

# **2021 Q3 SUMMA CANISTER REPORT COMMERCE CITY NORTH DENVER COMMUNITY AIR MONITORING NETWORK COMMERCE CITY, COLORADO**

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## EXECUTIVE SUMMARY

In response to feedback received by Suncor Energy (U.S.A.) Inc. (Suncor) through community engagement conducted in the fall of 2020, Suncor voluntarily committed to developing a continuous, near real-time air monitoring program to gain insight into air quality for neighborhoods in the vicinity of the Suncor refinery in Commerce City, Colorado. Montrose Environmental Group - Air Quality Services, LLC (Montrose) was contracted by Suncor to deploy, operate, and maintain the network in the Commerce City and North Denver (CCND) neighborhoods. Air monitoring was accomplished through three separate technical approaches: (1) providing continuous, near real-time monitoring for the following analytes: carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), hydrogen sulfide (H<sub>2</sub>S), nitrogen oxide (NO), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>2.5</sub>), and total volatile organic compounds (VOCs); (2) periodic collection and laboratory analysis for the presence of specific VOCs from 1-liter evacuated stainless steel (“Summa”) canisters; and (3) periodic real-time air monitoring throughout entire neighborhoods using a mobile van laboratory to detect presence of specific VOCs. An “analyte” is a material that a measuring device is designed to detect and measure. It may be a chemical gas, an airborne particle, or other type of material. This report details approach number 2, the periodic collection and laboratory analysis of Summa canister air samples and a screening health risk analysis. Continuous, near real-time air monitoring and mobile van laboratory monitoring data are presented in separate reports.

Planned and VOC sensor-triggered air samples were collected during the third quarter of 2021. Planned air samples were collected by a field technician while VOC sensor-triggered samples were collected automatically when instantaneous total VOCs were detected at an airborne concentration of 1 part per million (ppm) or higher for 1 minute or longer. A total of 16 pre-planned air samples (1-hour) were collected at eight locations within the CCND neighborhoods. An additional three non-CCND community monitoring reference sites (urban and rural background) were chosen for the second pre-planned sampling campaign. A total of two sensor-triggered samples were collected on September 9th and 27th. All air samples were collected using Summa canisters and sent to an accredited laboratory for analysis of a broad suite of VOCs in accordance with the United States Environmental Protection Agency methods TO-15 and TO-14.

Health scientists from CTEH, LLC (a subsidiary company of Montrose Environmental Group) performed a screening-level human health risk assessment based on the data collected by Montrose. A screening-level assessment uses the most health conservative assumptions about exposure and chemical toxicity. This risk assessment was conducted to determine whether measured concentrations of individual or cumulative VOCs could potentially cause acute (short-term) adverse health effects. The health risk calculations described in this report were performed per federal and state guidance. The risk assessment resulted in the following overall findings:

- Air sample data and health risk assessment indicate all measured individual and combined air concentrations in planned air samples (July and August) at CCND and reference locations were at least eight times less than their respective acute health-based reference levels.
- All chemical concentrations in the two sensor-triggered samples were below their respective acute health-based reference level.
- These risk results for samples taken from both CCND and reference locations indicate the measured concentrations are likely to be without an appreciable risk of adverse acute health effects, even for sensitive sub-populations.



## 1.0 INTRODUCTION

Montrose Environmental Group- Air Quality Services, LLC (Montrose) was contracted by Suncor Energy (U.S.A.) Inc. (Suncor) to deploy, operate, and maintain an air quality monitoring network in the Commerce City and North Denver (CCND) neighborhoods. Air monitoring was accomplished through three separate technical approaches: (1) providing continuous, near real-time monitoring for the following analytes: carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), hydrogen sulfide (H<sub>2</sub>S), nitrogen oxide (NO), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>2.5</sub>), and total volatile organic compounds (VOCs); (2) periodic collection and laboratory analysis for the presence of specific VOCs from Summa canisters' and (3) periodic real-time air monitoring throughout entire neighborhoods using a mobile van laboratory to detect presence of specific VOCs. An "analyte" is a material that a measuring device is designed to detect and measure. It may be a chemical gas, an airborne particle, or other type of material. This report details approach number 2. The continuous near real-time air monitoring and mobile van laboratory monitoring data are presented in separate reports. Air monitoring, sampling, and analysis from all three approaches were conducted in accordance with the Quality Assurance Project Plan (QAPP) can be found at online at [www.ccnd-air.com/documents](http://www.ccnd-air.com/documents).

### 1.1 Air Monitoring Site Description

Eight monitors and Summa cannister sampling locations were positioned throughout the Commerce City and North Denver (CCND) neighborhoods, within a three-mile radius of the refinery operations. The monitor locations are shown in Figures 1-1 and 1-2 and described in Table 1; they were selected based on the following criteria:

- Historical wind pattern data,
- Proximity to the refinery and non-refinery sources,
- Existing infrastructure, as well as site access and safety,
- Community feedback

An additional three planned air samples were collected at non-CCND community monitoring sites (reference locations), in both urban and rural locations (Table 1-2). These locations were at the E470-I25 Junction (JUNC), the Brighton Fire Department (BFD), and the Colorado Department of Health and Environment (CDPHE) CAMP air monitoring station (CAMP). The JUNC and BFD monitoring locations were chosen as rural background locations about 13 miles north of the CCND network. The CAMP location was selected as a representative urban location that has comparative data collected by CDPHE<sup>1</sup>.

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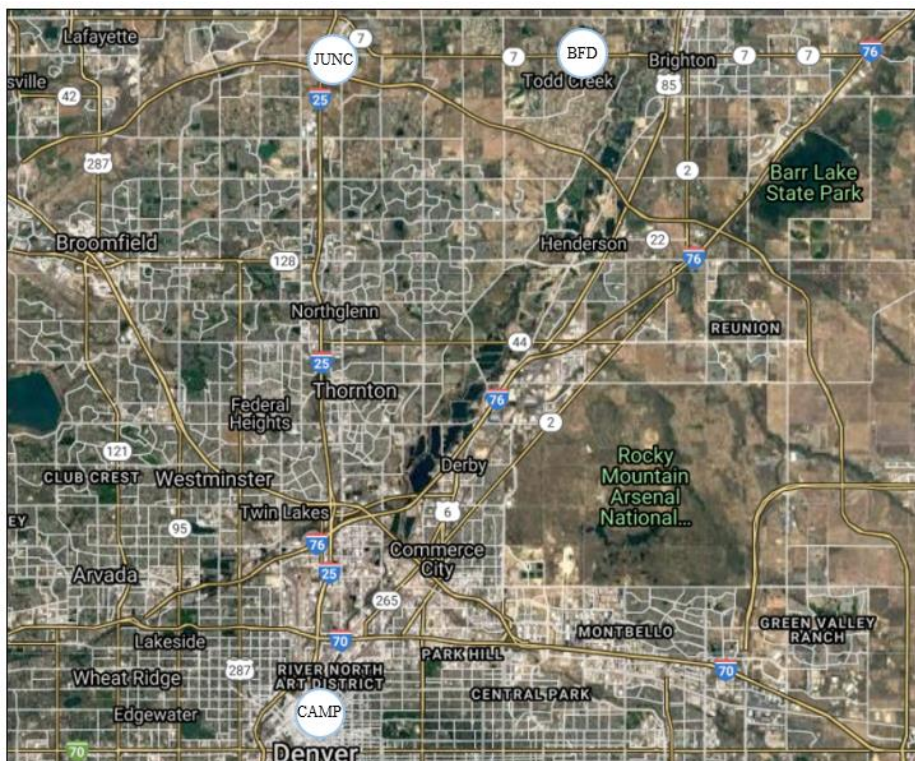
<sup>1</sup> CDPHE describes CAMP as Urban in many reports. As an example, this description can be found on page 6 of the [2020 Ambient Air Monitoring Network Assessment](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2020_CO_5yr_Network_Assessment.pdf):  
[https://www.colorado.gov/airquality/tech\\_doc\\_repository.aspx?action=open&file=2020\\_CO\\_5yr\\_Network\\_Assessment.pdf](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2020_CO_5yr_Network_Assessment.pdf)

**FIGURE 1-1**  
**MAP OF EIGHT CCND MONITOR LOCATIONS**



**FIGURE 1-2**

MAP OF THREE NON-CCND COMMUNITY MONITORING (URBAN AND RURAL BACKGROUND) SITES: E470/I25 (JUNC), BRIGHTON FIRE DEPARTMENT (BFD) AND COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE) CAMP AIR MONITORING STATION (CAMP)



**TABLE 1-1**  
**CCND MONITORS AND SUMMA CANISTER SAMPLING LOCATIONS**

<b>Location ID</b>	<b>Secondary ID</b>	<b>GPS Coordinates</b>	<b>Distance from Refinery Center (miles)</b>	<b>Cross Streets</b>
CM1	Rose	39.80164, -104.90882	2.0	E 58 <sup>th</sup> Ave & Oneida St, Commerce City
CM2	RBC	39.79599, -104.95603	0.70	Brighton Blvd & York St, Commerce City
CM3	Adams Highschool	39.82736, -104.90193	2.9	E 72 <sup>nd</sup> Ave & Quebec Pkwy, Commerce City
CM4	Adams Middle School	39.82893, -104.93499	1.9	Birch St & E 72 <sup>nd</sup> Ave, Commerce City
CM5	Central	39.81457, -104.91928	1.7	Holly St & E 64 <sup>th</sup> Ave, Commerce City
CM6	Focus	39.78436, -104.95663	1.4	Columbine St & 48 <sup>th</sup> Ave, Denver
CM7	Kearney	39.80888, -104.91545	1.7	E 62 <sup>nd</sup> Ave & Kearney St, Commerce City
CM8	Monroe	39.8156, -104.94503	0.85	Monroe St & E 64 <sup>th</sup> Ave, Denver



**TABLE 1-2**  
**SUMMA CANISTER REFERENCE LOCATIONS**

Location ID	Secondary ID	GPS Coordinates	Distance from Refinery Center (miles)	Cross Streets
CAMP	Denver CDPHE	39.75111, -104.98766	4.2	Champa St & N Broadway, Denver
JUNC	E470/I25	39.98614, -104.98468	12.8	E 160 <sup>th</sup> & Washington St, Thornton
BFD	Brighton	39.98512, -104.86665	13.1	Havana St & Havana Way, Brighton

## 1.2 Air Sampling Methods

Planned air and VOC sensor-triggered samples were collected during the third quarter of 2021. Planned air samples were collected on July 13, 2021, and August 10, 2021. Sensor-triggered samples were collected on September 9, 2021, and September 27, 2021. Entech Instruments Silonite™ CS1200E Passive Canister Samplers connected to 6-liter chemically inert stainless steel (“Summa” canisters) were used to collect samples over a 1-hour period. The Summa canisters were cleaned and blanked for use according to laboratory standard operating procedures. Planned air samples were collected by a field technician by manually opening and closing the Summa canister’s regulator valve during a time when real-time instruments indicated total VOC concentrations to be less than the 1-ppm trigger level. VOC sensor-triggered samples were collected automatically by the CCND Lunar Outpost Canary-S VOC monitor paired with an ACE Summa canister triggering system. The VOC sensor-triggered samples are collected if the VOC monitor detected one (1) part per million (ppm) of total VOCs during a 1-minute period. All sampling and quality assurance procedures were performed by Montrose. All Summa canister field sampling followed the Standard Operating Procedure (SOP) provided in the QAPP.

The canister samples were shipped to Enthalpy Analytical in Durham, North Carolina. The United States Environmental Protection Agency (USEPA) Compendium Method TO-14A “*Determination of Volatile Organic Compounds (VOCs) in Ambient Air using Specially Prepared Canisters with Subsequent Analysis by Gas Chromatography*” and TO-15 entitled “*Determination of Volatile Organic Compounds (VOCs) in Air Collected in Specially Prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)*” was followed for both sampling and analysis methodology. A total of 59 compounds were selected for analysis in this assessment and was based on the typical suite of compounds monitored for in urban and industrial areas, and accounting for laboratory analysis capabilities (Table 1-3).

**TABLE 1-3**  
**SELECTED COMPOUNDS MEASURED IN SUMMA CANISTERS**

Ethylene	Isopentane	3-Methylpentane	3-Methylheptane	2,4-Dimethylpentane
Acetylene	1-Pentene	1-Hexene	Nonane	2,3-Dimethylpentane
Ethane	Pentane	1,3-Butadiene	3-Ethyltoluene	1,2,3-Trimethylbenzene
Propylene	Isoprene	Heptane	2-Ethyltoluene	1,3,5-Trimethylbenzene
Propane	Trans-2-Pentene	2-Methylhexane	Decane	2,2,4-Trimethylpentane
Isobutane	Cis-2-Pentene	Toluene	Ethylbenzene	Tetrachloroethene
1-Butene	2,2-Dimethylbutane	3-Methylhexane	m-Diethylbenzene	1,2,4-Trimethylbenzene
Butane	Cyclopentane	Methylcyclohexane	p-Diethylbenzene	Methylcyclopentane
Trans-2-Butene	Cyclohexane	Hexane	Undecane	2,3,4-Trimethylpentane
Cis-2-Butene	2-Methylpentane	2-Methylheptane	Dodecane	2,3-Dimethylbutane
m-/p-Xylenes	o-Xylene	4-Ethyltoluene	Benzene	Carbon disulfide
n-Octane	Isopropylbenzene	n-Propylbenzene	Naphthalene	

### 1.3 Screening Health Risk Assessment Methods

CTEH conducted a screening-level public health risk assessment, consistent with federal risk assessment guidelines, to determine whether exposure to the detected concentrations of individual or cumulative (combined) analytes in the air could potentially pose acute (short-term) health impacts. A tiered approach to the risk assessment was used. This approach involves one or more iterative steps (or tiers) being performed in which health risks are calculated and evaluated multiple times. In most cases, risk assessors cannot know exactly the level of chemical exposure experienced by individuals or communities. Therefore, the first tier involves use of exposure assumptions that are health-conservative. This means that data reflecting maximum exposure potential are plugged into the risk calculations. These are worst-case scenarios that typically represent exposure conditions higher than would be reasonably expected. Such calculations are very simple and assume a person is constantly exposed to the highest measured chemical level. If the resulting risk values indicate the lack of likely adverse health effects under these worst-case conditions, then the risk assessment is complete. However, if the risk values

suggest a potential for adverse health effects, then a second tier of risk calculations are performed, but this time using more detailed assumptions about exposure that are still simple representations of the real world but are more realistic than the first-tier worst-case assumptions. Each successive tier represents a more complete characterization of exposure variability and/or uncertainty that requires a corresponding increase in calculation complexity and scientific level of effort.

The first tier of this risk assessment process is called a screening-level risk assessment. The conservative assumptions used for this level of risk calculation typically represent exposure conditions higher than would be reasonably expected. As such, an exceedance of an acceptable risk level (defined below) does not necessarily indicate that adverse health effects are likely. The Agency for Toxic Substances and Disease Registry (ATSDR) states, “*when health assessors find exposures higher than the MRLs (ATSDR’s specific health-based reference levels), it means that they may want to look more closely at a site*”<sup>2</sup>. In other words, screening-level findings of an estimated exposure to a VOC being higher than a health-based reference level do NOT indicate an actual likelihood of adverse effects but do indicate a need to move to a second tier of analysis and refine the risk assessment process with more realistic detail to determine if an actual risk exists that needs to be mitigated.

The screening-level risk assessment reported here includes calculated risks from exposure to individually measured chemicals as well as exposure to all measured chemicals at once (cumulative). For individual chemicals, an acute health risk value was calculated as the exposure concentration (EC) divided by the chemical-specific federal or state established human health-based Reference Levels (RL) (Equation 1). The result is referred to as the hazard quotient (HQ). Estimates of EC were derived from the 1-hour average concentrations of each analyte. Using the maximum average for the EC conservatively assumes that a hypothetical maximally exposed individual occupies the sampling location area and breathes the maximum 1-hour detected concentration continuously for an hour up to multiple days (an acute exposure). The health based RLs used to calculate the HQs are previously established exposure levels below which no adverse effect in humans is expected. If available, RLs adopted by the Colorado Department of Public Health and Environment (CDPHE) were selected for use within this assessment. If the analyte was not listed by CDPHE, CTEH followed a federal and state recommended hierarchy for selection of health-based reference levels<sup>3</sup>.

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<sup>2</sup>[https://www.atsdr.cdc.gov/minimalrisklevels/#:~:text=The%20ATSDR%2C%20in%20response%20to,minimal%20risk%20levels%20\(MRLs\).](https://www.atsdr.cdc.gov/minimalrisklevels/#:~:text=The%20ATSDR%2C%20in%20response%20to,minimal%20risk%20levels%20(MRLs).)

<sup>3</sup> <https://drive.google.com/file/d/1P2KEvu0MFiyzQAOQijUclqR-WGh1bEX/view>

Acute HQs were calculated as follows:

### Eq. 1 – Hazard Quotient (HQ) Equation

$$HQ = EC / RL$$

Where:

*HQ= Hazard Quotient*

*EC= Maximum 1-hour average air concentration*

*RL= Acute Health-based Reference Level (from USEPA, ATSDR, Cal EPA, and TCEQ)*

Health risks from potential cumulative exposures to all detected analytes were calculated by adding together each individual analyte's HQ calculated for a given sampling location. This sum of all the individual HQs is called a Hazard Index (HI). Adding together all the HQs is also a very health-conservative approach because it assumes that all the measured analytes exert an adverse effect on the body in a similar manner, which is rarely the case.

An HQ or HI of less than or equal to one is an indication that the estimated exposure is likely to be without an appreciable risk of adverse health effects, even for sensitive sub-populations. The potential for adverse health effects increases as HQ or HI increase above one, but it is not known by how much. Therefore, calculated risk values in this assessment that are equal to or less than one indicates an acceptable risk level. HQ or HI values of greater than one would prompt a second-tier risk assessment beyond the screening-level assessment.

According to the USEPA and ATSDR, the federal agencies that establish these reference levels, these values “are set below levels that, based on current information, might cause adverse health effects in the people most sensitive.” This is because health-based RLs are based on observed toxicity in human or animal studies with an added safety factor to account for uncertainties in the toxicity data. For example, ATSDR identified the lowest observed adverse effect level ([LOAEL](#)) for acute exposure to benzene as 10,200 parts per billion (ppb), based on a study of mice exposed six hours per day for six days. ATSDR then applied a combined safety factor of 300 to derive the final health-based RL to account for several uncertainties, including differences between mice and humans and for sensitive individuals. Therefore, it is scientifically incorrect to assume that all real-world exposures to a chemical at levels higher than a health-based RL will likely result in an adverse effect.

The USEPA also has established values for use in emergency situations, termed Acute Exposure Guideline Levels (AEGLs). Unlike health-based reference levels that can be thousands of times below exposure levels where adverse effects are observed, AEGL values are levels at which different acute adverse health effects may be anticipated to occur. According to USEPA, “AEGL-1 represent exposure levels that could produce mild and progressively increasing but transient and non-disabling odor, taste, and sensory irritation or certain asymptomatic, non-sensory effects. With increasing airborne concentration above each AEGL, there is a progressive increase in the



*likelihood of occurrence and the severity of effects described for each corresponding AEGL [i.e., AEGL-2 or AEGL-3].* The AEGL-1 60-minute value, if available for the applicable compound, was also used for comparison purposes because it is more precautionary (than AEGL-2 or AEGL-3) as the AEGL-1 level reflects potential health impacts that are reversible upon cessation of exposure.

#### 1.4 Summary of Air Sampling Results

A total of 19, 1-hour, planned air samples were collected during this quarter. Additionally, there were two sensor-triggered event samples during this quarter. Summary details are presented in Tables 4-6 and additional details are available in Appendix A.

Eight planned air samples were collected across all sampling locations on July 13, 2021, and 11 samples (eight CCND samples and three reference location samples) were collected on August 10, 2021. Samples collected on August 10, 2021, generally contained more detectable compounds than the samples collected on July 13, 2021. The compounds that were present in samples collected on both dates were generally present in higher concentrations on August 10, 2021. This might have occurred because the samples collected on August 10, 2021, were collected during the hours around sunrise (6:00 a.m.-9:00 a.m.). In the presence of sunlight, VOCs react with nitric oxides to form ozone. During nighttime hours, when the sun is not present, VOCs may accumulate at ground level which can lead to the highest concentrations, for that day, being present just prior to sunrise. The samples collected on July 13, 2021, were collected from 11:00 a.m. to 3:00 p.m., when some of the VOCs would have been removed due to the reaction with nitric oxides to form ozone.

Summa canister “VOC sensor triggered” samples are automatically collected remotely when VOC concentrations are above 1 ppm for 1 minute. There were two triggered Summa canister events. The first occurred at 1:16 a.m. on September 9, 2021, when a 1-minute VOC reading greater than 1 ppm at CM-5 was reported; the sample collection ended at 2:16 a.m. on September 9, 2021. The second 1-minute VOC reading greater than 1 ppm occurred at 7:38 a.m. on September 27, 2021, at CM-3 monitoring location; The triggered sample collection ended at 8:38 a.m. on September 27, 2021.

The elevated total VOC reading on the CM-5 monitor lasted from approximately 1:00 am to 1:31 am on September 9, 2021. Figure 3 below provides the 1-minute VOC concentrations and the wind direction data prior to, during, and after this period. Figure 4 is a wind rose of the wind data collected at the CM-5 location from 12:00 am to 2:30 am on September 9, 2021. The elevated total VOC reading was observed for approximately one-half hour and resulted in a 1-hour summa canister collection. This summa canisters compound-specific concentration results are shown in Table 6. The elevated total VOC levels were measured after winds were coming out of the south-southwest (SSW). When the wind direction briefly shifted to coming out of the southwest (SW) the total VOC levels began to decrease before the winds shifted to coming out of the SSW again and the elevated total VOC concentration rose again. The winds then shifted to coming out of the west-southwest (WSW) and the total VOC measurements returned to previous baseline levels (Figures 1-3 and 1-4).

The elevated VOC reading on the CM-3 monitor was part of a brief event that lasted from approximately 7:37 a.m. to 7:41 a.m. on September 27, 2021. Figure 5 below provides the 1-minute VOC concentrations and the wind direction data prior to, during, and after this period.

Figure 6 is a wind rose of the wind data collected at the CM-3 location from 7:00 a.m. to 9:00 a.m. on September 27, 2021. The elevated total VOC readings observed for approximately 4-minutes resulted in a 1-hour summa canister collection. This summa canisters compound-specific concentration results are shown in Table 6. The elevated total VOC levels were measured while the winds were steadily coming out of the SSW (Figures 1-5 and 1-6).

**TABLE 1-4**  
**Q3- PLANNED AIR SAMPLE DETECTION SUMMARY – CCND MONITORING LOCATIONS**  
**(ALL RESULTS IN PPBV)**

Compound Name	Cas No	# Samples	# Detections	Range of Detections
1-Butene	106-98-9	16	11	0.0663 - 5.7595
1-Hexene	592-41-6	16	0	ND
1-Pentene	109-67-1	16	7	0.0690 - 0.3190
1,2,3-Trimethylbenzene	526-73-8	16	5	0.0804 - 0.1929
1,2,4-Trimethylbenzene	95-63-6	16	6	0.0709 - 0.3050
1,3-Butadiene	106-99-0	16	3	0.0836 - 0.1050
1,3,5-Trimethylbenzene	108-67-8	16	1	0.0920
2-Ethyltoluene	611-14-3	16	1	0.1495
2-Methylheptane	592-27-8	16	5	0.0738 - 0.2500
2-Methylhexane	591-76-4	16	12	0.0836 - 0.7290
2-Methylpentane	107-83-5	16	15	0.1366 - 3.4800
2,2-Dimethylbutane	75-83-2	16	7	0.0642 - 0.3590
2,2,4-trimethylpentane	540-84-1	16	9	0.0766 - 0.2740
2,3-Dimethylbutane	79-29-8	16	11	0.0627 - 0.7560
2,3-Dimethylpentane	565-59-3	16	8	0.0668 - 0.2870
2,3,4-Trimethylpentane	565-75-3	16	2	0.0624 - 0.0631
2,4-Dimethylpentane	108-08-7	16	6	0.0759 - 0.2379
3-Ethyltoluene	620-14-4	16	6	0.0713 - 0.1490
3-Methylheptane	589-81-1	16	4	0.0665 - 0.2370
3-Methylhexane	589-34-4	16	12	0.0808 - 0.7240
3-Methylpentane	96-14-0	16	15	0.1015 - 2.0500
4-Ethyltoluene	622-96-8	16	1	0.0903
Acetylene	74-86-2	16	16	0.2707 - 1.2900
Benzene	71-43-2	16	16	0.1035 - 1.1100
Butane	106-97-8	16	16	0.9329 - 14.7000
Carbon disulfide	75-15-0	16	4	0.0775 - 0.2810
Cis-2-Butene	590-18-1	16	6	0.0746 - 1.1500
Cis-2-Pentene	627-20-3	16	2	0.1540 - 0.2860
Cyclohexane	110-82-7	16	16	0.0642 - 1.4200
Cyclopentane	287-92-3	16	12	0.0806 - 0.8760
Decane	124-18-5	16	4	0.1040 - 0.1960
Dodecane	112-40-3	16	3	0.0624 - 0.1573
Ethane	74-84-0	16	16	4.2713 - 20.2000
Ethylbenzene	100-41-4	16	9	0.0679 - 0.2960
Ethylene	74-85-1	16	16	0.4407 - 2.5000
Heptane	142-82-5	16	15	0.0665 - 0.7600
Hexane	110-54-3	16	16	0.1778 - 3.2600
Isobutane	75-28-5	16	16	0.3119 - 6.8000
Isopentane	78-78-4	16	16	0.6966 - 17.9000
Isoprene	78-79-5	16	12	0.0670 - 7.8359
m/p-Xylenes	108-38-3 & 106-42-3	16	12	0.0693 - 1.0900
m-Diethylbenzene	141-93-5	16	2	0.0722 - 0.1197
Methylcyclohexane	108-87-2	16	13	0.0703 - 0.6090
Methylcyclopentane	96-37-7	16	14	0.1096 - 1.3300
n-Octane	111-65-9	16	6	0.0700 - 0.2930
n-Propylbenzene	103-65-1	16	1	0.0747
Naphthalene	91-20-3	16	2	0.0686 - 0.0722
Nonane	111-84-2	16	7	0.0767 - 0.2130
o-Xylene	95-47-6	16	9	0.0624 - 0.3670
p-Diethylbenzene	105-05-5	16	10	0.0636 - 0.1431
Pentane	109-66-0	16	16	0.5338 - 12.0000
Propane	74-98-6	16	16	1.3812 - 51.6000
Propylene	115-07-1	16	16	0.0677 - 3.2800
Tetrachloroethene	127-18-4	16	1	0.0737
Toluene	108-88-3	16	16	0.0988 - 2.1600
Trans-2-Butene	624-64-6	16	4	0.0695 - 1.2100
Trans-2-Pentene	646-04-8	16	7	0.0735 - 0.6890
Undecane	1120-21-4	16	5	0.0806 - 0.1669
ND = "No detections recorded"				

**TABLE 1-5**  
**Q3- PLANNED AIR SAMPLE DETECTION SUMMARY – REFERENCE LOCATIONS**  
**(ALL RESULTS IN PPBV)**

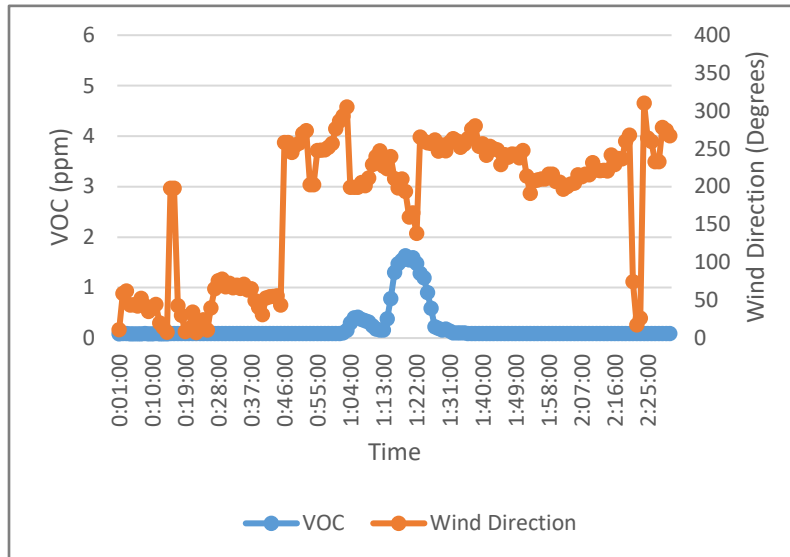
Compound Name	Cas No	# Samples	# Detections	Range of Detections
1-Butene	106-98-9	3	3	0.1020 - 0.3580
1-Hexene	592-41-6	3	1	0.0733
1-Pentene	109-67-1	3	1	0.0653
1,2,3-Trimethylbenzene	526-73-8	3	1	0.0691
1,2,4-Trimethylbenzene	95-63-6	3	3	0.0698 - 0.1140
1,3-Butadiene	106-99-0	3	2	0.0844 - 0.1260
1,3,5-Trimethylbenzene	108-67-8	3	0	ND
2-Ethyltoluene	611-14-3	3	0	ND
2-Methylheptane	592-27-8	3	3	0.0661 - 0.0848
2-Methylhexane	591-76-4	3	3	0.1690 - 0.2080
2-Methylpentane	107-83-5	3	3	0.5050 - 0.6160
2,2-Dimethylbutane	75-83-2	3	2	0.0753 - 0.3880
2,2,4-trimethylpentane	540-84-1	3	3	0.0941 - 0.1830
2,3-Dimethylbutane	79-29-8	3	3	0.1220 - 0.1580
2,3-Dimethylpentane	565-59-3	3	3	0.0836 - 0.1270
2,3,4-Trimethylpentane	565-75-3	3	0	ND
2,4-Dimethylpentane	108-08-7	3	3	0.0684 - 0.0860
3-Ethyltoluene	620-14-4	3	1	0.0729
3-Methylheptane	589-81-1	3	1	0.0632
3-Methylhexane	589-34-4	3	3	0.1890 - 1.5100
3-Methylpentane	96-14-0	3	3	0.5020 - 0.9050
4-Ethyltoluene	622-96-8	3	0	ND
Acetylene	74-86-2	3	3	0.1860 - 1.3700
Benzene	71-43-2	3	3	0.3980 - 0.5250
Butane	106-97-8	3	3	1.7000 - 4.7000
Carbon disulfide	75-15-0	3	2	0.1060 - 0.5620
Cis-2-Butene	590-18-1	3	1	0.0815
Cis-2-Pentene	627-20-3	3	0	ND
Cyclohexane	110-82-7	3	2	0.3050 - 0.4160
Cyclopentane	287-92-3	3	3	0.2060 - 0.2350
Decane	124-18-5	3	1	0.0943
Dodecane	112-40-3	3	0	ND
Ethane	74-84-0	3	3	5.4800 - 17.6000
Ethylbenzene	100-41-4	3	3	0.0825 - 0.1460
Ethylene	74-85-1	3	3	1.1400 - 1.9700
Heptane	142-82-5	3	3	0.2180 - 0.3330
Hexane	110-54-3	3	3	0.5830 - 0.7870
Isobutane	75-28-5	3	3	0.7810 - 1.8900
Isopentane	78-78-4	3	3	1.4300 - 2.4400
Isoprene	78-79-5	3	3	0.0670 - 0.0945
m-/p-Xylenes	108-38-3 & 106-42-3	3	3	0.2430 - 0.4700
m-Diethylbenzene	141-93-5	3	0	ND
Methylcyclohexane	108-87-2	3	3	0.1070 - 0.1890
Methylcyclopentane	96-37-7	3	3	0.2910 - 0.4060
n-Octane	111-65-9	3	3	0.0682 - 0.1330
n-Propylbenzene	103-65-1	3	0	ND
Naphthalene	91-20-3	3	1	0.0685
Nonane	111-84-2	3	3	0.0620 - 0.0791
o-Xylene	95-47-6	3	3	0.0813 - 0.1490
p-Diethylbenzene	105-05-5	3	0	ND
Pentane	109-66-0	3	3	0.9430 - 2.1700
Propane	74-98-6	3	3	3.4300 - 9.7500
Propylene	115-07-1	3	3	0.3040 - 0.5170
Tetrachloroethene	127-18-4	3	1	0.0673
Toluene	108-88-3	3	3	0.5170 - 1.0700
Trans-2-Butene	624-64-6	3	0	ND
Trans-2-Pentene	646-04-8	3	3	0.2320 - 0.3070
Undecane	1120-21-4	3	1	0.0724
ND = "No detections recorded"				

**TABLE 1-6**  
**SENSOR TRIGGERED SAMPLE CONCENTRATIONS (ALL RESULTS IN PPBV)**

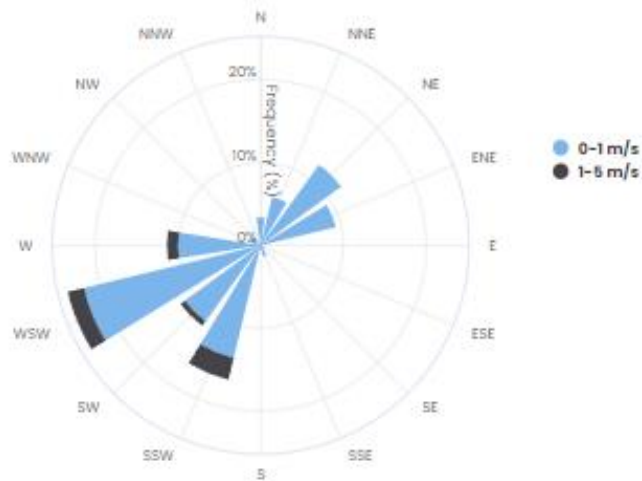
Compound Name	Cas No	CM3 - Adams Highschool	CM5 - Central
		9/27/2021	9/9/2021
1-Butene	106-98-9	0.095	< 0.062
1-Hexene	592-41-6	< 0.062	< 0.062
1-Pentene	109-67-1	< 0.062	< 0.062
1,2,3-Trimethylbenzene	526-73-8	0.072	< 0.062
1,2,4-Trimethylbenzene	95-63-6	0.076	< 0.062
1,3-Butadiene	106-99-0	0.116	< 0.062
1,3,5-Trimethylbenzene	108-67-8	< 0.062	< 0.062
2-Ethyltoluene	611-14-3	< 0.062	< 0.062
2-Methylheptane	592-27-8	< 0.062	< 0.062
2-Methylhexane	591-76-4	< 0.062	< 0.062
2-Methylpentane	107-83-5	0.458	0.163
2,2-Dimethylbutane	75-83-2	0.078	< 0.062
2,2,4-trimethylpentane	540-84-1	0.106	< 0.062
2,3-Dimethylbutane	79-29-8	0.121	< 0.062
2,3-Dimethylpentane	565-59-3	< 0.062	< 0.062
2,3,4-Trimethylpentane	565-75-3	< 0.062	< 0.062
2,4-Dimethylpentane	108-08-7	0.398	< 0.062
3-Ethyltoluene	620-14-4	0.077	0.090
3-Methylheptane	589-81-1	< 0.062	< 0.062
3-Methylhexane	589-34-4	0.075	0.072
3-Methylpentane	96-14-0	< 0.062	0.234
4-Ethyltoluene	622-96-8	< 0.062	< 0.062
Acetylene	74-86-2	0.877	0.357
Benzene	71-43-2	0.350	0.177
Butane	106-97-8	1.840	0.643
Carbon disulfide	75-15-0	< 0.062	< 0.062
Cis-2-Butene	590-18-1	< 0.062	< 0.062
Cis-2-Pentene	627-20-3	< 0.062	< 0.062
Cyclohexane	110-82-7	0.224	0.068 (J)
Cyclopentane	287-92-3	0.235	0.098
Decane	124-18-5	0.107	< 0.062
Dodecane	112-40-3	0.104	0.099
Ethane	74-84-0	8.860	4.730
Ethylbenzene	100-41-4	0.116	< 0.062
Ethylene	74-85-1	2.310	0.328
Heptane	142-82-5	0.157	< 0.062
Hexane	110-54-3	0.885	0.241
Isobutane	75-28-5	0.812	0.180
Isopentane	78-78-4	2.480	0.653
Isoprene	78-79-5	0.122	0.203
m-/p-Xylenes	108-38-3 & 106-42-3	0.336	0.078
m-Diethylbenzene	141-93-5	< 0.062	< 0.062
Methylcyclohexane	108-87-2	< 0.062	< 0.062
Methylcyclopentane	96-37-7	< 0.062	0.170
n-Octane	111-65-9	< 0.062	< 0.062
n-Propylbenzene	103-65-1	< 0.062	< 0.062
Naphthalene	91-20-3	< 0.062	< 0.062
Nonane	111-84-2	0.076	< 0.062
o-Xylene	95-47-6	0.109	< 0.062
p-Diethylbenzene	105-05-5	0.083	< 0.062
Pentane	109-66-0	6.930	1.340
Propane	74-98-6	2.770	0.978
Propylene	115-07-1	0.614	0.093
Tetrachloroethene	127-18-4	< 0.062	< 0.062
Toluene	108-88-3	0.808	0.229
Trans-2-Butene	624-64-6	< 0.062	0.183
Trans-2-Pentene	646-04-8	< 0.062	< 0.062
Undecane	1120-21-4	0.110	0.119

Laboratory non-detections are reported as less than ("<") the MDL. Result qualifiers are reported to the right of corresponding detections (in parentheses).

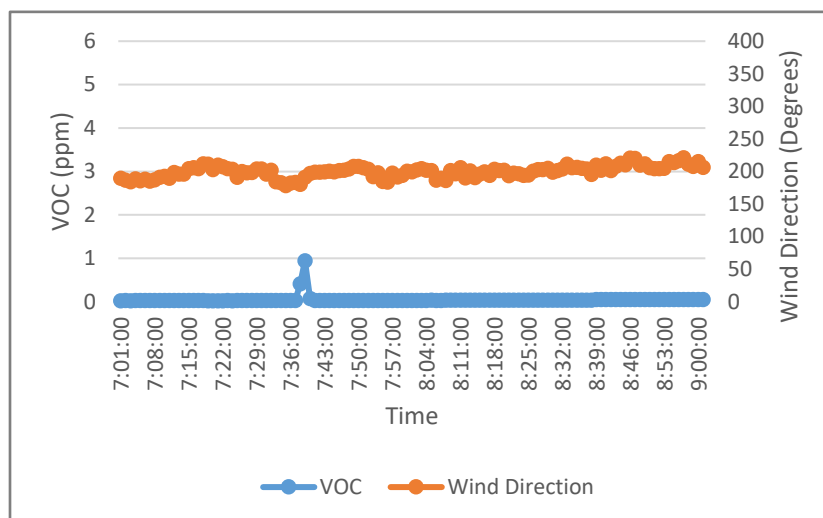
**FIGURE 1-3**  
LOCATION CM-5 TOTAL VOC AND WIND DIRECTION DATA – SEPTEMBER 9, 2021



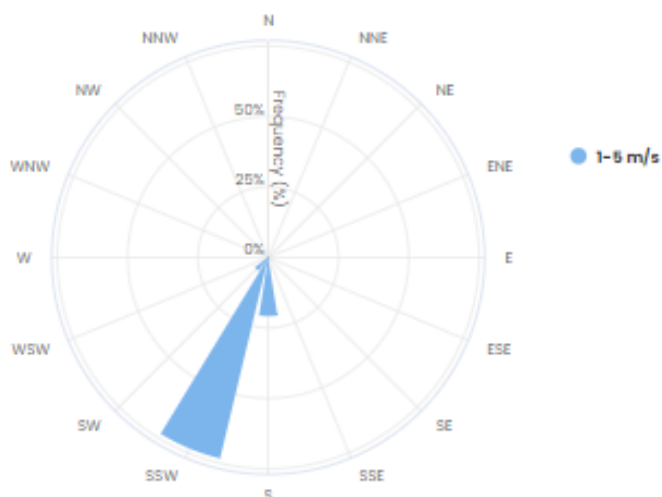
**FIGURE 1-4**  
LOCATION CM-5 WIND ROSE | SEPTEMBER 9, 2021, 1200-0230



**FIGURE 1-5**  
LOCATION CM-3 TOTAL VOC AND WIND DIRECTION DATA – SEPTEMBER 27, 2021



**FIGURE 1-6**  
LOCATION CM-3 WIND ROSE | SEPTEMBER 27, 2021, 0700-0900



## 1.5 Screening Health Risk Assessment Results

The purpose of this screening health risk assessment was to determine whether exposure to the measured concentrations of individual or cumulative VOCs could potentially pose acute (short-term) health hazards. Acute health hazards were estimated for each location for each substance both individually and combined. According to USEPA guidelines (USEPA 1989, 2004), a HQ or HI less than or equal to one indicates that exposures are likely to be without any appreciable risk of adverse noncancer health effects, even for sensitive subpopulations. The calculated acute HQ and HI are summarized in Table 1-7 through 1-9 and all data are presented in the Appendix tables. In general, the data and health risk assessment indicate:



- All measured individual and combined air concentrations during planned air samples (July and August) were at least 8-times below their respective acute health-based reference levels (Table 1-7).
  - Table 1-7 shows all HQs for individual compounds to be well below one. A HQ of less than one indicates unlikely risk of adverse health effects from that compound.
- Cumulative health risks (as indicated by hazard index) for all VOCs are shown in Figure 1-8. The HI from August planned air samples were higher than the July air samples, however all HI were less than one.
- All measured concentrations at reference sample locations were below their respective acute health-based reference levels (Table 8, Figure 8)
- All sensor-triggered event sample concentrations were below their respective acute health-based reference level (Table 1-9, Figures 1-7 through 1-8)
  - The sensor triggered event sample (CM5 HI = 0.06) was consistent with the planned air samples at the same location (HI = 0.03 and 0.06)
  - The sensor triggered event sample (CM3 HI = 0.10) was higher than the general air samples at the same location (HI = 0.07 and 0.02).



**TABLE 1-7**  
**QUARTER 3 | CCND SUMMA CANISTER SCREENING RISK ANALYSIS: COMPOUND-SPECIFIC HAZARD QUOTIENTS FOR PLANNED AIR SAMPLES – CCND MONITORING SITES**

Compound Name	Cas No	AEGLE 1.60 min Value (ppb)	Health Based Reference Level	Source	CM1 - Rose		CM2 - Suncor		CM3 - Adams Highs..		CM4 - Adams Middl..	
					July 13, 2021	August 10, 2021	July 13, 2021	August 10, 2021	July 13, 2021	August 10, 2021	July 13, 2021	August 10, 2021
1-Butene	106-98-9	NR	27,000	TCEQ Short-Term AMCV	0.0002	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-Hexene	592-41-6	NR	500	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
1-Pentene	109-67-1	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1,2,3-Trimethylbenzene	526-73-8	NR	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1,2,4-Trimethylbenzene	95-63-6	140,000	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1,3-Butadiene	106-99-0	670,000	298	OEHA Acute REL	0.0002	0.0002	0.0002	0.0003	0.0002	0.0003	0.0002	0.0002
1,3,5-Trimethylbenzene	108-67-8	140,000	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Ethyltoluene	611-14-3	NR	250	TCEQ Short-Term AMCV	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002
2-Methylheptane	592-27-8	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Methylhexane	591-76-4	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2-Methylpentane	107-83-5	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0005
2,2-Dimethylbutane	75-83-2	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,2,4-trimethylpentane	540-84-1	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001
2,3-Dimethylbutane	79-29-8	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2,3-Dimethylpentane	565-59-3	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,3,4-Trimethylpentane	565-75-3	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,4-Dimethylpentane	108-08-7	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Ethyltoluene	620-14-4	NR	250	TCEQ Short-Term AMCV	0.0003	0.0003	0.0002	0.0003	0.0002	0.0003	0.0003	0.0004
3-Methylheptane	589-81-1	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Methylhexane	589-34-4	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
3-Methylpentane	96-14-0	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0001	0.0001	0.0001	0.0000	0.0001	0.0000	0.0003
4-Ethyltoluene	622-96-8	NR	250	TCEQ Short-Term AMCV	0.0003	0.0003	0.0002	0.0002	0.0002	0.0002	0.0003	0.0002
Acetylene	74-86-2	NR	25,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Benzene	71-43-2	52,000	9	ATSDR Acute MRL	0.0152	0.0396	0.0115	0.0521	0.0121	0.0563	0.0115	0.0947
Butane	106-97-8	5,500,000	92,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
Carbon disulfide	75-15-0	13,000	1,990	OEHA Acute REL	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cis-2-Butene	590-18-1	NR	15,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cis-2-Pentene	627-20-3	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	110-82-7	NR	1,000	TCEQ Short-Term AMCV	0.0001	0.0003	0.0001	0.0004	0.0001	0.0003	0.0001	0.0010
Cyclopentane	287-92-3	NR	5,900	TCEQ Short-Term AMCV	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Decane	124-18-5	NR	1,000	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Dodecane	112-40-3	NR	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA
Ethane	74-84-0	NR	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100-41-4	33,000	5,000	ATSDR Acute MRL	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Ethylene	74-85-1	NR	500,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heptane	142-82-5	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Hexane	110-54-3	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001	0.0000	0.0006
Isobutane	75-28-5	NR	33,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
Isopentane	78-78-4	NR	68,000	TCEQ Short-Term AMCV	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
Isoprene	78-79-5	NR	1,400	TCEQ Short-Term AMCV	0.0056	0.0004	0.0001	0.0001	0.0000	0.0001	0.0001	0.0000
m-/p-Xylenes	108-38-3 & / 1.	NR	2,000	ATSDR Acute MRL	0.0000	0.0002	0.0000	0.0002	0.0000	0.0002	0.0000	0.0003
m-Diethylbenzene	141-93-5	NR	450	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001
Methylcyclohexane	108-87-2	NR	4,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Methylcyclopentane	96-37-7	NR	750	TCEQ Short-Term AMCV	0.0001	0.0003	0.0001	0.0005	0.0001	0.0005	0.0002	0.0018
n-Octane	111-65-9	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
n-Propylbenzene	103-65-1	NR	510	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Naphthalene	91-20-3	NR	95	TCEQ Short-Term AMCV	0.0007	0.0007	0.0006	0.0008	0.0007	0.0006	0.0007	0.0006
Nonane	111-84-2	NR	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
o-Xylene	95-47-6	NR	2,000	ATSDR Acute MRL	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001	0.0000	0.0001
p-Diethylbenzene	105-05-5	NR	450	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0002	0.0002	0.0001	0.0002	0.0002
Pentane	109-66-0	NR	68,000	TCEQ Short-Term AMCV	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
Propane	74-98-6	5,500,000	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA
Propylene	115-07-1	NR	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	127-18-4	35,000	6	ATSDR Acute MRL	0.0105	0.0105	0.0102	0.0104	0.0102	0.0101	0.0123	0.0101
Toluene	108-88-3	67,000	2,000	ATSDR Acute MRL	0.0001	0.0004	0.0001	0.0004	0.0001	0.0005	0.0001	0.0007
Trans-2-Butene	624-64-6	NR	15,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Trans-2-Pentene	646-04-8	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Undecane	1120-21-4	NR	550	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002
Hazard Index					0.0152	0.0396	0.0115	0.0521	0.0121	0.0563	0.0123	0.0947

**TABLE 1-7 (continued)**  
**QUARTER 3 | CCND SUMMA CANISTER SCREENING RISK ANALYSIS: COMPOUND-SPECIFIC HAZARD QUOTIENTS FOR PLANNED AIR SAMPLES – CCND MONITORING SITES**

Compound Name	Cas No	AEGL 1 60 min Value (ppb)	Health Based Reference Level	Source	CM5 - Central		CM6 - Focus		CM7 - Kearney		CM8 - Monroe	
					July 13, 2021	August 10, 2021	July 13, 2021	August 10, 2021	July 13, 2021	August 10, 2021	July 13, 2021	August 10, 2021
1-Butene	106-98-9	NR	27,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1-Hexene	592-41-6	NR	500	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
1-Pentene	109-67-1	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
1,2,3-Trimethylbenzene	526-73-8	NR	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000
1,2,4-Trimethylbenzene	95-63-6	140,000	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
1,3-Butadiene	106-99-0	670,000	298	OEHHA Acute REL	0.0002	0.0004	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
1,3,5-Trimethylbenzene	108-67-8	140,000	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2-Ethyltoluene	611-14-3	NR	250	TCEQ Short-Term AMCV	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0006	0.0002
2-Methylheptane	592-27-8	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2-Methylhexane	591-76-4	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2-Methylpentane	107-83-5	NR	5,400	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0006
2,2-Dimethylbutane	75-83-2	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2,2,4-trimethylpentane	540-84-1	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2,3-Dimethylbutane	79-29-8	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
2,3-Dimethylpentane	565-59-3	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,3,4-Trimethylpentane	565-75-3	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
2,4-Dimethylpentane	108-08-7	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
3-Ethyltoluene	620-14-4	NR	250	TCEQ Short-Term AMCV	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0005	0.0006
3-Methylheptane	589-81-1	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
3-Methylhexane	589-34-4	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
3-Methylpentane	96-14-0	NR	5,400	TCEQ Short-Term AMCV	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0001	0.0004
4-Ethyltoluene	622-96-8	NR	250	TCEQ Short-Term AMCV	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004
Acetylene	74-86-2	NR	25,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Benzene	71-43-2	52,000	9	ATSDR Acute MRL	0.0184	0.0450	0.0180	0.0412	0.0189	0.0400	0.0118	0.1233
Butane	106-97-8	5,500,000	92,000	TCEQ Short-Term AMCV	0.0001	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
Carbon disulfide	75-15-0	13,000	1,990	OEHHA Acute REL	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Cis-2-Butene	590-18-1	NR	15,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Cis-2-Pentene	627-20-3	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Cyclohexane	110-82-7	NR	1,000	TCEQ Short-Term AMCV	0.0002	0.0003	0.0002	0.0002	0.0002	0.0002	0.0001	0.0014
Cyclopentane	287-92-3	NR	5,900	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Decane	124-18-5	NR	1,000	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0001	0.0002
Dodecane	112-40-3	NR	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA
Ethane	74-84-0	NR	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA
Ethylbenzene	100-41-4	33,000	5,000	ATSDR Acute MRL	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Ethylene	74-85-1	NR	500,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Heptane	142-82-5	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Hexane	110-54-3	NR	5,400	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0006
Isobutane	75-28-5	NR	33,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
Isopentane	78-78-4	NR	68,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0003
Isoprene	78-79-5	NR	1,400	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0000	0.0000	0.0000
m-/p-Xylenes	108-38-3 & 1...	NR	2,000	ATSDR Acute MRL	0.0000	0.0002	0.0003	0.0001	0.0000	0.0001	0.0000	0.0005
m-Diethylbenzene	141-93-5	NR	450	TCEQ Short-Term AMCV	0.0002	0.0001	0.0001	0.0001	0.0001	0.0001	0.0003	0.0001
Methylcyclohexane	108-87-2	NR	4,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
Methylcyclopentane	96-37-7	NR	750	TCEQ Short-Term AMCV	0.0003	0.0003	0.0003	0.0003	0.0003	0.0005	0.0002	0.0018
n-Octane	111-65-9	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
n-Propylbenzene	103-65-1	NR	510	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001
Naphthalene	91-20-3	NR	95	TCEQ Short-Term AMCV	0.0006	0.0007	0.0007	0.0006	0.0006	0.0006	0.0007	0.0006
Nonane	111-84-2	NR	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
o-Xylene	95-47-6	NR	2,000	ATSDR Acute MRL	0.0000	0.0001	0.0001	0.0000	0.0000	0.0000	0.0000	0.0002
p-Diethylbenzene	105-05-5	NR	450	TCEQ Short-Term AMCV	0.0001	0.0002	0.0002	0.0001	0.0002	0.0001	0.0003	0.0002
Pentane	109-66-0	NR	68,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0002
Propane	74-98-6	5,500,000	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA
Propylene	115-07-1	NR	NE	NE	NA	NA	NA	NA	NA	NA	NA	NA
Tetrachloroethene	127-18-4	35,000	6	ATSDR Acute MRL	0.0101	0.0104	0.0103	0.0103	0.0102	0.0102	0.0104	0.0102
Toluene	108-88-3	67,000	2,000	ATSDR Acute MRL	0.0001	0.0004	0.0002	0.0002	0.0001	0.0004	0.0000	0.0011
Trans-2-Butene	624-64-6	NR	15,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Trans-2-Pentene	646-04-8	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0001
Undecane	1120-21-4	NR	550	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001	0.0001	0.0001	0.0002	0.0003	0.0003
Hazard Index					0.0184	0.0450	0.0180	0.0412	0.0189	0.0400	0.0118	0.1233

**TABLE 1-8**  
**QUARTER 3 | CCND SUMMA CANISTER SCREENING RISK ANALYSIS: COMPOUND-SPECIFIC HAZARD QUOTIENTS FOR PLANNED AIR SAMPLES – REFERENCE SITES**

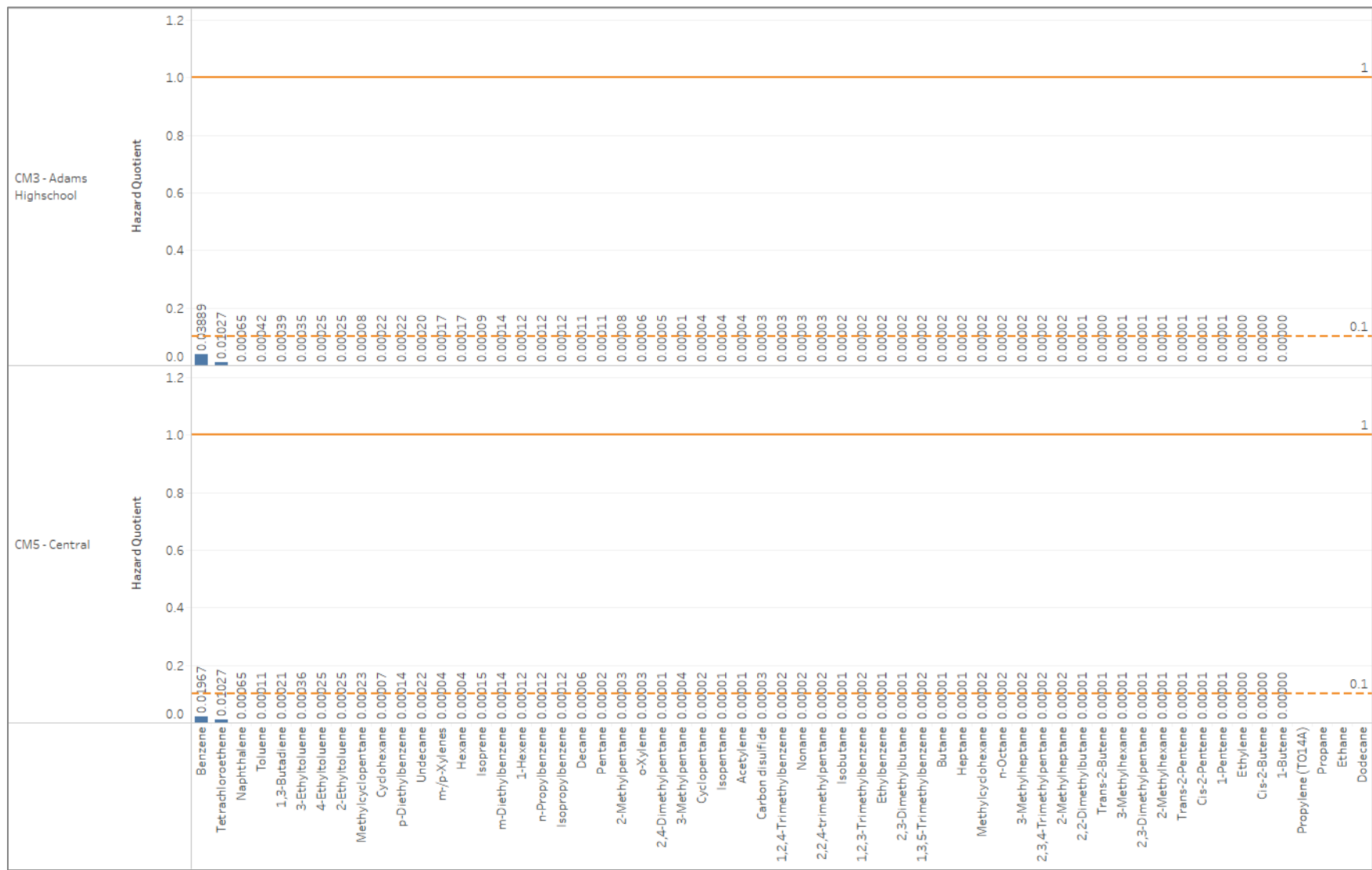
Compound Name	Cas No	AEGL 1 60 min Value (ppb)	Health Based Reference Level	Source	BFD- Brighton August 10, 2021	CAMP- Denver August 10, 2021	JUNC- E470/125 August 10, 2021
1-Butene	106-98-9	NR	27,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
1-Hexene	592-41-6	NR	500	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001
1-Pentene	109-67-1	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
1,2,3-Trimethylbenzene	526-73-8	NR	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
1,2,4-Trimethylbenzene	95-63-6	140,000	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
1,3-Butadiene	106-99-0	670,000	298	OEHA Acute REL	0.0002	0.0003	0.0004
1,3,5-Trimethylbenzene	108-67-8	140,000	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
2-Ethyltoluene	611-14-3	NR	250	TCEQ Short-Term AMCV	0.0002	0.0003	0.0002
2-Methylheptane	592-27-8	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
2-Methylhexane	591-76-4	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
2-Methylpentane	107-83-5	NR	5,400	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001
2,2-Dimethylbutane	75-83-2	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0000	0.0001
2,2,4-trimethylpentane	540-84-1	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
2,3-Dimethylbutane	79-29-8	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
2,3-Dimethylpentane	565-59-3	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
2,3,4-Trimethylpentane	565-75-3	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
2,4-Dimethylpentane	108-08-7	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
3-Ethyltoluene	620-14-4	NR	250	TCEQ Short-Term AMCV	0.0002	0.0003	0.0002
3-Methylheptane	589-81-1	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
3-Methylhexane	589-34-4	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0002
3-Methylpentane	96-14-0	NR	5,400	TCEQ Short-Term AMCV	0.0001	0.0001	0.0002
4-Ethyltoluene	622-96-8	NR	250	TCEQ Short-Term AMCV	0.0002	0.0003	0.0002
Acetylene	74-86-2	NR	25,000	TCEQ Short-Term AMCV	0.0000	0.0001	0.0001
Benzene	71-43-2	52,000	9	ATSDR Acute MRL	0.0442	0.0558	0.0583
Butane	106-97-8	5,500,000	92,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0001
Carbon disulfide	75-15-0	13,000	1,990	OEHA Acute REL	0.0000	0.0003	0.0001
Cis-2-Butene	590-18-1	NR	15,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
Cis-2-Pentene	627-20-3	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
Cyclohexane	110-82-7	NR	1,000	TCEQ Short-Term AMCV	0.0003	0.0003	0.0004
Cyclopentane	287-92-3	NR	5,900	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
Decane	124-18-5	NR	1,000	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001
Dodecane	112-40-3	NR	NE	NE	NA	NA	NA
Ethane	74-84-0	NR	NE	NE	NA	NA	NA
Ethylbenzene	100-41-4	33,000	5,000	ATSDR Acute MRL	0.0000	0.0000	0.0000
Ethylene	74-85-1	NR	500,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
Heptane	142-82-5	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
Hexane	110-54-3	NR	5,400	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001
Isobutane	75-28-5	NR	33,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0001
Isopentane	78-78-4	NR	68,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
Isoprene	78-79-5	NR	1,400	TCEQ Short-Term AMCV	0.0001	0.0001	0.0000
m-/p-Xylenes	108-38-3 &/ 1..	NR	2,000	ATSDR Acute MRL	0.0001	0.0002	0.0002
m-Diethylbenzene	141-93-5	NR	450	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001
Methylcyclohexane	108-87-2	NR	4,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
Methylcyclopentane	96-37-7	NR	750	TCEQ Short-Term AMCV	0.0004	0.0005	0.0005
n-Octane	111-65-9	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
n-Propylbenzene	103-65-1	NR	510	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001
Naphthalene	91-20-3	NR	95	TCEQ Short-Term AMCV	0.0006	0.0007	0.0007
Nonane	111-84-2	NR	3,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
o-Xylene	95-47-6	NR	2,000	ATSDR Acute MRL	0.0000	0.0001	0.0001
p-Diethylbenzene	105-05-5	NR	450	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001
Pentane	109-66-0	NR	68,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
Propane	74-98-6	5,500,000	NE	NE	NA	NA	NA
Propylene	115-07-1	NR	NE	NE	NA	NA	NA
Tetrachloroethene	127-18-4	35,000	6	ATSDR Acute MRL	0.0101	0.0105	0.0112
Toluene	108-88-3	67,000	2,000	ATSDR Acute MRL	0.0003	0.0005	0.0004
Trans-2-Butene	624-64-6	NR	15,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
Trans-2-Pentene	646-04-8	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000	0.0000
Undecane	1120-21-4	NR	550	TCEQ Short-Term AMCV	0.0001	0.0001	0.0001
Hazard Index					0.0442	0.0558	0.0583
NA = "Not Applicable"							
NE = "Not Established"							
NR = "Not recommended due to insufficient data"							



**TABLE 1-9**  
**QUARTER 3 | CCND SUMMA CANISTER SCREENING RISK ANALYSIS: COMPOUND-SPECIFIC HAZARD QUOTIENTS FOR SENSOR TRIGGERED AIR SAMPLES**

Compound Name	Cas No	AEGL 1 60 min Value (ppb)	Health Based Reference Level	Source	CM3 - Adams Highschool	CM5 - Central
					September 27, 2021	September 9, 2021
1-Butene	106-98-9	NR	27,000	TCEQ Short-Term AMCV	0.0000	0.0000
1-Hexene	592-41-6	NR	500	TCEQ Short-Term AMCV	0.0001	0.0001
1-Pentene	109-67-1	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000
1,2,3-Trimethylbenzene	526-73-8	NR	3,000	TCEQ Short-Term AMCV	0.0000	0.0000
1,2,4-Trimethylbenzene	95-63-6	140,000	3,000	TCEQ Short-Term AMCV	0.0000	0.0000
1,3-Butadiene	106-99-0	670,000	298	OEHA Acute REL	0.0004	0.0002
1,3,5-Trimethylbenzene	108-67-8	140,000	3,000	TCEQ Short-Term AMCV	0.0000	0.0000
2-Ethyltoluene	611-14-3	NR	250	TCEQ Short-Term AMCV	0.0002	0.0002
2-Methylheptane	592-27-8	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000
2-Methylhexane	591-76-4	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000
2-Methylpentane	107-83-5	NR	5,400	TCEQ Short-Term AMCV	0.0001	0.0000
2,2-Dimethylbutane	75-83-2	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0000
2,2,4-trimethylpentane	540-84-1	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000
2,3-Dimethylbutane	79-29-8	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0000
2,3-Dimethylpentane	565-59-3	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000
2,3,4-Trimethylpentane	565-75-3	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000
2,4-Dimethylpentane	108-08-7	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000
3-Ethyltoluene	620-14-4	NR	250	TCEQ Short-Term AMCV	0.0003	0.0004
3-Methylheptane	589-81-1	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000
3-Methylhexane	589-34-4	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000
3-Methylpentane	96-14-0	NR	5,400	TCEQ Short-Term AMCV	0.0000	0.0000
4-Ethyltoluene	622-96-8	NR	250	TCEQ Short-Term AMCV	0.0002	0.0002
Acetylene	74-86-2	NR	25,000	TCEQ Short-Term AMCV	0.0000	0.0000
Benzene	71-43-2	52,000	9	ATSDR Acute MRL	0.0389	0.0197
Butane	106-97-8	5,500,000	92,000	TCEQ Short-Term AMCV	0.0000	0.0000
Carbon disulfide	75-15-0	13,000	1,990	OEHA Acute REL	0.0000	0.0000
Cis-2-Butene	590-18-1	NR	15,000	TCEQ Short-Term AMCV	0.0000	0.0000
Cis-2-Pentene	627-20-3	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000
Cyclohexane	110-82-7	NR	1,000	TCEQ Short-Term AMCV	0.0002	0.0001
Cyclopentane	287-92-3	NR	5,900	TCEQ Short-Term AMCV	0.0000	0.0000
Decane	124-18-5	NR	1,000	TCEQ Short-Term AMCV	0.0001	0.0001
Dodecane	112-40-3	NR	NE	NE	NA	NA
Ethane	74-84-0	NR	NE	NE	NA	NA
Ethylbenzene	100-41-4	33,000	5,000	ATSDR Acute MRL	0.0000	0.0000
Ethylene	74-85-1	NR	500,000	TCEQ Short-Term AMCV	0.0000	0.0000
Heptane	142-82-5	NR	8,300	TCEQ Short-Term AMCV	0.0000	0.0000
Hexane	110-54-3	NR	5,400	TCEQ Short-Term AMCV	0.0002	0.0000
Isobutane	75-28-5	NR	33,000	TCEQ Short-Term AMCV	0.0000	0.0000
Isopentane	78-78-4	NR	68,000	TCEQ Short-Term AMCV	0.0000	0.0000
Isoprene	78-79-5	NR	1,400	TCEQ Short-Term AMCV	0.0001	0.0001
m-/p-Xylenes	108-38-3 & 1..	NR	2,000	ATSDR Acute MRL	0.0002	0.0000
m-Diethylbenzene	141-93-5	NR	450	TCEQ Short-Term AMCV	0.0001	0.0001
Methylcyclohexane	108-87-2	NR	4,000	TCEQ Short-Term AMCV	0.0000	0.0000
Methylcyclopentane	96-37-7	NR	750	TCEQ Short-Term AMCV	0.0001	0.0002
n-Octane	111-65-9	NR	4,100	TCEQ Short-Term AMCV	0.0000	0.0000
n-Propylbenzene	103-65-1	NR	510	TCEQ Short-Term AMCV	0.0001	0.0001
Naphthalene	91-20-3	NR	95	TCEQ Short-Term AMCV	0.0006	0.0006
Nonane	111-84-2	NR	3,000	TCEQ Short-Term AMCV	0.0000	0.0000
o-Xylene	95-47-6	NR	2,000	ATSDR Acute MRL	0.0001	0.0000
p-Diethylbenzene	105-05-5	NR	450	TCEQ Short-Term AMCV	0.0002	0.0001
Pentane	109-66-0	NR	68,000	TCEQ Short-Term AMCV	0.0001	0.0000
Propane	74-98-6	5,500,000	NE	NE	NA	NA
Propylene	115-07-1	NR	NE	NE	NA	NA
Tetrachloroethene	127-18-4	35,000	6	ATSDR Acute MRL	0.0103	0.0103
Toluene	108-88-3	67,000	2,000	ATSDR Acute MRL	0.0004	0.0001
Trans-2-Butene	624-64-6	NR	15,000	TCEQ Short-Term AMCV	0.0000	0.0000
Trans-2-Pentene	646-04-8	NR	12,000	TCEQ Short-Term AMCV	0.0000	0.0000
Undecane	1120-21-4	NR	550	TCEQ Short-Term AMCV	0.0002	0.0002
Hazard Index					0.0389	0.0197
NA = "Not Applicable"						
NE = "Not Established"						
NR = "Not recommended due to insufficient data"						

**FIGURE 1-7**  
HAZARD QUOTIENTS FOR SENSOR TRIGGERED EVENT SAMPLES



**FIGURE 1-8**  
HAZARD INDEX BY LOCATION AND SAMPLE DATE



## 1.6 Uncertainty Evaluation

Scientific uncertainty is inherent in each step of the risk assessment process because all risk assessments incorporate a variety of assumptions and professional judgments (USEPA 1989, 2004). Therefore, the noncancer hazard estimates presented in this assessment are conditional estimates given a considerable number of assumptions about exposure and toxicity. This screening-level risk assessment relied on a combination of health-protective exposure scenarios and input values (i.e., high-end exposures). This approach was selected to help risk management decision making. Because of these assumptions, the estimates of noncancer hazards are themselves uncertain.

This risk assessment did not address past or present health outcomes associated with current or past exposures. As such, this risk assessment cannot be used to make realistic predictions of biological effects and/or used to determine whether someone is ill (cancer or other adverse health effects) due to past or current exposures. This risk assessment was limited to inhalation exposures from outdoor exposures to all potential sources.

## 1.7 Program Changes

No program changes occurred during this reporting period.

Prepared by:



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Austin Heitmann  
Client Project Manager – Emerging  
Technology



---

Michael Lumpkin, PhD, DABT  
Senior Toxicologist  
CTEH, LLC

## **APPENDIX A SAMPLE CHAIN OF CUSTODIES**



					Air Chain of Custody Record			Turn Around Time (rush by advanced notice)															
					Lab No: <span style="border: 1px solid black; padding: 2px;">[REDACTED]</span>			7 Day: <input checked="" type="checkbox"/>		5 Day: <input type="checkbox"/>		3 Day: <input type="checkbox"/>											
Page: <span style="border: 1px solid black; padding: 2px;">1</span> of <span style="border: 1px solid black; padding: 2px;">1</span>			2 Day: <input type="checkbox"/>		1 Day: <input type="checkbox"/>		Custom TAT: <input type="checkbox"/>																
					CUSTOMER INFORMATION				PROJECT INFORMATION														
					Company: MAQS				Name: <span style="border: 1px solid black; padding: 2px;">[REDACTED]</span>														
Special Instructions:  <div style="font-family: cursive; font-size: 1.2em; margin-top: 20px;"> Ambient temp, good condition  Amm<sup>3</sup> 07-15-21 </div>					Report To: Austin Heitmann				Number: <span style="border: 1px solid black; padding: 2px;">[REDACTED]</span>														
					Email: <a href="mailto:aheitmann@montrose-env.com">aheitmann@montrose-env.com</a>				P.O. #: <span style="border: 1px solid black; padding: 2px;">[REDACTED]</span>														
					Address: 990 W 43rd Ave, Denver, CO 80211				Address: <span style="border: 1px solid black; padding: 2px;">[REDACTED]</span> N/A														
					Phone: 303-670-0530				Global ID: <span style="border: 1px solid black; padding: 2px;">[REDACTED]</span> N/A														
					Fax: N/A				Sampled By: <span style="border: 1px solid black; padding: 2px;">[REDACTED]</span> JG														
												Analysis Requested											
												TO-15 (Suncor List)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
													<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
													<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
													<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
													<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
													<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
													<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
													<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
													<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
													<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sample ID (Location ID)		Type <small>(I) Indoor (A) Ambient (SV) Soil Vapor (S) Source</small>	Equipment Information			Sampling Information																	
			Canister ID	Size (1L, 3L, 6L, 15L)	Flow Controller ID	Sample Start Date	Sample Start Time	Vacuum Start ("Hg)	Sample End Date	Sample End Time	Vacuum End ("Hg)												
1	Rose71321	A	842	6L	E-008	7/13/21	1417	25	7/13/2021	1517	4	x											
2	Kearney71321	A	757	6L	E-018	7/13/21	1110	25	7/13/21	1210	4	x											
3	AdamsHigh071321	A	832	6L	E-002	7/13/21	1205	24	7/13/21	1305	3	x											
4	Focus071321	A	860	6L	E-029	7/13/21	1405	24	7/13/21	1505	4	x											
5	Monroe071321	A	1458	6L	E-054	7/13/21	1140	26	7/13/21	1240	6	x											
6	Central071321	A	862	6L	E-005	7/13/21	1125	25	7/13/21	1223	4	x											
7	AdamsMiddle071321	A	99	6L	E-047	7/13/21	1153	26	7/13/21	1251	4	x											
8	RBC 071321	A	718	6L	E-035	7/13/21	1455	23	7/13/21	1555	4	x											
9																							
10																							
		Signature		Print Name			Company / Title			Date / Time													
1 Relinquished By:		<span style="background-color: black; color: black;">[REDACTED]</span>		Austin Heitmann			MAQS/PM			7-14-21/1000													
1 Received By:		<i>Alyssa M Miller</i>		<i>Alyssa M. Miller</i>			<i>EA</i>			<i>07-15-21 0920</i>													
2 Relinquished By:																							
2 Received By:																							
3 Relinquished By:																							
3 Received By:																							
												Delivery Tracking #											
												774257956128											



**Turn Around Time (rush by advanced notice only)**

Custom TAT:

## PROJECT INFORMATION

**Suncore**

\_\_\_\_\_

\_\_\_\_\_

N/A



N/A

EP/JG/AH/RK

Ambient temp  
good condition  
Amm<sup>3</sup> 08.17.21

## TO-15 (Suncor list)

Sample ID (Location ID)		Type	Equipment Information			Sampling Information						TO-15 (Suncor)								
		(I) Indoor (A) Ambient (SV) Soil Vapor (S) Source	Canister ID	Size (1L, 3L, 6L, 15L)	Flow Controller ID	Sample Start Date	Sample Start Time	Vacuum Start ("Hg)	Sample End Date	Sample End Time	Vacuum End ("Hg)									
1	AdamsHigh81021	A	1469	6L	E-029	8/10/21	6:38 AM	25	8/10/21	7:38 AM	5	x								
2	Monroe81021	A	1704	6L	E-005	8/10/21	6:18 AM	25	8/10/21	7:20 AM	4	x								
3	Kearney81021	A	856	6L	E-054	8/10/21	6:45 AM	25	8/10/21	7:45 AM	4	x								
4	AdamsMiddle81021	A	806	6L	E-002	8/10/21	6:26 AM	24	8/10/21	7:26 AM	5	x								
5	Focus81021	A	1625	6L	E-008	8/10/21	7:28 AM	25	8/10/21	8:28 AM	4	x								
6	Suncor81021	A	1446	6L	E-052	8/10/21	7:14 AM	26	8/10/21	8:14 AM	4	x								
7	Rose81021	A	1470	6L	E-036	8/10/21	6:52 AM	24	8/10/21	7:51 AM	5	x								
8	Central81021	A	1460	6L	E-035	8/10/21	6:58 AM	25	8/10/21	7:58 AM	4	x								

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:		Erin Peck	MAQS/PM	8/10/2021
1 Received By:		Alyssa M. Miller	EA	08.17.21 1320
2 Relinquished By:				
2 Received By:				
3 Relinquished By:				
3 Received By:				

Delivery Tracking #





### Air Chain of Custody Record

### Turn Around Time (rush by advanced notice only)

Lab No:		7 Day:	X	5 Day:		3 Day:	
Page:	2	of	2	2 Day:		1 Day:	Custom TAT:

CUSTOMER INFORMATION				PROJECT INFORMATION			
Company:	MAQS			Name:	Suncore		
Report To:	Austin Heitmann			Number:			
Email:	<a href="mailto:Aheitmann@montrose-env.com">Aheitmann@montrose-env.com</a>			P.O. #:			
Address:	990 W 43rd Ave, Denver, CO 80211			Address:	N/A		
Phone:	303-670-0530			Global ID:	N/A		
Fax:	N/A			Sampled By:	EP/JG/AH/RK		

#### Special Instructions:

Ambient temp.  
good condition  
Amm? 08.17.21

												Analysis Requested									
												TO-15 (Suncore list)									
Sample ID (Location ID)		Type	Equipment Information			Sampling Information															
		(I) Indoor (A) Ambient (SV) Soil Vapor (S) Source	Canister ID	Size (1L, 3L, 6L, 15L)	Flow Controller ID	Sample Start Date	Sample Start Time	Vacuum Start ("Hg)	Sample End Date	Sample End Time	Vacuum End ("Hg)										
9	Brighton81021	A	1414	6L	E-032	8/10/21	7:45 AM	26	8/10/21	8:45 AM	5	x									
10	Camp81021	A	1455	6L	E-018	8/10/21	7:47 AM	25	8/10/21	8:47 AM	3	x									
11	E470/125 81021	A	1404	6L	E-042	8/10/21	7:41 AM	25	8/10/21	8:41 AM	5	x									

	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:		Erin Peck	MAQS/PM	8/10/2021
1 Received By:	Alyssa M. Miller	Alyssa M. Miller	EA	08.17.21 1320
2 Relinquished By:				
2 Received By:				
3 Relinquished By:				
3 Received By:				

Delivery Tracking #
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# ENTHALPY ANALYTICAL

Air Chain of Custody Record		Turn Around Time (rush by advanced not only)					
Lab No:		7 Day:		5 Day:	X	3 Day:	
Page:	1 of 1	2 Day:		1 Day:		Custom TAT:	
CUSTOMER INFORMATION				PROJECT INFORMATION			
Company:	MAQS			Name:	CCND		
Report To:	Austin Heitmann			Number:	720-253-5496		
Email:	aheitmann@montrose-env.com			P.O. #:	PO-012395		
Address:	990 W 43rd Ave, Denver, CO 80211			Address:	N/A		
Phone:	303-670-0530			Global ID:	N/A		
Fax:	N/A			Sampled By:			

Special Instructions:

\*\*Canister pressure may increase as samples are shipping to a different elevation

Canister pressure may increase as samples are shipping to a different elevation												Suncor List																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																					</
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	Signature	Print Name	Company / Title	Date / Time
1 Relinquished By:	Austin Heitmann	Austin Heitmann	MAQS/PM	9/9/21 1519
1 Received By:	Alyssa M. Miller	Alyssa M. Miller	EA	09-10-21 0915
2 Relinquished By:				
2 Received By:				
3 Relinquished By:				
3 Received By:				





ENTHALPY  
ANALYTICAL

Air Chain of Custody Record

Lab No:

Page:

1

of

1

Turn Around Time (rush by advanced notice only)

7 Day:

5 Day:

x

3 Day:

2 Day:

1 Day:

Custom TAT

CUSTOMER INFORMATION

Company:

MAQS

Report To:

Austin Heitmann

Email:

Aheitmann@montrose-env.com

Address:

990 W 43rd Ave, Denver, CO 80211

Phone:

303-670-0530

Fax:

N/A

PROJECT INFORMATION

Name:

Suncor

Number:

P.O. #:

Address:

N/A

Global ID:

N/A

Sampled By:

JG

Special Instructions:

Analysis Requested

TO-15 (Suncor list)

Sample ID (Location ID)

Type

(I) Indoor  
(A) Ambient  
(SV) Soil  
Vapor (S)  
Source

Equipment Information

Canister ID

Size  
(1L,  
3L, 6L,  
15L)

Flow  
Controller  
ID

Sample  
Start  
Date

Sample  
Start  
Time

Vacuum  
Start ("Hg)

Sample  
End  
Date

Sample  
End  
Time

Vacuum  
End  
("Hg)

1 AdamsHigh092721

A

40108

6L

14884

9/27/21

7:38 AM

18.5

9/27/21

8:38 AM

7

x

Signature

Print Name

Company / Title

Date / Time

1 Relinquished By:

James Garrett

MAQS/PM

9/27/2021

1 Received By:

Alyssa M. Miller

Alyssa M. Miller

EA

09.29.21 0945

2 Relinquished By:

2 Received By:

3 Relinquished By:

3 Received By:

Ambient temp, good condition Amm3 09.29.21

Delivery Tracking #

2842 4287 7459

## **APPENDIX B AIR SAMPLING RESULTS AND SCREENING RISK ASSESSMENT**



Community Air Monitoring Network Summa Canister Results | Q3

All Results Presented in ppbv

					General Air Sample																Sensor Triggered Event Sample		Screening Legend						
					CM1 - Rose		CM2 - Suncor		CM3 - Adams Highschool		CM4 - Adams Middle School		CM5 - Central		CM6 - Focus		CM7 - Kearney		CM8 - Monroe		BFD-Brighton	CAMP-Denver	JUNC-E470/I25	CM3 - Adams Highschool	CM5 - Central	Detection (No Screening Value Established)	Detection < Screening Value	Non-Detection (No Screening Value Established)	Non-Detection < Screening Value
Compound Name	Cas No	Aeg11 60Min Value	Health Based Reference Level	Source	07/13	08/10	07/13	08/10	07/13	08/10	07/13	08/10	07/13	08/10	07/13	08/10	07/13	08/10	07/13	08/10	08/10	08/10	08/10	09/27	09/09				
1-Butene	106-98-9	NR	27,000	TCEQ Short-Term AMCV	5.7595	4.11	< 0.0609	0.258	0.1366	0.162	< 0.0691	0.756	0.0663 (J)	0.427	< 0.0619	0.231	< 0.0609	< 0.0609	0.5513	0.575	0.109	0.358	0.102	0.0953	< 0.0616				
1-Hexene	592-41-6	NR	500	TCEQ Short-Term AMCV	< 0.063	< 0.0629	< 0.0609	< 0.0622	< 0.0609	< 0.0603	< 0.0691	< 0.0607	< 0.0624	< 0.0619	< 0.0617	< 0.0609	< 0.0609	< 0.0624	< 0.0613	< 0.0603	< 0.0632	0.0733	< 0.0616	< 0.0616					
1-Pentene	109-67-1	NR	12,000	TCEQ Short-Term AMCV	0.1149	0.109	< 0.0609	0.0765	< 0.0609	< 0.0603	< 0.0691	0.222	< 0.0607	< 0.0624	0.069 (J)	< 0.0617	< 0.0609	< 0.0609	0.193	0.319	< 0.0603	< 0.0632	0.0653 (J)	< 0.0616	< 0.0616				
1,2,3-Trimethylbenzene	526-73-8	NR	3,000	TCEQ Short-Term AMCV	< 0.063	< 0.0629	< 0.0609	0.0804	< 0.0609	< 0.0603	< 0.0691	0.106	< 0.0607	< 0.0624	< 0.0619	< 0.0617	< 0.0609	0.0999	0.1929	< 0.0603	0.0691	< 0.0619	0.0724	< 0.0616					
1,2,4-Trimethylbenzene	95-63-6	140	3,000	TCEQ Short-Term AMCV	< 0.063	< 0.0629	< 0.0609	0.0969	< 0.0609	0.123	< 0.0691	0.117	< 0.0607	0.0821	< 0.0619	< 0.0617	< 0.0609	0.0709	< 0.0624	0.305	0.0698	0.108	0.114	0.076	< 0.0616				
1,3-Butadiene	106-99-0	670	298	OEHHA Acute REL	< 0.063	< 0.0629	< 0.0609	0.0836	< 0.0609	0.0993	< 0.0691	< 0.0607	< 0.0607	0.105	< 0.0619	< 0.0617	< 0.0609	< 0.0609	< 0.0624	< 0.0613	< 0.0603	0.0844	0.126	0.116	< 0.0616				
1,3,5-Trimethylbenzene	108-67-8	140	3,000	TCEQ Short-Term AMCV	< 0.063	< 0.0629	< 0.0609	< 0.0622	< 0.0609	< 0.0603	< 0.0691	< 0.0607	< 0.0607	< 0.0624	< 0.0619	< 0.0617	< 0.0609	< 0.0609	< 0.0624	0.092	< 0.0603	< 0.0632	< 0.0619	< 0.0616	< 0.0616				
2-Ethyltoluene	611-14-3	NR	250	TCEQ Short-Term AMCV	< 0.063	< 0.0629	< 0.0609	< 0.0622	< 0.0609	< 0.0603	< 0.0691	< 0.0607	< 0.0607	< 0.0624	< 0.0619	< 0.0617	< 0.0609	< 0.0609	0.1495	< 0.0613	< 0.0603	< 0.0632	< 0.0619	< 0.0616	< 0.0616				
2-Methylheptane	592-27-8	NR	4,100	TCEQ Short-Term AMCV	< 0.063	< 0.0629	< 0.0609	0.0743	< 0.0609	0.0738	< 0.0691	0.177	< 0.0607	< 0.0624	< 0.0619	< 0.0617	< 0.0609	< 0.0609	0.0813	0.25	0.0733	0.0661 (J)	0.0848	< 0.0616	< 0.0616				
2-Methylhexane	591-76-4	NR	8,300	TCEQ Short-Term AMCV	< 0.063	0.256	< 0.0609	0.209	< 0.0609	0.191	< 0.0691	0.564	0.1123	0.266	0.124	0.106	0.1221	0.103	0.0836	0.729	0.169	0.208	0.187	< 0.0616	< 0.0616				
2-Methylpentane	107-83-5	NR	5,400	TCEQ Short-Term AMCV	< 0.063	0.399	0.1366	0.589	0.1745	0.509	0.1872	0.3671	0.4093	0.403	0.3671	0.32	0.3681	0.31	0.2479	3.48	0.505	0.512	0.616	0.458	0.163				
2,2-Dimethylbutane	75-83-2	NR	5,400	TCEQ Short-Term AMCV	< 0.063	< 0.0629	< 0.0609	0.0891	< 0.0609	0.0926	< 0.0691	0.253	< 0.0607	< 0.0624	0.0694 (J)	0.0658 (J)	0.0642 (J)	< 0.0609	< 0.0624	0.359	< 0.0603	0.0753	0.388	0.0779	< 0.0616				
2,2,4-trimethylpentane	540-84-1	NR	4,100	TCEQ Short-Term AMCV	< 0.063	0.171	< 0.0609	0.149	< 0.0609	0.274	< 0.0691	0.217	< 0.0607	0.0908	0.1379	0.084	< 0.0609	0.0766	< 0.0624	0.237	0.0941	0.183	0.161	0.106	< 0.0616				
2,3-Dimethylbutane	79-29-8	NR	5,400	TCEQ Short-Term AMCV	< 0.063	0.102	< 0.0609	0.146	< 0.0609	0.106	< 0.0691	0.571	< 0.0607	0.113	0.0984	0.0627 (J)	0.0997	0.08	0.0795	0.756	0.122	0.158	0.141	0.121	< 0.0616				
2,3-Dimethylpentane	565-59-3	NR	8,300	TCEQ Short-Term AMCV	< 0.063	0.0826	< 0.0609	0.117	< 0.0609	0.101	< 0.0691	0.273	< 0.0607	0.129	0.0671 (J)	< 0.0617	0.0668 (J)	< 0.0609	< 0.0624	0.287	0.0836	0.127	0.0849	< 0.0616	< 0.0616				
2,3,4-Trimethylpentane	565-75-3	NR	4,100	TCEQ Short-Term AMCV	< 0.063	< 0.0629	< 0.0609	< 0.0622	< 0.0609	< 0.0603	< 0.0691	0.0631 (J)	< 0.0607	< 0.0624	< 0.0619	< 0.0617	< 0.0609	< 0.0609	0.0624 (J)	< 0.0613	< 0.0603	< 0.0632	< 0.0619	< 0.0616	< 0.0616				
2,4-Dimethylpentane	108-08-7	NR	8,300	TCEQ Short-Term AMCV	0.2379	< 0.0629	< 0.0609	0.155	< 0.0609	< 0.0603	< 0.0691	0.182	< 0.0607	0.0779	< 0.0619	< 0.0617	< 0.0609	< 0.0609	0.0759	0.212	0.086	0.0852	0.0684 (J)	0.398	< 0.0616				
3-Ethyltoluene	620-14-4	NR	250	TCEQ Short-Term AMCV	< 0.063	< 0.0629	< 0.0609	0.0713	< 0.0609	0.087	< 0.0691	0.104	< 0.0607	0.0772	< 0.0619	< 0.0617	< 0.0609	< 0.0609	0.1226	0.149	< 0.0603	0.0729	< 0.0619	0.0766	0.0899				
3-Methylheptane	589-81-1	NR	4,100	TCEQ Short-Term AMCV	< 0.063	< 0.0629	< 0.0609	0.0665 (J)	< 0.0609	< 0.0603	< 0.0691	0.145	< 0.0607	< 0.0624	< 0.0619	< 0.0617	< 0.0609	< 0.0609	0.0718	0.237	< 0.0603	< 0.0632	0.0632 (J)	< 0.0616	< 0.0616				
3-Methylhexane	589-34-4	NR	8,300	TCEQ Short-Term AMCV	< 0.063	0.224	< 0.0609	0.225	< 0.0609	0.204	< 0.0691	0.611	0.1063	0.328	0.1196	0.113	0.1166	0.117	0.0808	0.724	0.189	0.262	1.51	0.0746	0.0715				
3-Methylpentane	96-14-0	NR	5,400	TCEQ Short-Term AMCV	< 0.063	0.379	0.397	0.388	0.1051	0.709	0.1015	1.81	0.5871	0.323	0.2435	0.228	0.2321	0.198	0.4761	2.05	0.502	0.539	0.905	< 0.0616	0.234				
4-Ethyltoluene	622-96-8	NR	250																										

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