 am
Operator :
Sample : BLANK 1x WG1903843
Misc :
ALS Vial : 4 Sample Multiplier: 1

Quant Time: Aug 01 10:45:58 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration



SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

Lab Sample ID:	R3819755-1	**SDG:**	L1518164
Client Sample ID:	LCS	**Collected Date/Time:**	
Lab File ID:	0726_02	**Received Date/Time:**	
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 08:25
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 08:25
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	300 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ppbv		*ppbv*	*ppbv*	*ppbv*
Acetone	67-64-1	5.59	3.44		0.584	1.20	2.40
Allyl Chloride	107-05-1	5.82	3.79		0.114	0.250	0.500
Benzene	71-43-2	7.81	3.74		0.0715	0.150	0.300
Benzyl Chloride	100-44-7	13.87	3.83		0.0598	0.130	0.300
Bromodichloromethane	75-27-4	8.87	3.63		0.0702	0.150	0.300
Bromoform	75-25-2	12.15	3.79		0.0732	0.310	0.600
Bromomethane	74-83-9	4.69	3.64		0.0982	0.200	0.400
1,3-Butadiene	106-99-0	4.32	3.61		0.104	0.630	2.00
Carbon disulfide	75-15-0	5.78	3.80		0.102	0.250	0.500
Carbon tetrachloride	56-23-5	7.60	3.74		0.0732	0.150	0.300
Chlorobenzene	108-90-7	11.19	3.63		0.0832	0.200	0.400
Chloroethane	75-00-3	4.78	3.69		0.0996	0.200	0.400
Chloroform	67-66-3	7.28	3.69		0.0717	0.150	0.300
Chloromethane	74-87-3	4.17	3.98		0.103	0.250	0.500
2-Chlorotoluene	95-49-8	12.84	3.76		0.0828	0.200	0.400
Cyclohexane	110-82-7	7.48	4.08		0.0753	0.200	0.400
Dibromochloromethane	124-48-1	10.52	3.66		0.0727	0.150	0.300
1,2-Dibromoethane	106-93-4	10.71	3.78		0.0721	0.150	0.300
1,2-Dichlorobenzene	95-50-1	14.15	3.76		0.128	0.300	0.600
1,3-Dichlorobenzene	541-73-1	13.65	3.81		0.182	0.400	0.800
1,4-Dichlorobenzene	106-46-7	13.74	3.76		0.0557	0.130	0.300
1,2-Dichloroethane	107-06-2	7.87	3.56		0.0700	0.150	0.300
1,1-Dichloroethane	75-34-3	6.54	3.84		0.0723	0.150	0.300
1,1-Dichloroethene	75-35-4	5.50	3.83		0.0762	0.200	0.400
cis-1,2-Dichloroethene	156-59-2	7.04	3.89		0.0784	0.200	0.400
trans-1,2-Dichloroethene	156-60-5	6.15	3.82		0.0673	0.150	0.300
1,2-Dichloropropane	78-87-5	8.64	3.78		0.0760	0.200	0.400
cis-1,3-Dichloropropene	10061-01-5	9.30	3.90		0.0689	0.150	0.300
trans-1,3-Dichloropropene	10061-02-6	9.86	3.84		0.0728	0.150	0.300
1,4-Dioxane	123-91-1	8.74	3.69		0.0833	0.200	0.400
Ethanol	64-17-5	5.16	3.57		0.265	0.630	1.30
Ethylbenzene	100-41-4	11.22	3.76		0.0835	0.200	0.400
4-Ethyltoluene	622-96-8	12.77	3.90		0.0783	0.200	0.400
Trichlorofluoromethane	75-69-4	4.99	3.61		0.0819	0.175	0.350
Dichlorodifluoromethane	75-71-8	3.91	3.69		0.137	0.300	0.600
1,1,2-Trichlorotrifluoroethane	76-13-1	5.42	3.69		0.0793	0.200	0.400
1,2-Dichlorotetrafluoroethane	76-14-2	4.06	3.86		0.0890	0.200	0.400
Heptane	142-82-5	7.82	3.89		0.104	0.250	0.500
Hexachloro-1,3-butadiene	87-68-3	15.96	3.55		0.105	0.250	0.630
n-Hexane	110-54-3	6.27	3.99		0.206	0.500	1.00
Isopropylbenzene	98-82-8	12.19	4.08		0.0777	0.200	0.400
Methylene Chloride	75-09-2	5.95	3.68		0.0979	0.200	0.400
Methyl Butyl Ketone	591-78-6	10.26	3.59		0.133	0.300	1.25

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

Lab Sample ID:	R3819755-1	**SDG:**	L1518164
Client Sample ID:	LCS	**Collected Date/Time:**	
Lab File ID:	0726_02	**Received Date/Time:**	
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 08:25
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 08:25
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	300 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ppbv		*ppbv*	*ppbv*	*ppbv*
Methyl Ethyl Ketone	78-93-3	7.03	3.78		0.0814	0.190	1.25
4-Methyl-2-pentanone (MIBK)	108-10-1	9.40	3.73		0.0765	0.190	1.25
Methyl Methacrylate	80-62-6	8.58	3.84		0.0876	0.200	0.400
MTBE	1634-04-4	6.12	3.85		0.0647	0.130	0.300
Naphthalene	91-20-3	16.21	3.48		0.350	0.700	1.40
2-Propanol	67-63-0	5.63	3.64		0.264	0.625	1.25
Propene	115-07-1	3.87	3.87		0.0932	0.625	1.25
Styrene	100-42-5	11.84	4.00		0.0788	0.200	0.400
1,1,2,2-Tetrachloroethane	79-34-5	12.60	3.72		0.0743	0.150	0.300
Tetrachloroethylene	127-18-4	10.19	3.68		0.0814	0.200	0.400
Tetrahydrofuran	109-99-9	7.31	3.90		0.0734	0.150	0.300
Toluene	108-88-3	9.62	3.82		0.0870	0.250	0.500
1,2,4-Trichlorobenzene	120-82-1	15.88	3.37		0.148	0.310	0.630
1,1,1-Trichloroethane	71-55-6	7.48	3.68		0.0736	0.150	0.300
1,1,2-Trichloroethane	79-00-5	10.08	3.68		0.0775	0.200	0.400
Trichloroethylene	79-01-6	8.37	3.75		0.0680	0.150	0.300
1,2,4-Trimethylbenzene	95-63-6	13.26	3.97		0.0764	0.200	0.400
1,3,5-Trimethylbenzene	108-67-8	12.84	3.84		0.0779	0.200	0.400
2,2,4-Trimethylpentane	540-84-1	7.71	4.02		0.133	0.300	0.600
Vinyl chloride	75-01-4	4.29	3.89		0.0949	0.200	0.400
Vinyl Bromide	593-60-2	4.97	3.73		0.0852	0.200	0.400
Vinyl acetate	108-05-4	6.49	3.89		0.116	0.250	0.500
m&p-Xylene	1330-20-7	11.34	7.83		0.135	0.300	0.600
o-Xylene	95-47-6	11.82	4.00		0.0828	0.175	0.350

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_02.D
Acq On : 26 Jul 2022 8:25 am
Operator :
Sample : LCS 1x WG1900825
Misc :
ALS Vial : 2 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 10:07:08 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.281	130	210432	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	888174	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.159	117	813648	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	592426	3.9660180	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 99.15%				
Target Compounds						Qvalue	
2) Propene	3.867	41	54846	3.8652186	ppbv		96
3) BUTANE	4.263	43	185511	4.4565565	ppbv		98
4) 1,1-DIFLUOROETHANE	3.867	65	38278	3.8473641	ppbv		97
5) Dichlorodifluoromethane	3.910	85	136185	3.6932573	ppbv		100
6) CHLORODIFLUOROMETHANE	3.928	67	16564	3.7021707	ppbv		100
7) 1,2-Dichlorotetrafluor...	4.062	85	157205	3.8600909	ppbv		97
8) Chloromethane	4.172	50	59401	3.9784899	ppbv		99
9) Vinyl Chloride	4.294	62	66722	3.8923935	ppbv		99
10) 1,3-Butadiene	4.324	39	50406	3.6075904	ppbv		100
11) Bromomethane	4.690	94	59746	3.6425931	ppbv		99
12) Chloroethane	4.782	64	29209	3.6924335	ppbv		97
13) ISOPENTANE	4.794	43	63192	3.6320960	ppbv		97
14) Vinyl Bromide	4.971	106	61433	3.7335355	ppbv		98
15) Trichlorofluoromethane	4.989	101	172587	3.6070452	ppbv		98
16) PENTANE	5.026	43	97804	3.6378043	ppbv		98
17) Ethanol	5.160	45	25493	3.5685230	ppbv		98
18) ACROLEIN	5.452	56	27063	3.7864089	ppbv		98
19) 1,1,2-Trichlorotrifluo...	5.416	101	127223	3.6849189	ppbv		99
20) 1,1-Dichloroethene	5.501	61	106859	3.8283915	ppbv		99
21) Acetone	5.586	43	103445	3.4390842	ppbv		99
22) BROMOETHANE	5.696	108	50268	3.7372340	ppbv		98
23) 2-Propanol	5.629	45	106034	3.6426411	ppbv		99
24) Carbon Disulfide	5.782	76	207166	3.8016563	ppbv		97
25) Allyl Chloride	5.824	41	94010	3.7885671	ppbv		97
26) METHYL ACETATE	5.812	43	122954	3.7712894	ppbv	#	99
27) ACETONITRILE	5.879	41	255288	18.9937798	ppbv		99
28) Methylene Chloride	5.952	49	72980	3.6807033	ppbv		99
29) TERT-BUTYL ALCOHOL	5.989	59	121526	3.7605426	ppbv		98
30) Methyl Tert-Butyl Ether	6.117	73	156344	3.8484162	ppbv		99
31) Trans-1,2-Dichloroethene	6.147	61	96669	3.8227522	ppbv		99
32) ACRYLONITRILE	6.202	53	52268	3.7904246	ppbv		98
33) n-Hexane	6.269	57	89637	3.9883470	ppbv		98
34) 1,1-Dichloroethane	6.544	63	119649	3.8349252	ppbv		100
35) Vinyl Acetate	6.489	43	248618m	3.8871738	ppbv		
36) DI-ISOPROPYL ETHER	6.452	45	190529	4.0363043	ppbv		91
37) ETHYL TERT-BUTYL ETHER	6.763	59	187211	3.8878715	ppbv		100
38) ETHYL ACETATE	6.989	45	20407	3.8200397	ppbv		97
39) 2-Butanone (MEK)	7.031	72	29044	3.7841841	ppbv		98
40) cis-1,2-Dichloroethene	7.043	61	90492	3.8902126	ppbv		99
41) Tetrahydrofuran	7.306	42	65045	3.9011904	ppbv		96
42) Chloroform	7.281	83	121970	3.6871493	ppbv		96
43) Cyclohexane	7.482	84	69442	4.0792958	ppbv		97
44) 1,1,1-Trichloroethane	7.476	97	132991	3.6844466	ppbv		99
45) Carbon Tetrachloride	7.598	117	138070	3.7371001	ppbv		99
46) 2,2,4-Trimethylpentane	7.708	57	286211	4.0216927	ppbv		98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_02.D
Acq On : 26 Jul 2022 8:25 am
Operator :
Sample : LCS 1x WG1900825
Misc :
ALS Vial : 2 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 10:07:08 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

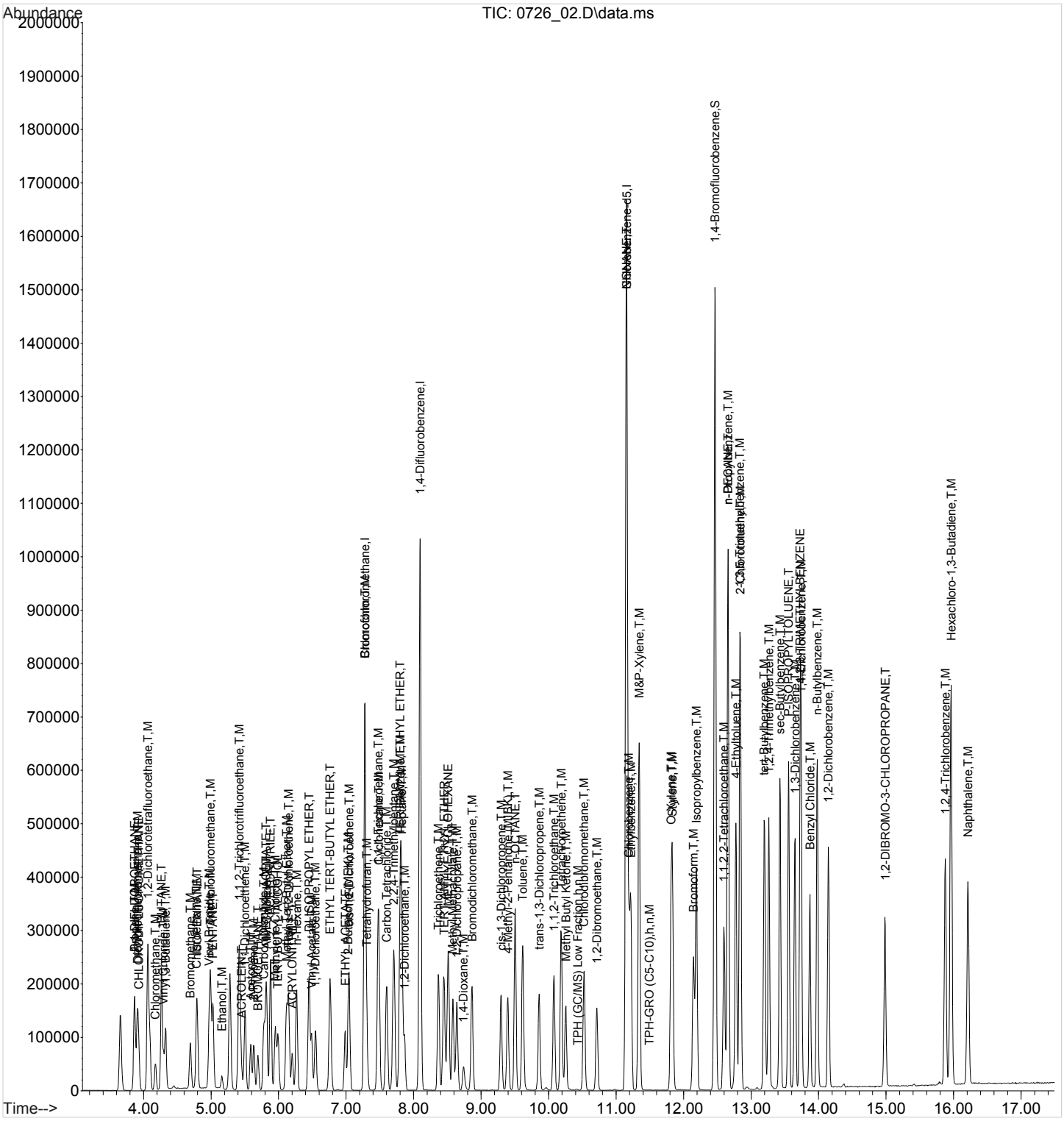
	Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48)	Benzene	7.805	78	183582	3.7377179	ppbv	98
49)	TERT-AMYL METHYL ETHER	7.799	73	173129	3.7938920	ppbv	98
50)	1,2-Dichloroethane	7.866	62	85125	3.5619474	ppbv	99
51)	Heptane	7.824	43	180700	3.8938717	ppbv	98
52)	Trichloroethene	8.366	95	81111	3.7517119	ppbv	99
53)	TERT-AMYL ETHYL ETHER	8.452	73	56283	3.7698792	ppbv	97
54)	METHYL CYCLOHEXANE	8.513	83	117113	3.9427318	ppbv	98
55)	1,2-Dichloropropane	8.641	63	72603	3.7766646	ppbv	98
56)	Methyl Methacrylate	8.580	69	69713	3.8387570	ppbv	99
57)	1,4-Dioxane	8.738	88	34806	3.6920919	ppbv	95
58)	Bromodichloromethane	8.866	83	138984	3.6276002	ppbv	99
59)	cis-1,3-Dichloropropene	9.299	75	113940	3.8963962	ppbv	97
60)	4-Methyl-2-Pentanone (...	9.397	43	140318	3.7320172	ppbv	99
61)	n-OCTANE	9.506	43	178314	4.0632104	ppbv	99
62)	Toluene	9.616	91	226430	3.8145173	ppbv	98
63)	trans-1,3-Dichloropropene	9.860	75	108999	3.8402684	ppbv	98
64)	1,1,2-Trichloroethane	10.079	97	77900	3.6752180	ppbv	98
65)	Tetrachloroethene	10.189	166	108069	3.6751654	ppbv	99
66)	Methyl Butyl Ketone	10.256	43	125899	3.5930425	ppbv	98
67)	Chlorodibromomethane	10.524	129	141029	3.6637893	ppbv	99
68)	1,2-Dibromoethane	10.713	107	124400	3.7808198	ppbv	99
69)	Chlorobenzene	11.189	112	171931	3.6268956	ppbv	98
70)	NONANE	11.152	43	187170	3.8760686	ppbv	100
72)	Ethylbenzene	11.219	91	278776	3.7559323	ppbv	100
73)	M&P-Xylene	11.341	91	443149	7.8339383	ppbv	100
74)	O-Xylene	11.817	91	220937	4.0040109	ppbv	99
77)	Styrene	11.835	104	191122	4.0035605	ppbv	98
78)	Bromoform	12.146	173	142495	3.7868696	ppbv	98
79)	Isopropylbenzene	12.189	105	313495	4.0768964	ppbv	99
80)	n-DECANE	12.658	43	206482	3.9751463	ppbv	99
81)	1,1,2,2-Tetrachloroethane	12.597	83	185026	3.7235861	ppbv	99
82)	n-Propylbenzene	12.658	91	432928	3.8169684	ppbv	100
83)	4-Ethyltoluene	12.774	105	354246	3.8954539	ppbv	98
84)	2-Chlorotoluene	12.841	91	295709	3.7607046	ppbv	99
86)	1,3,5-Trimethylbenzene	12.835	105	306414	3.8428763	ppbv	100
87)	tert-Butylbenzene	13.195	119	284261	3.9852357	ppbv	99
88)	1,2,4-Trimethylbenzene	13.262	105	308640	3.9672356	ppbv	99
89)	sec-Butylbenzene	13.426	105	445706	4.0036782	ppbv	99
90)	1,3-Dichlorobenzene	13.652	146	213411	3.8100367	ppbv	100
91)	P-ISOPROPYLTOLUENE	13.554	119	378467	3.9757975	ppbv	99
92)	1,4-Dichlorobenzene	13.743	146	210832	3.7639277	ppbv	99
93)	1,2,3-TRIMETHYLBENZENE	13.725	105	313227	3.8822248	ppbv	98
94)	Benzyl Chloride	13.871	91	270184	3.8333411	ppbv	100
95)	n-Butylbenzene	13.981	91	373203	3.9171665	ppbv	99
96)	1,2-Dichlorobenzene	14.146	146	204269	3.7644050	ppbv	99
97)	1,2-DIBROMO-3-CHLOROPR...	14.987	157	99040	3.6474401	ppbv	98
98)	1,2,4-Trichlorobenzene	15.877	180	169466	3.3685214	ppbv	98
99)	Hexachloro-1,3-Butadiene	15.962	225	200554	3.5480953	ppbv	100
100)	Naphthalene	16.212	128	381958	3.4791123	ppbv	100
101)	TPH (GC/MS) Low Fraction	10.430	TIC	26926575m	212.9053195	ppbv	
102)	TPH-GRO (C5-C10)	11.493	TIC	31136108m	302.0180289	ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_02.D
Acq On : 26 Jul 2022 8:25 am
Operator :
Sample : LCS 1x WG1900825
Misc :
ALS Vial : 2 Sample Multiplier: 1
InstName : AIRMS7

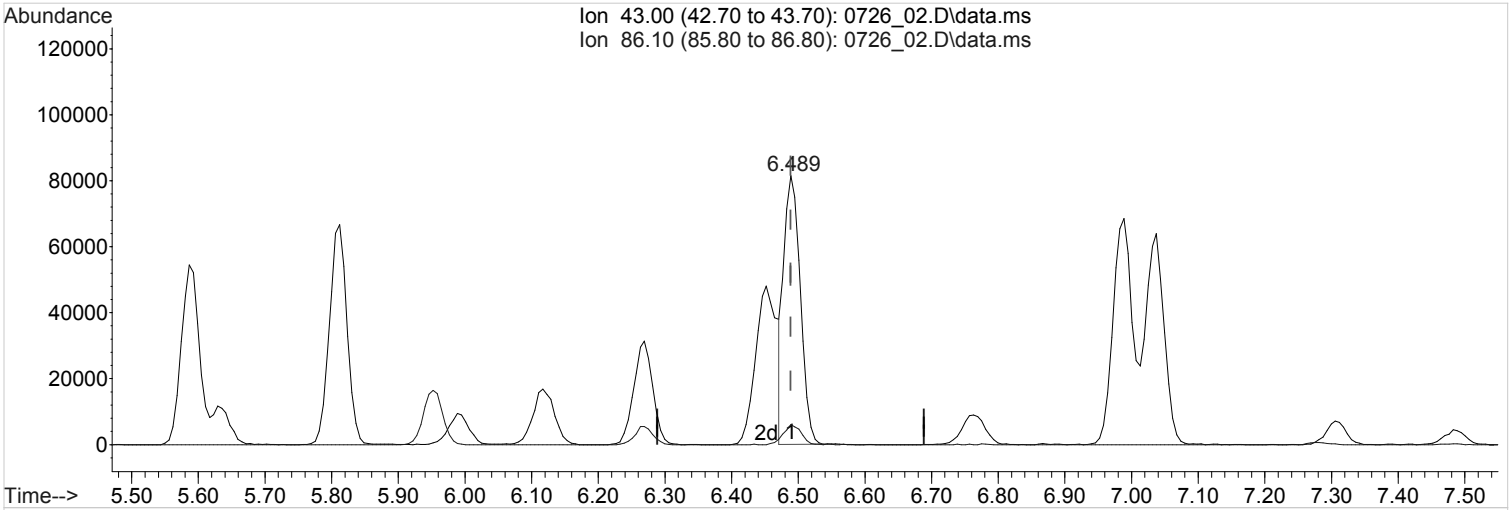
Quant Time: Jul 26 10:07:08 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

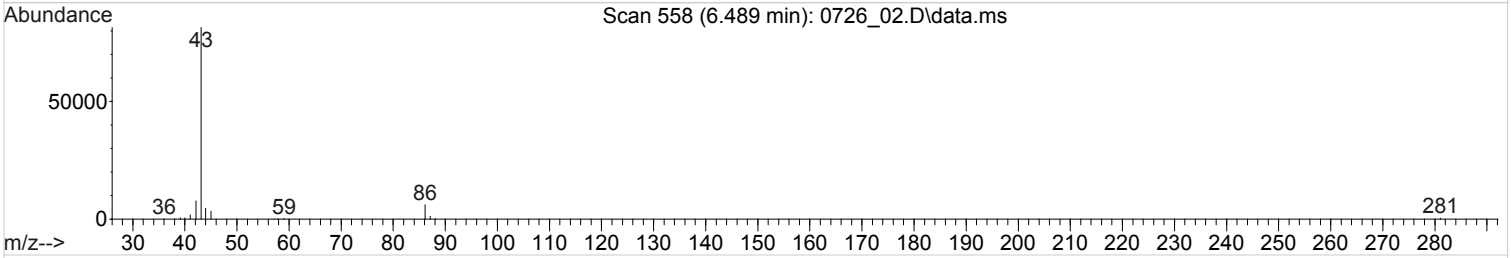


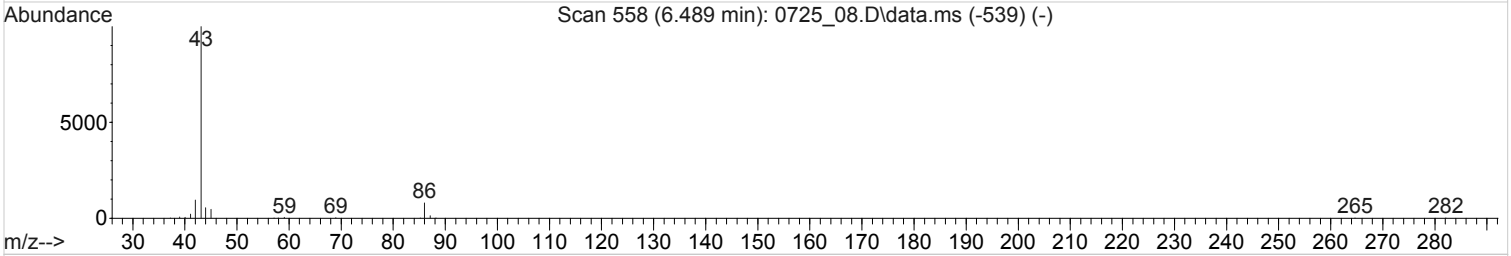
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_02.D
Acq On : 26 Jul 2022 8:25 am
Operator :
Sample : LCS 1x WG1900825
Misc :
ALS Vial : 2 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 10:05:28 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration







TIC: 0726_02.D\data.ms

(35) Vinyl Acetate (T,M)

6.489min (+0.000) 2.2096811 ppbv

Qvalue = 99

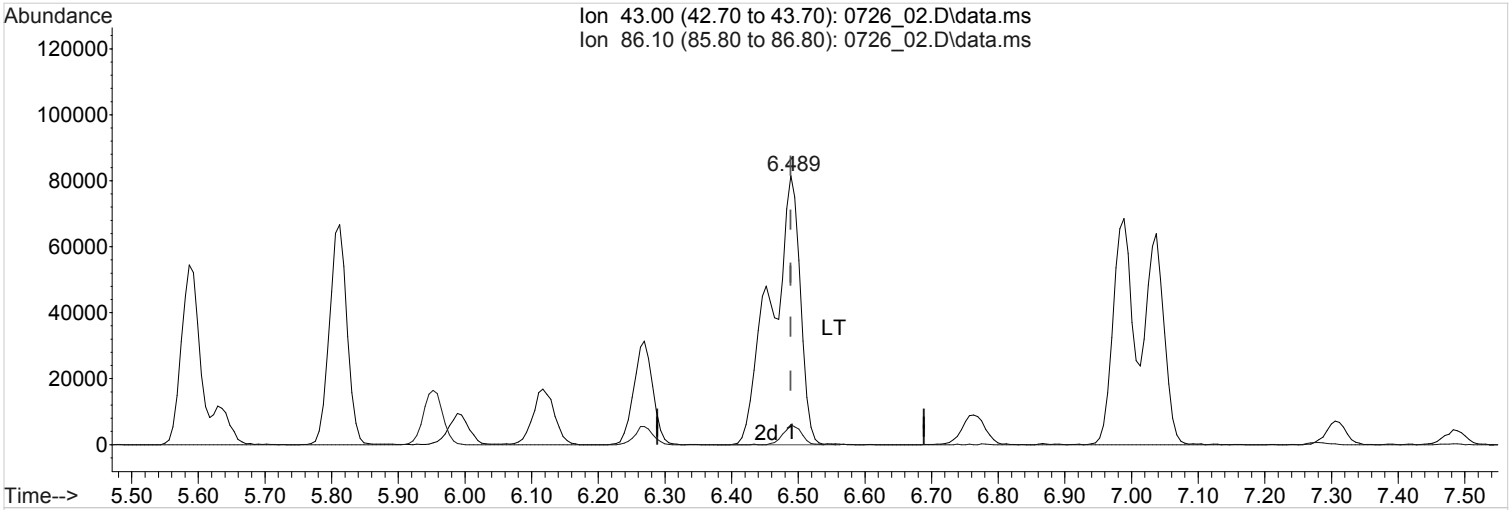
response 141328

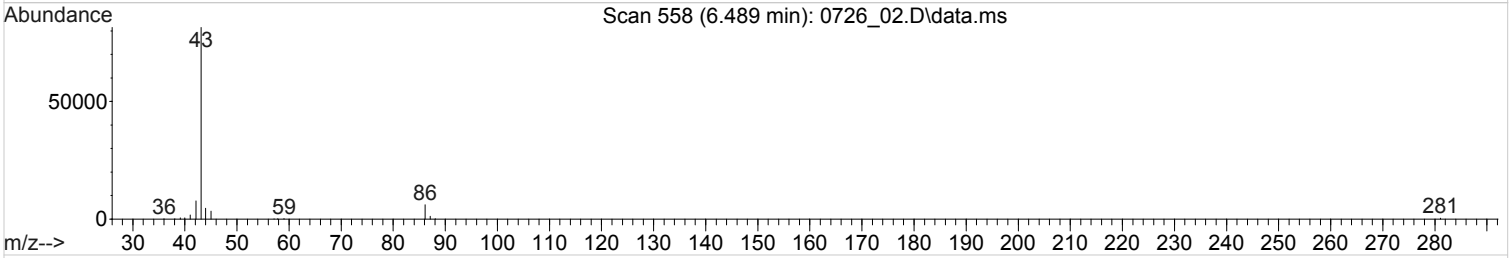
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	7.96
0.00	0.00	0.00
0.00	0.00	0.00

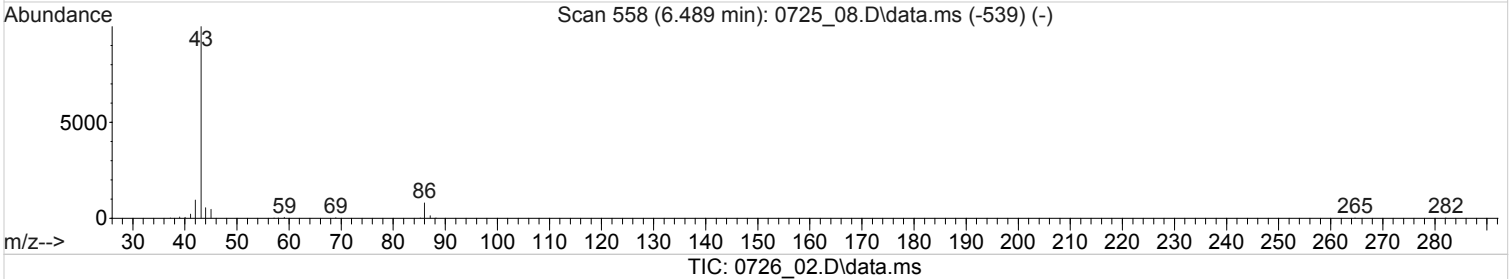
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_02.D
Acq On : 26 Jul 2022 8:25 am
Operator :
Sample : LCS 1x WG1900825
Misc :
ALS Vial : 2 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 10:05:28 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration







TIC: 0726_02.D\data.ms

(35) Vinyl Acetate (T,M)

6.489min (+0.000) 3.8871738 ppbv m

response 248618

Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.53#
0.00	0.00	0.00
0.00	0.00	0.00

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

Lab Sample ID:	R3821343-1	**SDG:**	L1518164
Client Sample ID:	LCS	**Collected Date/Time:**	
Lab File ID:	0801_02	**Received Date/Time:**	
Instrument ID:	AIRMS9	**Preparation Date/Time:**	08/01/22 09:09
Analytical Batch:	WG1903843	**Analysis Date/Time:**	08/01/22 09:09
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	300 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ppbv		*ppbv*	*ppbv*	*ppbv*
2-Propanol	67-63-0	2.31	3.11		0.264	0.625	1.25

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_02.D
Acq On : 01 Aug 2022 09:09 am
Operator :
Sample : LCS 1x WG1903843
Misc :
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 01 10:44:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.374	130	567209	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.318	114	1915891	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	1757162	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1129906	3.7907056	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 94.77%			
Target Compounds						Qvalue
2) Propene	1.652	41	59518	3.2530659	ppbv	99
3) BUTANE	1.872	43	119316	3.1710683	ppbv	98
4) 1,1-DIFLUOROETHANE	1.626	65	65706	3.4568802	ppbv	97
5) Dichlorodifluoromethane	1.675	85	204036	3.5847906	ppbv	99
6) CHLORODIFLUOROMETHANE	1.641	67	21015	3.5236819	ppbv	80
7) 1,2-Dichlorotetrafluor...	1.762	85	242824	3.5519882	ppbv	95
8) Chloromethane	1.728	50	50983	3.0497282	ppbv	99
9) Vinyl Chloride	1.804	62	79005	3.1917418	ppbv	99
10) 1,3-Butadiene	1.853	39	47702	3.4482429	ppbv	79
11) Bromomethane	1.944	94	116420	3.4571865	ppbv	99
12) Chloroethane	2.005	64	45493	3.1360363	ppbv	100
13) ISOPENTANE	2.426	41	42875	3.0954364	ppbv	98
14) Vinyl Bromide	2.134	106	127765	3.5747705	ppbv	100
15) Trichlorofluoromethane	2.293	101	228922	3.6963583	ppbv	99
16) PENTANE	2.426	43	88886	3.0760591	ppbv	96
17) Ethanol	2.043	45	21024	2.8102873	ppbv	98
18) ACROLEIN	2.172	56	33062	3.0693206	ppbv	99
19) 1,1,2-Trichlorotrifluo...	2.646	101	196012	3.6991952	ppbv	97
20) 1,1-Dichloroethene	2.517	61	99106	3.3680054	ppbv	94
21) Acetone	2.221	43	71387	2.9112746	ppbv	89
22) BROMOETHANE	2.502	108	101150	3.6391863	ppbv	98
23) 2-Propanol	2.308	45	92820	3.1083169	ppbv	97
24) Carbon Disulfide	2.650	76	234671	3.5738609	ppbv	100
25) Allyl Chloride	2.593	41	61265	3.0807292	ppbv	92
26) METHYL ACETATE	2.543	43	99393	3.0142699	ppbv #	95
27) ACETONITRILE	2.122	41	206908	14.7536997	ppbv	100
28) Methylene Chloride	2.551	49	55459	3.0609437	ppbv	90
29) TERT-BUTYL ALCOHOL	2.524	59	119309	3.0876055	ppbv	96
30) Methyl Tert-Butyl Ether	2.983	73	236866	3.6658418	ppbv	97
31) Trans-1,2-Dichloroethene	2.877	61	95114	3.3097250	ppbv	92
32) ACRYLONITRILE	2.392	53	59963	3.1146096	ppbv	97
33) n-Hexane	3.419	57	117661	3.4727302	ppbv	98
34) 1,1-Dichloroethane	2.953	63	164322	3.3798121	ppbv	98
35) Vinyl Acetate	3.021	43	128080	3.2002487	ppbv	95
36) DI-ISOPROPYL ETHER	3.419	45	205197	3.4811344	ppbv	98
37) ETHYL TERT-BUTYL ETHER	3.670	59	244271	3.6186496	ppbv	96
38) ETHYL ACETATE	3.419	43	253639	3.3860072	ppbv	99
39) 2-Butanone (MEK)	3.116	72	51121	3.3297319	ppbv	100
40) cis-1,2-Dichloroethene	3.302	61	117758	3.4080225	ppbv	92
41) Tetrahydrofuran	3.617	42	57463	3.2440328	ppbv	98

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_02.D
Acq On : 01 Aug 2022 09:09 am
Operator :
Sample : LCS 1x WG1903843
Misc :
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 01 10:44:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
42) Chloroform	3.435	83	209590	3.6496267 ppbv	100
43) Cyclohexane	4.258	84	148563	3.6825094 ppbv	94
44) 1,1,1-Trichloroethane	3.897	97	209501	3.8126715 ppbv	98
45) Carbon Tetrachloride	4.193	117	229601	3.9403962 ppbv	100
46) 2,2,4-Trimethylpentane	4.701	57	387674	3.4669576 ppbv	100
48) Benzene	4.117	78	345237	3.5800723 ppbv	100
49) TERT-AMYL METHYL ETHER	4.443	73	278061	3.6909782 ppbv	96
50) 1,2-Dichloroethane	3.772	62	95069	3.4901089 ppbv	98
51) Heptane	4.857	43	107318	3.4239886 ppbv	96
52) Trichloroethene	4.656	95	171677	3.7486958 ppbv	93
53) TERT-AMYL ETHYL ETHER	5.152	73	87834	3.9635585 ppbv	89
54) METHYL CYCLOHEXANE	5.155	83	236674	3.9025537 ppbv	93
55) 1,2-Dichloropropane	4.531	63	100682	3.2841860 ppbv	97
56) Methyl Methacrylate	4.800	69	107391	3.5582902 ppbv #	1
57) 1,4-Dioxane	4.663	88	82172	3.5731099 ppbv	95
58) Bromodichloromethane	4.629	83	224903	3.6996892 ppbv	100
59) cis-1,3-Dichloropropene	5.114	75	168448	3.6050781 ppbv	96
60) 4-Methyl-2-Pentanone (...	5.152	43	175418	3.5125799 ppbv	97
61) n-OCTANE	6.178	43	145364	3.5959675 ppbv	93
62) Toluene	5.615	91	448056	3.9138528 ppbv	99
63) trans-1,3-Dichloropropene	5.396	75	140269	3.7068222 ppbv	97
64) 1,1,2-Trichloroethane	5.468	97	183651	3.6997072 ppbv	96
65) Tetrachloroethene	6.191	166	350675	4.3079999 ppbv	97
66) Methyl Butyl Ketone	5.784	43	113566	3.3653440 ppbv	96
67) Chlorodibromomethane	5.812	129	324587	4.1793731 ppbv	100
68) 1,2-Dibromoethane	5.934	107	302718	3.9298806 ppbv	100
69) Chlorobenzene	6.526	112	450101	3.9630304 ppbv	94
70) NONANE	7.221	43	159983	3.7079523 ppbv #	96
72) Ethylbenzene	6.732	91	529225	3.8369032 ppbv	98
73) M&P-Xylene	6.826	91	920351	8.1887022 ppbv	98
74) O-Xylene	7.055	91	453142	4.2076993 ppbv	97
77) Styrene	7.002	104	410729	4.2630639 ppbv	96
78) Bromoform	6.823	173	367722	4.6570984 ppbv	100
79) Isopropylbenzene	7.365	105	696727	3.9812574 ppbv	98
80) n-DECANE	8.075	43	172884	3.8583823 ppbv	98
81) 1,1,2,2-Tetrachloroethane	7.045	83	365580	3.7211607 ppbv	99
82) n-Propylbenzene	7.628	91	829645	4.1266014 ppbv	96
83) 4-Ethyltoluene	7.709	105	770024	4.3203852 ppbv	99
84) 2-Chlorotoluene	7.590	91	500873	3.9157118 ppbv	96
86) 1,3,5-Trimethylbenzene	7.756	105	675593	4.3235080 ppbv	98
87) tert-Butylbenzene	7.969	119	754583	4.5048064 ppbv	97
88) 1,2,4-Trimethylbenzene	7.972	105	662988	4.4404931 ppbv	98
89) sec-Butylbenzene	8.119	105	990234	4.3464228 ppbv	98
90) 1,3-Dichlorobenzene	8.031	146	621226	4.5755953 ppbv	97
91) P-ISOPROPYLTOLUENE	8.219	119	973284	4.5400809 ppbv	98
92) 1,4-Dichlorobenzene	8.072	146	623191	4.6326685 ppbv	97
93) 1,2,3-TRIMETHYLBENZENE	8.200	105	691537	4.2702951 ppbv	97
94) Benzyl Chloride	8.028	91	345994	4.1246180 ppbv	96
95) n-Butylbenzene	8.460	91	651497	4.2532212 ppbv	97
96) 1,2-Dichlorobenzene	8.257	146	598804	4.2630449 ppbv	99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_02.D
Acq On : 01 Aug 2022 09:09 am
Operator :
Sample : LCS 1x WG1903843
Misc :
ALS Vial : 2 Sample Multiplier: 1

Quant Time: Aug 01 10:44:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
97) 1,2-DIBROMO-3-CHLOROPR...	8.510	157	322881	4.4072012 ppbv	96
98) 1,2,4-Trichlorobenzene	9.258	180	575077	5.2473380 ppbv	99
99) Hexachloro-1,3-Butadiene	9.543	225	522420	4.8656070 ppbv	99
100) Naphthalene	9.312	128	1079438	5.3030685 ppbv	99
101) TPH (GC/MS) Low Fraction	5.430	TIC	59120731m	249.5722726 ppbv	
102) TPH-GRO (C5-C10)	5.430	TIC	63148705m	351.6993761 ppbv	

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

Quantitation Report (QT Reviewed)

```
Data Path : C:\GCMS\1\data\080122\
Data File : 0801_02.D
Acq On    : 01 Aug 2022  09:09 am
Operator  :
Sample    : LCS 1x WG1903843
Misc      :
ALS Vial  : 2   Sample Multiplier: 1

Quant Time: Aug 01 10:44:57 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title  :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration
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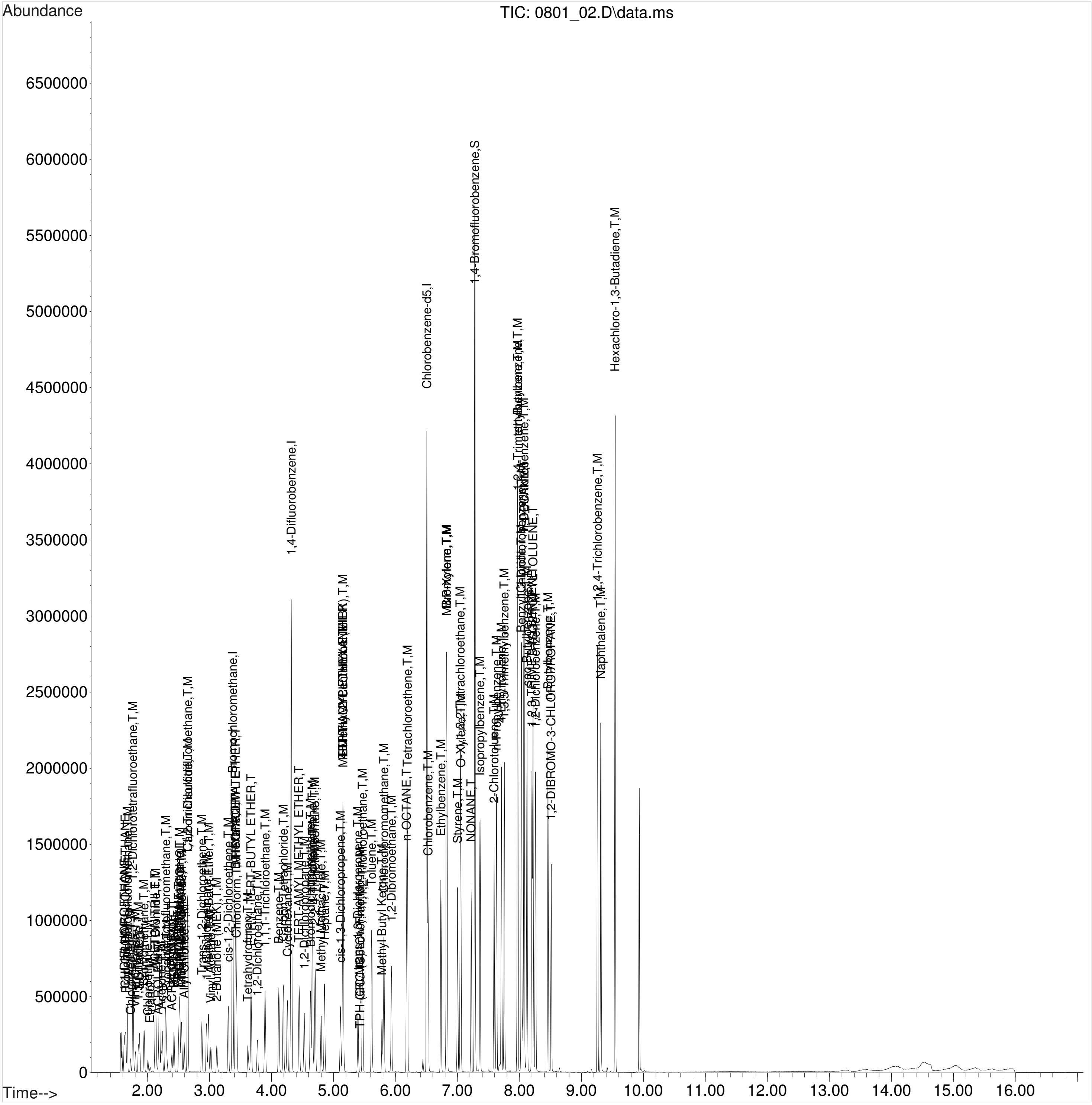


SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

Lab Sample ID:	R3819755-2	**SDG:**	L1518164
Client Sample ID:	LCSD	**Collected Date/Time:**	
Lab File ID:	0726_03	**Received Date/Time:**	
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 09:05
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 09:05
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	300 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ppbv		*ppbv*	*ppbv*	*ppbv*
Acetone	67-64-1	5.59	3.45		0.584	1.20	2.40
Allyl Chloride	107-05-1	5.82	3.81		0.114	0.250	0.500
Benzene	71-43-2	7.81	3.73		0.0715	0.150	0.300
Benzyl Chloride	100-44-7	13.87	3.79		0.0598	0.130	0.300
Bromodichloromethane	75-27-4	8.87	3.65		0.0702	0.150	0.300
Bromoform	75-25-2	12.15	3.79		0.0732	0.310	0.600
Bromomethane	74-83-9	4.69	3.60		0.0982	0.200	0.400
1,3-Butadiene	106-99-0	4.32	3.44		0.104	0.630	2.00
Carbon disulfide	75-15-0	5.78	3.78		0.102	0.250	0.500
Carbon tetrachloride	56-23-5	7.60	3.70		0.0732	0.150	0.300
Chlorobenzene	108-90-7	11.19	3.61		0.0832	0.200	0.400
Chloroethane	75-00-3	4.78	3.67		0.0996	0.200	0.400
Chloroform	67-66-3	7.28	3.69		0.0717	0.150	0.300
Chloromethane	74-87-3	4.17	3.75		0.103	0.250	0.500
2-Chlorotoluene	95-49-8	12.84	3.78		0.0828	0.200	0.400
Cyclohexane	110-82-7	7.48	4.00		0.0753	0.200	0.400
Dibromochloromethane	124-48-1	10.52	3.68		0.0727	0.150	0.300
1,2-Dibromoethane	106-93-4	10.71	3.78		0.0721	0.150	0.300
1,2-Dichlorobenzene	95-50-1	14.15	3.84		0.128	0.300	0.600
1,3-Dichlorobenzene	541-73-1	13.65	3.75		0.182	0.400	0.800
1,4-Dichlorobenzene	106-46-7	13.74	3.73		0.0557	0.130	0.300
1,2-Dichloroethane	107-06-2	7.86	3.71		0.0700	0.150	0.300
1,1-Dichloroethane	75-34-3	6.54	3.77		0.0723	0.150	0.300
1,1-Dichloroethene	75-35-4	5.50	3.79		0.0762	0.200	0.400
cis-1,2-Dichloroethene	156-59-2	7.04	3.86		0.0784	0.200	0.400
trans-1,2-Dichloroethene	156-60-5	6.15	3.83		0.0673	0.150	0.300
1,2-Dichloropropane	78-87-5	8.64	3.77		0.0760	0.200	0.400
cis-1,3-Dichloropropene	10061-01-5	9.29	3.84		0.0689	0.150	0.300
trans-1,3-Dichloropropene	10061-02-6	9.86	3.81		0.0728	0.150	0.300
1,4-Dioxane	123-91-1	8.74	3.62		0.0833	0.200	0.400
Ethanol	64-17-5	5.16	3.25		0.265	0.630	1.30
Ethylbenzene	100-41-4	11.22	3.80		0.0835	0.200	0.400
4-Ethyltoluene	622-96-8	12.77	3.94		0.0783	0.200	0.400
Trichlorofluoromethane	75-69-4	4.99	3.68		0.0819	0.175	0.350
Dichlorodifluoromethane	75-71-8	3.90	3.58		0.137	0.300	0.600
1,1,2-Trichlorotrifluoroethane	76-13-1	5.42	3.68		0.0793	0.200	0.400
1,2-Dichlorotetrafluoroethane	76-14-2	4.06	3.76		0.0890	0.200	0.400
Heptane	142-82-5	7.82	3.90		0.104	0.250	0.500
Hexachloro-1,3-butadiene	87-68-3	15.96	3.65		0.105	0.250	0.630
n-Hexane	110-54-3	6.27	3.99		0.206	0.500	1.00
Isopropylbenzene	98-82-8	12.19	4.08		0.0777	0.200	0.400
Methylene Chloride	75-09-2	5.95	3.60		0.0979	0.200	0.400
Methyl Butyl Ketone	591-78-6	10.25	3.68		0.133	0.300	1.25

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

Lab Sample ID:	R3819755-2	**SDG:**	L1518164
Client Sample ID:	LCSD	**Collected Date/Time:**	
Lab File ID:	0726_03	**Received Date/Time:**	
Instrument ID:	AIRMS7	**Preparation Date/Time:**	07/26/22 09:05
Analytical Batch:	WG1900825	**Analysis Date/Time:**	07/26/22 09:05
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	300 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ppbv		*ppbv*	*ppbv*	*ppbv*
Methyl Ethyl Ketone	78-93-3	7.04	3.86		0.0814	0.190	1.25
4-Methyl-2-pentanone (MIBK)	108-10-1	9.39	3.78		0.0765	0.190	1.25
Methyl Methacrylate	80-62-6	8.59	3.84		0.0876	0.200	0.400
MTBE	1634-04-4	6.12	3.86		0.0647	0.130	0.300
Naphthalene	91-20-3	16.21	3.58		0.350	0.700	1.40
2-Propanol	67-63-0	5.63	3.72		0.264	0.625	1.25
Propene	115-07-1	3.86	3.79		0.0932	0.625	1.25
Styrene	100-42-5	11.84	4.05		0.0788	0.200	0.400
1,1,2,2-Tetrachloroethane	79-34-5	12.60	3.73		0.0743	0.150	0.300
Tetrachloroethylene	127-18-4	10.19	3.69		0.0814	0.200	0.400
Tetrahydrofuran	109-99-9	7.31	3.91		0.0734	0.150	0.300
Toluene	108-88-3	9.62	3.81		0.0870	0.250	0.500
1,2,4-Trichlorobenzene	120-82-1	15.88	3.50		0.148	0.310	0.630
1,1,1-Trichloroethane	71-55-6	7.48	3.70		0.0736	0.150	0.300
1,1,2-Trichloroethane	79-00-5	10.08	3.74		0.0775	0.200	0.400
Trichloroethylene	79-01-6	8.37	3.73		0.0680	0.150	0.300
1,2,4-Trimethylbenzene	95-63-6	13.26	3.97		0.0764	0.200	0.400
1,3,5-Trimethylbenzene	108-67-8	12.83	3.85		0.0779	0.200	0.400
2,2,4-Trimethylpentane	540-84-1	7.71	3.97		0.133	0.300	0.600
Vinyl chloride	75-01-4	4.29	3.82		0.0949	0.200	0.400
Vinyl Bromide	593-60-2	4.97	3.71		0.0852	0.200	0.400
Vinyl acetate	108-05-4	6.49	3.91		0.116	0.250	0.500
m&p-Xylene	1330-20-7	11.34	7.88		0.135	0.300	0.600
o-Xylene	95-47-6	11.82	4.00		0.0828	0.175	0.350

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_03.D
Acq On : 26 Jul 2022 9:05 am
Operator :
Sample : LCSD 1x WG1900825
Misc :
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 10:08:53 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units		Dev(Min)
Internal Standards							
1) Bromochloromethane	7.281	130	209383	4.0000000	ppbv		0.00
47) 1,4-Difluorobenzene	8.098	114	879242	4.0000000	ppbv		0.00
71) Chlorobenzene-d5	11.152	117	801844	4.0000000	ppbv		0.00
System Monitoring Compounds							
85) 1,4-Bromofluorobenzene	12.463	95	585033	3.9741807	ppbv		0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 99.35%				
Target Compounds						Qvalue	
2) Propene	3.861	41	53500	3.7892499	ppbv		96
3) BUTANE	4.263	43	179116	4.3244860	ppbv		100
4) 1,1-DIFLUOROETHANE	3.867	65	36757	3.7129959	ppbv		99
5) Dichlorodifluoromethane	3.904	85	131226	3.5766014	ppbv		99
6) CHLORODIFLUOROMETHANE	3.928	67	16799	3.7735057	ppbv		94
7) 1,2-Dichlorotetrafluor...	4.062	85	152345	3.7594971	ppbv		98
8) Chloromethane	4.172	50	55754	3.7529338	ppbv		98
9) Vinyl Chloride	4.294	62	65217	3.8236564	ppbv		99
10) 1,3-Butadiene	4.324	39	47874	3.4435395	ppbv		97
11) Bromomethane	4.690	94	58751	3.5998753	ppbv		98
12) Chloroethane	4.782	64	28858	3.6663388	ppbv		96
13) ISOPENTANE	4.788	43	61437	3.5489149	ppbv		96
14) Vinyl Bromide	4.971	106	60669	3.7055764	ppbv		99
15) Trichlorofluoromethane	4.989	101	175004	3.6758844	ppbv		99
16) PENTANE	5.025	43	96508	3.6075835	ppbv		99
17) Ethanol	5.160	45	23064	3.2446850	ppbv		99
18) ACROLEIN	5.452	56	26731	3.7586955	ppbv		99
19) 1,1,2-Trichlorotrifluo...	5.416	101	126294	3.6763376	ppbv		99
20) 1,1-Dichloroethene	5.501	61	105340	3.7928783	ppbv		100
21) Acetone	5.586	43	103231	3.4491637	ppbv		99
22) BROMOETHANE	5.690	108	50685	3.7871151	ppbv		97
23) 2-Propanol	5.629	45	107859	3.7238999	ppbv		97
24) Carbon Disulfide	5.781	76	204682	3.7748908	ppbv		98
25) Allyl Chloride	5.824	41	94043	3.8088842	ppbv		99
26) METHYL ACETATE	5.812	43	123563	3.8089564	ppbv	#	100
27) ACETONITRILE	5.879	41	254596	19.0371942	ppbv		99
28) Methylene Chloride	5.952	49	71233	3.5953031	ppbv		98
29) TERT-BUTYL ALCOHOL	5.995	59	122017	3.7946526	ppbv		98
30) Methyl Tert-Butyl Ether	6.117	73	156052	3.8604730	ppbv		99
31) Trans-1,2-Dichloroethene	6.147	61	96270	3.8260466	ppbv		98
32) ACRYLONITRILE	6.202	53	53486	3.8981852	ppbv		99
33) n-Hexane	6.269	57	89235	3.9903521	ppbv		97
34) 1,1-Dichloroethane	6.543	63	116877	3.7648462	ppbv		100
35) Vinyl Acetate	6.489	43	248487m	3.9045899	ppbv		
36) DI-ISOPROPYL ETHER	6.452	45	189611	4.0369810	ppbv		97
37) ETHYL TERT-BUTYL ETHER	6.763	59	186176	3.8857477	ppbv		100
38) ETHYL ACETATE	6.982	45	20583	3.8722889	ppbv		96
39) 2-Butanone (MEK)	7.037	72	29493	3.8619366	ppbv		100
40) cis-1,2-Dichloroethene	7.043	61	89268	3.8568196	ppbv		100
41) Tetrahydrofuran	7.305	42	64889	3.9113320	ppbv		98
42) Chloroform	7.281	83	121451	3.6898538	ppbv		99
43) Cyclohexane	7.482	84	67720	3.9980691	ppbv		97
44) 1,1,1-Trichloroethane	7.476	97	132781	3.6970585	ppbv		99
45) Carbon Tetrachloride	7.598	117	135907	3.6969843	ppbv		99
46) 2,2,4-Trimethylpentane	7.708	57	281365	3.9734065	ppbv		98

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_03.D
Acq On : 26 Jul 2022 9:05 am
Operator :
Sample : LCSD 1x WG1900825
Misc :
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 10:08:53 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

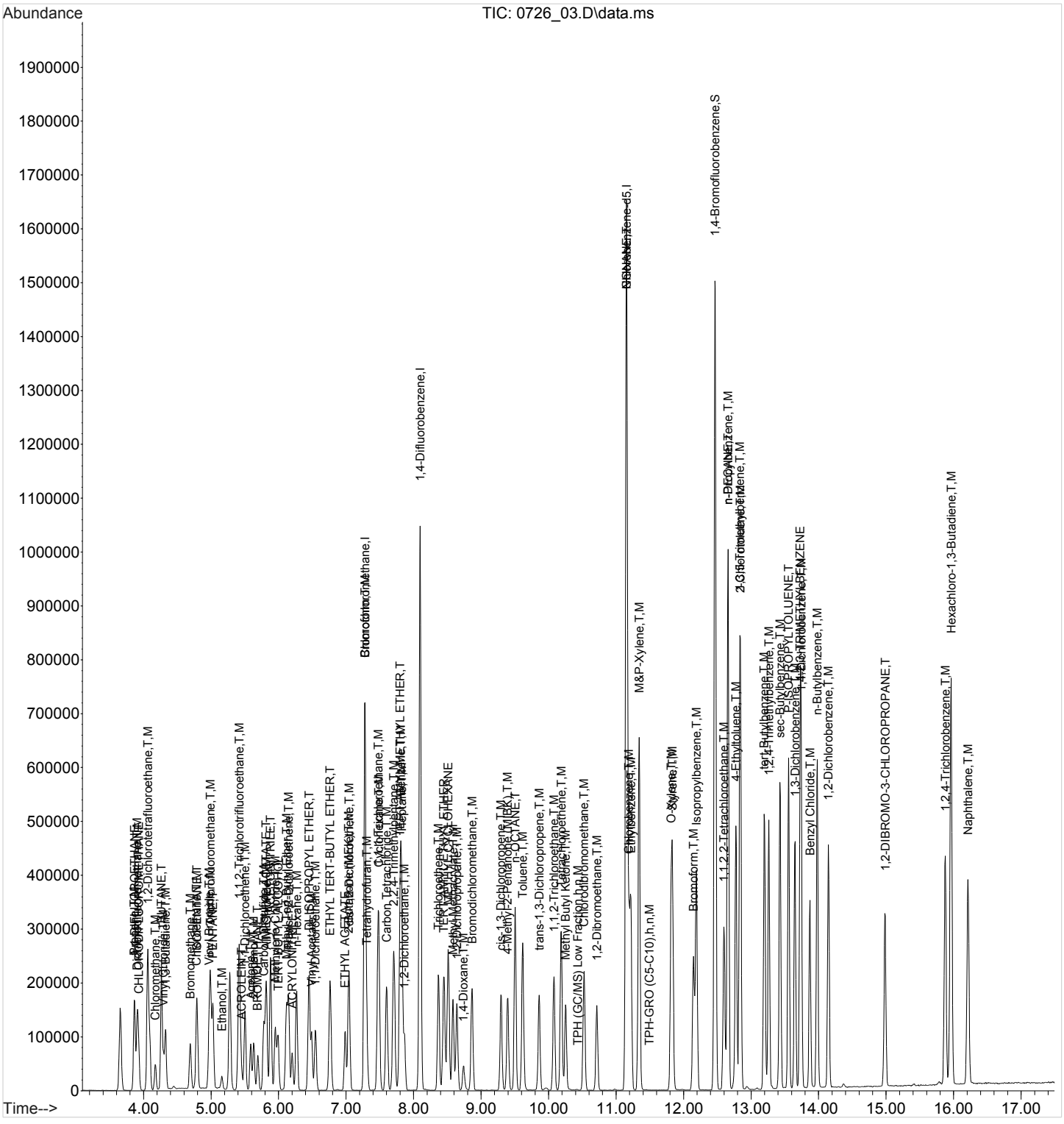
Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
48) Benzene	7.811	78	181246	3.7276444	ppbv	99
49) TERT-AMYL METHYL ETHER	7.799	73	172239	3.8127319	ppbv	98
50) 1,2-Dichloroethane	7.860	62	87729	3.7082003	ppbv	98
51) Heptane	7.824	43	179125	3.8991444	ppbv	98
52) Trichloroethene	8.366	95	79752	3.7263268	ppbv	99
53) TERT-AMYL ETHYL ETHER	8.445	73	54276	3.6723804	ppbv	98
54) METHYL CYCLOHEXANE	8.513	83	115160	3.9163673	ppbv	99
55) 1,2-Dichloropropane	8.641	63	71653	3.7651116	ppbv	98
56) Methyl Methacrylate	8.586	69	68995	3.8378156	ppbv	99
57) 1,4-Dioxane	8.738	88	33737	3.6150514	ppbv	97
58) Bromodichloromethane	8.866	83	138249	3.6450730	ppbv	100
59) cis-1,3-Dichloropropene	9.293	75	111109	3.8381838	ppbv	98
60) 4-Methyl-2-Pentanone (...	9.390	43	140505	3.7749539	ppbv	100
61) n-OCTANE	9.506	43	174982	4.0277905	ppbv	99
62) Toluene	9.616	91	224052	3.8128005	ppbv	100
63) trans-1,3-Dichloropropene	9.860	75	107156	3.8136883	ppbv	98
64) 1,1,2-Trichloroethane	10.079	97	78404	3.7365732	ppbv	95
65) Tetrachloroethene	10.189	166	107326	3.6869762	ppbv	99
66) Methyl Butyl Ketone	10.250	43	127613	3.6789563	ppbv	98
67) Chlorodibromomethane	10.524	129	140265	3.6809593	ppbv	99
68) 1,2-Dibromoethane	10.713	107	123225	3.7831543	ppbv	99
69) Chlorobenzene	11.189	112	169482	3.6115537	ppbv	99
70) NONANE	11.152	43	184873	3.8673932	ppbv	99
72) Ethylbenzene	11.219	91	277780	3.7976071	ppbv	100
73) M&P-Xylene	11.341	91	439501	7.8838240	ppbv	99
74) O-Xylene	11.817	91	217494	3.9996386	ppbv	99
77) Styrene	11.835	104	190611	4.0516354	ppbv	100
78) Bromoform	12.146	173	140453	3.7875504	ppbv	99
79) Isopropylbenzene	12.189	105	309232	4.0806577	ppbv	99
80) n-DECANE	12.658	43	206219	4.0285269	ppbv	99
81) 1,1,2,2-Tetrachloroethane	12.597	83	182797	3.7328830	ppbv	99
82) n-Propylbenzene	12.658	91	428472	3.8332930	ppbv	100
83) 4-Ethyltoluene	12.774	105	353157	3.9406477	ppbv	100
84) 2-Chlorotoluene	12.841	91	292678	3.7769518	ppbv	100
86) 1,3,5-Trimethylbenzene	12.835	105	302182	3.8455908	ppbv	99
87) tert-Butylbenzene	13.195	119	277838	3.9525289	ppbv	99
88) 1,2,4-Trimethylbenzene	13.262	105	304073	3.9660694	ppbv	100
89) sec-Butylbenzene	13.426	105	434057	3.9564358	ppbv	99
90) 1,3-Dichlorobenzene	13.652	146	206957	3.7492047	ppbv	99
91) P-ISOPROPYLTOLUENE	13.554	119	368376	3.9267589	ppbv	100
92) 1,4-Dichlorobenzene	13.743	146	206017	3.7321104	ppbv	100
93) 1,2,3-TRIMETHYLBENZENE	13.725	105	307561	3.8681155	ppbv	100
94) Benzyl Chloride	13.871	91	263350	3.7913846	ppbv	100
95) n-Butylbenzene	13.981	91	368371	3.9233677	ppbv	99
96) 1,2-Dichlorobenzene	14.146	146	205210	3.8374177	ppbv	99
97) 1,2-DIBROMO-3-CHLOROPR...	14.987	157	99269	3.7096920	ppbv	99
98) 1,2,4-Trichlorobenzene	15.877	180	173360	3.4966511	ppbv	99
99) Hexachloro-1,3-Butadiene	15.962	225	203537	3.6538776	ppbv	99
100) Naphthalene	16.212	128	387424	3.5808492	ppbv	100
101) TPH (GC/MS) Low Fraction	10.430	TIC	26573007m	213.2027367	ppbv	
102) TPH-GRO (C5-C10)	11.493	TIC	30754529m	302.7082801	ppbv	

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

Quantitation Report (QT Reviewed)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_03.D
Acq On : 26 Jul 2022 9:05 am
Operator :
Sample : LCSD 1x WG1900825
Misc :
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

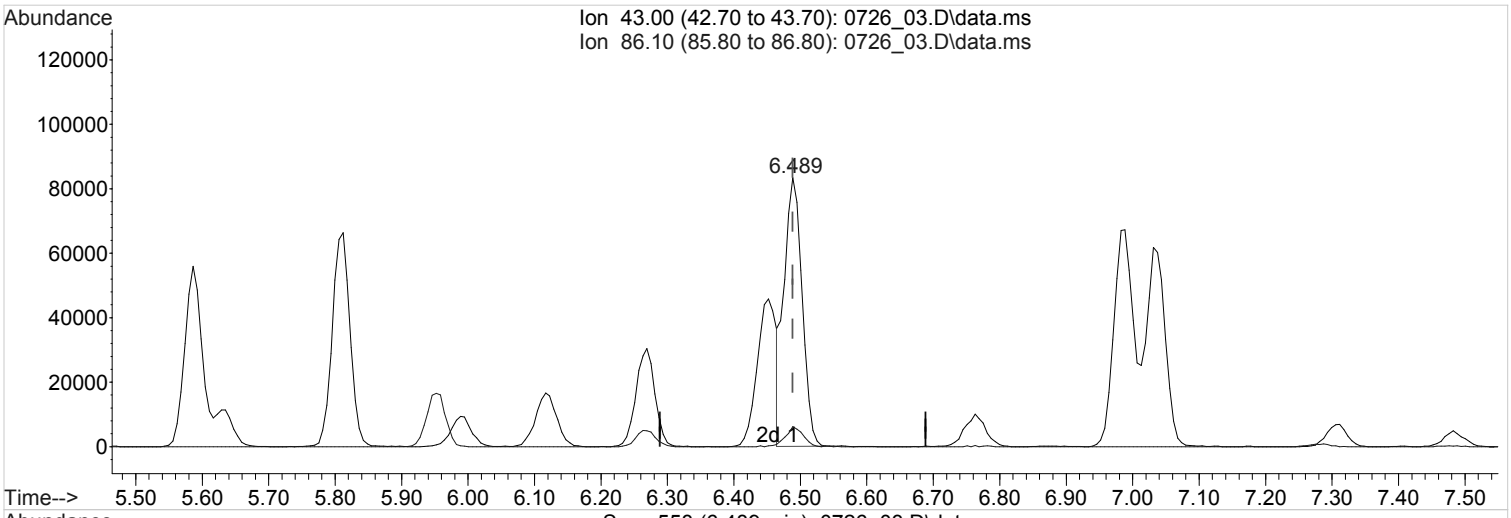
Quant Time: Jul 26 10:08:53 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration

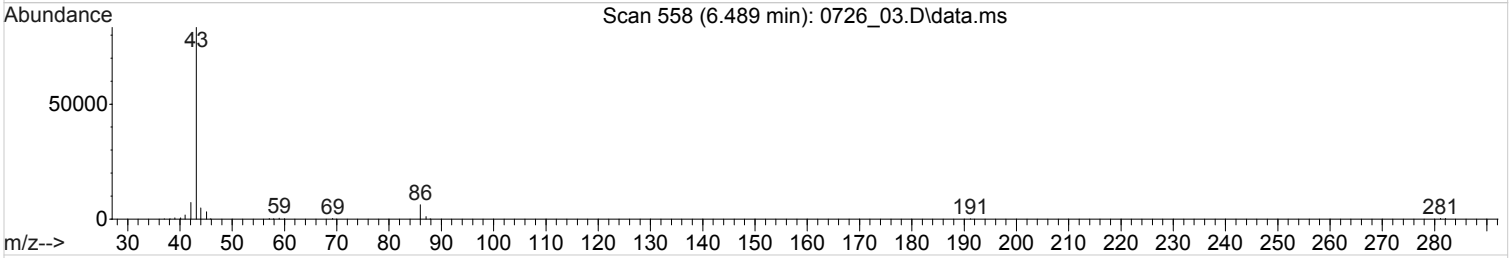


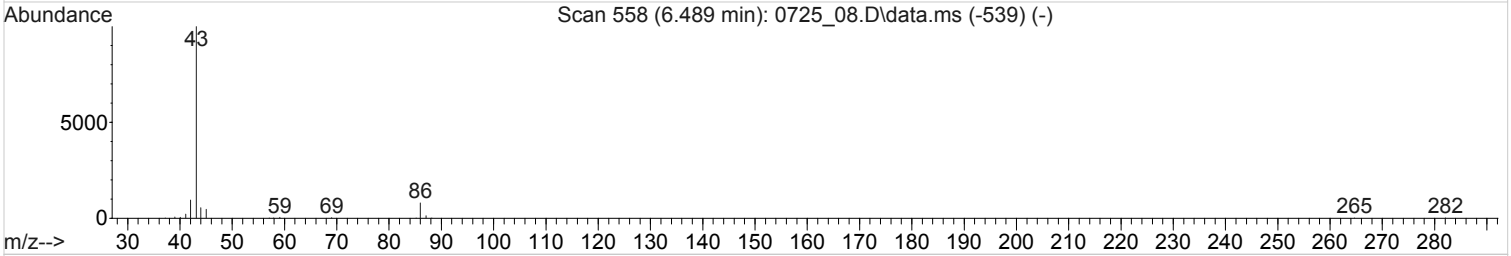
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_03.D
Acq On : 26 Jul 2022 9:05 am
Operator :
Sample : LCSD 1x WG1900825
Misc :
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 10:05:31 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration







TIC: 0726_03.D\data.ms

(35) Vinyl Acetate (T,M)

6.489min (-0.000) 2.4688984 ppbv

Qvalue = 99

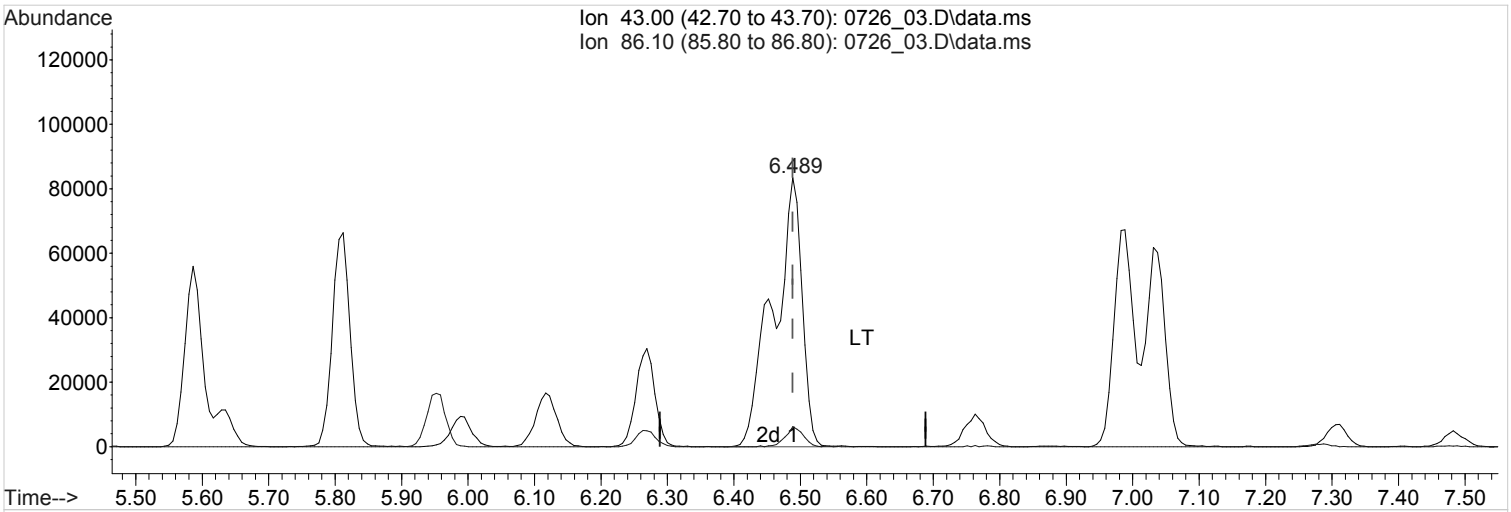
response 157120

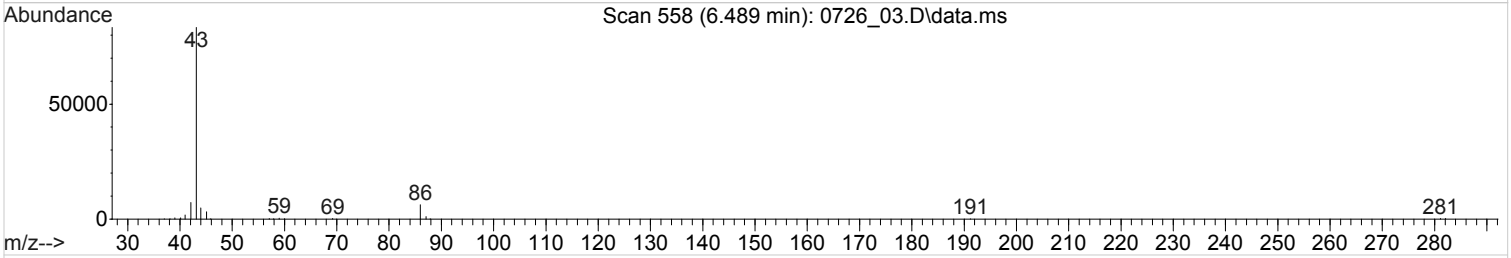
Ion	Exp%	Act%
43.00	100	100
86.10	7.50	7.27
0.00	0.00	0.00
0.00	0.00	0.00

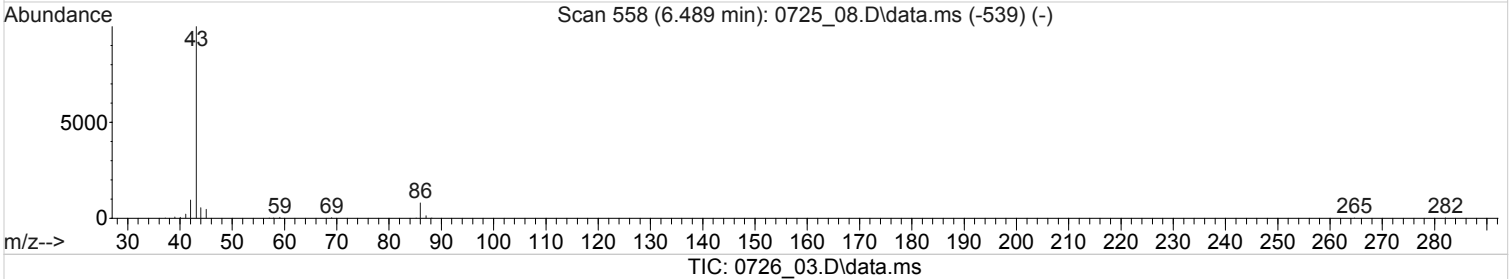
Quantitation Report (Qedit)

Data Path : C:\msdchem\1\data\072622\
Data File : 0726_03.D
Acq On : 26 Jul 2022 9:05 am
Operator :
Sample : LCSD 1x WG1900825
Misc :
ALS Vial : 3 Sample Multiplier: 1
InstName : AIRMS7

Quant Time: Jul 26 10:05:31 2022
Quant Method : C:\msdchem\1\methods\TOAIRMS7G25V.M
Quant Title :
QLast Update : Mon Jul 25 16:35:00 2022
Response via : Initial Calibration







TIC: 0726_03.D\data.ms

(35) Vinyl Acetate (T,M)

6.489min (-0.000) 3.9045899 ppbv m

response 248487

Ion	Exp%	Act%
43.00	100	100
86.10	7.50	4.60#
0.00	0.00	0.00
0.00	0.00	0.00

SAMPLE RESULT SUMMARY
ORGANIC ANALYSIS DATA SHEET

Lab Sample ID:	R3821343-2	**SDG:**	L1518164
Client Sample ID:	LCSD	**Collected Date/Time:**	
Lab File ID:	0801_03	**Received Date/Time:**	
Instrument ID:	AIRMS9	**Preparation Date/Time:**	08/01/22 09:39
Analytical Batch:	WG1903843	**Analysis Date/Time:**	08/01/22 09:39
Dilution Factor:	1	**Prep Method:**	TO-15
Analytical Method:	TO-15	**Sample Vol Used:**	300 mL
Matrix:	Air	**Initial Wt/Vol:**	
Total Solids (%):		**Final Wt/Vol:**	

Analyte	CAS	RT	Result	Qualifier	DL	LOD	LOQ
			ppbv		*ppbv*	*ppbv*	*ppbv*
2-Propanol	67-63-0	2.31	3.07		0.264	0.625	1.25

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_03.D
Acq On : 01 Aug 2022 09:39 am
Operator :
Sample : LCSD 1x WG1903843
Misc :
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 01 10:45:17 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc	Units	Dev(Min)
Internal Standards						
1) Bromochloromethane	3.374	130	575603	4.0000000	ppbv	0.00
47) 1,4-Difluorobenzene	4.318	114	1958486	4.0000000	ppbv	0.00
71) Chlorobenzene-d5	6.507	117	1791640	4.0000000	ppbv	0.00
System Monitoring Compounds						
85) 1,4-Bromofluorobenzene	7.280	95	1157171	3.8074686	ppbv	0.00
Spiked Amount 4.000	Range 60 - 140		Recovery = 95.19%			
Target Compounds						Qvalue
2) Propene	1.652	41	59314	3.1946391	ppbv	99
3) BUTANE	1.872	43	119901	3.1401456	ppbv	98
4) 1,1-DIFLUOROETHANE	1.626	65	65327	3.3868197	ppbv	100
5) Dichlorodifluoromethane	1.675	85	204013	3.5321155	ppbv	99
6) CHLORODIFLUOROMETHANE	1.641	67	20996	3.4691568	ppbv	83
7) 1,2-Dichlorotetrafluor...	1.762	85	244841	3.5292637	ppbv	94
8) Chloromethane	1.728	50	51135	3.0142139	ppbv	100
9) Vinyl Chloride	1.804	62	80775	3.2156606	ppbv	100
10) 1,3-Butadiene	1.853	39	38267	2.7258738	ppbv	97
11) Bromomethane	1.944	94	118142	3.4571609	ppbv	99
12) Chloroethane	2.005	64	45955	3.1216869	ppbv	99
13) ISOPENTANE	2.426	41	43237	3.0760499	ppbv	98
14) Vinyl Bromide	2.134	106	131318	3.6206003	ppbv	100
15) Trichlorofluoromethane	2.293	101	232320	3.6965211	ppbv	100
16) PENTANE	2.426	43	89245	3.0434437	ppbv	97
17) Ethanol	2.043	45	21909	2.8858782	ppbv	97
18) ACROLEIN	2.172	56	33160	3.0335260	ppbv	98
19) 1,1,2-Trichlorotrifluo...	2.646	101	201748	3.7519228	ppbv	96
20) 1,1-Dichloroethene	2.517	61	99782	3.3415279	ppbv	93
21) Acetone	2.221	43	72200	2.9014915	ppbv	89
22) BROMOETHANE	2.502	108	104604	3.7085724	ppbv	99
23) 2-Propanol	2.308	45	92905	3.0657934	ppbv	99
24) Carbon Disulfide	2.650	76	238066	3.5726927	ppbv	99
25) Allyl Chloride	2.593	41	61573	3.0510651	ppbv	92
26) METHYL ACETATE	2.543	43	101845	3.0435897	ppbv #	95
27) ACETONITRILE	2.122	41	208906	14.6789380	ppbv	100
28) Methylene Chloride	2.551	49	56690	3.0832577	ppbv	90
29) TERT-BUTYL ALCOHOL	2.524	59	120819	3.0810866	ppbv	94
30) Methyl Tert-Butyl Ether	2.983	73	238120	3.6315074	ppbv	97
31) Trans-1,2-Dichloroethene	2.877	61	96855	3.3211583	ppbv	93
32) ACRYLONITRILE	2.392	53	60781	3.1110584	ppbv	97
33) n-Hexane	3.419	57	119043	3.4622819	ppbv	97
34) 1,1-Dichloroethane	2.953	63	163652	3.3169447	ppbv	98
35) Vinyl Acetate	3.021	43	128372	3.1607692	ppbv	95
36) DI-ISOPROPYL ETHER	3.419	45	205545	3.4361868	ppbv	99
37) ETHYL TERT-BUTYL ETHER	3.670	59	247146	3.6078483	ppbv	97
38) ETHYL ACETATE	3.419	43	255149	3.3564933	ppbv	99
39) 2-Butanone (MEK)	3.116	72	52043	3.3403527	ppbv	98
40) cis-1,2-Dichloroethene	3.302	61	119557	3.4096288	ppbv	93
41) Tetrahydrofuran	3.617	42	56530	3.1448214	ppbv	95

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_03.D
Acq On : 01 Aug 2022 09:39 am
Operator :
Sample : LCSD 1x WG1903843
Misc :
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 01 10:45:17 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
42) Chloroform	3.435	83	209847	3.6008142 ppbv	100
43) Cyclohexane	4.258	84	150361	3.6727255 ppbv	93
44) 1,1,1-Trichloroethane	3.897	97	209840	3.7631508 ppbv	98
45) Carbon Tetrachloride	4.193	117	230215	3.8933173 ppbv	100
46) 2,2,4-Trimethylpentane	4.705	57	390539	3.4416471 ppbv	99
48) Benzene	4.117	78	350325	3.5538240 ppbv	99
49) TERT-AMYL METHYL ETHER	4.443	73	277727	3.6063662 ppbv	96
50) 1,2-Dichloroethane	3.772	62	95933	3.4452315 ppbv	98
51) Heptane	4.857	43	107628	3.3591959 ppbv	97
52) Trichloroethene	4.660	95	172324	3.6809861 ppbv	93
53) TERT-AMYL ETHYL ETHER	5.152	73	88274	3.8967787 ppbv	89
54) METHYL CYCLOHEXANE	5.155	83	236288	3.8114509 ppbv	93
55) 1,2-Dichloropropane	4.531	63	101820	3.2490719 ppbv	97
56) Methyl Methacrylate	4.800	69	108096	3.5037526 ppbv #	1
57) 1,4-Dioxane	4.663	88	82449	3.5071814 ppbv	95
58) Bromodichloromethane	4.629	83	223663	3.5992703 ppbv	100
59) cis-1,3-Dichloropropene	5.114	75	168642	3.5307331 ppbv	96
60) 4-Methyl-2-Pentanone (...	5.152	43	174786	3.4238050 ppbv	98
61) n-OCTANE	6.178	43	146667	3.5492912 ppbv	94
62) Toluene	5.615	91	449798	3.8436164 ppbv	99
63) trans-1,3-Dichloropropene	5.396	75	138210	3.5729740 ppbv	97
64) 1,1,2-Trichloroethane	5.468	97	183802	3.6222182 ppbv	96
65) Tetrachloroethene	6.191	166	352124	4.2317191 ppbv	97
66) Methyl Butyl Ketone	5.781	43	114819	3.3284744 ppbv	96
67) Chlorodibromomethane	5.812	129	322010	4.0560164 ppbv	100
68) 1,2-Dibromoethane	5.934	107	302175	3.8375140 ppbv	99
69) Chlorobenzene	6.526	112	448399	3.8621789 ppbv	95
70) NONANE	7.221	43	161032	3.6510924 ppbv	97
72) Ethylbenzene	6.732	91	537832	3.8242668 ppbv	98
73) M&P-Xylene	6.826	91	922938	8.0536948 ppbv	98
74) O-Xylene	7.055	91	457034	4.1621712 ppbv	98
77) Styrene	7.002	104	413233	4.2065158 ppbv	96
78) Bromoform	6.823	173	363487	4.5148750 ppbv	100
79) Isopropylbenzene	7.362	105	702494	3.9369626 ppbv	99
80) n-DECANE	8.075	43	171849	3.7614779 ppbv	97
81) 1,1,2,2-Tetrachloroethane	7.045	83	366205	3.6557907 ppbv	99
82) n-Propylbenzene	7.628	91	825740	4.0281404 ppbv	96
83) 4-Ethyltoluene	7.709	105	779344	4.2885301 ppbv	99
84) 2-Chlorotoluene	7.590	91	498330	3.8208605 ppbv	95
86) 1,3,5-Trimethylbenzene	7.756	105	676439	4.2456170 ppbv	98
87) tert-Butylbenzene	7.969	119	757794	4.4369172 ppbv	97
88) 1,2,4-Trimethylbenzene	7.972	105	667100	4.3820520 ppbv	98
89) sec-Butylbenzene	8.122	105	988316	4.2545244 ppbv	99
90) 1,3-Dichlorobenzene	8.031	146	625254	4.5166404 ppbv	97
91) P-ISOPROPYLTOLUENE	8.219	119	979742	4.4822574 ppbv	99
92) 1,4-Dichlorobenzene	8.072	146	624851	4.5556208 ppbv	97
93) 1,2,3-TRIMETHYLBENZENE	8.200	105	698784	4.2320079 ppbv	98
94) Benzyl Chloride	8.028	91	341300	3.9903640 ppbv	96
95) n-Butylbenzene	8.460	91	656964	4.2063768 ppbv	97
96) 1,2-Dichlorobenzene	8.257	146	599971	4.1891560 ppbv	99

Quantitation Report (QT Reviewed)

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_03.D
Acq On : 01 Aug 2022 09:39 am
Operator :
Sample : LCSD 1x WG1903843
Misc :
ALS Vial : 3 Sample Multiplier: 1

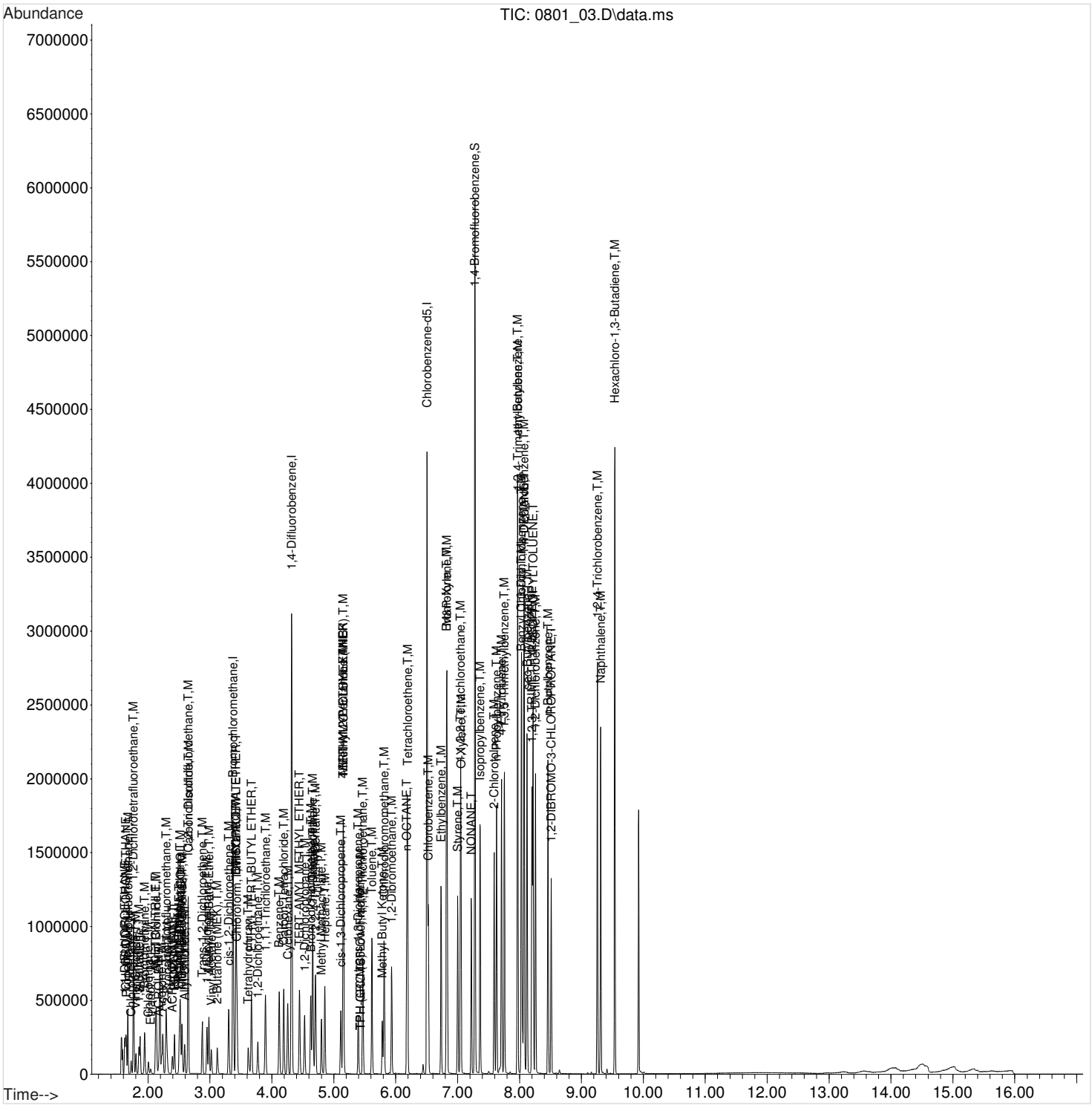
Quant Time: Aug 01 10:45:17 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration

	Compound	R.T.	QIon	Response	Conc Units	Dev(Min)
97)	1,2-DIBROMO-3-CHLOROPR...	8.513	157	319035	4.2709037 ppbv	97
98)	1,2,4-Trichlorobenzene	9.258	180	576280	5.1571248 ppbv	99
99)	Hexachloro-1,3-Butadiene	9.540	225	525855	4.8033507 ppbv	98
100)	Naphthalene	9.312	128	1073821	5.1739530 ppbv	99
101)	TPH (GC/MS) Low Fraction	5.430	TIC	59489058m	246.2944827 ppbv	
102)	TPH-GRO (C5-C10)	5.430	TIC	63293447m	345.7219470 ppbv	

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

Data Path : C:\GCMS\1\data\080122\
Data File : 0801_03.D
Acq On : 01 Aug 2022 09:39 am
Operator :
Sample : LCSD 1x WG1903843
Misc :
ALS Vial : 3 Sample Multiplier: 1

Quant Time: Aug 01 10:45:17 2022
Quant Method : C:\GCMS\1\methods\TOAIRMS9G27V.M
Quant Title :
QLast Update : Thu Jul 28 09:58:39 2022
Response via : Initial Calibration



TO-15 Air VOCs Benchsheet

Batch: WG1900825

Analyst: SDS3717 **SOP:** ENV-SOP-MTJL-0104 **Method:** EPA TO-15

ICV, LCS/D Std: 22G12761 Amt. Used: 300 cc Exp. Date:01/12/23 **Internal Standard/Surrogate:** 22G13913 Amt. Used: 50 cc Exp. Date:01/11/23
High Standard: 22G13975 Amt. Used: 800 cc Exp. Date:01/13/23

Sample Number	Prep Flags	Reference Volume (mL)	Analytical Dilution	Sample Vol Used (mL)	Prep Factor	Prep Ratio	Collection Date	Spike Factor	Surrogate Factor	Review Analyst	Review Date
BLANK		200	1	200	1	1		1	1	SDS3717	07/26/22 10:29:51
LCS		300	1	300	1	1		1	1	SDS3717	07/26/22 10:29:51
LCSD		300	1	300	1	1		1	1	SDS3717	07/26/22 10:29:51
1. L1518140-01		200	1	200	1	1	07/21/22 11:57	1	1	SDS3717	07/26/22 13:15:54
2. L1518140-02		200	1	200	1	1	07/21/22 12:12	1	1	SDS3717	07/26/22 13:15:54
3. L1518140-03		200	1	200	1	1	07/21/22 12:28	1	1	SDS3717	07/26/22 13:15:54
4. L1518140-04		200	1	200	1	1	07/21/22 12:44	1	1	SDS3717	07/26/22 13:15:54
5. L1518140-05		200	1	200	1	1	07/21/22 13:06	1	1	SDS3717	07/26/22 13:15:54
6. L1518140-06		200	1	200	1	1	07/21/22 13:22	1	1	SDS3717	07/26/22 13:15:54
7. L1518140-07		200	10	20	1	1	07/21/22 13:37	1	1	SDS3717	07/26/22 13:15:54
8. L1518140-08		200	1	200	1	1	07/21/22 13:49	1	1	SDS3717	07/26/22 13:15:54
9. L1518164-01		200	1	200	1	1	07/22/22 15:45	1	1	SDS3717	07/26/22 10:29:51
10. L1518164-02		200	1	200	1	1	07/22/22 15:50	1	1	SDS3717	07/26/22 10:29:51
11. L1518164-03		200	1	200	1	1	07/22/22 12:00	1	1	SDS3717	07/26/22 10:29:51
12. L1518164-04		200	1	200	1	1	07/22/22 12:20	1	1	SDS3717	07/26/22 10:29:51
13. L1518164-05		200	1	200	1	1	07/22/22 12:40	1	1	SDS3717	07/26/22 10:29:51
14. L1518164-06		200	1	200	1	1	07/22/22 12:55	1	1	SDS3717	07/26/22 10:29:51
15. L1518170-01		200	1	200	1	1	07/22/22 09:00	1	1	SDS3717	07/26/22 10:29:51
16. L1518363-01		200	1	200	1	1	07/13/22 08:01	1	1	SDS3717	07/26/22 15:09:29
17. L1518363-02		200	1	200	1	1	07/13/22 06:42	1	1	SDS3717	07/26/22 15:09:29
18. L1518363-03		200	1	200	1	1	07/13/22 06:36	1	1	SDS3717	07/26/22 15:09:29
19. L1518363-04		200	1	200	1	1	07/13/22 10:00	1	1	SDS3717	07/26/22 15:09:29
20. L1518439-01	W4	200	2000	0.1	1	1	07/25/22 14:15	1	1	SDS3717	07/26/22 15:09:29

Comments:
L1518363-01 Time Added: 07/26/22 15:02:02
L1518363-02 Time Added: 07/26/22 15:02:02
L1518439-01 Time Added: 07/26/22 15:02:02
L1518363-04 Time Added: 07/26/22 15:02:02
L1518363-03 Time Added: 07/26/22 15:02:02

Reviewed By:SDS3717 on 07/26/22 15:09:29

TO-15 Air VOCs Benchsheet

Batch: WG1903843

Analyst: CEP3540 **SOP:** ENV-SOP-MTJL-0104 **Method:** EPA TO-15

ICV, LCS/D Std: 22G26577 Amt. Used: 300 cc Exp. Date:01/26/23 **Internal Standard/Surrogate:** 22G21991 Amt. Used: 50 cc Exp. Date:01/21/23
High Standard: 22G12764 Amt. Used: 800 cc Exp. Date:01/12/23

Sample Number	Reference Volume (mL)	Analytical Dilution	Sample Vol Used (mL)	Prep Factor	Prep Ratio	Collection Date	Spike Factor	Surrogate Factor	Review Analyst	Review Date
BLANK	200	1	200	1	1		1	1	CEP3540	08/01/22 12:06:11
LCS	300	1	300	1	1		1	1	CEP3540	08/01/22 12:06:11
LCSD	300	1	300	1	1		1	1	CEP3540	08/01/22 12:06:11
1. L1518140-07	200	20	10	1	1	07/21/22 13:37	1	1	CEP3540	08/01/22 12:06:11
2. L1518164-05	200	10	20	1	1	07/22/22 12:40	1	1	CEP3540	08/01/22 12:06:11
3. L1518164-06	200	10	20	1	1	07/22/22 12:55	1	1	CEP3540	08/01/22 12:06:11
4. L1518170-01	200	100	2	1	1	07/22/22 09:00	1	1	CEP3540	08/01/22 12:06:11

Comments:
L1518170-01 Time Added: 08/01/22 14:47:19

Reviewed By:CEP3540 on 08/01/22 12:06:11

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

COD	Coefficient of Determination.
DL	Detection Limit.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
Mass	Mass of parameter.
MDL	Method Detection Limit.
RDL	Reported Detection Limit.
Rec.	Recovery.
RPD	Relative Percent Difference.
RRF	Relative Response Factor.
RT	Retention Time.
SDG	Sample Delivery Group.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.
NI	Manual Integration Code to indicate that the peak was not integrated at all by the computer software.
LT	Manual Integration Code to indicate that the peak in question was inappropriately integrated to an area less than what it should be (i.e., peak area was cut).
GT	Manual Integration Code to indicate that the peak in question was inappropriately integrated to an area greater than it should be (i.e., peak tailing).
BA	Manual Integration Code to indicate that the baseline had to be adjusted correctly by the analyst.
WP	Manual Integration Code to indicate that the wrong peak was chosen.
CO	Manual Integration Code to indicate that the analyst had to split two co-eluting peaks apart that were not (or could not be) separated by the computer system.
RT	Manual Integration Code to indicate that the retention time for the peak in question has shifted from the expected retention time.
INT	Manual Integration Code to indicate that there was electronic interference (i.e., noise).

Qualifier Description

GLOSSARY OF TERMS

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LA000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Pace Analytical - West Columbia, SC

106 Vantage Point Dr.
West Columbia, SC 29172

Billing Information:
PM
106 Vantage Point Dr.
West Columbia, SC 29172

Report To:
Kathy Smith ~~NASA - KSC CRCA Air Sampling~~

Email To:
kathy.smith@pacelabs.com

Project
Description: NASA KSC-CRCA Air Sampling

City/State
Collected: Kennedy Space Center, FL

Please Circle:
PT MT CT (ET)

Phone:
(321) 636-6470

Client Project #
112G08970

Lab Project #
PACEWCSC-TETRATECHFL

Collected by (print):
Chuck Sorden

Site/Facility ID #
KSC - CRCA

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Three Day
___ Next Day ___ Five Day
___ Two Day

Date Results Needed

Analysis: DODTO-15 Summa

Chain of Custody Page 1 of 1

Pace
PEOPLE ADVANCING SCIENCE
MT JULIET, TN
12065 Lebanon Road Mt Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1518164

C037

Acctnum: PACEWCSC
Template: T207717
Prelogin: P936725
PM: 844 - Christi M Wagner
PB: CS 7/12

Shipped Via: FedEx Ground

Sample ID	Can #	Flow Cont. #	Collection Date	Collection Time	Canister Pressure/Vacuum Initial	Canister Pressure/Vacuum Final	DODTO-15 Summa	Rem./Contaminant	Sample # (lab only)
CRCA-AMB01-20220722	9118	020137	07/22/22	0745 1545	-29" Hg	~~-7" Hg~~ -3" Hg CS	X		-01
CRCA-AMB02-20220722	12213	007502	07/22/22	0750 1550	-29" Hg	~~0" Hg~~ -3.5" Hg	X		-02
CRCA-VMP01-20220722	8861	012527	07/22/22	1100 1200	-30" Hg	-7" Hg CS	X		-03
CRCA-VMP02-20220722	12345	~~123~~ 011448	07/22/22	1120 1220	-29" Hg	*0" Hg	X		-04
CRCA-VMP03-20220722	007165	007566	07/22/22	1140 1240	> -30" Hg	-2" Hg	X		-05
CRCA-VMP04-20220722	12240	007111	07/22/22	1155 1255	-28" Hg	0" Hg	X		-06

Sample Receipt Checklist
COC Seal Present/Intact: Y / N — If Applicable
COC Signed/Accurate: Y N — VOA Zero Headspace: Y N
Bottles arrive intact: Y N — Pres.Correct/Check: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
RAD Screen <0.5 mR/hr: Y N

Remarks:

Samples returned via:
__ UPS X FedEx __ Courier __

Tracking # 5349 7830 7670

Hold #

	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	07/22/22	1600	FedEx	07/22/22	1600
Relinquished by: (Signature) FedEx	Date:	Time:	Received by: (Signature)	Date:	Time:
Relinquished by: (Signature)	Date:	Time:	Received for lab by: (Signature)	Date: 07-23-22	Time: 0900

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

NCF:

Chain of Custody

Workorder: XG26033 Workorder Name: Owner Received Date: Results Requested By:

Report To:	Subcontract To:	Requested Analysis
Kathy E. Smith	Project #	
Pace Analytical		
106 Vantage Point Drive	Pace National	
Columbia SC, 29223		
803-227-2704		
Kathy.Smith@pacelabs.com		

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					TO-15												LAB USE ONLY
1	CRCA-AMB01-20220722	grab	07/22/2022 @ 1545	XG26033-001	Aqueous						x												
2	CRCA-AMB02-20220722	grab	07/22/2022 @ 1550	XG26033-002	Aqueous						x												
3	CRCA-VMP01-20220722	grab	07/22/2022 @ 1200	XG26033-003	Aqueous						x												
4	CRCA-VMP02-20220722	grab	07/22/2022 @ 1220	XG26033-004	Aqueous						x												
5	CRCA-VMP03-20220722	grab	07/22/2022 @ 1240	XG26033-005	Aqueous						x												
6	CRCA-VMP04-20220722	grab	07/22/2022 @ 1255	XG26033-006	Aqueous						x												
7																							
8																							
9																							
10																							

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1					
2					
3					

Cooler Temperature on Receipt _____ °C	Custody Seal Y or N	Received on Ice Y or N	Sample Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

10515 Research Drive
Knoxville, TN 37932
Phone: (865) 573-8188
Fax: (865) 573-8133

ANSI National Accreditation Board ACCREDITED ISO/IEC 17025 TESTING LABORATORY

Client: Kathy Smith
Pace Analytical Labs
106 Vantage Point Drive
West Columbia, SC 29172

Phone: 912-465-7901

Fax:

Identifier: 073TG **Date Rec:** 07/22/2022 **Report Date:** 07/28/2022

Client Project #: 112G-09237 **Client Project Name:** KSC-CRCA

Purchase Order #:

Test results provided for: CENSUS

Reviewed By:

Charles Slater

Results relate only to the items tested and the sample(s) as received by the laboratory.

MICROBIAL INSIGHTS, INC.

10515 Research Dr., Knoxville, TN 37932
Tel. (865) 573-8188 Fax. (865) 573-8133

CENSUS

Client: **Pace Analytical Labs**
Project: KSC-CRCA

MI Project Number: **073TG**
Date Received: 07/22/2022

Sample Information

Client Sample ID:		**CRCA-MW0031-058-0-20220721**	**CRCA-MW0018-058-0-20220721**	**CRCA-MW0019-058-0-20220721**
Sample Date:		07/21/2022	07/21/2022	07/21/2022
Units:		cells/mL	cells/mL	cells/mL
Analyst/Reviewer:		BB/CS	BB/CS	BB/CS
Dechlorinating Bacteria				
Dehalococcoides	*DHC*	**9.80E+00**	**1.82E+01**	**2.11E+01**
tceA Reductase	TCE	<5.00E-01	<5.00E-01	<5.00E-01
BAV1 Vinyl Chloride Reductase	BVC	<5.00E-01	<5.00E-01	<5.00E-01
Vinyl Chloride Reductase	VCR	<5.00E-01	<5.00E-01	<5.00E-01

Legend:
NA = Not Analyzed NS = Not Sampled J = Estimated gene copies below PQL but above LQL I = Inhibited
< = Result not detected

Quality Assurance/Quality Control Data

Samples Received **7/22/2022**

Component	Date Prepared	Date Analyzed	Arrival Temperature	Positive Control	Extraction Blank	Negative Control
DHC	07/22/2022	07/28/2022	0 °C	103%	non-detect	non-detect
BVC	07/22/2022	07/28/2022	0 °C	102%	non-detect	non-detect
TCE	07/22/2022	07/28/2022	0 °C	88%	non-detect	non-detect
VCR	07/22/2022	07/28/2022	0 °C	104%	non-detect	non-detect

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Chris Neumann

Project Name: KSC-CRCA

Project Number: 112G09237

Lot Number:**XG22012**

Date Completed:09/09/2022
Revision Date: 09/20/2022

09/20/2022 4:03 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.

Case Narrative
Tetra Tech
Lot Number: XG22012

This report supersedes and replaces any prior reports issued under this lot number.

This report was revised September 20, 2022 to update sample IDs.

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL

B is the y-intercept from the ICAL

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
The method blank for prep batch 50101 contained analyte 13C2_6:2FTS greater than the acceptance criteria. The data has been reported.

Samples XG22012-008, XG22012-009 had surrogates recovered outside of the acceptance limits due to confirmed matrix interference.

The following samples required a dilution which was performed outside of the analytical holding time: XG22012-008, XG22012-009. All data has been reported.

Dissolved Gases
The method blank associated with batch 50061 had Methane detected at a concentration that was above the MDL but below ½ the PQL. All samples associated with this method blank that have detections for Methane have been flagged with a "B".

Sample Summary

Tetra Tech

Lot Number: XG22012

Project Name: KSC-CRCA

Project Number: 112G09237

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	CRCA-MW0002-032.5-20220721	Aqueous	07/21/2022 0910	07/22/2022
002	CRCA-MW0027-035.0-20220721	Aqueous	07/21/2022 0950	07/22/2022
003	CRCA-MW0031-058.0-20220721	Aqueous	07/21/2022 1025	07/22/2022
004	CRCA-MW0018-058.0-20220721	Aqueous	07/21/2022 1110	07/22/2022
005	CRCA-MW0032-058.0-20220721	Aqueous	07/21/2022 1255	07/22/2022
006	CRCA-MW0019-058.0-20220721	Aqueous	07/21/2022 1345	07/22/2022
007	CRCA-MW0013-027.5-20220721	Aqueous	07/21/2022 1435	07/22/2022
008	CRCA-ASINFLUENT-20220721	Aqueous	07/21/2022 1500	07/22/2022
009	CRCA-ASEFFLUENT-20220721	Aqueous	07/21/2022 1515	07/22/2022

(9 samples)

Detection Summary

Tetra Tech

Lot Number: XG22012

Project Name: KSC-CRCA

Project Number: 112G09237

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	CRCA-MW0002-032.5-20220721	Aqueous	Vinyl chloride	8260D	2.0		ug/L	7
003	CRCA-MW0031-058.0-20220721	Aqueous	Vinyl chloride	8260D	4.6		ug/L	11
003	CRCA-MW0031-058.0-20220721	Aqueous	Methane	RSK - 175	390	B	ug/L	12
004	CRCA-MW0018-058.0-20220721	Aqueous	Vinyl chloride	8260D	31		ug/L	14
004	CRCA-MW0018-058.0-20220721	Aqueous	Methane	RSK - 175	580	B	ug/L	15
005	CRCA-MW0032-058.0-20220721	Aqueous	Acetone	8260D	5.6	J	ug/L	16
005	CRCA-MW0032-058.0-20220721	Aqueous	Vinyl chloride	8260D	14		ug/L	17
006	CRCA-MW0019-058.0-20220721	Aqueous	Vinyl chloride	8260D	1.7		ug/L	19
006	CRCA-MW0019-058.0-20220721	Aqueous	Methane	RSK - 175	520	B	ug/L	20
007	CRCA-MW0013-027.5-20220721	Aqueous	Vinyl chloride	8260D	2.0		ug/L	22
008	CRCA-ASINFLUENT-20220721	Aqueous	Vinyl chloride	8260D	3.2		ug/L	24
008	CRCA-ASINFLUENT-20220721	Aqueous	PFHxS	PFAS by ID	5.2		ng/L	25
008	CRCA-ASINFLUENT-20220721	Aqueous	PFHpA	PFAS by ID	8.1		ng/L	25
008	CRCA-ASINFLUENT-20220721	Aqueous	PFHxA	PFAS by ID	21		ng/L	25
008	CRCA-ASINFLUENT-20220721	Aqueous	PFNA	PFAS by ID	1.0	J	ng/L	25
008	CRCA-ASINFLUENT-20220721	Aqueous	PFOA	PFAS by ID	17		ng/L	25
008	CRCA-ASINFLUENT-20220721	Aqueous	PFPeA	PFAS by ID	27		ng/L	25
008	CRCA-ASINFLUENT-20220721	Aqueous	PFOS	PFAS by ID	5.2		ng/L	25
008	CRCA-ASINFLUENT-20220721	Aqueous	PFBA	PFAS by ID	35000	HD	ng/L	27
009	CRCA-ASEFFLUENT-20220721	Aqueous	PFHxS	PFAS by ID	5.0		ng/L	31
009	CRCA-ASEFFLUENT-20220721	Aqueous	PFHpA	PFAS by ID	8.3		ng/L	31
009	CRCA-ASEFFLUENT-20220721	Aqueous	PFHxA	PFAS by ID	22		ng/L	31
009	CRCA-ASEFFLUENT-20220721	Aqueous	PFNA	PFAS by ID	1.1	J	ng/L	31
009	CRCA-ASEFFLUENT-20220721	Aqueous	PFOA	PFAS by ID	16		ng/L	31
009	CRCA-ASEFFLUENT-20220721	Aqueous	PFPeA	PFAS by ID	25		ng/L	31
009	CRCA-ASEFFLUENT-20220721	Aqueous	PFOS	PFAS by ID	5.2		ng/L	31
009	CRCA-ASEFFLUENT-20220721	Aqueous	PFBA	PFAS by ID	34000	HD	ng/L	33

(27 detections)

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-001

Description: CRCA-MW0002-032.5-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 0910 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/27/2022 0452	JMM2		49180

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-001

Description: CRCA-MW0002-032.5-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 0910 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/27/2022 0452	JMM2		49180

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	2.0		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		93	81-118
Bromofluorobenzene		90	85-114
Toluene-d8		95	89-112
Dibromofluoromethane		100	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-002

Description: CRCA-MW0027-035.0-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 0950 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/27/2022 0517	JMM2		49180

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-002

Description: CRCA-MW0027-035.0-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 0950 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/27/2022 0517	JMM2		49180

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		94	81-118
Bromofluorobenzene		88	85-114
Toluene-d8		96	89-112
Dibromofluoromethane		99	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-003

Description: CRCA-MW0031-058.0-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1025 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/27/2022 2306	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-003

Description: CRCA-MW0031-058.0-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1025 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/27/2022 2306	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	4.6		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		111	81-118
Bromofluorobenzene		94	85-114
Toluene-d8		98	89-112
Dibromofluoromethane		95	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Dissolved Gases

Client: Tetra Tech
Laboratory ID: XG22012-003
Description: CRCA-MW0031-058.0-20220721
Matrix: Aqueous
Date Sampled: 07/21/2022 1025
Project Name: KSC-CRCA
Date Received: 07/22/2022
Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		RSK - 175	1	08/03/2022 1248	BBW		50061

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Ethane	74-84-0	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Ethene	74-85-1	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Methane	74-82-8	RSK - 175	390	B	10	5.0	2.5	ug/L	1
Propane	74-98-6	RSK - 175	7.5	U	15	7.5	5.0	ug/L	1

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-004

Description: CRCA-MW0018-058.0-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1110 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/27/2022 2331	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-004

Description: CRCA-MW0018-058.0-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1110 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/27/2022 2331	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	31		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		113	81-118
Bromofluorobenzene		94	85-114
Toluene-d8		97	89-112
Dibromofluoromethane		98	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Dissolved Gases

Client: Tetra Tech
Laboratory ID: XG22012-004
Description: CRCA-MW0018-058.0-20220721
Matrix: Aqueous
Date Sampled: 07/21/2022 1110
Project Name: KSC-CRCA
Date Received: 07/22/2022
Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		RSK - 175	1	08/03/2022 1304	BBW		50061

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Ethane	74-84-0	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Ethene	74-85-1	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Methane	74-82-8	RSK - 175	580	B	10	5.0	2.5	ug/L	1
Propane	74-98-6	RSK - 175	7.5	U	15	7.5	5.0	ug/L	1

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-005

Description: CRCA-MW0032-058.0-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1255 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/27/2022 2357	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	5.6	J	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-005

Description: CRCA-MW0032-058.0-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1255 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/27/2022 2357	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	14		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		112	81-118
Bromofluorobenzene		91	85-114
Toluene-d8		95	89-112
Dibromofluoromethane		98	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-006

Description: CRCA-MW0019-058.0-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1345 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/28/2022 0022	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-006

Description: CRCA-MW0019-058.0-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1345 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/28/2022 0022	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	1.7		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		111	81-118
Bromofluorobenzene		93	85-114
Toluene-d8		98	89-112
Dibromofluoromethane		98	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Dissolved Gases

Client: Tetra Tech
Laboratory ID: XG22012-006
Description: CRCA-MW0019-058.0-20220721
Matrix: Aqueous
Date Sampled: 07/21/2022 1345
Project Name: KSC-CRCA
Date Received: 07/22/2022
Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1		RSK - 175	1	08/03/2022 1320	BBW		50061

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Ethane	74-84-0	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Ethene	74-85-1	RSK - 175	5.0	U	10	5.0	2.5	ug/L	1
Methane	74-82-8	RSK - 175	520	B	10	5.0	2.5	ug/L	1
Propane	74-98-6	RSK - 175	7.5	U	15	7.5	5.0	ug/L	1

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-007

Description: CRCA-MW0013-027.5-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1435 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/28/2022 0047	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-007

Description: CRCA-MW0013-027.5-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1435 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/28/2022 0047	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	2.0		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		111	81-118
Bromofluorobenzene		92	85-114
Toluene-d8		97	89-112
Dibromofluoromethane		99	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-008

Description: CRCA-ASINFLUENT-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1500 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/28/2022 0112	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech
Laboratory ID: XG22012-008
Description: CRCA-ASINFLUENT-20220721
Matrix: Aqueous
Date Sampled: 07/21/2022 1500
Project Name: KSC-CRCA
Date Received: 07/22/2022
Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/28/2022 0112	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	3.2		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		114	81-118
Bromofluorobenzene		90	85-114
Toluene-d8		95	89-112
Dibromofluoromethane		99	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XG22012-008
Description: CRCA-ASINFLUENT-20220721 | Matrix: Aqueous
Date Sampled: 07/21/2022 1500 | Project Name: KSC-CRCA
Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/10/2022 1544	LAB	08/04/2022 1305	50101
2	SOP SPE	PFAS by ID SOP QSM B-15	100	09/06/2022 1344	LAB	08/04/2022 1305	50101

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.5	UQ	7.0	3.5	1.7	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.5	UQ	7.0	3.5	1.7	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.5	U	7.0	3.5	1.7	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.2		3.5	1.8	0.87	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	9500	EQ	3.5	1.8	0.87	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	8.1		3.5	1.8	0.87	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	21		3.5	1.8	0.87	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.0	J	3.5	1.8	0.87	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	17		3.5	1.8	0.87	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	27		3.5	1.8	0.87	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.5	1.8	0.87	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5.2		3.5	1.8	0.87	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	217	50-150	H	108	50-150
13C2_6:2FTS	N	240	50-150	H	107	50-150
13C2_8:2FTS		128	50-150	H	125	50-150
13C2_PFDoA		99	50-150	H	109	50-150
13C2_PFTeDA		99	50-150	H	104	50-150
13C3_PFBS		86	50-150	H	97	50-150
13C3_PFHxS		106	50-150	H	106	50-150
13C3-HFPO-DA		75	50-150	H	98	50-150
13C4_PFBA	N	11	50-150	H	93	50-150
13C4_PFHpA		98	50-150	H	113	50-150
13C5_PFHxA		92	50-150	H	101	50-150
13C5_PFPeA		65	50-150	H	112	50-150
13C6_PFDA		113	50-150	H	102	50-150

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U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XG22012-008
Description: CRCA-ASINFLUENT-20220721
Matrix: Aqueous
Date Sampled: 07/21/2022 1500
Project Name: KSC-CRCA
Date Received: 07/22/2022
Project Number: 112G09237

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		108	50-150	H	97	50-150
13C8_PFOA		112	50-150	H	104	50-150
13C8_PFOS		111	50-150	H	98	50-150
13C9_PFNA		125	50-150	H	114	50-150
d-EtFOSA		93	50-150	H	89	50-150
d5-EtFOSAA		101	50-150	H	110	50-150
d3-MeFOSAA		104	50-150	H	97	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
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E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XG22012-008
Description: CRCA-ASINFLUENT-20220721 | Matrix: Aqueous
Date Sampled: 07/21/2022 1500 | Project Name: KSC-CRCA
Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/10/2022 1544	LAB	08/04/2022 1305	50101
2	SOP SPE	PFAS by ID SOP QSM B-15	100	09/06/2022 1344	LAB	08/04/2022 1305	50101

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	350	UH	700	350	170	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	350	UH	700	350	170	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	350	UH	700	350	170	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	350	UH	700	350	170	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	350	UH	700	350	170	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	350	UH	700	350	170	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	350	UH	700	350	170	ng/L	2
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	350	UH	700	350	170	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	350	UH	700	350	170	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	350	UH	700	350	170	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	35000	HD	350	180	87	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	180	UH	350	180	87	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	180	UH	350	180	87	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	217	50-150	H	108	50-150
13C2_6:2FTS	N	240	50-150	H	107	50-150
13C2_8:2FTS		128	50-150	H	125	50-150
13C2_PFDoA		99	50-150	H	109	50-150
13C2_PFTeDA		99	50-150	H	104	50-150
13C3_PFBS		86	50-150	H	97	50-150
13C3_PFHxS		106	50-150	H	106	50-150
13C3-HFPO-DA		75	50-150	H	98	50-150
13C4_PFBA	N	11	50-150	H	93	50-150
13C4_PFHpA		98	50-150	H	113	50-150
13C5_PFHxA		92	50-150	H	101	50-150
13C5_PFPeA		65	50-150	H	112	50-150
13C6_PFDA		113	50-150	H	102	50-150

LOQ = Limit of Quantitation
B = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
J = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
H = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XG22012-008
Description: CRCA-ASINFLUENT-20220721
Matrix: Aqueous
Date Sampled: 07/21/2022 1500
Project Name: KSC-CRCA
Date Received: 07/22/2022
Project Number: 112G09237

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		108	50-150	H	97	50-150
13C8_PFOA		112	50-150	H	104	50-150
13C8_PFOS		111	50-150	H	98	50-150
13C9_PFNA		125	50-150	H	114	50-150
d-EtFOSA		93	50-150	H	89	50-150
d5-EtFOSAA		101	50-150	H	110	50-150
d3-MeFOSAA		104	50-150	H	97	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
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E = Quantitation of compound exceeded the calibration range
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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-009

Description: CRCA-ASEFFLUENT-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1515 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/28/2022 0137	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XG22012-009

Description: CRCA-ASEFFLUENT-20220721 | Matrix: Aqueous

Date Sampled: 07/21/2022 1515 | Project Name: KSC-CRCA

Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	07/28/2022 0137	JMM2		49324

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		111	81-118
Bromofluorobenzene		90	85-114
Toluene-d8		96	89-112
Dibromofluoromethane		100	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XG22012-009
Description: CRCA-ASEFFLUENT-20220721 | Matrix: Aqueous
Date Sampled: 07/21/2022 1515 | Project Name: KSC-CRCA
Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/10/2022 1554	LAB	08/04/2022 1305	50101
2	SOP SPE	PFAS by ID SOP QSM B-15	100	09/06/2022 1355	LAB	08/04/2022 1305	50101

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.6	UQ	7.2	3.6	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.6	UQ	7.2	3.6	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.6	U	7.2	3.6	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	5.0		3.6	1.8	0.90	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	10000	EQ	3.6	1.8	0.90	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	8.3		3.6	1.8	0.90	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	22		3.6	1.8	0.90	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.1	J	3.6	1.8	0.90	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	16		3.6	1.8	0.90	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	25		3.6	1.8	0.90	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.90	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	5.2		3.6	1.8	0.90	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	239	50-150	H	98	50-150
13C2_6:2FTS	N	253	50-150	H	108	50-150
13C2_8:2FTS		134	50-150	H	110	50-150
13C2_PFDoA		102	50-150	H	98	50-150
13C2_PFTeDA		109	50-150	H	108	50-150
13C3_PFBS		90	50-150	H	100	50-150
13C3_PFHxS		108	50-150	H	98	50-150
13C3-HFPO-DA		75	50-150	H	95	50-150
13C4_PFBA	N	11	50-150	H	93	50-150
13C4_PFHpA		97	50-150	H	99	50-150
13C5_PFHxA		90	50-150	H	98	50-150
13C5_PFPeA		69	50-150	H	118	50-150
13C6_PFDA		111	50-150	H	105	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XG22012-009
Description: CRCA-ASEFFLUENT-20220721
Matrix: Aqueous
Date Sampled: 07/21/2022 1515
Project Name: KSC-CRCA
Date Received: 07/22/2022
Project Number: 112G09237

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		111	50-150	H	109	50-150
13C8_PFOA		115	50-150	H	107	50-150
13C8_PFOS		110	50-150	H	108	50-150
13C9_PFNA		121	50-150	H	94	50-150
d-EtFOSA		99	50-150	H	105	50-150
d5-EtFOSAA		110	50-150	H	105	50-150
d3-MeFOSAA		109	50-150	H	89	50-150

LOQ = Limit of Quantitation
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PFAS by LC/MS/MS

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Date Sampled: 07/21/2022 1515 | Project Name: KSC-CRCA
Date Received: 07/22/2022 | Project Number: 112G09237

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	08/10/2022 1554	LAB	08/04/2022 1305	50101
2	SOP SPE	PFAS by ID SOP QSM B-15	100	09/06/2022 1355	LAB	08/04/2022 1305	50101

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	360	UH	720	360	180	ng/L	2
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	360	UH	720	360	180	ng/L	2
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	360	UH	720	360	180	ng/L	2
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	360	UH	720	360	180	ng/L	2
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	360	UH	720	360	180	ng/L	2
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	360	UH	720	360	180	ng/L	2
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	360	UH	720	360	180	ng/L	2
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	360	UH	720	360	180	ng/L	2
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	360	UH	720	360	180	ng/L	2
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	360	UH	720	360	180	ng/L	2
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	34000	HD	360	180	90	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	180	UH	360	180	90	ng/L	2
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	180	UH	360	180	90	ng/L	2

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	239	50-150	H	98	50-150
13C2_6:2FTS	N	253	50-150	H	108	50-150
13C2_8:2FTS		134	50-150	H	110	50-150
13C2_PFDoA		102	50-150	H	98	50-150
13C2_PFTeDA		109	50-150	H	108	50-150
13C3_PFBS		90	50-150	H	100	50-150
13C3_PFHxS		108	50-150	H	98	50-150
13C3-HFPO-DA		75	50-150	H	95	50-150
13C4_PFBA	N	11	50-150	H	93	50-150
13C4_PFHpA		97	50-150	H	99	50-150
13C5_PFHxA		90	50-150	H	98	50-150
13C5_PFPeA		69	50-150	H	118	50-150
13C6_PFDA		111	50-150	H	105	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XG22012-009
Description: CRCA-ASEFFLUENT-20220721
Matrix: Aqueous
Date Sampled: 07/21/2022 1515
Project Name: KSC-CRCA
Date Received: 07/22/2022
Project Number: 112G09237

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		111	50-150	H	109	50-150
13C8_PFOA		115	50-150	H	107	50-150
13C8_PFOS		110	50-150	H	108	50-150
13C9_PFNA		121	50-150	H	94	50-150
d-EtFOSA		99	50-150	H	105	50-150
d5-EtFOSAA		110	50-150	H	105	50-150
d3-MeFOSAA		109	50-150	H	89	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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QC Summary

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ49180-001
Batch: 49180
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	07/26/2022 2202
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	07/26/2022 2202
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	07/26/2022 2202
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	07/26/2022 2202
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	07/26/2022 2202
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	07/26/2022 2202
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	07/26/2022 2202
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	07/26/2022 2202
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	07/26/2022 2202
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	07/26/2022 2202
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	07/26/2022 2202
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ49180-001
Batch: 49180
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	07/26/2022 2202

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		92	81-118
Bromofluorobenzene		95	85-114
Toluene-d8		99	89-112
Dibromofluoromethane		99	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ49180-002
Batch: 49180
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	100		1	104	39-160	07/26/2022 2057
Benzene	50	49		1	98	79-120	07/26/2022 2057
Bromodichloromethane	50	48		1	97	79-125	07/26/2022 2057
Bromoform	50	48		1	97	66-130	07/26/2022 2057
Bromomethane (Methyl bromide)	50	44		1	89	53-141	07/26/2022 2057
2-Butanone (MEK)	100	100		1	104	56-143	07/26/2022 2057
Carbon disulfide	50	51		1	102	64-133	07/26/2022 2057
Carbon tetrachloride	50	48		1	97	72-136	07/26/2022 2057
Chlorobenzene	50	48		1	96	82-118	07/26/2022 2057
Chloroethane	50	48		1	95	60-138	07/26/2022 2057
Chloroform	50	48		1	96	79-124	07/26/2022 2057
Chloromethane (Methyl chloride)	50	45		1	89	50-139	07/26/2022 2057
Cyclohexane	50	49		1	97	71-130	07/26/2022 2057
1,2-Dibromo-3-chloropropane (DBCP)	50	50		1	101	62-128	07/26/2022 2057
Dibromochloromethane	50	49		1	98	74-126	07/26/2022 2057
1,2-Dibromoethane (EDB)	50	49		1	98	77-121	07/26/2022 2057
1,2-Dichlorobenzene	50	49		1	98	80-119	07/26/2022 2057
1,3-Dichlorobenzene	50	48		1	96	80-119	07/26/2022 2057
1,4-Dichlorobenzene	50	45		1	91	79-118	07/26/2022 2057
Dichlorodifluoromethane	50	50		1	100	32-152	07/26/2022 2057
1,1-Dichloroethane	50	49		1	99	77-125	07/26/2022 2057
1,2-Dichloroethane	50	47		1	94	73-128	07/26/2022 2057
1,1-Dichloroethene	50	53		1	106	71-131	07/26/2022 2057
cis-1,2-Dichloroethene	50	51		1	102	78-123	07/26/2022 2057
trans-1,2-Dichloroethene	50	50		1	100	75-124	07/26/2022 2057
1,2-Dichloropropane	50	49		1	97	78-122	07/26/2022 2057
cis-1,3-Dichloropropene	50	52		1	103	75-124	07/26/2022 2057
trans-1,3-Dichloropropene	50	50		1	99	73-127	07/26/2022 2057
Ethylbenzene	50	52		1	103	79-121	07/26/2022 2057
2-Hexanone	100	100		1	102	57-139	07/26/2022 2057
Isopropylbenzene	50	55		1	110	72-131	07/26/2022 2057
Methyl acetate	50	51		1	102	56-136	07/26/2022 2057
Methyl tertiary butyl ether (MTBE)	50	51		1	102	71-124	07/26/2022 2057
4-Methyl-2-pentanone	100	110		1	106	67-130	07/26/2022 2057
Methylcyclohexane	50	54		1	107	72-132	07/26/2022 2057
Methylene chloride	50	50		1	101	74-124	07/26/2022 2057
Styrene	50	49		1	98	78-123	07/26/2022 2057
1,1,2,2-Tetrachloroethane	50	47		1	94	71-121	07/26/2022 2057
Tetrachloroethene	50	48		1	96	74-129	07/26/2022 2057
Toluene	50	51		1	102	80-121	07/26/2022 2057
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	52		1	103	70-136	07/26/2022 2057
1,2,4-Trichlorobenzene	50	50		1	101	69-130	07/26/2022 2057
1,1,1-Trichloroethane	50	49		1	98	74-131	07/26/2022 2057
1,1,2-Trichloroethane	50	48		1	96	80-119	07/26/2022 2057

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ49180-002
Batch: 49180
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	48		1	96	79-123	07/26/2022 2057
Trichlorofluoromethane	50	50		1	99	65-141	07/26/2022 2057
Vinyl chloride	50	46		1	93	58-137	07/26/2022 2057
Xylenes (total)	100	110		1	105	79-121	07/26/2022 2057

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		93	81-118
Bromofluorobenzene		99	85-114
Toluene-d8		101	89-112
Dibromofluoromethane		98	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ49324-001
Batch: 49324
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	07/27/2022 1945
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	07/27/2022 1945
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	07/27/2022 1945
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	07/27/2022 1945
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	07/27/2022 1945
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	07/27/2022 1945
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	07/27/2022 1945
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	07/27/2022 1945
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	07/27/2022 1945
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	07/27/2022 1945
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	07/27/2022 1945
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ49324-001
Batch: 49324
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	07/27/2022 1945

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		111	81-118
Bromofluorobenzene		96	85-114
Toluene-d8		98	89-112
Dibromofluoromethane		97	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ49324-002
Batch: 49324
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	110		1	110	39-160	07/27/2022 1841
Benzene	50	49		1	99	79-120	07/27/2022 1841
Bromodichloromethane	50	48		1	95	79-125	07/27/2022 1841
Bromoform	50	43		1	87	66-130	07/27/2022 1841
Bromomethane (Methyl bromide)	50	45		1	89	53-141	07/27/2022 1841
2-Butanone (MEK)	100	86		1	86	56-143	07/27/2022 1841
Carbon disulfide	50	43		1	86	64-133	07/27/2022 1841
Carbon tetrachloride	50	47		1	95	72-136	07/27/2022 1841
Chlorobenzene	50	49		1	97	82-118	07/27/2022 1841
Chloroethane	50	45		1	91	60-138	07/27/2022 1841
Chloroform	50	47		1	94	79-124	07/27/2022 1841
Chloromethane (Methyl chloride)	50	49		1	97	50-139	07/27/2022 1841
Cyclohexane	50	53		1	105	71-130	07/27/2022 1841
1,2-Dibromo-3-chloropropane (DBCP)	50	46		1	92	62-128	07/27/2022 1841
Dibromochloromethane	50	47		1	94	74-126	07/27/2022 1841
1,2-Dibromoethane (EDB)	50	50		1	99	77-121	07/27/2022 1841
1,2-Dichlorobenzene	50	51		1	101	80-119	07/27/2022 1841
1,3-Dichlorobenzene	50	49		1	99	80-119	07/27/2022 1841
1,4-Dichlorobenzene	50	49		1	98	79-118	07/27/2022 1841
Dichlorodifluoromethane	50	43		1	85	32-152	07/27/2022 1841
1,1-Dichloroethane	50	48		1	97	77-125	07/27/2022 1841
1,2-Dichloroethane	50	51		1	101	73-128	07/27/2022 1841
1,1-Dichloroethene	50	45		1	91	71-131	07/27/2022 1841
cis-1,2-Dichloroethene	50	45		1	91	78-123	07/27/2022 1841
trans-1,2-Dichloroethene	50	46		1	92	75-124	07/27/2022 1841
1,2-Dichloropropane	50	50		1	99	78-122	07/27/2022 1841
cis-1,3-Dichloropropene	50	50		1	100	75-124	07/27/2022 1841
trans-1,3-Dichloropropene	50	50		1	100	73-127	07/27/2022 1841
Ethylbenzene	50	50		1	100	79-121	07/27/2022 1841
2-Hexanone	100	97		1	97	57-139	07/27/2022 1841
Isopropylbenzene	50	52		1	104	72-131	07/27/2022 1841
Methyl acetate	50	50		1	100	56-136	07/27/2022 1841
Methyl tertiary butyl ether (MTBE)	50	46		1	92	71-124	07/27/2022 1841
4-Methyl-2-pentanone	100	110		1	106	67-130	07/27/2022 1841
Methylcyclohexane	50	43		1	85	72-132	07/27/2022 1841
Methylene chloride	50	46		1	93	74-124	07/27/2022 1841
Styrene	50	46		1	93	78-123	07/27/2022 1841
1,1,2,2-Tetrachloroethane	50	52		1	104	71-121	07/27/2022 1841
Tetrachloroethene	50	48		1	96	74-129	07/27/2022 1841
Toluene	50	50		1	99	80-121	07/27/2022 1841
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	45		1	90	70-136	07/27/2022 1841
1,2,4-Trichlorobenzene	50	51		1	102	69-130	07/27/2022 1841
1,1,1-Trichloroethane	50	47		1	95	74-131	07/27/2022 1841
1,1,2-Trichloroethane	50	50		1	100	80-119	07/27/2022 1841

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ49324-002
Batch: 49324
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	46		1	92	79-123	07/27/2022 1841
Trichlorofluoromethane	50	44		1	88	65-141	07/27/2022 1841
Vinyl chloride	50	48		1	96	58-137	07/27/2022 1841
Xylenes (total)	100	100		1	100	79-121	07/27/2022 1841

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		97	81-118
Bromofluorobenzene		89	85-114
Toluene-d8		90	89-112
Dibromofluoromethane		85	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
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N = Recovery is out of criteria
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Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved Gases - MB

Sample ID: XQ50061-001
Batch: 50061
Analytical Method: RSK - 175

Matrix: Aqueous

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Ethane	5.0	U	1	10	5.0	2.5	ug/L	08/03/2022 1026
Ethene	5.0	U	1	10	5.0	2.5	ug/L	08/03/2022 1026
Methane	2.7	J	1	10	5.0	2.5	ug/L	08/03/2022 1026
Propane	7.5	U	1	15	7.5	5.0	ug/L	08/03/2022 1026

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Dissolved Gases - LCS

Sample ID: XQ50061-002
Batch: 50061
Analytical Method: RSK - 175

Matrix: Aqueous

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Ethane	550	580		1	104	74-131	08/03/2022 0931
Ethene	520	510		1	99	72-133	08/03/2022 0931
Methane	300	240		1	82	73-125	08/03/2022 0931
Propane	810	940		1	116	74-123	08/03/2022 0931

LOQ = Limit of Quantitation
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LOD = Limit of Detection

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J = Estimated result < LOQ and ≥ DL
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N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
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Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ50101-001
Batch: 50101
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/04/2022 1305

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/10/2022 1419
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/10/2022 1419
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/10/2022 1419
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/10/2022 1419
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/10/2022 1419
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/10/2022 1419
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/10/2022 1419
EtFOSA	4.0	U	1	8.0	4.0	2.0	ng/L	08/10/2022 1419
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/10/2022 1419
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/10/2022 1419
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/10/2022 1419

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		113	50-150
13C2_6:2FTS	N	157	50-150
13C2_8:2FTS		100	50-150
13C2_PFDoA		101	50-150
13C2_PFTeDA		104	50-150
13C3_PFBS		102	50-150
13C3_PFHxS		106	50-150
13C3-HFPO-DA		99	50-150
13C4_PFBA		99	50-150
13C4_PFHpA		98	50-150
13C5_PFHxA		100	50-150
13C5_PFPeA		102	50-150

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J = Estimated result < LOQ and ≥ DL
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N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ50101-001
Batch: 50101
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/04/2022 1305

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		106	50-150
13C7_PFUdA		107	50-150
13C8_PFOA		104	50-150
13C8_PFOS		101	50-150
13C9_PFNA		109	50-150
d-EtFOSA		86	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		105	50-150

LOQ = Limit of Quantitation
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LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ50101-002
Batch: 50101
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/04/2022 1305

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	93	50-150	08/10/2022 1429
11Cl-PF3OUdS	15	14		1	93	50-150	08/10/2022 1429
8:2 FTS	15	17		1	108	67-138	08/10/2022 1429
6:2 FTS	15	18		1	119	64-140	08/10/2022 1429
4:2 FTS	15	16		1	107	63-143	08/10/2022 1429
GenX	32	29		1	91	50-150	08/10/2022 1429
ADONA	15	16		1	104	50-150	08/10/2022 1429
EtFOSA	16	16		1	102	50-150	08/10/2022 1429
EtFOSAA	16	15		1	94	61-135	08/10/2022 1429
MeFOSAA	16	16		1	101	65-136	08/10/2022 1429
PFBS	14	14		1	100	72-130	08/10/2022 1429
PFDS	15	15		1	98	53-142	08/10/2022 1429
PFHpS	15	15		1	100	69-134	08/10/2022 1429
PFNS	15	15		1	99	69-127	08/10/2022 1429
PFPeS	15	15		1	101	71-127	08/10/2022 1429
PFHxS	15	15		1	101	68-131	08/10/2022 1429
PFBA	16	17		1	109	73-129	08/10/2022 1429
PFDA	16	16		1	103	71-129	08/10/2022 1429
PFDoA	16	16		1	99	72-134	08/10/2022 1429
PFHpA	16	15		1	96	72-130	08/10/2022 1429
PFHxA	16	16		1	99	72-129	08/10/2022 1429
PFNA	16	16		1	102	69-130	08/10/2022 1429
PFOA	16	16		1	102	71-133	08/10/2022 1429
PFPeA	16	17		1	104	72-129	08/10/2022 1429
PFTeDA	16	17		1	108	71-132	08/10/2022 1429
PFTrDA	16	16		1	100	65-144	08/10/2022 1429
PFUdA	16	16		1	102	69-133	08/10/2022 1429
PFOS	15	14		1	95	65-140	08/10/2022 1429

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		105	50-150
13C2_6:2FTS		135	50-150
13C2_8:2FTS		107	50-150
13C2_PFDoA		97	50-150
13C2_PFTeDA		101	50-150
13C3_PFBS		106	50-150
13C3_PFHxS		105	50-150
13C3-HFPO-DA		108	50-150
13C4_PFBA		105	50-150
13C4_PFHpA		99	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		98	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ50101-002
Batch: 50101
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/04/2022 1305

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		97	50-150
13C7_PFUdA		103	50-150
13C8_PFOA		102	50-150
13C8_PFOS		106	50-150
13C9_PFNA		112	50-150
d-EtFOSA		87	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		107	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: XQ50101-003
Batch: 50101
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/04/2022 1305

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
9Cl-PF3ONS	15	16		1	110	16	50-150	30	08/10/2022 1440
11Cl-PF3OUdS	15	15		1	97	4.2	50-150	30	08/10/2022 1440
8:2 FTS	15	17		1	112	4.1	67-138	30	08/10/2022 1440
6:2 FTS	15	16		1	105	13	64-140	30	08/10/2022 1440
4:2 FTS	15	15		1	100	6.7	63-143	30	08/10/2022 1440
GenX	32	33		1	103	12	50-150	30	08/10/2022 1440
ADONA	15	16		1	106	1.0	50-150	30	08/10/2022 1440
EtFOSA	16	17		1	108	5.4	50-150	30	08/10/2022 1440
EtFOSAA	16	15		1	91	3.0	61-135	30	08/10/2022 1440
MeFOSAA	16	13		1	84	18	65-136	30	08/10/2022 1440
PFBS	14	14		1	98	1.8	72-130	30	08/10/2022 1440
PFDS	15	14		1	90	8.4	53-142	30	08/10/2022 1440
PFHpS	15	16		1	103	3.1	69-134	30	08/10/2022 1440
PFNS	15	15		1	100	0.61	69-127	30	08/10/2022 1440
PFPeS	15	14		1	92	9.0	71-127	30	08/10/2022 1440
PFHxS	15	14		1	95	6.9	68-131	30	08/10/2022 1440
PFBA	16	18		1	110	0.71	73-129	30	08/10/2022 1440
PFDA	16	16		1	101	1.5	71-129	30	08/10/2022 1440
PFDoA	16	16		1	100	1.4	72-134	30	08/10/2022 1440
PFHpA	16	17		1	105	9.7	72-130	30	08/10/2022 1440
PFHxA	16	16		1	100	1.1	72-129	30	08/10/2022 1440
PFNA	16	15		1	93	8.9	69-130	30	08/10/2022 1440
PFOA	16	15		1	95	6.3	71-133	30	08/10/2022 1440
PFPeA	16	16		1	101	3.0	72-129	30	08/10/2022 1440
PFTeDA	16	17		1	109	0.44	71-132	30	08/10/2022 1440
PFTrDA	16	16		1	103	2.5	65-144	30	08/10/2022 1440
PFUdA	16	17		1	107	5.3	69-133	30	08/10/2022 1440
PFOS	15	14		1	94	0.12	65-140	30	08/10/2022 1440

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	50-150
13C2_6:2FTS		144	50-150
13C2_8:2FTS		108	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		98	50-150
13C3_PFBS		109	50-150
13C3_PFHxS		104	50-150
13C3-HFPO-DA		100	50-150
13C4_PFBA		100	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		99	50-150
13C5_PFPeA		103	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCSD

Sample ID: XQ50101-003
Batch: 50101
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/04/2022 1305

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		101	50-150
13C7_PFUdA		95	50-150
13C8_PFOA		103	50-150
13C8_PFOS		100	50-150
13C9_PFNA		115	50-150
d-EtFOSA		76	50-150
d5-EtFOSAA		96	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

Tetra Tech, Inc.

CHAIN OF CUSTODY | NUMBER No. 2650 | PAGE 1 OF 1

PROJECT NO: 112G09237	FACILITY: KSC-CRCA	PROJECT MANAGER Chris Neumann	PHONE NUMBER (321) 636-6470	LABORATORY NAME AND CONTACT: Pace Analytical — Katey Smith
SAMPLERS (SIGNATURE) - Chuck Sorden		FIELD OPERATIONS LEADER Chuck Sorden	PHONE NUMBER (321) 591-7580	ADDRESS 106 Vantage Point Dr.
		CARRIER/WAYBILL NUMBER		CITY, STATE West Columbia, SC

STANDARD TAT ☒
RUSH TAT ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE (YEAR 2022)	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: VOCs	Dissolved Gases (RSK 8M Table B-15)	COMMENTS
									G	HCl/4°C			XG22012 KEsz
									G	MCl/4°C			
									P	4°C			
07/21	0910	CRCA-MW0002-032.5-20220721		30	35	GW	G	3			X		
	0950	CRCA-MW0027-035.0-20220721		30	40			3					
	1025	CRCA-MW0031-058.0-20220721		53	63			5			X		
	1110	CRCA-MW0018-058.0-20220721		53	63			5			X		
	1255	CRCA-MW0032-058.0-20220721		53	63			3					
	1345	CRCA-MW0014-058.0-20220721		53	63			5			X		
	1435	CRCA-MW0013-027.5-20220721		25	30			3					
	1500	CRCA-ASINFLUENT-20220721		—	—			5				X	
07/21	1515	CRCA-ASEFFLUENT-20220721		—	—	GW	G	5			X	X	

1. RELINQUISHED BY		DATE 07/21/22	TIME 1600	1. RECEIVED BY FedEx	DATE 07/21/22	TIME 1600
2. RELINQUISHED BY FedEx		DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY FedEx		DATE 7-22-22	TIME 0950	3. RECEIVED BY	DATE 7-22-22	TIME 0950

COMMENTS

7= 4.9°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TINUS-001

PaceAnalytical

Samples Receipt Checklist (SRC) (ME0018C-15)
Issuing Authority: Pace ENV - WCOL

Revised:9/29/2020
Page 1 of 1

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: KNR / 07/22/2022 Lot #: XGZ2012

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☐ Yes	☑ No		1. Were custody seals present on the cooler?
☐ Yes	☐ No	☑ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

4.4 / 4.4 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 6 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☐ Yes	☐ No	☑ NA	3. If temperature of any cooler exceeded 6.0°C, was Project Manager Notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC?
☑ Yes	☐ No		7. Were sample IDs listed on all sample containers?
☑ Yes	☐ No		8. Was collection date & time listed on the COC?
☑ Yes	☐ No		9. Was collection date & time listed on all sample containers?
☑ Yes	☐ No		10. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		11. Were tests to be performed listed on the COC?
☑ Yes	☐ No		12. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		13. Was adequate sample volume available?
☑ Yes	☐ No		14. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☐ Yes	☑ No		15. Were any samples containers missing/excess (circle one) samples Not listed on COC?
☐ Yes	☑ No	☐ NA	16. For VOA and RSK-175 samples, were bubbles present >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	17. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	18. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	19. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☐ No	☑ NA	20. Were client remarks/requests (i.e. requested dilutions, MS/MSD designations, etc…) correctly transcribed from the COC into the comment section in LIMS?
☐ Yes	☑ No		21. Was the quote number listed on the container label? If yes, Quote # 24792

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA.
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Shealy ID: NA.

SR barcode labels applied by: TEC Date: 07/22/2022

Comments:

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Alex Murphy

Project Name: CRCA - NASA

Project Number: 112G09581

Lot Number:**XH16026**

Date Completed:10/10/2022

10/16/2022 3:15 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

Pace Analytical Services, LLC (*formerly Shealy Environmental Services, Inc.*)
106 Vantage Point Drive West Columbia, SC 29172
Tel: 803-791-9700 Fax: 803-791-9111 www.pacelabs.com

Case Narrative
Tetra Tech
Lot Number: XH16026

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a DoD/DOE accredited laboratory; however, the following analyses are currently not listed on our DoD/DOE scope of accreditation: Drinking Water: pH EPA 150.1, Turbidity EPA 18.01, Metals EPA 200.7

& 200.8, Mercury EPA 245.1, Anions EPA 300.0, Cyanide EPA 335.4, Nitrates EPA 353.2, Orthophosphate & Phosphorus EPA 365.1, EDB/DBCP EPA 504.1, HPC SIMPLATE, Color SM 2120 B-2011, Alkalinity SM 2320 B-2011, Specific Conductance SM 2510 B-2011, Residue-filterable (TDS) SM 2540 C, Calcium Hardness (CaCO2) SM 3500-Ca B-2011, TRC SM 4500 Cl G-2011, pH SM 4500 H=B-2011, E.Coli, Total Coliform; Non-Potable Water: Metals EPA 200.7, Strontium EPA 200.8, Chlorate EPA 300.0, Cyanide EPA 335.4, Phenolics EPA 420.4, 2-Methyl-4,6-Dinitrophenol EPA 625.1, Propane RSK-175, Specific Conductance SM 2510 B-2011, Salinity SM250 B, Residue- total SM 2540 B, Sulfite SM 4500 SO32- B-2011, Amenable Cyanide SM 4500-CN- G-2011, BOD & CBOD SM 5210 B, MBAS SM 5540 C-2011; Solid and Chemical Materials: Boron & Titanium SW-846 6010D, Boron, Molybdenum, & Titanium SW-846 6020B, Alcohols & Glycols SW-846 8015C, Pentachlorophenol SW-846 8151A, Ethyl Acetate, Hexane, & n-Hexane SW-846 8260D, SVOC 1,4-Dioxane, 3&4-Methylphenols, 4-Dimethyl aminoazobenzene, 1,4-Naphthoquinone, 3,5-Dinitroaniline, PETN SW-846 8270E, Amenable Cyanide SW-846 9012B; Boron & Titanium SW-846 6010D, Molybdenum SW-846 6020B, Ethylene Glycol SW-846 8015B, Pentachlorophenol SW-846 8151A, Chloroprene SW-846 8260B, SVOC 1,3,5-Trinitrobenzene, 1,4-Dioxane, 1,4-Naphthoquinone, 1,4-Phenylenediamine, 2,5-Dinitrotoluene, 2,6-Dinitrotoluene, 3-Methylcholanthrene, 4- Aminobiphenyl, 4-Dimethyl aminoazobenzene, 4-Nitroquinoline-1-oxide, 7,12- Dimethylbenzo(a)anthracene, Chlorobenzilate, Diallate, Ethyl methanesulfonate, Isodrin, Isosafrole, Methyl methanesulfonate, n-Nitrosomethylethylamine, n-Nitrosomorpholine, n-Nitrosopiperidine, Piperonyl butoxide, Pronamide, Safrole, 3,5-Dinitroaniline, PETN SW-846 8270E, Oil & Grease SW-846 9071B.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

PFAS
The method blank, laboratory control sample (LCS) and / or laboratory control sample duplicate (LCSD) for prep batch 52055 exceeded acceptance criteria for the following analytes: 6:2 FTS EIS. The data has been reported.

Surrogate recovery for the following sample was outside the upper control limit: XH16026-002. This sample did not contain any target analytes; therefore, re-extraction and/or re-analysis was not performed.

Manual Integration Summary

Tetra Tech

Lot Number: XH16026

Project Name: CRCA - NASA

Project Number: 112G09581

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	XH16026-002	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	XH16026-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ53675-002	1	1H, 1H, 2H, 2H-perfluorodecane	M-03
PFAS by ID SOP	XQ53675-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	XQ53675-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ53675-001	1	13C2_6:2FTS	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Sample Summary

Tetra Tech

Lot Number: XH16026

Project Name: CRCA - NASA

Project Number: 112G09581

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	CRCA-Effluent-20220815	Aqueous	08/15/2022 1530	08/16/2022
002	CRCA-Influent-20220815	Aqueous	08/15/2022 1535	08/16/2022

(2 samples)

Detection Summary

Tetra Tech

Lot Number: XH16026

Project Name: CRCA - NASA

Project Number: 112G09581

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	CRCA-Effluent-20220815	Aqueous	PFBA	PFAS by ID	39000	D	ng/L	9
002	CRCA-Influent-20220815	Aqueous	Vinyl chloride	8260D	2.9		ug/L	12
002	CRCA-Influent-20220815	Aqueous	PFHxS	PFAS by ID	4.6	M-03	ng/L	13
002	CRCA-Influent-20220815	Aqueous	PFBA	PFAS by ID	29000	D	ng/L	13
002	CRCA-Influent-20220815	Aqueous	PFHpA	PFAS by ID	8.6		ng/L	13
002	CRCA-Influent-20220815	Aqueous	PFHxA	PFAS by ID	21		ng/L	13
002	CRCA-Influent-20220815	Aqueous	PFNA	PFAS by ID	1.1	I	ng/L	13
002	CRCA-Influent-20220815	Aqueous	PFOA	PFAS by ID	17		ng/L	13
002	CRCA-Influent-20220815	Aqueous	PFPeA	PFAS by ID	23		ng/L	13
002	CRCA-Influent-20220815	Aqueous	PFOS	PFAS by ID	6.1	M-03	ng/L	13

(10 detections)

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XH16026-001

Description: CRCA-Effluent-20220815 | Matrix: Aqueous

Date Sampled: 08/15/2022 1530 | Project Name: CRCA - NASA

Date Received: 08/16/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	08/24/2022 0125	SDC		52033
2	5030B	8260D	1	08/25/2022 0130	SDC		52161

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	2
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | V = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | I = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

Q = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | D = Dilution > 1 | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XH16026-001

Description: CRCA-Effluent-20220815 | Matrix: Aqueous

Date Sampled: 08/15/2022 1530 | Project Name: CRCA - NASA

Date Received: 08/16/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	08/24/2022 0125	SDC		52033
2	5030B	8260D	1	08/25/2022 0130	SDC		52161

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		108	81-118		111	81-118
Bromofluorobenzene		101	85-114		102	85-114
Toluene-d8		107	89-112		109	89-112
Dibromofluoromethane		108	80-119		111	80-119

LOQ = Limit of Quantitation | V = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | I = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

Q = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | D = Dilution > 1 | S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XH16026-001
Description: CRCA-Effluent-20220815
Matrix: Aqueous
Date Sampled: 08/15/2022 1530
Project Name: CRCA - NASA
Date Received: 08/16/2022
Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	100	08/24/2022 2226	ALM	08/24/2022 0857	52055
2	SOP SPE	PFAS by ID SOP QSM B-15	200	08/25/2022 1823	MMM	08/24/2022 0857	52055

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	380	U	750	380	190	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	380	U	750	380	190	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	380	U	750	380	190	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	380	U	750	380	190	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	380	U	750	380	190	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	380	U	750	380	190	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	380	U	750	380	190	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	380	U	750	380	190	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	380	U	750	380	190	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	380	U	750	380	190	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	39000	D	750	380	190	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	190	U	380	190	94	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	190	U	380	190	94	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		96	50-150		96	50-150
13C2_6:2FTS		96	50-150		94	50-150
13C2_8:2FTS		97	50-150		98	50-150
13C2_PFDoA		99	50-150		100	50-150
13C2_PFTeDA		98	50-150		99	50-150
13C3_PFBS		100	50-150		100	50-150
13C3_PFHxS		101	50-150		106	50-150
13C3-HFPO-DA		96	50-150		95	50-150
13C4_PFBA		87	50-150		94	50-150
13C4_PFHpA		97	50-150		101	50-150
13C5_PFHxA		98	50-150		102	50-150
13C5_PFPeA		104	50-150		98	50-150
13C6_PFDA		100	50-150		104	50-150

LOQ = Limit of Quantitation
V = Detected in the method blank
E = Quantitation of compound exceeded the calibration range
DL = Detection Limit
Q = Surrogate failure
U = Not detected at or above the LOD
N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
I = Estimated result < LOQ and ≥ DL
L = LCS/LCSD failure
Q = Out of holding time
W = Reported on wet weight basis
LOD = Limit of Detection
D = Dilution > 1
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XH16026-001
Description: CRCA-Effluent-20220815
Matrix: Aqueous
Date Sampled: 08/15/2022 1530
Project Name: CRCA - NASA
Date Received: 08/16/2022
Project Number: 112G09581

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		103	50-150		101	50-150
13C8_PFOA		96	50-150		95	50-150
13C8_PFOS		95	50-150		105	50-150
13C9_PFNA		92	50-150		100	50-150
d-EtFOSA		103	50-150		92	50-150
d5-EtFOSAA		101	50-150		98	50-150
d3-MeFOSAA		102	50-150		101	50-150

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XH16026-002

Description: CRCA-Influent-20220815 | Matrix: Aqueous

Date Sampled: 08/15/2022 1535 | Project Name: CRCA - NASA

Date Received: 08/16/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	08/24/2022 0148	SDC		52033
2	5030B	8260D	1	08/25/2022 0152	SDC		52161

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	2
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | V = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | I = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

Q = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | D = Dilution > 1 | S = MS/MSD failure

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XH16026-002

Description: CRCA-Influent-20220815 | Matrix: Aqueous

Date Sampled: 08/15/2022 1535 | Project Name: CRCA - NASA

Date Received: 08/16/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	08/24/2022 0148	SDC		52033
2	5030B	8260D	1	08/25/2022 0152	SDC		52161

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	2.9		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		109	81-118		111	81-118
Bromofluorobenzene		100	85-114		102	85-114
Toluene-d8		106	89-112		108	89-112
Dibromofluoromethane		110	80-119		108	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XH16026-002
Description: CRCA-Influent-20220815 | Matrix: Aqueous
Date Sampled: 08/15/2022 1535 | Project Name: CRCA - NASA
Date Received: 08/16/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	1	09/12/2022 2033	LAB	09/09/2022 0757	53675
2	SOP SPE	PFAS by ID SOP QSM B-15	100	10/05/2022 1530	ALM	09/09/2022 0757	53675

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	3.7	UQ	7.3	3.7	1.8	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	3.7	U	7.3	3.7	1.8	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	4.6	M-03	3.6	1.8	0.91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	29000	D	360	180	91	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	8.6		3.6	1.8	0.91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	21		3.6	1.8	0.91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	1.1	I	3.6	1.8	0.91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	17		3.6	1.8	0.91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	23		3.6	1.8	0.91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	1.8	U	3.6	1.8	0.91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	6.1	M-03	3.6	1.8	0.91	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS	N	251	50-150	N	160	50-150
13C2_6:2FTS	N	186	50-150		139	50-150
13C2_8:2FTS		110	50-150	N	176	50-150
13C2_PFDoA		101	50-150	N	166	50-150
13C2_PFTeDA		93	50-150		145	50-150
13C3_PFBS		81	50-150		126	50-150
13C3_PFHxS		105	50-150		120	50-150
13C3-HFPO-DA		91	50-150		105	50-150
13C4_PFBA	N	8.8	50-150		107	50-150
13C4_PFHpA		98	50-150		125	50-150
13C5_PFHxA		89	50-150		128	50-150
13C5_PFPeA		65	50-150		128	50-150
13C6_PFDA		90	50-150		128	50-150

LOQ = Limit of Quantitation | V = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | I = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
Q = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | D = Dilution > 1 | S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XH16026-002
Description: CRCA-Influent-20220815
Matrix: Aqueous
Date Sampled: 08/15/2022 1535
Project Name: CRCA - NASA
Date Received: 08/16/2022
Project Number: 112G09581

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		88	50-150		147	50-150
13C8_PFOA		101	50-150		121	50-150
13C8_PFOS		90	50-150		120	50-150
13C9_PFNA		101	50-150		113	50-150
d-EtFOSA		60	50-150		119	50-150
d5-EtFOSAA		96	50-150	N	190	50-150
d3-MeFOSAA		114	50-150	N	161	50-150

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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QC Summary

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ52033-001
Batch: 52033
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	08/23/2022 2229
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	08/23/2022 2229
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	08/23/2022 2229
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	08/23/2022 2229
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	08/23/2022 2229
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	08/23/2022 2229
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	08/23/2022 2229
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	08/23/2022 2229
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	08/23/2022 2229
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	08/23/2022 2229
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	08/23/2022 2229
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ52033-001
Batch: 52033
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	08/23/2022 2229

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		106	81-118
Bromofluorobenzene		100	85-114
Toluene-d8		105	89-112
Dibromofluoromethane		109	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ52033-002
Batch: 52033
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	98		1	98	39-160	08/23/2022 2125
Benzene	50	45		1	89	79-120	08/23/2022 2125
Bromodichloromethane	50	47		1	93	79-125	08/23/2022 2125
Bromoform	50	45		1	89	66-130	08/23/2022 2125
Bromomethane (Methyl bromide)	50	50		1	101	53-141	08/23/2022 2125
2-Butanone (MEK)	100	100		1	105	56-143	08/23/2022 2125
Carbon disulfide	50	44		1	89	64-133	08/23/2022 2125
Carbon tetrachloride	50	46		1	92	72-136	08/23/2022 2125
Chlorobenzene	50	48		1	96	82-118	08/23/2022 2125
Chloroethane	50	50		1	100	60-138	08/23/2022 2125
Chloroform	50	46		1	91	79-124	08/23/2022 2125
Chloromethane (Methyl chloride)	50	46		1	91	50-139	08/23/2022 2125
1,2-Dibromo-3-chloropropane (DBCP)	50	46		1	93	62-128	08/23/2022 2125
Dibromochloromethane	50	49		1	99	74-126	08/23/2022 2125
1,2-Dibromoethane (EDB)	50	50		1	99	77-121	08/23/2022 2125
1,2-Dichlorobenzene	50	48		1	96	80-119	08/23/2022 2125
1,3-Dichlorobenzene	50	47		1	95	80-119	08/23/2022 2125
1,4-Dichlorobenzene	50	47		1	94	79-118	08/23/2022 2125
Dichlorodifluoromethane	50	43		1	86	32-152	08/23/2022 2125
1,1-Dichloroethane	50	43		1	87	77-125	08/23/2022 2125
1,2-Dichloroethane	50	47		1	94	73-128	08/23/2022 2125
1,1-Dichloroethene	50	44		1	89	71-131	08/23/2022 2125
cis-1,2-Dichloroethene	50	46		1	92	78-123	08/23/2022 2125
trans-1,2-Dichloroethene	50	46		1	93	75-124	08/23/2022 2125
1,2-Dichloropropane	50	44		1	88	78-122	08/23/2022 2125
cis-1,3-Dichloropropene	50	47		1	94	75-124	08/23/2022 2125
trans-1,3-Dichloropropene	50	48		1	97	73-127	08/23/2022 2125
Ethylbenzene	50	48		1	97	79-121	08/23/2022 2125
2-Hexanone	100	96		1	96	57-139	08/23/2022 2125
Isopropylbenzene	50	49		1	97	72-131	08/23/2022 2125
Methyl acetate	50	48		1	96	56-136	08/23/2022 2125
Methyl tertiary butyl ether (MTBE)	50	48		1	95	71-124	08/23/2022 2125
4-Methyl-2-pentanone	100	91		1	91	67-130	08/23/2022 2125
Methylcyclohexane	50	44		1	89	72-132	08/23/2022 2125
Methylene chloride	50	47		1	93	74-124	08/23/2022 2125
Styrene	50	49		1	99	78-123	08/23/2022 2125
1,1,2,2-Tetrachloroethane	50	44		1	88	71-121	08/23/2022 2125
Tetrachloroethene	50	47		1	94	74-129	08/23/2022 2125
Toluene	50	47		1	94	80-121	08/23/2022 2125
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	45		1	90	70-136	08/23/2022 2125
1,2,4-Trichlorobenzene	50	50		1	99	69-130	08/23/2022 2125
1,1,1-Trichloroethane	50	46		1	92	74-131	08/23/2022 2125
1,1,2-Trichloroethane	50	48		1	96	80-119	08/23/2022 2125
Trichloroethene	50	46		1	92	79-123	08/23/2022 2125

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ52033-002
Batch: 52033
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichlorofluoromethane	50	47		1	95	65-141	08/23/2022 2125
Vinyl chloride	50	45		1	90	58-137	08/23/2022 2125
Xylenes (total)	100	96		1	96	79-121	08/23/2022 2125

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		106	81-118
Bromofluorobenzene		109	85-114
Toluene-d8		108	89-112
Dibromofluoromethane		109	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ52161-001
Batch: 52161
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	08/24/2022 2313

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		108	81-118
Bromofluorobenzene		101	85-114
Toluene-d8		107	89-112
Dibromofluoromethane		108	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ52161-002
Batch: 52161
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Cyclohexane	50	38		1	76	71-130	08/24/2022 2157

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		104	81-118
Bromofluorobenzene		105	85-114
Toluene-d8		103	89-112
Dibromofluoromethane		108	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ52055-001
Batch: 52055
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/24/2022 0857

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	08/24/2022 1803
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	08/24/2022 1803
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/24/2022 1803
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/24/2022 1803
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	08/24/2022 1803
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	08/24/2022 1803
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	08/24/2022 1803
EtFOSA	4.0	U	1	8.0	4.0	2.0	ng/L	08/24/2022 1803
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/24/2022 1803
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	08/24/2022 1803
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	08/24/2022 1803

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		98	50-150
13C2_6:2FTS	N	286	50-150
13C2_8:2FTS		101	50-150
13C2_PFDoA		99	50-150
13C2_PFTeDA		92	50-150
13C3_PFBS		104	50-150
13C3_PFHxS		107	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		106	50-150
13C4_PFHpA		109	50-150
13C5_PFHxA		106	50-150
13C5_PFPeA		105	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ52055-001
Batch: 52055
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/24/2022 0857

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		103	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		105	50-150
13C8_PFOS		98	50-150
13C9_PFNA		99	50-150
d-EtFOSA		88	50-150
d5-EtFOSAA		102	50-150
d3-MeFOSAA		104	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ52055-002
Batch: 52055
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/24/2022 0857

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	94	50-150	08/24/2022 1813
11Cl-PF3OUdS	15	13		1	84	50-150	08/24/2022 1813
8:2 FTS	15	15		1	99	67-138	08/24/2022 1813
6:2 FTS	15	14		1	94	64-140	08/24/2022 1813
4:2 FTS	15	14		1	97	63-143	08/24/2022 1813
GenX	32	35		1	109	50-150	08/24/2022 1813
ADONA	15	14		1	96	50-150	08/24/2022 1813
EtFOSA	16	20		1	123	50-150	08/24/2022 1813
EtFOSAA	16	14		1	88	61-135	08/24/2022 1813
MeFOSAA	16	15		1	94	65-136	08/24/2022 1813
PFBS	14	14		1	100	72-130	08/24/2022 1813
PFDS	15	14		1	91	53-142	08/24/2022 1813
PFHpS	15	15		1	96	69-134	08/24/2022 1813
PFNS	15	15		1	96	69-127	08/24/2022 1813
PFPeS	15	15		1	97	71-127	08/24/2022 1813
PFHxS	15	14		1	96	68-131	08/24/2022 1813
PFBA	16	16		1	97	73-129	08/24/2022 1813
PFDA	16	16		1	102	71-129	08/24/2022 1813
PFDoA	16	15		1	96	72-134	08/24/2022 1813
PFHpA	16	15		1	97	72-130	08/24/2022 1813
PFHxA	16	16		1	97	72-129	08/24/2022 1813
PFNA	16	15		1	94	69-130	08/24/2022 1813
PFOA	16	15		1	95	71-133	08/24/2022 1813
PFPeA	16	16		1	101	72-129	08/24/2022 1813
PFTeDA	16	15		1	95	71-132	08/24/2022 1813
PFTrDA	16	14		1	85	65-144	08/24/2022 1813
PFUdA	16	14		1	88	69-133	08/24/2022 1813
PFOS	15	14		1	98	65-140	08/24/2022 1813

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		105	50-150
13C2_6:2FTS	N	387	50-150
13C2_8:2FTS		107	50-150
13C2_PFDoA		104	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		105	50-150
13C3_PFHxS		114	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		107	50-150
13C4_PFHpA		111	50-150
13C5_PFHxA		108	50-150
13C5_PFPeA		110	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ52055-002
Batch: 52055
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 08/24/2022 0857

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		107	50-150
13C7_PFUdA		105	50-150
13C8_PFOA		111	50-150
13C8_PFOS		102	50-150
13C9_PFNA		107	50-150
d-EtFOSA		87	50-150
d5-EtFOSAA		105	50-150
d3-MeFOSAA		109	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ53675-001
Batch: 53675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/09/2022 0757

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	09/12/2022 2012
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	09/12/2022 2012
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/12/2022 2012
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/12/2022 2012
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	09/12/2022 2012
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	09/12/2022 2012
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	09/12/2022 2012
EtFOSA	4.0	U	1	8.0	4.0	2.0	ng/L	09/12/2022 2012
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/12/2022 2012
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	09/12/2022 2012
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	09/12/2022 2012

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		96	50-150
13C2_6:2FTS	M-03	108	50-150
13C2_8:2FTS		85	50-150
13C2_PFDoA		93	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		89	50-150
13C3-HFPO-DA		76	50-150
13C4_PFBA		87	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		95	50-150
13C5_PFPeA		82	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ53675-001
Batch: 53675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/09/2022 0757

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		78	50-150
13C7_PFUdA		87	50-150
13C8_PFOA		94	50-150
13C8_PFOS		88	50-150
13C9_PFNA		99	50-150
d-EtFOSA		64	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		100	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ53675-002
Batch: 53675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/09/2022 0757

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	14		1	92	50-150	09/12/2022 2022
11Cl-PF3OUdS	15	14		1	96	50-150	09/12/2022 2022
8:2 FTS	15	15	M-03	1	96	67-138	09/12/2022 2022
6:2 FTS	15	15		1	99	64-140	09/12/2022 2022
4:2 FTS	15	13		1	87	63-143	09/12/2022 2022
GenX	32	35		1	109	50-150	09/12/2022 2022
ADONA	15	14		1	92	50-150	09/12/2022 2022
EtFOSA	16	19		1	120	50-150	09/12/2022 2022
EtFOSAA	16	15	M-03	1	91	61-135	09/12/2022 2022
MeFOSAA	16	13	M-03	1	80	65-136	09/12/2022 2022
PFBS	14	15		1	106	72-130	09/12/2022 2022
PFDS	15	15		1	96	53-142	09/12/2022 2022
PFHpS	15	15		1	97	69-134	09/12/2022 2022
PFNS	15	16		1	106	69-127	09/12/2022 2022
PFPeS	15	17		1	111	71-127	09/12/2022 2022
PFHxS	15	14		1	97	68-131	09/12/2022 2022
PFBA	16	16		1	101	73-129	09/12/2022 2022
PFDA	16	17		1	105	71-129	09/12/2022 2022
PFDoA	16	16		1	100	72-134	09/12/2022 2022
PFHpA	16	14		1	90	72-130	09/12/2022 2022
PFHxA	16	20		1	128	72-129	09/12/2022 2022
PFNA	16	15		1	96	69-130	09/12/2022 2022
PFOA	16	15		1	94	71-133	09/12/2022 2022
PFPeA	16	15		1	93	72-129	09/12/2022 2022
PFTeDA	16	18		1	113	71-132	09/12/2022 2022
PFTrDA	16	14		1	86	65-144	09/12/2022 2022
PFUdA	16	15		1	96	69-133	09/12/2022 2022
PFOS	15	13		1	89	65-140	09/12/2022 2022

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		105	50-150
13C2_6:2FTS		131	50-150
13C2_8:2FTS		90	50-150
13C2_PFDoA		89	50-150
13C2_PFTeDA		94	50-150
13C3_PFBS		89	50-150
13C3_PFHxS		102	50-150
13C3-HFPO-DA		101	50-150
13C4_PFBA		91	50-150
13C4_PFHpA		103	50-150
13C5_PFHxA		88	50-150
13C5_PFPeA		96	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ53675-002
Batch: 53675
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/09/2022 0757

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		77	50-150
13C7_PFUdA		84	50-150
13C8_PFOA		102	50-150
13C8_PFOS		93	50-150
13C9_PFNA		102	50-150
d-EtFOSA		63	50-150
d5-EtFOSAA		97	50-150
d3-MeFOSAA		106	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

Pace Analytical

PACE ANALYTICAL SERVICES, LLC
106 Vantage Point Drive • West Columbia, SC 29172
Telephone No. 803-791-9700 Fax No. 803-791-9111
www.pacelabs.com

Number 135317

Client: TETRA TECH	Report to Contact	Telephone No. / E-mail: ALOIC.MURPHY@TETRATECH.COM	Quote No.
Address: 1350 N COURTENAY PKWY SUITE F	Sampler's Signature: X	Analysis (Attach list if more space is needed)	Page ___ of ___
City: MERRITT ISLAND	State: FL	Zip Code: 32953	Printed Name: JAN FORESTIER
Project Name: CRCA - NASA			XH16026 KESZ
Project No.	P.O. No.		Remarks / Cooler I.D.

Sample ID / Description (Containers for each sample may be combined on one line.)	Collection Date(s)	Collection Time (Military)	Sample Composition	Matrix: Aqueous	Solid	Non-Aqueous	No of Containers by Preservative Type: Unpres.	H2SO4	HNO3	HCl	NaOH	ASCORBIC	Other	VOC	PFAS
CRCA-EFFLUENT-20220815	15AUG22	1530	G	X						10				X	X
CRCA-INFLUENT-20220815	15AUG22	1535	G	X						10				X	X
~~BLANK~~															

Turn Around Time Required (Prior lab approval required for expedited TAT.): ☒ Standard ☐ Rush (Specify)

Sample Disposal: ☐ Return to Client ☐ Disposal by Lab

Possible Hazard Identification: ☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison ☐ Unknown

QC Requirements (Specify)

	Date	Time		Date	Time
1. Relinquished by	15AUG22	1630	1. Received by: FEDEX	15AUG22	1630
2. Relinquished by	Date	Time	2. Received by	Date	Time
3. Relinquished by	Date	Time	3. Received by	Date	Time
4. Relinquished by: FedEx	8/16/22	1000	4. Laboratory received by	8/16/22	1000

Note: All samples are retained for four weeks from receipt unless other arrangements are made.

LAB USE ONLY
Received on ice (Circle): (Yes) No Ice Pack — Receipt Temp. 1.4 °C — Temp Blank ☒ Y ☐ N

DISTRIBUTION: WHITE & YELLOW-Return to laboratory with Sample(s); PINK Field/Client Copy

Document Number: ME002N2-01

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: KSC / 08/16/2022 Lot #: H16026

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: _____

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

1.9 / 1.9 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? _____
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☑ Yes	☐ No	☐ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼" or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☑ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # _____

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA _____ were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA _____ were received with bubbles >6 mm in diameter.

Samples(s) NA _____ were received with TRC > 0.5 mg/L. (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360

Pace® Analytical Services, LLC

Page 1 of 1

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Alex Murphy

Project Name: CRCA

Project Number: 112G08970

Lot Number:**XI09029**

Date Completed:10/18/2022

10/19/2022 1:37 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.

Case Narrative
Tetra Tech
Lot Number: XI09029

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report.

Sample receipt, sample analysis, and data review have been performed in accordance with the Pace Quality Assurance Management Plan (QAMP), applicable Shealy standard operating procedures (SOPs), the 2003 NELAC standard, and Shealy policies. Additionally, the DoD QSM version 5.3 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the QAMP, SOPs, NELAC standards, the DoD QSM, or policies are qualified on the results page or discussed below.

All QC associated with these samples were compliant with DOD QSM 5.3 table B-15 and our PFAS SOP.

Correction factors (CF) are used to calculate the original sample concentration. The CF is the inverse of the concentration factor (sample volume / extract final volume) times the dilution factor (DF). The CF is calculated as follows:

CF = DF * FV / Vo

FV is volume of extract (mL)
Vo is initial sample volume (mL)
DF is dilution factor. For undiluted analysis, DF = 1.

Sample concentration for aqueous samples:
Concentration (ng/L) = Cs*CF,

$$C_s = \frac{\left(\frac{(A_s x C_{is})}{A_{is}}\right) - B}{M1}$$

Where

C_s is on column concentration of target analyte in the sample (ng/L)
C_{is} is concentration of internal standard in the sample (ng/L)
A_s is peak response of target analyte in the sample
A_{is} is peak response of internal standard in the sample
M1 is the average RF from ICAL or the slope from linear regression ICAL
B is the y-intercept from the ICAL

Pace is a DoD/DOE accredited laboratory; however, the following analyses are currently not listed on our DoD/DOE scope of accreditation: Drinking Water: pH EPA 150.1, Turbidity EPA 18.01, Metals EPA 200.7

& 200.8, Mercury EPA 245.1, Anions EPA 300.0, Cyanide EPA 335.4, Nitrates EPA 353.2, Orthophosphate & Phosphorus EPA 365.1, EDB/DBCP EPA 504.1, HPC SIMPLATE, Color SM 2120 B-2011, Alkalinity SM 2320 B-2011, Specific Conductance SM 2510 B-2011, Residue-filterable (TDS) SM 2540 C, Calcium Hardness (CaCO2) SM 3500-Ca B-2011, TRC SM 4500 Cl G-2011, pH SM 4500 H=B-2011, E.Coli, Total Coliform; Non-Potable Water: Metals EPA 200.7, Strontium EPA 200.8, Chlorate EPA 300.0, Cyanide EPA 335.4, Phenolics EPA 420.4, 2-Methyl-4,6-Dinitrophenol EPA 625.1, Propane RSK-175, Specific Conductance SM 2510 B-2011, Salinity SM250 B, Residue- total SM 2540 B, Sulfite SM 4500 SO32- B-2011, Amenable Cyanide SM 4500-CN- G-2011, BOD & CBOD SM 5210 B, MBAS SM 5540 C-2011; Solid and Chemical Materials: Boron & Titanium SW-846 6010D, Boron, Molybdenum, & Titanium SW-846 6020B, Alcohols & Glycols SW-846 8015C, Pentachlorophenol SW-846 8151A, Ethyl Acetate, Hexane, & n-Hexane SW-846 8260D, SVOC 1,4-Dioxane, 3&4-Methylphenols, 4-Dimethyl aminoazobenzene, 1,4-Naphthoquinone, 3,5-Dinitroaniline, PETN SW-846 8270E, Amenable Cyanide SW-846 9012B; Boron & Titanium SW-846 6010D, Molybdenum SW-846 6020B, Ethylene Glycol SW-846 8015B, Pentachlorophenol SW-846 8151A, Chloroprene SW-846 8260B, SVOC 1,3,5-Trinitrobenzene, 1,4-Dioxane, 1,4-Naphthoquinone, 1,4-Phenylenediamine, 2,5-Dinitrotoluene, 2,6-Dinitrotoluene, 3-Methylcholanthrene, 4- Aminobiphenyl, 4-Dimethyl aminoazobenzene, 4-Nitroquinoline-1-oxide, 7,12- Dimethylbenzo(a)anthracene, Chlorobenzilate, Diallate, Ethyl methanesulfonate, Isodrin, Isosafrole, Methyl methanesulfonate, n-Nitrosomethylethylamine, n-Nitrosomorpholine, n-Nitrosopiperidine, Piperonyl butoxide, Pronamide, Safrole, 3,5-Dinitroaniline, PETN SW-846 8270E, Oil & Grease SW-846 9071B.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Volatiles
Reanalysis of the following samples was performed outside of the analytical holding time: XI09029-001, XI09029-002. Run 1 was analzyed on an instrument that was not calibrated for bromomethane. The continuing calibration verification and laboratory control sample for run 2 failed criteria high for Bromomethane. The samples had no detection for Bromomethane, and all data has been reported.

The LCS associated with batch 55261 had Methyl bromide, Methyl chloride, Vinyl chloride recovered above the acceptance limits. This demonstrates a high bias on analytical results. There were no detections for this compound in the samples associated with this batch; therefore, data quality is not impacted.

Manual Integration Summary

Tetra Tech

Lot Number: XI09029

Project Name: CRCA

Project Number: 112G08970

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
8260D	XI09029-001	1	Acetone	M-03
PFAS by ID SOP	XQ55371-002	1	9-chlorohexadecafluoro-3-oxanone-1-	M-03
PFAS by ID SOP	XQ55371-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	XQ55371-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ55371-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03
PFAS by ID SOP	XQ55371-001	1	d-EtFOSA	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Sample Summary

Tetra Tech

Lot Number: XI09029

Project Name: CRCA

Project Number: 112G08970

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	CRCA-ASEffluent-20220908	Aqueous	09/08/2022 1510	09/09/2022
002	CRCA-ASInfluent-20220908	Aqueous	09/08/2022 1525	09/09/2022

(2 samples)

Detection Summary

Tetra Tech

Lot Number: XI09029

Project Name: CRCA

Project Number: 112G08970

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	CRCA-ASEffluent-20220908	Aqueous	Chloromethane (Methyl	8260D	1.8	J	ug/L	7
001	CRCA-ASEffluent-20220908	Aqueous	PFBA	PFAS by ID	35000	D	ng/L	11
002	CRCA-ASInfluent-20220908	Aqueous	Chloromethane (Methyl	8260D	0.86	J	ug/L	13
002	CRCA-ASInfluent-20220908	Aqueous	Vinyl chloride	8260D	3.8		ug/L	14
002	CRCA-ASInfluent-20220908	Aqueous	PFBA	PFAS by ID	32000	D	ng/L	17

(5 detections)

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XI09029-001

Description: CRCA-ASEffluent-20220908 | Matrix: Aqueous

Date Sampled: 09/08/2022 1510 | Project Name: CRCA

Date Received: 09/09/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	09/21/2022 1733	BBW		54816
2	5030B	8260D	1	09/26/2022 1449	CDA		55261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	UM-03	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	UXL	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.8	J	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech
Laboratory ID: XI09029-001
Description: CRCA-ASEffluent-20220908
Matrix: Aqueous
Date Sampled: 09/08/2022 1510
Project Name: CRCA
Date Received: 09/09/2022
Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	09/21/2022 1733	BBW		54816
2	5030B	8260D	1	09/26/2022 1449	CDA		55261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		99	81-118	H	105	81-118
Bromofluorobenzene		94	85-114	H	92	85-114
Toluene-d8		99	89-112	H	100	89-112
Dibromofluoromethane		98	80-119	H	106	80-119

LOQ = Limit of Quantitation
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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XI09029-001

Description: CRCA-ASEffluent-20220908 | Matrix: Aqueous

Date Sampled: 09/08/2022 1510 | Project Name: CRCA

Date Received: 09/09/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	09/21/2022 1733	BBW		54816
2	5030B	8260D	1	09/26/2022 1449	CDA		55261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	UH	20	10	5.0	ug/L	2
Benzene	71-43-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromodichloromethane	75-27-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromoform	75-25-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	UHL	2.0	0.80	0.40	ug/L	2
2-Butanone (MEK)	78-93-3	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Carbon disulfide	75-15-0	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Carbon tetrachloride	56-23-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chlorobenzene	108-90-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chloroethane	75-00-3	8260D	0.80	UH	2.0	0.80	0.40	ug/L	2
Chloroform	67-66-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chloromethane (Methyl chloride)	74-87-3	8260D	1.3	HJL	2.0	1.0	0.50	ug/L	2
Cyclohexane	110-82-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Dibromochloromethane	124-48-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichlorobenzene	95-50-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,3-Dichlorobenzene	541-73-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,4-Dichlorobenzene	106-46-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Dichlorodifluoromethane	75-71-8	8260D	1.2	UH	2.0	1.2	0.60	ug/L	2
1,1-Dichloroethane	75-34-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichloroethane	107-06-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1-Dichloroethene	75-35-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichloropropane	78-87-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Ethylbenzene	100-41-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
2-Hexanone	591-78-6	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Isopropylbenzene	98-82-8	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Methyl acetate	79-20-9	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
4-Methyl-2-pentanone	108-10-1	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Methylcyclohexane	108-87-2	8260D	0.80	UH	5.0	0.80	0.40	ug/L	2
Methylene chloride	75-09-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Styrene	100-42-5	8260D	0.82	UH	1.0	0.82	0.41	ug/L	2
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Tetrachloroethene	127-18-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Toluene	108-88-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	UH	1.0	0.84	0.42	ug/L	2
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1,1-Trichloroethane	71-55-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XI09029-001

Description: CRCA-ASEffluent-20220908 | Matrix: Aqueous

Date Sampled: 09/08/2022 1510 | Project Name: CRCA

Date Received: 09/09/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	09/21/2022 1733	BBW		54816
2	5030B	8260D	1	09/26/2022 1449	CDA		55261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1,1,2-Trichloroethane	79-00-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Trichloroethene	79-01-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Trichlorofluoromethane	75-69-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Vinyl chloride	75-01-4	8260D	0.80	UHL	1.0	0.80	0.40	ug/L	2
Xylenes (total)	1330-20-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		99	81-118	H	105	81-118
Bromofluorobenzene		94	85-114	H	92	85-114
Toluene-d8		99	89-112	H	100	89-112
Dibromofluoromethane		98	80-119	H	106	80-119

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XI09029-001
Description: CRCA-ASEffluent-20220908 | Matrix: Aqueous
Date Sampled: 09/08/2022 1510 | Project Name: CRCA
Date Received: 09/09/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	100	10/13/2022 1750	BWS	09/27/2022 1314	55371

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	370	U	740	370	180	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	370	U	740	370	180	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	370	U	740	370	180	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	370	U	740	370	180	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	370	U	740	370	180	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	370	U	740	370	180	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	370	U	740	370	180	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	370	U	740	370	180	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	370	U	740	370	180	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	370	U	740	370	180	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	35000	D	370	190	92	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	190	U	370	190	92	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	190	U	370	190	92	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		118	50-150
13C2_6:2FTS		102	50-150
13C2_8:2FTS		112	50-150
13C2_PFDoA		102	50-150
13C2_PFTeDA		97	50-150
13C3_PFBS		107	50-150
13C3_PFHxS		102	50-150
13C3-HFPO-DA		111	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		102	50-150
13C5_PFHxA		108	50-150
13C5_PFPeA		101	50-150
13C6_PFDA		101	50-150
13C7_PFUdA		106	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XI09029-001
Description: CRCA-ASEffluent-20220908
Matrix: Aqueous
Date Sampled: 09/08/2022 1510
Project Name: CRCA
Date Received: 09/09/2022
Project Number: 112G08970

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		100	50-150
13C8_PFOS		103	50-150
13C9_PFNA		102	50-150
d-EtFOSA		111	50-150
d5-EtFOSAA		106	50-150
d3-MeFOSAA		114	50-150

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XI09029-002

Description: CRCA-ASInfluent-20220908 | Matrix: Aqueous

Date Sampled: 09/08/2022 1525 | Project Name: CRCA

Date Received: 09/09/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	09/21/2022 1755	BBW		54816
2	5030B	8260D	1	09/26/2022 1515	CDA		55261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	UXL	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	0.86	J	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XI09029-002

Description: CRCA-ASInfluent-20220908 | Matrix: Aqueous

Date Sampled: 09/08/2022 1525 | Project Name: CRCA

Date Received: 09/09/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	09/21/2022 1755	BBW		54816
2	5030B	8260D	1	09/26/2022 1515	CDA		55261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	3.8		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		97	81-118	H	106	81-118
Bromofluorobenzene		91	85-114	H	94	85-114
Toluene-d8		98	89-112	H	102	89-112
Dibromofluoromethane		97	80-119	H	111	80-119

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XI09029-002

Description: CRCA-ASInfluent-20220908 | Matrix: Aqueous

Date Sampled: 09/08/2022 1525 | Project Name: CRCA

Date Received: 09/09/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	09/21/2022 1755	BBW		54816
2	5030B	8260D	1	09/26/2022 1515	CDA		55261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	UH	20	10	5.0	ug/L	2
Benzene	71-43-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromodichloromethane	75-27-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromoform	75-25-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	UHL	2.0	0.80	0.40	ug/L	2
2-Butanone (MEK)	78-93-3	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Carbon disulfide	75-15-0	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Carbon tetrachloride	56-23-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chlorobenzene	108-90-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chloroethane	75-00-3	8260D	0.80	UH	2.0	0.80	0.40	ug/L	2
Chloroform	67-66-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chloromethane (Methyl chloride)	74-87-3	8260D	1.1	HJL	2.0	1.0	0.50	ug/L	2
Cyclohexane	110-82-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Dibromochloromethane	124-48-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichlorobenzene	95-50-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,3-Dichlorobenzene	541-73-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,4-Dichlorobenzene	106-46-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Dichlorodifluoromethane	75-71-8	8260D	1.2	UH	2.0	1.2	0.60	ug/L	2
1,1-Dichloroethane	75-34-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichloroethane	107-06-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1-Dichloroethene	75-35-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichloropropane	78-87-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Ethylbenzene	100-41-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
2-Hexanone	591-78-6	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Isopropylbenzene	98-82-8	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Methyl acetate	79-20-9	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
4-Methyl-2-pentanone	108-10-1	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Methylcyclohexane	108-87-2	8260D	0.80	UH	5.0	0.80	0.40	ug/L	2
Methylene chloride	75-09-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Styrene	100-42-5	8260D	0.82	UH	1.0	0.82	0.41	ug/L	2
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Tetrachloroethene	127-18-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Toluene	108-88-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	UH	1.0	0.84	0.42	ug/L	2
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1,1-Trichloroethane	71-55-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XI09029-002

Description: CRCA-ASInfluent-20220908 | Matrix: Aqueous

Date Sampled: 09/08/2022 1525 | Project Name: CRCA

Date Received: 09/09/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	09/21/2022 1755	BBW		54816
2	5030B	8260D	1	09/26/2022 1515	CDA		55261

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1,1,2-Trichloroethane	79-00-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Trichloroethene	79-01-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Trichlorofluoromethane	75-69-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Vinyl chloride	75-01-4	8260D	3.9	HL	1.0	0.80	0.40	ug/L	2
Xylenes (total)	1330-20-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		97	81-118	H	106	81-118
Bromofluorobenzene		91	85-114	H	94	85-114
Toluene-d8		98	89-112	H	102	89-112
Dibromofluoromethane		97	80-119	H	111	80-119

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XI09029-002
Description: CRCA-ASInfluent-20220908 | Matrix: Aqueous
Date Sampled: 09/08/2022 1525 | Project Name: CRCA
Date Received: 09/09/2022 | Project Number: 112G08970

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	100	10/13/2022 1801	BWS	09/27/2022 1314	55371

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	380	U	760	380	190	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	380	U	760	380	190	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	380	U	760	380	190	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	380	U	760	380	190	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	380	U	760	380	190	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	380	U	760	380	190	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	380	U	760	380	190	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	380	U	760	380	190	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	380	U	760	380	190	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	380	U	760	380	190	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	32000	D	380	190	95	ng/L	1
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	190	U	380	190	95	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	190	U	380	190	95	ng/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C2_4:2FTS		129	50-150
13C2_6:2FTS		113	50-150
13C2_8:2FTS		125	50-150
13C2_PFDoA		111	50-150
13C2_PFTeDA		109	50-150
13C3_PFBS		118	50-150
13C3_PFHxS		110	50-150
13C3-HFPO-DA		127	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		111	50-150
13C5_PFHxA		115	50-150
13C5_PFPeA		113	50-150
13C6_PFDA		113	50-150
13C7_PFUdA		110	50-150

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XI09029-002
Description: CRCA-ASInfluent-20220908
Matrix: Aqueous
Date Sampled: 09/08/2022 1525
Project Name: CRCA
Date Received: 09/09/2022
Project Number: 112G08970

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
13C8_PFOA		109	50-150
13C8_PFOS		110	50-150
13C9_PFNA		107	50-150
d-EtFOSA		123	50-150
d5-EtFOSAA		121	50-150
d3-MeFOSAA		128	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
H = Out of holding time
B = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
J = Estimated result < LOQ and ≥ DL
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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QC Summary

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ54816-001
Batch: 54816
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	09/21/2022 1108
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	09/21/2022 0000
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	09/21/2022 1108
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	09/21/2022 1108
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	09/21/2022 1108
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	09/21/2022 1108
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	09/21/2022 1108
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	09/21/2022 1108
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	09/21/2022 1108
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	09/21/2022 1108
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	09/21/2022 1108
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ54816-001
Batch: 54816
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	09/21/2022 1108

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		98	81-118
Bromofluorobenzene		93	85-114
Toluene-d8		97	89-112
Dibromofluoromethane		98	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ54816-002
Batch: 54816
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	110		1	109	39-160	09/21/2022 0912
Benzene	50	46		1	92	79-120	09/21/2022 0912
Bromodichloromethane	50	49		1	97	79-125	09/21/2022 0912
Bromoform	50	44		1	89	66-130	09/21/2022 0912
Bromomethane (Methyl bromide)	50	ND	N	1	0.00	53-141	09/21/2022 0000
2-Butanone (MEK)	100	96		1	96	56-143	09/21/2022 0912
Carbon disulfide	50	44		1	89	64-133	09/21/2022 0912
Carbon tetrachloride	50	46		1	92	72-136	09/21/2022 0912
Chlorobenzene	50	48		1	95	82-118	09/21/2022 0912
Chloroethane	50	51		1	101	60-138	09/21/2022 0912
Chloroform	50	46		1	92	79-124	09/21/2022 0912
Chloromethane (Methyl chloride)	50	43		1	86	50-139	09/21/2022 0912
Cyclohexane	50	44		1	89	71-130	09/21/2022 0912
1,2-Dibromo-3-chloropropane (DBCP)	50	51		1	102	62-128	09/21/2022 0912
Dibromochloromethane	50	44		1	89	74-126	09/21/2022 0912
1,2-Dibromoethane (EDB)	50	50		1	99	77-121	09/21/2022 0912
1,2-Dichlorobenzene	50	48		1	96	80-119	09/21/2022 0912
1,3-Dichlorobenzene	50	48		1	96	80-119	09/21/2022 0912
1,4-Dichlorobenzene	50	48		1	96	79-118	09/21/2022 0912
Dichlorodifluoromethane	50	43		1	85	32-152	09/21/2022 0912
1,1-Dichloroethane	50	43		1	87	77-125	09/21/2022 0912
1,2-Dichloroethane	50	48		1	96	73-128	09/21/2022 0912
1,1-Dichloroethene	50	46		1	93	71-131	09/21/2022 0912
cis-1,2-Dichloroethene	50	46		1	91	78-123	09/21/2022 0912
trans-1,2-Dichloroethene	50	44		1	89	75-124	09/21/2022 0912
1,2-Dichloropropane	50	46		1	93	78-122	09/21/2022 0912
cis-1,3-Dichloropropene	50	49		1	99	75-124	09/21/2022 0912
trans-1,3-Dichloropropene	50	47		1	94	73-127	09/21/2022 0912
Ethylbenzene	50	47		1	94	79-121	09/21/2022 0912
2-Hexanone	100	100		1	100	57-139	09/21/2022 0912
Isopropylbenzene	50	47		1	95	72-131	09/21/2022 0912
Methyl acetate	50	49		1	99	56-136	09/21/2022 0912
Methyl tertiary butyl ether (MTBE)	50	47		1	94	71-124	09/21/2022 0912
4-Methyl-2-pentanone	100	99		1	99	67-130	09/21/2022 0912
Methylcyclohexane	50	44		1	88	72-132	09/21/2022 0912
Methylene chloride	50	46		1	91	74-124	09/21/2022 0912
Styrene	50	51		1	101	78-123	09/21/2022 0912
1,1,2,2-Tetrachloroethane	50	52		1	103	71-121	09/21/2022 0912
Tetrachloroethene	50	46		1	92	74-129	09/21/2022 0912
Toluene	50	48		1	97	80-121	09/21/2022 0912
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	40		1	81	70-136	09/21/2022 0912
1,2,4-Trichlorobenzene	50	46		1	92	69-130	09/21/2022 0912
1,1,1-Trichloroethane	50	46		1	91	74-131	09/21/2022 0912
1,1,2-Trichloroethane	50	50		1	101	80-119	09/21/2022 0912

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ54816-002
Batch: 54816
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	46		1	92	79-123	09/21/2022 0912
Trichlorofluoromethane	50	48		1	96	65-141	09/21/2022 0912
Vinyl chloride	50	48		1	96	58-137	09/21/2022 0912
Xylenes (total)	100	96		1	96	79-121	09/21/2022 0912

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		97	81-118
Bromofluorobenzene		98	85-114
Toluene-d8		97	89-112
Dibromofluoromethane		96	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ55261-001
Batch: 55261
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	09/26/2022 1147
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	09/26/2022 1147
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	09/26/2022 1147
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	09/26/2022 1147
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	09/26/2022 1147
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	09/26/2022 1147
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	09/26/2022 1147
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	09/26/2022 1147
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	09/26/2022 1147
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	09/26/2022 1147
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	09/26/2022 1147
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ55261-001
Batch: 55261
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	09/26/2022 1147

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		109	81-118
Bromofluorobenzene		92	85-114
Toluene-d8		99	89-112
Dibromofluoromethane		109	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ55261-002
Batch: 55261
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	120		1	122	39-160	09/26/2022 1027
Benzene	50	53		1	107	79-120	09/26/2022 1027
Bromodichloromethane	50	51		1	102	79-125	09/26/2022 1027
Bromoform	50	48		1	95	66-130	09/26/2022 1027
Bromomethane (Methyl bromide)	50	88	N	1	177	53-141	09/26/2022 1027
2-Butanone (MEK)	100	97		1	97	56-143	09/26/2022 1027
Carbon disulfide	50	49		1	99	64-133	09/26/2022 1027
Carbon tetrachloride	50	51		1	102	72-136	09/26/2022 1027
Chlorobenzene	50	48		1	96	82-118	09/26/2022 1027
Chloroethane	50	64		1	129	60-138	09/26/2022 1027
Chloroform	50	52		1	104	79-124	09/26/2022 1027
Chloromethane (Methyl chloride)	50	75	N	1	150	50-139	09/26/2022 1027
Cyclohexane	50	53		1	106	71-130	09/26/2022 1027
1,2-Dibromo-3-chloropropane (DBCP)	50	48		1	97	62-128	09/26/2022 1027
Dibromochloromethane	50	49		1	97	74-126	09/26/2022 1027
1,2-Dibromoethane (EDB)	50	48		1	96	77-121	09/26/2022 1027
1,2-Dichlorobenzene	50	49		1	98	80-119	09/26/2022 1027
1,3-Dichlorobenzene	50	49		1	97	80-119	09/26/2022 1027
1,4-Dichlorobenzene	50	48		1	96	79-118	09/26/2022 1027
Dichlorodifluoromethane	50	60		1	121	32-152	09/26/2022 1027
1,1-Dichloroethane	50	55		1	109	77-125	09/26/2022 1027
1,2-Dichloroethane	50	50		1	101	73-128	09/26/2022 1027
1,1-Dichloroethene	50	50		1	100	71-131	09/26/2022 1027
cis-1,2-Dichloroethene	50	55		1	109	78-123	09/26/2022 1027
trans-1,2-Dichloroethene	50	53		1	107	75-124	09/26/2022 1027
1,2-Dichloropropane	50	53		1	107	78-122	09/26/2022 1027
cis-1,3-Dichloropropene	50	54		1	108	75-124	09/26/2022 1027
trans-1,3-Dichloropropene	50	50		1	100	73-127	09/26/2022 1027
Ethylbenzene	50	48		1	95	79-121	09/26/2022 1027
2-Hexanone	100	120		1	116	57-139	09/26/2022 1027
Isopropylbenzene	50	49		1	97	72-131	09/26/2022 1027
Methyl acetate	50	64		1	128	56-136	09/26/2022 1027
Methyl tertiary butyl ether (MTBE)	50	54		1	108	71-124	09/26/2022 1027
4-Methyl-2-pentanone	100	110		1	111	67-130	09/26/2022 1027
Methylcyclohexane	50	49		1	98	72-132	09/26/2022 1027
Methylene chloride	50	55		1	111	74-124	09/26/2022 1027
Styrene	50	48		1	96	78-123	09/26/2022 1027
1,1,2,2-Tetrachloroethane	50	53		1	107	71-121	09/26/2022 1027
Tetrachloroethene	50	49		1	98	74-129	09/26/2022 1027
Toluene	50	50		1	99	80-121	09/26/2022 1027
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	53		1	106	70-136	09/26/2022 1027
1,2,4-Trichlorobenzene	50	47		1	95	69-130	09/26/2022 1027
1,1,1-Trichloroethane	50	50		1	101	74-131	09/26/2022 1027
1,1,2-Trichloroethane	50	49		1	98	80-119	09/26/2022 1027

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ55261-002
Batch: 55261
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	47		1	94	79-123	09/26/2022 1027
Trichlorofluoromethane	50	58		1	117	65-141	09/26/2022 1027
Vinyl chloride	50	85	N	1	170	58-137	09/26/2022 1027
Xylenes (total)	100	93		1	93	79-121	09/26/2022 1027

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		106	81-118
Bromofluorobenzene		100	85-114
Toluene-d8		102	89-112
Dibromofluoromethane		104	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ55371-001
Batch: 55371
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/27/2022 1314

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	10/13/2022 1559
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	10/13/2022 1559
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	10/13/2022 1559
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	10/13/2022 1559
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	10/13/2022 1559
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	10/13/2022 1559
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	10/13/2022 1559
EtFOSA	4.0	U	1	8.0	4.0	2.0	ng/L	10/13/2022 1559
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	10/13/2022 1559
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	10/13/2022 1559
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	10/13/2022 1559

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		103	50-150
13C2_6:2FTS		113	50-150
13C2_8:2FTS		105	50-150
13C2_PFDoA		92	50-150
13C2_PFTeDA		89	50-150
13C3_PFBS		98	50-150
13C3_PFHxS		90	50-150
13C3-HFPO-DA		103	50-150
13C4_PFBA		95	50-150
13C4_PFHpA		96	50-150
13C5_PFHxA		98	50-150
13C5_PFPeA		96	50-150

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P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ55371-001
Batch: 55371
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/27/2022 1314

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		92	50-150
13C7_PFUdA		92	50-150
13C8_PFOA		93	50-150
13C8_PFOS		94	50-150
13C9_PFNA		92	50-150
d-EtFOSA	M-03	80	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		100	50-150

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P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ55371-002
Batch: 55371
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/27/2022 1314

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16	M-03	1	109	50-150	10/13/2022 1610
11Cl-PF3OUdS	15	15		1	98	50-150	10/13/2022 1610
8:2 FTS	15	17		1	109	67-138	10/13/2022 1610
6:2 FTS	15	15		1	102	64-140	10/13/2022 1610
4:2 FTS	15	16		1	110	63-143	10/13/2022 1610
GenX	32	38		1	119	50-150	10/13/2022 1610
ADONA	15	17		1	116	50-150	10/13/2022 1610
EtFOSA	16	18		1	109	50-150	10/13/2022 1610
EtFOSAA	16	16	M-03	1	102	61-135	10/13/2022 1610
MeFOSAA	16	16	M-03	1	100	65-136	10/13/2022 1610
PFBS	14	15		1	107	72-130	10/13/2022 1610
PFDS	15	14		1	94	53-142	10/13/2022 1610
PFHpS	15	17		1	111	69-134	10/13/2022 1610
PFNS	15	16		1	101	69-127	10/13/2022 1610
PFPeS	15	16		1	104	71-127	10/13/2022 1610
PFHxS	15	15		1	103	68-131	10/13/2022 1610
PFBA	16	17		1	106	73-129	10/13/2022 1610
PFDA	16	17		1	107	71-129	10/13/2022 1610
PFDoA	16	18		1	110	72-134	10/13/2022 1610
PFHpA	16	17		1	106	72-130	10/13/2022 1610
PFHxA	16	17		1	107	72-129	10/13/2022 1610
PFNA	16	17		1	108	69-130	10/13/2022 1610
PFOA	16	16		1	101	71-133	10/13/2022 1610
PFPeA	16	17		1	107	72-129	10/13/2022 1610
PFTeDA	16	17		1	108	71-132	10/13/2022 1610
PFTrDA	16	16		1	103	65-144	10/13/2022 1610
PFUdA	16	17		1	106	69-133	10/13/2022 1610
PFOS	15	15	M-03	1	103	65-140	10/13/2022 1610

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		105	50-150
13C2_6:2FTS		119	50-150
13C2_8:2FTS		95	50-150
13C2_PFDoA		88	50-150
13C2_PFTeDA		87	50-150
13C3_PFBS		94	50-150
13C3_PFHxS		88	50-150
13C3-HFPO-DA		96	50-150
13C4_PFBA		92	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		93	50-150
13C5_PFPeA		92	50-150

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PFAS by LC/MS/MS - LCS

Sample ID: XQ55371-002
Batch: 55371
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 09/27/2022 1314

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		90	50-150
13C7_PFUdA		90	50-150
13C8_PFOA		92	50-150
13C8_PFOS		93	50-150
13C9_PFNA		90	50-150
d-EtFOSA		75	50-150
d5-EtFOSAA		99	50-150
d3-MeFOSAA		99	50-150

LOQ = Limit of Quantitation
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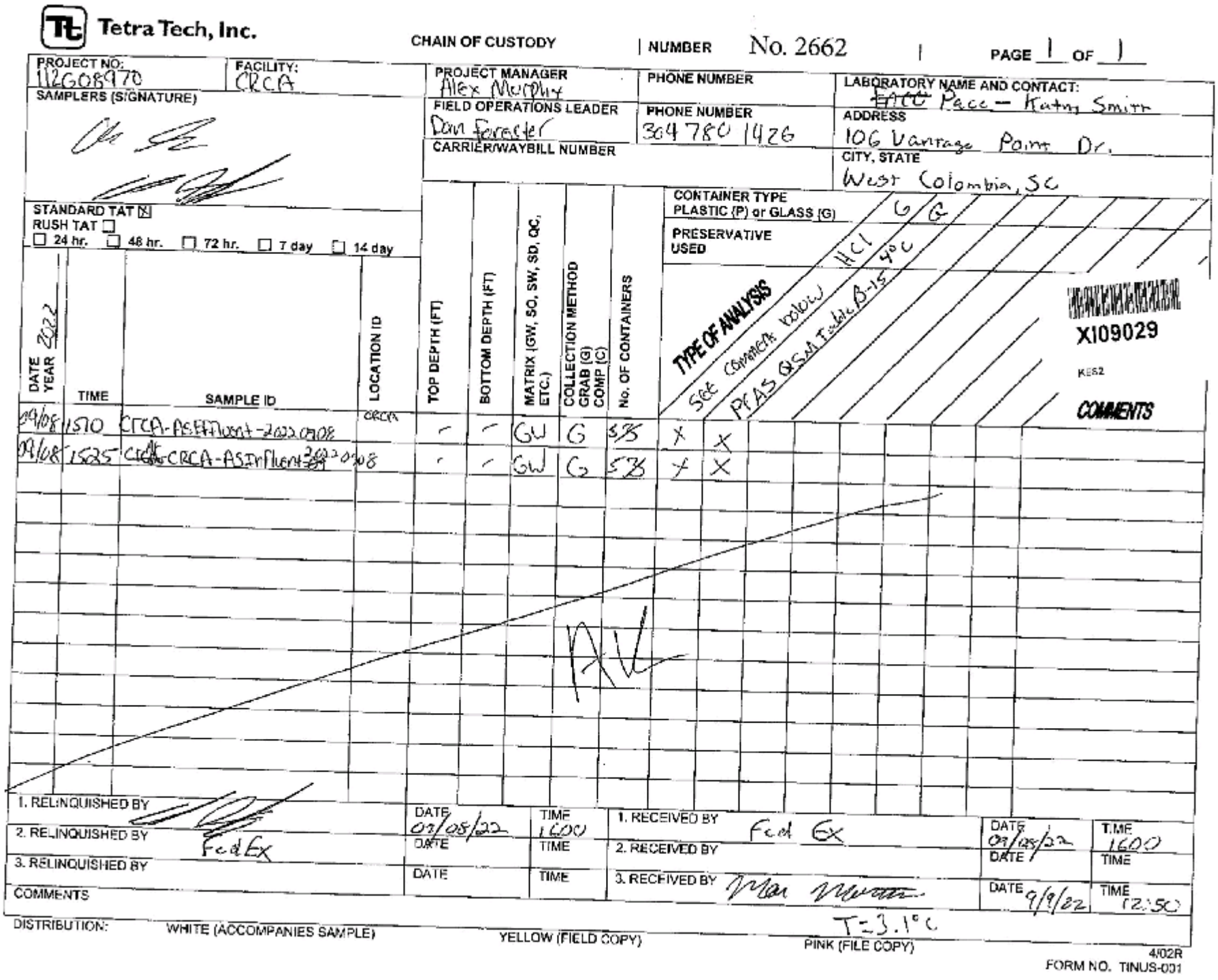
Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents



Tetra Tech, Inc.

CHAIN OF CUSTODY | NUMBER No. 2662 | PAGE 1 OF 1

PROJECT NO: 112G08970 | FACILITY: CRCA

SAMPLERS (SIGNATURE)

PROJECT MANAGER: Alex Murphy | PHONE NUMBER

FIELD OPERATIONS LEADER: Dan Forrester | PHONE NUMBER: 304 780 1426

CARRIER/WAYBILL NUMBER

LABORATORY NAME AND CONTACT: Pace – Kathy Smith

ADDRESS: 106 Vantage Point Dr.

CITY, STATE: West Columbia, SC

STANDARD TAT ☒
RUSH TAT ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2022	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS: See Comment Below: PFAS QSM Table B-15	HCl 4°C	COMMENTS
09/08	1510	CRCA-Effluent-20220908	CRCA	-	-	GW	G	5 3	G		X	X	
09/08	1525	CRCA-Influent-20220908		-	-	GW	G	5 3	G		X	X	

XI09029

KES2

1. RELINQUISHED BY		DATE 09/08/22	TIME 1600	1. RECEIVED BY Fed Ex		DATE 09/08/22	TIME 1600
2. RELINQUISHED BY Fed Ex		DATE	TIME	2. RECEIVED BY		DATE	TIME
3. RELINQUISHED BY		DATE	TIME	3. RECEIVED BY		DATE 9/9/22	TIME 12:50

COMMENTS: T=3.1°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TINUS-001

PACE ANALYTICAL SERVICES, LLC

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: MKM2 / 09/09/2022 Lot #: XI09029

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt: 3.1 / 3.1 °C %Solid Snap-Cup ID: NA

NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☑ Yes	☐ No	☐ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☐ Yes	☑ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote #

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H2SO4, HNO3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) NA were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is ***no***) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

ANALYTICAL REPORT

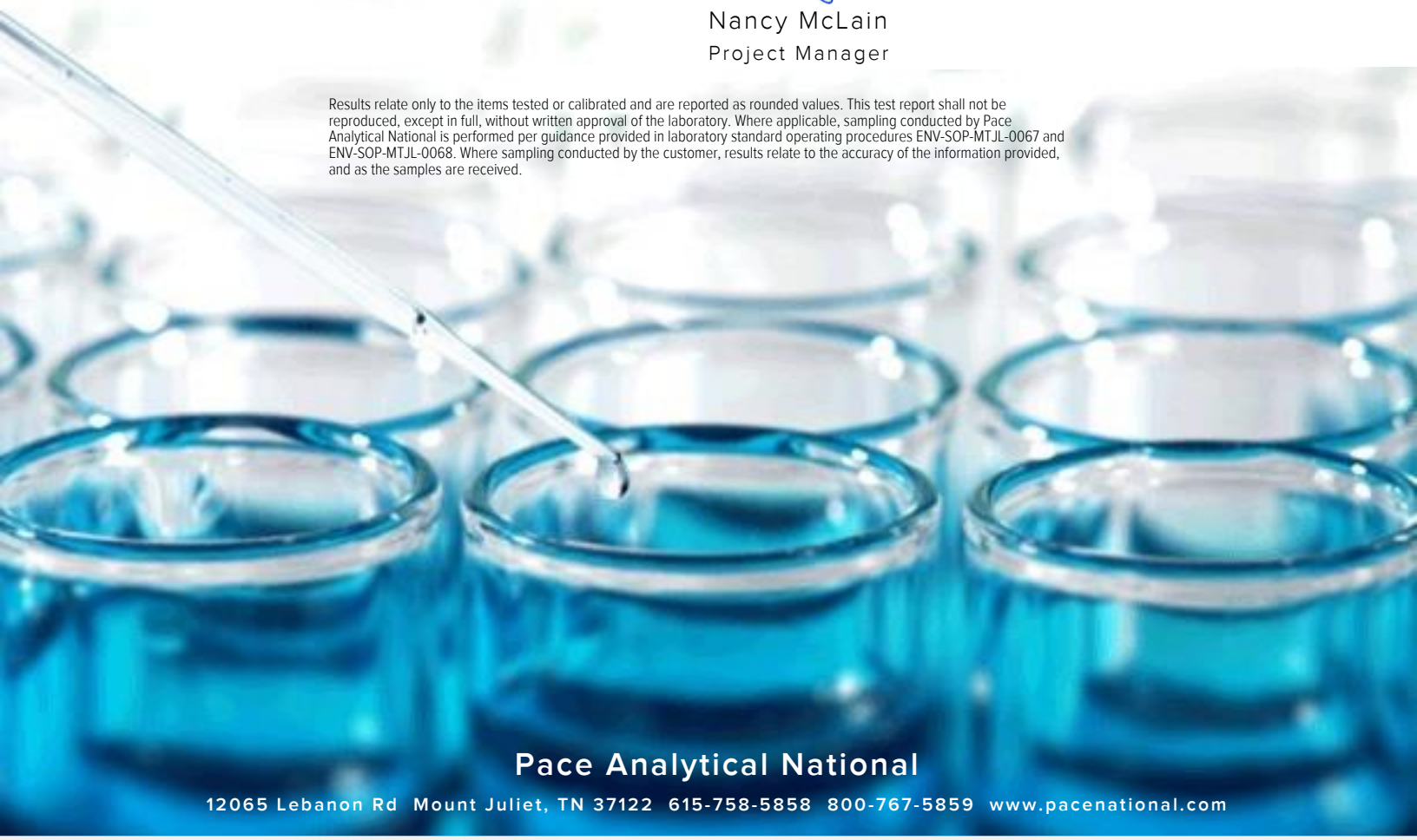
November 07, 2022

Pace Analytical - West Columbia, SC

Sample Delivery Group:	L1551591
Samples Received:	10/28/2022
Project Number:	XJ31007
Description:	NASA CRCA
Site:	001
Report To:	Kathy Smith 106 Vantage Point Dr. West Columbia, SC 29172

Entire Report Reviewed By:

Nancy McLain
Project Manager



Pace Analytical National
12065 Lebanon Rd Mount Juliet, TN 37122 615-758-5858 800-767-5859 www.pacenational.com

TABLE OF CONTENTS

CRCA-AMB01-20221027 L1551591-01 Air

Collected by: Cory O'Brien | Collected date/time: 10/27/22 17:10 | Received date/time: 10/28/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1952319	1	11/01/22 11:48	11/01/22 11:48	FKG	Mt. Juliet, TN

CRCA-VMP01-20221027 L1551591-02 Air

Collected by: Cory O'Brien | Collected date/time: 10/27/22 11:16 | Received date/time: 10/28/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1952319	1	11/01/22 12:17	11/01/22 12:17	FKG	Mt. Juliet, TN

CRCA-VMP02-20221027 L1551591-03 Air

Collected by: Cory O'Brien | Collected date/time: 10/27/22 11:20 | Received date/time: 10/28/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1952319	1	11/01/22 12:46	11/01/22 12:46	FKG	Mt. Juliet, TN

CRCA-VMP03-20221027 L1551591-04 Air

Collected by: Cory O'Brien | Collected date/time: 10/27/22 11:25 | Received date/time: 10/28/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1952319	1	11/01/22 13:15	11/01/22 13:15	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1953072	10	11/02/22 13:22	11/02/22 13:22	DBB	Mt. Juliet, TN

CRCA-VMP04-20221027 L1551591-05 Air

Collected by: Cory O'Brien | Collected date/time: 10/27/22 11:30 | Received date/time: 10/28/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1952319	1	11/01/22 13:44	11/01/22 13:44	FKG	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1953072	10	11/02/22 14:04	11/02/22 14:04	DBB	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Nancy McLain
Project Manager

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	6.91		1.39	2.85	5.70	1	11/01/2022 11:48	WG1952319
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	11/01/2022 11:48	WG1952319
Benzene	71-43-2	0.706	J	0.228	0.479	0.958	1	11/01/2022 11:48	WG1952319
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	11/01/2022 11:48	WG1952319
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	11/01/2022 11:48	WG1952319
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	11/01/2022 11:48	WG1952319
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	11/01/2022 11:48	WG1952319
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	11/01/2022 11:48	WG1952319
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	11/01/2022 11:48	WG1952319
Carbon tetrachloride	56-23-5	0.945	U	0.461	0.945	1.89	1	11/01/2022 11:48	WG1952319
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	11/01/2022 11:48	WG1952319
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	11/01/2022 11:48	WG1952319
Chloroform	67-66-3	0.730	U	0.349	0.730	1.46	1	11/01/2022 11:48	WG1952319
Chloromethane	74-87-3	1.25		0.213	0.516	1.03	1	11/01/2022 11:48	WG1952319
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	11/01/2022 11:48	WG1952319
Cyclohexane	110-82-7	0.281	J	0.259	0.689	1.38	1	11/01/2022 11:48	WG1952319
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	11/01/2022 11:48	WG1952319
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	11/01/2022 11:48	WG1952319
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	11/01/2022 11:48	WG1952319
1,3-Dichlorobenzene	541-73-1	2.40	U	1.09	2.40	4.81	1	11/01/2022 11:48	WG1952319
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	11/01/2022 11:48	WG1952319
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	11/01/2022 11:48	WG1952319
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	11/01/2022 11:48	WG1952319
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	11/01/2022 11:48	WG1952319
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	11/01/2022 11:48	WG1952319
trans-1,2-Dichloroethene	156-60-5	9.39		0.267	0.594	1.19	1	11/01/2022 11:48	WG1952319
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	11/01/2022 11:48	WG1952319
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	11/01/2022 11:48	WG1952319
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	11/01/2022 11:48	WG1952319
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	11/01/2022 11:48	WG1952319
Ethanol	64-17-5	7.54	B	0.500	1.19	2.45	1	11/01/2022 11:48	WG1952319
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	11/01/2022 11:48	WG1952319
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	11/01/2022 11:48	WG1952319
Trichlorofluoromethane	75-69-4	1.13	J	0.460	0.983	1.97	1	11/01/2022 11:48	WG1952319
Dichlorodifluoromethane	75-71-8	2.16	J	0.678	1.48	2.97	1	11/01/2022 11:48	WG1952319
1,1,2-Trichlorotrifluoroethane	76-13-1	1.53	U	0.608	1.53	3.07	1	11/01/2022 11:48	WG1952319
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	11/01/2022 11:48	WG1952319
Heptane	142-82-5	1.02	U	0.425	1.02	2.04	1	11/01/2022 11:48	WG1952319
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	11/01/2022 11:48	WG1952319
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	11/01/2022 11:48	WG1952319
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	11/01/2022 11:48	WG1952319
Methylene Chloride	75-09-2	0.694	J	0.340	0.694	1.39	1	11/01/2022 11:48	WG1952319
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	11/01/2022 11:48	WG1952319
2-Butanone (MEK)	78-93-3	1.03	J	0.240	0.560	3.69	1	11/01/2022 11:48	WG1952319
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	11/01/2022 11:48	WG1952319
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	11/01/2022 11:48	WG1952319
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	11/01/2022 11:48	WG1952319
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	11/01/2022 11:48	WG1952319
2-Propanol	67-63-0	4.33		0.649	1.54	3.07	1	11/01/2022 11:48	WG1952319
Propene	115-07-1	0.837	B J	0.160	1.08	2.15	1	11/01/2022 11:48	WG1952319
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	11/01/2022 11:48	WG1952319
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	11/01/2022 11:48	WG1952319
Tetrachloroethylene	127-18-4	1.36	U	0.553	1.36	2.72	1	11/01/2022 11:48	WG1952319
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	11/01/2022 11:48	WG1952319
Toluene	108-88-3	1.33	J	0.328	0.942	1.88	1	11/01/2022 11:48	WG1952319
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	11/01/2022 11:48	WG1952319

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	11/01/2022 11:48	WG1952319
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	11/01/2022 11:48	WG1952319
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	11/01/2022 11:48	WG1952319
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	11/01/2022 11:48	WG1952319
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	11/01/2022 11:48	WG1952319
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	11/01/2022 11:48	WG1952319
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	11/01/2022 11:48	WG1952319
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	11/01/2022 11:48	WG1952319
Vinyl acetate	108-05-4	0.729	J	0.408	0.880	1.76	1	11/01/2022 11:48	WG1952319
m&p-Xylene	1330-20-7	1.30	U	0.585	1.30	2.60	1	11/01/2022 11:48	WG1952319
o-Xylene	95-47-6	0.759	U	0.359	0.759	1.52	1	11/01/2022 11:48	WG1952319
(S) 1,4-Bromofluorobenzene	*460-00-4*	*99.1*					*60.0-140*	*11/01/2022 11:48*	WG1952319

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	8.44		1.39	2.85	5.70	1	11/01/2022 12:17	WG1952319
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	11/01/2022 12:17	WG1952319
Benzene	71-43-2	0.479	U	0.228	0.479	0.958	1	11/01/2022 12:17	WG1952319
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	11/01/2022 12:17	WG1952319
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	11/01/2022 12:17	WG1952319
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	11/01/2022 12:17	WG1952319
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	11/01/2022 12:17	WG1952319
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	11/01/2022 12:17	WG1952319
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	11/01/2022 12:17	WG1952319
Carbon tetrachloride	56-23-5	0.945	U	0.461	0.945	1.89	1	11/01/2022 12:17	WG1952319
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	11/01/2022 12:17	WG1952319
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	11/01/2022 12:17	WG1952319
Chloroform	67-66-3	2.78		0.349	0.730	1.46	1	11/01/2022 12:17	WG1952319
Chloromethane	74-87-3	0.516	U	0.213	0.516	1.03	1	11/01/2022 12:17	WG1952319
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	11/01/2022 12:17	WG1952319
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	11/01/2022 12:17	WG1952319
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	11/01/2022 12:17	WG1952319
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	11/01/2022 12:17	WG1952319
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	11/01/2022 12:17	WG1952319
1,3-Dichlorobenzene	541-73-1	7.76		1.09	2.40	4.81	1	11/01/2022 12:17	WG1952319
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	11/01/2022 12:17	WG1952319
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	11/01/2022 12:17	WG1952319
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	11/01/2022 12:17	WG1952319
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	11/01/2022 12:17	WG1952319
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	11/01/2022 12:17	WG1952319
trans-1,2-Dichloroethene	156-60-5	1.07	J	0.267	0.594	1.19	1	11/01/2022 12:17	WG1952319
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	11/01/2022 12:17	WG1952319
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	11/01/2022 12:17	WG1952319
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	11/01/2022 12:17	WG1952319
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	11/01/2022 12:17	WG1952319
Ethanol	64-17-5	29.4		0.500	1.19	2.45	1	11/01/2022 12:17	WG1952319
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	11/01/2022 12:17	WG1952319
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	11/01/2022 12:17	WG1952319
Trichlorofluoromethane	75-69-4	2.71		0.460	0.983	1.97	1	11/01/2022 12:17	WG1952319
Dichlorodifluoromethane	75-71-8	2.13	J	0.678	1.48	2.97	1	11/01/2022 12:17	WG1952319
1,1,2-Trichlorotrifluoroethane	76-13-1	15.0		0.608	1.53	3.07	1	11/01/2022 12:17	WG1952319
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	11/01/2022 12:17	WG1952319
Heptane	142-82-5	1.02	U	0.425	1.02	2.04	1	11/01/2022 12:17	WG1952319
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	11/01/2022 12:17	WG1952319
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	11/01/2022 12:17	WG1952319
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	11/01/2022 12:17	WG1952319
Methylene Chloride	75-09-2	0.642	J	0.340	0.694	1.39	1	11/01/2022 12:17	WG1952319
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	11/01/2022 12:17	WG1952319
2-Butanone (MEK)	78-93-3	0.734	J	0.240	0.560	3.69	1	11/01/2022 12:17	WG1952319
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	11/01/2022 12:17	WG1952319
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	11/01/2022 12:17	WG1952319
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	11/01/2022 12:17	WG1952319
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	11/01/2022 12:17	WG1952319
2-Propanol	67-63-0	51.6		0.649	1.54	3.07	1	11/01/2022 12:17	WG1952319
Propene	115-07-1	1.08	U	0.160	1.08	2.15	1	11/01/2022 12:17	WG1952319
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	11/01/2022 12:17	WG1952319
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	11/01/2022 12:17	WG1952319
Tetrachloroethylene	127-18-4	1.36	U	0.553	1.36	2.72	1	11/01/2022 12:17	WG1952319
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	11/01/2022 12:17	WG1952319
Toluene	108-88-3	0.746	J	0.328	0.942	1.88	1	11/01/2022 12:17	WG1952319
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	11/01/2022 12:17	WG1952319

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	11/01/2022 12:17	WG1952319
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	11/01/2022 12:17	WG1952319
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	11/01/2022 12:17	WG1952319
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	11/01/2022 12:17	WG1952319
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	11/01/2022 12:17	WG1952319
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	11/01/2022 12:17	WG1952319
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	11/01/2022 12:17	WG1952319
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	11/01/2022 12:17	WG1952319
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	11/01/2022 12:17	WG1952319
m&p-Xylene	1330-20-7	0.607	J	0.585	1.30	2.60	1	11/01/2022 12:17	WG1952319
o-Xylene	95-47-6	0.759	U	0.359	0.759	1.52	1	11/01/2022 12:17	WG1952319
(S) 1,4-Bromofluorobenzene	*460-00-4*	*99.3*					*60.0-140*	*11/01/2022 12:17*	WG1952319

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	11.4		1.39	2.85	5.70	1	11/01/2022 12:46	WG1952319
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	11/01/2022 12:46	WG1952319
Benzene	71-43-2	0.479	U	0.228	0.479	0.958	1	11/01/2022 12:46	WG1952319
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	11/01/2022 12:46	WG1952319
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	11/01/2022 12:46	WG1952319
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	11/01/2022 12:46	WG1952319
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	11/01/2022 12:46	WG1952319
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	11/01/2022 12:46	WG1952319
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	11/01/2022 12:46	WG1952319
Carbon tetrachloride	56-23-5	0.945	U	0.461	0.945	1.89	1	11/01/2022 12:46	WG1952319
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	11/01/2022 12:46	WG1952319
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	11/01/2022 12:46	WG1952319
Chloroform	67-66-3	0.823	J	0.349	0.730	1.46	1	11/01/2022 12:46	WG1952319
Chloromethane	74-87-3	0.516	U	0.213	0.516	1.03	1	11/01/2022 12:46	WG1952319
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	11/01/2022 12:46	WG1952319
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	11/01/2022 12:46	WG1952319
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	11/01/2022 12:46	WG1952319
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	11/01/2022 12:46	WG1952319
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	11/01/2022 12:46	WG1952319
1,3-Dichlorobenzene	541-73-1	4.60	J	1.09	2.40	4.81	1	11/01/2022 12:46	WG1952319
1,4-Dichlorobenzene	106-46-7	2.78		0.335	0.782	1.80	1	11/01/2022 12:46	WG1952319
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	11/01/2022 12:46	WG1952319
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	11/01/2022 12:46	WG1952319
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	11/01/2022 12:46	WG1952319
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	11/01/2022 12:46	WG1952319
trans-1,2-Dichloroethene	156-60-5	7.25		0.267	0.594	1.19	1	11/01/2022 12:46	WG1952319
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	11/01/2022 12:46	WG1952319
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	11/01/2022 12:46	WG1952319
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	11/01/2022 12:46	WG1952319
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	11/01/2022 12:46	WG1952319
Ethanol	64-17-5	1.19	U	0.500	1.19	2.45	1	11/01/2022 12:46	WG1952319
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	11/01/2022 12:46	WG1952319
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	11/01/2022 12:46	WG1952319
Trichlorofluoromethane	75-69-4	0.747	J	0.460	0.983	1.97	1	11/01/2022 12:46	WG1952319
Dichlorodifluoromethane	75-71-8	1.48	U	0.678	1.48	2.97	1	11/01/2022 12:46	WG1952319
1,1,2-Trichlorotrifluoroethane	76-13-1	27.7		0.608	1.53	3.07	1	11/01/2022 12:46	WG1952319
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	11/01/2022 12:46	WG1952319
Heptane	142-82-5	1.02	U	0.425	1.02	2.04	1	11/01/2022 12:46	WG1952319
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	11/01/2022 12:46	WG1952319
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	11/01/2022 12:46	WG1952319
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	11/01/2022 12:46	WG1952319
Methylene Chloride	75-09-2	0.670	J	0.340	0.694	1.39	1	11/01/2022 12:46	WG1952319
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	11/01/2022 12:46	WG1952319
2-Butanone (MEK)	78-93-3	1.85	J	0.240	0.560	3.69	1	11/01/2022 12:46	WG1952319
4-Methyl-2-pentanone (MIBK)	108-10-1	0.807	J	0.313	0.778	5.12	1	11/01/2022 12:46	WG1952319
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	11/01/2022 12:46	WG1952319
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	11/01/2022 12:46	WG1952319
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	11/01/2022 12:46	WG1952319
2-Propanol	67-63-0	73.3		0.649	1.54	3.07	1	11/01/2022 12:46	WG1952319
Propene	115-07-1	1.08	U	0.160	1.08	2.15	1	11/01/2022 12:46	WG1952319
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	11/01/2022 12:46	WG1952319
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	11/01/2022 12:46	WG1952319
Tetrachloroethylene	127-18-4	1.81	J	0.553	1.36	2.72	1	11/01/2022 12:46	WG1952319
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	11/01/2022 12:46	WG1952319
Toluene	108-88-3	0.881	J	0.328	0.942	1.88	1	11/01/2022 12:46	WG1952319
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	11/01/2022 12:46	WG1952319

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	11/01/2022 12:46	WG1952319
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	11/01/2022 12:46	WG1952319
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	11/01/2022 12:46	WG1952319
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	11/01/2022 12:46	WG1952319
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	11/01/2022 12:46	WG1952319
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	11/01/2022 12:46	WG1952319
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	11/01/2022 12:46	WG1952319
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	11/01/2022 12:46	WG1952319
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	11/01/2022 12:46	WG1952319
m&p-Xylene	1330-20-7	0.637	J	0.585	1.30	2.60	1	11/01/2022 12:46	WG1952319
o-Xylene	95-47-6	0.759	U	0.359	0.759	1.52	1	11/01/2022 12:46	WG1952319
(S) 1,4-Bromofluorobenzene	*460-00-4*	*99.2*					*60.0-140*	*11/01/2022 12:46*	WG1952319

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	13.4		1.39	2.85	5.70	1	11/01/2022 13:15	WG1952319
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	11/01/2022 13:15	WG1952319
Benzene	71-43-2	0.232	J	0.228	0.479	0.958	1	11/01/2022 13:15	WG1952319
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	11/01/2022 13:15	WG1952319
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	11/01/2022 13:15	WG1952319
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	11/01/2022 13:15	WG1952319
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	11/01/2022 13:15	WG1952319
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	11/01/2022 13:15	WG1952319
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	11/01/2022 13:15	WG1952319
Carbon tetrachloride	56-23-5	0.945	U	0.461	0.945	1.89	1	11/01/2022 13:15	WG1952319
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	11/01/2022 13:15	WG1952319
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	11/01/2022 13:15	WG1952319
Chloroform	67-66-3	8.52		0.349	0.730	1.46	1	11/01/2022 13:15	WG1952319
Chloromethane	74-87-3	0.516	U	0.213	0.516	1.03	1	11/01/2022 13:15	WG1952319
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	11/01/2022 13:15	WG1952319
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	11/01/2022 13:15	WG1952319
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	11/01/2022 13:15	WG1952319
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	11/01/2022 13:15	WG1952319
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	11/01/2022 13:15	WG1952319
1,3-Dichlorobenzene	541-73-1	2.09	J	1.09	2.40	4.81	1	11/01/2022 13:15	WG1952319
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	11/01/2022 13:15	WG1952319
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	11/01/2022 13:15	WG1952319
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	11/01/2022 13:15	WG1952319
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	11/01/2022 13:15	WG1952319
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	11/01/2022 13:15	WG1952319
trans-1,2-Dichloroethene	156-60-5	2.66		0.267	0.594	1.19	1	11/01/2022 13:15	WG1952319
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	11/01/2022 13:15	WG1952319
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	11/01/2022 13:15	WG1952319
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	11/01/2022 13:15	WG1952319
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	11/01/2022 13:15	WG1952319
Ethanol	64-17-5	1.19	U	0.500	1.19	2.45	1	11/01/2022 13:15	WG1952319
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	11/01/2022 13:15	WG1952319
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	11/01/2022 13:15	WG1952319
Trichlorofluoromethane	75-69-4	1.23	J	0.460	0.983	1.97	1	11/01/2022 13:15	WG1952319
Dichlorodifluoromethane	75-71-8	2.40	J	0.678	1.48	2.97	1	11/01/2022 13:15	WG1952319
1,1,2-Trichlorotrifluoroethane	76-13-1	18.9		0.608	1.53	3.07	1	11/01/2022 13:15	WG1952319
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	11/01/2022 13:15	WG1952319
Heptane	142-82-5	1.02	U	0.425	1.02	2.04	1	11/01/2022 13:15	WG1952319
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	11/01/2022 13:15	WG1952319
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	11/01/2022 13:15	WG1952319
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	11/01/2022 13:15	WG1952319
Methylene Chloride	75-09-2	0.608	J	0.340	0.694	1.39	1	11/01/2022 13:15	WG1952319
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	11/01/2022 13:15	WG1952319
2-Butanone (MEK)	78-93-3	2.56	J	0.240	0.560	3.69	1	11/01/2022 13:15	WG1952319
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	11/01/2022 13:15	WG1952319
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	11/01/2022 13:15	WG1952319
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	11/01/2022 13:15	WG1952319
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	11/01/2022 13:15	WG1952319
2-Propanol	67-63-0	460		6.49	15.4	30.7	10	11/02/2022 13:22	WG1953072
Propene	115-07-1	1.08	U	0.160	1.08	2.15	1	11/01/2022 13:15	WG1952319
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	11/01/2022 13:15	WG1952319
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	11/01/2022 13:15	WG1952319
Tetrachloroethylene	127-18-4	1.36	U	0.553	1.36	2.72	1	11/01/2022 13:15	WG1952319
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	11/01/2022 13:15	WG1952319
Toluene	108-88-3	0.727	J	0.328	0.942	1.88	1	11/01/2022 13:15	WG1952319
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	11/01/2022 13:15	WG1952319

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	11/01/2022 13:15	WG1952319
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	11/01/2022 13:15	WG1952319
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	11/01/2022 13:15	WG1952319
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	11/01/2022 13:15	WG1952319
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	11/01/2022 13:15	WG1952319
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	11/01/2022 13:15	WG1952319
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	11/01/2022 13:15	WG1952319
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	11/01/2022 13:15	WG1952319
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	11/01/2022 13:15	WG1952319
m&p-Xylene	1330-20-7	1.30	U	0.585	1.30	2.60	1	11/01/2022 13:15	WG1952319
o-Xylene	95-47-6	0.759	U	0.359	0.759	1.52	1	11/01/2022 13:15	WG1952319
(S) 1,4-Bromofluorobenzene	*460-00-4*	*99.4*					*60.0-140*	*11/01/2022 13:15*	WG1952319
(S) 1,4-Bromofluorobenzene	*460-00-4*	*98.8*					*60.0-140*	*11/02/2022 13:22*	WG1953072

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	16.3		1.39	2.85	5.70	1	11/01/2022 13:44	WG1952319
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	11/01/2022 13:44	WG1952319
Benzene	71-43-2	0.479	U	0.228	0.479	0.958	1	11/01/2022 13:44	WG1952319
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	11/01/2022 13:44	WG1952319
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	11/01/2022 13:44	WG1952319
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	11/01/2022 13:44	WG1952319
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	11/01/2022 13:44	WG1952319
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	11/01/2022 13:44	WG1952319
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	11/01/2022 13:44	WG1952319
Carbon tetrachloride	56-23-5	0.945	U	0.461	0.945	1.89	1	11/01/2022 13:44	WG1952319
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	11/01/2022 13:44	WG1952319
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	11/01/2022 13:44	WG1952319
Chloroform	67-66-3	13.3		0.349	0.730	1.46	1	11/01/2022 13:44	WG1952319
Chloromethane	74-87-3	0.516	U	0.213	0.516	1.03	1	11/01/2022 13:44	WG1952319
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	11/01/2022 13:44	WG1952319
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	11/01/2022 13:44	WG1952319
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	11/01/2022 13:44	WG1952319
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	11/01/2022 13:44	WG1952319
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	11/01/2022 13:44	WG1952319
1,3-Dichlorobenzene	541-73-1	1.21	J	1.09	2.40	4.81	1	11/01/2022 13:44	WG1952319
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	11/01/2022 13:44	WG1952319
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	11/01/2022 13:44	WG1952319
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	11/01/2022 13:44	WG1952319
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	11/01/2022 13:44	WG1952319
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	11/01/2022 13:44	WG1952319
trans-1,2-Dichloroethene	156-60-5	2.27		0.267	0.594	1.19	1	11/01/2022 13:44	WG1952319
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	11/01/2022 13:44	WG1952319
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	11/01/2022 13:44	WG1952319
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	11/01/2022 13:44	WG1952319
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	11/01/2022 13:44	WG1952319
Ethanol	64-17-5	1.19	U	0.500	1.19	2.45	1	11/01/2022 13:44	WG1952319
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	11/01/2022 13:44	WG1952319
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	11/01/2022 13:44	WG1952319
Trichlorofluoromethane	75-69-4	1.03	J	0.460	0.983	1.97	1	11/01/2022 13:44	WG1952319
Dichlorodifluoromethane	75-71-8	1.81	J	0.678	1.48	2.97	1	11/01/2022 13:44	WG1952319
1,1,2-Trichlorotrifluoroethane	76-13-1	210		0.608	1.53	3.07	1	11/01/2022 13:44	WG1952319
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	11/01/2022 13:44	WG1952319
Heptane	142-82-5	0.691	J	0.425	1.02	2.04	1	11/01/2022 13:44	WG1952319
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	11/01/2022 13:44	WG1952319
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	11/01/2022 13:44	WG1952319
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	11/01/2022 13:44	WG1952319
Methylene Chloride	75-09-2	0.688	J	0.340	0.694	1.39	1	11/01/2022 13:44	WG1952319
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	11/01/2022 13:44	WG1952319
2-Butanone (MEK)	78-93-3	2.80	J	0.240	0.560	3.69	1	11/01/2022 13:44	WG1952319
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	11/01/2022 13:44	WG1952319
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	11/01/2022 13:44	WG1952319
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	11/01/2022 13:44	WG1952319
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	11/01/2022 13:44	WG1952319
2-Propanol	67-63-0	388		6.49	15.4	30.7	10	11/02/2022 14:04	WG1953072
Propene	115-07-1	1.08	U	0.160	1.08	2.15	1	11/01/2022 13:44	WG1952319
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	11/01/2022 13:44	WG1952319
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	11/01/2022 13:44	WG1952319
Tetrachloroethylene	127-18-4	1.36	U	0.553	1.36	2.72	1	11/01/2022 13:44	WG1952319
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	11/01/2022 13:44	WG1952319
Toluene	108-88-3	1.22	J	0.328	0.942	1.88	1	11/01/2022 13:44	WG1952319
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	11/01/2022 13:44	WG1952319

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	11/01/2022 13:44	WG1952319
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	11/01/2022 13:44	WG1952319
Trichloroethylene	79-01-6	0.474	J	0.364	0.804	1.61	1	11/01/2022 13:44	WG1952319
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	11/01/2022 13:44	WG1952319
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	11/01/2022 13:44	WG1952319
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	11/01/2022 13:44	WG1952319
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	11/01/2022 13:44	WG1952319
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	11/01/2022 13:44	WG1952319
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	11/01/2022 13:44	WG1952319
m&p-Xylene	1330-20-7	1.30	U	0.585	1.30	2.60	1	11/01/2022 13:44	WG1952319
o-Xylene	95-47-6	0.759	U	0.359	0.759	1.52	1	11/01/2022 13:44	WG1952319
(S) 1,4-Bromofluorobenzene	*460-00-4*	*99.2*					*60.0-140*	*11/01/2022 13:44*	WG1952319
(S) 1,4-Bromofluorobenzene	*460-00-4*	*98.8*					*60.0-140*	*11/02/2022 14:04*	WG1953072

1 Cp
2 Tc
3 Ss
4 Cn
5 Sr
6 Qc
7 Gl
8 Al
9 Sc

Method Blank (MB)

(MB) R3855932-3 11/01/22 09:29

Analyte	MB Result ug/m3	MB Qualifier	MB MDL ug/m3	MB LOD ug/m3	MB RDL ug/m3
Acetone	2.85	U	1.39	2.85	5.70
Allyl Chloride	0.783	U	0.357	0.783	1.57
Benzene	0.479	U	0.228	0.479	0.958
Benzyl Chloride	0.675	U	0.311	0.675	1.56
Bromodichloromethane	1.01	U	0.471	1.01	2.01
Bromoform	3.21	U	0.757	3.21	6.21
Bromomethane	0.776	U	0.381	0.776	1.55
1,3-Butadiene	1.39	U	0.230	1.39	4.43
Carbon disulfide	0.778	U	0.317	0.778	1.56
Carbon tetrachloride	0.945	U	0.461	0.945	1.89
Chlorobenzene	0.924	U	0.385	0.924	1.85
Chloroethane	0.528	U	0.263	0.528	1.06
Chloroform	0.730	U	0.349	0.730	1.46
Chloromethane	0.516	U	0.213	0.516	1.03
2-Chlorotoluene	1.03	U	0.427	1.03	2.06
Cyclohexane	0.689	U	0.259	0.689	1.38
Dibromochloromethane	1.28	U	0.618	1.28	2.55
1,2-Dibromoethane	1.15	U	0.554	1.15	2.31
1,2-Dichlorobenzene	1.80	U	0.770	1.80	3.61
1,3-Dichlorobenzene	2.40	U	1.09	2.40	4.81
1,4-Dichlorobenzene	0.782	U	0.335	0.782	1.80
1,2-Dichloroethane	0.607	U	0.283	0.607	1.21
1,1-Dichloroethane	0.601	U	0.290	0.601	1.20
1,1-Dichloroethene	0.793	U	0.302	0.793	1.59
cis-1,2-Dichloroethene	0.793	U	0.311	0.793	1.59
trans-1,2-Dichloroethene	0.594	U	0.267	0.594	1.19
1,2-Dichloropropane	0.924	U	0.351	0.924	1.85
cis-1,3-Dichloropropene	0.681	U	0.313	0.681	1.36
trans-1,3-Dichloropropene	0.681	U	0.331	0.681	1.36
1,4-Dioxane	0.721	U	0.300	0.721	1.44
Ethanol	1.07	J	0.500	1.19	2.45
Ethylbenzene	0.867	U	0.362	0.867	1.73
4-Ethyltoluene	0.982	U	0.384	0.982	1.96
Trichlorofluoromethane	0.983	U	0.460	0.983	1.97
Dichlorodifluoromethane	1.48	U	0.678	1.48	2.97
1,1,2-Trichlorotrifluoroethane	1.53	U	0.608	1.53	3.07
1,2-Dichlorotetrafluoroethane	1.40	U	0.622	1.40	2.80
Heptane	1.02	U	0.425	1.02	2.04
Hexachloro-1,3-butadiene	2.67	U	1.12	2.67	6.73
n-Hexane	1.76	U	0.726	1.76	3.53

Method Blank (MB)

(MB) R3855932-3 11/01/22 09:29

Analyte	MB Result ug/m3	MB Qualifier	MB MDL ug/m3	MB LOD ug/m3	MB RDL ug/m3
Isopropylbenzene	0.983	U	0.382	0.983	1.97
Methylene Chloride	0.694	U	0.340	0.694	1.39
Methyl Butyl Ketone	1.23	U	0.544	1.23	5.11
2-Butanone (MEK)	0.560	U	0.240	0.560	3.69
4-Methyl-2-pentanone (MIBK)	0.778	U	0.313	0.778	5.12
Methyl Methacrylate	0.819	U	0.359	0.819	1.64
MTBE	0.468	U	0.233	0.468	1.08
Naphthalene	3.66	U	1.83	3.66	7.33
2-Propanol	1.54	U	0.649	1.54	3.07
Propene	0.189	J	0.160	1.08	2.15
Styrene	0.851	U	0.335	0.851	1.70
1,1,2,2-Tetrachloroethane	1.03	U	0.511	1.03	2.06
Tetrachloroethylene	1.36	U	0.553	1.36	2.72
Tetrahydrofuran	0.442	U	0.216	0.442	0.885
Toluene	0.942	U	0.328	0.942	1.88
1,2,4-Trichlorobenzene	2.29	U	1.10	2.29	4.66
1,1,1-Trichloroethane	0.816	U	0.400	0.816	1.63
1,1,2-Trichloroethane	1.09	U	0.422	1.09	2.18
Trichloroethylene	0.804	U	0.364	0.804	1.61
1,2,4-Trimethylbenzene	0.982	U	0.375	0.982	1.96
1,3,5-Trimethylbenzene	0.982	U	0.382	0.982	1.96
2,2,4-Trimethylpentane	1.40	U	0.621	1.40	2.80
Vinyl chloride	0.511	U	0.243	0.511	1.02
Vinyl Bromide	0.875	U	0.373	0.875	1.75
Vinyl acetate	0.880	U	0.408	0.880	1.76
m&p-Xylene	1.30	U	0.585	1.30	2.60
o-Xylene	0.759	U	0.359	0.759	1.52
(S) 1,4-Bromofluorobenzene	*98.5*				*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3855932-1 11/01/22 08:30 • (LCSD) R3855932-2 11/01/22 09:00

Analyte	Spike Amount ug/m3	LCS Result ug/m3	LCSD Result ug/m3	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	8.91	8.44	9.53	94.7	107	58.0-128			12.2	20
Allyl Chloride	11.7	10.8	11.1	92.0	94.4	71.0-131			2.58	20
Benzene	12.0	12.2	12.4	102	103	69.0-119			1.04	20
Benzyl Chloride	19.5	18.8	18.8	96.5	96.5	50.0-147			0.000	20
Bromodichloromethane	25.2	25.9	25.7	103	102	72.0-128			0.780	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3855932-1 11/01/22 08:30 • (LCSD) R3855932-2 11/01/22 09:00

Analyte	Spike Amount ug/m3	LCS Result ug/m3	LCSD Result ug/m3	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromoform	38.8	37.4	37.7	96.3	97.1	66.0-139			0.828	20
Bromomethane	14.6	13.4	13.7	92.3	93.9	63.0-134			1.72	20
1,3-Butadiene	8.30	7.72	7.81	93.1	94.1	66.0-134			1.14	20
Carbon disulfide	11.7	10.5	10.6	90.1	91.2	57.0-134			1.18	20
Carbon tetrachloride	23.6	22.8	23.1	96.5	97.9	68.0-132			1.37	20
Chlorobenzene	17.3	17.6	17.5	101	101	70.0-119			0.264	20
Chloroethane	9.89	9.02	9.34	91.2	94.4	63.0-127			3.45	20
Chloroform	18.3	18.1	18.3	99.2	101	68.0-123			1.34	20
Chloromethane	7.75	7.33	7.37	94.7	95.2	59.0-132			0.562	20
2-Chlorotoluene	19.3	19.6	19.6	102	102	74.0-130			0.000	20
Cyclohexane	12.9	12.7	12.8	98.4	99.2	70.0-117			0.810	20
Dibromochloromethane	31.9	32.8	32.8	103	103	70.0-130			0.259	20
1,2-Dibromoethane	28.8	29.9	30.1	104	105	74.0-122			0.768	20
1,2-Dichlorobenzene	22.5	22.2	22.5	98.7	99.7	63.0-129			1.08	20
1,3-Dichlorobenzene	22.5	22.7	22.7	101	101	65.0-130			0.000	20
1,4-Dichlorobenzene	22.5	22.4	22.4	99.2	99.2	60.0-131			0.000	20
1,2-Dichloroethane	15.2	15.5	15.8	102	104	65.0-128			1.55	20
1,1-Dichloroethane	15.0	14.5	14.9	96.8	98.9	68.0-126			2.18	20
1,1-Dichloroethene	14.9	13.8	14.1	92.8	95.2	61.0-133			2.55	20
cis-1,2-Dichloroethene	14.9	14.6	14.7	98.1	99.2	70.0-121			1.08	20
trans-1,2-Dichloroethene	14.9	13.8	14.1	92.5	95.2	67.0-124			2.84	20
1,2-Dichloropropane	17.3	17.4	17.5	101	101	69.0-123			0.529	20
cis-1,3-Dichloropropene	17.0	17.6	17.6	103	103	70.0-128			0.258	20
trans-1,3-Dichloropropene	17.0	17.5	17.3	103	102	75.0-133			0.782	20
1,4-Dioxane	13.5	13.8	13.8	102	102	71.0-122			0.000	20
Ethanol	7.07	6.67	7.11	94.4	101	59.0-125			6.29	20
Ethylbenzene	16.3	16.3	16.4	101	101	70.0-124			0.265	20
4-Ethyltoluene	18.4	19.0	18.9	103	103	67.0-129			0.259	20
Trichlorofluoromethane	21.1	19.7	20.2	93.3	96.0	62.0-126			2.82	20
Dichlorodifluoromethane	18.5	17.2	17.5	92.5	94.1	59.0-128			1.71	20
1,1,2-Trichlorotrifluoroethane	28.7	26.6	27.1	92.5	94.4	66.0-126			2.00	20
1,2-Dichlorotetrafluoroethane	26.2	25.0	25.5	95.5	97.1	63.0-121			1.66	20
Heptane	15.3	16.0	15.8	104	103	69.0-123			1.03	20
Hexachloro-1,3-butadiene	40.0	40.2	40.5	101	101	56.0-138			0.529	20
n-Hexane	13.2	13.1	13.2	99.2	100	63.0-120			0.803	20
Isopropylbenzene	18.4	18.6	18.7	101	102	68.0-124			0.526	20
Methylene Chloride	13.0	12.0	12.3	92.0	94.7	62.0-115			2.86	20
Methyl Butyl Ketone	15.3	16.1	16.0	105	104	62.0-128			0.764	20
Methyl Ethyl Ketone	11.1	10.8	11.0	97.9	99.2	67.0-130			1.35	20
4-Methyl-2-pentanone (MIBK)	15.4	16.3	16.4	106	107	67.0-130			0.751	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3855932-1 11/01/22 08:30 • (LCSD) R3855932-2 11/01/22 09:00

Analyte	Spike Amount ug/m3	LCS Result ug/m3	LCSD Result ug/m3	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Methyl Methacrylate	15.4	15.6	15.6	101	101	70.0-128			0.000	20
MTBE	13.5	13.1	13.3	97.1	98.1	66.0-126			1.09	20
Naphthalene	19.6	20.3	20.3	103	103	57.0-138			0.258	20
2-Propanol	9.22	9.02	9.66	97.9	105	52.0-125			6.84	20
Propene	6.46	6.22	6.34	96.3	98.1	57.0-136			1.92	20
Styrene	16.0	16.0	16.1	100	101	73.0-127			0.795	20
1,1,2,2-Tetrachloroethane	25.8	26.7	26.9	103	104	65.0-127			0.770	20
Tetrachloroethylene	25.5	24.9	25.2	97.9	98.9	66.0-124			1.08	20
Tetrahydrofuran	11.1	10.9	10.9	98.7	98.9	64.0-123			0.270	20
Toluene	14.1	14.5	14.6	103	103	66.0-119			0.518	20
1,2,4-Trichlorobenzene	27.8	27.0	27.1	97.3	97.6	55.0-142			0.274	20
1,1,1-Trichloroethane	20.4	19.5	19.8	95.7	97.1	68.0-125			1.38	20
1,1,2-Trichloroethane	20.4	20.7	21.0	101	103	73.0-119			1.57	20
Trichloroethylene	20.1	20.5	20.6	102	103	71.0-123			0.521	20
1,2,4-Trimethylbenzene	18.4	18.9	19.2	103	105	66.0-132			1.54	20
1,3,5-Trimethylbenzene	18.4	19.0	19.1	103	104	67.0-130			0.515	20
2,2,4-Trimethylpentane	17.5	17.4	17.5	99.2	100	68.0-121			0.803	20
Vinyl chloride	9.59	9.00	9.15	93.9	95.5	64.0-127			1.69	20
Vinyl Bromide	16.4	15.1	15.4	92.3	94.1	71.0-126			2.00	20
Vinyl acetate	13.2	12.8	12.7	97.1	96.3	56.0-139			0.828	20
m&p-Xylene	32.5	33.9	34.2	104	105	61.0-134			0.764	20
o-Xylene	16.3	16.9	17.0	104	104	67.0-125			0.256	20
(S) 1,4-Bromofluorobenzene				*101*	*101*	*60.0-140*				

Method Blank (MB)

(MB) R3856369-3 11/02/22 10:23

Analyte	MB Result ug/m3	MB Qualifier	MB MDL ug/m3	MB LOD ug/m3	MB RDL ug/m3
2-Propanol	1.54	U	0.649	1.54	3.07
(S) 1,4-Bromofluorobenzene	*96.1*				*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3856369-1 11/02/22 08:56 • (LCSD) R3856369-2 11/02/22 09:40

Analyte	Spike Amount ug/m3	LCS Result ug/m3	LCSD Result ug/m3	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
2-Propanol	9.22	9.96	10.2	108	111	52.0-125			2.68	20
(S) 1,4-Bromofluorobenzene				*101*	*104*	*60.0-140*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

DL	Detection Limit.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Pace Analytical - West Columbia, SC

106 Vantage Point Dr.
West Columbia, SC 29172

Billing Information:
PM
106 Vantage Point Dr.
West Columbia, SC 29172

Report To:
Kathy Smith

Email To:
kathy.smith@pacelabs.com

Project Description: CRCA

City/State Collected: Merritt Island FL

Please Circle: PT MT CT (ET)

Phone: 803-791-9700

Client Project #

Lab Project #
PACEWCSC-TETRATECHFL

Collected by (print): Cory O'Brien

Site/Facility ID #: CRCA

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Three Day
___ Next Day ___ Five Day
___ Two Day

Date Results Needed

Sample ID	Can #	Flow Cont. #	Collection Date	Collection Time	Canister Pressure/Vacuum Initial	Canister Pressure/Vacuum Final	DODTO-15 Summa	Rem./Contaminant	Sample # (lab only)
CRCA-AmBol-20221027	9205	007416	10/27	0910/1710	≥30	03	X		-01
CRCA-VMP01-20221027	010544	012348	10/27	1016/1116	≥30	09	X		-02
CRCA-VMP02-20221027	012499	09882	10/27	1020/1120	≥30	02 01	X		-03
CRCA-VMP03-20221027	005017	006709	10/27	1025/1125	≥30	09	X		-04
CRCA-VMP04-20221027	021397	008402	10/27	1030/1130	≥30	02	X		-05

Sample Receipt Checklist
COC Seal Present/Intact: Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
RAD Screen <0.5 mR/hr: Y N
If Applicable
VOA Zero Headspace: Y N
Pres.Correct/Check: Y N

Remarks:
For Chuck Sorden - TetraTech - reporting through Pace-SC.

Samples returned via: __ UPS ✓ FedEx ~~✓~~ Courier __ _____

Tracking # 6040 5527 9225
6040 5527 9236

Relinquished by : (Signature) — Date: 10/27/2022 — Time: 1745

Received by: (Signature) — Date: — Time:

Relinquished by : (Signature) — Date: — Time:

Received by: (Signature) — Date: — Time:

Relinquished by : (Signature) — Date: — Time:

Received for lab by: (Signature) — Date: 10/28/22 — Time: 0900

Hold #

Condition: (lab use only)

COC Seal Intact: ___Y ___N ___NA

NCF:

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE
MT JULIET, TN
12065 Lebanon Road Mt Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1551591
C201

Acctnum: PACEWCSC
Template: T207717
Prelogin: P957804
PM: 844 - Christi M Wagner
PB: CSL 10/28/22
Shipped Via: FedEX Ground

Chain of Custody

Pace Analytical
www.pacelabs.com

Workorder: XJ31007 Workorder Name: NASA CRCA Owner Received Date: 10/28/2022 Results Requested By: 11/12/202

Report To:	Subcontract To:
Kathy E. Smith	Project #
Pace Analytical	
106 Vantage Point Drive	Pace National
Columbia SC, 29223	
803-227-2704	
Kathy.Smith@pacelabs.com	

Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix	Preserved Containers					Requested Analysis: TO-15 - DOD											LAB US
1																						
2	CRCA-AMB01-20221027	grab	10/27/2022 @ 1710	XJ31007-001	Aqueous						x											
3	CRCA-VMP01-20221027	grab	10/27/2022 @ 1116	XJ31007-003	Aqueous						x											
4	CRCA-VMP02-20221027	grab	10/27/2022 @ 1120	XJ31007-004	Aqueous						x											
5	CRCA-VMP03-20221027	grab	10/27/2022 @ 1125	XJ31007-005	Aqueous						x											
6	CRCA-VMP04-20221027	grab	10/27/2022 @ 1130	XJ31007-006	Aqueous						x											
7																						
8																						
9																						
10																						

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1					
2					
3					

Cooler Temperature on Receipt _____ °C | **Custody Seal Y or N** | **Received on Ice Y or N** | **Sample Intact Y or N**

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC

This chain of custody is considered complete as is since this information is available in the owner laboratory.

ANALYTICAL REPORT

November 07, 2022

Pace Analytical - West Columbia, SC

Sample Delivery Group:	L1553021
Samples Received:	11/02/2022
Project Number:	XJ31007A
Description:	NASA CRCA
Site:	007
Report To:	Kathy Smith 106 Vantage Point Dr. West Columbia, SC 29172

Entire Report Reviewed By:

Nancy McLain
Project Manager

TABLE OF CONTENTS

SAMPLE SUMMARY

CRCA-AMB03-20221101 L1553021-01 Air

Collected by: Kyle Hoard
Collected date/time: 11/01/22 13:05
Received date/time: 11/02/22 09:00

Method	Batch	Dilution	Preparation date/time	Analysis date/time	Analyst	Location
Volatile Organic Compounds (MS) by Method TO-15	WG1953830	1	11/03/22 12:55	11/03/22 12:55	CEP	Mt. Juliet, TN
Volatile Organic Compounds (MS) by Method TO-15	WG1954865	10	11/05/22 21:15	11/05/22 21:15	FKG	Mt. Juliet, TN

CASE NARRATIVE

All sample aliquots were received at the correct temperature, in the proper containers, with the appropriate preservatives, and within method specified holding times, unless qualified or notated within the report. Where applicable, all MDL (LOD) and RDL (LOQ) values reported for environmental samples have been corrected for the dilution factor used in the analysis. All Method and Batch Quality Control are within established criteria except where addressed in this case narrative, a non-conformance form or properly qualified within the sample results. By my digital signature below, I affirm to the best of my knowledge, all problems/anomalies observed by the laboratory as having the potential to affect the quality of the data have been identified by the laboratory, and no information or data have been knowingly withheld that would affect the quality of the data.

Nancy McLain
Project Manager

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
Acetone	67-64-1	6.46		1.39	2.85	5.70	1	11/03/2022 12:55	WG1953830
Allyl Chloride	107-05-1	0.783	U	0.357	0.783	1.57	1	11/03/2022 12:55	WG1953830
Benzene	71-43-2	0.479	U	0.228	0.479	0.958	1	11/03/2022 12:55	WG1953830
Benzyl Chloride	100-44-7	0.675	U	0.311	0.675	1.56	1	11/03/2022 12:55	WG1953830
Bromodichloromethane	75-27-4	1.01	U	0.471	1.01	2.01	1	11/03/2022 12:55	WG1953830
Bromoform	75-25-2	3.21	U	0.757	3.21	6.21	1	11/03/2022 12:55	WG1953830
Bromomethane	74-83-9	0.776	U	0.381	0.776	1.55	1	11/03/2022 12:55	WG1953830
1,3-Butadiene	106-99-0	1.39	U	0.230	1.39	4.43	1	11/03/2022 12:55	WG1953830
Carbon disulfide	75-15-0	0.778	U	0.317	0.778	1.56	1	11/03/2022 12:55	WG1953830
Carbon tetrachloride	56-23-5	0.649	J	0.461	0.945	1.89	1	11/03/2022 12:55	WG1953830
Chlorobenzene	108-90-7	0.924	U	0.385	0.924	1.85	1	11/03/2022 12:55	WG1953830
Chloroethane	75-00-3	0.528	U	0.263	0.528	1.06	1	11/03/2022 12:55	WG1953830
Chloroform	67-66-3	0.730	U	0.349	0.730	1.46	1	11/03/2022 12:55	WG1953830
Chloromethane	74-87-3	2.29		0.213	0.516	1.03	1	11/03/2022 12:55	WG1953830
2-Chlorotoluene	95-49-8	1.03	U	0.427	1.03	2.06	1	11/03/2022 12:55	WG1953830
Cyclohexane	110-82-7	0.689	U	0.259	0.689	1.38	1	11/03/2022 12:55	WG1953830
Dibromochloromethane	124-48-1	1.28	U	0.618	1.28	2.55	1	11/03/2022 12:55	WG1953830
1,2-Dibromoethane	106-93-4	1.15	U	0.554	1.15	2.31	1	11/03/2022 12:55	WG1953830
1,2-Dichlorobenzene	95-50-1	1.80	U	0.770	1.80	3.61	1	11/03/2022 12:55	WG1953830
1,3-Dichlorobenzene	541-73-1	2.40	U	1.09	2.40	4.81	1	11/03/2022 12:55	WG1953830
1,4-Dichlorobenzene	106-46-7	0.782	U	0.335	0.782	1.80	1	11/03/2022 12:55	WG1953830
1,2-Dichloroethane	107-06-2	0.607	U	0.283	0.607	1.21	1	11/03/2022 12:55	WG1953830
1,1-Dichloroethane	75-34-3	0.601	U	0.290	0.601	1.20	1	11/03/2022 12:55	WG1953830
1,1-Dichloroethene	75-35-4	0.793	U	0.302	0.793	1.59	1	11/03/2022 12:55	WG1953830
cis-1,2-Dichloroethene	156-59-2	0.793	U	0.311	0.793	1.59	1	11/03/2022 12:55	WG1953830
trans-1,2-Dichloroethene	156-60-5	1.61		0.267	0.594	1.19	1	11/03/2022 12:55	WG1953830
1,2-Dichloropropane	78-87-5	0.924	U	0.351	0.924	1.85	1	11/03/2022 12:55	WG1953830
cis-1,3-Dichloropropene	10061-01-5	0.681	U	0.313	0.681	1.36	1	11/03/2022 12:55	WG1953830
trans-1,3-Dichloropropene	10061-02-6	0.681	U	0.331	0.681	1.36	1	11/03/2022 12:55	WG1953830
1,4-Dioxane	123-91-1	0.721	U	0.300	0.721	1.44	1	11/03/2022 12:55	WG1953830
Ethanol	64-17-5	1.19	U	0.500	1.19	2.45	1	11/03/2022 12:55	WG1953830
Ethylbenzene	100-41-4	0.867	U	0.362	0.867	1.73	1	11/03/2022 12:55	WG1953830
4-Ethyltoluene	622-96-8	0.982	U	0.384	0.982	1.96	1	11/03/2022 12:55	WG1953830
Trichlorofluoromethane	75-69-4	1.13	J	0.460	0.983	1.97	1	11/03/2022 12:55	WG1953830
Dichlorodifluoromethane	75-71-8	2.15	J	0.678	1.48	2.97	1	11/03/2022 12:55	WG1953830
1,1,2-Trichlorotrifluoroethane	76-13-1	1.07	J	0.608	1.53	3.07	1	11/03/2022 12:55	WG1953830
1,2-Dichlorotetrafluoroethane	76-14-2	1.40	U	0.622	1.40	2.80	1	11/03/2022 12:55	WG1953830
Heptane	142-82-5	1.02	U	0.425	1.02	2.04	1	11/03/2022 12:55	WG1953830
Hexachloro-1,3-butadiene	87-68-3	2.67	U	1.12	2.67	6.73	1	11/03/2022 12:55	WG1953830
n-Hexane	110-54-3	1.76	U	0.726	1.76	3.53	1	11/03/2022 12:55	WG1953830
Isopropylbenzene	98-82-8	0.983	U	0.382	0.983	1.97	1	11/03/2022 12:55	WG1953830
Methylene Chloride	75-09-2	0.347	J	0.340	0.694	1.39	1	11/03/2022 12:55	WG1953830
Methyl Butyl Ketone	591-78-6	1.23	U	0.544	1.23	5.11	1	11/03/2022 12:55	WG1953830
2-Butanone (MEK)	78-93-3	0.389	J	0.240	0.560	3.69	1	11/03/2022 12:55	WG1953830
4-Methyl-2-pentanone (MIBK)	108-10-1	0.778	U	0.313	0.778	5.12	1	11/03/2022 12:55	WG1953830
Methyl Methacrylate	80-62-6	0.819	U	0.359	0.819	1.64	1	11/03/2022 12:55	WG1953830
MTBE	1634-04-4	0.468	U	0.233	0.468	1.08	1	11/03/2022 12:55	WG1953830
Naphthalene	91-20-3	3.66	U	1.83	3.66	7.33	1	11/03/2022 12:55	WG1953830
2-Propanol	67-63-0	440		6.49	15.4	30.7	10	11/05/2022 21:15	WG1954865
Propene	115-07-1	0.424	B J	0.160	1.08	2.15	1	11/03/2022 12:55	WG1953830
Styrene	100-42-5	0.851	U	0.335	0.851	1.70	1	11/03/2022 12:55	WG1953830
1,1,2,2-Tetrachloroethane	79-34-5	1.03	U	0.511	1.03	2.06	1	11/03/2022 12:55	WG1953830
Tetrachloroethylene	127-18-4	10.5		0.553	1.36	2.72	1	11/03/2022 12:55	WG1953830
Tetrahydrofuran	109-99-9	0.442	U	0.216	0.442	0.885	1	11/03/2022 12:55	WG1953830
Toluene	108-88-3	0.368	J	0.328	0.942	1.88	1	11/03/2022 12:55	WG1953830
1,2,4-Trichlorobenzene	120-82-1	2.29	U	1.10	2.29	4.66	1	11/03/2022 12:55	WG1953830

Volatile Organic Compounds (MS) by Method TO-15

Analyte	CAS #	Result ug/m3	Qualifier	DL ug/m3	LOD ug/m3	LOQ ug/m3	Dilution	Analysis date / time	Batch
1,1,1-Trichloroethane	71-55-6	0.816	U	0.400	0.816	1.63	1	11/03/2022 12:55	WG1953830
1,1,2-Trichloroethane	79-00-5	1.09	U	0.422	1.09	2.18	1	11/03/2022 12:55	WG1953830
Trichloroethylene	79-01-6	0.804	U	0.364	0.804	1.61	1	11/03/2022 12:55	WG1953830
1,2,4-Trimethylbenzene	95-63-6	0.982	U	0.375	0.982	1.96	1	11/03/2022 12:55	WG1953830
1,3,5-Trimethylbenzene	108-67-8	0.982	U	0.382	0.982	1.96	1	11/03/2022 12:55	WG1953830
2,2,4-Trimethylpentane	540-84-1	1.40	U	0.621	1.40	2.80	1	11/03/2022 12:55	WG1953830
Vinyl chloride	75-01-4	0.511	U	0.243	0.511	1.02	1	11/03/2022 12:55	WG1953830
Vinyl Bromide	593-60-2	0.875	U	0.373	0.875	1.75	1	11/03/2022 12:55	WG1953830
Vinyl acetate	108-05-4	0.880	U	0.408	0.880	1.76	1	11/03/2022 12:55	WG1953830
m&p-Xylene	1330-20-7	1.30	U	0.585	1.30	2.60	1	11/03/2022 12:55	WG1953830
o-Xylene	95-47-6	0.759	U	0.359	0.759	1.52	1	11/03/2022 12:55	WG1953830
(S) 1,4-Bromofluorobenzene	*460-00-4*	*98.3*					*60.0-140*	*11/03/2022 12:55*	WG1953830
(S) 1,4-Bromofluorobenzene	*460-00-4*	*93.8*					*60.0-140*	*11/05/2022 21:15*	WG1954865

Method Blank (MB)

(MB) R3856954-3 11/03/22 10:55

Analyte	MB Result ug/m3	MB Qualifier	MB MDL ug/m3	MB LOD ug/m3	MB RDL ug/m3
Acetone	2.85	U	1.39	2.85	5.70
Allyl Chloride	0.783	U	0.357	0.783	1.57
Benzene	0.479	U	0.228	0.479	0.958
Benzyl Chloride	0.675	U	0.311	0.675	1.56
Bromodichloromethane	1.01	U	0.471	1.01	2.01
Bromoform	3.21	U	0.757	3.21	6.21
Bromomethane	0.776	U	0.381	0.776	1.55
1,3-Butadiene	1.39	U	0.230	1.39	4.43
Carbon disulfide	0.778	U	0.317	0.778	1.56
Carbon tetrachloride	0.945	U	0.461	0.945	1.89
Chlorobenzene	0.924	U	0.385	0.924	1.85
Chloroethane	0.528	U	0.263	0.528	1.06
Chloroform	0.730	U	0.349	0.730	1.46
Chloromethane	0.516	U	0.213	0.516	1.03
2-Chlorotoluene	1.03	U	0.427	1.03	2.06
Cyclohexane	0.689	U	0.259	0.689	1.38
Dibromochloromethane	1.28	U	0.618	1.28	2.55
1,2-Dibromoethane	1.15	U	0.554	1.15	2.31
1,2-Dichlorobenzene	1.80	U	0.770	1.80	3.61
1,3-Dichlorobenzene	2.40	U	1.09	2.40	4.81
1,4-Dichlorobenzene	0.782	U	0.335	0.782	1.80
1,2-Dichloroethane	0.607	U	0.283	0.607	1.21
1,1-Dichloroethane	0.601	U	0.290	0.601	1.20
1,1-Dichloroethene	0.793	U	0.302	0.793	1.59
cis-1,2-Dichloroethene	0.793	U	0.311	0.793	1.59
trans-1,2-Dichloroethene	0.594	U	0.267	0.594	1.19
1,2-Dichloropropane	0.924	U	0.351	0.924	1.85
cis-1,3-Dichloropropene	0.681	U	0.313	0.681	1.36
trans-1,3-Dichloropropene	0.681	U	0.331	0.681	1.36
1,4-Dioxane	0.721	U	0.300	0.721	1.44
Ethanol	0.913	J	0.500	1.19	2.45
Ethylbenzene	0.867	U	0.362	0.867	1.73
4-Ethyltoluene	0.982	U	0.384	0.982	1.96
Trichlorofluoromethane	0.983	U	0.460	0.983	1.97
Dichlorodifluoromethane	1.48	U	0.678	1.48	2.97
1,1,2-Trichlorotrifluoroethane	1.53	U	0.608	1.53	3.07
1,2-Dichlorotetrafluoroethane	1.40	U	0.622	1.40	2.80
Heptane	1.02	U	0.425	1.02	2.04
Hexachloro-1,3-butadiene	2.67	U	1.12	2.67	6.73
n-Hexane	1.76	U	0.726	1.76	3.53

Method Blank (MB)

(MB) R3856954-3 11/03/22 10:55

Analyte	MB Result ug/m3	MB Qualifier	MB MDL ug/m3	MB LOD ug/m3	MB RDL ug/m3
Isopropylbenzene	0.983	U	0.382	0.983	1.97
Methylene Chloride	0.694	U	0.340	0.694	1.39
Methyl Butyl Ketone	1.23	U	0.544	1.23	5.11
2-Butanone (MEK)	0.560	U	0.240	0.560	3.69
4-Methyl-2-pentanone (MIBK)	0.778	U	0.313	0.778	5.12
Methyl Methacrylate	0.819	U	0.359	0.819	1.64
MTBE	0.468	U	0.233	0.468	1.08
Naphthalene	3.66	U	1.83	3.66	7.33
Propene	0.181	J	0.160	1.08	2.15
Styrene	0.851	U	0.335	0.851	1.70
1,1,2,2-Tetrachloroethane	1.03	U	0.511	1.03	2.06
Tetrachloroethylene	1.36	U	0.553	1.36	2.72
Tetrahydrofuran	0.442	U	0.216	0.442	0.885
Toluene	0.942	U	0.328	0.942	1.88
1,2,4-Trichlorobenzene	2.29	U	1.10	2.29	4.66
1,1,1-Trichloroethane	0.816	U	0.400	0.816	1.63
1,1,2-Trichloroethane	1.09	U	0.422	1.09	2.18
Trichloroethylene	0.804	U	0.364	0.804	1.61
1,2,4-Trimethylbenzene	0.982	U	0.375	0.982	1.96
1,3,5-Trimethylbenzene	0.982	U	0.382	0.982	1.96
2,2,4-Trimethylpentane	1.40	U	0.621	1.40	2.80
Vinyl chloride	0.511	U	0.243	0.511	1.02
Vinyl Bromide	0.875	U	0.373	0.875	1.75
Vinyl acetate	0.880	U	0.408	0.880	1.76
m&p-Xylene	1.30	U	0.585	1.30	2.60
o-Xylene	0.759	U	0.359	0.759	1.52
(S) 1,4-Bromofluorobenzene	*96.3*				*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3856954-1 11/03/22 09:01 • (LCSD) R3856954-2 11/03/22 09:31

Analyte	Spike Amount ug/m3	LCS Result ug/m3	LCSD Result ug/m3	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Acetone	8.91	9.27	9.01	104	101	58.0-128			2.86	20
Allyl Chloride	11.7	10.9	11.0	93.1	93.3	71.0-131			0.286	20
Benzene	12.0	12.8	12.7	107	106	69.0-119			0.751	20
Benzyl Chloride	19.5	18.4	17.9	94.4	91.7	50.0-147			2.87	20
Bromodichloromethane	25.2	26.6	26.2	106	104	72.0-128			1.27	20
Bromoform	38.8	36.8	36.4	94.9	93.9	66.0-139			1.13	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3856954-1 11/03/22 09:01 • (LCSD) R3856954-2 11/03/22 09:31

Analyte	Spike Amount ug/m3	LCS Result ug/m3	LCSD Result ug/m3	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
Bromomethane	14.6	14.3	14.3	98.1	98.4	63.0-134			0.271	20
1,3-Butadiene	8.30	7.99	7.86	96.3	94.7	66.0-134			1.68	20
Carbon disulfide	11.7	10.5	10.4	89.6	89.1	57.0-134			0.597	20
Carbon tetrachloride	23.6	23.7	23.2	101	98.1	68.0-132			2.42	20
Chlorobenzene	17.3	18.1	18.0	104	104	70.0-119			0.513	20
Chloroethane	9.89	9.50	9.42	96.0	95.2	63.0-127			0.837	20
Chloroform	18.3	19.3	19.0	106	104	68.0-123			1.53	20
Chloromethane	7.75	7.52	7.50	97.1	96.8	59.0-132			0.275	20
2-Chlorotoluene	19.3	20.6	20.5	106	106	74.0-130			0.503	20
Cyclohexane	12.9	13.4	13.2	104	102	70.0-117			2.07	20
Dibromochloromethane	31.9	33.2	32.5	104	102	70.0-130			2.07	20
1,2-Dibromoethane	28.8	30.2	30.1	105	104	74.0-122			0.510	20
1,2-Dichlorobenzene	22.5	23.1	22.7	102	101	63.0-129			1.84	20
1,3-Dichlorobenzene	22.5	23.2	23.0	103	102	65.0-130			0.780	20
1,4-Dichlorobenzene	22.5	23.0	22.9	102	102	60.0-131			0.524	20
1,2-Dichloroethane	15.2	16.5	16.2	109	107	65.0-128			1.73	20
1,1-Dichloroethane	15.0	15.2	14.8	101	98.7	68.0-126			2.40	20
1,1-Dichloroethene	14.9	14.2	14.3	95.5	96.3	61.0-133			0.834	20
cis-1,2-Dichloroethene	14.9	15.1	14.9	102	101	70.0-121			1.06	20
trans-1,2-Dichloroethene	14.9	14.2	14.2	95.7	95.5	67.0-124			0.279	20
1,2-Dichloropropane	17.3	17.7	17.7	102	102	69.0-123			0.261	20
cis-1,3-Dichloropropene	17.0	17.3	17.4	102	102	70.0-128			0.261	20
trans-1,3-Dichloropropene	17.0	17.3	17.2	102	101	75.0-133			0.791	20
1,4-Dioxane	13.5	14.3	14.3	106	106	71.0-122			0.252	20
Ethanol	7.07	7.05	6.92	99.7	97.9	59.0-125			1.89	20
Ethylbenzene	16.3	17.2	17.0	106	104	70.0-124			1.52	20
4-Ethyltoluene	18.4	19.2	18.9	104	103	67.0-129			1.55	20
Trichlorofluoromethane	21.1	20.5	21.0	97.3	99.7	62.0-126			2.44	20
Dichlorodifluoromethane	18.5	18.2	18.0	98.1	97.1	59.0-128			1.09	20
1,1,2-Trichlorotrifluoroethane	28.7	27.7	27.9	96.5	97.1	66.0-126			0.551	20
1,2-Dichlorotetrafluoroethane	26.2	26.0	25.8	99.2	98.4	63.0-121			0.810	20
Heptane	15.3	16.5	16.4	108	107	69.0-123			0.745	20
Hexachloro-1,3-butadiene	40.0	41.2	40.5	103	101	56.0-138			1.83	20
n-Hexane	13.2	13.5	13.2	102	99.7	63.0-120			2.12	20
Isopropylbenzene	18.4	19.0	18.7	103	102	68.0-124			1.56	20
Methylene Chloride	13.0	12.3	12.4	94.7	95.5	62.0-115			0.842	20
Methyl Butyl Ketone	15.3	16.3	16.2	106	105	62.0-128			1.01	20
Methyl Ethyl Ketone	11.1	10.9	10.9	98.4	98.1	67.0-130			0.271	20
4-Methyl-2-pentanone (MIBK)	15.4	16.7	16.6	109	108	67.0-130			0.983	20
Methyl Methacrylate	15.4	15.5	15.5	101	101	70.0-128			0.000	20

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3856954-1 11/03/22 09:01 • (LCSD) R3856954-2 11/03/22 09:31

Analyte	Spike Amount ug/m3	LCS Result ug/m3	LCSD Result ug/m3	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
MTBE	13.5	13.3	13.2	98.7	97.9	66.0-126			0.814	20
Naphthalene	19.6	21.0	20.7	107	106	57.0-138			1.25	20
Propene	6.46	6.39	6.23	98.9	96.5	57.0-136			2.46	20
Styrene	16.0	16.1	15.9	101	99.7	73.0-127			1.33	20
1,1,2,2-Tetrachloroethane	25.8	28.1	27.6	109	107	65.0-127			1.98	20
Tetrachloroethylene	25.5	25.7	25.5	101	100	66.0-124			0.795	20
Tetrahydrofuran	11.1	11.2	10.9	102	98.9	64.0-123			2.66	20
Toluene	14.1	15.3	15.2	108	108	66.0-119			0.494	20
1,2,4-Trichlorobenzene	27.8	27.4	27.1	98.7	97.6	55.0-142			1.09	20
1,1,1-Trichloroethane	20.4	20.5	20.1	100	98.7	68.0-125			1.61	20
1,1,2-Trichloroethane	20.4	21.5	21.4	106	105	73.0-119			0.506	20
Trichloroethylene	20.1	21.5	21.3	107	106	71.0-123			0.751	20
1,2,4-Trimethylbenzene	18.4	19.6	19.4	107	106	66.0-132			1.01	20
1,3,5-Trimethylbenzene	18.4	19.4	19.1	105	104	67.0-130			1.27	20
2,2,4-Trimethylpentane	17.5	17.8	17.6	101	101	68.0-121			0.793	20
Vinyl chloride	9.59	9.23	9.15	96.3	95.5	64.0-127			0.834	20
Vinyl Bromide	16.4	15.3	15.7	93.3	95.5	71.0-126			2.26	20
Vinyl acetate	13.2	13.0	12.5	98.4	94.7	56.0-139			3.87	20
m&p-Xylene	32.5	35.2	34.8	108	107	61.0-134			0.991	20
o-Xylene	16.3	17.6	17.4	108	107	67.0-125			0.993	20
(S) 1,4-Bromofluorobenzene				*100*	*100*	*60.0-140*				

Method Blank (MB)

(MB) R3857504-2 11/05/22 08:51

Analyte	MB Result ug/m3	MB Qualifier	MB MDL ug/m3	MB LOD ug/m3	MB RDL ug/m3
2-Propanol	1.54	U	0.649	1.54	3.07
(S) 1,4-Bromofluorobenzene	*95.7*				*60.0-140*

Laboratory Control Sample (LCS) • Laboratory Control Sample Duplicate (LCSD)

(LCS) R3857504-1 11/05/22 08:20 • (LCSD) R3857504-3 11/05/22 09:35

Analyte	Spike Amount ug/m3	LCS Result ug/m3	LCSD Result ug/m3	LCS Rec. %	LCSD Rec. %	Rec. Limits %	LCS Qualifier	LCSD Qualifier	RPD %	RPD Limits %
2-Propanol	9.22	10.6	10.1	115	109	52.0-125			5.47	20
(S) 1,4-Bromofluorobenzene				*99.7*	*101*	*60.0-140*				

GLOSSARY OF TERMS

Guide to Reading and Understanding Your Laboratory Report

The information below is designed to better explain the various terms used in your report of analytical results from the Laboratory. This is not intended as a comprehensive explanation, and if you have additional questions please contact your project representative.

Results Disclaimer - Information that may be provided by the customer, and contained within this report, include Permit Limits, Project Name, Sample ID, Sample Matrix, Sample Preservation, Field Blanks, Field Spikes, Field Duplicates, On-Site Data, Sampling Collection Dates/Times, and Sampling Location. Results relate to the accuracy of this information provided, and as the samples are received.

Abbreviations and Definitions

DL	Detection Limit.
LOD	Limit of Detection.
LOQ	Limit of Quantitation.
Rec.	Recovery.
RPD	Relative Percent Difference.
SDG	Sample Delivery Group.
(S)	Surrogate (Surrogate Standard) - Analytes added to every blank, sample, Laboratory Control Sample/Duplicate and Matrix Spike/Duplicate; used to evaluate analytical efficiency by measuring recovery. Surrogates are not expected to be detected in all environmental media.
Analyte	The name of the particular compound or analysis performed. Some Analyses and Methods will have multiple analytes reported.
Dilution	If the sample matrix contains an interfering material, the sample preparation volume or weight values differ from the standard, or if concentrations of analytes in the sample are higher than the highest limit of concentration that the laboratory can accurately report, the sample may be diluted for analysis. If a value different than 1 is used in this field, the result reported has already been corrected for this factor.
Limits	These are the target % recovery ranges or % difference value that the laboratory has historically determined as normal for the method and analyte being reported. Successful QC Sample analysis will target all analytes recovered or duplicated within these ranges.
Qualifier	This column provides a letter and/or number designation that corresponds to additional information concerning the result reported. If a Qualifier is present, a definition per Qualifier is provided within the Glossary and Definitions page and potentially a discussion of possible implications of the Qualifier in the Case Narrative if applicable.
Result	The actual analytical final result (corrected for any sample specific characteristics) reported for your sample. If there was no measurable result returned for a specific analyte, the result in this column may state “ND” (Not Detected) or “BDL” (Below Detectable Levels). The information in the results column should always be accompanied by either an MDL (Method Detection Limit) or RDL (Reporting Detection Limit) that defines the lowest value that the laboratory could detect or report for this analyte.
Uncertainty (Radiochemistry)	Confidence level of 2 sigma.
Case Narrative (Cn)	A brief discussion about the included sample results, including a discussion of any non-conformances to protocol observed either at sample receipt by the laboratory from the field or during the analytical process. If present, there will be a section in the Case Narrative to discuss the meaning of any data qualifiers used in the report.
Quality Control Summary (Qc)	This section of the report includes the results of the laboratory quality control analyses required by procedure or analytical methods to assist in evaluating the validity of the results reported for your samples. These analyses are not being performed on your samples typically, but on laboratory generated material.
Sample Chain of Custody (Sc)	This is the document created in the field when your samples were initially collected. This is used to verify the time and date of collection, the person collecting the samples, and the analyses that the laboratory is requested to perform. This chain of custody also documents all persons (excluding commercial shippers) that have had control or possession of the samples from the time of collection until delivery to the laboratory for analysis.
Sample Results (Sr)	This section of your report will provide the results of all testing performed on your samples. These results are provided by sample ID and are separated by the analyses performed on each sample. The header line of each analysis section for each sample will provide the name and method number for the analysis reported.
Sample Summary (Ss)	This section of the Analytical Report defines the specific analyses performed for each sample ID, including the dates and times of preparation and/or analysis.

Qualifier	Description
B	The same analyte is found in the associated blank.
J	The identification of the analyte is acceptable; the reported value is an estimate.
U	Below Detectable Limits: Indicates that the analyte was not detected.

ACCREDITATIONS & LOCATIONS

Pace Analytical National 12065 Lebanon Rd Mount Juliet, TN 37122

Alabama	40660	Nebraska	NE-OS-15-05
Alaska	17-026	Nevada	TN000032021-1
Arizona	AZ0612	New Hampshire	2975
Arkansas	88-0469	New Jersey–NELAP	TN002
California	2932	New Mexico [1]	TN00003
Colorado	TN00003	New York	11742
Connecticut	PH-0197	North Carolina	Env375
Florida	E87487	North Carolina [1]	DW21704
Georgia	NELAP	North Carolina [3]	41
Georgia [1]	923	North Dakota	R-140
Idaho	TN00003	Ohio–VAP	CL0069
Illinois	200008	Oklahoma	9915
Indiana	C-TN-01	Oregon	TN200002
Iowa	364	Pennsylvania	68-02979
Kansas	E-10277	Rhode Island	LAO000356
Kentucky [1 6]	KY90010	South Carolina	84004002
Kentucky [2]	16	South Dakota	n/a
Louisiana	AI30792	Tennessee [1 4]	2006
Louisiana	LA018	Texas	T104704245-20-18
Maine	TN00003	Texas [5]	LAB0152
Maryland	324	Utah	TN000032021-11
Massachusetts	M-TN003	Vermont	VT2006
Michigan	9958	Virginia	110033
Minnesota	047-999-395	Washington	C847
Mississippi	TN00003	West Virginia	233
Missouri	340	Wisconsin	998093910
Montana	CERT0086	Wyoming	A2LA
A2LA – ISO 17025	1461.01	AIHA-LAP,LLC EMLAP	100789
A2LA – ISO 17025 [5]	1461.02	DOD	1461.01
Canada	1461.01	USDA	P330-15-00234
EPA–Crypto	TN00003		

[1] Drinking Water [2] Underground Storage Tanks [3] Aquatic Toxicity [4] Chemical/Microbiological [5] Mold [6] Wastewater n/a Accreditation not applicable

* Not all certifications held by the laboratory are applicable to the results reported in the attached report.

* Accreditation is only applicable to the test methods specified on each scope of accreditation held by Pace Analytical.

Company Name/Address:
Pace Analytical - West Columbia, SC

106 Vantage Point Dr.
West Columbia, SC 29172

Billing Information:
PM
106 Vantage Point Dr.
West Columbia, SC 29172

Report To:
Kathy Smith

Email To:
kathy.smith@pacelabs.com

Project Description: CRCA - AIR

City/State Collected: Kennedy Space Center, FL

Please Circle: PT MT CT (ET)

Phone: 321-636-6470

Client Project # 1126-08970

Lab Project # PACEWCSC-TETRATECHFL

Collected by (print): KYLE HOARD

Site/Facility ID # KSC-CRCA

P.O. #

Collected by (signature):

Rush? (Lab MUST Be Notified)
___ Same Day ___ Three Day
___ Next Day ___ Five Day
___ Two Day

Date Results Needed

Sample ID	Can #	Flow Cont. #	Collection Date	Collection Time	Canister Pressure/Vacuum Initial	Canister Pressure/Vacuum Final
CRLA-AMB03-20221101	021149	020130	11-01-22	0745 1305	-30 inHg	0

Analysis: DO-TO-15 Summa: X

Chain of Custody Page ___ of ___

Pace
PEOPLE ADVANCING SCIENCE
MT JULIET, TN
12065 Lebanon Road Mt Juliet, TN 37122
Phone: 615-758-5858 Alt: 800-767-5859
Submitting a sample via this chain of custody constitutes acknowledgment and acceptance of the Pace Terms and Conditions found at: https://info.pacelabs.com/hubfs/pas-standard-terms.pdf

SDG # L1553021

B118

Acctnum: PACEWCSC
Template: T218935
Prelogin: P960190
PM: 464 - Nancy McLain
PB: CSC-10/20/22

Shipped Via: FedEX Priority

Rem./Contaminant	Sample # (lab only)
	-01

Sample Receipt Checklist
COC Seal Present/Intact: Y N
COC Signed/Accurate: Y N
Bottles arrive intact: Y N
Correct bottles used: Y N
Sufficient volume sent: Y N
RAD Screen <0.5 mR/hr: Y N
If Applicable
VOA Zero Headspace: Y N
Pres.Correct/Check: Y N

Remarks:
For Chuck Sorden - TetraTech - reporting through Pace-SC.

Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
	11-1-2022	1600	
Relinquished by : (Signature)	Date:	Time:	Received by: (Signature)
Relinquished by : (Signature)	Date:	Time:	Received for lab by: (Signature)
			Date: 11.2.22 Time: 0900

Samples returned via: __ UPS __ FedEx __ Courier _____
Tracking #
Hold #
Condition: (lab use only)
COC Seal Intact: ___Y ___N ___NA
NCF:

Chain of Custody

Workorder: XJ31007a Workorder Name: NASA CRCA Owner Received Date: 11/2/2022 Results Requested By: 11/16/202

Report To:	Subcontract To:	Requested Analysis
Kathy E. Smith	Project #	
Pace Analytical		
106 Vantage Point Drive	Pace National	
Columbia SC, 29223		
803-227-2704		
Kathy.Smith@pacelabs.com		

						Preserved Containers																							
Item	Sample ID	Sample Type	Collect Date/Time	Lab ID	Matrix							TO-15 - DOD																	LAB US
1																													
2	CRCA-AMB03-20221101	grab	11/01/2022 @ 1305	XJ31007-007	Air							x																	
3																													
4																													
5																													
6																													
7																													
8																													
9																													
10																													

Transfers	Released By	Date/Time	Reveived By	Date/Time	Comments
1					
2					
3					

Cooler Temperature on Receipt _____ °C	Custody Seal Y or N	Received on Ice Y or N	Sample Intact Y or N

***In order to maintain client confidentiality, location/name of the sampling site, sampler's name and signature may not be provided on this COC
This chain of custody is considered complete as is since this information is available in the owner laboratory.

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Alex Murphy

Project Name: NASA KSC

Project Number: 112G09581

Lot Number:**XJ29006**

Date Completed:11/22/2022

Kathy Smith

11/22/2022 6:31 PM
Approved and released by:
Project Manager II: **Kathy E. Smith**

The electronic signature above is the equivalent of a handwritten signature.

Case Narrative
Tetra Tech
Lot Number: XJ29006

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report. Where sampling is conducted by the client, results relate to the accuracy of the information provided, and as the samples are received.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Additionally, the DoD QSM version 5.4 has been followed for these samples. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs, the DoD QSM, or policies are qualified on the results page or discussed below.

Pace is a DoD/DOE accredited laboratory; however, the following analyses are currently not listed on our DoD/DOE scope of accreditation: Drinking Water: pH EPA 150.1, Turbidity EPA 18.01, Metals EPA 200.7 & 200.8, Mercury EPA 245.1, Anions EPA 300.0, Cyanide EPA 335.4, Nitrates EPA 353.2, Orthophosphate & Phosphorus EPA 365.1, EDB/DBCP EPA 504.1, HPC SIMPLATE, Color SM 2120 B-2011, Alkalinity SM 2320 B-2011, Specific Conductance SM 2510 B-2011, Residue-filterable (TDS) SM 2540 C, Calcium Hardness (CaCO2) SM 3500-Ca B-2011, TRC SM 4500 Cl G-2011, pH SM 4500 H=B-2011, E.Coli, Total Coliform; Non-Potable Water: Metals EPA 200.7, Strontium EPA 200.8, Chlorate EPA 300.0, Cyanide EPA 335.4, Phenolics EPA 420.4, 2-Methyl-4,6-Dinitrophenol EPA 625.1, Propane RSK-175, Specific Conductance SM 2510 B-2011, Salinity SM250 B, Residue- total SM 2540 B, Sulfite SM 4500 SO32- B-2011, Amenable Cyanide SM 4500-CN- G-2011, BOD & CBOD SM 5210 B, MBAS SM 5540 C-2011; Solid and Chemical Materials: Boron & Titanium SW-846 6010D, Boron, Molybdenum, & Titanium SW-846 6020B, Alcohols & Glycols SW-846 8015C, Pentachlorophenol SW-846 8151A, Ethyl Acetate, Hexane, & n-Hexane SW-846 8260D, SVOC 1,4-Dioxane, 3&4-Methylphenols, 4-Dimethyl aminoazobenzene, 1,4-Naphthoquinone, 3,5-Dinitroaniline, PETN SW-846 8270E, Amenable Cyanide SW-846 9012B; Boron & Titanium SW-846 6010D, Molybdenum SW-846 6020B, Ethylene Glycol SW-846 8015B, Pentachlorophenol SW-846 8151A, Chloroprene SW-846 8260B, SVOC 1,3,5-Trinitrobenzene, 1,4-Dioxane, 1,4-Naphthoquinone, 1,4-Phenylenediamine, 2,5-Dinitrotoluene, 2,6-Dinitrotoluene, 3-Methylcholanthrene, 4- Aminobiphenyl, 4-Dimethyl aminoazobenzene, 4-Nitroquinoline-1-oxide, 7,12- Dimethylbenzo(a)anthracene, Chlorobenzilate, Diallate, Ethyl methanesulfonate, Isodrin, Isosafrole, Methyl methanesulfonate, n-Nitrosomethylethylamine, n-Nitrosomorpholine, n-Nitrosopiperidine, Piperonyl butoxide, Pronamide, Safrole, 3,5-Dinitroaniline, PETN SW-846 8270E, Oil & Grease SW-846 9071B.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Volatiles
Reanalysis of the following sample was performed outside of the analytical holding time for Acetone which failed below CCV criteria during analysis: XJ29006-001.

Manual Integration Summary

Tetra Tech

Lot Number: XJ29006

Project Name: NASA KSC

Project Number: 112G09581

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
8260D	XJ29006-001	1	Vinyl chloride	M-03
8260D	XJ29006-003	1	Acetone	M-03
8260D	XQ59528-002	1	Methyl acetate	M-03
8260D	XQ60535-002	1	Methyl acetate	M-03
8260D	XQ59671-002	1	Methyl acetate	M-03
8260D	XQ59746-002	1	Methyl acetate	M-03
8260D	XQ59746-003	1	Methyl acetate	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Sample Summary

Tetra Tech

Lot Number: XJ29006

Project Name: NASA KSC

Project Number: 112G09581

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	CRCA-MW0018-058.0-20221026	Aqueous	10/26/2022 1050	10/29/2022
002	CRCA-MW0031-058.0-20221027	Aqueous	10/27/2022 1440	10/29/2022
003	CRCA-MW0019-058.0-20221028	Aqueous	10/28/2022 1355	10/29/2022
004	CRCA-MW0032-058.0-20221028	Aqueous	10/28/2022 1455	10/29/2022

(4 samples)

Detection Summary

Tetra Tech

Lot Number: XJ29006

Project Name: NASA KSC

Project Number: 112G09581

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	CRCA-MW0018-058.0-20221026	Aqueous	Vinyl chloride	8260D	26	M-03	ug/L	8
001	CRCA-MW0018-058.0-20221026	Aqueous	Acetone	8260D	18	HJ	ug/L	9
002	CRCA-MW0031-058.0-20221027	Aqueous	Acetone	8260D	7.4	J	ug/L	11
002	CRCA-MW0031-058.0-20221027	Aqueous	Vinyl chloride	8260D	5.3		ug/L	12
003	CRCA-MW0019-058.0-20221028	Aqueous	Acetone	8260D	9.5	JM-03	ug/L	13
003	CRCA-MW0019-058.0-20221028	Aqueous	Vinyl chloride	8260D	0.46	J	ug/L	14
004	CRCA-MW0032-058.0-20221028	Aqueous	Acetone	8260D	14	J	ug/L	15
004	CRCA-MW0032-058.0-20221028	Aqueous	Chloroethane	8260D	1.9	J	ug/L	15
004	CRCA-MW0032-058.0-20221028	Aqueous	Vinyl chloride	8260D	9.2		ug/L	16

(9 detections)

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29006-001

Description: CRCA-MW0018-058.0-20221026 | Matrix: Aqueous

Date Sampled: 10/26/2022 1050 | Project Name: NASA KSC

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/09/2022 0245	JMM2		59528
2	5030B	8260D	1	11/18/2022 2056	JM1		60535

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	13	J	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29006-001

Description: CRCA-MW0018-058.0-20221026 | Matrix: Aqueous

Date Sampled: 10/26/2022 1050 | Project Name: NASA KSC

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/09/2022 0245	JMM2		59528
2	5030B	8260D	1	11/18/2022 2056	JM1		60535

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	26	M-03	1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		106	81-118	H	104	81-118
Bromofluorobenzene		96	85-114	H	97	85-114
Toluene-d8		105	89-112	H	104	89-112
Dibromofluoromethane		101	80-119	H	103	80-119

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29006-001

Description: CRCA-MW0018-058.0-20221026 | Matrix: Aqueous

Date Sampled: 10/26/2022 1050 | Project Name: NASA KSC

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/09/2022 0245	JMM2		59528
2	5030B	8260D	1	11/18/2022 2056	JM1		60535

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	18	HJ	20	10	5.0	ug/L	2
Benzene	71-43-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromodichloromethane	75-27-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromoform	75-25-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	UH	2.0	0.80	0.40	ug/L	2
2-Butanone (MEK)	78-93-3	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Carbon disulfide	75-15-0	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Carbon tetrachloride	56-23-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chlorobenzene	108-90-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chloroethane	75-00-3	8260D	0.80	UH	2.0	0.80	0.40	ug/L	2
Chloroform	67-66-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	UH	2.0	1.0	0.50	ug/L	2
Cyclohexane	110-82-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Dibromochloromethane	124-48-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichlorobenzene	95-50-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,3-Dichlorobenzene	541-73-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,4-Dichlorobenzene	106-46-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Dichlorodifluoromethane	75-71-8	8260D	1.2	UH	2.0	1.2	0.60	ug/L	2
1,1-Dichloroethane	75-34-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichloroethane	107-06-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1-Dichloroethene	75-35-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,2-Dichloropropane	78-87-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Ethylbenzene	100-41-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
2-Hexanone	591-78-6	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Isopropylbenzene	98-82-8	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Methyl acetate	79-20-9	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
4-Methyl-2-pentanone	108-10-1	8260D	4.0	UH	10	4.0	2.0	ug/L	2
Methylcyclohexane	108-87-2	8260D	0.80	UH	5.0	0.80	0.40	ug/L	2
Methylene chloride	75-09-2	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Styrene	100-42-5	8260D	0.82	UH	1.0	0.82	0.41	ug/L	2
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Tetrachloroethene	127-18-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Toluene	108-88-3	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	UH	1.0	0.84	0.42	ug/L	2
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
1,1,1-Trichloroethane	71-55-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29006-001

Description: CRCA-MW0018-058.0-20221026 | Matrix: Aqueous

Date Sampled: 10/26/2022 1050 | Project Name: NASA KSC

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/09/2022 0245	JMM2		59528
2	5030B	8260D	1	11/18/2022 2056	JM1		60535

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
1,1,2-Trichloroethane	79-00-5	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Trichloroethene	79-01-6	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Trichlorofluoromethane	75-69-4	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2
Vinyl chloride	75-01-4	8260D	23	H	1.0	0.80	0.40	ug/L	2
Xylenes (total)	1330-20-7	8260D	0.80	UH	1.0	0.80	0.40	ug/L	2

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		106	81-118	H	104	81-118
Bromofluorobenzene		96	85-114	H	97	85-114
Toluene-d8		105	89-112	H	104	89-112
Dibromofluoromethane		101	80-119	H	103	80-119

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29006-002

Description: CRCA-MW0031-058.0-20221027 | Matrix: Aqueous

Date Sampled: 10/27/2022 1440 | Project Name: NASA KSC

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/10/2022 0319	JMM2		59671

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	7.4	J	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29006-002

Description: CRCA-MW0031-058.0-20221027 | Matrix: Aqueous

Date Sampled: 10/27/2022 1440 | Project Name: NASA KSC

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/10/2022 0319	JMM2		59671

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	5.3		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		104	81-118
Bromofluorobenzene		94	85-114
Toluene-d8		101	89-112
Dibromofluoromethane		102	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29006-003

Description: CRCA-MW0019-058.0-20221028 | Matrix: Aqueous

Date Sampled: 10/28/2022 1355 | Project Name: NASA KSC

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/10/2022 1652	CDA		59746

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	9.5	JM-03	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29006-003

Description: CRCA-MW0019-058.0-20221028 | Matrix: Aqueous

Date Sampled: 10/28/2022 1355 | Project Name: NASA KSC

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/10/2022 1652	CDA		59746

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	0.46	J	1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		107	81-118
Bromofluorobenzene		95	85-114
Toluene-d8		103	89-112
Dibromofluoromethane		101	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29006-004

Description: CRCA-MW0032-058.0-20221028 | Matrix: Aqueous

Date Sampled: 10/28/2022 1455 | Project Name: NASA KSC

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/10/2022 1716	CDA		59746

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	14	J	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	1.9	J	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | B = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | J = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

H = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29006-004

Description: CRCA-MW0032-058.0-20221028 | Matrix: Aqueous

Date Sampled: 10/28/2022 1455 | Project Name: NASA KSC

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/10/2022 1716	CDA		59746

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	9.2		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		95	81-118
Bromofluorobenzene		87	85-114
Toluene-d8		95	89-112
Dibromofluoromethane		93	80-119

LOQ = Limit of Quantitation	B = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	J = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
H = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection		S = MS/MSD failure

Pace Analytical Services, LLC *(formerly Shealy Environmental Services, Inc.)*
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

QC Summary

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ59528-001
Batch: 59528
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	11/09/2022 0117
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	11/09/2022 0117
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	11/09/2022 0117
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	11/09/2022 0117
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	11/09/2022 0117
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	11/09/2022 0117
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	11/09/2022 0117
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	11/09/2022 0117
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	11/09/2022 0117
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	11/09/2022 0117
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	11/09/2022 0117
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ59528-001
Batch: 59528
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 0117

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		107	81-118
Bromofluorobenzene		97	85-114
Toluene-d8		104	89-112
Dibromofluoromethane		103	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ59528-002
Batch: 59528
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	69		1	69	39-160	11/08/2022 2311
Benzene	50	49		1	98	79-120	11/08/2022 2311
Bromodichloromethane	50	49		1	98	79-125	11/08/2022 2311
Bromoform	50	49		1	98	66-130	11/08/2022 2311
Bromomethane (Methyl bromide)	50	53		1	106	53-141	11/08/2022 2311
2-Butanone (MEK)	100	99		1	99	56-143	11/08/2022 2311
Carbon disulfide	50	49		1	99	64-133	11/08/2022 2311
Carbon tetrachloride	50	51		1	102	72-136	11/08/2022 2311
Chlorobenzene	50	49		1	97	82-118	11/08/2022 2311
Chloroethane	50	52		1	103	60-138	11/08/2022 2311
Chloroform	50	48		1	95	79-124	11/08/2022 2311
Chloromethane (Methyl chloride)	50	57		1	114	50-139	11/08/2022 2311
Cyclohexane	50	52		1	104	71-130	11/08/2022 2311
1,2-Dibromo-3-chloropropane (DBCP)	50	54		1	107	62-128	11/08/2022 2311
Dibromochloromethane	50	51		1	102	74-126	11/08/2022 2311
1,2-Dibromoethane (EDB)	50	51		1	101	77-121	11/08/2022 2311
1,2-Dichlorobenzene	50	49		1	99	80-119	11/08/2022 2311
1,3-Dichlorobenzene	50	49		1	98	80-119	11/08/2022 2311
1,4-Dichlorobenzene	50	48		1	96	79-118	11/08/2022 2311
Dichlorodifluoromethane	50	68		1	136	32-152	11/08/2022 2311
1,1-Dichloroethane	50	49		1	99	77-125	11/08/2022 2311
1,2-Dichloroethane	50	50		1	100	73-128	11/08/2022 2311
1,1-Dichloroethene	50	53		1	105	71-131	11/08/2022 2311
cis-1,2-Dichloroethene	50	48		1	96	78-123	11/08/2022 2311
trans-1,2-Dichloroethene	50	47		1	95	75-124	11/08/2022 2311
1,2-Dichloropropane	50	50		1	100	78-122	11/08/2022 2311
cis-1,3-Dichloropropene	50	53		1	107	75-124	11/08/2022 2311
trans-1,3-Dichloropropene	50	54		1	108	73-127	11/08/2022 2311
Ethylbenzene	50	51		1	102	79-121	11/08/2022 2311
2-Hexanone	100	110		1	115	57-139	11/08/2022 2311
Isopropylbenzene	50	54		1	107	72-131	11/08/2022 2311
Methyl acetate	50	47	M-03	1	94	56-136	11/08/2022 2311
Methyl tertiary butyl ether (MTBE)	50	47		1	93	71-124	11/08/2022 2311
4-Methyl-2-pentanone	100	110		1	112	67-130	11/08/2022 2311
Methylcyclohexane	50	52		1	104	72-132	11/08/2022 2311
Methylene chloride	50	53		1	106	74-124	11/08/2022 2311
Styrene	50	53		1	107	78-123	11/08/2022 2311
1,1,2,2-Tetrachloroethane	50	51		1	103	71-121	11/08/2022 2311
Tetrachloroethene	50	49		1	99	74-129	11/08/2022 2311
Toluene	50	51		1	102	80-121	11/08/2022 2311
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	53		1	105	70-136	11/08/2022 2311
1,2,4-Trichlorobenzene	50	51		1	101	69-130	11/08/2022 2311
1,1,1-Trichloroethane	50	52		1	104	74-131	11/08/2022 2311
1,1,2-Trichloroethane	50	50		1	101	80-119	11/08/2022 2311

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ59528-002
Batch: 59528
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	48		1	95	79-123	11/08/2022 2311
Trichlorofluoromethane	50	60		1	120	65-141	11/08/2022 2311
Vinyl chloride	50	55		1	111	58-137	11/08/2022 2311
Xylenes (total)	100	100		1	104	79-121	11/08/2022 2311

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		106	81-118
Bromofluorobenzene		107	85-114
Toluene-d8		109	89-112
Dibromofluoromethane		106	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ59671-001
Batch: 59671
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	11/09/2022 1957
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	11/09/2022 1957
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	11/09/2022 1957
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	11/09/2022 1957
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	11/09/2022 1957
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	11/09/2022 1957
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	11/09/2022 1957
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	11/09/2022 1957
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	11/09/2022 1957
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	11/09/2022 1957
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	11/09/2022 1957
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ59671-001
Batch: 59671
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		105	81-118
Bromofluorobenzene		100	85-114
Toluene-d8		104	89-112
Dibromofluoromethane		100	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ59671-002
Batch: 59671
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	100		1	100	39-160	11/09/2022 1851
Benzene	50	50		1	100	79-120	11/09/2022 1851
Bromodichloromethane	50	52		1	103	79-125	11/09/2022 1851
Bromoform	50	52		1	104	66-130	11/09/2022 1851
Bromomethane (Methyl bromide)	50	51		1	102	53-141	11/09/2022 1851
2-Butanone (MEK)	100	110		1	115	56-143	11/09/2022 1851
Carbon disulfide	50	54		1	109	64-133	11/09/2022 1851
Carbon tetrachloride	50	55		1	109	72-136	11/09/2022 1851
Chlorobenzene	50	49		1	98	82-118	11/09/2022 1851
Chloroethane	50	50		1	101	60-138	11/09/2022 1851
Chloroform	50	50		1	99	79-124	11/09/2022 1851
Chloromethane (Methyl chloride)	50	54		1	107	50-139	11/09/2022 1851
Cyclohexane	50	56		1	111	71-130	11/09/2022 1851
1,2-Dibromo-3-chloropropane (DBCP)	50	57		1	113	62-128	11/09/2022 1851
Dibromochloromethane	50	54		1	108	74-126	11/09/2022 1851
1,2-Dibromoethane (EDB)	50	50		1	100	77-121	11/09/2022 1851
1,2-Dichlorobenzene	50	51		1	101	80-119	11/09/2022 1851
1,3-Dichlorobenzene	50	50		1	101	80-119	11/09/2022 1851
1,4-Dichlorobenzene	50	49		1	98	79-118	11/09/2022 1851
Dichlorodifluoromethane	50	59		1	117	32-152	11/09/2022 1851
1,1-Dichloroethane	50	52		1	104	77-125	11/09/2022 1851
1,2-Dichloroethane	50	51		1	103	73-128	11/09/2022 1851
1,1-Dichloroethene	50	56		1	111	71-131	11/09/2022 1851
cis-1,2-Dichloroethene	50	50		1	100	78-123	11/09/2022 1851
trans-1,2-Dichloroethene	50	50		1	100	75-124	11/09/2022 1851
1,2-Dichloropropane	50	51		1	102	78-122	11/09/2022 1851
cis-1,3-Dichloropropene	50	55		1	110	75-124	11/09/2022 1851
trans-1,3-Dichloropropene	50	56		1	113	73-127	11/09/2022 1851
Ethylbenzene	50	53		1	105	79-121	11/09/2022 1851
2-Hexanone	100	120		1	120	57-139	11/09/2022 1851
Isopropylbenzene	50	57		1	114	72-131	11/09/2022 1851
Methyl acetate	50	46	M-03	1	93	56-136	11/09/2022 1851
Methyl tertiary butyl ether (MTBE)	50	51		1	101	71-124	11/09/2022 1851
4-Methyl-2-pentanone	100	110		1	109	67-130	11/09/2022 1851
Methylcyclohexane	50	56		1	112	72-132	11/09/2022 1851
Methylene chloride	50	53		1	107	74-124	11/09/2022 1851
Styrene	50	54		1	109	78-123	11/09/2022 1851
1,1,2,2-Tetrachloroethane	50	52		1	104	71-121	11/09/2022 1851
Tetrachloroethene	50	52		1	104	74-129	11/09/2022 1851
Toluene	50	52		1	105	80-121	11/09/2022 1851
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	56		1	111	70-136	11/09/2022 1851
1,2,4-Trichlorobenzene	50	53		1	106	69-130	11/09/2022 1851
1,1,1-Trichloroethane	50	56		1	111	74-131	11/09/2022 1851
1,1,2-Trichloroethane	50	51		1	101	80-119	11/09/2022 1851

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ59671-002
Batch: 59671
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	49		1	98	79-123	11/09/2022 1851
Trichlorofluoromethane	50	60		1	120	65-141	11/09/2022 1851
Vinyl chloride	50	53		1	107	58-137	11/09/2022 1851
Xylenes (total)	100	110		1	108	79-121	11/09/2022 1851

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		100	81-118
Bromofluorobenzene		102	85-114
Toluene-d8		105	89-112
Dibromofluoromethane		103	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ59746-001
Batch: 59746
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	11/10/2022 1136
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	11/10/2022 1136
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	11/10/2022 1136
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	11/10/2022 1136
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	11/10/2022 1136
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	11/10/2022 1136
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	11/10/2022 1136
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	11/10/2022 1136
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	11/10/2022 1136
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	11/10/2022 1136
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	11/10/2022 1136
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ59746-001
Batch: 59746
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	11/10/2022 1136

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		103	81-118
Bromofluorobenzene		97	85-114
Toluene-d8		103	89-112
Dibromofluoromethane		101	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ59746-002
Batch: 59746
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	88		1	88	39-160	11/10/2022 0933
Benzene	50	52		1	103	79-120	11/10/2022 0933
Bromodichloromethane	50	51		1	103	79-125	11/10/2022 0933
Bromoform	50	52		1	104	66-130	11/10/2022 0933
Bromomethane (Methyl bromide)	50	52		1	105	53-141	11/10/2022 0933
2-Butanone (MEK)	100	110		1	111	56-143	11/10/2022 0933
Carbon disulfide	50	55		1	110	64-133	11/10/2022 0933
Carbon tetrachloride	50	53		1	105	72-136	11/10/2022 0933
Chlorobenzene	50	50		1	100	82-118	11/10/2022 0933
Chloroethane	50	52		1	103	60-138	11/10/2022 0933
Chloroform	50	51		1	101	79-124	11/10/2022 0933
Chloromethane (Methyl chloride)	50	55		1	110	50-139	11/10/2022 0933
Cyclohexane	50	54		1	108	71-130	11/10/2022 0933
1,2-Dibromo-3-chloropropane (DBCP)	50	60		1	120	62-128	11/10/2022 0933
Dibromochloromethane	50	53		1	106	74-126	11/10/2022 0933
1,2-Dibromoethane (EDB)	50	52		1	104	77-121	11/10/2022 0933
1,2-Dichlorobenzene	50	52		1	103	80-119	11/10/2022 0933
1,3-Dichlorobenzene	50	51		1	101	80-119	11/10/2022 0933
1,4-Dichlorobenzene	50	50		1	100	79-118	11/10/2022 0933
Dichlorodifluoromethane	50	61		1	123	32-152	11/10/2022 0933
1,1-Dichloroethane	50	52		1	104	77-125	11/10/2022 0933
1,2-Dichloroethane	50	53		1	106	73-128	11/10/2022 0933
1,1-Dichloroethene	50	58		1	116	71-131	11/10/2022 0933
cis-1,2-Dichloroethene	50	51		1	103	78-123	11/10/2022 0933
trans-1,2-Dichloroethene	50	52		1	103	75-124	11/10/2022 0933
1,2-Dichloropropane	50	53		1	105	78-122	11/10/2022 0933
cis-1,3-Dichloropropene	50	56		1	111	75-124	11/10/2022 0933
trans-1,3-Dichloropropene	50	57		1	113	73-127	11/10/2022 0933
Ethylbenzene	50	54		1	108	79-121	11/10/2022 0933
2-Hexanone	100	120		1	120	57-139	11/10/2022 0933
Isopropylbenzene	50	57		1	115	72-131	11/10/2022 0933
Methyl acetate	50	52	EM-03	1	104	56-136	11/10/2022 0933
Methyl tertiary butyl ether (MTBE)	50	50		1	101	71-124	11/10/2022 0933
4-Methyl-2-pentanone	100	120		1	118	67-130	11/10/2022 0933
Methylcyclohexane	50	54		1	108	72-132	11/10/2022 0933
Methylene chloride	50	58		1	117	74-124	11/10/2022 0933
Styrene	50	55		1	110	78-123	11/10/2022 0933
1,1,2,2-Tetrachloroethane	50	55		1	109	71-121	11/10/2022 0933
Tetrachloroethene	50	52		1	104	74-129	11/10/2022 0933
Toluene	50	53		1	106	80-121	11/10/2022 0933
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	55		1	109	70-136	11/10/2022 0933
1,2,4-Trichlorobenzene	50	56		1	112	69-130	11/10/2022 0933
1,1,1-Trichloroethane	50	55		1	111	74-131	11/10/2022 0933
1,1,2-Trichloroethane	50	52		1	105	80-119	11/10/2022 0933

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ59746-002
Batch: 59746
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	50		1	99	79-123	11/10/2022 0933
Trichlorofluoromethane	50	58		1	115	65-141	11/10/2022 0933
Vinyl chloride	50	53		1	106	58-137	11/10/2022 0933
Xylenes (total)	100	110		1	110	79-121	11/10/2022 0933

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		99	81-118
Bromofluorobenzene		97	85-114
Toluene-d8		99	89-112
Dibromofluoromethane		100	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCSD

Sample ID: XQ59746-003
Batch: 59746
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
Acetone	100	74		1	74	17	39-160	20	11/10/2022 1945
Benzene	50	51		1	102	1.8	79-120	20	11/10/2022 1945
Bromodichloromethane	50	52		1	104	1.1	79-125	20	11/10/2022 1945
Bromoform	50	48		1	96	7.5	66-130	20	11/10/2022 1945
Bromomethane (Methyl bromide)	50	49		1	97	7.1	53-141	20	11/10/2022 1945
2-Butanone (MEK)	100	110		1	105	5.3	56-143	20	11/10/2022 1945
Carbon disulfide	50	51		1	101	8.2	64-133	20	11/10/2022 1945
Carbon tetrachloride	50	55		1	109	3.9	72-136	20	11/10/2022 1945
Chlorobenzene	50	49		1	98	2.2	82-118	20	11/10/2022 1945
Chloroethane	50	50		1	100	3.1	60-138	20	11/10/2022 1945
Chloroform	50	50		1	100	1.0	79-124	20	11/10/2022 1945
Chloromethane (Methyl chloride)	50	53		1	105	4.6	50-139	20	11/10/2022 1945
Cyclohexane	50	56		1	112	3.7	71-130	20	11/10/2022 1945
1,2-Dibromo-3-chloropropane (DBCP)	50	53		1	106	12	62-128	20	11/10/2022 1945
Dibromochloromethane	50	52		1	104	2.1	74-126	20	11/10/2022 1945
1,2-Dibromoethane (EDB)	50	51		1	103	1.5	77-121	20	11/10/2022 1945
1,2-Dichlorobenzene	50	49		1	99	4.3	80-119	20	11/10/2022 1945
1,3-Dichlorobenzene	50	49		1	97	4.0	80-119	20	11/10/2022 1945
1,4-Dichlorobenzene	50	48		1	95	4.6	79-118	20	11/10/2022 1945
Dichlorodifluoromethane	50	64		1	128	4.1	32-152	20	11/10/2022 1945
1,1-Dichloroethane	50	53		1	105	1.0	77-125	20	11/10/2022 1945
1,2-Dichloroethane	50	52		1	104	1.6	73-128	20	11/10/2022 1945
1,1-Dichloroethene	50	52		1	105	11	71-131	20	11/10/2022 1945
cis-1,2-Dichloroethene	50	50		1	101	2.3	78-123	20	11/10/2022 1945
trans-1,2-Dichloroethene	50	50		1	101	2.4	75-124	20	11/10/2022 1945
1,2-Dichloropropane	50	51		1	101	3.9	78-122	20	11/10/2022 1945
cis-1,3-Dichloropropene	50	54		1	108	3.5	75-124	20	11/10/2022 1945
trans-1,3-Dichloropropene	50	54		1	107	5.1	73-127	20	11/10/2022 1945
Ethylbenzene	50	53		1	105	2.2	79-121	20	11/10/2022 1945
2-Hexanone	100	120		1	116	3.3	57-139	20	11/10/2022 1945
Isopropylbenzene	50	56		1	112	2.6	72-131	20	11/10/2022 1945
Methyl acetate	50	49	M-03	1	98	6.0	56-136	20	11/10/2022 1945
Methyl tertiary butyl ether (MTBE)	50	50		1	99	1.4	71-124	20	11/10/2022 1945
4-Methyl-2-pentanone	100	110		1	114	2.9	67-130	20	11/10/2022 1945
Methylcyclohexane	50	56		1	111	3.0	72-132	20	11/10/2022 1945
Methylene chloride	50	52		1	104	12	74-124	20	11/10/2022 1945
Styrene	50	54		1	108	2.0	78-123	20	11/10/2022 1945
1,1,2,2-Tetrachloroethane	50	52		1	104	5.0	71-121	20	11/10/2022 1945
Tetrachloroethene	50	51		1	102	1.4	74-129	20	11/10/2022 1945
Toluene	50	53		1	106	0.68	80-121	20	11/10/2022 1945
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	54		1	109	0.48	70-136	20	11/10/2022 1945
1,2,4-Trichlorobenzene	50	48		1	97	14	69-130	20	11/10/2022 1945
1,1,1-Trichloroethane	50	54		1	109	1.8	74-131	20	11/10/2022 1945
1,1,2-Trichloroethane	50	51		1	102	2.8	80-119	20	11/10/2022 1945

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCSD

Sample ID: XQ59746-003
Batch: 59746
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	% RPD	%Rec Limit	% RPD Limit	Analysis Date
Trichloroethene	50	50		1	100	0.95	79-123	20	11/10/2022 1945
Trichlorofluoromethane	50	58		1	115	0.019	65-141	20	11/10/2022 1945
Vinyl chloride	50	53		1	107	0.46	58-137	20	11/10/2022 1945
Xylenes (total)	100	110		1	106	3.8	79-121	20	11/10/2022 1945

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		92	81-118
Bromofluorobenzene		91	85-114
Toluene-d8		94	89-112
Dibromofluoromethane		92	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ60535-001
Batch: 60535
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	11/18/2022 1345
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	11/18/2022 1345
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	11/18/2022 1345
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	11/18/2022 1345
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	11/18/2022 1345
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	11/18/2022 1345
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	11/18/2022 1345
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	11/18/2022 1345
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	11/18/2022 1345
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	11/18/2022 1345
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	11/18/2022 1345
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ60535-001
Batch: 60535
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	11/18/2022 1345

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		99	81-118
Bromofluorobenzene		92	85-114
Toluene-d8		99	89-112
Dibromofluoromethane		95	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ60535-002
Batch: 60535
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	84		1	84	39-160	11/18/2022 1241
Benzene	50	49		1	97	79-120	11/18/2022 1241
Bromodichloromethane	50	49		1	97	79-125	11/18/2022 1241
Bromoform	50	48		1	95	66-130	11/18/2022 1241
Bromomethane (Methyl bromide)	50	51		1	102	53-141	11/18/2022 1241
2-Butanone (MEK)	100	110		1	108	56-143	11/18/2022 1241
Carbon disulfide	50	55		1	111	64-133	11/18/2022 1241
Carbon tetrachloride	50	49		1	98	72-136	11/18/2022 1241
Chlorobenzene	50	47		1	94	82-118	11/18/2022 1241
Chloroethane	50	52		1	105	60-138	11/18/2022 1241
Chloroform	50	48		1	96	79-124	11/18/2022 1241
Chloromethane (Methyl chloride)	50	53		1	107	50-139	11/18/2022 1241
Cyclohexane	50	45		1	90	71-130	11/18/2022 1241
1,2-Dibromo-3-chloropropane (DBCP)	50	55		1	110	62-128	11/18/2022 1241
Dibromochloromethane	50	51		1	101	74-126	11/18/2022 1241
1,2-Dibromoethane (EDB)	50	50		1	100	77-121	11/18/2022 1241
1,2-Dichlorobenzene	50	48		1	96	80-119	11/18/2022 1241
1,3-Dichlorobenzene	50	47		1	94	80-119	11/18/2022 1241
1,4-Dichlorobenzene	50	46		1	92	79-118	11/18/2022 1241
Dichlorodifluoromethane	50	48		1	95	32-152	11/18/2022 1241
1,1-Dichloroethane	50	50		1	101	77-125	11/18/2022 1241
1,2-Dichloroethane	50	49		1	99	73-128	11/18/2022 1241
1,1-Dichloroethene	50	54		1	109	71-131	11/18/2022 1241
cis-1,2-Dichloroethene	50	48		1	97	78-123	11/18/2022 1241
trans-1,2-Dichloroethene	50	49		1	98	75-124	11/18/2022 1241
1,2-Dichloropropane	50	49		1	98	78-122	11/18/2022 1241
cis-1,3-Dichloropropene	50	53		1	106	75-124	11/18/2022 1241
trans-1,3-Dichloropropene	50	53		1	106	73-127	11/18/2022 1241
Ethylbenzene	50	49		1	99	79-121	11/18/2022 1241
2-Hexanone	100	110		1	112	57-139	11/18/2022 1241
Isopropylbenzene	50	53		1	106	72-131	11/18/2022 1241
Methyl acetate	50	49	M-03	1	99	56-136	11/18/2022 1241
Methyl tertiary butyl ether (MTBE)	50	51		1	102	71-124	11/18/2022 1241
4-Methyl-2-pentanone	100	110		1	111	67-130	11/18/2022 1241
Methylcyclohexane	50	44		1	88	72-132	11/18/2022 1241
Methylene chloride	50	56		1	113	74-124	11/18/2022 1241
Styrene	50	52		1	103	78-123	11/18/2022 1241
1,1,2,2-Tetrachloroethane	50	50		1	100	71-121	11/18/2022 1241
Tetrachloroethene	50	48		1	96	74-129	11/18/2022 1241
Toluene	50	50		1	100	80-121	11/18/2022 1241
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	46		1	92	70-136	11/18/2022 1241
1,2,4-Trichlorobenzene	50	52		1	104	69-130	11/18/2022 1241
1,1,1-Trichloroethane	50	51		1	103	74-131	11/18/2022 1241
1,1,2-Trichloroethane	50	49		1	98	80-119	11/18/2022 1241

LOQ = Limit of Quantitation
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LOD = Limit of Detection

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J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ60535-002
Batch: 60535
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	46		1	92	79-123	11/18/2022 1241
Trichlorofluoromethane	50	52		1	103	65-141	11/18/2022 1241
Vinyl chloride	50	53		1	105	58-137	11/18/2022 1241
Xylenes (total)	100	100		1	102	79-121	11/18/2022 1241

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		99	81-118
Bromofluorobenzene		98	85-114
Toluene-d8		102	89-112
Dibromofluoromethane		101	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
J = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

Tetra Tech, Inc.

CHAIN OF CUSTODY | NUMBER No. 2341 | PAGE 1 OF 1

PROJECT NO:	FACILITY:	PROJECT MANAGER	PHONE NUMBER	LABORATORY NAME AND CONTACT:
112G08970	KSC	Alex Murphy	321-292-9842	Pace - Kathy Smith
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER	PHONE NUMBER	ADDRESS
Cory O'Brien		Chuck Sorden	321-591-7580	106 Vintage Point Dr.
		CARRIER/WAYBILL NUMBER		CITY, STATE
				West Columbia, SC

STANDARD TAT ☑
RUSH TAT ☐
☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

DATE YEAR 2022	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	CONTAINER TYPE PLASTIC (P) or GLASS (G)	PRESERVATIVE USED	TYPE OF ANALYSIS VOC	COMMENTS
									G	HCl		XJ29006 RBS2
10/26	1050	CRCA-MW0016-0.5-5.0-20221026	-	-	-	GW	G	3			X	
10/27	1490	CRCA-MW0031-0.5-5.0-20221027	-	-	-	GW	G	3			X	
10/28	1355	CRCA-MW0019-0.5-5.0-20221028	-	-	-	GW	G	3			X	
10/28	1455	CRCA-MW0032-0.5-5.0-20221028	-	-	-	GW	G	3			X	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	10/28/2022		1. RECEIVED BY		
2. RELINQUISHED BY	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY FED EX	10/29/22	1020	3. RECEIVED BY Kaylin N Roberts	10/29/22	1020

COMMENTS T=9.1°C

DISTRIBUTION WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: KNR / 10/29/2022 Lot #: XJ29006

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other:

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt: %Solid Snap-Cup ID: NA

2.1 / 2.1 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)?
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☑ No	☐ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/L) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes. Quote # 24792

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) 001(2) were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

Report of Analysis

Tetra Tech
Foster Plaza 7
661 Anderson Drive
Pittsburgh, PA 15220
Attention: Alex Murphy

Project Name: CRCA

Project Number: 112G09581

Lot Number:**XJ29007**

Date Completed:11/21/2022

Project Manager:**Kathy E. Smith**

11/21/2022 8:04 AM
Approved and released by:
Project Manager II: **Edward Barnett**

The electronic signature above is the equivalent of a handwritten signature.

Case Narrative
Tetra Tech
Lot Number: XJ29007

This Report of Analysis contains the analytical result(s) for the sample(s) listed on the Sample Summary following this Case Narrative. The sample receiving date is documented in the header information associated with each sample.

All results listed in this report relate only to the samples that are contained within this report. Where sampling is conducted by the client, results relate to the accuracy of the information provided, and as the samples are received.

Sample receipt, sample analysis, and data review have been performed in accordance with the most current approved The NELAC Institute (TNI) standards, the Pace Analytical Services, LLC ("Pace") Laboratory Quality Manual, standard operating procedures (SOPs), and Pace policies. Additionally, the DoD QSM version 5.4 has been followed for these samples, and specifically Table B-15 was followed for all PFAS samples. Any exceptions to the TNI standards, the Laboratory Quality Manual, SOPs, the DoD QSM, or policies are qualified on the results page or discussed below.

Pace is a DoD/DOE accredited laboratory; however, the following analyses are currently not listed on our DoD/DOE scope of accreditation: Drinking Water: pH EPA 150.1, Turbidity EPA 18.01, Metals EPA 200.7 & 200.8, Mercury EPA 245.1, Anions EPA 300.0, Cyanide EPA 335.4, Nitrates EPA 353.2, Orthophosphate & Phosphorus EPA 365.1, EDB/DBCP EPA 504.1, HPC SIMPLATE, Color SM 2120 B-2011, Alkalinity SM 2320 B-2011, Specific Conductance SM 2510 B-2011, Residue-filterable (TDS) SM 2540 C, Calcium Hardness (CaCO2) SM 3500-Ca B-2011, TRC SM 4500 Cl G-2011, pH SM 4500 H=B-2011, E.Coli, Total Coliform; Non-Potable Water: Metals EPA 200.7, Strontium EPA 200.8, Chlorate EPA 300.0, Cyanide EPA 335.4, Phenolics EPA 420.4, 2-Methyl-4,6-Dinitrophenol EPA 625.1, Propane RSK-175, Specific Conductance SM 2510 B-2011, Salinity SM250 B, Residue- total SM 2540 B, Sulfite SM 4500 SO32- B-2011, Amenable Cyanide SM 4500-CN- G-2011, BOD & CBOD SM 5210 B, MBAS SM 5540 C-2011; Solid and Chemical Materials: Boron & Titanium SW-846 6010D, Boron, Molybdenum, & Titanium SW-846 6020B, Alcohols & Glycols SW-846 8015C, Pentachlorophenol SW-846 8151A, Ethyl Acetate, Hexane, & n-Hexane SW-846 8260D, SVOC 1,4-Dioxane, 3&4-Methylphenols, 4-Dimethyl aminoazobenzene, 1,4-Naphthoquinone, 3,5-Dinitroaniline, PETN SW-846 8270E, Amenable Cyanide SW-846 9012B; Boron & Titanium SW-846 6010D, Molybdenum SW-846 6020B, Ethylene Glycol SW-846 8015B, Pentachlorophenol SW-846 8151A, Chloroprene SW-846 8260B, SVOC 1,3,5-Trinitrobenzene, 1,4-Dioxane, 1,4-Naphthoquinone, 1,4-Phenylenediamine, 2,5-Dinitrotoluene, 2,6-Dinitrotoluene, 3-Methylcholanthrene, 4- Aminobiphenyl, 4-Dimethyl aminoazobenzene, 4-Nitroquinoline-1-oxide, 7,12- Dimethylbenzo(a)anthracene, Chlorobenzilate, Diallate, Ethyl methanesulfonate, Isodrin, Isosafrole, Methyl methanesulfonate, n-Nitrosomethylethylamine, n-Nitrosomorpholine, n-Nitrosopiperidine, Piperonyl butoxide, Pronamide, Safrole, 3,5-Dinitroaniline, PETN SW-846 8270E, Oil & Grease SW-846 9071B.

Pace is a TNI accredited laboratory; however, the following analyses are currently not listed on our TNI scope of accreditation: Drinking Water: VOC (excluding BTEX, MTBE, Naphthalene, & 1,2-dichloroethane) EPA 524.2, E. coli and Total coliforms SM 9223 B-2004, Solid Chemical Material: TOC Walkley-Black, Biological Tissue: All, Non-Potable Water: SGT-HEM EPA 1664B, Silica EPA 200.7, Boron, Calcium, Silicon, Strontium EPA 200.8, Bicarbonate, Carbonate, and Hydroxide Alkalinity SM 2320 B-2011, SM 9221 C E-2006 & SM 9222D-2006, Strontium SW-846 6010D, VOC SM 6200 B-2011, Fecal Coliform Colilert-18.

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

VOCs

The initial calibration verification (ICV) associated with samples XJ29007-001 and XJ29007-002 exceeded control criteria for 112-trichloro-122-trifluoroethane (129%).

Manual Integration Summary

Tetra Tech

Lot Number: XJ29007

Project Name: CRCA

Project Number: 112G09581

Where applicable, analytes for which manual integration occurred have been flagged with the following:

Qualifier	Technical Justification	Qualifier	Technical Justification	Qualifier	Technical Justification
M-01	Split peak	M-07	Low fit	M-13	Error
M-02	Peak tailing	M-08	Peak not found	M-14	Baseline
M-03	Incorrect auto integration	M-09	Analyte not Identified by the Data System	M-15	Other
M-04	Poor chromatography	M-10	Analyte misidentified by the Data System	M-16	Retention time shift
M-05	Manually assigned peak	M-11	Invalid integration	M-17	Shouldering
M-06	Wrong isomer	M-12	Wrong peak		

A summary of instances where manual integration occurred is included below:

Method	Sample	Run Number	Parameter	Qualifier
PFAS by ID SOP	XJ29007-001	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
PFAS by ID SOP	XJ29007-001	2	13C6_PFDA	M-03
PFAS by ID SOP	XJ29007-002	1	Perfluorohexanesulfonic acid (PFHxS)	M-03
8260D	XQ59671-002	1	Methyl acetate	M-03
PFAS by ID SOP	XQ59479-002	1	N-ethylperfluoro-1-	M-03
PFAS by ID SOP	XQ59479-002	1	N-methylperfluoro-1-	M-03
PFAS by ID SOP	XQ59479-002	1	Perfluorooctanesulfonic acid (PFOS)	M-03

If you have any questions regarding this report, please contact the Pace Project Manager listed on the cover page.

Sample Summary

Tetra Tech

Lot Number: XJ29007

Project Name: CRCA

Project Number: 112G09581

Sample Number	Sample ID	Matrix	Date Sampled	Date Received
001	CRCA-ASEFFLUENT-20221027	Aqueous	10/27/2022 1100	10/29/2022
002	CRCA-ASINFLUENT-20221027	Aqueous	10/27/2022 1110	10/29/2022

(2 samples)

Detection Summary

Tetra Tech

Lot Number: XJ29007

Project Name: CRCA

Project Number: 112G09581

Sample	Sample ID	Matrix	Parameter	Method	Result	Q	Units	Page
001	CRCA-ASEFFLUENT-20221027	Aqueous	PFBA	PFAS by ID	42000	D	ng/L	8
002	CRCA-ASINFLUENT-20221027	Aqueous	Vinyl chloride	8260D	2.0		ug/L	11
002	CRCA-ASINFLUENT-20221027	Aqueous	PFBA	PFAS by ID	34000	D	ng/L	12

(3 detections)

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29007-001

Description: CRCA-ASEFFLUENT-20221027 | Matrix: Aqueous

Date Sampled: 10/27/2022 1100 | Project Name: CRCA

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/10/2022 0343	JMM2		59671

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | V = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | I = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

Q = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | D = Dilution > 1 | S = MS/MSD failure

Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29007-001

Description: CRCA-ASEFFLUENT-20221027 | Matrix: Aqueous

Date Sampled: 10/27/2022 1100 | Project Name: CRCA

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/10/2022 0343	JMM2		59671

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		100	81-118
Bromofluorobenzene		91	85-114
Toluene-d8		99	89-112
Dibromofluoromethane		97	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XJ29007-001

Description: CRCA-ASEFFLUENT-20221027 | Matrix: Aqueous

Date Sampled: 10/27/2022 1100 | Project Name: CRCA

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	100	11/15/2022 1919	BWS	11/08/2022 1410	59479
2	SOP SPE	PFAS by ID SOP QSM B-15	500	11/16/2022 1836	MMM	11/08/2022 1410	59479

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	370	U	740	370	190	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	370	U	740	370	190	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	370	U	740	370	190	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	370	U	740	370	190	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	370	U	740	370	190	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	370	U	740	370	190	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	370	U	740	370	190	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	370	U	740	370	190	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	370	U	740	370	190	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	370	U	740	370	190	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	190	UM-03	370	190	93	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	42000	D	1900	950	460	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	190	U	370	190	93	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	190	U	370	190	93	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		86	50-150		92	50-150
13C2_6:2FTS		92	50-150		81	50-150
13C2_8:2FTS		98	50-150		72	50-150
13C2_PFDoA		108	50-150		91	50-150
13C2_PFTeDA		94	50-150		88	50-150
13C3_PFBS		105	50-150		102	50-150
13C3_PFHxS		100	50-150		82	50-150
13C3-HFPO-DA		100	50-150		89	50-150
13C4_PFBA		91	50-150		87	50-150
13C4_PFHpA		97	50-150		77	50-150
13C5_PFHxA		102	50-150		93	50-150
13C5_PFPeA		97	50-150		96	50-150
13C6_PFDA		83	50-150	M-03	93	50-150

LOQ = Limit of Quantitation
U = Not detected at or above the LOD
Q = Out of holding time
V = Detected in the method blank
N = Recovery is out of criteria
W = Reported on wet weight basis
E = Quantitation of compound exceeded the calibration range
P = The RPD between two GC columns exceeds 40%
LOD = Limit of Detection
DL = Detection Limit
I = Estimated result < LOQ and ≥ DL
D = Dilution > 1
Q = Surrogate failure
L = LCS/LCSD failure
S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XJ29007-001

Description: CRCA-ASEFFLUENT-20221027 | Matrix: Aqueous

Date Sampled: 10/27/2022 1100 | Project Name: CRCA

Date Received: 10/29/2022 | Project Number: 112G09581

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		106	50-150		91	50-150
13C8_PFOA		110	50-150		104	50-150
13C8_PFOS		101	50-150		89	50-150
13C9_PFNA		101	50-150		93	50-150
d-EtFOSA		99	50-150		95	50-150
d5-EtFOSAA		98	50-150		99	50-150
d3-MeFOSAA		97	50-150		91	50-150

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29007-002

Description: CRCA-ASINFLUENT-20221027 | Matrix: Aqueous

Date Sampled: 10/27/2022 1110 | Project Name: CRCA

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/10/2022 0407	JMM2		59671

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Acetone	67-64-1	8260D	10	U	20	10	5.0	ug/L	1
Benzene	71-43-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromodichloromethane	75-27-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromoform	75-25-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Bromomethane (Methyl bromide)	74-83-9	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
2-Butanone (MEK)	78-93-3	8260D	4.0	U	10	4.0	2.0	ug/L	1
Carbon disulfide	75-15-0	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Carbon tetrachloride	56-23-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chlorobenzene	108-90-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloroethane	75-00-3	8260D	0.80	U	2.0	0.80	0.40	ug/L	1
Chloroform	67-66-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Chloromethane (Methyl chloride)	74-87-3	8260D	1.0	U	2.0	1.0	0.50	ug/L	1
Cyclohexane	110-82-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dibromochloromethane	124-48-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dibromoethane (EDB)	106-93-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichlorobenzene	95-50-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,3-Dichlorobenzene	541-73-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,4-Dichlorobenzene	106-46-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Dichlorodifluoromethane	75-71-8	8260D	1.2	U	2.0	1.2	0.60	ug/L	1
1,1-Dichloroethane	75-34-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloroethane	107-06-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1-Dichloroethene	75-35-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,2-Dichloroethene	156-59-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,2-Dichloroethene	156-60-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,2-Dichloropropane	78-87-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
cis-1,3-Dichloropropene	10061-01-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
trans-1,3-Dichloropropene	10061-02-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Ethylbenzene	100-41-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
2-Hexanone	591-78-6	8260D	4.0	U	10	4.0	2.0	ug/L	1
Isopropylbenzene	98-82-8	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl acetate	79-20-9	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Methyl tertiary butyl ether (MTBE)	1634-04-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
4-Methyl-2-pentanone	108-10-1	8260D	4.0	U	10	4.0	2.0	ug/L	1
Methylcyclohexane	108-87-2	8260D	0.80	U	5.0	0.80	0.40	ug/L	1
Methylene chloride	75-09-2	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Styrene	100-42-5	8260D	0.82	U	1.0	0.82	0.41	ug/L	1
1,1,2,2-Tetrachloroethane	79-34-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Tetrachloroethene	127-18-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Toluene	108-88-3	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloro-1,2,2-Trifluoroethane	76-13-1	8260D	0.84	U	1.0	0.84	0.42	ug/L	1
1,2,4-Trichlorobenzene	120-82-1	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,1-Trichloroethane	71-55-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
1,1,2-Trichloroethane	79-00-5	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

LOQ = Limit of Quantitation | V = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure

U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | I = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure

Q = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | D = Dilution > 1 | S = MS/MSD failure

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Volatile Organic Compounds by GC/MS

Client: Tetra Tech | Laboratory ID: XJ29007-002

Description: CRCA-ASINFLUENT-20221027 | Matrix: Aqueous

Date Sampled: 10/27/2022 1110 | Project Name: CRCA

Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	5030B	8260D	1	11/10/2022 0407	JMM2		59671

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
Trichloroethene	79-01-6	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Trichlorofluoromethane	75-69-4	8260D	0.80	U	1.0	0.80	0.40	ug/L	1
Vinyl chloride	75-01-4	8260D	2.0		1.0	0.80	0.40	ug/L	1
Xylenes (total)	1330-20-7	8260D	0.80	U	1.0	0.80	0.40	ug/L	1

Surrogate	Q	Run 1 % Recovery	Acceptance Limits
1,2-Dichloroethane-d4		104	81-118
Bromofluorobenzene		93	85-114
Toluene-d8		103	89-112
Dibromofluoromethane		100	80-119

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech | Laboratory ID: XJ29007-002
Description: CRCA-ASINFLUENT-20221027 | Matrix: Aqueous
Date Sampled: 10/27/2022 1110 | Project Name: CRCA
Date Received: 10/29/2022 | Project Number: 112G09581

Run	Prep Method	Analytical Method	Dilution	Analysis Date	Analyst	Prep Date	Batch
1	SOP SPE	PFAS by ID SOP QSM B-15	100	11/15/2022 1930	BWS	11/08/2022 1410	59479
2	SOP SPE	PFAS by ID SOP QSM B-15	500	11/16/2022 1847	MMM	11/08/2022 1410	59479

Parameter	CAS Number	Analytical Method	Result	Q	LOQ	LOD	DL	Units	Run
9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid (9Cl-PF3ONS)	756426-58-1	PFAS by ID SOP	370	U	730	370	180	ng/L	1
11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid (11Cl-PF3...)	763051-92-9	PFAS by ID SOP	370	U	730	370	180	ng/L	1
1H, 1H, 2H, 2H-perfluorodecane sulfonic acid (8:2 FTS)	39108-34-4	PFAS by ID SOP	370	U	730	370	180	ng/L	1
1H, 1H, 2H, 2H-perfluorooctane sulfonic acid (6:2 FTS)	27619-97-2	PFAS by ID SOP	370	U	730	370	180	ng/L	1
1H,1H,2H,2H-perfluorohexane sulfonic acid (4:2 FTS)	757124-72-4	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Hexafluoropropylene oxide dimer acid (GenX)	13252-13-6	PFAS by ID SOP	370	U	730	370	180	ng/L	1
4,8-dioxa-3H-perfluorononanoic acid (ADONA)	919005-14-4	PFAS by ID SOP	370	U	730	370	180	ng/L	1
N-ethylperfluoro-1-octanesulfonamide (EtFOSA)	4151-50-2	PFAS by ID SOP	370	U	730	370	180	ng/L	1
N-ethylperfluoro-1-octanesulfonamidoacetic acid (EtFOSAA)	2991-50-6	PFAS by ID SOP	370	U	730	370	180	ng/L	1
N-methylperfluoro-1-octanesulfonamidoacetic acid (MeFOSAA)	2355-31-9	PFAS by ID SOP	370	U	730	370	180	ng/L	1
Perfluoro-1-butanesulfonic acid (PFBS)	375-73-5	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-1-decanesulfonic acid (PFDS)	335-77-3	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-1-heptanesulfonic acid (PFHpS)	375-92-8	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-1-nonanesulfonic acid (PFNS)	68259-12-1	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-1-pentanesulfonic acid (PFPeS)	2706-91-4	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluorohexanesulfonic acid (PFHxS)	355-46-4	PFAS by ID SOP	190	UM-03	370	190	91	ng/L	1
Perfluoro-n-butanoic acid (PFBA)	375-22-4	PFAS by ID SOP	34000	D	1800	900	460	ng/L	2
Perfluoro-n-decanoic acid (PFDA)	335-76-2	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-n-dodecanoic acid (PFDoA)	307-55-1	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-n-heptanoic acid (PFHpA)	375-85-9	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-n-hexanoic acid (PFHxA)	307-24-4	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-n-nonanoic acid (PFNA)	375-95-1	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-n-octanoic acid (PFOA)	335-67-1	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-n-pentanoic acid (PFPeA)	2706-90-3	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-n-tetradecanoic acid (PFTeDA)	376-06-7	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-n-tridecanoic acid (PFTrDA)	72629-94-8	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluoro-n-undecanoic acid (PFUdA)	2058-94-8	PFAS by ID SOP	190	U	370	190	91	ng/L	1
Perfluorooctanesulfonic acid (PFOS)	1763-23-1	PFAS by ID SOP	190	U	370	190	91	ng/L	1

Surrogate	Run 1 Q	Run 1 % Recovery	Run 1 Acceptance Limits	Run 2 Q	Run 2 % Recovery	Run 2 Acceptance Limits
13C2_4:2FTS		92	50-150		99	50-150
13C2_6:2FTS		97	50-150		121	50-150
13C2_8:2FTS		105	50-150		78	50-150
13C2_PFDoA		108	50-150		104	50-150
13C2_PFTeDA		102	50-150		94	50-150
13C3_PFBS		116	50-150		94	50-150
13C3_PFHxS		107	50-150		90	50-150
13C3-HFPO-DA		108	50-150		102	50-150
13C4_PFBA		94	50-150		105	50-150
13C4_PFHpA		107	50-150		90	50-150
13C5_PFHxA		107	50-150		104	50-150
13C5_PFPeA		118	50-150		105	50-150
13C6_PFDA		86	50-150		102	50-150

LOQ = Limit of Quantitation | V = Detected in the method blank | E = Quantitation of compound exceeded the calibration range | DL = Detection Limit | Q = Surrogate failure
U = Not detected at or above the LOD | N = Recovery is out of criteria | P = The RPD between two GC columns exceeds 40% | I = Estimated result < LOQ and ≥ DL | L = LCS/LCSD failure
Q = Out of holding time | W = Reported on wet weight basis | LOD = Limit of Detection | D = Dilution > 1 | S = MS/MSD failure

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PFAS by LC/MS/MS

Client: Tetra Tech
Laboratory ID: XJ29007-002
Description: CRCA-ASINFLUENT-20221027
Matrix: Aqueous
Date Sampled: 10/27/2022 1110
Project Name: CRCA
Date Received: 10/29/2022
Project Number: 112G09581

Surrogate	Q	Run 1 % Recovery	Acceptance Limits	Q	Run 2 % Recovery	Acceptance Limits
13C7_PFUdA		110	50-150		105	50-150
13C8_PFOA		95	50-150		97	50-150
13C8_PFOS		102	50-150		99	50-150
13C9_PFNA		105	50-150		106	50-150
d-EtFOSA		96	50-150		95	50-150
d5-EtFOSAA		109	50-150		106	50-150
d3-MeFOSAA		106	50-150		103	50-150

LOQ = Limit of Quantitation	V = Detected in the method blank	E = Quantitation of compound exceeded the calibration range	DL = Detection Limit	Q = Surrogate failure
U = Not detected at or above the LOD	N = Recovery is out of criteria	P = The RPD between two GC columns exceeds 40%	I = Estimated result < LOQ and ≥ DL	L = LCS/LCSD failure
Q = Out of holding time	W = Reported on wet weight basis	LOD = Limit of Detection	D = Dilution > 1	S = MS/MSD failure

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QC Summary

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ59671-001
Batch: 59671
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Acetone	10	U	1	20	10	5.0	ug/L	11/09/2022 1957
Benzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Bromodichloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Bromoform	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Bromomethane (Methyl bromide)	0.80	U	1	2.0	0.80	0.40	ug/L	11/09/2022 1957
2-Butanone (MEK)	4.0	U	1	10	4.0	2.0	ug/L	11/09/2022 1957
Carbon disulfide	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Carbon tetrachloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Chlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Chloroethane	0.80	U	1	2.0	0.80	0.40	ug/L	11/09/2022 1957
Chloroform	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Chloromethane (Methyl chloride)	1.0	U	1	2.0	1.0	0.50	ug/L	11/09/2022 1957
Cyclohexane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,2-Dibromo-3-chloropropane (DBCP)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Dibromochloromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,2-Dibromoethane (EDB)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,2-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,3-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,4-Dichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Dichlorodifluoromethane	1.2	U	1	2.0	1.2	0.60	ug/L	11/09/2022 1957
1,1-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,2-Dichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,1-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
cis-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
trans-1,2-Dichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,2-Dichloropropane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
cis-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
trans-1,3-Dichloropropene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Ethylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
2-Hexanone	4.0	U	1	10	4.0	2.0	ug/L	11/09/2022 1957
Isopropylbenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Methyl acetate	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Methyl tertiary butyl ether (MTBE)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
4-Methyl-2-pentanone	4.0	U	1	10	4.0	2.0	ug/L	11/09/2022 1957
Methylcyclohexane	0.80	U	1	5.0	0.80	0.40	ug/L	11/09/2022 1957
Methylene chloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Styrene	0.82	U	1	1.0	0.82	0.41	ug/L	11/09/2022 1957
1,1,2,2-Tetrachloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Tetrachloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Toluene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,1,2-Trichloro-1,2,2-Trifluoroethane	0.84	U	1	1.0	0.84	0.42	ug/L	11/09/2022 1957
1,2,4-Trichlorobenzene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,1,1-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
1,1,2-Trichloroethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - MB

Sample ID: XQ59671-001
Batch: 59671
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
Trichloroethene	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Trichlorofluoromethane	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Vinyl chloride	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957
Xylenes (total)	0.80	U	1	1.0	0.80	0.40	ug/L	11/09/2022 1957

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		105	81-118
Bromofluorobenzene		100	85-114
Toluene-d8		104	89-112
Dibromofluoromethane		100	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ59671-002
Batch: 59671
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Acetone	100	100		1	100	39-160	11/09/2022 1851
Benzene	50	50		1	100	79-120	11/09/2022 1851
Bromodichloromethane	50	52		1	103	79-125	11/09/2022 1851
Bromoform	50	52		1	104	66-130	11/09/2022 1851
Bromomethane (Methyl bromide)	50	51		1	102	53-141	11/09/2022 1851
2-Butanone (MEK)	100	110		1	115	56-143	11/09/2022 1851
Carbon disulfide	50	54		1	109	64-133	11/09/2022 1851
Carbon tetrachloride	50	55		1	109	72-136	11/09/2022 1851
Chlorobenzene	50	49		1	98	82-118	11/09/2022 1851
Chloroethane	50	50		1	101	60-138	11/09/2022 1851
Chloroform	50	50		1	99	79-124	11/09/2022 1851
Chloromethane (Methyl chloride)	50	54		1	107	50-139	11/09/2022 1851
Cyclohexane	50	56		1	111	71-130	11/09/2022 1851
1,2-Dibromo-3-chloropropane (DBCP)	50	57		1	113	62-128	11/09/2022 1851
Dibromochloromethane	50	54		1	108	74-126	11/09/2022 1851
1,2-Dibromoethane (EDB)	50	50		1	100	77-121	11/09/2022 1851
1,2-Dichlorobenzene	50	51		1	101	80-119	11/09/2022 1851
1,3-Dichlorobenzene	50	50		1	101	80-119	11/09/2022 1851
1,4-Dichlorobenzene	50	49		1	98	79-118	11/09/2022 1851
Dichlorodifluoromethane	50	59		1	117	32-152	11/09/2022 1851
1,1-Dichloroethane	50	52		1	104	77-125	11/09/2022 1851
1,2-Dichloroethane	50	51		1	103	73-128	11/09/2022 1851
1,1-Dichloroethene	50	56		1	111	71-131	11/09/2022 1851
cis-1,2-Dichloroethene	50	50		1	100	78-123	11/09/2022 1851
trans-1,2-Dichloroethene	50	50		1	100	75-124	11/09/2022 1851
1,2-Dichloropropane	50	51		1	102	78-122	11/09/2022 1851
cis-1,3-Dichloropropene	50	55		1	110	75-124	11/09/2022 1851
trans-1,3-Dichloropropene	50	56		1	113	73-127	11/09/2022 1851
Ethylbenzene	50	53		1	105	79-121	11/09/2022 1851
2-Hexanone	100	120		1	120	57-139	11/09/2022 1851
Isopropylbenzene	50	57		1	114	72-131	11/09/2022 1851
Methyl acetate	50	46	M-03	1	93	56-136	11/09/2022 1851
Methyl tertiary butyl ether (MTBE)	50	51		1	101	71-124	11/09/2022 1851
4-Methyl-2-pentanone	100	110		1	109	67-130	11/09/2022 1851
Methylcyclohexane	50	56		1	112	72-132	11/09/2022 1851
Methylene chloride	50	53		1	107	74-124	11/09/2022 1851
Styrene	50	54		1	109	78-123	11/09/2022 1851
1,1,2,2-Tetrachloroethane	50	52		1	104	71-121	11/09/2022 1851
Tetrachloroethene	50	52		1	104	74-129	11/09/2022 1851
Toluene	50	52		1	105	80-121	11/09/2022 1851
1,1,2-Trichloro-1,2,2-Trifluoroethane	50	56		1	111	70-136	11/09/2022 1851
1,2,4-Trichlorobenzene	50	53		1	106	69-130	11/09/2022 1851
1,1,1-Trichloroethane	50	56		1	111	74-131	11/09/2022 1851
1,1,2-Trichloroethane	50	51		1	101	80-119	11/09/2022 1851

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Volatile Organic Compounds by GC/MS - LCS

Sample ID: XQ59671-002
Batch: 59671
Analytical Method: 8260D

Matrix: Aqueous
Prep Method: 5030B

Parameter	Spike Amount (ug/L)	Result (ug/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
Trichloroethene	50	49		1	98	79-123	11/09/2022 1851
Trichlorofluoromethane	50	60		1	120	65-141	11/09/2022 1851
Vinyl chloride	50	53		1	107	58-137	11/09/2022 1851
Xylenes (total)	100	110		1	108	79-121	11/09/2022 1851

Surrogate	Q	% Rec	Acceptance Limit
1,2-Dichloroethane-d4		100	81-118
Bromofluorobenzene		102	85-114
Toluene-d8		105	89-112
Dibromofluoromethane		103	80-119

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ59479-001
Batch: 59479
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/08/2022 1410

Parameter	Result	Q	Dil	LOQ	LOD	DL	Units	Analysis Date
9Cl-PF3ONS	4.0	U	1	8.0	4.0	2.0	ng/L	11/15/2022 1754
11Cl-PF3OUdS	4.0	U	1	8.0	4.0	2.0	ng/L	11/15/2022 1754
8:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	11/15/2022 1754
6:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	11/15/2022 1754
4:2 FTS	4.0	U	1	8.0	4.0	2.0	ng/L	11/15/2022 1754
GenX	4.0	U	1	8.0	4.0	2.0	ng/L	11/15/2022 1754
ADONA	4.0	U	1	8.0	4.0	2.0	ng/L	11/15/2022 1754
EtFOSA	4.0	U	1	8.0	4.0	2.0	ng/L	11/15/2022 1754
EtFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	11/15/2022 1754
MeFOSAA	4.0	U	1	8.0	4.0	2.0	ng/L	11/15/2022 1754
PFBS	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFDS	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFHpS	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFNS	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFPeS	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFHxS	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFBA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFDA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFDoA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFHpA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFHxA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFNA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFOA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFPeA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFTeDA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFTrDA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFUdA	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754
PFOS	2.0	U	1	4.0	2.0	1.0	ng/L	11/15/2022 1754

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		94	50-150
13C2_6:2FTS		103	50-150
13C2_8:2FTS		106	50-150
13C2_PFDoA		91	50-150
13C2_PFTeDA		93	50-150
13C3_PFBS		110	50-150
13C3_PFHxS		103	50-150
13C3-HFPO-DA		102	50-150
13C4_PFBA		103	50-150
13C4_PFHpA		115	50-150
13C5_PFHxA		115	50-150
13C5_PFPeA		111	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - MB

Sample ID: XQ59479-001
Batch: 59479
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/08/2022 1410

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		103	50-150
13C7_PFUdA		100	50-150
13C8_PFOA		104	50-150
13C8_PFOS		104	50-150
13C9_PFNA		125	50-150
d-EtFOSA		84	50-150
d5-EtFOSAA		92	50-150
d3-MeFOSAA		93	50-150

LOQ = Limit of Quantitation
DL = Detection Limit
LOD = Limit of Detection

U = Not detected at or above the LOD
I = Estimated result < LOQ and ≥ DL
* = RSD is out of criteria

N = Recovery is out of criteria
P = The RPD between two GC columns exceeds 40%
+ = RPD is out of criteria

Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ59479-002
Batch: 59479
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/08/2022 1410

Parameter	Spike Amount (ng/L)	Result (ng/L)	Q	Dil	% Rec	%Rec Limit	Analysis Date
9Cl-PF3ONS	15	16		1	108	50-150	11/16/2022 1411
11Cl-PF3OUdS	15	15		1	102	50-150	11/16/2022 1411
8:2 FTS	15	18		1	121	67-138	11/16/2022 1411
6:2 FTS	15	17		1	110	64-140	11/16/2022 1411
4:2 FTS	15	15		1	102	63-143	11/16/2022 1411
GenX	32	39		1	123	50-150	11/16/2022 1411
ADONA	15	20		1	131	50-150	11/16/2022 1411
EtFOSA	16	18		1	115	50-150	11/16/2022 1411
EtFOSAA	16	19	M-03	1	117	61-135	11/16/2022 1411
MeFOSAA	16	15	M-03	1	96	65-136	11/16/2022 1411
PFBS	14	15		1	104	72-130	11/16/2022 1411
PFDS	15	15		1	99	53-142	11/16/2022 1411
PFHpS	15	18		1	116	69-134	11/16/2022 1411
PFNS	15	16		1	102	69-127	11/16/2022 1411
PFPeS	15	15		1	98	71-127	11/16/2022 1411
PFHxS	15	16		1	110	68-131	11/16/2022 1411
PFBA	16	17		1	108	73-129	11/16/2022 1411
PFDA	16	17		1	109	71-129	11/16/2022 1411
PFDoA	16	18		1	111	72-134	11/16/2022 1411
PFHpA	16	18		1	112	72-130	11/16/2022 1411
PFHxA	16	18		1	112	72-129	11/16/2022 1411
PFNA	16	18		1	113	69-130	11/16/2022 1411
PFOA	16	17		1	105	71-133	11/16/2022 1411
PFPeA	16	18		1	109	72-129	11/16/2022 1411
PFTeDA	16	18		1	112	71-132	11/16/2022 1411
PFTrDA	16	16		1	99	65-144	11/16/2022 1411
PFUdA	16	17		1	104	69-133	11/16/2022 1411
PFOS	15	16	M-03	1	111	65-140	11/16/2022 1411

Surrogate	Q	% Rec	Acceptance Limit
13C2_4:2FTS		113	50-150
13C2_6:2FTS		106	50-150
13C2_8:2FTS		80	50-150
13C2_PFDoA		105	50-150
13C2_PFTeDA		93	50-150
13C3_PFBS		113	50-150
13C3_PFHxS		91	50-150
13C3-HFPO-DA		104	50-150
13C4_PFBA		102	50-150
13C4_PFHpA		90	50-150
13C5_PFHxA		104	50-150
13C5_PFPeA		105	50-150

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Note: Calculations are performed before rounding to avoid round-off errors in calculated results

PFAS by LC/MS/MS - LCS

Sample ID: XQ59479-002
Batch: 59479
Analytical Method: PFAS by ID SOP QSM B-15

Matrix: Aqueous
Prep Method: SOP SPE
Prep Date: 11/08/2022 1410

Surrogate	Q	% Rec	Acceptance Limit
13C6_PFDA		105	50-150
13C7_PFUdA		108	50-150
13C8_PFOA		105	50-150
13C8_PFOS		111	50-150
13C9_PFNA		108	50-150
d-EtFOSA		82	50-150
d5-EtFOSAA		94	50-150
d3-MeFOSAA		103	50-150

LOQ = Limit of Quantitation
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Note: Calculations are performed before rounding to avoid round-off errors in calculated results

Chain of Custody

and

Miscellaneous Documents

Pace Analytical Services, LLC (formerly Shealy Environmental Services, Inc.)
106 Vantage Point Drive West Columbia, SC 29172 (803) 791-9700 Fax (803) 791-9111 www.pacelabs.com

Tetra Tech, Inc.

CHAIN OF CUSTODY | NUMBER No. 2678 | PAGE 1 OF 1

PROJECT NO: 1120	FACILITY: CRCA	PROJECT MANAGER ALEX MURPHY	PHONE NUMBER	LABORATORY NAME AND CONTACT: PACE
SAMPLERS (SIGNATURE)		FIELD OPERATIONS LEADER DAN FORESTER	PHONE NUMBER 304-780-1426	ADDRESS
		CARRIER/WAYBILL NUMBER		CITY, STATE SOUTH CAROLINA

STANDARD TAT ☑
RUSH TAT ☐ ☐ 24 hr. ☐ 48 hr. ☐ 72 hr. ☐ 7 day ☐ 14 day

CONTAINER TYPE PLASTIC (P) or GLASS (G): G P
PRESERVATIVE USED: HCl

XJ29007

DATE YEAR	TIME	SAMPLE ID	LOCATION ID	TOP DEPTH (FT)	BOTTOM DEPTH (FT)	MATRIX (GW, SO, SW, SD, QC, ETC.)	COLLECTION METHOD GRAB (G) COMP (C)	No. OF CONTAINERS	TYPE OF ANALYSIS: VOC's	PFAS	COMMENTS
22001	1100	CRCA-AGEFFLUENT-20220627	CRCA	/	/	GW	G	3/2	3	2	
22001	1110	CRCA-AFFLUENT-20221027	CRCA	/	/	GW	G	3/2	3	2	

	DATE	TIME		DATE	TIME
1. RELINQUISHED BY	10/27/22	1120	1. RECEIVED BY FedEx	10/28/22	1100
2. RELINQUISHED BY FedEx	DATE	TIME	2. RECEIVED BY	DATE	TIME
3. RELINQUISHED BY Fed ex	DATE 10/28/22	TIME 1020	3. RECEIVED BY Shayla N Nichols	DATE 10/28/22	TIME 1020

COMMENTS T=2.1°C

DISTRIBUTION: WHITE (ACCOMPANIES SAMPLE) YELLOW (FIELD COPY) PINK (FILE COPY)

4/02R
FORM NO. TtNUS-001

DC#_Title: ENV-FRM-WCOL-0286 v02_Samples Receipt Checklist (SRC)
Effective Date: 8/2/2022

Sample Receipt Checklist (SRC)

Client: Tetra Tech Cooler Inspected by/date: KNR / 10/29/2022 Lot #: XJ29007

Means of receipt: ☐ Pace ☐ Client ☐ UPS ☑ FedEx ☐ Other: ____

☑ Yes	☐ No		1. Were custody seals present on the cooler?
☑ Yes	☐ No	☐ NA	2. If custody seals were present, were they intact and unbroken?

pH Strip ID: NA Chlorine Strip ID: NA Tested by: NA

Original temperature upon receipt / Derived (Corrected) temperature upon receipt %Solid Snap-Cup ID: NA

2.1 / 2.1 °C NA / NA °C NA / NA °C NA / NA °C

Method: ☑ Temperature Blank ☐ Against Bottles IR Gun ID: 8 IR Gun Correction Factor: 0 °C

Method of coolant: ☑ Wet Ice ☐ Ice Packs ☐ Dry Ice ☐ None

☑ Yes	☐ No	☐ NA	3. Were all coolers received at or below 6.0°C? If no, was Project Manager notified? PM was Notified by: phone / email / face-to-face (circle one).
☑ Yes	☐ No	☐ NA	4. Is the commercial courier's packing slip attached to this form?
☑ Yes	☐ No		5. Were proper custody procedures (relinquished/received) followed?
☑ Yes	☐ No		6. Were sample IDs listed on the COC and all sample containers?
☑ Yes	☐ No		7. Was collection date & time listed on the COC and all sample containers?
☑ Yes	☐ No		8. Did all container label information (ID, date, time) agree with the COC?
☑ Yes	☐ No		9. Were tests to be performed listed on the COC?
☑ Yes	☐ No		10. Did all samples arrive in the proper containers for each test and/or in good condition (unbroken, lids on, etc.)? ____
☑ Yes	☐ No		11. Was adequate sample volume available?
☑ Yes	☐ No		12. Were all samples received within ½ the holding time or 48 hours, whichever comes first?
☑ Yes	☐ No		13. Were all samples containers accounted for? (No missing/excess)
☐ Yes	☑ No	☐ NA	14. Were VOA, 8015C and RSK-175 samples free of bubbles >"pea-size" (¼"or 6mm in diameter) in any of the VOA vials?
☐ Yes	☐ No	☑ NA	15. Were all DRO/metals/nutrient samples received at a pH of < 2?
☐ Yes	☐ No	☑ NA	16. Were all cyanide samples received at a pH > 12 and sulfide samples received at a pH > 9?
☐ Yes	☐ No	☑ NA	17. Were all applicable NH_3/TKN/cyanide/phenol/625.1/608.3 (< 0.5mg/l) samples free of residual chlorine?
☑ Yes	☐ No	☐ NA	18. Was the quote number listed on the container label? If yes, Quote # 24792

Sample Preservation (Must be completed for any sample(s) incorrectly preserved or with headspace.)

Sample(s) NA were received incorrectly preserved and were adjusted accordingly in sample receiving with NA mL of circle one: H_2SO_4, HNO_3, HCl, NaOH using SR # NA. ☐
Time of preservation NA. If more than one preservative is needed, please note in the comments below.

Sample(s) 001(2) 002(2) were received with bubbles >6 mm in diameter.

Samples(s) NA were received with TRC > 0.5 mg/L (If #19 is *no*) and were adjusted accordingly in sample receiving with sodium thiosulfate ($Na_2S_2O_3$) with Unique ID: NA.

Comments:

Qualtrax ID: 56360 Pace® Analytical Services, LLC Page 1 of 1

APPENDIX C
O&M FIELD NOTES

Date	time	vapor				recovery wells														
						1					2					3				
		PID AS outlet	Blower Pressure	After Damper Pressure	AS Differential Pressure	Totalizer	Pressure	Flow Rate	Flow Rate	Pump Savor Calibration	Totalizer	Pressure	Flow Rate	Flow Rate	Pump Savor Calibration	Totalizer	Pressure	Flow Rate	Flow Rate	Pump Savor Calibration
		ppmv	in wc	in wc	in wc	gal	psi	sec	gpm	Check	gal	psi	sec	gpm	Check	gal	psi	sec	gpm	Check
07/22/19	7:30	0	0	0	0	0	0	6000	0.01	bad	0	0	6000	0.01	bad	0	0	6000	0.01	bad
07/23/19	7:30	0	21	21	20	2630	24	8.5	7.06	good	2630	30	8.5	7.06	good	2630	30	8.5	7.06	good
07/29/19	15:30	0	21	20.5	20	5141	24	8.5	7.06	good	4731	26	8.5	7.06	good	5387	28	8.5	7.06	good
08/09/19	7:00	0	21	20	20	11818	25	8.5	7.06	good	11489	28	8.5	7.06	good	11908	28	8.5	7.06	good
08/13/19	14:30	0	21	20	20	24866	24	8.5	7.06	good	24542	28	8.5	7.06	good	24808	28	8.5	7.06	good
08/16/19	14:00	0	21	20	20	48461	25	8.4	7.14	good	47890	28	8.5	7.06	good	47568	30	8.8	6.82	good
08/19/19	9:30	0	21	20	20	77322	25	8.4	7.14	good	76455	28	8.1	7.41	good	75413	28	8.6	6.98	good
08/26/19	12:00	0	21	19	20	149348	25	8.3	7.23	good	147613	30	8.5	7.06	good	145534	28	8.7	6.90	good
09/11/19	11:30	0	21	16	20	222768	25	8.8	6.82	good	219938	28	8.8	6.82	good	217486	30	8.8	6.82	good
10/03/19	12:30	0	21	16	20	393268	25	8.8	6.82	recaled	392264	28	8.6	6.98	good	387647	29	8.7	6.90	good
11/07/19	10:45	0	21	16	20	726973	25	8.6	6.98	good	733624	30	8.6	6.98	good	713331	26	8.5	7.06	good
12/10/19	7:30	0	21	16	20	959017	25	8.8	6.82	good	1001969	28	8.7	6.90	good	989308	27	8.5	7.06	good
01/14/20	8:00	0	21	21	21	1060912	25	8.65	6.94	good	1115779	28	8.4	7.14	good	1103493	27	8.7	6.90	good
02/13/20	12:00	0	21	21	21	1198882	25	8.7	6.90	good	1350492	28	8.8	6.82	good	1336679	27	8.6	6.98	good
04/09/20	14:30	0	21	21	21	1695616	24	8.75	6.86	good	1836189	29	8.8	6.82	good	1837863	27	8.78	6.83	good
05/14/20	7:30	0	21	20	20	2095090	24	8.7	6.90	good	2226678	28	8.7	6.90	good	2227509	27	8.7	6.90	good
06/04/20	15:15	0	20	20	20	2224488	24	8.7	6.90	good	2352477	30	8.5	7.06	good	2252151	30	9.5	6.32	good
07/13/20	7:30	0	20	20	20	2513663	24	8.6	6.98	good	2628965	28	8.5	7.06	good	2334764	32	8.7	6.90	good
08/11/20	13:30	0	20	20	20	2802838	25	8.6	6.98	good	2905452	28	8.5	7.06	good	2417377	32	8.7	6.90	good
09/15/20	17:00	0	20	20	20	3010147	25	8.8	6.82	good	3098691	28	8.6	6.98	good	2573860	25	8.7	6.90	good
10/21/20	14:00	0	20	20	20	3258940	25	8.8	6.82	good	3330570	29	8.6	6.98	good	2761631	22	8.7	6.90	good
11/23/20	9:00	0	20	20	20	3572540	24	8.8	6.82	good	3625583	32	8.6	6.98	good	2995119	38	8.7	6.90	good
12/15/20	13:00	0	20	20	20	3776198	22	8.5	7.06	good	3819990	28	8.6	6.98	good	3148850	26	8.6	6.98	good
01/18/21	15:00	0	20	20	20	4085132	24	8.5	7.06	good	4128186	24	8.5	7.06	good	3453454	28	8.5	7.06	good
02/16/21	16:00	0	20	20	20	4313428	30	8.5	7.06	good	4337220	34	8.5	7.06	good	3686863	28	8.5	7.06	good
03/14/21	15:00	0	20	20	20	4571305	28	8.5	7.06	good	4583369	32	8.5	7.06	good	3961882	28	8.6	6.98	good
04/17/21	18:00	0	20	20	20	4829182	26	8.6	6.98	good	4829519	32	8.6	6.98	good	4236902	28	8.5	7.06	good
05/18/21	14:00	0	20	20	20	5087060	26	8.6	6.98	good	5075669	32	8.6	6.98	good	4511922	30	8.6	6.98	good
06/14/21	15:00	0	20	20	20	5370063	24	8.6	6.98	good	5217417	34	8.4	7.14	good	4831905	30	8.6	6.98	good
07/30/21	13:00	0	20	20	20	5653066	22	8.7	6.90	good	5359166	34	8.4	7.14	good	5151888	30	8.6	6.98	good
08/19/21	13:00	0	20	20	20	5734800	24	8.7	6.90	good	5444533	33	8.4	7.14	good	5237244	28	8.8	6.82	good
09/10/21	13:00	0	20	20	20	5836143	23	8.7	6.90	good	5540599	32	8.4	7.14	good	5341477	28	8.8	6.82	good
10/07/21	13:00	0	21	20	20	5937475	20	8.7	6.90	good	5636662	30	8.4	7.14	good	5445500	26	8.5	7.06	good
11/10/21	13:00	0	21	20	20	6200701	22	8.7	6.90	good	5921416	30	8.4	7.14	good	5740049	26	8.5	7.06	good
12/12/21	13:00	0	21	20	20	6463926	21	8.7	6.90	good	6206171	30	8.4	7.14	good	6034597	26	8.5	7.06	good
01/21/22	13:00	0	21	20	20	6727152	21	8.7	6.90	good	6490925	30	8.4	7.14	good	6329146	26	8.5	7.06	good
02/25/22	13:00	0	21	20	20	6990377	21	8.7	6.90	good	6775680	30	8.4	7.14	good	6623694	26	8.5	7.06	good
03/28/22	13:00	0	21	20	20	7253603	20	8.7	6.90	good	7060434	30	8.4	7.14	good	6918243	26	8.5	7.06	good
04/25/22	13:00	0	21	20	20	7504238	20	8.7	6.90	good	7295903	34	8.4	7.14	good	7173128	26	8.5	7.06	good
05/19/22	13:00	0	20	20	20	7858524	22	8.7	6.90	good	7546649	32	8.4	7.14	good	7441635	26	8.5	7.06	good
06/20/22	13:00	0	20	20	20	8212809	21	8.7	6.90	good	7797396	32	8.4	7.14	good	7710143	26	8.5	7.06	good
07/25/22	13:00	0	20	20	20	8212809	24	8.7	6.90	good	8048142	30	8.4	7.14	good	7978650	26	8.5	7.06	good
08/22/22	13:00	0	20	20	20	8497576	24	8.7	6.90	good	8332909	30	8.4	7.14	good	8263417	26	8.5	7.06	good
09/19/22	13:00	0	20	20	20	8782540	24	8.7	6.90	good	8617873	30	8.4	7.14	good	8548381	26	8.5	7.06	good
10/24/22	13:00	0	20	20	20	9138040	24	8.7	6.90	good	8973373	30	8.4	7.14	good	8903881	26	8.5	7.06	good
11/21/22	13:00	0	20	20	20	9421281	24	8.7	6.90	good	9256614	30	8.4	7.14	good	9187122	26	8.5	7.06	good

water																				
EQ					AS pump					Bag filters										
										Infulent		Effluent		1				2			
Totalizer	Pressure	Flow Rate	Flow Rate	Sensor Status	Totalizer	Pressure	Flow Rate	Flow Rate	Sensor Status	First Filter	Second Filter	First Filter	Second Filter	Totalizer	Pressure	Flow Rate	Flow Rate	Totalizer	Pressure	Flow Rate	Flow Rate
gal	psi	sec	gpm	Check	gal	psi	sec	gpm	Check	psi	psi	psi	psi	gal	psi	sec	gpm	gal	psi	sec	gpm
0	0	6000	0.01	bad	0	0	6000	0.01	good	0	0	0	0	0	0	6000	0.01	0	0	6000	0.01
7890	30	2	30.00	bad	7780	36	1.75	34.29	good	1	1	6	6	0	0	6000	0.01	0	0	6000	0.01
14458	30	2	30.00	good	14503	38	1.8	33.33	good	1	0	20	20	1512	4	6.7	8.96	215	16	6.7	8.96
41705	30	2	30.00	good	42009	34	1.9	31.58	good	1	1	20	20	6660	5	6.7	8.96	4383	4	6.7	8.96
80193	30	2	30.00	good	80890	34	1.7	35.29	good	1	1	20	20	11568	5	9	6.67	11743	5	8	7.50
149193	28	1.94	30.93	good	150828	40	1.7	35.29	good	1	1	20	20	20959	4	8.7	6.90	25117	2	7.95	7.55
233626	30	2.07	28.99	good	235658	40	1.7	35.29	good	1	1	20	20	35166	4	10	6.00	40841	3	10	6.00
445076	28	2.1	28.57	good	448205	40	1.7	35.29	good	1	1	21	21	58754	8	28	2.14	85434	1	9	6.67
664091	30	2.2	27.27	good	665511	40	1.7	35.29	good	1	1	22	22	77208	2	8	7.50	126812	2	8	7.50
1201258	28	2.2	27.27	good	1175082	39	1.7	35.29	good	1	1	22	24	175336	11	7	8.57	229376	6	7	8.57
2334155	28	2.1	28.57	good	2253219	38	1.5	40.00	good	1	1	22	25	276686	10	6	10.00	411749	10	7	8.57
3416384	28	1.8	33.33	good	3103418	38	1.5	40.00	good	1	1	30	30	459922	13	7	8.57	540057	14	6	10.00
3959892	28	1.5	40.00	good	3460705	38	1.3	46.15	good	1	1	30	35	538417	10	6	10.00	604893	11	8	7.50
5114020	28	1.3	46.15	good	4127819	38	1.6	37.50	good	1	1	25	30	670951	4	8	7.50	653339	6	8	7.50
8203623	28	1.2	50.00	good	5791342	35	1.3	46.15	good	1	1	30	30	995473	18	12	5.00	842375	18	12	5.00
8325468	28	1.8	33.33	good	6504740	35	1.5	40.00	good	1	1	30	30	1197975	14	8	7.50	1036584	14	8	7.50
51412	28	2.5	24.00	replaced	49758	35	1.8	33.33	replaced	1	1	20	20	1263415	14	8	7.50	1085565	12	9	6.67
717428	28	1.8	33.33	good	674891	35	1.7	35.29	good	1	1	25	22	1416442	14	9	6.67	1198162	15	10	6.00
1383444	28	1.9	31.58	good	1300025	35	1.5	40.00	good	1	1	20	20	1569469	18	10	6.00	1310759	20	15	4.00
2022664	28	2.2	27.27	good	1861104	38	1.8	33.33	good	2	1	25	25	1693722	18	10	6.00	1410661	17	12	5.00
2789727	28	2.2	27.27	good	2534399	38	1.9	31.58	good	2	1	25	25	1842827	16	10	6.00	1530536	17	10	6.00
3666572	28	2	30.00	good	3427715	38	1.7	35.29	good	1	1	25	25	2033467	20	8	7.50	1692785	19	8	7.50
4247200	20	2	30.00	good	4034244	35	1.7	35.29	good	1	1	25	25	2167914	20	8	7.50	1806250	19	8	7.50
5453518	26	2.1	28.57	good	5031544	32	1.5	40.00	good	1	1	25	25	2395119	20	8	7.50	1989448	20	8	7.50
6239511	26	2	30.00	good	5734532	36	1.7	35.29	good	1	1	25	25	2547099	24	8	7.50	2116668	22	8	7.50
7076134	26	2	30.00	good	6564836	34	1.7	35.29	good	1	1	25	25	2702510	22	8	7.50	2263474	19	8	7.50
7912757	26	2.1	28.57	good	7395140	40	1.6	37.50	good	1	1	25	25	2857921	24	8	7.50	2410281	18	8	7.50
8749381	26	2	30.00	good	8225445	32	1.7	35.29	good	1	1	25	25	3013332	20	8	7.50	2557088	18	8	7.50
9532960	26	2	30.00	good	9023440	34	1.6	37.50	good	1	1	25	25	3169404	18	8	7.50	2686066	16	8	7.50
10316540	26	2	30.00	good	9821436	30	1.6	37.50	good	1	1	25	25	3325476	16	8	7.50	2815044	14	8	7.50
10577807	26	2	30.00	good	10095354	30	1.6	37.50	good	1	1	25	25	3383684	16	8	7.50	2861678	12	8	7.50
10884923	26	2	30.00	good	10126755	30	1.6	37.50	good	1	1	25	25	3445536	16	8	7.50	2916393	12	8	7.50
11191999	26	2	30.00	good	10158410	30	1.6	37.50	good	1	1	25	25	3507367	16	8	7.50	2971116	12	8	7.50
12184957	26	2	30.00	good	10326804	30	1.6	37.50	good	1	1	25	25	3691744	16	8	7.50	3110545	12	8	7.50
13177915	26	2	30.00	good	10495197	30	1.6	37.50	good	1	1	25	25	3876121	16	8	7.50	3249975	12	8	7.50
14170872	26	2	30.00	good	10663591	30	1.6	37.50	good	1	1	25	25	4060498	16	8	7.50	3389404	12	8	7.50
15163830	26	2	30.00	good	10663591	30	1.6	37.50	good	1	1	25	25	4244875	16	8	7.50	3528834	12	8	7.50
16156788	26	2	30.00	good	10663591	30	1.6	37.50	good	1	1	25	25	4429252	16	8	7.50	3668263	12	8	7.50
17128129	26	2	30.00	good	10663591	30	1.6	37.50	good	1	1	25	25	4595569	16	8	7.50	3801730	12	8	7.50
17539308	26	2	30.00	good	10831984	30	1.6	37.50	good	1	1	25	25	4758163	16	8	7.50	3930431	12	8	7.50
17950487	26	2	30.00	good	11000378	30	1.6	37.50	good	1	1	25	25	4920758	16	8	7.50	4059132	12	8	7.50
18361666	26	2	30.00	good	11168771	30	1.6	37.50	good	1	1	25	25	5083352	16	8	7.50	4187833	12	8	7.50
19215967	26	2	30.00	good	12023072	30	1.6	37.50	good	1	1	25	25	5182689	16	8	7.50	4292016	12	8	7.50
20070859	26	2	30.00	good	12877964	30	1.6	37.50	good	1	1	25	25	5282095	16	8	7.50	4396271	12	8	7.50
21137359	26	2	30.00	good	13944464	30	1.6	37.50	good	1	1	25	25	5406106	16	8	7.50	4526331	12	8	7.50
21987082	26	2	30.00	good	14794187	30	1.6	37.50	good	1	1	25	25	5504911	16	8	7.50	4629955	12	8	7.50

Injection wells																			
3				4				5				6				7			
Totalizer	Pressure	Flow Rate	Flow Rate	Totalizer	Pressure	Flow Rate	Flow Rate	Totalizer	Pressure	Flow Rate	Flow Rate	Totalizer	Pressure	Flow Rate	Flow Rate	Totalizer	Pressure	Flow Rate	Flow Rate
gal	psi	sec	gpm	gal	psi	sec	gpm	gal	psi	sec	gpm	gal	psi	sec	gpm	gal	psi	sec	gpm
0	0	6000	0.01	0	0	6000	0.01	0	0	6000	0.01	0	0	6000	0.01	0	0	6000	0.01
0	0	6000	0.01	0	0	6000	0.01	0	0	6000	0.01	0	0	6000	0.01	0	0	6000	0.01
1667	7	6	10.00	146	12	6000	0.01	1627	4	7.5	8.00	158	17	120	0.50	1860	8	5.5	10.91
8078	9	6	10.00	239	14	6000	0.01	7940	8	7.5	8.00	763	10	90	0.67	6805	4	5.5	10.91
15861	9	14	4.29	271	12	6000	0.01	15278	6	9	6.67	6792	6	5.5	10.91	12464	6	5.5	10.91
29482	10	73	0.82	349	16	6000	0.01	28427	4	8	7.50	17635	5	10.2	5.88	22421	3	11.2	5.36
45402	4	9	6.67	384	12	6000	0.01	43870	4	9.3	6.45	31453	5	10	6.00	34514	2	12	5.00
91377	6	8.2	7.32	1931	8	16.5	3.64	87113	2	10	6.00	70767	4	10	6.00	61888	0	18	3.33
130518	18	6000	0.01	34521	12	35	1.71	130227	6	8	7.50	110247	7	9	6.67	79524	10	6000	0.01
226980	18	7	8.57	82125	12	20	3.00	194059	8	8	7.50	204488	8	30	2.00	85522	10	8	7.50
320324	4	10	6.00	224094	12	9	6.67	227644	11	6000	0.01	343320	11	6000	0.01	266542	8	10	6.00
418838	6	10	6.00	353212	18	14.5	4.14	227644	14	6000	0.01	343320	18	6000	0.01	349620	16	8	7.50
432723	6	6000	0.01	410284	12	9	6.67	227644	14	6000	0.01	343320	18	6000	0.01	376022	16	6000	0.01
501872	4	14	4.29	514298	6	10	6.00	309684	4	10	6.00	445348	5	10	6.00	407270	4	10	6.00
755959	8	12	5.00	755696	12	8	7.50	537835	9	8	7.50	705275	9	10	6.00	473490	4	10	6.00
999789	8	10	6.00	954789	12	10	6.00	737432	8	8	7.50	897650	10	10	6.00	490057	8	10	6.00
1056257	10	8.5	7.06	1002399	15	10	6.00	782046	12	21	2.86	9500258	16	18	3.33	491265	14	600	0.10
1191676	12	9	6.67	1110185	16	11	5.45	886853	8	12	5.00	10332517	9	12	5.00	491265	18	6000	0.01
1327092	22	12	5.00	1217971	23	12	5.00	991660	22	15	4.00	11164777	18	16	3.75	491265	20	6000	0.01
1456169	17	12	5.00	1311059	20	12	5.00	1092682	18	11	5.45	11252780	18	10	6.00	491266	20	6000	0.01
1611062	15	10	6.00	1422772	19	11	5.45	1213903	17	10	6.00	11358345	14	12	5.00	491266	18	6000	0.01
1832982	16	6	10.00	1574801	23	10	6.00	1369336	22	10	6.00	1504488	24	28	2.14	568379	20	12	5.00
1981572	16	6	10.00	1669804	23	10	6.00	1467588	22	10	6.00	1597536	23	28	2.14	631547	20	12	5.00
2201105	16	6	10.00	1838177	20	10	6.00	1623849	18	12	5.00	1752367	22	20	3.00	739835	18	15	4.00
2321242	22	8	7.50	1970773	24	11	5.45	1734758	22	7	8.57	1851611	20	18	3.33	815827	16	10	6.00
2454419	18	7	8.57	2123962	22	12	5.00	1865719	20	11	5.45	1974125	22	21	2.86	907984	18	15	4.00
2587596	16	8	7.50	2277151	22	13	4.62	1996680	18	9	6.67	2096639	22	21	2.86	1000141	18	15	4.00
2720774	19	7	8.57	2430340	20	10	6.00	2127641	19	10	6.00	2219154	21	20	3.00	1092298	18	16	3.75
2859036	18	10	6.00	2534003	18	10	6.00	2252315	18	12	5.00	2342927	18	18	3.33	1184712	14	16	3.75
2997299	16	10	6.00	2637667	18	10	6.00	2376990	18	12	5.00	2466700	14	14	4.29	1277126	12	14	4.29
3044345	18	10	6.00	2686656	18	10	6.00	2420537	18	12	5.00	2506067	14	14	4.29	1308783	12	14	4.29
3099258	18	10	6.00	2744523	18	10	6.00	2473568	18	12	5.00	2555555	14	14	4.29	1343452	12	14	4.29
3154116	18	10	6.00	2802489	18	10	6.00	2526589	18	12	5.00	2604503	14	14	4.29	1378100	15	12	5.00
3354093	18	10	6.00	2977295	18	10	6.00	2658526	18	12	5.00	2750587	14	14	4.29	1477152	15	12	5.00
3554070	18	10	6.00	3152101	18	10	6.00	2790464	18	12	5.00	2896671	14	14	4.29	1576204	15	12	5.00
3754046	18	10	6.00	3326907	18	10	6.00	2922401	18	12	5.00	3042756	14	14	4.29	1675257	15	12	5.00
3954023	18	10	6.00	3501713	18	10	6.00	3054339	18	12	5.00	3188840	14	14	4.29	1774309	15	12	5.00
4154000	18	10	6.00	3676519	18	10	6.00	3186276	18	12	5.00	3334924	14	14	4.29	1873361	15	12	5.00
4358449	18	10	6.00	3856246	18	10	6.00	3316138	18	12	5.00	3465129	14	14	4.29	1956897	15	12	5.00
3060014	18	10	6.00	4045008	18	10	6.00	3483976	18	12	5.00	3578943	14	14	4.29	2031882	15	12	5.00
1761580	18	10	6.00	4233770	18	10	6.00	3651813	18	12	5.00	3692756	14	14	4.29	2106867	15	12	5.00
463145	18	10	6.00	4422532	18	10	6.00	3819651	18	12	5.00	3806570	14	14	4.29	2181852	15	12	5.00
590652	18	10	6.00	4554981	18	10	6.00	3936678	18	12	5.00	3961897	14	14	4.29	2300504	15	12	5.00
718247	18	10	6.00	4687522	18	10	6.00	4053786	18	12	5.00	4117331	14	14	4.29	2419239	15	12	5.00
877426	18	10	6.00	4852870	18	10	6.00	4199881	18	12	5.00	4311240	14	14	4.29	2567364	15	12	5.00
1004250	18	10	6.00	4984610	18	10	6.00	4316281	18	12	5.00	4465735	14	14	4.29	2685381	15	12	5.00

Calculated values						Notes:									
Total Totalizer Input	Total EQ totalizer	Total AS totalizer	Flow meter extraction rate	Avg extraction rate	Air flow	Bag filters replaced	Air Stripper trays cleaned	Grease points NOT APPLICPALE							
gal	gal	gal	gpm	gpm	scfm	Date	date	date							
0	0	0	0.03			07/22/19	07/22/19	na							
7890	7890	7780	21.18	5.48		na	na	na							
15259	14458	14503	21.18	0.81		na	na	na							
35215	41705	42009	21.18	1.30		na	na	na							
74216	80193	80890	21.18	6.28		08/12/19	na	na							
143919	149193	150828	21.02	16.25		na	na	na	took effluent bag filters and took them from series to parallel						
229190	233626	235658	21.53	21.05		na	na	na							
442495	445076	448205	21.18	20.85		na	na	na							
660192	664091	665511	20.45	9.46		09/11/19	09/11/19	na	monthly om as cleaned						
1173179	1201258	1175082	20.69	16.16		10/01/19	10/01/19	na	monthly om as cleaned, cleaned all ij flow meters and removed selionds guts.						
2173928	2334155	2253219	21.01	19.90		11/04/19	11/04/19	na	monthly om as cleaned						
2950294	3416384	3103418	20.77	16.40		12/09/19	12/09/19	na	monthly om as cleaned						
3280184	3959892	3460705	20.98	6.54				na							
3886053	5114020	4127819	20.69	13.95		02/11/20	02/11/20	na	all ij flow meters were cleaned in jan						
5369668	8203623	5791342	20.51	18.36		04/06/20	04/06/20	na							
6549277	8325468	6504740	20.69	23.60		05/13/20	05/13/20	na	EQ tank and AS totalizers are not counting need further review						
6829116	8376880	6554498	20.27	9.11		06/04/20	06/04/20	na	ft301 &ft501 replaced 2jun20						
7477392	9042896	7179631	20.93	11.64		07/13/20	07/13/20	na	monthly om						
8125667	9708912	7804765	20.93	15.39		08/11/20	08/11/20	na	monthly om						
8682698	10348132	8365844	20.69	11.01		09/15/20	09/15/20	na	monthly om as cleaned						
9351141	11115195	9039139	20.69	12.94		10/19/20	10/19/20	na	monthly om as cleaned						
10193242	11992040	9932455	20.69	17.83		11/06/20	11/06/20	na	monthly om as cleaned						
10745038	12572668	10538984	21.01	17.29		12/15/20	12/15/20	na	monthly om as cleaned, floats cleaned, meters cleaned						
11666772	13778986	11536284	21.18	18.78		01/18/21	01/18/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
12337511	14564979	12239272	21.18	16.04		02/16/21	02/16/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
13116556	15401602	13069576	21.09	20.84		03/14/21	03/14/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
13895603	16238225	13899880	21.01	15.85		04/17/21	04/17/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
14674651	17074849	14730185	20.93	17.55		05/18/21	05/18/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
15419385	17858428	15528180	21.10	19.13		06/14/21	06/14/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
16164120	18642008	16326176	21.02	11.26		07/30/21	07/30/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
16416577	18903275	16600094	20.86	8.77		08/19/21	08/19/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
16718219	19210391	16631495	20.86	9.52		09/10/21	09/10/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
17019637	19517467	16663150	21.10	7.75		10/07/21	10/07/21	na	monthly om as cleaned, floats cleaned, meters cleaned						September the blower motor was
17862166	20510425	16831544	21.10	17.21		11/10/21	11/10/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
18704694	21503383	16999937	21.10	18.28		12/12/21	12/12/21	na	monthly om as cleaned, floats cleaned, meters cleaned						
19547223	22496340	17168331	21.10	14.627233		01/21/22	01/21/22	na	monthly om as cleaned, floats cleaned, meters cleaned						
20389751	23489298	17168331	21.10	16.72		02/25/22	02/25/22	na	monthly om as cleaned, floats cleaned, meters cleaned						
21232280	24482256	17168331	21.10	18.87		03/28/22	03/28/22	na	monthly om as cleaned, floats cleaned, meters cleaned						
21973269	25453597	17168331	21.10	18.38		04/25/22	04/25/22	na	monthly om as cleaned, floats cleaned, meters cleaned						
22846808	25864776	17336724	21.10	25.276018		05/19/22	05/19/22	na	monthly om as cleaned, floats cleaned, meters cleaned						
23720347	26275955	17505118	21.10	18.96		06/20/22	06/20/22	na	monthly om as cleaned, floats cleaned, meters cleaned						
24239601	26687134	17673511	21.10	10.30		07/25/22	07/25/22	na	monthly om as cleaned, floats cleaned, meters cleaned						
25093902	27541435	18527812	21.10	21.19		08/22/22	08/22/22	na	monthly om as cleaned, floats cleaned, meters cleaned						
25948794	28396327	19382704	21.10	21.20		09/19/22	09/19/22	na	monthly om as cleaned, floats cleaned, meters cleaned						
27015294	29462827	20449204	21.10	21.16		10/24/22	10/24/22	na	monthly om as cleaned, floats cleaned, meters cleaned						
27865017	30312550	21298927	21.10	21.07		11/21/22	11/21/22	na	monthly om as cleaned, floats cleaned, meters cleaned						

APPENDIX D
SAMPLING FIELD NOTES

Location NASA Date 10 7 21

Project / Client CACA

112 60 8970

Clear 0 wind 80°
Robert Siegel Kyle K Chuck S

6 00 TT —
715 onsite gen setup 1160
Carl Chuck Tailgate
safety review

840 TT Ice

850 onsite CACA meet
Dan F and Ronke
gen review
start opening all wells

10 30 all wells open start
water levels ref log

1230 End water levels START
Sampling setup/Start
MW 19 with Kyle
ref log

Location NASA Date 10 7 21

Project / Client CACA

112 60 8970

Light Rain Wind 80°
Robert Siegel Kyle

1350 End MW19 Ice Sample
decon Rain Lighting Phase 2
delay / Tablet online delay

1515 setup start MW18
ref sample log

1615 End MW 18 Ice
Sample decon load all
Equipment supplies
1730 TT meet at Drums
gen review SOW

1815 offsite TT

1830 onsite store equipment

1900 offsite 1177
2015 Break

Tetra Tech, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NASA - CRCA
Project No.: 112G08970
Location: Kennedy Space Center, Florida
Personnel: Rob Seigel, Kyle Kercher
Weather Conditions: Sunny to Scattered Showers
Measuring Device: Heron Skinny Dipper
Tidally Influenced: Yes ____ No __X__
Remarks:

Well or Piezometer Number	Date	Time	Top of Casing Elevation (feet)*	Screened Interval (feet bls)	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
MW0001	10/7/2021	1057	6.11	5-15	3.47	None		
MW0002	10/7/2021	1058	6.14	30-35	5.48	None		
MW0003	10/7/2021	1145	6.99	5-15	4.4	None		
MW0004	10/7/2021	1156	6.3	5-15	3.6	None		
MW0005	10/7/2021	1045	6.69	5-15	4.28	None		
MW0005A	10/7/2021	1040	6.55	5-10	3.98	None		
MW0005B	10/7/2021	1055	6.69	12-17	4.14	None		
MW0005C	10/7/2021	1044	6.85	2-7	4.23	None		
MW0006	10/7/2021	1101	6.58	5-15	3.95	None		
MW0007	10/7/2021	1106	6.54	5-15	3.96	None		
MW0008	10/7/2021	1214	7.36	5-15	4.75	None		
MW0009	10/7/2021	1104	6.84	5-15	4.09	None		
MW0010	10/7/2021	1035	6.66	5-15	4.09	None		
MW0011	10/7/2021	1142	7.40	5-10	4.46	None		
MW0012	10/7/2021	1141	7.07	25-30	4.47	None		
MW0013	10/7/2021	1201	7.46	25-30	5.05	None		
MW0014	10/7/2021	1115	6.86	5-10	4.36	None		
MW0015	10/7/2021	1116	6.82	25-30	4.45	None		
MW0016	10/7/2021	1111	6.18	5-10	3.62	None		
MW0017	10/7/2021	1111	6.16	25-30	3.61	None		
MW0018	10/7/2021	1145	7.05	53-63	4.41	None		
MW0019	10/7/2021	1206	7.13	53-63	4.9	None		
MW0020	10/7/2021	1133	7.27	53-63	4.88	None		
MW0021	10/7/2021	1132	7.54	30-40	5.06	None		
MW0022	10/7/2021	1137	6.44	30-40	3.82	None		
MW0023	10/7/2021	1138	6.50	53-63	3.86	None		
MW0024	10/7/2021	1113	6.22	53-63	3.62	None		
MW0025	10/7/2021	1118	6.91	53-63	4.59	None		
MW0026	10/7/2021	1125	4.45	5-15	2.2	None		
MW0027	10/7/2021	1124	4.33	30-40	2.15	None		
MW0028	10/7/2021	1123	4.34	53-63	2.19	None		
MW0029	10/7/2021	1128	4.79	30-40	2.66	None		
MW0030	10/7/2021	1129	4.77	53-63	2.71	None		
MW0031	10/7/2021	1120		53-63	4.74	None		
MW0032	10/7/2021	1620	4.70	53-63	2.69	None		

* All measurements to the nearest 0.01 foot

TETRA TECH

INSTRUMENT CALIBRATION LOGSHEET

PROJECT NAME : CRCA
SITE NAME: CRCA
PROJECT NO.: 112G08970

INSTRUMENT NAME/MODEL YSI, Proquatro
MANUFACTURER: YSI
SERIAL NUMBER: **21D101770**

Date of Calibration (mm/dd/yr)	Person Performing Calibration (Name)	pH (S.U.)				Cond. (µS/cm)	D.O. (mg/L)	Temp. ºC	ORP (mV)	Salinity (%)	Turbidity (1) (NTUs)	Turbidity (10) (NTUs)	Calibration Standard Lot # / Expiration Date	Remarks
		Pre	*4.03*	*6.98*	10.02	1376	103.2	24.2	239.4	Na	Na	Na	***Lot # 0GL537***	
10/7/2021	Kyle Kercher	*Post*	*4.00*	*7.00*	10.00	1413	100.6	24.2	238	Na	Na	Na	***Exp. Date: Dec 22***	pH = 4
		Pre								Na	Na	Na	***Lot # 0GL758***	
		Post								Na	Na	Na	***Exp. Date: Dec 22***	pH = 7
		Pre											***Lot # 0GK984***	
		Post											***Exp. Date: Nov 22***	pH = 10
		Pre	***4.06***	***6.97***	9.99	1465	96.8	27.2	232.5	Na	Na	Na	***Lot # 0GK969***	
10/8/2021	Kyle Kercher	*Post*	***4***	***7***	10	1413	100.4	27.2	238	Na	Na	Na	***Exp. Date: Nov21***	Conductivity = 1413 µS/cm
		Pre											***Lot # 1GD875***	
		Post											***Exp. Date: Jan 22***	ORP = 238 mV
		Pre												
		Post												
		Pre												
		Post												
		Pre												
		Post												
		Pre												
		Post												
		Pre												
		Post												

10/07/21 CRCA 1126089 70

Personnel : Chuck Soreben (CS)
Rob Siegel (RS)
Kyle Kercher (KK)
Weather: Sunny to Partly Cloudy High 87°F
PPE : Level D
Health + Safety (HAS): Topics - PPE, SSHASP, IDW, wildlife
Objective : Start 20210 Performance Monitoring CRCA

0715 KK onsite POL, for cal. + equip prep.
0730 RS onsite POL
0735 Calibration
0800 Cal. complete
0815 CS onsite
0830 CS offsite POL
0840 KK, RS depart POL for ice machine
0845 KK, RS depart ice machine for CRCA
0855 KK, RS arrive at CRCA, DF, Ronnie onsite
0910 Start uncapping MW for WL's
1030 Finished uncapping MWs at CRCA, KK, RS
1035 Start WL
1230 End WL
1250 KK, RS at MW 19
1255 RS start purge
1329 RS end purge
1330 Sample collected CRCA-MW0019-058.0-20211007
~~ ① 8260D TCL SOM01
~~ ② RSK 175 MEE
~~ ③ DHC/VC Reductase
1350 Exit CRCA building prep for weekly meeting
1400 Chain of custody work, RS at MW18
1420 KK at MW31
1430 KK leave MW31, Phase II lightning alert
1450 KK at MW31

10/07/21 CRCA 1IZG08970

1455 KK start purge MW31
1515 End purge
1520 Sample collected
1525 Ice sample, 4°C cooler
1530 Decon equip.
1535 Paperwork
1550 KK arrive at MW32, carry in equip + supplies, clear path
1620 Start purge
1730 End purge
1735 Sample collected, CRCA-MW0032-058.0-20211007
1740 Ice sample, 4°C cooler
1745 Decon equip
1800 Pack DHC/VC reductase for shipping RS CS onsite
1805 CS offsite w/ DHC/VC reductase samples
1815 Depart CRCA for ice
1830 Depart ice for POL
1845 Arrive at POL, equip storage + Decon.
1910 Offsite POL
1940 Office

LAMOTTE TURBIDITY METER CALIBRATION LOG

Tetra Tech, Inc.

PROJECT NAME : CRCA

SITE NAME: CRCA

PROJECT No.: 112G08970

INSTRUMENT NAME/MODEL: Lamotte 2020t Turbidimeter

MANUFACTURER: Lamotte

SERIAL NUMBER: SN1914-4019

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration		
(mm/dd/yy)	(Number)	(Name)	Nephelometric Turbidity Units (NTUs)				(Number)	
10/7/2021	Na	Kyle Kercher	0.0	0.0	0.0	0.0	19330172 for 0	
			10.0	10.0	9.9	10.0		
			0.0	0.0			9450157 for 1	
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				
			0.0	0.0				
			10.0	10.0				

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0018	SAMPLE ID: **CRCA-MW0018-058.0-20211007** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **10/07//2021**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.40	CASING HEIGHT (feet als): -0.2 bls	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.71 Liters. (0.005 x 45) + 0.475 = 0.71

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58	PURGING INITIATED AT: 1525	PURGING ENDED AT: 1549	TOTAL VOLUME PURGED (Liters): 2.4

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1535	1.0	1.0	100.0	4.40	7.07	28.7	1145.0	0.40	5.45	-87.5	Clear
1540	0.5	1.5	100.0	4.40	7.05	28.6	1162.0	0.24	3.25	-93.2	
1545	0.5	2.0	100.0	4.40	7.04	28.4	1172.0	0.18	2.22	-96.5	
1549	0.4	2.4	100.0	4.40	7.04	28.3	1170.0	0.15	1.95	-98.5	Clear

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Robert Siegel Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1550	SAMPLING ENDED AT: 1605

PUMP OR TUBING DEPTH IN WELL (feet): 58	SAMPLE PUMP: FLOW RATE (mL per minute): 100.0	TUBING MATERIAL CODE: T

FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
18	3	CG	40 mL	HCl	None	<2	8260D TCL	PP
18	3	CG	10 mL	None	None	See above	RSK 175 MEE	PP
18	1	PE	1 L	None	None	See Above	DHC / VC Reductase	PP

REMARKS: TD 63.5 ft from TOC

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0019	SAMPLE ID: **CRCA-MW0019-058.0-20211007** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **10/07/2021**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.90	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 0.84

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58	PURGING INITIATED AT: 1255	PURGING ENDED AT: 1329	TOTAL VOLUME PURGED (Liters): 4.08

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1305	1.20	1.2	120.0	5.61	6.93	22.8	707	0.17	94.20	-94.2	Cloudy
1310	0.60	1.8	120.0	5.58	6.96	22.8	711	0.17	14.60	-91.5	Clean
1315	0.60	2.4	120.0	5.58	6.98	22.8	714	0.18	11.10	-90.1	
1320	0.60	3.0	120.0	5.58	6.98	22.8	717	0.15	8.98	-89.8	
1325	0.60	3.6	120.0	5.58	6.99	22.8	718	0.14	8.07	-90.0	
1329	0.48	4.08	120.0	5.58	6.99	22.8	718	0.14	6.80	-90.0	Clear
1330	Samples	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Kyle Kercher /Tetra Tech Rob Seigel /Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1330	SAMPLING ENDED AT: 1345
PUMP OR TUBING DEPTH IN WELL (feet): 58	SAMPLE PUMP: FLOW RATE (mL per minute): 120.0	TUBING MATERIAL CODE: T	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
19	3	CG	40 mL	HCl +ICE	None	<2	8260D TCL	PP
19	3	CG	10 mL	None +ICE	None	See above	RSK 175 MEE	PP
319	1	PE	1 L	None +ICE	None	See Above	DHC / VC Reductase	PP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0031	SAMPLE ID: **CRCA-MW0031-058.0-20211007** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **10/07/2021**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.69	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 0.84

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58	PURGING INITIATED AT: 1455	PURGING ENDED AT: 1515	TOTAL VOLUME PURGED (Liters): 4.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1505	2.0	2.0	200	4.69	6.89	26.3	904	0.07	1.18	-81.6	Clear
1510	1.0	3.0	200	4.70	6.90	26.6	906	0.04	0.80	-84.7	Clear
1512	0.4	3.4	200	4.71	6.90	26.6	907	0.04	0.64	-84.9	Clear
1515	0.6	4.0	200	4.72	6.90	26.4	904	0.03	0.67	-85.5	Clear
1520	Samples	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Kyle Kercher /Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1520	SAMPLING ENDED AT: 1530
PUMP OR TUBING DEPTH IN WELL (feet): 58	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: T	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl	None	<2	8260D TCL	PP
2	3	CG	10 mL	None	None	See above	RSK 175 MEE	PP
3	1	PE	1 L	None	None	See Above	DHC / VC Reductase	PP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0032	SAMPLE ID: **CRCA-MW0032-058.0-20211007** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **10/07/2021**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 2.69	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 1/4	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.0098 x 73) + 0.475 = 1.19

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58	PURGING INITIATED AT: 1620	PURGING ENDED AT: 1730	TOTAL VOLUME PURGED (Liters): 11.4

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1630	3.0	3.0	300	3.25	6.83	24.9	2508	0.02	Overrange	-83.2	Cloudy
1640	2.0	5.0	200	3.17	6.84	25.0	2722	0.04	Overrange	-83.8	Cloudy
1650	2.0	7.0	200	3.09	6.85	25.0	2817	0.02	82.9	-84.2	Cloudy
1700	1.0	8.0	100	3.08	6.86	25.0	2879	0.02	32.3	-84.3	Cloudy
1710	1.0	9.0	100	3.08	6.86	25.0	2889	0.02	21.4	-84.1	Clear
1720	1.0	10.0	100	3.08	6.86	24.8	2901	0.02	18.2	-84.3	Clear
1725	1.0	11.0	100	3.09	6.86	24.9	2908	0.02	17.8	-84.4	Clear
1730	0.4	11.4	100	3.08	6.86	24.8	2914	0.02	13.2	-84.6	Clear
1735	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Kyle Kercher /Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1735	SAMPLING ENDED AT: 1740
PUMP OR TUBING DEPTH IN WELL (feet): 58	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: HDPE	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl	None	<2	8260D TCL	PP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

TETRA TECH

INSTRUMENT CALIBRATION LOGSHEET

PROJECT NAME : CRCA

SITE NAME: CRCA

PROJECT NO.: 112G08970

INSTRUMENT NAME/MODEL YSI ProQ Muti meter / LaMotte 2020e ntu only

MANUFACTURER: YSI / LaMotte

SERIAL NUMBER: 21D101766 / Me14842

Date of Calibration (mm/dd/yr)	Person Performing Calibration (Name)	pH (S.U.)				Cond. (µS/cm)	D.O. (mg/L)	Temp. °C	ORP (mV)	Salinity (%)	Turbidity (0) (NTUs)	Turbidity (10) (NTUs)	Calibration Standard Lot # / Expiration Date	Remarks
1/14/2022	R Siegel	*Pre*	4.03	7.10	9.95	1413	9.45	18	237		0	9.81	*Lot #1GF009*	
		Post											*Exp. Date:06/23*	pH = 4
		Pre											*Lot #1GF484*	
		Post											*Exp. Date:06/23*	pH = 7
		Pre											*Lot #1GF482*	
		Post											*Exp. Date:06/23*	pH = 10
		Pre											*Lot #1GF406*	
		Post											*Exp. Date:06/22*	Conductivity = 1413 µS/cm
		Pre											*Lot # 4801*	
		Post											*Exp. Date:11/24*	ORP = 240 mV
		Pre											*Lot #21030063*	
		Post											*Exp. Date: 7/22*	Turb.=0 ntu
		Pre											*Lot # 20320111*	
		Post											*Exp. Date 5/22*	Turb.=10 ntu
		Pre												
		Post												
		Pre												
		Post												
		Pre												
		Post												

Tetra Tech, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NASA - CRCA
Project No.: 112G08970
Location: Kennedy Space Center, Florida
Personnel: Chuck Sorden, Rob Siegel
Weather Conditions: Sunny 53 Degrees F
Measuring Device: Heron Skinny Dipper
Tidally Influenced: Yes ___ No _X_
Remarks:

Well or Piezometer Number	Date	Time	Top of Casing Elevation (feet)*	Screened Interval (feet bls)	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
MW0001	1/14/2022	900	6.11	5-15	3.29	None		
MW0002	1/14/2022	859	6.14	30-35	3.28	None		
MW0003	1/14/2022	903	6.99	5-15	4.18	None		
MW0004	1/14/2022	857	2	5-15	3.42	None		
MW0005	1/14/2022	856	6.69	5-15	3.99	None		
MW0005A	1/14/2022	854	6.55	5-10	3.7	None		
MW0005B	1/14/2022	857	6.69	12-17	3.96	None		
MW0005C	1/14/2022	853	6.85	2-7	3.91	None		
MW0006	1/14/2022	915	6.58	5-15	3.78	None		
MW0007	1/14/2022	918	6.54	5-15	3.76	None		
MW0008	1/14/2022	912	7.36	5-15	4.56	None		
MW0009	1/14/2022	911	6.84	5-15	3.91	None		
MW0010	1/14/2022	851	6.66	5-15	3.91	None		
MW0011	1/14/2022	907	7.40	5-10	4.21	None		
MW0012	1/14/2022	908	7.07	25-30	4.31	None		
MW0013	1/14/2022	906	7.46	25-30	4.82	None		
MW0014	1/14/2022	929	6.86	5-10	4.18	None		
MW0015	1/14/2022	930	6.82	25-30	4.16	None		
MW0016	1/14/2022	921	6.18	5-10	3.41	None		
MW0017	1/14/2022	920	6.16	25-30	3.45	None		
MW0018	1/14/2022	904	7.05	53-63	4.22	None		
MW0019	1/14/2022	932	7.13	53-63	4.62	None		
MW0020	1/14/2022	949	7.27	53-63	4.7	None		
MW0021	1/14/2022	951	7.54	30-40	4.88	None		
MW0022	1/14/2022	954	6.44	30-40	3.62	None		
MW0023	1/14/2022	955	6.50	53-63	3.66	None		
MW0024	1/14/2022	919	6.22	53-63	3.42	None		
MW0025	1/14/2022	928	6.91	53-63	4.28	None		
MW0026	1/14/2022	941	4.45	5-15	2.02	None		
MW0027	1/14/2022	942	4.33	30-40	1.95	None		
MW0028	1/14/2022	943	4.34	53-63	1.98	None		
MW0029	1/14/2022	946	4.79	30-40	2.45	None		
MW0030	1/14/2022	947	4.77	53-63	2.53	None		
MW0031	1/14/2022	939	?	53-63	4.57	None		
MW0032	1/14/2022	837	4.70	53-63	2.48	None		

* All measurements to the nearest 0.01 foot

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0002	SAMPLE ID: **CRCA-MW0002-032.5-20220114** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **01/14/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 3.28	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 30 to 35

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 30	BOTTOM DEPTH (feet bls): 35

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.73 Liters. (0.005 x 45) + 0.475 = 0.71

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 32.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 32.5	PURGING INITIATED AT: 1100	PURGING ENDED AT: 1120	TOTAL VOLUME PURGED (Liters): 4.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1110	2.0	2.0	200	3.46	6.50	24.96	1017.1	0.08	7.22	52.8	Clear
1115	1.0	3.0	200	3.46	6.50	24.99	1025.9	0.07	5.09	41.4	Clear
1120	1.0	4.0	200	3.46	6.50	25.10	1015.2	0.06	7.42	19.5	Clear
1125	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Chuck Sorden /Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1125	SAMPLING ENDED AT: 1130

PUMP OR TUBING DEPTH IN WELL (feet): 32.5	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: T

FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 ml	HCl	None	<2	8260D TCL	PP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0013	SAMPLE ID: **CRCA-MW0013-027.5-20220114** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **01/14/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.82	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 25 to 30

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 25	BOTTOM DEPTH (feet bls): 30

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.68 Liters. (0.005 x 40) + 0.475 = 0.68

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 27.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 27.5	PURGING INITIATED AT: 1235	PURGING ENDED AT: 1255	TOTAL VOLUME PURGED (Liters): 4.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1245	2.0	2.0	200	5.15	6.27	23.09	1024.2	0.21	0.71	63.5	Yellow
1250	1.0	3.0	200	5.15	6.30	23.06	1024.5	0.16	0.78	39.6	Yellow
1255	1.0	4.0	200	5.15	6.34	23.05	1024.2	0.15	1.02	28.5	Yellow
1300	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Chuck Sorden / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1300	SAMPLING ENDED AT: 1305

PUMP OR TUBING DEPTH IN WELL (feet): 27.5	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: T

FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl	None	<2	8260D TCL	PP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0018	SAMPLE ID: **CRCA-MW0018-058.0-20220114** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **01/14/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.22	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 0.84

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1145	PURGING ENDED AT: 1205	TOTAL VOLUME PURGED (Liters): 4.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1155	2.0	2.0	200	4,43	7.00	24.94	1126.9	0.05	1.89	-29.2	Clear
1200	1.0	3.0	200	4.43	7.00	24.87	1120.6	0.04	4.49	-41.3	Clear
1205	1.0	4.0	200	4.43	7.00	25.02	1131.3	0.04	3.73	-45.6	Clear
1210	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Chuck Sorden/Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1210	SAMPLING ENDED AT: 1220

PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: T

FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl	None	<2	8260D TCL	PP
2	3	CG	10 mL	None	None	See above	RSK 175 MEE	PP
3	1	PE	1 L	None	None	See Above	DHC / VC Reductase	PP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0019	SAMPLE ID: **CRCA-MW0019-058.0-20220114** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **01/14/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.61	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 0.84

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1235	PURGING ENDED AT: 1304	TOTAL VOLUME PURGED (Liters): 8.2

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1245	3.0	3.0	300.0	5.45	7.28	22.2	785.0	0.13	36.00	-124.0	Clear
1250	1.5	4.5	300.0	5.45	7.29	22.3	787.0	0.12	17.20	-124.0	
1255	1.5	6.0	300.0	5.45	7.29	22.4	789.0	0.10	16.50	-123.8	
1300	1.5	7.5	300.0	5.45	7.30	22.4	790.0	0.10	10.05	-124.0	
1304	1.2	8.2	300.0	5.45	7.29	22.4	790.0	0.11	7.75	-123.5	Clear
1305	sample	collected									

WELL CAPACITY (Liters Per Foot): **0.75”** = 0.076; **1”** = 0.15; **1.25”** = 0.23; **2”** = 0.61; **3”** = 1.40; **4”** = 2.46; **5”** = 3.86; **6”** = 5.57; **12”** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Robert Siegel / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1305	SAMPLING ENDED AT: 1315
PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute):	TUBING MATERIAL CODE: T	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
19	3	CG	40 mL	HCl	None	<2	8260D TCL	aPP
19	3	CG	10 mL	None	None	See above	RSK 175 MEE	aPP
19	1	PE	1 L	None	None	See Above	DHC / VC Reductase	aPP

REMARKS: after sample total depth check. 63.2. Ft from toc/tor

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0027	SAMPLE ID: **CRCA-MW0027-035.0-20220114** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **01/14/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 1.95	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 30 to 40

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 30	BOTTOM DEPTH (feet bls): 40

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

.0.97 Liters. (0.0005 x 50) + 0.475 = 0.97

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 35.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 35.0	PURGING INITIATED AT: 1025	PURGING ENDED AT: 1054	TOTAL VOLUME PURGED (Liters): 8.7

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1035	3.0	3.0	300.0	2.01	7.95	23.8	257.2	0.18	63.5	-164.2	Clear
1040	1.5	4.5	300.0	2.01	7.96	23.8	257.5	0.19	13.5	-167.0	
1045	1.5	6.0	300.0	2.01	7.96	23.9	258.5	0.15	9.28	-169.0	
1050	1.5	7.5	300.0	2.01	7.96	23.9	260.0	0.11	6.58	-170.5	
1054	1.2	8.7	300.0	2.01	7.96	23.8	259.0	0.13	6.58	-171.3	Clear
1055	sample	collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Robert Siegel /Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1055	SAMPLING ENDED AT: 1105

PUMP OR TUBING DEPTH IN WELL (feet): 35.0	SAMPLE PUMP: FLOW RATE (mL per minute): 250.0	TUBING MATERIAL CODE: hdpe

FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
27	3	CG	40 mL	HCL+Ice	None	<2	8260D TCL	PP

REMARKS: after sample total depth check 40.1. Ft from toc/tor

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0031	SAMPLE ID: **CRCA-MW0031-058.0-20220114** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **01/14/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.52	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 0.84

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1120	PURGING ENDED AT: 1144	TOTAL VOLUME PURGED (Liters): 7.2

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1130	3.0	3.0	300.0	4.52	7.27	23.4	811.0	0.17	1.80	-100.0	Clear
1135	1.5	4.5	300.0	4.52	7.25	23.4	811.0	0.18	1.21	-100.8	
1140	1.5	6.0	300.0	4.52	7.26	23.4	810.0	0.11	0.68	-101.8	
1144	1.2	7.2	300.0	4.52	7.25	23.5	812.0	0.10	0.78	-102.1	Clear
1145	sample	collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Robert Siegel / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1145	SAMPLING ENDED AT: 1155

PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute): 250.0	TUBING MATERIAL CODE: hdpe

FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
31	3	CG	40 mL	HCl	None	<2	8260D TCL	PP
31	3	CG	10 mL	None	None	See above	RSK 175 MEE	PP
31	1	PE	1 L	None	None	See Above	DHC / VC Reductase	PP

REMARKS: after sample total depth check. 63.65 ft from toc/tor

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0032	SAMPLE ID: **CRCA-MW0032-058.0-202201** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **01/. /2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 2.48	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches):	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.0005 x 73) + 0.475 = 1.19

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1405	PURGING ENDED AT: 1455	TOTAL VOLUME PURGED (Liters): 11.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1435	6.0	6.0	200	2.78	6.60	22.66	1488.5	0.07	44.2	14.3	Cloudy
1445	2.0	8.0	200	2.78	6.64	22.68	1495.5	0.07	30.4	-1.2	Cloudy
1450	2.0	10.0	200	2.78	6.65	22.68	1507.1	0.07	30.3	-6.3	Cloudy
1452	0.4	10.4	200	2.78	6.67	22.59	1506.6	0.06	29.3	-8.9	Cloudy
1455	0.6	11.0	200	2.78	6.67	22.55	1509.8	0.07	28.2	-12.4	Cloudy
1500	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Robert Siegel / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1500	SAMPLING ENDED AT: 1505
PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute):	TUBING MATERIAL CODE: T	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl	None	<2	8260D TCL	PP

REMARKS: High Turbidity. Sampled per FS2212. 5 screen volumes purged.

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

04/18/2022 **AOSB** **112G09237**

Personnel: Chuck Sorden (CS) Geologist Tt
PPE: Level D
Objective: Complete CRCA Performance GW monitoring event

0800: CS on base; gathering equipment and supplies; calibration/setup
0930: CS at CRCA
0950: CS Purging CRCA-MW0018
1010: Purging complete on CRCA-MW0018
1015: Sample Collected CRCA-MW0018-058.0-20220418 8260D, MEE
1040: CS Purging CRCA-MW0019
1120: Purging Complete on CRCA-MW0019
1125: Sample Collected CRCA-MW0019-058.0-20220418 8260D, MEE
1145: Purging CRCA-MW0031
1210: Purging complete on CRCA-MW0031
1215: Sample Collected CRCA-MW0031-058.0-20220418 8260D, MEE
1250: CS Purging CRCA-MW0032
1350: Purging Complete on CRCA-MW0032. High Turbidity
1355: Sample Collected CRCA-MW0032-058.0-20220418 8260D
1430: Sample Collected CRCA-ASINFLUENT-20220418 8260D/PFAS QSM Table B15
1445: Sample Collected CRCA-ASEFFLUENT-20220418 8260D/PFAS QSM Table B15

Tetra Tech, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NASA - CRCA
Project No.: 112G08970
Location: Kennedy Space Center, Florida
Personnel: Chuck Sorden
Weather Conditions: Sunny 78 Degrees F
Measuring Device: Heron Skinny Dipper
Tidally Influenced: Yes ___ No _X_
Remarks:

Well or Piezometer Number	Date	Time	Top of Casing Elevation (feet)*	Screened Interval (feet bls)	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
MW0001	4/26/2022	1441	6.11	5-15	3.93	None		
MW0002	4/26/2022	1442	6.14	30-35	3.93	None		
MW0003	4/26/2022	1448	6.99	5-15	4.88	None		
MW0004	4/26/2022	1440	2	5-15	4.04	None		
MW0005	4/26/2022	1437	6.69	5-15	4.6	None		
MW0005A	4/26/2022	1438	6.55	5-10	4.4	None		
MW0005B	4/26/2022	1436	6.69	12-17	4.58	None		
MW0005C	4/26/2022	1437	6.85	2-7	4.58	None		
MW0006	4/26/2022	1443	6.58	5-15	4.44	None		
MW0007	4/26/2022	1446	6.54	5-15	4.4	None		
MW0008	4/26/2022	1444	7.36	5-15	5.25	None		
MW0009	4/26/2022	1442	6.84	5-15	4.58	None		
MW0010	4/26/2022	1434	6.66	5-15	4.5	None		
MW0011	4/26/2022	1450	7.40	5-10	4.9	None		
MW0012	4/26/2022	1449	7.07	25-30	4.95	None		
MW0013	4/26/2022	1451	7.46	25-30	5.53	None		
MW0014	4/26/2022	1500	6.86	5-10	4.86	None		
MW0015	4/26/2022	1501	6.82	25-30	4.88	None		
MW0016	4/26/2022	1454	6.18	5-10	4.06	None		
MW0017	4/26/2022	1455	6.16	25-30	4.05	None		
MW0018	4/26/2022	1449	7.05	53-63	4.92	None		
MW0019	4/26/2022	1458	7.13	53-63	5.34	None		
MW0020	4/26/2022	1512	7.27	53-63	5.39	None		
MW0021	4/26/2022	1511	7.54	30-40	5.59	None		
MW0022	4/26/2022	1514	6.44	30-40	4.27	None		
MW0023	4/26/2022	1513	6.50	53-63	4.34	None		
MW0024	4/26/2022	1456	6.22	53-63	4.08	None		
MW0025	4/26/2022	1502	6.91	53-63	5.05	None		
MW0026	4/26/2022	1505	4.45	5-15	2.78	None		
MW0027	4/26/2022	1506	4.33	30-40	2.73	None		
MW0028	4/26/2022	1507	4.34	53-63	2.77	None		
MW0029	4/26/2022	1508	4.79	30-40	3.23	None		
MW0030	4/26/2022	1509	4.77	53-63	3.25	None		
MW0031	4/26/2022	1503	?	53-63	5.24	None		
MW0032	4/26/2022	1522	4.70	53-63	3.39	None		

* All measurements to the nearest 0.01 foot

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0018	SAMPLE ID: **CRCA-MW0018-058.0-20220418** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **04/18/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.52	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 0.84

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 0950	PURGING ENDED AT: 1010	TOTAL VOLUME PURGED (Liters): 4.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1000	2.0	2.0	200	4.55	6.77	27.10	1480.3	0.05	4.63	26.3	Clear
1005	1.0	3.0	200	4.55	6.78	27.11	1486.1	0.04	3.98	23.4	Clear
1010	1.0	4.0	200	4.55	6.79	27.09	1466.6	0.04	0.77	21.3	Clear
1015	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Chuck Sorden/Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT 1015:	SAMPLING ENDED AT: 1025
PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: T	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl	None	<2	8260D TCL	PP
2	3	CG	10 mL	None	None	See above	RSK 175 MEE	PP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0019	SAMPLE ID: **CRCA-MW0019-058.0-20220418** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **04/18/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 5.52	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 0.84

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1040	PURGING ENDED AT: 1120	TOTAL VOLUME PURGED (Liters): 8.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1050	2.0	2.0	200	5.59	6.67	23.02	1081.4	0.17	35.83	7.4	Clear
1100	2.0	4.0	200	5.59	6.68	22.99	1085.1	0.13	22.24	9.6	Clear
1110	2.0	6.0	200	5.59	6.69	22.94	1088.6	0.11	7.82	16.6	Clear
1115	1.0	7.0	200	5.59	6.70	22.93	1089.0	0.10	7.67	18.4	Clear
1120	1.0	8.0	200	5.59	6.70	22.92	1089.2	0.10	6.06	19.6	Clear
1125	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Chuck Sorden / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1125	SAMPLING ENDED AT: 1135

PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: T

FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
19	3	CG	40 mL	HCl	None	<2	8260D TCL	aPP
19	2	CG	40 mL	HCl	None	<2	RSK 175 MEE	aPP

REMARKS: initial high turbidity.

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0031	SAMPLE ID: **CRCA-MW0031-058.0-20220418** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **04/18/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.77	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 0.84

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1145	PURGING ENDED AT: 1210	TOTAL VOLUME PURGED (Liters): 5.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1155	2.0	2.0	200	4.79	6.68	26.10	1177.0	0.23	1.18	69.3	Clear
1205	2.0	4.0	200	4.79	6.69	25.97	1159.0	0.15	2.82	54.3	Clear
1210	1.0	5.0	200	4.79	6/71	25.90	1151.8	0.13	5.87	51.3	Clear
1215	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Chuck Sorden / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1215	SAMPLING ENDED AT: 1225

PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute): 250.0	TUBING MATERIAL CODE: hdpe

FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
31	3	CG	40 mL	HCl	None	<2	8260D TCL	PP
31	3	CG	10 mL	None	None	See above	RSK 175 MEE	PP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0032	SAMPLE ID: **CRCA-MW0032-058.0-20220418** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **04/18/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 2.85	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 1.19

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1250	PURGING ENDED AT: 1350	TOTAL VOLUME PURGED (Liters): 9.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1320	6.0	6.0	200	3.42	6.61	23.99	2118.5	0.11	27.15	72.8	Cloudy
1340	2.0	8.0	100	3.24	6.63	23.91	2134.8	0.03	22.36	60.5	Clear
1345	0.5	8.5	100	3.24	6.64	24.05	2141.5	0.04	24.98	59.1	Clear
1350	0.5	9.0	200	3.24	6.61	24.11	2137.0	0.04	26.31	58.2	Clear
1355	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Chuck Sorden / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1355	SAMPLING ENDED AT: 1400

PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: T

FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl	None	<2	8260D TCL	PP

REMARKS: High Turbidity. Sampled per FS2212. 5 screen volumes purged.

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

07/21/2022 **AOSB** **112G09237**

Personnel: Chuck Sorden (CS) Geologist Tt
Weather: Sunny 82°F
PPE: Level D
Objective: Complete CRCA Performance GW monitoring event

0730:	CS on base; gathering equipment and supplies; calibration/daily prep		
0830:	CS on site		
0845:	CS Purging CRCA-MW0002		
0905:	Purging Complete		
0910:	Sample Collected	CRCA-MW0002-032.5-20220721	8260 VOC
0920:	CS Purging CRCA-MW0027		
0945:	Purging Complete		
0950:	Sample Collected	CRCA-MW0027-035.0-20220721	8260 VOC
1000:	CS Purging CRCA-MW0031		
1020:	Purging Complete		
1025:	Sample Collected	CRCA-MW0031-058.0-20220721	8260VOC, MEE, DHC/VCR
1045:	Purging CRCA-MW0018		
1105:	Purging Complete		
1110:	Sample Collected	CRCA-MW0018-058.0-20220721	8260VOC, MEE, DHC/VCR
1135:	CS Purging CRCA-MW0032		
1250:	Purging Complete		
1255:	Sample Colleted	CRCA-MW0032-058.0-20220721	8260 VOC
1320:	CS Purging CRCA-MW0019		
1340:	Purging Complete		
1345:	Sample Collected	CRCA-MW0019-058.0-20220721	8260VOC, MEE, DHC/VCR
1410:	CS Purging CRCA-MW0013		
1430:	Purging Complete		
1435:	Sample Collected	CRCA-MW0013-027.5-20220721	8260 VOC
1500:	Sample Collected	CRCA-ASINFLUENT-20220721	8260 VOC/PFAS
1515:	Sample Collected	CRCA-ASEFFLUENT-20220721	8260 VOC/PFAS

Calibration Report

Instrument	Aqua TROLL 600 Vented
Serial Number	840822
Created	7/21/2022

[redacted]

Serial Number	742651
Last Calibrated	7/21/2022

Calibration Details

Calibration Point 1

pH of Buffer	4.01 pH
pH mV	154.0 mV
Temperature	28.70 °C

Pre Measurement

pH	4.04 pH
pH mV	154.0 mV

Post Measurement

pH	4.01 pH
pH mV	155.9 mV

Calibration Point 2

pH of Buffer	6.99 pH
pH mV	-9.4 mV
Temperature	28.54 °C

Pre Measurement

pH	6.94 pH
pH mV	-9.4 mV

Post Measurement

pH	6.99 pH
pH mV	-9.5 mV

Calibration Point 3

pH of Buffer	9.95 pH
pH mV	-159.8 mV
Temperature	28.60 °C

Pre Measurement

pH	9.87 pH
pH mV	-159.8 mV

Post Measurement

pH	9.95 pH
pH mV	-161.8 mV

Slope and Offset 1

Slope	-54.83 mV/pH
Offset	-9.9 mV

Slope and Offset 2

Slope	-50.83 mV/pH
Offset	-9.9 mV

ORP

ORP Solution	ORP Standard
Offset	20.0 mV
Temperature	28.64 °C
Pre Measurement	224.9 mV
Post Measurement	223.0 mV

[redacted]

Serial Number	839497
Last Calibrated	7/21/2022

Calibration Details

Slope	1.081493
Offset	0.00 mg/L

Calibration point 100%

Concentration	7.29 mg/L
Pre Measurement	100.70 %Sat
Post Measurement	100.00 %Sat
Temperature	27.91 °C
Barometric Pressure	1,018.4 mbar

[redacted]

Serial Number 836715
Last Calibrated 7/21/2022

Calibration Details

TDS Conversion Factor (ppm)	0.65
Cell Constant	1.073
Reference Temperature	25.00 °C

Pre Measurement

Actual Conductivity	1,642.7 µS/cm
Specific Conductivity	1,537.8 µS/cm

Post Measurement

Actual Conductivity	1,509.4 µS/cm
Specific Conductivity	1,413.0 µS/cm

[redacted]

Serial Number 844541
Last Calibrated 7/21/2022

Calibration Details

Slope	1
Offset	-2.14 NTU

Calibration Point 1

Pre Measurement	0.00 NTU
Post Measurement	0.00 NTU

[redacted]

Serial Number 840822
Last Calibrated Factory Defaults

[redacted]

Serial Number 825947
Last Calibrated Factory Defaults

Tetra Tech, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NASA - CRCA
Project No.: 112G08970
Location: Kennedy Space Center, Florida
Personnel: Chuck Sorden
Weather Conditions: Sunny 88° F
Measuring Device: Heron Skinny Dipper
Tidally Influenced: Yes ___ No __X__
Remarks:

Well or Piezometer Number	Date	Time	Top of Casing Elevation (feet)*	Screened Interval (feet bls)	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
MW0001	7/15/2022	1343	6.11	5-15	3.82	None		
MW0002	7/15/2022	1344	6.14	30-35	3.86	None		
MW0003	7/15/2022	1349	6.99	5-15	4.77	None		
MW0004	7/15/2022	1342	2	5-15	3.99	None		
MW0005	7/15/2022	1339	6.69	5-15	4.52	None		
MW0005A	7/15/2022	1340	6.55	5-10	4.25	None		
MW0005B	7/15/2022	1338	6.69	12-17	4.48	None		
MW0005C	7/15/2022	1341	6.85	2-7	4.2	None		
MW0006	7/15/2022	1345	6.58	5-15	4.3	None		
MW0007	7/15/2022	1337	6.54	5-15	4.32	None		
MW0008	7/15/2022	1346	7.36	5-15	5.14	None		
MW0009	7/15/2022	1348	6.84	5-15	4.98	None		
MW0010	7/15/2022	1336	6.66	5-15	4.41	None		
MW0011	7/15/2022	1351	7.40	5-10	4.81	None		
MW0012	7/15/2022	1352	7.07	25-30	4.87	None		
MW0013	7/15/2022	1353	7.46	25-30	5.42	None		
MW0014	7/15/2022	1400	6.86	5-10	4.72	None		
MW0015	7/15/2022	1401	6.82	25-30	4.73	None		
MW0016	7/15/2022	1356	6.18	5-10	3.97	None		
MW0017	7/15/2022	1357	6.16	25-30	3.94	None		
MW0018	7/15/2022	1350	7.05	53-63	4.81	None		
MW0019	7/15/2022	1404	7.13	53-63	5.17	None		
MW0020	7/15/2022	1333	7.27	53-63	5.27	None		
MW0021	7/15/2022	1332	7.54	30-40	5.47	None		
MW0022	7/15/2022	1334	6.44	30-40	4.22	None		
MW0023	7/15/2022	1335	6.50	53-63	4.27	None		
MW0024	7/15/2022	1358	6.22	53-63	3.95	None		
MW0025	7/15/2022	1401	6.91	53-63	4.94	None		
MW0026	7/15/2022	1316	4.45	5-15	2.57	None		
MW0027	7/15/2022	1317	4.33	30-40	2.52	None		
MW0028	7/15/2022	1318	4.34	53-63	2.55	None		
MW0029	7/15/2022	1319	4.79	30-40	3	None		
MW0030	7/15/2022	1320	4.77	53-63	3.09	None		
MW0031	7/15/2022	1314	?	53-63	5.05	None		
MW0032	7/15/2022	1305	4.70	53-63	3.05	None		

* All measurements to the nearest 0.01 foot

Tetra Tech, Inc. / FDEP Groundwater Sampling Sheet

SITE NAME: **Component Refurbishment & Chemical Analysis Facility (CRCA)**	SITE LOCATION: **Kennedy Space Center (KSC), FL**	
LOCATION ID: MW0002	SAMPLE ID: **CRCA-MW0002-032.5-20220721** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **07/21/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 2.87	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): **30 to 35**

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): **3/16**	PURGE PUMP TYPE OR BAILER: **Peristaltic Pump**	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): **30**	BOTTOM DEPTH (feet bls): **35**

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.70 Liters. (0.005 x 45) + 0.475 = 0.70

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 32.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 32.5	PURGING INITIATED AT: 0845	PURGING ENDED AT: 0905	TOTAL VOLUME PURGED (Liters): 4.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
0855	2.0	2.0	200	2.89	5.91	27.63	1307.4	0.09	13.38	-11.6	Clear
0900	1.0	3.0	200	2.89	6.02	27.52	1275.1	0.05	14.00	-17.2	Clear
0905	1.0	4.0	200	2.89	6.08	27.53	1276.9	0.04	11.94	-25.0	Clear
0910	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.09

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Charles Sorden / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 0910	SAMPLING ENDED AT: 0915
PUMP OR TUBING DEPTH IN WELL (feet): 32.5	SAMPLE PUMP FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: HDPE	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl/4°C	N/A	<2	8260D TCL SOM01.2 CLP-LIKE (ENCO)	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech, Inc. / FDEP Groundwater Sampling Sheet

SITE NAME: **Component Refurbishment & Chemical Analysis Facility (CRCA)**	SITE LOCATION: **Kennedy Space Center (KSC), FL**	
LOCATION ID: MW0013	SAMPLE ID: **CRCA-MW0013-027.5-20220721** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **07/21/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.45	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): **25 to 30**

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): **3/16**	PURGE PUMP TYPE OR BAILER: **Peristaltic Pump**	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): **25**	BOTTOM DEPTH (feet bls): **30**

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.68 Liters. (0.005 x 40) + 0.475 = 0.68

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 27.5	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 27.5	PURGING INITIATED AT: 1410	PURGING ENDED AT: 1430	TOTAL VOLUME PURGED (Liters): 4.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1420	2.0	2.0	200	4.67	6.10	23.29	1219.0	0.19	3.01	-16.5	Clear
1425	1.0	3.0	200	4.67	6.08	23.20	1216.2	0.12	1.67	-16.8	Clear
1430	1.0	4.0	200	4.67	6.08	23.22	1215.9	0.10	0.88	-17.5	Clear
1435	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.09

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Charles Sorden / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1435	SAMPLING ENDED AT: 1440
PUMP OR TUBING DEPTH IN WELL (feet): 27.5	SAMPLE PUMP FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: T	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl/4°C	N/A	<2	8260 VOCs (Pace)	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech, Inc. / FDEP Groundwater Sampling Sheet

SITE NAME: **Component Refurbishment & Chemical Analysis Facility (CRCA)**	SITE LOCATION: **Kennedy Space Center (KSC), FL**	
LOCATION ID: MW0018	SAMPLE ID: **CRCA-MW0018-058.0-20220721** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **07/21/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 3.82	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): **53 to 63**

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): **3/16**	PURGE PUMP TYPE OR BAILER: **Peristaltic Pump**	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): **53**	BOTTOM DEPTH (feet bls): **63**

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.85 Liters. (0.005 x 75) + 0.475 = 0.85

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1045	PURGING ENDED AT: 1105	TOTAL VOLUME PURGED (Liters): 4.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1055	2.0	2.0	200	3.95	6.65	29.96	1397.9	0.07	14.81	-68.3	Clear
1100	1.0	3.0	200	3.95	6.63	30.02	1397.1	0.04	13.07	-68.1	Clear
1105	1.0	4.02	200	3.95	6.64	29.92	1377.1	0.04	17.51	-68.6	Clear
1110	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.09

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Charles Sorden/ Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1110	SAMPLING ENDED AT: 1120
PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE:	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl/4°C	N/A	<2	8260 VOCs (Pace))	APP
2	2	CG	40 mL	HCl/4°C	N/A	<2	Dissolved Gasses (Pace)	APP
3	1	HDPE	1 L	4°C	N/A	See Above	DHC/VCR	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech, Inc. / FDEP Groundwater Sampling Sheet

SITE NAME: **Component Refurbishment & Chemical Analysis Facility (CRCA)**	SITE LOCATION: **Kennedy Space Center (KSC), FL**	
LOCATION ID: MW0019	SAMPLE ID: **CRCA-MW0019-058.0-20220721** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **07/21/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.20	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): **53 to 63**

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): **3/16**	PURGE PUMP TYPE OR BAILER: **Peristaltic Pump**	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): **53**	BOTTOM DEPTH (feet bls): **63**

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.85 Liters. (0.005 x 75) + 0.475 = 0.85

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1320	PURGING ENDED AT: 1340	TOTAL VOLUME PURGED (Liters): 4.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1330	2.0	2.0	200	4.33	6.60	23.08	971.56	0.15	15.71	-45.5	Clear
1335	1.0	3.0	200	4.33	6.58	22.94	972.77	0.15	15.12	-44.3	Clear
1340	1.0	4.0	200	4.33	6.56	22.91	972.22	0.14	16.46	-43.8	Clear
1345	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.09

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Charles Sorden/ Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1345	SAMPLING ENDED AT: 355
PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE:	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl/4°C	N/A	<2	8260D TCL SOM01.2 CLP-LIKE (ENCO)	APP
2	2	CG	40 mL	HCl/4°C	N/A	<2	Dissolved Gasses (Pace)	APP
3	1	HDPE	1 L	4°C	N/A	See Above	DHC/VCR	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech, Inc. / FDEP Groundwater Sampling Sheet

SITE NAME: **Component Refurbishment & Chemical Analysis Facility (CRCA)**	SITE LOCATION: **Kennedy Space Center (KSC), FL**	
LOCATION ID: MW0027	SAMPLE ID: **CRCA-MW0027-035.0-20220721** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **07/21/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 1.41	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): **30 to 40**

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): **3/16**	PURGE PUMP TYPE OR BAILER: **Peristaltic Pump**	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): **30**	BOTTOM DEPTH (feet bls): **40**

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.97 Liters. (0.0098 x 50) + 0.475 = 0.97

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 35.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 35.0	PURGING INITIATED AT: 0920	PURGING ENDED AT: 0945	TOTAL VOLUME PURGED (Liters): 5.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
0930	2.0	2.0	200	1.46	6.89	26.34	314.66	0.07	15.02	-75.2	Clear
0935	1.0	3.0	200	1.46	6.92	26.32	314.75	0.06	7.39	-80.1	Clear
0940	1.0	4.0	200	1.46	6.93	26.36	315.25	0.05	6.27	-83.3	Clear
0945	1.0	5.0	200	1.46	6.95	26.50	316.49	0.06	6.73	-84.7	Clear
0950	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.09

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Charles Sorden / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 0950	SAMPLING ENDED AT: 0955
PUMP OR TUBING DEPTH IN WELL (feet): 35.0	SAMPLE PUMP FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: HDPE	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl/4°C	N/A	<2	8260 VOCs (Pace)	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech, Inc. / FDEP Groundwater Sampling Sheet

SITE NAME: **Component Refurbishment & Chemical Analysis Facility (CRCA)**	SITE LOCATION: **Kennedy Space Center (KSC), FL**	
LOCATION ID: MW0031	SAMPLE ID: **CRCA-MW0031-058.0-202** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **7/21/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.04	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): **53 to 63**

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): **3/16**	PURGE PUMP TYPE OR BAILER: **Peristaltic Pump**	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): **53**	BOTTOM DEPTH (feet bls): **63**

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.85 Liters. (0.005 x 75) + 0.475 = 0.85

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1000	PURGING ENDED AT: 1020	TOTAL VOLUME PURGED (Liters): 4.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1010	2.0	2.0	200	4.11	6.48	27.56	1082.9	0.12	1.04	-32.9	Clear
1015	1.0	3.0	200	4.11	6.47	27.70	1088.6	0.11	0.26	-33.3	Clear
1020	1.0	4.0	200	4.11	6.46	27.72	1091.5	0.11	1.44	-33.9	Clear
1025	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.09

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Charles Sorden / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1025	SAMPLING ENDED AT: 1035
PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: HDPE	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl/4°C	N/A	<2	8260 VOCs	APP
2	2	CG	40 mL	HCl/4°C	N/A	<2	Dissolved Gasses (Pace)	APP
3	1	HDPE	1 L	4°C	NA	See Above	DHC/VCR	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Tetra Tech, Inc. / FDEP Groundwater Sampling Sheet

SITE NAME: **Component Refurbishment & Chemical Analysis Facility (CRCA)**	SITE LOCATION: **Kennedy Space Center (KSC), FL**	
LOCATION ID: MW0032	SAMPLE ID: **CRCA-MW0032-058.0-20220721** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **07/21/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 2.23	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): **53 to 63**

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): **3/16**	PURGE PUMP TYPE OR BAILER: **Peristaltic Pump**	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): **53**	BOTTOM DEPTH (feet bls): **63**

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

_____Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.85 Liters. (0.005 x 65) + 0.475 = 0.85

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1135	PURGING ENDED AT: 1250	TOTAL VOLUME PURGED (Liters): 15.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (^{O}C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1145	2.0	2.0	200	2.55	6.45	25.03	1782.0	0.05	221.83	-23.5	Cloudy
1205	4.0	6.0	200	2.55	6.43	26.09	1870.7	0.06	101.96	-32.3	Cloudy
1225	4.0	10.0	200	2.55	6.43	26.11	1985.1	0.15	30.10	-32.9	Clear
1245	4.0	14.0	200	2.55	6.45	26.97	1940.0	0.08	16.67	-29.0	Clear
1247	0.4	14.4	200	2.55	6.45	26.93	1945.8	0.08	17.92	-29.3	Clear
1250	0.6	15.0	200	2.55	6.46	26.90	1953.9	0.08	15.72	-29.5	Clear
1255	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.09

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Charles Sorden/ Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1255	SAMPLING ENDED AT: 1300
PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: HDPE	
FIELD DECONTAMINATION: **(Y)** N	FIELD-FILTERED: Y **(N)** FILTER SIZE: ____ µm Filtration Equipment Type: _____	DUPLICATE: Y **(N)**	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
1	3	CG	40 mL	HCl/4°C	N/A	<2	8260 VOCs (Pace)	APP

REMARKS:

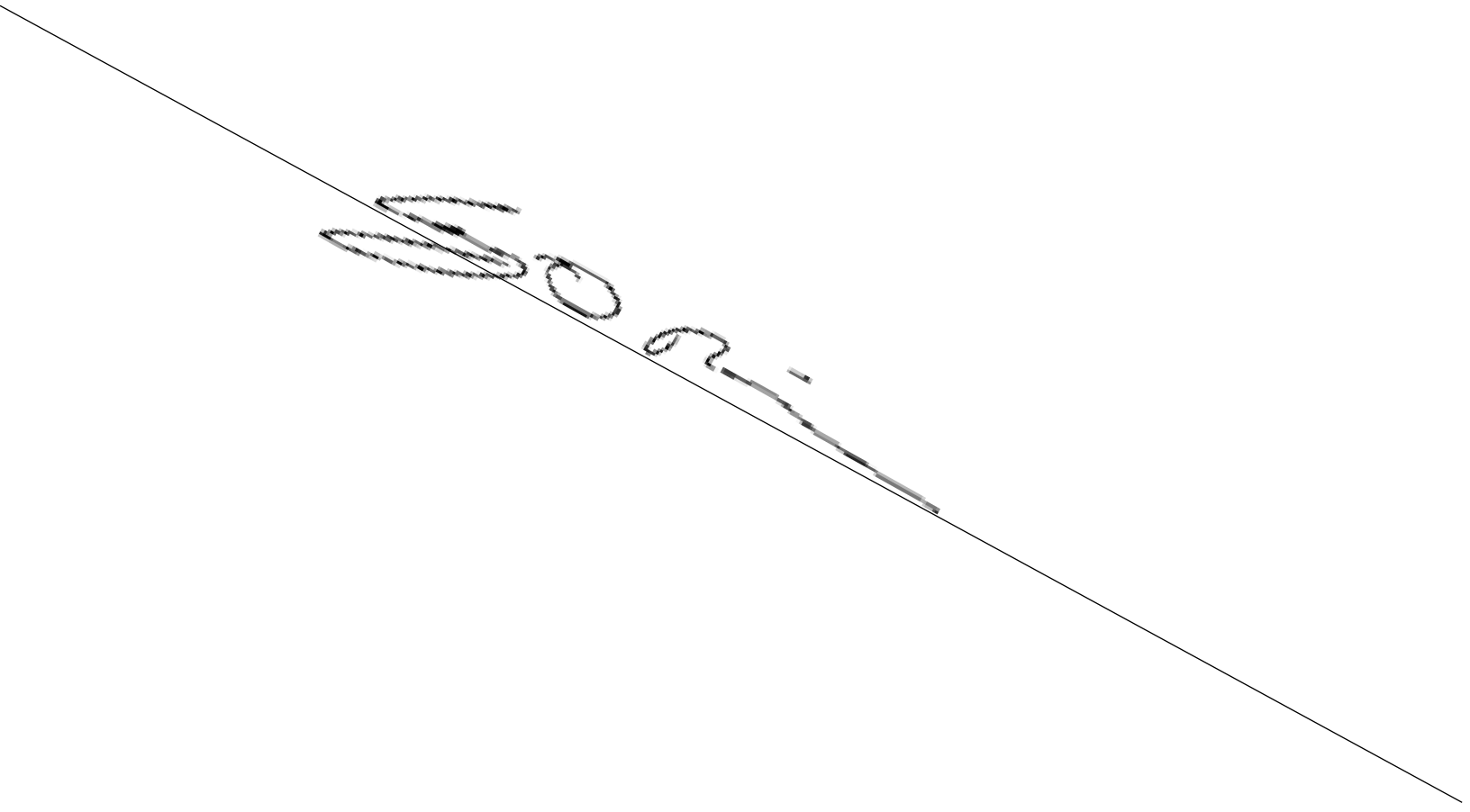
MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

Date:10-24-2022
Weather: sunny
Health and Safety Topics: Tour of site, working around the buildings, chemical hazards near site

Personnel: Cory O'Brien
PPE: level D
Objective: tour of site, collect GW levels

0715	Arrive at site
0830	Chuck arrives at the site to drop off supplies
0850	Chuck leaves site; Cory leaves the site to pick up the equipment at POL
0905	Cory arrives at POL and collects the YSI water quality meter, GEO pump Peristaltic pump, and LaMotte 2020 WE Turbidity meter. Cory then leaves POL to return to CRCA.
0920	Cory arrives at CRCA and starts to open all wells for synoptic gauging
1020	Cory finished opening all of the monitoring wells. (MW 0032 was inaccessible due to vegetation and standing water).
1040	Start water level measurements
1115	Cory drives to POL for a wire to remove tubing from wells
1135	Cory returns from POL with wire to remove dedicated tubing with
1435	Tubing is stuck in monitoring well MW0025. Cory drives to POL to get a different water level indicator that can fit past the tubing
1450	Cory returns to CRCA with the water level indicator and obtains water level from MW0025
1510	Cory packs up equipment and heads off-site for the day



Date: 10/25/2022

Weather: Sunny

Personnel: Cory O'Brien

Health and Safety: Working along, review HASP and Note Marshaling locations at site

PPE: Level D (PFAS compliant)

Objective: Groundwater sampling for PFAS

Equipment: YSI Pro quatro, Lamotte 2020, Geopump II

0730: arrive at the site and start to calibrate equipment issues with calibration solutions; drive to the POL site to find additional calibration solutions

0900: arrive at CRCA and finish calibration. After calibration set up on MW0010 and start groundwater purge. Teflon tubing in the monitoring well was removed and replaced with HDPE

Initial water level: 3.49

Well diameter: 1 inch

1 well volume: 1.72 liters

Sample ID: CRCA-MW0010-010.0-20221025

Sample Time: 0955

Analysis: PFAS

1040: set up on MW0024 HDEP tubing in well.

Initial water level: 3.11

Well diameter: 1 inch

1 well volume: 4.75 liters

Sample ID: CRCA-MW0024-058.0-20221025

Sample time: 1120

Analysis: PFAS

1129: set up on MW0017 Teflon tubing in the monitoring well was removed and replaced with HDPE

Initial water level: 3.17

Well diameter: 1 inch

1 well volume: 4.0 liters

Sample ID: CRCA-MW0017-027.5-20221025

Sample time: 1207

Analysis: PFAS

1140: Dan Forester arrives to show Cory the location of a path to get to monitoring well MW0032

1150: Dan leaves to work on the CRCA air stripper system.

1215: set up on MW0016 Teflon tubing in the monitoring well was removed and replaced with HDPE

Initial water level: 3.10

Well diameter: 1 inch

1 well volume: 1.03 liters

Sample ID: CRCA-MW0016-007.5-20221025

Sample time: 1240

Analysis: PFAS

1310: Set up on MW0005 Teflon tubing in the monitoring well was removed and replaced with HDPE

Initial water level: 3.62

Well diameter: 1 inch

1 well volume: 1.70 liters

Sample ID: CRCA-MW0005-010.0-20221025/ CRCA-FD-20221025-01

Sample time:1330

Analysis: PFAS

1345: Dump purge water into IDW container at the CRCA trailer

1400: Arrive at MW0014 no Teflon tubing in the monitoring well

Initial water level:3.85

Well diameter:1

1 well volume: 0.92 liters

Sample ID: CRCA-MW0014-007.5-20221025

Sample time: 1430

Analysis: PFAS

1445: Arrive MW0015, Teflon tubing located in well, tubing removed, will remove 1 well volume

Initial water level: 3.89

Well diameter: 1 inch

1 well volume: 3.91 liters

Sample ID: CRCA-MW0015-027.5-20221025

Sample time: 1505

Analysis: PFAS

1515: MW0025, HDEP tubing in well

Initial water level 3.98

Well diameter: 1 inch

1 well volume: 8.8 liters

Sample ID: CRCA-MW0025-058.0-20221025 / CRCA-FD-20221025-02

Sample time:1535

Analysis: PFAS

1550: Arrive at MW0007 Teflon tubing in the monitoring well was removed and replaced with HDPE

Initial water level: 3.39

Well diameter: 1 inch

1WELL volume: 1.75 liters

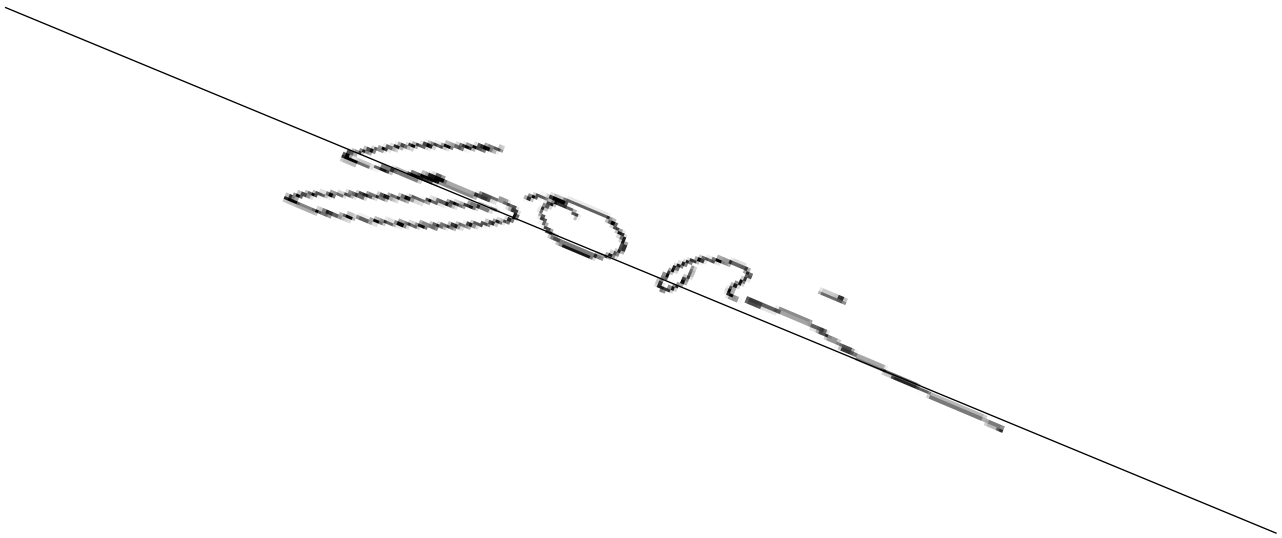
Sample ID: CRCA-MW0007-0007.5-20221025

Sample time: 1612

Analysis: PFAS

1625: Collect Field Blank CRCA-FB-20221025

1630: Cory leaves the site



Date: 10/26/2022

Weather: Sunny

Personnel: Cory O'Brien

Health and Safety: Working alone, Working near roadway, Biological hazards

Objective: Groundwater sampling

Equipment: YSI Pro Quattro, Lamotte 2020, Geopump II

0730: Arrive at CRCA, review Health and safety topics and calibrate equipment

0900: set up on MW0006, Teflon tubing in the monitoring well was removed and replaced with HDPE.

Initial water level:3.42

Well diameter: 1inch

1 Well volume: 1.73 liters

Sample ID: CRCA-MW0006-010.0-20221026

Sample time:0925

Analysis: PFAS

0950: set up on MW0003

Initial water level: 3.99

Well diameter: 1 inch

1 Well volume: 1.65 liters

Sample ID: CRCA-MW0003-010.0-20221026

Sample time: 1015

Analysis: PFAS

1025: set up on MW0018

Initial water level: 4.01

Well diameter: 1 inch

1 Well volume: 8.84 liters

Sample ID:CRCA-MW0018-058.0-20221026

Sample time:1050

Analysis: PFAS/ VOC 8260

1130: set up on MW0013, Teflon tubing was removed from the well and replaced with HDPE

Initial water level: 4.58

Well diameter: 1 inch

1 well volume: 3.8 liters

Sample ID:CRCA-MW0013-027.5-20221026

Sample time:1155

Analysis: PFAS

1215: set up on MW0011, Teflon tubing was removed from the well and replaced with HDPE

Initial water level: 3.95

Well diameter: 1 inch

1 well volume: 0.9 liters

Sample ID: CRCA-MW0011-007.5-20221026

Sample time:1240

Analysis: PFAS

1250: set up on MW0012, Teflon tubing remove from the well and replaced with HDPE

Initial water level: 3.94

Well diameter: 1 inch

1 well volume: 3.9 liters

Sample ID: CRCA-MW0012-027.5-20221026 / CRCA-FD-20221026-03

Sample time: 1320

Analysis: PFAS

1340: move to the trailer to dump IDW into the system

1355: set up at MW0022

Initial water level:3.29

Well diameter: 1 inch

1 well volume: 5.5 liters

Sample ID: CRCA-MW0022-035.0-20221026

Sample time: 1425

Analysis: PFAS

1415: set up at MW0023

Initial water level: 3.35

Well diameter: 1 inch

Well volume:8.94 liters

Sample ID: CRCA-MW002-058.0-20221026

Sample time: 1503

Analysis: PFAS

1515: arrive at MW0004, no tubing in well

Initial water level: 3.01

Well diameter: 1 inch

Well volume: 1.79

Sample ID: CRCA-MW0004-010.0-20221026

Sample time: 1540

Analysis: PFAS

1535: Arrive at MW0009, Teflon touring in well is removed and replaced with HDPE, well cap broke when removing, replace with new cap.

Initial water level: 3.60

Well diameter 1 inch

Well volume 1.71 liters

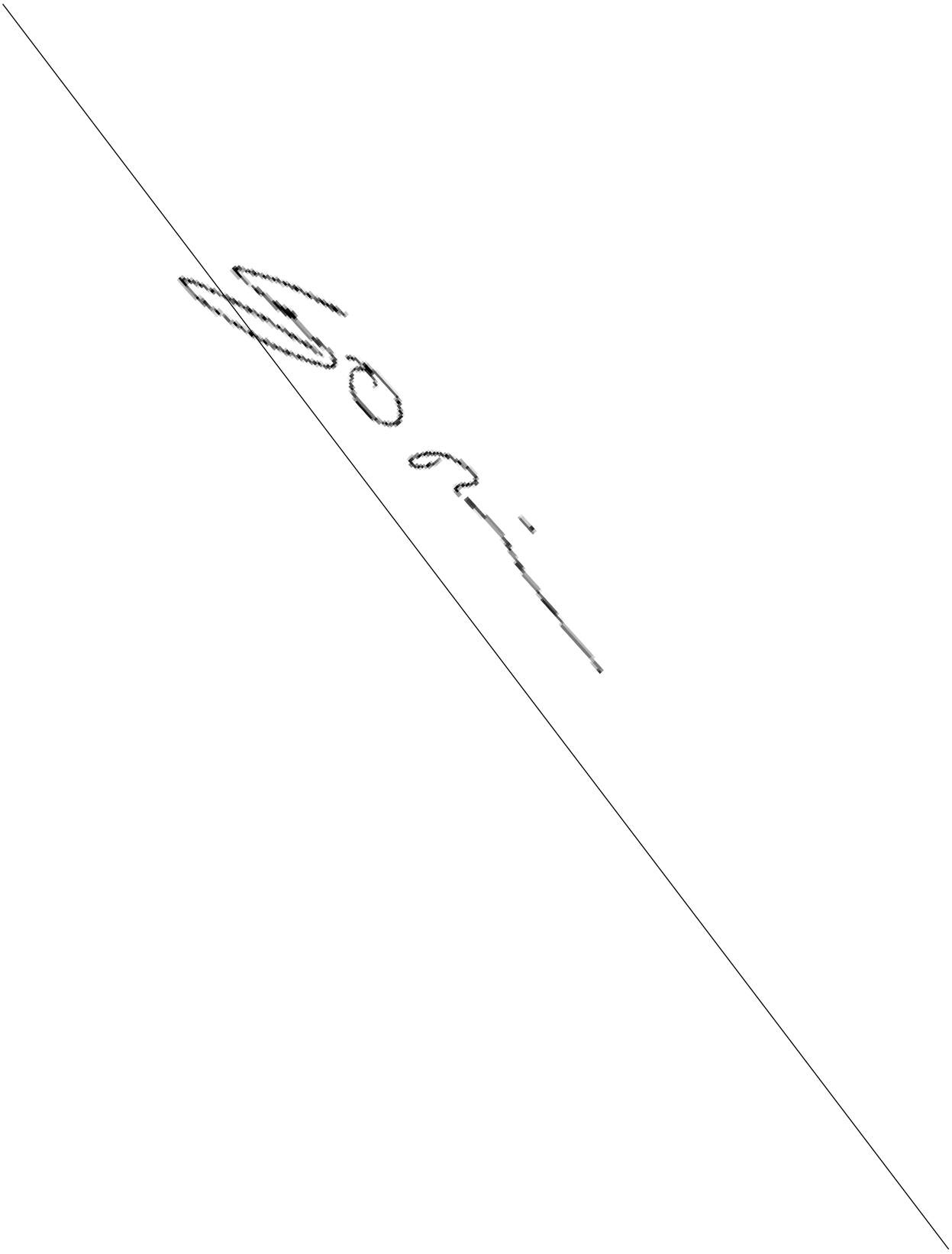
Sample ID: CRCA-MW0009-010.0-20221026

Sample time: 1606

Analysis: PFAS

1630: Collect field blank CRCA-FB-20221026

Cory leaves site



Date: 10/27/2022

Personnel: Cory O'Brien, Chuck Sorden

Weather: Sunny/ Temp 77 F / Barometric Pressure 760mmHg

Health and Safety: Biologicals

PPE: Level D (SA 1.8 compliant)

Objective: Collect Air samples and groundwater samples

Equipment: YSI, Lamotte 2020, Geopump II

0730: Arrive on site and calibrate equipment

0830: set up summa canisters for 8 hour ambient air samples.

0910: Set up CRCA-AMB01-20221027 and start sample

Cannister: 9205

Flow controller: 007416

Initial pressure >30

0920: Have difficulty with canister and regulator not fitting properly for AMB02. Call Chuck Sorden (Tetra Tech) Chuck arrives at the site and assists in fixing the canister

0940: Set up CRCA-AMB02-20221027

Canister:

Flow Controller:

Initial pressure: 23

1016: Set up CRCA-VMP01-20221027 for 1 hour air sample

Canister: 10544

Flow Controller: 012348

Initial pressure: >30

1020: Set up CRCA-VMP02-20221027 for 1 hour air sample

Canister: 012499

Flow Controller: 09882

Initial pressure: >30

1025: Set up CRCA-VMP03-20221027 for 1 hour air sample

Canister: 005017

Flow Controller: 006709

Initial pressure: >30

1030: Set up CRCA-VMP04-20221027 for 1 hour air sample

Canister: 021397

Flow Controller: 008402

Initial pressure: >30

1116: Shut off summa canister at CRCA-VMP01-20221027

Final pressure: 09

1120: Shut off summa canister at CRCA-VMP02-20221027

Final pressure:01

1125: Shut off summa canister at CRCA-VMP03-20221027

Final pressure:09

1130: Shut off summa canister at CRCA-VMP04-20221027

Final pressure:02

1145: Chris Adkison arrives at the site

1225: Collect equipment blank CRCA-EB-20221027 from the water level indicator using laboratory-provided PFAS free water.

1235: Set up on MW0002

Initial water level: 3.09

Well diameter: 1 inch

Well volume: 4.78

Sample ID: CRCA-MW0002-035.0-20221027

Sample Time: 1250

1251: set up on MW0001

Initial water level: 3.05

Well diameter: 1 inch

Well volume: 1.79

Sample ID: CRCA-MW0001-010.0-20221027

Sample time:1305

Analysis: PFAS

1325: Check the pressure on the summa canister at AMB02; canister is almost out of pressure. Close canister.

Final pressure: 1

1326: Call Alex Murphy (Project Manager) and explain that the 8 hour sample is out of pressure and asked if the sample should be recollected with a new summa canister. Alex states that he will call the NASA RPM and explain the situation.

1335: Set up on MW0008, Teflon tubing in well was removed and replaced with HDPE

Initial water level: 4.18

Well diameter: 1 inch

Well volume: 1.62 L

Sample ID: CRCA-MW0008-010.0-20221027

Sample Time: 1355

Analysis: PFAS

1430: Set up on MW0031

Initial water level: 4.15

Well diameter: 1 inch

Well volume: 8.82 L

Sample ID: CRCA-MW0031-058.0-20221027

Sample Time: 1440

Analysis: PFAS/ VOC 8260

1500: SGS calls to say they are at the badging office for sample pick up.

Field blank CRCA-FB-20221027 collected

Cory departs for badging office

1515: Cory transfers samples under Chain of Custody to SGS personnel

1548: Set up on MW0028

Initial water level: 1.71

Well diameter: 1 inch

Well volume: 9.19 L

Sample ID: CRCA-MW0028-058.0-20221027

Sample Time: 1605

Analysis: PFAS

1610: Set up on MW0027

Initial water level: 1.64

Well diameter: 1 inch

Well volume: 5.75 L

Sample ID: CRCA-MW0027-035.0-20221027

Sample Time: 1625

Analysis: PFAS

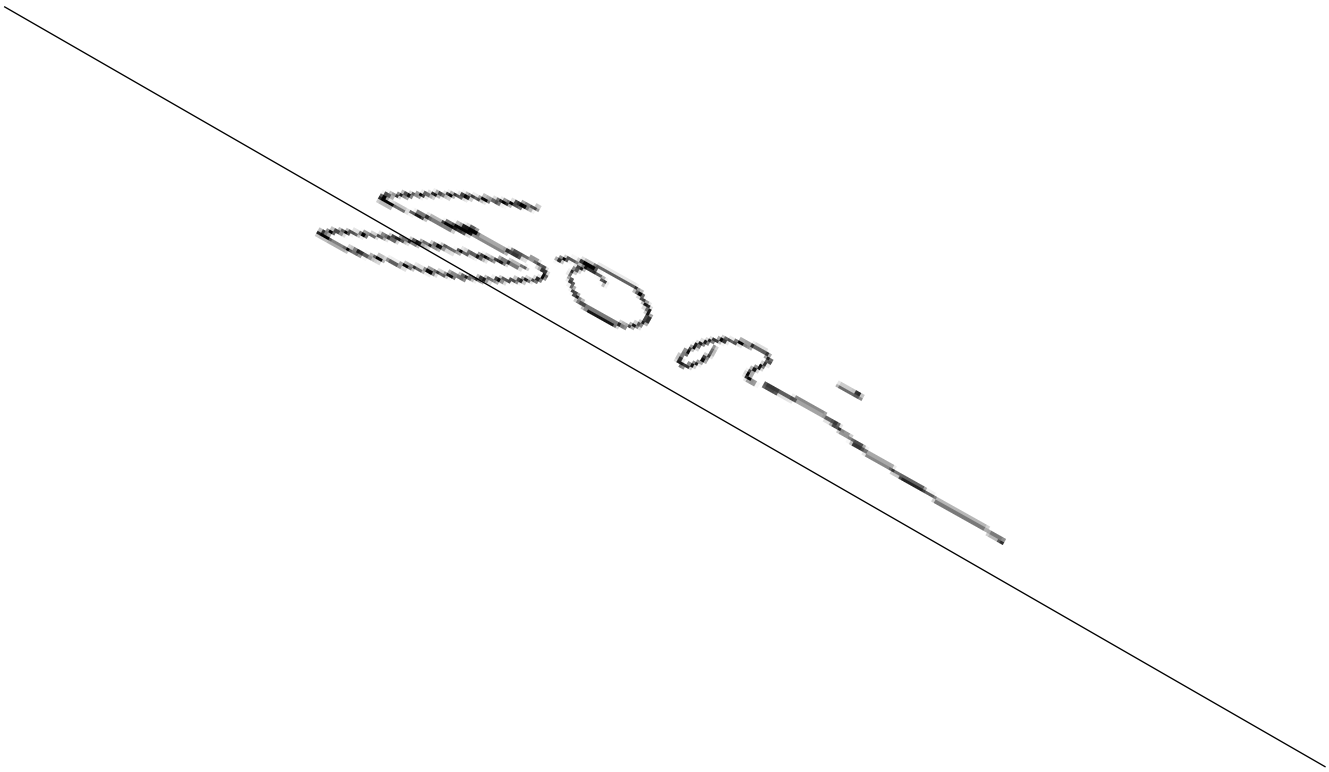
1710: close summa canister at AMB01

Pressure 03

1720: leave the site to go to FedEx and ship summa canisters

1745: summa canisters shipped via FedEx overnight to Pace Laboratories

Tracking # 604055279236 / 604055279225



Date: 10/28/2022

Personnel: Cory O'Brien

Weather: Sunny

Health and Saftey: working near road, water hazards

PPE: Level D (SA 1.8 compliant)

Objective: Groundwater sampling

Equipment: YSI, Geo pump 2, Lamotte 2020, in-situ

0720: arrive on site, review health and safety, calibrate equipment

0800: set up on MW0026

Initial water level: 1.75

Well diameter: 1 inch

Well volume: 1.98 L

Sample ID: CRCA-MW0026-010.0-20221028

Sample Time: 0830

Analysis: PFAS

0840: set up on MW0030

Initial water level:2.25

Well diameter: 1 inch

Well volume: 9.1L

Sample ID: CRCA-MW0030-058.0-20221028 / CRCA-FD-20221028-04

Sample time:0915

Analysis: PFAS

0922: set up on MW0029

Initial water level:

Well diameter: 1 inch

Well volume: 8.77 L

Sample ID: CRCA-MW0029-035.0-20221028

Sample Time: 0940

0950: Set up on MW0020, Teflon tubing in the well was removed and replaced with HDPE tubing

Initial water level: 4.50

Welll diameter: 1 inch

Well volume: 8.77 L

Sample ID: CRCA-MW0020-058.0-20221028

Sample Time: 1025

1040: Set up on MW0021

Initial water level: 4.61

Well diameter: 1 inch

Well volume: 5.37 L

Sample ID: CRCA-MW0021-035.0-20221028

Sample time: 1116

1130: move to system trailer and dump IDW into system. Set up cart to sample inside well.

1200: leave site for EOR training

1300: return to site from EOR training

1337: MW0019

Initial water level: 4.39

Well diameter: 1 inch

Well volume: 8.79 L

Sample ID: CRCA-MW0019-058.0-20221028

Sample Time: 1355

Analysis: PFAS/ VOC 8260

1440: MW0032

Initial water level: 2.50

Well diameter: 1 inch

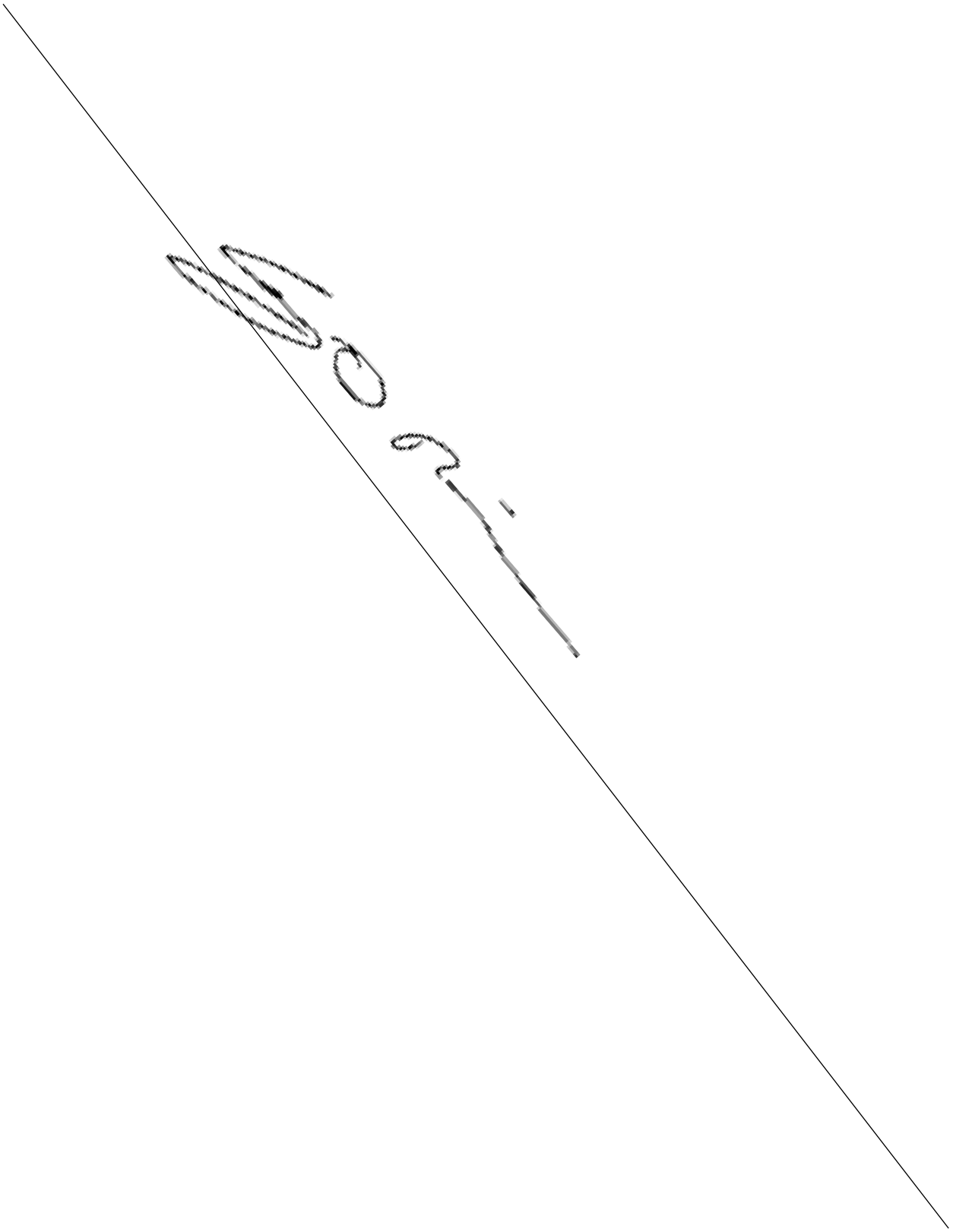
Well Volume: 9 L

Sample ID: CRCA-MW0032-058.0-20221028

Sample Time: 1455

Analysis: PFAS/ VOC 8260

1500: off-site



TETRA TECH

INSTRUMENT CALIBRATION LOGSHEET

PROJECT NAME : CRCA
SITE NAME: CRCA
PROJECT NO.: 112G08970

INSTRUMENT NAME/MODEL: YSI 556 MPS
MANUFACTURER: YSI
SERIAL NUMBER: -

Date of Calibration (mm/dd/yr)	Person Performing Calibration (Initial)		pH 4 (S.U.)	pH 7 (S.U.)	pH 10 (S.U.)	S.C (mS/cm)	D.O. (mg/L)	Temp. ºC	ORP (mV)	Salinity (%)	Turbidity (1) (NTUs)	Turbidity (10) (NTUs)	Calibration Standard Lot # / Expiration Date	Remarks
	Co	*Pre*	4.48	6.54	9.96	1511	8.52	20.7					*Lot # -*	
10/25/2022		*Post*	3.99	7.02	10.01	1413	8.46	20.7					*Exp. Date: -*	
		Pre	4.66	7.43	9.9	1512	7.94	23.2					*Lot # -*	
26-Oct	Co	*Post*	3.99	7.01	10.02	1410	7.94	23.2					*Exp. Date: -*	
	Co	*Pre*	4.76	7.34	9.98	1517	8.13	22.1					*Lot # -*	
27-Oct		*Post*	4.01	7	10.01	1412	8.12	22.1					*Exp. Date: -*	
	Co	*Pre*	4.57	6.88	9.97	1457	5.63	26.2					*Lot # -*	
28-Oct		*Post*	3.98	7	10	1407	5.56	26.2					*Exp. Date: -*	
		Pre											*Lot #*	
		Post											*Exp. Date:*	
		Pre											*Lot #*	
		Post											*Exp. Date:*	
		Pre											*Lot #*	
		Post											*Exp. Date:*	
		Pre											*Lot #*	
		Post											*Exp. Date:*	
		Pre											*Lot #*	
		Post											*Exp. Date:*	
		Pre											*Lot #*	
		Post											*Exp. Date:*	

Tetra Tech NUS, Inc.

GROUNDWATER LEVEL MEASUREMENT SHEET

Project Name: NASA - CRCA
Project No.: 112G08970
Location: Kennedy Space Center, Florida
Personnel: Cory O'Brien
Weather Conditions: Sunny 78 wind NNE 6mph
Measuring Device: In-Situ
Tidally Influenced: Yes ___ No _X_
Remarks:

Well or Piezometer Number	Date	Time	Top of Casing Elevation (feet)*	Screened Interval (feet bls)	Water Level Indicator Reading (feet)*	Thickness of Free Product (feet)*	Groundwater Elevation (feet)*	Comments
MW0001	10/24/2022	1453	6.11	5-15	2.83	None		
MW0002	10/24/2022	1451	6.14	30-35	2.81	None		
MW0003	10/24/2022	1205	6.99	5-15	3.77	None		
MW0004	10/24/2022	1410	6.3	5-15	2.98	None		
MW0005	10/24/2022	1103	6.69	5-15	3.86	None		
MW0006	10/24/2022	1156	6.58	5-15	3.35	None		
MW0007	10/24/2022	1447	6.54	5-15	3..34	None		
MW0008	10/24/2022	1109	7.36	5-15	4.15	None		
MW0009	10/24/2022	1159	6.84	5-15	3.48	None		
MW0010	10/24/2022	1055	6.66	5-15	3.46	None		
MW0011	10/24/2022	1216	7.40	5-10	3.85	None		
MW0012	10/24/2022	1213	7.07	25-30	3.96	None		
MW0013	10/24/2022	1209	7.46	25-30	4.49	None		
MW0014	10/24/2022	1325	6.86	5-10	3.78	None		
MW0015	10/24/2022	1328	6.82	25-30	3.89	None		
MW0016	10/24/2022	1349	6.18	5-10	3.02	None		
MW0017	10/24/2022	1352	6.16	25-30	3.31	None		
MW0018	10/24/2022	1203	7.05	53-63	3.8	None		
MW0019	10/24/2022	1314	7.13	53-63	4.66	None		
MW0020	10/24/2022	1232	7.27	53-63	3.8	None		
MW0021	10/24/2022	1237	7.54	30-40	4.51	None		
MW0022	10/24/2022	1223	6.44	30-40	3.16	None		
MW0023	10/24/2022	1225	6.50	53-63	3.24	None		
MW0024	10/24/2022	1346	6.22	53-63	3.19	None		
MW0025	10/24/2022	1455	6.91	53-63	3.98	None		
MW0026	10/24/2022	1335	4.45	5-15	1.62	None		
MW0027	10/24/2022	1338	4.33	30-40	1.54	None		
MW0028	10/24/2022	1341	4.34	53-63	1.59	None		
MW0029	24-Oct	1247	4.79	30-40	2.01	None		
MW0030	24-Oct	1242	4.77	53-63	2.07	None		
MW0031	24-Oct	1255	6.92	53-63	4.11	None		
MW0032	-	-	4.70	53-63	-	None		Well inaccessible

* All measurements to the nearest 0.01 foot

LAMOTTE TURBIDITY METER CALIBRATION LOG

Tetra Tech NUS, Inc.

PROJECT NAME : CRCA

INSTRUMENT NAME/MODEL: Lamotte 2020 Turbidimeter

SITE NAME: Components Refurbishment and Chemical Analysis

MANUFACTURER: Lamotte

PROJECT No.: 112G07637

SERIAL NUMBER:

Date of Calibration	Instrument I.D. Number	Person Performing Calibration	Instrument Settings		Instrument Readings		Calibration Standard (Lot No.)	Remarks and Comments
			Pre-Calibration	Post-Calibration	Pre-Calibration	Post-Calibration		
(mm/dd/yy)	(Number)	(Name)	Nephelometric Turbidity Units (NTUs)				(Number)	
10/25/2022	1513-2219	Cory OBrien	1.0	1.0	1.7	1.2		
			10.0	10.0	9.85	10.0		
10/26/2022		Cory OBrien	1.0	1.0	1.86	1.4		
			10.0	10.0	9.85	10.0		
10/27/2022		Cory O'Brien	1.0	1.0	1.72	1.3		
			10.0	10.0	9.96	10.0		
10/28/2022		Cory O'Brien	1.0	1.0	1.28	1.0		
			10.0	10.0	7.63	10.0		
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
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			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				
			1.0	1.0				
			10.0	10.0				

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0018	SAMPLE ID: **CRCA-MW0018-058.0-202210226** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **10/26/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.01	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

(63 – 4.01) x 0.15 = 8.84 Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

(0.005 x 73) + 0.475 = 0.84 Liters.

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 10:30	PURGING ENDED AT: 1050	TOTAL VOLUME PURGED (Liters): 4

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1040	2	2	200	4.09	7.09	27.3	1054	0.02	2.32	-117.5	Clear
1045	1	3	200	4.09	7.18	27.3	1059	0.01	1.75	-119.7	Clear
1050	1	4	200	4.09	7.19	27.2	1061	0.01	1.56	-121.1	Clear
1050	Collect	Sample									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Cory O'Brien /Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT 1050	SAMPLING ENDED AT: 1053

PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: HDPE

FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type:	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
	2	HDPE	250 mL	4 °C	None	See above	PFAS QSM Table	APP
	3	CG	40 mL	HCl/4°C	N/A	<2	8260 VOCs	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0019	SAMPLE ID: **CRCA-MW0019-058.0-20221028** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **10/28/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.39	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

(63 – 4.39) x 0.15 = 8.79 Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

(0.005 x 73) + 0.475 = 0.84 Liters.

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1327	PURGING ENDED AT: 1355	TOTAL VOLUME PURGED (Liters): 9

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1337	3	3	300	6.05	7.01	23.1	785	0.18	91.1	-152.4	Light brown
1340	1.5	4.5	300	6.05	7.06	23.0	787	0.12	95.1	-155.6	Light brown
1345	1.5	6	300	6.05	7.08	23.0	782	0.09	62.5	-155.9	Light brown
1350	1.5	7.5	300	6.05	7.08	23.1	780	0.09	64.5	-159.3	Light brown
1355	1.5	9	300	6.05	7.11	23.1	788	0.06	63.7	-159.0	Light brown
1355	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Cory O'Brien	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1355	SAMPLING ENDED AT: 1356
PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: T	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type:	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
	2	HDPE	120 mL	4°C	None	See above	PFAS QSM Table	APP
	3	CG	40 mL	HCl/4°C	N/A	<2	8260 VOCs	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0031	SAMPLE ID: **CRCA-MW0031-058.0-20221027** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **10/27/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 4.15	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63

WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

(63 – 4.15) x 0.15 = 8.82 Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 0.84

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGINg INITIATED AT: 1430	PURGING ENDED AT: 1440	TOTAL VOLUME PURGED (Liters): 2.2

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1435	1	1	200	4.31	7.05	26.6	827	0.08	1.41	-97.8	Clear
1437	.6	1.6	200	4.31	7.07	26.2	826	0.07	1.54	-101.2	Clear
1440	.6	2.2	200	4.31	7.08	26.1	826	0.07	1.34	-103.2	Clear
1440	Sample	Collected									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Cory O'Brien / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1440	SAMPLING ENDED AT: 1441

PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute): 250.0	TUBING MATERIAL CODE: HDPE

FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type:	DUPLICATE: Y (N)

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
	2	HDPE	120 mL	Cool 4C	None	See above	PFAS QSM Table	APP
	3	CG	40 mL	HCl/4 deg C	N/A	<2	8260 VOCs	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)

SITE NAME: Component Refurbishment & Chemical Analysis Facility (CRCA)	SITE LOCATION: Kennedy Space Center (KSC), Florida	
LOCATION ID: MW0032	SAMPLE ID: **CRCA-MW0032-058.0-20221028** Sample depth (ddd.d)=[bottom of screen (feet bls)-Top depth] x 0.5-bottom of screen (feet bls)	DATE: **10/28/2022**

PURGING DATA

STATIC DEPTH TO WATER (feet btoc): 2.5	CASING HEIGHT (feet als): NA	STATIC DEPTH TO WATER (feet bls) = DTW (btoc) - Casing Height (feet als): NA	WELL SCREEN INTERVAL DEPTH (feet bls): 53 to 63	
WELL DIAMETER (inches): 1	TUBING DIAMETER (inches): 3/16	PURGE PUMP TYPE OR BAILER: Peristaltic Pump	TOP DEPTH = top of screen or depth to water which ever is greatest (feet bls): 53	BOTTOM DEPTH (feet bls): 63

WELL VOLUME PURGE: 1 WELL VOLUME = (TOTAL WELL DEPTH – STATIC DEPTH TO WATER) X WELL CAPACITY
(only fill out if applicable)

(63 - 2.5) x 0.15 = 9 Liters.

EQUIPMENT VOLUME PURGE: 1 EQUIPMENT VOL. = PUMP VOLUME + (TUBING CAPACITY X TUBING LENGTH) + FLOW CELL VOLUME
(only fill out if applicable)

0.84 Liters. (0.005 x 73) + 0.475 = 1.19

INITIAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	FINAL PUMP OR TUBING DEPTH IN WELL (feet): 58.0	PURGING INITIATED AT: 1420	PURGING ENDED AT: 1455	TOTAL VOLUME PURGED (Liters): 7.0

TIME	VOLUME PURGED (Liters)	CUMUL. VOLUME PURGED (Liters)	PURGE RATE (mlpm)	DEPTH TO WATER (feet)	pH (standard units)	TEMP. (°C)	COND. (µS/cm)	DISSOLVED OXYGEN (mg/L)	TURBIDITY (NTUs)	ORP (mV)	COLOR (describe)
1440	4	4	200	2.61	7.03	25.1	1145	13.6	14.19	-54.9	Clear
1445	1	5	200	2.61	6.77	24.3	1155	0.24	14.09	-77.1	Clear
1450	1	6	200	2.61	6.79	24.3	1159	0.23	12.05	-78.5	Clear
1455	1	7	200	2.61	6.80	24.3	1168	0.24	13.5	-79.2	Clear
1455	Collect	Sample									

WELL CAPACITY (Liters Per Foot): **0.75"** = 0.076; **1"** = 0.15; **1.25"** = 0.23; **2"** = 0.61; **3"** = 1.40; **4"** = 2.46; **5"** = 3.86; **6"** = 5.57; **12"** = 22.26
TUBING INSIDE DIA. CAPACITY (Liters/Ft.): **1/8"** = 0.002; **3/16"** = 0.005; **1/4"** = 0.0098; **5/16"** = 0.015; **3/8"** = 0.023; **1/2"** = 0.038; **5/8"** = 0.06

SAMPLING DATA

SAMPLED BY (PRINT) / AFFILIATION: Cory O'Brien / Tetra Tech	SAMPLER(S) SIGNATURES:	SAMPLING INITIATED AT: 1455	SAMPLING ENDED AT: 1456
PUMP OR TUBING DEPTH IN WELL (feet): 58.0	SAMPLE PUMP: FLOW RATE (mL per minute): 200	TUBING MATERIAL CODE: HDPE	
FIELD DECONTAMINATION: (Y) N	FIELD-FILTERED: Y (N) FILTER SIZE: ____ µm Filtration Equipment Type:	DUPLICATE: Y (N)	

SAMPLE CONTAINER SPECIFICATION				SAMPLE PRESERVATION			INTENDED ANALYSIS AND/OR METHOD	SAMPLING EQUIPMENT CODE
SAMPLE ID CODE	# CONTAINERS	MATERIAL CODE	VOLUME	PRESERVATIVE USED	TOTAL VOL ADDED IN FIELD (mL)	FINAL pH		
	2	HDPE	120 mL	4°C	None	See above	PFAS QSM Table	APP
	3	CG	40 mL	HCl/4°C	N/A	<2	8260 VOCs	APP

REMARKS:

MATERIAL CODES: **AG** = Amber Glass; **CG** = Clear Glass; **PE** = Polyethylene; **PP** = Polypropylene; **S** = Silicone; **T** = Teflon; **O** = Other (Specify)

SAMPLING/PURGING EQUIPMENT CODES: **APP** = After Peristaltic Pump; **B** = Bailer; **BP** = Bladder Pump; **ESP** = Electric Submersible Pump; **PP =** Peristaltic Pump **RFPP** = Reverse Flow Peristaltic Pump; **SM** = Straw Method (Tubing Gravity Drain); **VT** = Vacuum Trap; **O** = Other (Specify)