Q3 2021 - Q1 2022 CHRONIC RISK ASSESSMENT COMMERCE CITY NORTH DENVER COMMUNITY AIR MONITORING NETWORK: REVISION 1

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) continuous, near real-time monitoring for the following analytes[1]: carbon monoxide (CO), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), nitric oxide or nitrogen oxide (NO), nitrogen dioxide (NO_2), particulate matter ($PM_{2.5}$), and total volatile organic compounds (VOCs); (2) periodic collection and laboratory analysis for the presence of specific VOCs from six-liter evacuated stainless steel ("Summa") canisters, and (3) periodic real-time air monitoring throughout neighborhoods using a mobile monitoring van to detect presence of specific VOCs and hydrogen sulfide (H_2S).

Health scientists from CTEH, LLC (CTEH®) (a subsidiary company of Montrose) performed a screening-level human health risk assessment based on the data collected by Montrose. This evaluation was consistent with federal and state risk assessment guidelines and was conducted to determine whether the average measured concentrations of individual or cumulative (combined) VOCs could potentially pose chronic (long-term) non-cancer or cancer health hazards. Acute health risks assessments were also completed and are presented in previous quarterly reports.

Approximately 90,100 one-hour rolling average samples and 38 Summa canister samples were collected in six CCND Air Monitoring neighborhoods using two specific data collection platforms. Summa canister samples were also collected in identical fashion from three reference sites approximately four to 13 miles away from the Suncor facility to compare with the CCND neighborhood sample data. For each neighborhood or reference site, the average concentrations measured across three calendar quarters (nine months) were compared to chronic health Reference Levels (RL). This is called a chronic Hazard Quotient (HQ). The Hazard Indices (HI) represent cumulative risks from exposure to all detected chemicals measured in a given neighborhood. The HI is determined by adding together the HQs. According to United States Environmental Protection Agency (USEPA) guidelines, a chronic HQ or HI less than or equal to one (1) indicates that exposure is not likely to result in chronic non-cancer adverse health effects, even for sensitive sub-populations. The risk assessment resulted in the following overall findings:

- The data collected during this study phase did not indicate a potential for chronic non-cancer adverse health effects from exposure to the measured chemicals, both individually and combined, in either the CCND neighborhoods or the reference sites.
    - All estimated chronic HQ and HI values for non-cancer adverse health effects in each CCND neighborhood were below one.
    - All estimated chronic HQ and HI values for non-cancer adverse health effects at each reference site were also below one.

[1] 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.

The cancer risk assessment showed the following:

- For average and above average potential exposures, the calculated risks were within the range deemed by USEPA and referenced by Colorado Department of Public Health and Environment (CDPHE) as an acceptable risk.
    - All chemical-specific and total cancer risks fell between the range of one in ten thousand to one in a million chances of developing cancer above background risks, which are typically one in two for men and one in three for women in the United States.
- The average cancer risks estimated for CCND neighborhoods were very similar to the risks calculated for the three reference sites, suggesting similar cancer risks for an individual spending an entire lifetime in a CCND neighborhood or one of the reference sites outside of a CCND neighborhood.

Revision 1: Changes to Report

Section 2.3 Cancer Screening Health Risk Assessment

In this section, a calculation error was identified for the conversion of units for the Inhalation Unit Risk (IUR) values for the five carcinogenic chemicals under consideration. The IURs taken from the USEPA, California Environmental Protection Agency Office of Environmental Health Hazard Assessment (OEHHA), and Texas Commission on Environmental Quality (TCEQ) were in units of excess lifetime risk per $\mu g/m^3$ of airborne exposure. To calculate excess lifetime cancer risk estimates using the CCND data, the IUR units were converted to parts per billion (ppb). The IUR values in the previous report were incorrectly multiplied by conversion factors to convert from one unit to another, when they should have been divided by the conversion factors. The corrected values for risk per ppb are now shown on page 14.

Section 3.2 Cancer Risk

The calculated estimates of chemical-specific and total excess lifetime cancer risk shown in Tables 3-2 and 3-3 (page 18) for each monitoring site and CCND neighborhood were revised based on the corrected IURs for each chemical.

Impact of Revisions on Report Conclusions

This revised report's conclusions on human health risk do not differ from the conclusions in the previous report. The revised risks (ranging from 1 in 100,000 to 1 in 25,000) are still within the acceptable range of excess lifetime risk (1 in a million to 1 in 10,000) used by USEPA and CDPHE for human health risk assessment. Further, the estimated cancer risks in the revised report using data at the CCND sites remain similar to risks using data from the reference sites located outside of the CCND neighborhoods (Table 3-2).

1.0 INTRODUCTION

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. Continuous, near real-time stationary monitoring for the following analytes: carbon monoxide (CO), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), nitric oxide or nitrogen oxide (NO), nitrogen dioxide (NO_2), particulate matter ($PM_{2.5}$), and total volatile organic compounds (VOCs),

2. Periodic sample collection using Summa canisters and laboratory analysis for the presence of specific VOCs, and

3. Periodic real-time air monitoring throughout neighborhoods using a mobile monitoring van to detect presence of specific chemicals.

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.

To date, air monitoring data from approaches #2 and #3 have been used for screening level assessments of potential human health risk from acute-duration (hours to days) exposures to specific chemicals in the CCND community air. These acute risk assessments were based on data collected during a specific calendar quarter (3rd and 4th quarter of 2021 and 1st quarter of 2022). Data collected using approach #1 was not included because the analytes measured for approach #1 (except for H_2S) do not have established health reference levels of cancer potency factors needed to perform a screening level health risk assessment. Risk associated with potential H2S exposure was addressed in the assessment of the mobile monitoring van data. The risk assessments were developed assuming short-term (three-month or less) exposures to airborne analytes within a monitored CCND neighborhood. Reports of these acute risk assessments are available online at ccnd-air.com/documents.

This report contains a screening-level health risk assessment (non-cancer and cancer) of potential chronic exposures in CCND neighborhoods to VOCs and hydrogen sulfide. Non-cancer health outcomes vary widely by chemical, but the most sensitive health outcome for each chemical was used for this assessment. The risk assessment is based on the air monitoring data from approaches #2 and #3 collected over a nine-month period (3rd quarter of 2021 through 1st quarter of 2022). The definition of chronic human exposures varies across regulatory agencies and scientific bodies. In general, toxicologists define chronic human exposures as repeated exposures occurring for many months to years[2]. The risk assessment presented herein provides estimates of lifetime inhalation non-cancer and cancer risks for CCND communities based on nine months of measurements, assuming that the sampling periods represent airborne chemical levels

[2] Casarett & Doull’s Toxicology: The Basic Science of Poisons. 7th Edition.

present over years of time. Refined estimates of chronic health risks may be developed as more data are collected through the CCND Air Monitoring program.

2.0 METHODS

2.1 AIR MONITORING METHODS

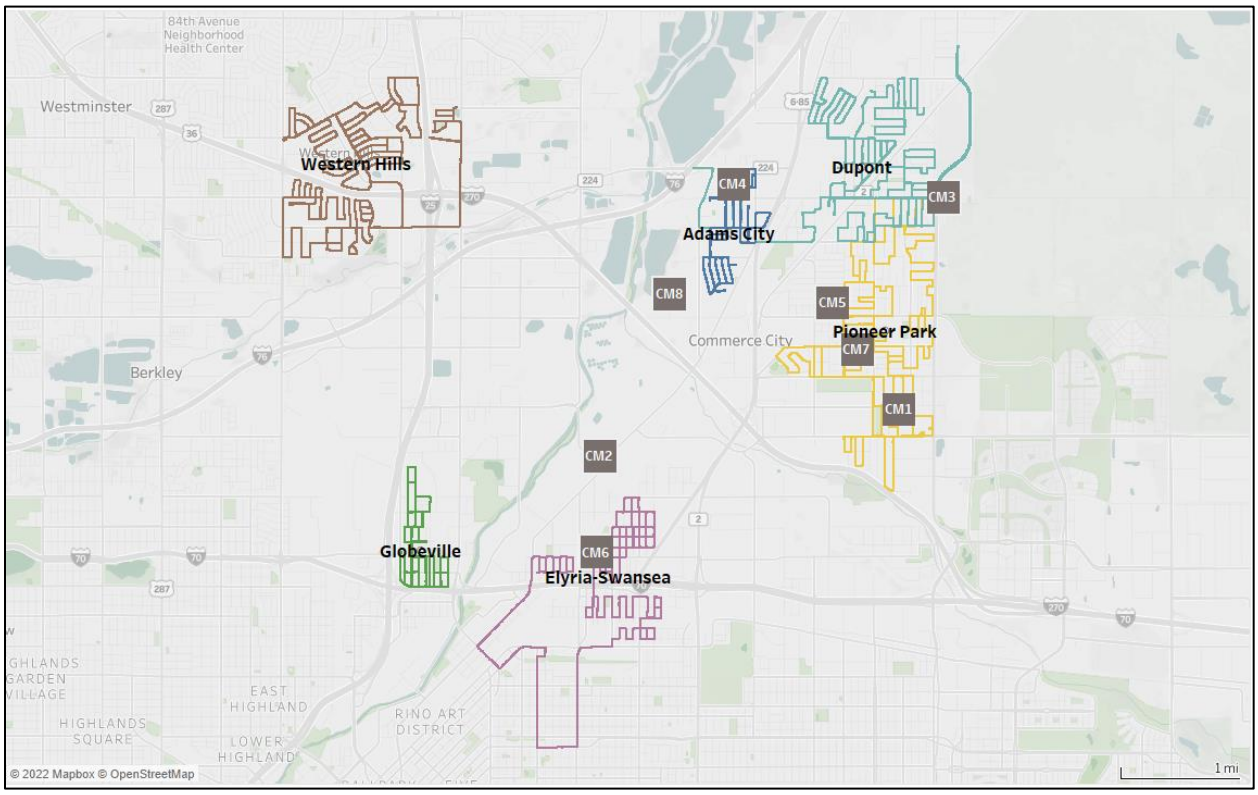
The chronic non-cancer and cancer health risk assessment was developed using air monitoring data from Summa canister analysis and mobile monitoring van tours in the CCND neighborhoods from the 3rd quarter of 2021 through the 1st quarter of 2022. The following discussion briefly describes the two different air monitoring processes. Detailed air monitoring methods are provided in Appendix A.

Planned and VOC sensor-triggered air samples were collected during the third and fourth quarters of 2021, and the first quarter of 2022. During that period, there were eight CCND locations (CM-1 through CM-8 shown in Figure 2-1) and three non-CCND reference sites (Denver Colorado Department of Public Health and Environment (CDPHE) office; Brighton, CO; junction of E470 and I-25) from which data were collected for all three quarters. The reference locations were selected so that air quality of CCND neighborhoods could be directly compared with air quality in areas not directly impacted by the various and multiple sources of chemicals found in the vicinity of the CCND neighborhoods. Planned one-hour air samples were collected by a field technician on pre-determined dates. Sensor-triggered samples were collected automatically when instantaneous total VOCs were detected on that location's total VOC sensor at an airborne concentration of one part per million (ppm) or higher for one minute or longer. A total of 38 air samples (one-hour) were collected at eight locations within the CCND neighborhoods (32 planned and six sensor-triggered). An additional nine samples were collected across three non-CCND community monitoring reference sites. All air samples were collected using Summa canisters and sent to an accredited laboratory for analysis of 59 VOCs in accordance with the USEPA methods TO-15 and TO-14.

The mobile monitoring van contains the equipment necessary to identify and quantitate individual chemicals present in ambient air at ultra-low concentrations. This equipment measures and reports concentrations of 65 select chemicals (64 VOCs plus hydrogen sulfide) at sub-parts per billion (ppb) levels and as quickly as one measurement per second. During the three quarterly monitoring periods, the mobile monitoring van travelled a dense route through six CCND residential neighborhoods (colored routes shown in Figure 2-1) within a three-mile radius around the refinery. Accessible streets in the monitored neighborhoods were traversed at approximately 10 miles per hour while collecting a data point for each chemical every second. From Q3 2021 through Q1 2022, the mobile monitoring van sampled a total of six neighborhoods and collected over 178,000 data points, resulting in approximately 90,100, one-hour rolling average concentrations. The Globeville neighborhood had insufficient data to derive a one-hour rolling average during the Q4 sampling period. Therefore, data collected during the 3rd quarter of 2021 and 1st quarter of 2022 were combined to assess health risks for this neighborhood.

FIGURE 2-1

Mobile Monitoring Van Program Route and Summa Canister Locations in Six Neighborhood Areas



2.2 NON-CANCER SCREENING HEALTH RISK ASSESSMENT

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) chemicals in the air could potentially pose chronic (long-term) non-cancer and cancer adverse health effects. 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 may be calculated and evaluated multiple times.

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"[3]. In other words, screening-level findings of an estimated exposure to a specific or cumulative set of chemical(s) being higher than its health reference level (RL) does NOT indicate an actual likelihood of adverse effects but does 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.

Such calculations assume a person is constantly exposed to each detected chemical continuously for a chronic duration. If the resulting risk values indicate the lack of likely chronic adverse health effects under these worst-case conditions, then the risk assessment is complete. However, if the risk values suggest a potential for chronic 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 screening-level risk assessment reported here includes calculated chronic risks from exposure to individually measured chemicals as well as exposure to all measured chemicals at once (cumulative). For individual chemicals, a chronic non-cancer health risk value was calculated as the exposure concentration (EC) divided by the chemical-specific federal or state established chronic RL (Equation 1). The result is referred to as the hazard quotient (HQ).

Eq. 1 – Hazard Quotient (HQ) Equation

$$HQ = EC / RL$$

Where:

HQ= Hazard Quotient

EC= Summa canister average air concentration or mobile monitoring van average of 1-hour averages air concentration of the chemical, averaged over three quarters.

RL= Chronic Health-based Reference Level (EPA, ATSDR, Cal EPA OEHHA, and TCEQ).

For the Summa canister data, the EC for each chemical was assumed to be the average concentration of all one-hour samples collected across three quarters at each location. For the mobile monitoring van data, the estimated EC for each chemical was assumed to be the average of the one-hour rolling average concentration collected across three quarters in an individual CCND neighborhood. As such, use of the Summa canister ECs assumes that airborne chemical levels measured at the monitoring location are representative of the entire neighborhood, while the ECs from the mobile monitoring van data represent a larger actual footprint of individual neighborhood exposure.

The RLs used to calculate the chronic HQs are previously established exposure levels below which no non-cancer adverse health effect in humans is expected. If available, RLs adopted by

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

CDPHE were selected for use within this assessment and include USEPA chronic reference concentration (RfC) and residential screening levels (RSLs); ATSDR chronic minimum risk levels (MRLs); California EPA's Office of Environmental Health Hazard Assessment (OEHHA) chronic risk levels; and Texas Commission on Environmental Quality (TCEQ) chronic, long-term air monitoring comparison values (AMCV). If the chemical was not listed by CDPHE, a federal and state recommended hierarchy for selection of RLs was used[4]. Where the mobile monitoring van was unable to differentiate between specific chemicals, the lowest, most health-protective RL of the "isomer" group was selected for use in that analysis and group details are provided in the appendix.

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

A chronic 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 chronic non-cancer health effects, even for sensitive sub-populations. The potential for adverse health effects increases as chronic HQ or HI increase above one, but it is not known by how much. Chronic 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 RLs, these values "*are set below levels that, based on current information, might cause adverse health effects in the people most sensitive*."[5] This is because RLs are based on observed toxicity in human or animal studies with an added safety factor to account for uncertainties and variabilities in the toxicity data. For example, ATSDR identified the lowest observed adverse effect level (LOAEL) for chronic exposure to benzene as 100 parts per billion (ppb), based on a human epidemiology study of adult workers. ATSDR then applied a combined safety factor of 3 to derive the final RL to account for uncertainty in sensitivity to benzene's chronic effects across the general human population. Therefore, it is scientifically incorrect to assume that all real-world exposures to an analyte at levels at or slightly higher than a RL will likely result in an adverse effect.

Using the average concentration for the EC across quarters assumes that airborne levels of a chemical vary over time similarly to what was observed during Summa canister sampling and mobile monitoring van sampling. It is also assumed that an individual occupies the monitored neighborhood and breathes this concentration continuously for months to years (chronic exposure)[6].

2.3 CANCER SCREENING HEALTH RISK ASSESSMENT

CTEH also conducted a screening-level health risk assessment to determine whether chronic inhalation exposure to the detected concentrations of individual or cumulative chemicals in the air

[4] CDPHE (2019) Memo: Updated acute and chronic health guideline values for use in preliminary risk assessments (referred to as "FA2019 HGVs"); https://drive.google.com/file/d/1P2KEvu0MFiyzQAOQtjQUclqR-WGh1bEX/view
[5]https://www.atsdr.cdc.gov/mrls/index.html#:~:text=ATSDR%20uses%20the%20no%20observed,to%20such%20substance%2Dinduced%20effects.
[6] Casarett & Doull's Toxicology: The Basic Science of Poisons. 7th Edition.

could potentially cause the development of cancer. The cancer risk assessment was also performed using methods consistent with federal risk assessment guidelines. Among the chemicals measured by Montrose using Summa canisters and the mobile monitoring van, there are five chemicals that are categorized by various regulatory agencies (USEPA, OEHHA, and TCEQ) as probable or possible carcinogens: benzene; ethylbenzene; 1,3-butadiene; isoprene; and tetrachloroethene. Cancer risk for this assessment is defined as the likelihood that "*a person may develop cancer over the course of their lifetime as a result of the exposures under study. This risk is the incremental risk of cancer from the exposure being analyzed that is above the risk that the individuals in the population have already (i.e., due to non-air toxics related issues)"* [7].

Cancer risks were calculated for a hypothetical person occupying a CCND neighborhood and any one of the three non-CCND reference sites for their entire lifetime. Risks from a lifetime exposure to each of the five carcinogenic chemicals listed above and the total (cumulative) risks from exposure to all five simultaneously were calculated. Separate calculations of risk were performed for Summa canister data and mobile monitoring van data. The reason for separate calculations based on canister and van data is discussed below.

The difference in approach to calculating non-cancer risk (as described in Section 2.2) and cancer risk is based on toxicological understanding of the mechanisms by which chemicals exert their toxic effects on the body. Non-cancer effects occur when a chemical concentration in the body surpasses the body's ability to either clear the chemical from the affected tissue or organ or to compensate for the presence of the chemical (initiating protective biochemical processes to offset the effect of the chemical). The toxic threshold is the exposure level and duration above which the chemical exposure overcomes the body's ability to compensate. Thus, any exposure below the toxic threshold is assumed to be dealt with by the body's protective processes and will not cause an adverse health effect. Cancer effects are different from non-cancer effects because the carcinogen affects the body's ability to control cell growth, either by directly or indirectly changing the body's genetic control mechanisms. Theoretically, a single change of genetic material or genetic controls could cause cell growth and replication to occur uncontrollably, leading to tumor formation. However, the body's many built-in processes to identify and reverse such occurrences are very effective in countering such insults to genetic control. Chemical carcinogen-caused cancers may occur due to exposures levels that are too high and occur for too long of a duration for the body to reverse the genetic damage and loss of control of cell predication. A person's inherited ability to correct damage to cell genetics may also impact their risk of developing cancer by chance or from chemical exposure.

Scientists studying chemical carcinogenesis (the ability of a chemical to cause cancer) have debated for decades whether certain chemical carcinogens have a threshold exposure below which genetic loss of control (and, thus, cancer) will not happen. For this reason, risk assessment methods used by regulatory bodies conservatively assume that a risk exists for a carcinogen to cause cancer to develop, even at extremely low exposure levels. For environmental exposures, such assumed risks from ppb-levels of inhalation exposures would take decades of exposure to result in cancer. Cancer risks are calculated not by comparing exposure to a health reference level to see if an exceedance has occurred, but by multiplying by a cancer potency factor to estimate a likelihood of cancer occurring over a lifetime. Cancer potency factors for inhaled carcinogens have been determined by USEPA and other federal and state regulatory agencies.

[7] USEPA (2004). Air Toxics Risk Assessment Reference Library. Volume 1 Technical Reference Library.

These potency factors are based on observed tumor development in laboratory animal and human epidemiology studies.

Just like non-cancer health reference levels, cancer potency factors include adjustments to err on the side of caution when there are uncertainties in differences between animal and human sensitivity to a carcinogen as well as differences between humans with genetic sensitivity based on health status, genetic background, and stage of life (very young or very old). Thus, a cancer risk estimate has built into it a conservative level of safety and likely overestimates actual risk.

Cancer risks calculated in this assessment are for inhalation of airborne carcinogens only. Equation 2 (from USEPA guidance[8]) was used to calculate each chemical-specific cancer risk.

Eq. 2 – Excess Cancer Risk Estimate Equation

$$\text{Cancer Risk} = EC \times IUR$$

Where:

Cancer Risk = Excess risk of an individual contracting cancer over a lifetime.

EC= Summa canister average air concentration or mobile monitoring van maximum one-hour average air concentration of the chemical, averaged over three quarters.

IUR= Inhalation Unit Risk estimate (EPA, OEHHA, and TCEQ).

The Inhalation Unit Risk (IUR) estimate for each chemical are the cancer potency factors used for this assessment. An IUR is the increased likelihood of cancer development per unit amount of chemical exposure. For example, if a chemical has an established IUR of 1.0×10^{-6} per ppb, then a person is estimated to receive an additional one chance in a million of developing cancer for every increase in 1 ppb of lifetime exposure to that chemical. Thus, a lifetime continuous exposure to 5 ppb of the chemical in air would result in an increased estimate of five chances in a million (above their background cancer risk) that they might develop cancer from that exposure. Likewise, if a chemical has an established IUR of 1.0×10^{-45} per ppb, this chemical is considered 100-times more potent a carcinogen than the previous one, and then a person is estimated to take on an additional one chance in one hundred thousand of developing cancer for every increase in 1 ppb of lifetime exposure.

The IURs used for cancer estimates in this risk assessment (and in CDPHE preliminary risk assessments[9]) and their sources, follow:

- Benzene: 7.8×10^{-6} per µg/m^3 = 2.5×10^{-5} per ppb (USEPA IRIS)
- 1,3-Butadiene: 3.0×10^{-5} per µg/m^3 = 6.7×10^{-5} per ppb (USEPA IRIS)
- Ethylbenzene: 2.5×10^{-6} per µg/m^3 = 1.1×10^{-5} per ppb (Cal EPA OEHHA)
- Tetrachloroethene: 2.6×10^{-7} per µg/m^3 = 1.7×10^{-6} per ppb (USEPA IRIS)

[8] USEPA (2004). Air Toxics Risk Assessment Reference Library. Volume 1 Technical Reference Library
[9] CDPHE (2019) Memo: Updated acute and chronic health guideline values for use in preliminary risk assessments (referred to as "FA2019 HGVs"); https://drive.google.com/file/d/1P2KEvu0MFiyzQAOQtjQUclqR-WGh1bEX/view

- Isoprene: 2.2 x 10^{-8} per µg/m^3 = 6.1 x 10^{-8} per ppb (TCEQ)

It is important to understand that the conservative nature of IURs should *not* be interpreted as meaning one in 1,000,000 people *will* get cancer if the risk of 1 x 10^{-6} is calculated. According to USEPA, "*Because IURs are typically upper-bound estimates, actual risks may be lower than predicted…, and the true value of the risk is unknown and may be as low as zero. These statistical projections of hypothetical risk are intended as screening tools for risk managers and cannot make realistic predictions of biological effects. Such risk estimates also cannot be used to determine whether someone who already has cancer is ill because of a past exposure*."[10]

Cancer risk assessment results are typically reported as a range using the available data. Federal and state guidance recommends reporting a central tendency (an average) and upper-bound (a statistically derived value) estimate of exposure to understand potential variability of risk within the studied population. This risk assessment examined the risk for each neighborhood and reference site. Thus, the number of Summa canisters available for statistical analysis were relatively small (three to six samples per sampling site over the 9-month study period). However, the variation in chemical levels measured in Summa samples at a given site was small across the study period. Therefore, data from the Summa canisters were used to represent the central tendency (or average) of exposure at each CCND and reference site. The mobile monitoring van data set for the three quarters of the study period consists of thousands of one-hour concentrations of each chemical in each neighborhood. This allowed for calculation of a maximum one-hour concentration for each neighborhood during each quarter of monitoring, used to represent the upper bound of exposure for this cancer assessment.

3.0 RESULTS

3.1 NON-CANCER RISK

For each neighborhood and reference site, the average concentrations measured across three quarters were compared to chronic RLs to derive chronic HQs for each chemical of interest. The estimated HI values were calculated by adding together the HQs of all detected chemicals measured in each neighborhood. According to USEPA guidelines, a chronic HQ or HI less than or equal to one (1) indicates that exposures are likely to be without any chronic adverse health effects, even for sensitive sub-populations. All calculated HQ (Appendix B) and HI (Table 3-1 and Figures 3-1 and 3-2) in each neighborhood were below one.

Nine Summa canisters samples were taken at three reference sites and averaged data were used as comparators. The estimated risks in the reference locations were consistent with estimated risks in CCND neighborhoods.

[10] USEPA (2004). Air Toxics Risk Assessment Reference Library. Volume 1 Technical Reference Library

TABLE 3-1

Number of Measurements and Chronic Non-Cancer Hazard Indices from Mobile Monitoring Van and Corresponding Summa Canister Monitoring site (Q3 2021 – Q1 2022)

Mobile Van Sampling Neighborhood	No. of mobile van sampling hours (Rolling one-hour averages)	Chronic Hazard Index	CCND Monitoring Sites	Total no. of analytical samples	Chronic Hazard Index
Adams City	9,611	0.51	**CM-4 Adams Middle School**	6	0.57
			CM-8 Monroe	4	0.54
Dupont	22,929	0.54	**CM-3 Adams High School**	6	0.40
Pioneer Park	23,645	0.55	**CM-1 Rose**	5	0.41
			CM-5 Central	5	0.40
			CM-7 Kearney	4	0.41
Elyria-Swansea	10,552	0.60	**CM-2 Suncor**	4	0.41
			CM-6 Focus	4	0.40
Globeville	8,520	0.46	-	-	-
Western Hills	14,876	0.51			

FIGURE 3-1
Chronic Non-Cancer Hazard Indices for CCND Sampling Locations and Reference Monitoring Sites (Summa Canisters Q3 2021 – Q1 2022)

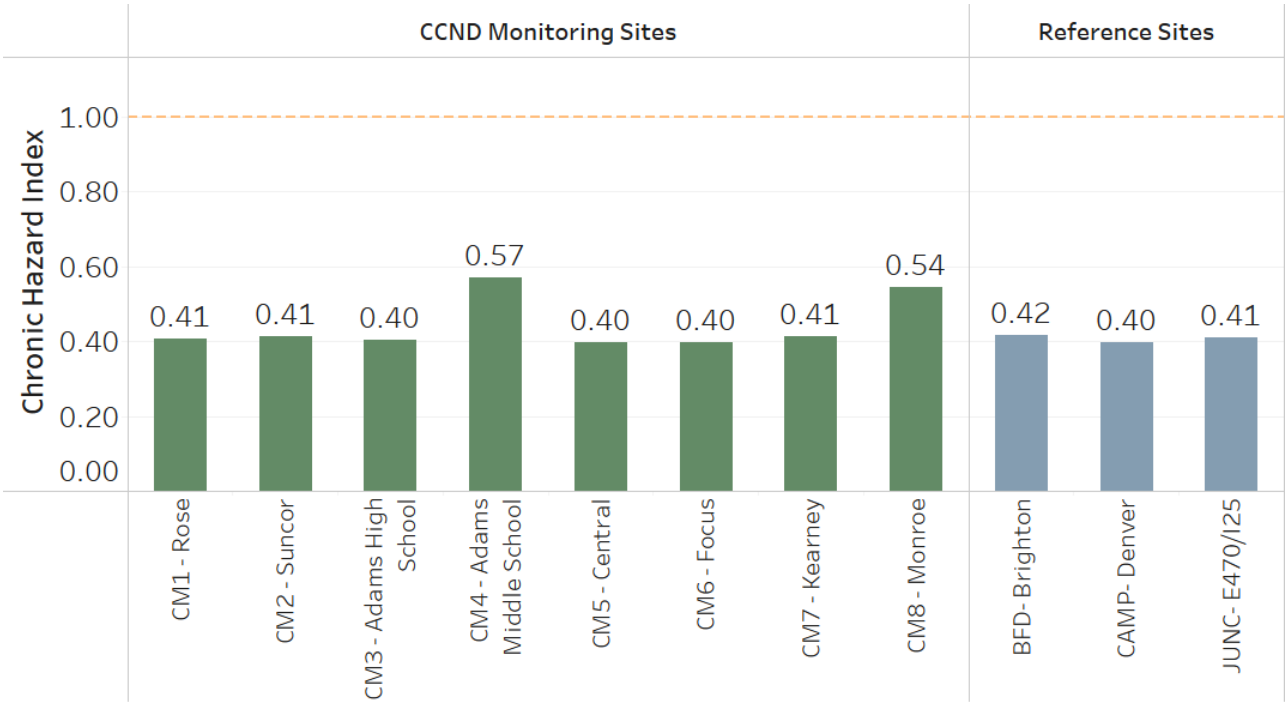
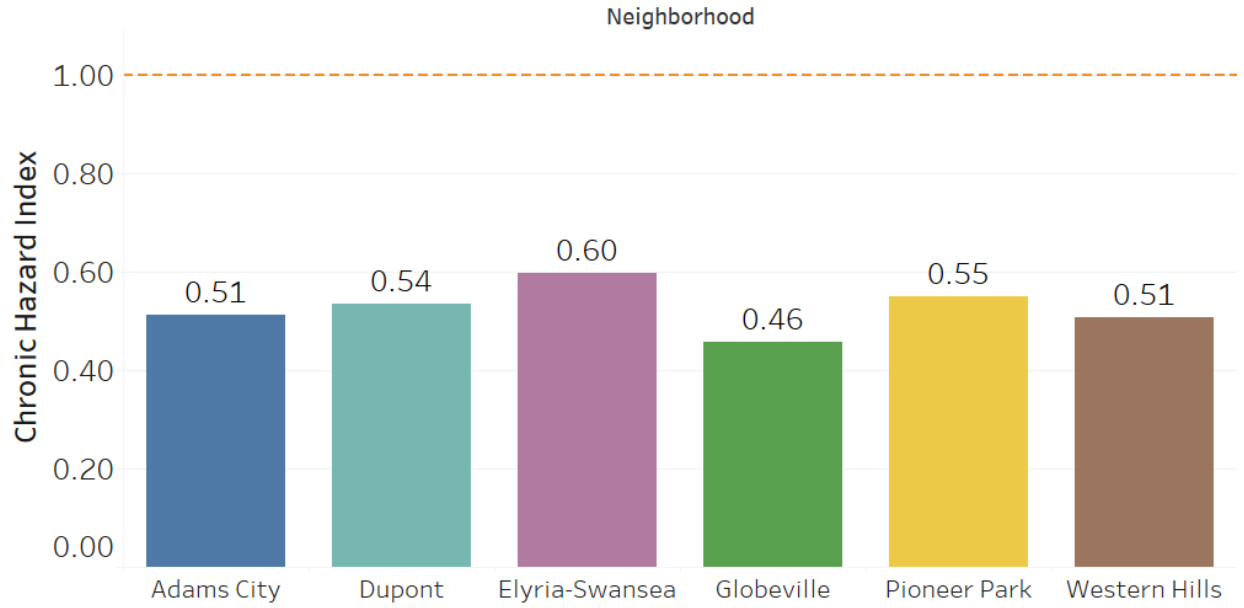


FIGURE 3-2
Chronic Non-Cancer Hazard Indices for CCND Neighborhoods (Mobile Monitoring Van Data Q3 2021 – Q1 2022)



3.2 CANCER RISK

For each neighborhood and reference site, the average concentrations (Summa canister data) or maximum one-hour rolling average concentrations (mobile monitoring van data) measured across three quarters were multiplied by the respective IUR to estimate cancer risks for each chemical of interest. The total (cumulative) risks were calculated by adding together the chemical-specific risks for each neighborhood or reference site. The results of these calculations are shown in Tables 3-2 and 3-3.

TABLE 3-2

Chemical-Specific and Total Cancer Risk Estimates by Sampling Site from Summa Canister Data

Risk Estimates							
Location		**1,3-Butadiene IUR: $6.7x10^{-5}$**	**Benzene IUR: $2.5x10^{-5}$**	**Ethylbenzene IUR: $1.1x10^{-5}$**	**Isoprene IUR: $6.1x10^{-8}$**	**Tetrachloro-ethene IUR: $1.7x10^{-6}$**	**Total Risk Estimate**
CCND Monitoring Sites	**CM1 – Rose**	$5.5x10^{-6}$	$6.5x10^{-6}$	$8.0x10^{-7}$	$1.1x10^{-7}$	$1.1x10^{-7}$	**$1.3x10^{-5}$**
	CM2 – RBC	$5.5x10^{-6}$	$6.9x10^{-6}$	$1.0x10^{-6}$	$5.6x10^{-9}$	$1.1x10^{-7}$	**$1.4x10^{-5}$**
	CM3 – Adams High School	$5.6x10^{-6}$	$6.5x10^{-6}$	$9.7x10^{-7}$	$4.9x10^{-9}$	$1.1x10^{-7}$	**$1.3x10^{-5}$**
	CM4 – Adams Middle School	$7.0x10^{-6}$	$1.1x10^{-5}$	$1.7x10^{-6}$	$4.8x10^{-9}$	$1.2x10^{-7}$	**$2.0x10^{-5}$**
	CM5 – Central	$5.4x10^{-6}$	$6.5x10^{-6}$	$8.7x10^{-7}$	$6.6x10^{-9}$	$1.1x10^{-7}$	**$1.3x10^{-5}$**
	CM6 – Focus	$4.9x10^{-6}$	$6.7x10^{-6}$	$1.1x10^{-6}$	$4.7x10^{-9}$	$1.1x10^{-7}$	**$1.3x10^{-5}$**
	CM7 – Kearney	$5.5x10^{-6}$	$6.6x10^{-6}$	$9.3x10^{-7}$	$4.1x10^{-9}$	$1.1x10^{-7}$	**$1.3x10^{-5}$**
	CM8 – Monroe	$5.2x10^{-6}$	$1.1x10^{-5}$	$1.4x10^{-6}$	$4.3x10^{-9}$	$1.1x10^{-7}$	**$1.8x10^{-5}$**
Reference Sites	**BFD- Brighton**	$5.2x10^{-6}$	$7.5x10^{-6}$	$8.5x10^{-7}$	$4.4x10^{-9}$	$1.1x10^{-7}$	**$1.4x10^{-5}$**
	CAMP- Denver	$4.7x10^{-6}$	$7.0x10^{-6}$	$9.9x10^{-7}$	$4.3x10^{-9}$	$1.1x10^{-7}$	**$1.3x10^{-5}$**
	JUNC- E470/I25	$6.1x10^{-6}$	$7.0x10^{-6}$	$9.1x10^{-7}$	$3.9x10^{-9}$	$1.1x10^{-7}$	**$1.4x10^{-5}$**

TABLE 3-3

Chemical-Specific and Total Cancer Risk Estimates by Sampling Site from Mobile Monitoring Van Data

Risk Estimates						
Neighborhood	**1,3 Butadiene IUR: $6.7x10^{-5}$**	**Benzene IUR: $2.5x10^{-5}$**	**Ethylbenzene* IUR: $1.1x10^{-5}$**	**Isoprene IUR: $6.1x10^{-8}$**	**Tetrachloroethene IUR: $1.7x10^{-6}$**	**Total Risk Estimate**
Adams City	$4.8x10^{-6}$	$6.7x10^{-6}$	$7.3x10^{-6}$	$1.2x10^{-8}$	$3.7x10^{-8}$	**$1.9x10^{-5}$**
Dupont	$5.3x10^{-6}$	$7.6x10^{-6}$	$4.2x10^{-6}$	$1.5x10^{-8}$	$2.3x10^{-8}$	**$1.7x10^{-5}$**
Elyria-Swansea	$7.0x10^{-6}$	$1.1x10^{-5}$	$1.6x10^{-5}$	$1.3x10^{-8}$	$2.5x10^{-7}$	**$3.4x10^{-5}$**
Globeville	$7.3x10^{-6}$	$9.6x10^{-6}$	$1.4x10^{-5}$	$1.9x10^{-8}$	$3.7x10^{-8}$	**$3.1x10^{-5}$**
Pioneer Park	$6.4x10^{-6}$	$1.3x10^{-5}$	$1.0x10^{-5}$	$1.5x10^{-8}$	$4.3x10^{-8}$	**$2.9x10^{-5}$**
Western Hills	$5.3x10^{-6}$	$1.3x10^{-5}$	$1.7x10^{-5}$	$6.9x10^{-8}$	$2.0x10^{-7}$	**$3.5x10^{-5}$**

Note: One significant figure is displayed for consistency with EPA's reporting of IUR's.
*Risk estimates may include multiple isomer groups (ethylbenzene and xylenes) since they are unable to be differentiated in this analysis.

It is helpful to understand the cancer risks calculated in this report in the context of typical background cancer risks in the United States (U.S.) For federal regulatory agencies in the U.S., a 10^{-4} risk level is the upper end of the generally acceptable risk range of 10^{-6} (one in 1,000,000) to 10^{-4} (one in 10,000) above background, as discussed in the National Contingency Plan (NCP), 40 CFR 300.430[11]. Those values may be compared with the average lifetime likelihood of developing cancer for any reason (environmental factors, genetic heredity, lifestyle choices, etc.). According to data from the National Cancer Institute's Surveillance Epidemiology and End Results (SEER) database from 2016 through 2018, the estimated lifetime likelihood of a person living in the U.S. developing cancer is one in two for men and one in three for women. Thus, an additional one in 10,000 to one in 1,000,000 risk does not add appreciable risk to an individual's overall chance of developing cancer over a lifetime.

Table 3-2 shows that the total cancer risks in the CCND neighborhoods are all in the 10^{-5} range, which is the same as those of the reference sites. This indicates no difference in lifetime cancer risks between the CCND and reference sites.

Comparing Tables 3-2 and 3-3, the range of average, central tendency risks (Table 3-2) are very similar to upper bound risks (Table 3-3). This indicates a very stable cancer risk profile estimated for the CCND neighborhoods using two different data collection platforms.

4.0 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. Therefore, the hazard estimates presented in this assessment are estimates of risk due to several assumptions about exposure and toxicity. This screening-level risk assessment relied on a combination of health-protective exposure scenarios and input values (i.e., lifetime exposure estimates, assumed similar toxic effect from all chemicals measured). Because of these assumptions, the estimates of chronic hazards and cancer risks are themselves uncertain but likely to be over-estimates of actual risk.

The chronic non-cancer and cancer risk assessments for a nine-month period is based on data collected on specific dates using the Summa canister and mobile monitoring van platforms. There is uncertainty in using air quality data from single-hour and less-than-24-hour sampling periods to represent an entire nine-month period (non-cancer risks) or an entire lifetime (cancer risks). However, the relatively small variation between chemical concentrations measured during each three-month period indicates a relatively stable presence of these chemicals across the entire time. Further, the concentration of chemicals measured during sensor-triggered samples (representing outliers of total VOC presence) was comparable to levels seen during planned sampling when total VOC levels were less than 1 ppm. Taken together, these findings suggest the estimated ECs derived from both the Summa canister data and the mobile monitoring van data are reasonably representative of the airborne chemical levels over the nine-month period for which this risk assessment covers.

[11] 40 CFR Ch. I (7–1–11 Edition) § 300.430. https://www.govinfo.gov/content/pkg/CFR-2011-title40-vol28/pdf/CFR-2011-title40-vol28-sec300-430.pdf

In addition, risks calculated from mobile monitoring van data have some level of uncertainty because the van's instrumentation does not differentiate some of the detected isomers (see Appendix A). For the sake of simplicity, the concentration and HQ values shown in Appendix B refer to generic names for a group of specific isomers. Risks from the isomer groups are calculated based on health RL for the isomer representing the isomer group, which may conservatively overestimate risk from exposure to the isomer group. This is of particular importance for cancer risk estimates for ethylbenzene. The PTR-ToF-MS in the van used to measure ethylbenzene cannot distinguish it from the three isomers of xylene due to structural similarities. Any measurement of xylenes may be comprised of all xylenes, all ethylbenzene, or some combination of the two. The Summa canister data consistently show total xylene levels to be higher than ethylbenzene. Thus, without a suitable method to separate ethylbenzene from the mobile monitoring van's xylenes measurements, the conservative assumption is that these measurements are completely ethylbenzene. This instrument limitation overestimates the cancer risk from ethylbenzene exposure.

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.

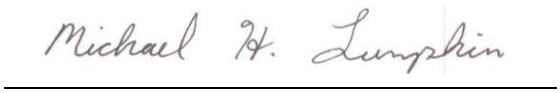
5.0 CONCLUSIONS

In conclusion, the data collected during this nine-month study phase did not indicate a potential for chronic non-cancer adverse health effects from exposure to the measured chemicals, both individually and combined. The result of all HQ and HI calculations falling below one (1) indicates the lack of potential adverse chronic non-cancer health effects, even for sensitive sub-populations. Data from two different types of data collection platforms (Summa canister sampling and mobile monitoring van sampling) were used for this assessment.

Further, the chemical-specific and total (cumulative) central tendency (Summa canister-based) and upper bound (mobile monitoring van-based) estimates of lifetime cancer risk from exposure to the five potential carcinogens that were measured in the CCND neighborhoods and reference site all fell between the range of approximately one in 100,000 to one in 25,000 chances of developing cancer above background risks, which is typically one in two for men and one in three for women in the U.S. This range (between 1 in 10,000 and 1 in a million) is deemed by USEPA[12] and referenced by Colorado Department of Public Health and Environment (CDPHE)[13] as an acceptable risk. Further, the central tendency (average) cancer risks estimated for CCND neighborhoods were very similar to the three refence sites, suggesting similar cancer risks for an individual spending an entire lifetime in a CCND neighborhood or one of the reference sites outside of the CCND neighborhoods.

[12] USEPA (2004). Air Toxics Risk Assessment Reference Library. Volume 1 Technical Reference Library
[13] CDPHE (2019) Memo: Updated acute and chronic health guideline values for use in preliminary risk assessments (referred to as "FA2019 HGVs"); https://drive.google.com/file/d/1P2KEvu0MFiyzQAOQtjQUclqR-WGh1bEX/view

Respectfully Submitted:



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Appendix A – Air Monitoring Collection Method Details

Summa Canister Collection Methods

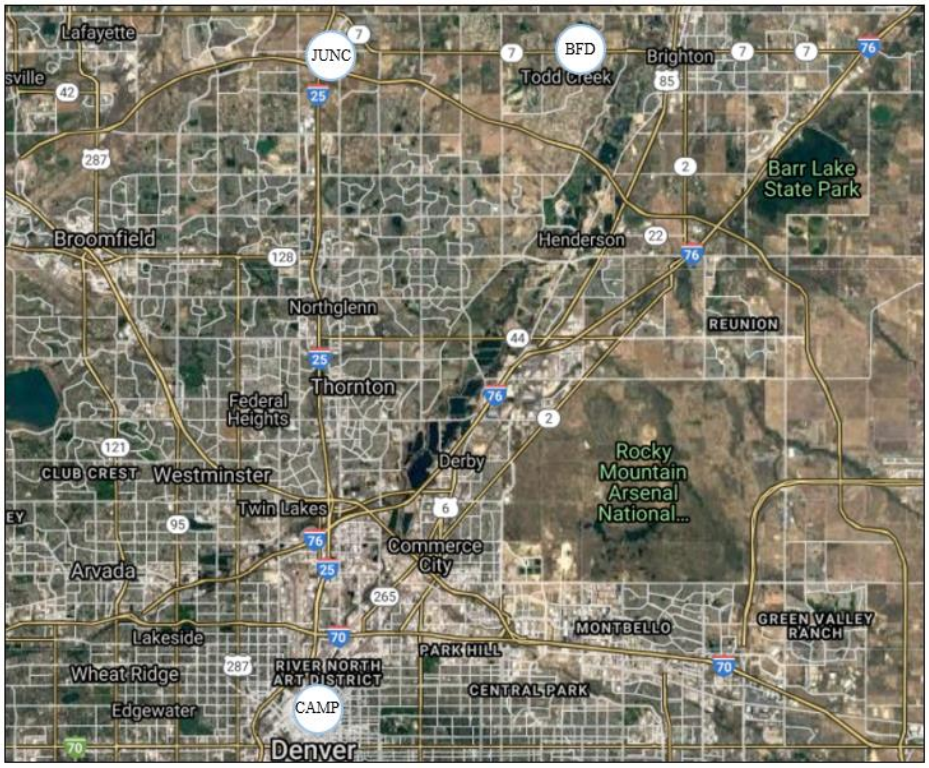
Eight monitors and Summa canister sampling locations were positioned throughout the Commerce City and North Denver (CCND) neighborhoods, within a three-mile radius of the refinery operations. The monitor locations are shown in Figures A-1 and A-2 and described in Table 1; they were selected based on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

FIGURE A-1
MAP OF EIGHT CCND MONITOR LOCATIONS

Additional planned air samples were collected at non-CCND community monitoring sites (reference locations), in both urban and rural locations (Table A-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[14].

FIGURE A-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)



[14] 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

TABLE A-1
CCND MONITORS AND SUMMA CANISTER SAMPLING LOCATIONS

Location ID	Secondary ID	GPS Coordinates	Distance from Refinery Center (miles)	Cross Streets
CM1	Rose	39.80164, -104.90882	2.0	E. 58th 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. 72nd Ave. & Quebec Pkwy., Commerce City
CM4	Adams Middle School	39.82893, -104.93499	1.9	Birch St. & E. 72nd Ave., Commerce City
CM5	Central	39.81457, -104.91928	1.7	Holly St. & E 64th Ave., Commerce City
CM6	Focus	39.78436, -104.95663	1.4	Columbine St. & 48th Ave., Denver
CM7	Kearney	39.80888, -104.91545	1.7	E. 62nd Ave. & Kearney St., Commerce City
CM8	Monroe	39.8156, -104.94503	0.85	Monroe St. & E. 64th Ave., Denver

TABLE A-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. 160th & Washington St., Thornton
BFD	Brighton	39.98512, -104.86665	13.1	Havana St. & Havana Way, Brighton

Entech Instruments Silonite™ CS1200E Passive Canister Samplers connected to six-liter chemically inert stainless steel ("Summa" canisters) were used to collect samples over a one-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 one-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 set of compounds monitored for in urban and industrial areas, and accounting for laboratory analysis capabilities (Table 1-3).

TABLE A-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	

Mobile Van Sampling Methods

The mobile monitoring van is a Mercedes 2500 Sprinter Van outfitted with equipment necessary to identify and quantitate individual chemicals present in ambient air to ultra-low concentrations. The mobile monitoring van is equipped with an Ionicon Model 6000-X2 proton transfer reaction time-of-flight mass spectrometer (PTR-TOF-MS). This instrument provides concentrations of select chemicals at sub-parts per billion (ppb) levels and as quickly as one measurement per second. The mobile monitoring van is outfitted with an external sampling system, which transports ambient air from outside of the van into the PTR-TOF-MS sample inlet for immediate real-time analysis. The entire sampling system is comprised of Teflon or Teflon-coated materials, which ensures the lowest amount of sample loss due to surface absorption of chemical molecules. The mobile monitoring van incorporates a high-precision global positioning system (GPS), a sonic anemometer to measure wind direction and wind velocity and a multitude of other incorporated meteorological (MET) sensors.

During the mobile monitoring program, the list of 64 chemicals in Table A-4 were measured to determine the instantaneous ambient concentrations. This list of chemicals was compiled based on the typical chemicals that are monitored in urban and industrial areas, and the mobile monitoring van analysis capabilities.

The mobile monitoring van followed a driving route through each of the six CCND residential neighborhoods that fall within a three-mile radius around the refinery operations. Accessible streets in the neighborhoods were traversed at approximately 10 MPH while collecting a data point every one second.

TABLE A-4
MOBILE MONITORING VAN PROGRAM CHEMICALS

Propane	2-Methylhexane	Ethane	Methyl-cyclopentane	o-Ethyltoluene (2-ethyltoluene)
1,3-Butadiene	2-Methylpentane	Ethylbenzene	m-Ethyltoluene	p-Diethylbenzene (1,4-diethylbenzene)
1-Butene	3-Methylheptane	Ethylcyclohexane	m/o/p-Xylenes	p-Ethyltoluene (4-ethyltoluene)
1-Hexene	3-Methylhexane	Ethylene	n-Butane	1,2,4-trimethylbenzene
1-Pentene	3-Methylpentane	Hydrogen Cyanide	n-Decane	Propylene (Propene)
Styrene	Acetylene	Hydrogen Sulfide	n-Dodecane	2,2,4-Trimethylpentane
2,2-Dimethylbutane	Benzene	i-Butane	n-Heptane	Tetrachloroethylene
Toluene	Carbon disulfide	i-Pentane	n-Hexane	2,3,4-Trimethylpentane
2,3-Dimethylbutane	trans-2-Butene	Isopentane	n-Nonane	trans-1,2-Dimethylcyclohexane
2,3-Dimethylpentane	cis-2-Butene	Isoprene	n-Octane	trans-1,3-Dimethylcyclohexane
2,4-Dimethylpentane	cis-2-Pentene	m-Diethylbenzene	n-Pentane	cis-1,3-dimethylcyclohexane
2-Methyl-2-butene	Cumene	Methanol	n-Propylbenzene	trans-2-Pentene
2-Methylheptane	Cyclohexane	Methyl-cyclohexane	n-Undecane	Cyclopentane

In a real-time PTR-TOF analysis, it is not possible to speciate isomers, or chemical compounds that have the same molecular weight. For example, n-hexane, 2-methyl pentane, and 2,2-dimethyl butane all have a molecular mass of 86.178 g/mol. To provide the most conservative determination of concentration during this mapping program, each isomer's concentration is reported as the sum of all isomers with the same molecular weight. For the sake of simplicity, the calculations in the report refer to generic names for a group of specific isomers. The following table defines which isomers comprise each generic group. For risk assessment calculations, risks from the isomer groups are calculated based on health RL for the isomer representing the isomer group, which may conservatively overestimate risk from exposure to the isomer group.

Table A-5
MOBILE MONITORING VAN PROGRAM CHEMICAL GROUP

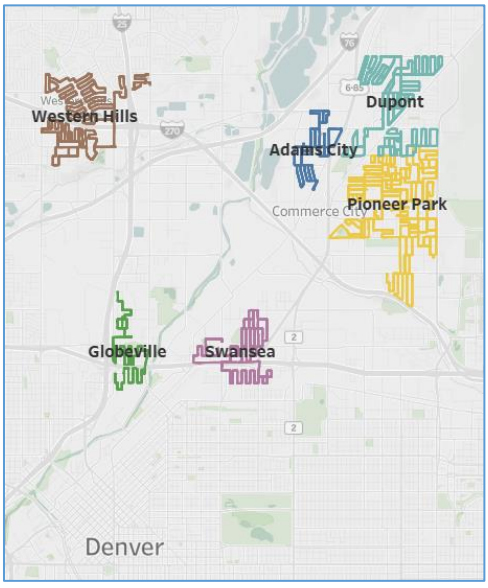
Group Name	Specific Isomers
Butenes	1-Butene
	cis-2-Butene
	trans-2-Butene
Butanes	iso-Butane
	n-Butane
Pentenes	1-Pentene
	2-Methyl-2-butene
	cis-2-Pentene
	trans-2-Pentene
Pentanes	iso-Pentane
	n-Pentane
	neo-Pentane
Hexenes	1-Hexene
	Cyclohexane
	Methylcyclopentane
Hexanes	n-Hexane
	2-Methylpentane
	3-Methylpentane
	2,2-Dimethylbutane
	2,3-Dimethylbutane
Heptanes	n-Heptane
	2-Methylhexane
	3-Methylhexane
	2,3-Dimethylpentane
	2,4-Dimethylpentane
Xylenes	Ethyl Benzene
	o-Xylene
	m-Xylene
	p-Xylene
Dimethylcyclohexanes	Ethylcyclohexane
	cis-1,3-Dimethylcyclohexane
	trans-1,2-Dimethylcyclohexane
	trans-1,3-Dimethylcyclohexane
Octanes	n-Octane
	2-Methylheptane
	3-Methylheptane
	2,2,4-Trimethylpentane
	2,3,4-Trimethylpentane
Trimethylbenzenes	Cumene
	1,2,4-Trimethylbenzene
	o-Ethyltoluene
	m-Ethyltoluene
	p-Ethyltoluene
	n-Propylbenzene
Diethylbenzenes	o-Diethylbenzene
	m-Diethylbenzene
	p-Diethylbenzene

The PTR-TOF-MS calibration was checked and the instrument was zeroed each day prior to collection of any ambient air data. The instrument was calibrated using United States Environmental Protection Agency (USEPA) protocol certified calibration gases. The multi-chemical cylinder standards were used to generate multiple point calibration curves for each commercially available chemical present in the standard. Note: Not all chemicals listed in Table 2-1 are available as certified calibration gases. The chemical dilutions were made using an Environics Model 4040 gas dilution system. The gas dilution system was validated using the appropriate USEPA methodology (40 Code of Federal Regulation Part 51 Appendix M, Method 205). Zero-count measurements were obtained to ensure proper baseline measurements were incorporated into the calculation of each chemical's concentration. Zero-count measurements were performed through the entire sampling system using ultra-high purity air. Post-testing calibration checks were performed on the instrument to ensure there was no significant drift during the course of the sampling event. Drift can cause an increase or decrease in the measured chemical concentrations, which can lead to both positive and negative biasing of the obtained results.

The mobile monitoring van collected continuous measurements throughout each neighborhood following the routes shown in Figure A-3. Measurements that were collected from transition periods or from moving between neighborhoods were excluded in this assessment.

The measurements were collected from the ambient environment at a height of 15 feet above grade at approximately 8 liters per minute using a Teflon-coated sampling boom and pump. The PTR-TOF-MS sampled a slip stream of this flow at approximately 100 ml/min. The sample was introduced into the reaction tube of the PTR-TOF-MS, and results were collected in 1-second intervals. Specific PTR-TOF-MS instrument operation conditions are available on the CCND website.

FIGURE A-3
MOBILE MONITORING VAN PROGRAM ROUTE THROUGH SIX NEIGHBORHOOD AREAS



Appendix B

Chronic Hazard Quotients for Individual Chemicals from Summa Canister by Location

Summa Canister Detection Summary

CM1 - Rose | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	5	3	5.7595	2.0334	2300	TCEQ Long-Term AMCV	0.0009
1-Hexene	592-41-6	5	0	< 0.0630	< 0.0619	50	TCEQ Long-Term AMCV	0.0012
1-Pentene	109-67-1	5	3	0.1220	0.0936	560	TCEQ Long-Term AMCV	0.0002
1,2,3-Trimethylbenzene	526-73-8	5	1	0.1340	0.0764	12	EPA Inhalation RfCi	0.0063
1,2,4-Trimethylbenzene	95-63-6	5	0	< 0.0630	< 0.0619	12	EPA Inhalation RfCi	0.0051
1,3-Butadiene	106-99-0	5	1	0.1640	0.0824	0.95	EPA RSL Non-Cancer	0.0869
1,3,5-Trimethylbenzene	108-67-8	5	0	< 0.0630	< 0.0619	12	EPA Inhalation RfCi	0.0051
2-Ethyltoluene	611-14-3	5	0	< 0.0630	< 0.0619	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	5	0	< 0.0630	< 0.0619	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	5	2	0.2560	0.1019	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	5	4	0.4580	0.2777	190	TCEQ Long-Term AMCV	0.0015
2,2-Dimethylbutane	75-83-2	5	1	0.1280	0.0752	190	TCEQ Long-Term AMCV	0.0004
2,2,4-trimethylpentane	540-84-1	5	2	0.3890	0.1491	380	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylbutane	79-29-8	5	2	0.1380	0.0851	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	5	2	0.1810	0.0898	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	5	0	< 0.0630	< 0.0619	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	5	2	0.2460	0.1338	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	5	0	< 0.0630	< 0.0619	25	TCEQ Long-Term AMCV	0.0025
3-Methylheptane	589-81-1	5	0	< 0.0630	< 0.0619	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	5	2	0.2240	0.0994	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	5	3	0.3790	0.1799	190	TCEQ Long-Term AMCV	0.0009
4-Ethyltoluene	622-96-8	5	0	< 0.0630	< 0.0619	25	TCEQ Long-Term AMCV	0.0025
Acetylene	74-86-2	5	5	2.7000	1.1770	2500	TCEQ Long-Term AMCV	0.0005
Benzene	71-43-2	5	5	0.3900	0.2568	3	ATSDR Chronic MRL	0.0856
Butane	106-97-8	5	5	3.2900	1.7907	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	5	2	0.0803	0.0666	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	5	2	0.1060	0.0760	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	5	1	0.0630	0.0619	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	5	5	0.2690	0.1645	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	5	4	0.5072	0.2142	590	TCEQ Long-Term AMCV	0.0004
Decane	124-18-5	5	0	< 0.0630	< 0.0619	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	5	0	< 0.0630	< 0.0619	3.8	CDPHE Chronic	0.0163
Ethane	74-84-0	5	5	21.8000	11.7267	NA	NA	NA
Ethylbenzene	100-41-4	5	3	0.0969	0.0738	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	5	5	4.4100	1.8139	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	5	5	0.2170	0.1576	98	EPA Inhalation RfCi	0.0016
Hexane	110-54-3	5	5	0.3790	0.2707	199	EPA Inhalation RfCi	0.0014
Isobutane	75-28-5	5	5	4.5300	1.3479	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	5	5	5.5550	2.0083	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	5	2	7.8359	1.7225	140	TCEQ Long-Term AMCV	0.0123
Isopropylbenzene	98-82-8	5	0	< 0.0630	< 0.0619	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	5	5	0.3150	0.1909	23	EPA RSL Non-Cancer	0.0166
m-Diethylbenzene	141-93-5	5	0	< 0.0630	< 0.0619	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	5	1	0.1400	0.0773	400	TCEQ Long-Term AMCV	0.0004
Methylcyclopentane	96-37-7	5	2	0.2880	0.1373	75	TCEQ Long-Term AMCV	0.0018
n-Octane	111-65-9	5	1	0.0630	0.0619	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	5	0	< 0.0630	< 0.0619	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	5	0	< 0.0630	< 0.0619	0.57	EPA Inhalation RfCi	0.1081
Nonane	111-84-2	5	0	< 0.0630	< 0.0619	3.8	EPA Inhalation RfCi	0.0162
o-Xylene	95-47-6	5	3	0.0987	0.0719	23	EPA RSL Non-Cancer	0.0031
p-Diethylbenzene	105-05-5	5	0	< 0.0630	< 0.0619	45	TCEQ Long-Term AMCV	0.0014
Pentane	109-66-0	5	5	6.7868	2.1074	338	EPA Inhalation RfCi	0.0062
Propane	74-98-6	5	5	6.7700	3.4231	NA	NA	NA
Propylene	115-07-1	5	5	0.8890	0.4209	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	5	0	< 0.0630	< 0.0619	5.9	EPA Inhalation RfCi	0.0105
Toluene	108-88-3	5	5	0.7320	0.4359	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	5	1	0.3460	0.1188	700	TCEQ Long-Term AMCV	0.0002
Trans-2-Pentene	646-04-8	5	2	0.4500	0.1431	560	TCEQ Long-Term AMCV	0.0003
Undecane	1120-21-4	5	0	< 0.0630	< 0.0619	55	TCEQ Long-Term AMCV	0.0011
							Hazard Index	0.4065

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

CM2 - RBC | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	4	2	0.2580	0.1285	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	4	0	< 0.0622	< 0.0615	50	TCEQ Long-Term AMCV	0.0012
1-Pentene	109-67-1	4	2	0.1430	0.0854	560	TCEQ Long-Term AMCV	0.0002
1,2,3-Trimethylbenzene	526-73-8	4	2	0.0804	0.0699	12	EPA Inhalation RfCi	0.0057
1,2,4-Trimethylbenzene	95-63-6	4	2	0.1190	0.0845	12	EPA Inhalation RfCi	0.0069
1,3-Butadiene	106-99-0	4	3	0.1260	0.0830	0.95	EPA RSL Non-Cancer	0.0874
1,3,5-Trimethylbenzene	108-67-8	4	0	< 0.0622	< 0.0615	12	EPA Inhalation RfCi	0.0050
2-Ethyltoluene	611-14-3	4	0	< 0.0622	< 0.0615	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	4	1	0.0743	0.0645	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	4	2	0.2090	0.1157	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	4	3	0.5890	0.3270	190	TCEQ Long-Term AMCV	0.0017
2,2-Dimethylbutane	75-83-2	4	2	0.1170	0.0821	190	TCEQ Long-Term AMCV	0.0004
2,2,4-trimethylpentane	540-84-1	4	2	0.1490	0.0973	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	4	2	0.1460	0.0990	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	4	2	0.2010	0.1100	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	4	0	< 0.0622	< 0.0615	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	4	3	0.3170	0.1755	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	4	2	0.1300	0.0809	25	TCEQ Long-Term AMCV	0.0032
3-Methylheptane	589-81-1	4	1	0.0665	0.0626	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	4	2	0.2250	0.1164	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	4	3	0.3970	0.3026	190	TCEQ Long-Term AMCV	0.0016
4-Ethyltoluene	622-96-8	4	0	< 0.0622	< 0.0615	25	TCEQ Long-Term AMCV	0.0025
Acetylene	74-86-2	4	4	2.1200	1.1893	2500	TCEQ Long-Term AMCV	0.0005
Benzene	71-43-2	4	4	0.4690	0.2742	3	ATSDR Chronic MRL	0.0914
Butane	106-97-8	4	4	3.0200	2.2765	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	4	1	0.0948	0.0698	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	4	2	0.1070	0.0810	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	4	1	0.0698	0.0635	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	4	4	0.3540	0.1998	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	4	3	0.2290	0.1609	590	TCEQ Long-Term AMCV	0.0003
Decane	124-18-5	4	1	0.0815	0.0665	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	4	0	< 0.0622	< 0.0615	3.8	CDPHE Chronic	0.0162
Ethane	74-84-0	4	4	13.9000	10.9678	NA	NA	NA
Ethylbenzene	100-41-4	4	2	0.1320	0.0940	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	4	4	3.0500	1.6874	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	4	4	0.2080	0.1585	98	EPA Inhalation RfCi	0.0016
Hexane	110-54-3	4	4	0.5920	0.3945	199	EPA Inhalation RfCi	0.0020
Isobutane	75-28-5	4	4	1.1400	0.7918	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	4	4	2.0300	1.3816	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	4	2	0.1550	0.0923	140	TCEQ Long-Term AMCV	0.0007
Isopropylbenzene	98-82-8	4	0	< 0.0622	< 0.0615	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	4	3	0.4330	0.2600	23	EPA RSL Non-Cancer	0.0226
m-Diethylbenzene	141-93-5	4	0	< 0.0622	< 0.0615	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	4	1	0.1430	0.0817	400	TCEQ Long-Term AMCV	0.0004
Methylcyclopentane	96-37-7	4	3	0.3950	0.2331	75	TCEQ Long-Term AMCV	0.0031
n-Octane	111-65-9	4	2	0.0784	0.0676	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	4	0	< 0.0622	< 0.0615	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	4	1	0.0722	0.0640	0.57	EPA Inhalation RfCi	0.1118
Nonane	111-84-2	4	1	0.0850	0.0673	3.8	EPA Inhalation RfCi	0.0177
o-Xylene	95-47-6	4	2	0.1280	0.0940	23	EPA RSL Non-Cancer	0.0041
p-Diethylbenzene	105-05-5	4	2	0.0991	0.0736	45	TCEQ Long-Term AMCV	0.0016
Pentane	109-66-0	4	4	1.3600	0.9612	338	EPA Inhalation RfCi	0.0028
Propane	74-98-6	4	4	6.1200	3.8641	NA	NA	NA
Propylene	115-07-1	4	4	0.5780	0.3623	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	4	0	< 0.0622	< 0.0615	5.9	EPA Inhalation RfCi	0.0104
Toluene	108-88-3	4	4	0.8060	0.5059	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	4	2	0.1100	0.0754	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	4	2	0.3020	0.1244	560	TCEQ Long-Term AMCV	0.0002
Undecane	1120-21-4	4	1	0.0733	0.0644	55	TCEQ Long-Term AMCV	0.0012
							Hazard Index	**0.4140**

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

CM3 - Adams High School | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	6	6	0.1930	0.1319	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	6	0	< 0.0617	< 0.0613	50	TCEQ Long-Term AMCV	0.0012
1-Pentene	109-67-1	6	1	0.0742	0.0634	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	6	3	0.0972	0.0702	12	EPA Inhalation RfCi	0.0058
1,2,4-Trimethylbenzene	95-63-6	6	3	0.1230	0.0775	12	EPA Inhalation RfCi	0.0064
1,3-Butadiene	106-99-0	6	3	0.1160	0.0844	0.95	EPA RSL Non-Cancer	0.0889
1,3,5-Trimethylbenzene	108-67-8	6	0	< 0.0617	< 0.0613	12	EPA Inhalation RfCi	0.0050
2-Ethyltoluene	611-14-3	6	0	< 0.0617	< 0.0613	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	6	1	0.0738	0.0635	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	6	2	0.1910	0.0906	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	6	5	0.5090	0.3002	190	TCEQ Long-Term AMCV	0.0016
2,2-Dimethylbutane	75-83-2	6	3	0.0993	0.0756	190	TCEQ Long-Term AMCV	0.0004
2,2,4-trimethylpentane	540-84-1	6	3	0.2740	0.1065	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	6	3	0.1210	0.0873	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	6	2	0.1770	0.0873	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	6	0	< 0.0617	< 0.0613	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	6	2	0.3980	0.1429	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	6	4	0.1210	0.0844	25	TCEQ Long-Term AMCV	0.0034
3-Methylheptane	589-81-1	6	0	< 0.0617	< 0.0613	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	6	3	0.2040	0.0935	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	6	5	0.7090	0.2245	190	TCEQ Long-Term AMCV	0.0012
4-Ethyltoluene	622-96-8	6	0	< 0.0617	< 0.0613	25	TCEQ Long-Term AMCV	0.0025
Acetylene	74-86-2	6	6	1.6800	0.9221	2500	TCEQ Long-Term AMCV	0.0004
Benzene	71-43-2	6	6	0.5070	0.2562	3	ATSDR Chronic MRL	0.0854
Butane	106-97-8	6	6	3.3400	2.1390	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	6	1	0.4110	0.1195	225	EPA Inhalation RfCi	0.0005
Cis-2-Butene	590-18-1	6	2	0.1390	0.0765	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	6	0	< 0.0617	< 0.0613	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	6	5	0.2910	0.1584	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	6	2	0.2350	0.1017	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	6	3	0.1070	0.0767	190	TCEQ Long-Term AMCV	0.0004
Dodecane	112-40-3	6	1	0.1040	0.0683	3.8	CDPHE Chronic	0.0180
Ethane	74-84-0	6	6	11.2000	8.5061	NA	NA	NA
Ethylbenzene	100-41-4	6	3	0.1370	0.0888	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	6	6	2.6500	1.6418	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	6	6	0.2100	0.1270	98	EPA Inhalation RfCi	0.0013
Hexane	110-54-3	6	6	0.8850	0.3711	199	EPA Inhalation RfCi	0.0019
Isobutane	75-28-5	6	6	1.0500	0.7466	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	6	6	2.4800	1.2953	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	6	2	0.1220	0.0798	140	TCEQ Long-Term AMCV	0.0006
Isopropylbenzene	98-82-8	6	0	< 0.0617	< 0.0613	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	6	4	0.4340	0.2115	23	EPA RSL Non-Cancer	0.0184
m-Diethylbenzene	141-93-5	6	0	< 0.0617	< 0.0613	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	6	3	0.1760	0.0857	400	TCEQ Long-Term AMCV	0.0004
Methylcyclopentane	96-37-7	6	5	0.3540	0.1745	75	TCEQ Long-Term AMCV	0.0023
n-Octane	111-65-9	6	1	0.0791	0.0644	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	6	0	< 0.0617	< 0.0613	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	6	1	0.0686	0.0626	0.57	EPA Inhalation RfCi	0.1093
Nonane	111-84-2	6	3	0.0755	0.0664	3.8	EPA Inhalation RfCi	0.0174
o-Xylene	95-47-6	6	3	0.1490	0.0895	23	EPA RSL Non-Cancer	0.0039
p-Diethylbenzene	105-05-5	6	2	0.0828	0.0684	45	TCEQ Long-Term AMCV	0.0015
Pentane	109-66-0	6	6	6.9300	1.7643	338	EPA Inhalation RfCi	0.0052
Propane	74-98-6	6	6	4.5500	3.5335	NA	NA	NA
Propylene	115-07-1	6	6	0.6870	0.3955	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	6	0	< 0.0617	< 0.0613	5.9	EPA Inhalation RfCi	0.0104
Toluene	108-88-3	6	6	0.9170	0.4574	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	6	2	0.2580	0.1073	700	TCEQ Long-Term AMCV	0.0002
Trans-2-Pentene	646-04-8	6	0	< 0.0617	< 0.0613	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	6	2	0.1100	0.0724	55	TCEQ Long-Term AMCV	0.0013
							Hazard Index	0.4039

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

CM4 - Adams Middle School | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	6	5	0.7560	0.2855	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	6	0	< 0.0732	< 0.0648	50	TCEQ Long-Term AMCV	0.0013
1-Pentene	109-67-1	6	3	0.2660	0.1328	560	TCEQ Long-Term AMCV	0.0002
1,2,3-Trimethylbenzene	526-73-8	6	4	0.1450	0.0932	12	EPA Inhalation RfCi	0.0076
1,2,4-Trimethylbenzene	95-63-6	6	5	0.2800	0.1391	12	EPA Inhalation RfCi	0.0114
1,3-Butadiene	106-99-0	6	4	0.2080	0.1043	0.95	EPA RSL Non-Cancer	0.1099
1,3,5-Trimethylbenzene	108-67-8	6	2	0.1280	0.0742	12	EPA Inhalation RfCi	0.0061
2-Ethyltoluene	611-14-3	6	1	0.0732	0.0662	25	TCEQ Long-Term AMCV	0.0026
2-Methylheptane	592-27-8	6	1	0.1770	0.0841	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	6	1	0.5640	0.1486	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	6	4	2.8900	0.8192	190	TCEQ Long-Term AMCV	0.0043
2,2-Dimethylbutane	75-83-2	6	3	0.2530	0.1226	190	TCEQ Long-Term AMCV	0.0006
2,2,4-trimethylpentane	540-84-1	6	4	0.2260	0.1399	380	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylbutane	79-29-8	6	3	0.5710	0.1970	190	TCEQ Long-Term AMCV	0.0010
2,3-Dimethylpentane	565-59-3	6	5	0.4100	0.2217	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	6	1	0.0732	0.0652	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	6	2	0.3920	0.1400	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	6	5	0.1900	0.1204	25	TCEQ Long-Term AMCV	0.0048
3-Methylheptane	589-81-1	6	1	0.1450	0.0788	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	6	1	0.6110	0.1565	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	6	3	1.8100	0.4116	190	TCEQ Long-Term AMCV	0.0022
4-Ethyltoluene	622-96-8	6	1	0.1340	0.0749	25	TCEQ Long-Term AMCV	0.0030
Acetylene	74-86-2	6	6	4.6400	1.7501	2500	TCEQ Long-Term AMCV	0.0007
Benzene	71-43-2	6	6	0.8520	0.4298	3	ATSDR Chronic MRL	0.1433
Butane	106-97-8	6	6	13.8000	7.8437	10000	TCEQ Long-Term AMCV	0.0008
Carbon disulfide	75-15-0	6	2	0.1260	0.0783	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	6	4	0.8080	0.2909	700	TCEQ Long-Term AMCV	0.0004
Cis-2-Pentene	627-20-3	6	2	0.1610	0.0968	560	TCEQ Long-Term AMCV	0.0002
Cyclohexane	110-82-7	6	6	1.0400	0.4108	1,743	EPA Inhalation RfCi	0.0002
Cyclopentane	287-92-3	6	2	0.8290	0.2524	590	TCEQ Long-Term AMCV	0.0004
Decane	124-18-5	6	5	0.1660	0.1052	190	TCEQ Long-Term AMCV	0.0006
Dodecane	112-40-3	6	3	0.1010	0.0741	3.8	CDPHE Chronic	0.0195
Ethane	74-84-0	6	6	52.2000	20.2369	NA	NA	NA
Ethylbenzene	100-41-4	6	5	0.2650	0.1555	230	EPA Inhalation RfCi	0.0007
Ethylene	74-85-1	6	6	6.5700	2.6767	5300	TCEQ Long-Term AMCV	0.0005
Heptane	142-82-5	6	5	0.7200	0.3462	98	EPA Inhalation RfCi	0.0035
Hexane	110-54-3	6	6	3.0500	1.1907	199	EPA Inhalation RfCi	0.0060
Isobutane	75-28-5	6	6	6.8000	2.9622	10000	TCEQ Long-Term AMCV	0.0003
Isopentane	78-78-4	6	5	13.5000	4.0059	8100	TCEQ Long-Term AMCV	0.0005
Isoprene	78-79-5	6	2	0.1230	0.0789	140	TCEQ Long-Term AMCV	0.0006
Isopropylbenzene	98-82-8	6	1	0.0891	0.0674	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	6	5	0.7810	0.4287	23	EPA RSL Non-Cancer	0.0372
m-Diethylbenzene	141-93-5	6	0	< 0.0732	< 0.0648	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	6	1	0.5560	0.1473	400	TCEQ Long-Term AMCV	0.0007
Methylcyclopentane	96-37-7	6	3	1.3300	0.3388	75	TCEQ Long-Term AMCV	0.0045
n-Octane	111-65-9	6	4	0.2120	0.1312	380	TCEQ Long-Term AMCV	0.0003
n-Propylbenzene	103-65-1	6	1	0.1160	0.0719	203	EPA Inhalation RfCi	0.0004
Naphthalene	91-20-3	6	2	0.1110	0.0715	0.57	EPA Inhalation RfCi	0.1250
Nonane	111-84-2	6	5	0.1750	0.1114	3.8	EPA Inhalation RfCi	0.0292
o-Xylene	95-47-6	6	5	0.2730	0.1616	23	EPA RSL Non-Cancer	0.0070
p-Diethylbenzene	105-05-5	6	4	0.0887	0.0727	45	TCEQ Long-Term AMCV	0.0016
Pentane	109-66-0	6	5	12.0000	3.3572	338	EPA Inhalation RfCi	0.0099
Propane	74-98-6	6	6	51.6000	18.0607	NA	NA	NA
Propylene	115-07-1	6	6	3.2800	1.0035	1,801	EPA RSL Non-Cancer	0.0006
Tetrachloroethene	127-18-4	6	3	0.1020	0.0709	5.9	EPA Inhalation RfCi	0.0120
Toluene	108-88-3	6	6	1.7400	0.9707	1,327	EPA Inhalation RfCi	0.0007
Trans-2-Butene	624-64-6	6	5	0.7620	0.3112	700	TCEQ Long-Term AMCV	0.0004
Trans-2-Pentene	646-04-8	6	3	0.4990	0.1725	560	TCEQ Long-Term AMCV	0.0003
Undecane	1120-21-4	6	4	0.1740	0.0997	55	TCEQ Long-Term AMCV	0.0018
							Hazard Index	**0.5691**

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

CM5 - Central | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	5	4	0.4270	0.1615	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	5	0	< 0.0624	< 0.0615	50	TCEQ Long-Term AMCV	0.0012
1-Pentene	109-67-1	5	1	0.1150	0.0723	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	5	1	0.0800	0.0653	12	EPA Inhalation RfCi	0.0053
1,2,4-Trimethylbenzene	95-63-6	5	2	0.0969	0.0726	12	EPA Inhalation RfCi	0.0059
1,3-Butadiene	106-99-0	5	3	0.1110	0.0811	0.95	EPA RSL Non-Cancer	0.0854
1,3,5-Trimethylbenzene	108-67-8	5	0	< 0.0624	< 0.0615	12	EPA Inhalation RfCi	0.0050
2-Ethyltoluene	611-14-3	5	0	< 0.0624	< 0.0615	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	5	0	< 0.0624	< 0.0615	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	5	2	0.2660	0.1125	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	5	4	0.5600	0.3194	190	TCEQ Long-Term AMCV	0.0017
2,2-Dimethylbutane	75-83-2	5	1	0.1030	0.0699	190	TCEQ Long-Term AMCV	0.0004
2,2,4-trimethylpentane	540-84-1	5	2	0.1030	0.0755	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	5	2	0.1350	0.0864	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	5	3	0.2390	0.1271	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	5	0	< 0.0624	< 0.0615	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	5	2	0.3100	0.1144	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	5	4	0.1320	0.0859	25	TCEQ Long-Term AMCV	0.0034
3-Methylheptane	589-81-1	5	0	< 0.0624	< 0.0615	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	5	4	0.3280	0.1300	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	5	5	0.5871	0.3143	190	TCEQ Long-Term AMCV	0.0017
4-Ethyltoluene	622-96-8	5	0	< 0.0624	< 0.0615	25	TCEQ Long-Term AMCV	0.0025
Acetylene	74-86-2	5	5	1.9300	0.9660	2500	TCEQ Long-Term AMCV	0.0004
Benzene	71-43-2	5	5	0.4050	0.2573	3	ATSDR Chronic MRL	0.0858
Butane	106-97-8	5	5	6.2000	3.2234	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	5	0	< 0.0624	< 0.0615	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	5	1	0.1890	0.0871	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	5	1	0.0667	0.0626	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	5	5	0.3050	0.1895	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	5	4	0.2250	0.1380	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	5	1	0.1030	0.0699	190	TCEQ Long-Term AMCV	0.0004
Dodecane	112-40-3	5	2	0.0985	0.0714	3.8	CDPHE Chronic	0.0188
Ethane	74-84-0	5	5	14.7000	9.5405	NA	NA	NA
Ethylbenzene	100-41-4	5	2	0.1190	0.0799	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	5	5	3.4600	1.5583	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	5	3	0.2110	0.1678	98	EPA Inhalation RfCi	0.0017
Hexane	110-54-3	5	5	0.4705	0.3515	199	EPA Inhalation RfCi	0.0018
Isobutane	75-28-5	5	5	1.7500	0.9114	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	5	5	2.2800	1.3927	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	5	3	0.2030	0.1081	140	TCEQ Long-Term AMCV	0.0008
Isopropylbenzene	98-82-8	5	0	< 0.0624	< 0.0615	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	5	5	0.3480	0.1953	23	EPA RSL Non-Cancer	0.0170
m-Diethylbenzene	141-93-5	5	1	0.0722	0.0638	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	5	2	0.1390	0.0868	400	TCEQ Long-Term AMCV	0.0004
Methylcyclopentane	96-37-7	5	4	0.3640	0.2184	75	TCEQ Long-Term AMCV	0.0029
n-Octane	111-65-9	5	2	0.0723	0.0659	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	5	0	< 0.0624	< 0.0615	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	5	0	< 0.0624	< 0.0615	0.57	EPA Inhalation RfCi	0.1074
Nonane	111-84-2	5	2	0.0957	0.0716	3.8	EPA Inhalation RfCi	0.0188
o-Xylene	95-47-6	5	2	0.1160	0.0802	23	EPA RSL Non-Cancer	0.0035
p-Diethylbenzene	105-05-5	5	2	0.0853	0.0666	45	TCEQ Long-Term AMCV	0.0015
Pentane	109-66-0	5	5	1.5027	1.1147	338	EPA Inhalation RfCi	0.0033
Propane	74-98-6	5	5	7.1437	4.0343	NA	NA	NA
Propylene	115-07-1	5	5	0.6940	0.3553	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	5	0	< 0.0624	< 0.0615	5.9	EPA Inhalation RfCi	0.0104
Toluene	108-88-3	5	5	0.7610	0.4442	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	5	2	0.2290	0.1193	700	TCEQ Long-Term AMCV	0.0002
Trans-2-Pentene	646-04-8	5	2	0.3860	0.1826	560	TCEQ Long-Term AMCV	0.0003
Undecane	1120-21-4	5	3	0.1190	0.0786	55	TCEQ Long-Term AMCV	0.0014
							Hazard Index	0.3985

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

CM6 - Focus | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	4	3	0.2310	0.1176	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	4	0	< 0.0619	< 0.0617	50	TCEQ Long-Term AMCV	0.0012
1-Pentene	109-67-1	4	2	0.0711	0.0658	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	4	0	< 0.0619	< 0.0617	12	EPA Inhalation RfCi	0.0051
1,2,4-Trimethylbenzene	95-63-6	4	1	0.0978	0.0707	12	EPA Inhalation RfCi	0.0058
1,3-Butadiene	106-99-0	4	1	0.1110	0.0740	0.95	EPA RSL Non-Cancer	0.0779
1,3,5-Trimethylbenzene	108-67-8	4	0	< 0.0619	< 0.0617	12	EPA Inhalation RfCi	0.0051
2-Ethyltoluene	611-14-3	4	0	< 0.0619	< 0.0617	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	4	0	< 0.0619	< 0.0617	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	4	3	0.1240	0.0971	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	4	3	0.3970	0.2864	190	TCEQ Long-Term AMCV	0.0015
2,2-Dimethylbutane	75-83-2	4	3	0.0833	0.0700	190	TCEQ Long-Term AMCV	0.0004
2,2,4-trimethylpentane	540-84-1	4	3	0.1379	0.0928	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	4	4	0.1160	0.0894	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	4	2	0.1330	0.0808	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	4	0	< 0.0619	< 0.0617	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	4	1	0.2310	0.1040	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	4	1	0.1260	0.0777	25	TCEQ Long-Term AMCV	0.0031
3-Methylheptane	589-81-1	4	0	< 0.0619	< 0.0617	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	4	3	0.1200	0.1036	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	4	3	0.3580	0.2227	190	TCEQ Long-Term AMCV	0.0012
4-Ethyltoluene	622-96-8	4	0	< 0.0619	< 0.0617	25	TCEQ Long-Term AMCV	0.0025
Acetylene	74-86-2	4	4	2.5200	1.0650	2500	TCEQ Long-Term AMCV	0.0004
Benzene	71-43-2	4	4	0.3710	0.2651	3	ATSDR Chronic MRL	0.0884
Butane	106-97-8	4	4	2.4300	1.8880	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	4	0	< 0.0619	< 0.0617	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	4	2	0.1260	0.0811	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	4	0	< 0.0619	< 0.0617	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	4	4	0.2020	0.1626	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	4	3	0.4370	0.1718	590	TCEQ Long-Term AMCV	0.0003
Decane	124-18-5	4	1	0.0765	0.0653	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	4	0	< 0.0619	< 0.0617	3.8	CDPHE Chronic	0.0162
Ethane	74-84-0	4	4	10.4000	7.8743	NA	NA	NA
Ethylbenzene	100-41-4	4	3	0.1639	0.1015	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	4	4	2.8700	1.4664	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	4	4	0.1350	0.1192	98	EPA Inhalation RfCi	0.0012
Hexane	110-54-3	4	4	0.3415	0.2816	199	EPA Inhalation RfCi	0.0014
Isobutane	75-28-5	4	4	0.7740	0.6506	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	4	4	1.6034	1.1778	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	4	2	0.1070	0.0764	140	TCEQ Long-Term AMCV	0.0005
Isopropylbenzene	98-82-8	4	0	< 0.0619	< 0.0617	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	4	4	0.6290	0.3167	23	EPA RSL Non-Cancer	0.0275
m-Diethylbenzene	141-93-5	4	0	< 0.0619	< 0.0617	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	4	3	0.1340	0.0942	400	TCEQ Long-Term AMCV	0.0005
Methylcyclopentane	96-37-7	4	4	0.2660	0.2183	75	TCEQ Long-Term AMCV	0.0029
n-Octane	111-65-9	4	0	< 0.0619	< 0.0617	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	4	0	< 0.0619	< 0.0617	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	4	0	< 0.0619	< 0.0617	0.57	EPA Inhalation RfCi	0.1078
Nonane	111-84-2	4	1	0.0893	0.0686	3.8	EPA Inhalation RfCi	0.0180
o-Xylene	95-47-6	4	3	0.1634	0.0995	23	EPA RSL Non-Cancer	0.0043
p-Diethylbenzene	105-05-5	4	2	0.0822	0.0710	45	TCEQ Long-Term AMCV	0.0016
Pentane	109-66-0	4	4	0.9211	0.7750	338	EPA Inhalation RfCi	0.0023
Propane	74-98-6	4	4	6.0500	3.4285	NA	NA	NA
Propylene	115-07-1	4	4	0.5650	0.3707	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	4	0	< 0.0619	< 0.0617	5.9	EPA Inhalation RfCi	0.0105
Toluene	108-88-3	4	4	0.5520	0.4098	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	4	1	0.0675	0.0631	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	4	2	0.5080	0.2523	560	TCEQ Long-Term AMCV	0.0005
Undecane	1120-21-4	4	0	< 0.0619	< 0.0617	55	TCEQ Long-Term AMCV	0.0011
							Hazard Index	0.3984

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

CM7 - Kearney | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	4	2	0.1650	0.0920	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	4	0	< 0.0629	< 0.0617	50	TCEQ Long-Term AMCV	0.0012
1-Pentene	109-67-1	4	1	0.0908	0.0689	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	4	2	0.1240	0.0869	12	EPA Inhalation RfCi	0.0071
1,2,4-Trimethylbenzene	95-63-6	4	2	0.0990	0.0734	12	EPA Inhalation RfCi	0.0060
1,3-Butadiene	106-99-0	4	2	0.1110	0.0829	0.95	EPA RSL Non-Cancer	0.0873
1,3,5-Trimethylbenzene	108-67-8	4	0	< 0.0629	< 0.0617	12	EPA Inhalation RfCi	0.0051
2-Ethyltoluene	611-14-3	4	0	< 0.0629	< 0.0617	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	4	0	< 0.0629	< 0.0617	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	4	2	0.1221	0.0875	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	4	3	0.4960	0.3092	190	TCEQ Long-Term AMCV	0.0016
2,2-Dimethylbutane	75-83-2	4	2	0.1010	0.0723	190	TCEQ Long-Term AMCV	0.0004
2,2,4-trimethylpentane	540-84-1	4	2	0.1170	0.0794	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	4	3	0.1310	0.0934	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	4	3	0.3140	0.1484	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	4	0	< 0.0629	< 0.0617	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	4	1	0.3290	0.1284	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	4	1	0.1110	0.0739	25	TCEQ Long-Term AMCV	0.0030
3-Methylheptane	589-81-1	4	0	< 0.0629	< 0.0617	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	4	2	0.1170	0.0896	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	4	3	0.3580	0.2128	190	TCEQ Long-Term AMCV	0.0011
4-Ethyltoluene	622-96-8	4	0	< 0.0629	< 0.0617	25	TCEQ Long-Term AMCV	0.0025
Acetylene	74-86-2	4	4	1.9700	1.0740	2500	TCEQ Long-Term AMCV	0.0004
Benzene	71-43-2	4	4	0.3600	0.2626	3	ATSDR Chronic MRL	0.0875
Butane	106-97-8	4	4	4.2300	2.7052	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	4	0	< 0.0629	< 0.0617	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	4	1	0.2570	0.1104	700	TCEQ Long-Term AMCV	0.0002
Cis-2-Pentene	627-20-3	4	1	0.0750	0.0649	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	4	4	0.2770	0.1822	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	4	2	0.1490	0.0884	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	4	2	0.2430	0.1397	190	TCEQ Long-Term AMCV	0.0007
Dodecane	112-40-3	4	1	0.0629	0.0620	3.8	CDPHE Chronic	0.0163
Ethane	74-84-0	4	4	15.2000	10.4075	NA	NA	NA
Ethylbenzene	100-41-4	4	3	0.1310	0.0856	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	4	4	3.2100	1.6498	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	4	4	0.2330	0.1810	98	EPA Inhalation RfCi	0.0019
Hexane	110-54-3	4	4	0.4189	0.3577	199	EPA Inhalation RfCi	0.0018
Isobutane	75-28-5	4	4	1.3100	0.8309	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	4	4	1.7200	1.3271	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	4	1	0.0798	0.0664	140	TCEQ Long-Term AMCV	0.0005
Isopropylbenzene	98-82-8	4	0	< 0.0629	< 0.0617	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	4	4	0.4150	0.2303	23	EPA RSL Non-Cancer	0.0200
m-Diethylbenzene	141-93-5	4	0	< 0.0629	< 0.0617	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	4	2	0.1060	0.0825	400	TCEQ Long-Term AMCV	0.0004
Methylcyclopentane	96-37-7	4	3	0.3870	0.2602	75	TCEQ Long-Term AMCV	0.0035
n-Octane	111-65-9	4	2	0.0717	0.0666	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	4	0	< 0.0629	< 0.0617	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	4	0	< 0.0629	< 0.0617	0.57	EPA Inhalation RfCi	0.1077
Nonane	111-84-2	4	3	0.1630	0.1028	3.8	EPA Inhalation RfCi	0.0270
o-Xylene	95-47-6	4	3	0.1450	0.0917	23	EPA RSL Non-Cancer	0.0040
p-Diethylbenzene	105-05-5	4	2	0.0958	0.0784	45	TCEQ Long-Term AMCV	0.0017
Pentane	109-66-0	4	4	1.0200	0.8859	338	EPA Inhalation RfCi	0.0026
Propane	74-98-6	4	4	7.5600	5.3794	NA	NA	NA
Propylene	115-07-1	4	4	0.6030	0.3828	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	4	0	< 0.0629	< 0.0617	5.9	EPA Inhalation RfCi	0.0105
Toluene	108-88-3	4	4	0.8800	0.5618	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	4	1	0.2080	0.0982	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	4	1	0.4340	0.1547	560	TCEQ Long-Term AMCV	0.0003
Undecane	1120-21-4	4	2	0.0992	0.0800	55	TCEQ Long-Term AMCV	0.0015
							Hazard Index	0.4130

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

CM8 - Monroe | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	4	3	0.5750	0.3615	2300	TCEQ Long-Term AMCV	0.0002
1-Hexene	592-41-6	4	0	< 0.0624	< 0.0617	50	TCEQ Long-Term AMCV	0.0012
1-Pentene	109-67-1	4	3	0.3190	0.1737	560	TCEQ Long-Term AMCV	0.0003
1,2,3-Trimethylbenzene	526-73-8	4	4	0.1929	0.1266	12	EPA Inhalation RfCi	0.0104
1,2,4-Trimethylbenzene	95-63-6	4	2	0.3050	0.1297	12	EPA Inhalation RfCi	0.0106
1,3-Butadiene	106-99-0	4	1	0.1250	0.0776	0.95	EPA RSL Non-Cancer	0.0817
1,3,5-Trimethylbenzene	108-67-8	4	1	0.0920	0.0694	12	EPA Inhalation RfCi	0.0057
2-Ethyltoluene	611-14-3	4	1	0.1495	0.0835	25	TCEQ Long-Term AMCV	0.0033
2-Methylheptane	592-27-8	4	2	0.2500	0.1136	380	TCEQ Long-Term AMCV	0.0003
2-Methylhexane	591-76-4	4	2	0.7290	0.2340	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	4	3	3.4800	1.0964	190	TCEQ Long-Term AMCV	0.0058
2,2-Dimethylbutane	75-83-2	4	2	0.3590	0.1470	190	TCEQ Long-Term AMCV	0.0008
2,2,4-trimethylpentane	540-84-1	4	2	0.2370	0.1107	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	4	4	0.7560	0.2766	190	TCEQ Long-Term AMCV	0.0015
2,3-Dimethylpentane	565-59-3	4	3	0.2870	0.1654	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	4	1	0.0624	0.0617	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	4	3	0.3230	0.1681	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	4	3	0.1490	0.1113	25	TCEQ Long-Term AMCV	0.0045
3-Methylheptane	589-81-1	4	2	0.2370	0.1080	380	TCEQ Long-Term AMCV	0.0003
3-Methylhexane	589-34-4	4	2	0.7240	0.2320	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	4	3	2.0500	0.7497	190	TCEQ Long-Term AMCV	0.0039
4-Ethyltoluene	622-96-8	4	1	0.0903	0.0690	25	TCEQ Long-Term AMCV	0.0028
Acetylene	74-86-2	4	4	1.9900	1.1490	2500	TCEQ Long-Term AMCV	0.0005
Benzene	71-43-2	4	4	1.1100	0.4396	3	ATSDR Chronic MRL	0.1465
Butane	106-97-8	4	4	14.7000	6.3428	10000	TCEQ Long-Term AMCV	0.0006
Carbon disulfide	75-15-0	4	2	0.2810	0.1220	225	EPA Inhalation RfCi	0.0005
Cis-2-Butene	590-18-1	4	2	1.1500	0.4070	700	TCEQ Long-Term AMCV	0.0006
Cis-2-Pentene	627-20-3	4	2	0.2860	0.1248	560	TCEQ Long-Term AMCV	0.0002
Cyclohexane	110-82-7	4	4	1.4200	0.4808	1,743	EPA Inhalation RfCi	0.0003
Cyclopentane	287-92-3	4	3	0.8760	0.3624	590	TCEQ Long-Term AMCV	0.0006
Decane	124-18-5	4	4	0.1960	0.1593	190	TCEQ Long-Term AMCV	0.0008
Dodecane	112-40-3	4	1	0.1573	0.0855	3.8	CDPHE Chronic	0.0225
Ethane	74-84-0	4	4	20.2000	13.3387	NA	NA	NA
Ethylbenzene	100-41-4	4	2	0.2960	0.1310	230	EPA Inhalation RfCi	0.0006
Ethylene	74-85-1	4	4	2.9300	1.8988	5300	TCEQ Long-Term AMCV	0.0004
Heptane	142-82-5	4	4	0.7600	0.3014	98	EPA Inhalation RfCi	0.0031
Hexane	110-54-3	4	4	3.2600	1.0763	199	EPA Inhalation RfCi	0.0054
Isobutane	75-28-5	4	4	5.9600	2.4766	10000	TCEQ Long-Term AMCV	0.0002
Isopentane	78-78-4	4	4	17.9000	5.7374	8100	TCEQ Long-Term AMCV	0.0007
Isoprene	78-79-5	4	2	0.0910	0.0702	140	TCEQ Long-Term AMCV	0.0005
Isopropylbenzene	98-82-8	4	0	< 0.0624	< 0.0617	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	4	3	1.0900	0.4076	23	EPA RSL Non-Cancer	0.0354
m-Diethylbenzene	141-93-5	4	1	0.1197	0.0761	45	TCEQ Long-Term AMCV	0.0017
Methylcyclohexane	108-87-2	4	2	0.6090	0.2065	400	TCEQ Long-Term AMCV	0.0010
Methylcyclopentane	96-37-7	4	3	1.3300	0.4792	75	TCEQ Long-Term AMCV	0.0064
n-Octane	111-65-9	4	2	0.2930	0.1274	380	TCEQ Long-Term AMCV	0.0003
n-Propylbenzene	103-65-1	4	1	0.0747	0.0651	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	4	0	< 0.0624	< 0.0617	0.57	EPA Inhalation RfCi	0.1079
Nonane	111-84-2	4	3	0.2130	0.1365	3.8	EPA Inhalation RfCi	0.0358
o-Xylene	95-47-6	4	2	0.3670	0.1493	23	EPA RSL Non-Cancer	0.0065
p-Diethylbenzene	105-05-5	4	3	0.1431	0.1031	45	TCEQ Long-Term AMCV	0.0023
Pentane	109-66-0	4	4	11.8000	3.9257	338	EPA Inhalation RfCi	0.0116
Propane	74-98-6	4	4	8.8700	6.2479	NA	NA	NA
Propylene	115-07-1	4	4	2.3200	0.8676	1,801	EPA RSL Non-Cancer	0.0005
Tetrachloroethene	127-18-4	4	0	< 0.0624	< 0.0617	5.9	EPA Inhalation RfCi	0.0105
Toluene	108-88-3	4	4	2.1600	0.8412	1,327	EPA Inhalation RfCi	0.0006
Trans-2-Butene	624-64-6	4	2	1.2100	0.4483	700	TCEQ Long-Term AMCV	0.0006
Trans-2-Pentene	646-04-8	4	3	0.6890	0.3149	560	TCEQ Long-Term AMCV	0.0006
Undecane	1120-21-4	4	3	0.1669	0.1219	55	TCEQ Long-Term AMCV	0.0022
							Hazard Index	**0.5430**

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

CM9 - 48th and Race | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	1	1	0.1740	0.1740	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	1	0	< 0.0614	< 0.0614	50	TCEQ Long-Term AMCV	0.0012
1-Pentene	109-67-1	1	1	0.0957	0.0957	560	TCEQ Long-Term AMCV	0.0002
1,2,3-Trimethylbenzene	526-73-8	1	0	< 0.0614	< 0.0614	12	EPA Inhalation RfCi	0.0050
1,2,4-Trimethylbenzene	95-63-6	1	1	0.0713	0.0713	12	EPA Inhalation RfCi	0.0058
1,3-Butadiene	106-99-0	1	1	0.2430	0.2430	0.95	EPA RSL Non-Cancer	0.2560
1,3,5-Trimethylbenzene	108-67-8	1	0	< 0.0614	< 0.0614	12	EPA Inhalation RfCi	0.0050
2-Ethyltoluene	611-14-3	1	0	< 0.0614	< 0.0614	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	1	0	< 0.0614	< 0.0614	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	1	0	< 0.0614	< 0.0614	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	1	1	0.7840	0.7840	190	TCEQ Long-Term AMCV	0.0041
2,2-Dimethylbutane	75-83-2	1	1	0.1360	0.1360	190	TCEQ Long-Term AMCV	0.0007
2,2,4-trimethylpentane	540-84-1	1	1	0.2220	0.2220	380	TCEQ Long-Term AMCV	0.0006
2,3-Dimethylbutane	79-29-8	1	1	0.2250	0.2250	190	TCEQ Long-Term AMCV	0.0012
2,3-Dimethylpentane	565-59-3	1	1	0.2330	0.2330	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	1	0	< 0.0614	< 0.0614	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	1	1	0.3890	0.3890	2200	TCEQ Long-Term AMCV	0.0002
3-Ethyltoluene	620-14-4	1	1	0.0661	0.0661	25	TCEQ Long-Term AMCV	0.0026
3-Methylheptane	589-81-1	1	0	< 0.0614	< 0.0614	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	1	0	< 0.0614	< 0.0614	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	1	1	0.5810	0.5810	190	TCEQ Long-Term AMCV	0.0031
4-Ethyltoluene	622-96-8	1	0	< 0.0614	< 0.0614	25	TCEQ Long-Term AMCV	0.0025
Acetylene	74-86-2	1	1	2.6700	2.6700	2500	TCEQ Long-Term AMCV	0.0011
Benzene	71-43-2	1	1	0.5130	0.5130	3	ATSDR Chronic MRL	0.1710
Butane	106-97-8	1	1	5.0200	5.0200	10000	TCEQ Long-Term AMCV	0.0005
Carbon disulfide	75-15-0	1	1	0.2300	0.2300	225	EPA Inhalation RfCi	0.0010
Cis-2-Butene	590-18-1	1	1	0.1530	0.1530	700	TCEQ Long-Term AMCV	0.0002
Cis-2-Pentene	627-20-3	1	1	0.0795	0.0795	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	1	1	0.4330	0.4330	1,743	EPA Inhalation RfCi	0.0002
Cyclopentane	287-92-3	1	1	0.5250	0.5250	590	TCEQ Long-Term AMCV	0.0009
Decane	124-18-5	1	0	< 0.0614	< 0.0614	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	1	0	< 0.0614	< 0.0614	3.8	CDPHE Chronic	0.0162
Ethane	74-84-0	1	1	21.4000	21.4000	NA	NA	NA
Ethylbenzene	100-41-4	1	1	0.1670	0.1670	230	EPA Inhalation RfCi	0.0007
Ethylene	74-85-1	1	1	4.4400	4.4400	5300	TCEQ Long-Term AMCV	0.0008
Heptane	142-82-5	1	1	0.2690	0.2690	98	EPA Inhalation RfCi	0.0028
Hexane	110-54-3	1	1	0.6420	0.6420	199	EPA Inhalation RfCi	0.0032
Isobutane	75-28-5	1	1	1.1800	1.1800	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	1	1	2.3600	2.3600	8100	TCEQ Long-Term AMCV	0.0003
Isoprene	78-79-5	1	0	< 0.0614	< 0.0614	140	TCEQ Long-Term AMCV	0.0004
Isopropylbenzene	98-82-8	1	0	< 0.0614	< 0.0614	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	1	1	0.3940	0.3940	23	EPA RSL Non-Cancer	0.0342
m-Diethylbenzene	141-93-5	1	0	< 0.0614	< 0.0614	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	1	0	< 0.0614	< 0.0614	400	TCEQ Long-Term AMCV	0.0003
Methylcyclopentane	96-37-7	1	1	0.4560	0.4560	75	TCEQ Long-Term AMCV	0.0061
n-Octane	111-65-9	1	1	0.1070	0.1070	380	TCEQ Long-Term AMCV	0.0003
n-Propylbenzene	103-65-1	1	0	< 0.0614	< 0.0614	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	1	0	< 0.0614	< 0.0614	0.57	EPA Inhalation RfCi	0.1073
Nonane	111-84-2	1	1	0.0619	0.0619	3.8	EPA Inhalation RfCi	0.0162
o-Xylene	95-47-6	1	1	0.1360	0.1360	23	EPA RSL Non-Cancer	0.0059
p-Diethylbenzene	105-05-5	1	0	< 0.0614	< 0.0614	45	TCEQ Long-Term AMCV	0.0014
Pentane	109-66-0	1	1	1.2200	1.2200	338	EPA Inhalation RfCi	0.0036
Propane	74-98-6	1	1	3.9100	3.9100	NA	NA	NA
Propylene	115-07-1	1	1	0.9850	0.9850	1,801	EPA RSL Non-Cancer	0.0005
Tetrachloroethene	127-18-4	1	0	< 0.0614	< 0.0614	5.9	EPA Inhalation RfCi	0.0104
Toluene	108-88-3	1	1	1.1700	1.1700	1,327	EPA Inhalation RfCi	0.0009
Trans-2-Butene	624-64-6	1	1	0.1760	0.1760	700	TCEQ Long-Term AMCV	0.0003
Trans-2-Pentene	646-04-8	1	1	0.4180	0.4180	560	TCEQ Long-Term AMCV	0.0007
Undecane	1120-21-4	1	0	< 0.0614	< 0.0614	55	TCEQ Long-Term AMCV	0.0011
							Hazard Index	0.6831

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

BFD- Brighton | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	3	2	0.2320	0.1342	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	3	1	0.0869	0.0696	50	TCEQ Long-Term AMCV	0.0014
1-Pentene	109-67-1	3	1	0.1670	0.0963	560	TCEQ Long-Term AMCV	0.0002
1,2,3-Trimethylbenzene	526-73-8	3	2	0.1580	0.0971	12	EPA Inhalation RfCi	0.0080
1,2,4-Trimethylbenzene	95-63-6	3	3	0.0808	0.0719	12	EPA Inhalation RfCi	0.0059
1,3-Butadiene	106-99-0	3	1	0.1100	0.0773	0.95	EPA RSL Non-Cancer	0.0814
1,3,5-Trimethylbenzene	108-67-8	3	0	< 0.0616	< 0.0611	12	EPA Inhalation RfCi	0.0050
2-Ethyltoluene	611-14-3	3	0	< 0.0616	< 0.0611	25	TCEQ Long-Term AMCV	0.0024
2-Methylheptane	592-27-8	3	1	0.0733	0.0654	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	3	1	0.1690	0.0973	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	3	2	0.6370	0.4012	190	TCEQ Long-Term AMCV	0.0021
2,2-Dimethylbutane	75-83-2	3	1	0.0923	0.0714	190	TCEQ Long-Term AMCV	0.0004
2,2,4-trimethylpentane	540-84-1	3	2	0.0941	0.0769	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	3	2	0.1540	0.1125	190	TCEQ Long-Term AMCV	0.0006
2,3-Dimethylpentane	565-59-3	3	2	0.1800	0.1084	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	3	0	< 0.0616	< 0.0611	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	3	2	0.3270	0.1582	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	3	1	0.0998	0.0739	25	TCEQ Long-Term AMCV	0.0030
3-Methylheptane	589-81-1	3	1	0.0718	0.0646	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	3	2	0.1890	0.1135	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	3	2	0.5020	0.3169	190	TCEQ Long-Term AMCV	0.0017
4-Ethyltoluene	622-96-8	3	0	< 0.0616	< 0.0611	25	TCEQ Long-Term AMCV	0.0024
Acetylene	74-86-2	3	3	2.4300	1.0767	2500	TCEQ Long-Term AMCV	0.0004
Benzene	71-43-2	3	3	0.3980	0.2987	3	ATSDR Chronic MRL	0.0996
Butane	106-97-8	3	3	5.7300	3.7967	10000	TCEQ Long-Term AMCV	0.0004
Carbon disulfide	75-15-0	3	1	0.0991	0.0737	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	3	1	0.0676	0.0632	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	3	0	< 0.0616	< 0.0611	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	3	3	0.3050	0.2247	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	3	2	0.3230	0.2065	590	TCEQ Long-Term AMCV	0.0004
Decane	124-18-5	3	3	0.4540	0.2294	190	TCEQ Long-Term AMCV	0.0012
Dodecane	112-40-3	3	0	< 0.0616	< 0.0611	3.8	CDPHE Chronic	0.0161
Ethane	74-84-0	3	3	22.6000	13.5267	NA	NA	NA
Ethylbenzene	100-41-4	3	2	0.0905	0.0782	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	3	3	3.2000	1.7373	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	3	3	0.2810	0.2080	98	EPA Inhalation RfCi	0.0021
Hexane	110-54-3	3	3	0.6860	0.5223	199	EPA Inhalation RfCi	0.0026
Isobutane	75-28-5	3	3	2.3500	1.5700	10000	TCEQ Long-Term AMCV	0.0002
Isopentane	78-78-4	3	3	2.5300	1.8660	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	3	1	0.0945	0.0725	140	TCEQ Long-Term AMCV	0.0005
Isopropylbenzene	98-82-8	3	0	< 0.0616	< 0.0611	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	3	3	0.2780	0.2080	23	EPA RSL Non-Cancer	0.0181
m-Diethylbenzene	141-93-5	3	0	< 0.0616	< 0.0611	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	3	1	0.1760	0.0996	400	TCEQ Long-Term AMCV	0.0005
Methylcyclopentane	96-37-7	3	2	0.3830	0.2452	75	TCEQ Long-Term AMCV	0.0033
n-Octane	111-65-9	3	2	0.1060	0.0810	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	3	0	< 0.0616	< 0.0611	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	3	0	< 0.0616	< 0.0611	0.57	EPA Inhalation RfCi	0.1067
Nonane	111-84-2	3	3	0.1300	0.0879	3.8	EPA Inhalation RfCi	0.0231
o-Xylene	95-47-6	3	2	0.0916	0.0782	23	EPA RSL Non-Cancer	0.0034
p-Diethylbenzene	105-05-5	3	2	0.0784	0.0692	45	TCEQ Long-Term AMCV	0.0015
Pentane	109-66-0	3	3	2.2200	1.7507	338	EPA Inhalation RfCi	0.0052
Propane	74-98-6	3	3	10.3000	8.0633	NA	NA	NA
Propylene	115-07-1	3	3	0.6530	0.3783	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	3	0	< 0.0616	< 0.0611	5.9	EPA Inhalation RfCi	0.0104
Toluene	108-88-3	3	3	0.5860	0.4380	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	3	1	0.1150	0.0790	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	3	1	0.2320	0.1183	560	TCEQ Long-Term AMCV	0.0002
Undecane	1120-21-4	3	2	0.1320	0.0887	55	TCEQ Long-Term AMCV	0.0016
							Hazard Index	0.4176

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

CAMP- Denver | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	3	2	0.3580	0.1707	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	3	0	< 0.0632	< 0.0621	50	TCEQ Long-Term AMCV	0.0012
1-Pentene	109-67-1	3	0	< 0.0632	< 0.0621	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	3	2	0.1560	0.0955	12	EPA Inhalation RfCi	0.0078
1,2,4-Trimethylbenzene	95-63-6	3	1	0.1080	0.0770	12	EPA Inhalation RfCi	0.0063
1,3-Butadiene	106-99-0	3	2	0.0844	0.0706	0.95	EPA RSL Non-Cancer	0.0743
1,3,5-Trimethylbenzene	108-67-8	3	0	< 0.0632	< 0.0621	12	EPA Inhalation RfCi	0.0051
2-Ethyltoluene	611-14-3	3	0	< 0.0632	< 0.0621	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	3	1	0.0661	0.0631	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	3	1	0.2080	0.1104	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	3	2	0.5120	0.2421	190	TCEQ Long-Term AMCV	0.0013
2,2-Dimethylbutane	75-83-2	3	2	0.0753	0.0687	190	TCEQ Long-Term AMCV	0.0004
2,2,4-trimethylpentane	540-84-1	3	1	0.1830	0.1020	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	3	1	0.1580	0.0937	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	3	1	0.1270	0.0834	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	3	0	< 0.0632	< 0.0621	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	3	3	0.1370	0.1057	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	3	2	0.0729	0.0656	25	TCEQ Long-Term AMCV	0.0026
3-Methylheptane	589-81-1	3	0	< 0.0632	< 0.0621	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	3	1	0.2620	0.1284	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	3	2	0.5390	0.2408	190	TCEQ Long-Term AMCV	0.0013
4-Ethyltoluene	622-96-8	3	0	< 0.0632	< 0.0621	25	TCEQ Long-Term AMCV	0.0025
Acetylene	74-86-2	3	3	1.3700	1.2213	2500	TCEQ Long-Term AMCV	0.0005
Benzene	71-43-2	3	3	0.5020	0.2757	3	ATSDR Chronic MRL	0.0919
Butane	106-97-8	3	3	1.7000	1.6833	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	3	3	0.5620	0.2442	225	EPA Inhalation RfCi	0.0011
Cis-2-Butene	590-18-1	3	1	0.0815	0.0682	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	3	0	< 0.0632	< 0.0621	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	3	2	0.3050	0.1486	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	3	1	0.2060	0.1097	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	3	0	< 0.0632	< 0.0621	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	3	0	< 0.0632	< 0.0621	3.8	CDPHE Chronic	0.0163
Ethane	74-84-0	3	3	8.0100	7.6467	NA	NA	NA
Ethylbenzene	100-41-4	3	1	0.1460	0.0897	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	3	3	1.9700	1.4677	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	3	1	0.2340	0.1190	98	EPA Inhalation RfCi	0.0012
Hexane	110-54-3	3	3	0.7850	0.3493	199	EPA Inhalation RfCi	0.0018
Isobutane	75-28-5	3	3	0.7810	0.6390	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	3	3	1.4300	0.8457	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	3	1	0.0861	0.0697	140	TCEQ Long-Term AMCV	0.0005
Isopropylbenzene	98-82-8	3	0	< 0.0632	< 0.0621	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	3	3	0.4700	0.2284	23	EPA RSL Non-Cancer	0.0198
m-Diethylbenzene	141-93-5	3	0	< 0.0632	< 0.0621	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	3	1	0.1070	0.0767	400	TCEQ Long-Term AMCV	0.0004
Methylcyclopentane	96-37-7	3	2	0.3710	0.1811	75	TCEQ Long-Term AMCV	0.0024
n-Octane	111-65-9	3	1	0.0682	0.0638	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	3	0	< 0.0632	< 0.0621	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	3	1	0.0685	0.0639	0.57	EPA Inhalation RfCi	0.1116
Nonane	111-84-2	3	1	0.0791	0.0674	3.8	EPA Inhalation RfCi	0.0177
o-Xylene	95-47-6	3	1	0.1490	0.0907	23	EPA RSL Non-Cancer	0.0039
p-Diethylbenzene	105-05-5	3	0	< 0.0632	< 0.0621	45	TCEQ Long-Term AMCV	0.0014
Pentane	109-66-0	3	3	0.9430	0.5897	338	EPA Inhalation RfCi	0.0017
Propane	74-98-6	3	3	3.4300	2.7233	NA	NA	NA
Propylene	115-07-1	3	3	0.5170	0.3353	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	3	0	< 0.0632	< 0.0621	5.9	EPA Inhalation RfCi	0.0105
Toluene	108-88-3	3	3	1.0700	0.5033	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	3	0	< 0.0632	< 0.0621	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	3	1	0.2490	0.1240	560	TCEQ Long-Term AMCV	0.0002
Undecane	1120-21-4	3	0	< 0.0632	< 0.0621	55	TCEQ Long-Term AMCV	0.0011
							Hazard Index	0.3962

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Summa Canister Detection Summary

JUNC- E470/I25 | Q3 2021 - Q1 2022

Compound Name	Cas No	# Samples	# Detections	Maximum Detections	Average of Samples	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	3	2	0.1020	0.0766	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	3	1	0.0733	0.0657	50	TCEQ Long-Term AMCV	0.0013
1-Pentene	109-67-1	3	2	0.0680	0.0650	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	3	0	< 0.0623	< 0.0619	12	EPA Inhalation RfCi	0.0051
1,2,4-Trimethylbenzene	95-63-6	3	1	0.1140	0.0793	12	EPA Inhalation RfCi	0.0065
1,3-Butadiene	106-99-0	3	2	0.1260	0.0907	0.95	EPA RSL Non-Cancer	0.0956
1,3,5-Trimethylbenzene	108-67-8	3	0	< 0.0623	< 0.0619	12	EPA Inhalation RfCi	0.0051
2-Ethyltoluene	611-14-3	3	0	< 0.0623	< 0.0619	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	3	1	0.0848	0.0696	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	3	1	0.1870	0.1036	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	3	2	0.6160	0.2912	190	TCEQ Long-Term AMCV	0.0015
2,2-Dimethylbutane	75-83-2	3	1	0.3880	0.1706	190	TCEQ Long-Term AMCV	0.0009
2,2,4-trimethylpentane	540-84-1	3	1	0.1610	0.0950	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	3	1	0.1410	0.0883	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	3	2	0.0849	0.0729	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	3	0	< 0.0623	< 0.0619	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	3	3	0.1070	0.0938	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	3	0	< 0.0623	< 0.0619	25	TCEQ Long-Term AMCV	0.0025
3-Methylheptane	589-81-1	3	1	0.0632	0.0624	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	3	1	1.5100	0.5446	2200	TCEQ Long-Term AMCV	0.0002
3-Methylpentane	96-14-0	3	3	0.9050	0.3685	190	TCEQ Long-Term AMCV	0.0019
4-Ethyltoluene	622-96-8	3	0	< 0.0623	< 0.0619	25	TCEQ Long-Term AMCV	0.0025
Acetylene	74-86-2	3	3	1.2700	0.9763	2500	TCEQ Long-Term AMCV	0.0004
Benzene	71-43-2	3	3	0.5250	0.2787	3	ATSDR Chronic MRL	0.0929
Butane	106-97-8	3	3	4.7000	2.6433	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	3	1	0.1060	0.0766	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	3	0	< 0.0623	< 0.0619	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	3	0	< 0.0623	< 0.0619	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	3	3	0.4160	0.1887	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	3	1	0.2130	0.1123	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	3	2	0.0941	0.0768	190	TCEQ Long-Term AMCV	0.0004
Dodecane	112-40-3	3	0	< 0.0623	< 0.0619	3.8	CDPHE Chronic	0.0163
Ethane	74-84-0	3	3	17.6000	10.7833	NA	NA	NA
Ethylbenzene	100-41-4	3	1	0.1260	0.0833	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	3	3	1.9500	1.3137	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	3	2	0.3330	0.1628	98	EPA Inhalation RfCi	0.0017
Hexane	110-54-3	3	3	0.7870	0.3793	199	EPA Inhalation RfCi	0.0019
Isobutane	75-28-5	3	3	1.8900	1.0347	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	3	3	2.4400	1.2320	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	3	1	0.0670	0.0636	140	TCEQ Long-Term AMCV	0.0005
Isopropylbenzene	98-82-8	3	1	0.0705	0.0649	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3 ..	3	3	0.3210	0.1737	23	EPA RSL Non-Cancer	0.0151
m-Diethylbenzene	141-93-5	3	0	< 0.0623	< 0.0619	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	3	1	0.1890	0.1043	400	TCEQ Long-Term AMCV	0.0005
Methylcyclopentane	96-37-7	3	2	0.4060	0.1972	75	TCEQ Long-Term AMCV	0.0026
n-Octane	111-65-9	3	1	0.1330	0.0856	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	3	0	< 0.0623	< 0.0619	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	3	0	< 0.0623	< 0.0619	0.57	EPA Inhalation RfCi	0.1082
Nonane	111-84-2	3	1	0.0623	0.0620	3.8	EPA Inhalation RfCi	0.0163
o-Xylene	95-47-6	3	1	0.1360	0.0866	23	EPA RSL Non-Cancer	0.0038
p-Diethylbenzene	105-05-5	3	1	0.0749	0.0661	45	TCEQ Long-Term AMCV	0.0015
Pentane	109-66-0	3	3	2.1700	1.0310	338	EPA Inhalation RfCi	0.0030
Propane	74-98-6	3	3	9.7500	5.2167	NA	NA	NA
Propylene	115-07-1	3	3	0.4650	0.2967	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	3	1	0.0673	0.0637	5.9	EPA Inhalation RfCi	0.0108
Toluene	108-88-3	3	3	0.7640	0.3907	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	3	0	< 0.0623	< 0.0619	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	3	1	0.3070	0.1436	560	TCEQ Long-Term AMCV	0.0003
Undecane	1120-21-4	3	1	0.0712	0.0651	55	TCEQ Long-Term AMCV	0.0012
							Hazard Index	0.4095

All results presented in ppb.
Laboratory non-detections are reported as less than ("<") the method detection limit. Average and maximum MDL may differ due to varying lab analyses.

Appendix C

Chronic Hazard Quotients for Individual Chemicals from Mobile Monitoring Van Data by Location

Mobile Sampling Van Data Summary and Hazard Quotients
Adams City Neighborhood |Q3 2021 - Q1 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	22,207	9,611	0.07	0.05	0.95	EPA RSL Non-Cancer	0.0549
ACETYLENE	74-86-2	22,207	9,611	0.47	0.16	2500	TCEQ Long-Term AMCV	0.0001
BENZENE	71-43-2	22,207	9,611	0.27	0.20	3	ATSDR Chronic MRL	0.0664
BUTANES	106-97-8	22,207	9,611	2.87	0.76	10000	TCEQ Long-Term AMCV	0.0001
BUTENES	106-98-9	22,207	9,611	1.25	0.60	2300	TCEQ Long-Term AMCV	0.0003
CARBON DISULFIDE	75-15-0	22,207	9,611	0.01	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANE	287-92-3	22,207	9,611	0.67	0.24	590	TCEQ Long-Term AMCV	0.0004
DECANES	124-18-5	22,207	9,611	0.04	0.02	190	TCEQ Long-Term AMCV	0.0001
DIETHYLBENZENES	141-93-5	22,207	9,611	0.03	0.02	45	TCEQ Long-Term AMCV	0.0004
DIMETHYLCYCLOHEXANES	590-66-9	22,207	9,611	0.03	0.02	400	CDPHE	0.0000
DODECANES	112-40-3	22,207	9,611	0.00	0.00	3.8	CDPHE	0.0003
ETHYLENE	74-85-1	22,207	9,611	11.29	7.27	5300	TCEQ Long-Term AMCV	0.0014
HEPTANES	142-82-5	22,207	9,611	0.02	0.01	98	EPA Inhalation RfCi	0.0001
HEXANES	110-54-3	22,207	9,611	0.07	0.04	199	EPA Inhalation RfCi	0.0002
HEXENES	592-41-6	22,207	9,611	0.33	0.11	50	TCEQ Long-Term AMCV	0.0022
HYDROGEN CYANIDE	74-90-8	22,207	9,611	0.30	0.18	0.75	EPA RSL Non-Cancer	0.2373
HYDROGEN SULFIDE	7783-06-4	22,207	9,611	0.27	0.15	1.4	EPA Inhalation RfCi	0.1056
ISOPRENE	78-79-5	22,207	9,611	0.20	0.13	140	TCEQ Long-Term AMCV	0.0010
METHANOL	67-56-1	22,207	9,611	9.58	7.77	15261	EPA Inhalation RfCi	0.0005
METHYLCYCLOHEXANE	108-87-2	22,207	9,611	0.05	0.03	400	TCEQ Long-Term AMCV	0.0001
NONANES	111-84-2	22,207	9,611	0.02	0.01	3.8	EPA Inhalation RfCi	0.0029
OCTANES	111-65-9	22,207	9,611	0.04	0.02	380	TCEQ Long-Term AMCV	0.0001
PENTANES	109-66-0	22,207	9,611	0.03	0.02	339	EPA Inhalation RfCi	0.0001
PROPYLENE	115-07-1	22,207	9,611	0.20	0.09	1801	EPA RSL Non-Cancer	0.0000
STYRENE	100-42-5	22,207	9,611	0.09	0.05	235	EPA Inhalation RfCi	0.0002
TETRACHLOROETHYLENE	127-18-4	22,207	9,611	0.02	0.01	5.9	EPA Inhalation RfCi	0.0022
TOLUENE	108-88-3	22,207	9,611	0.77	0.54	1327	EPA Inhalation RfCi	0.0004
TRIMETHYLBENZENES	526-73-8	22,207	9,611	0.26	0.16	12	EPA Inhalation RfCi	0.0133
UNDECANES	1120-21-4	22,207	9,611	0.04	0.02	55	TCEQ Long-Term AMCV	0.0004
XYLENES	1330-20-7	22,207	9,611	0.67	0.49	23	EPA Inhalation RfCi	0.0212
							Hazard Index	**0.5120**

Mobile Sampling Van Data Summary and Hazard Quotients
Dupont Neighborhood |Q3 2021 - Q1 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	39,685	22,929	0.08	0.06	0.95	EPA RSL Non-Cancer	0.0634
ACETYLENE	74-86-2	39,685	22,929	0.21	0.10	2500	TCEQ Long-Term AMCV	0.0000
BENZENE	71-43-2	39,685	22,929	0.30	0.23	3	ATSDR Chronic MRL	0.0779
BUTANES	106-97-8	39,685	22,929	4.75	3.44	10000	TCEQ Long-Term AMCV	0.0003
BUTENES	106-98-9	39,685	22,929	1.88	0.86	2300	TCEQ Long-Term AMCV	0.0004
CARBON DISULFIDE	75-15-0	39,685	22,929	0.02	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANE	287-92-3	39,685	22,929	2.17	1.00	590	TCEQ Long-Term AMCV	0.0017
DECANES	124-18-5	39,685	22,929	0.03	0.02	190	TCEQ Long-Term AMCV	0.0001
DIETHYLBENZENES	141-93-5	39,685	22,929	0.01	0.00	45	TCEQ Long-Term AMCV	0.0001
DIMETHYLCYCLOHEXANES	590-66-9	39,685	22,929	0.03	0.02	400	CDPHE	0.0000
DODECANES	112-40-3	39,685	22,929	0.00	0.00	3.8	CDPHE	0.0001
ETHYLENE	74-85-1	39,685	22,929	9.39	7.95	5300	TCEQ Long-Term AMCV	0.0015
HEPTANES	142-82-5	39,685	22,929	0.05	0.04	98	EPA Inhalation RfCi	0.0004
HEXANES	110-54-3	39,685	22,929	0.61	0.32	199	EPA Inhalation RfCi	0.0016
HEXENES	592-41-6	39,685	22,929	1.39	0.55	50	TCEQ Long-Term AMCV	0.0111
HYDROGEN CYANIDE	74-90-8	39,685	22,929	0.79	0.23	0.75	EPA RSL Non-Cancer	0.3026
HYDROGEN SULFIDE	7783-06-4	39,685	22,929	0.16	0.07	1.4	EPA Inhalation RfCi	0.0515
ISOPRENE	78-79-5	39,685	22,929	0.25	0.18	140	TCEQ Long-Term AMCV	0.0013
METHANOL	67-56-1	39,685	22,929	11.51	6.37	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	39,685	22,929	0.06	0.05	400	TCEQ Long-Term AMCV	0.0001
NONANES	111-84-2	39,685	22,929	0.02	0.01	3.8	EPA Inhalation RfCi	0.0035
OCTANES	111-65-9	39,685	22,929	0.04	0.03	380	TCEQ Long-Term AMCV	0.0001
PENTANES	109-66-0	39,685	22,929	1.54	0.78	339	EPA Inhalation RfCi	0.0023
PROPYLENE	115-07-1	39,685	22,929	0.34	0.19	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	39,685	22,929	0.02	0.01	235	EPA Inhalation RfCi	0.0001
TETRACHLOROETHYLENE	127-18-4	39,685	22,929	0.01	0.01	5.9	EPA Inhalation RfCi	0.0014
TOLUENE	108-88-3	39,685	22,929	1.47	0.79	1327	EPA Inhalation RfCi	0.0006
TRIMETHYLBENZENES	526-73-8	39,685	22,929	0.11	0.04	12	EPA Inhalation RfCi	0.0034
UNDECANES	1120-21-4	39,685	22,929	0.01	0.01	55	TCEQ Long-Term AMCV	0.0002
XYLENES	1330-20-7	39,685	22,929	0.39	0.22	23	EPA Inhalation RfCi	0.0095
							Hazard Index	**0.5355**

Mobile Sampling Van Data Summary and Hazard Quotients
Elyria-Swansea Neighborhood |Q3 2021 - Q1 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	24,661	10,552	0.11	0.08	0.95	EPA RSL Non-Cancer	0.0858
ACETYLENE	74-86-2	24,661	10,552	0.33	0.19	2500	TCEQ Long-Term AMCV	0.0001
BENZENE	71-43-2	24,661	10,552	0.45	0.32	3	ATSDR Chronic MRL	0.1060
BUTANES	106-97-8	24,661	10,552	2.64	2.02	10000	TCEQ Long-Term AMCV	0.0002
BUTENES	106-98-9	24,661	10,552	1.09	0.59	2300	TCEQ Long-Term AMCV	0.0003
CARBON DISULFIDE	75-15-0	24,661	10,552	0.05	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANE	287-92-3	24,661	10,552	1.68	0.55	590	TCEQ Long-Term AMCV	0.0009
DECANES	124-18-5	24,661	10,552	0.07	0.03	190	TCEQ Long-Term AMCV	0.0001
DIETHYLBENZENES	141-93-5	24,661	10,552	0.03	0.01	45	TCEQ Long-Term AMCV	0.0002
DIMETHYLCYCLOHEXANES	590-66-9	24,661	10,552	0.06	0.03	400	CDPHE	0.0001
DODECANES	112-40-3	24,661	10,552	0.02	0.00	3.8	CDPHE	0.0008
ETHYLENE	74-85-1	24,661	10,552	10.19	8.19	5300	TCEQ Long-Term AMCV	0.0015
HEPTANES	142-82-5	24,661	10,552	0.09	0.04	98	EPA Inhalation RfCi	0.0004
HEXANES	110-54-3	24,661	10,552	0.10	0.05	199	EPA Inhalation RfCi	0.0002
HEXENES	592-41-6	24,661	10,552	0.92	0.20	50	TCEQ Long-Term AMCV	0.0039
HYDROGEN CYANIDE	74-90-8	24,661	10,552	0.41	0.19	0.75	EPA RSL Non-Cancer	0.2560
HYDROGEN SULFIDE	7783-06-4	24,661	10,552	0.39	0.16	1.4	EPA Inhalation RfCi	0.1134
ISOPRENE	78-79-5	24,661	10,552	0.22	0.12	140	TCEQ Long-Term AMCV	0.0008
METHANOL	67-56-1	24,661	10,552	11.62	7.51	15261	EPA Inhalation RfCi	0.0005
METHYLCYCLOHEXANE	108-87-2	24,661	10,552	0.12	0.06	400	TCEQ Long-Term AMCV	0.0002
NONANES	111-84-2	24,661	10,552	0.03	0.01	3.8	EPA Inhalation RfCi	0.0020
OCTANES	111-65-9	24,661	10,552	0.13	0.04	380	TCEQ Long-Term AMCV	0.0001
PENTANES	109-66-0	24,661	10,552	0.06	0.02	339	EPA Inhalation RfCi	0.0001
PROPYLENE	115-07-1	24,661	10,552	0.50	0.23	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	24,661	10,552	0.05	0.01	235	EPA Inhalation RfCi	0.0000
TETRACHLOROETHYLENE	127-18-4	24,661	10,552	0.14	0.03	5.9	EPA Inhalation RfCi	0.0049
TOLUENE	108-88-3	24,661	10,552	1.85	1.13	1327	EPA Inhalation RfCi	0.0009
TRIMETHYLBENZENES	526-73-8	24,661	10,552	0.25	0.05	12	EPA Inhalation RfCi	0.0038
UNDECANES	1120-21-4	24,661	10,552	0.03	0.01	55	TCEQ Long-Term AMCV	0.0001
XYLENES	1330-20-7	24,661	10,552	1.42	0.33	23	EPA Inhalation RfCi	0.0144
							Hazard Index	**0.5979**

Mobile Sampling Van Data Summary and Hazard Quotients
Globeville Neighborhood |Q3 2021 - Q1 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	21,490	8,520	0.11	0.08	0.95	EPA RSL Non-Cancer	0.0847
ACETYLENE	74-86-2	21,490	8,520	0.28	0.18	2500	TCEQ Long-Term AMCV	0.0001
BENZENE	71-43-2	21,490	8,520	0.38	0.29	3	ATSDR Chronic MRL	0.0951
BUTANES	106-97-8	21,490	8,520	6.63	2.65	10000	TCEQ Long-Term AMCV	0.0003
BUTENES	106-98-9	21,490	8,520	1.61	0.63	2300	TCEQ Long-Term AMCV	0.0003
CARBON DISULFIDE	75-15-0	21,490	8,520	0.05	0.02	225	EPA Inhalation RfCi	0.0001
CYCLOPENTANE	287-92-3	21,490	8,520	1.21	0.43	590	TCEQ Long-Term AMCV	0.0007
DECANES	124-18-5	21,490	8,520	0.06	0.03	190	TCEQ Long-Term AMCV	0.0002
DIETHYLBENZENES	141-93-5	21,490	8,520	0.07	0.03	45	TCEQ Long-Term AMCV	0.0006
DIMETHYLCYCLOHEXANES	590-66-9	21,490	8,520	0.05	0.02	400	CDPHE	0.0001
DODECANES	112-40-3	21,490	8,520	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	21,490	8,520	11.60	9.12	5300	TCEQ Long-Term AMCV	0.0017
HEPTANES	142-82-5	21,490	8,520	0.05	0.02	98	EPA Inhalation RfCi	0.0002
HEXANES	110-54-3	21,490	8,520	0.04	0.03	199	EPA Inhalation RfCi	0.0002
HEXENES	592-41-6	21,490	8,520	0.59	0.15	50	TCEQ Long-Term AMCV	0.0029
HYDROGEN CYANIDE	74-90-8	21,490	8,520	0.17	0.11	0.75	EPA RSL Non-Cancer	0.1413
HYDROGEN SULFIDE	7783-06-4	21,490	8,520	0.22	0.12	1.4	EPA Inhalation RfCi	0.0861
ISOPRENE	78-79-5	21,490	8,520	0.32	0.25	140	TCEQ Long-Term AMCV	0.0018
METHANOL	67-56-1	21,490	8,520	9.63	7.79	15261	EPA Inhalation RfCi	0.0005
METHYLCYCLOHEXANE	108-87-2	21,490	8,520	0.10	0.05	400	TCEQ Long-Term AMCV	0.0001
NONANES	111-84-2	21,490	8,520	0.03	0.02	3.8	EPA Inhalation RfCi	0.0045
OCTANES	111-65-9	21,490	8,520	0.07	0.04	380	TCEQ Long-Term AMCV	0.0001
PENTANES	109-66-0	21,490	8,520	0.03	0.02	339	EPA Inhalation RfCi	0.0000
PROPYLENE	115-07-1	21,490	8,520	0.36	0.20	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	21,490	8,520	0.04	0.01	235	EPA Inhalation RfCi	0.0000
TETRACHLOROETHYLENE	127-18-4	21,490	8,520	0.02	0.01	5.9	EPA Inhalation RfCi	0.0025
TOLUENE	108-88-3	21,490	8,520	6.31	1.89	1327	EPA Inhalation RfCi	0.0014
TRIMETHYLBENZENES	526-73-8	21,490	8,520	0.30	0.10	12	EPA Inhalation RfCi	0.0084
UNDECANES	1120-21-4	21,490	8,520	0.06	0.04	55	TCEQ Long-Term AMCV	0.0006
XYLENES	1330-20-7	21,490	8,520	1.32	0.50	23	EPA Inhalation RfCi	0.0218
							Hazard Index	**0.4568**

Mobile Sampling Van Data Summary and Hazard Quotients

Pioneer Park Neighborhood |Q3 2021 - Q1 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	43,063	23,645	0.10	0.07	0.95	EPA RSL Non-Cancer	0.0686
ACETYLENE	74-86-2	43,063	23,645	0.26	0.16	2500	TCEQ Long-Term AMCV	0.0001
BENZENE	71-43-2	43,063	23,645	0.35	0.22	3	ATSDR Chronic MRL	0.0727
BUTANES	106-97-8	43,063	23,645	3.11	2.05	10000	TCEQ Long-Term AMCV	0.0002
BUTENES	106-98-9	43,063	23,645	1.05	0.40	2300	TCEQ Long-Term AMCV	0.0002
CARBON DISULFIDE	75-15-0	43,063	23,645	0.01	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANE	287-92-3	43,063	23,645	1.12	0.29	590	TCEQ Long-Term AMCV	0.0005
DECANES	124-18-5	43,063	23,645	0.05	0.03	190	TCEQ Long-Term AMCV	0.0001
DIETHYLBENZENES	141-93-5	43,063	23,645	0.03	0.02	45	TCEQ Long-Term AMCV	0.0004
DIMETHYLCYCLOHEXANES	590-66-9	43,063	23,645	0.03	0.02	400	CDPHE	0.0000
DODECANES	112-40-3	43,063	23,645	0.00	0.00	3.8	CDPHE	0.0003
ETHYLENE	74-85-1	43,063	23,645	11.22	9.11	5300	TCEQ Long-Term AMCV	0.0017
HEPTANES	142-82-5	43,063	23,645	0.08	0.04	98	EPA Inhalation RfCi	0.0005
HEXANES	110-54-3	43,063	23,645	0.06	0.03	199	EPA Inhalation RfCi	0.0002
HEXENES	592-41-6	43,063	23,645	0.56	0.09	50	TCEQ Long-Term AMCV	0.0019
HYDROGEN CYANIDE	74-90-8	43,063	23,645	0.36	0.17	0.75	EPA RSL Non-Cancer	0.2258
HYDROGEN SULFIDE	7783-06-4	43,063	23,645	0.31	0.21	1.4	EPA Inhalation RfCi	0.1455
ISOPRENE	78-79-5	43,063	23,645	0.25	0.18	140	TCEQ Long-Term AMCV	0.0013
METHANOL	67-56-1	43,063	23,645	11.54	7.57	15261	EPA Inhalation RfCi	0.0005
METHYLCYCLOHEXANE	108-87-2	43,063	23,645	0.05	0.03	400	TCEQ Long-Term AMCV	0.0001
NONANES	111-84-2	43,063	23,645	0.06	0.02	3.8	EPA Inhalation RfCi	0.0054
OCTANES	111-65-9	43,063	23,645	0.04	0.03	380	TCEQ Long-Term AMCV	0.0001
PENTANES	109-66-0	43,063	23,645	0.10	0.05	339	EPA Inhalation RfCi	0.0001
PROPYLENE	115-07-1	43,063	23,645	0.37	0.19	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	43,063	23,645	1.57	0.12	235	EPA Inhalation RfCi	0.0005
TETRACHLOROETHYLENE	127-18-4	43,063	23,645	0.03	0.01	5.9	EPA Inhalation RfCi	0.0021
TOLUENE	108-88-3	43,063	23,645	0.80	0.43	1327	EPA Inhalation RfCi	0.0003
TRIMETHYLBENZENES	526-73-8	43,063	23,645	0.21	0.06	12	EPA Inhalation RfCi	0.0049
UNDECANES	1120-21-4	43,063	23,645	0.03	0.02	55	TCEQ Long-Term AMCV	0.0004
XYLENES	1330-20-7	43,063	23,645	0.92	0.34	23	EPA Inhalation RfCi	0.0148
							Hazard Index	**0.5492**

Mobile Sampling Van Data Summary and Hazard Quotients

Western Hills Neighborhood |Q3 2021 - Q1 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Count of 1-hr Rolling Averages Derived (#)	Maximum 1-hr Rolling Average (ppbv)	Average 1-hr Rolling Average (ppbv)	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	27,859	14,876	0.08	0.06	0.95	EPA RSL Non-Cancer	0.0665
ACETYLENE	74-86-2	27,859	14,876	0.36	0.21	2500	TCEQ Long-Term AMCV	0.0001
BENZENE	71-43-2	27,859	14,876	0.49	0.29	3	ATSDR Chronic MRL	0.0974
BUTANES	106-97-8	27,859	14,876	3.59	1.74	10000	TCEQ Long-Term AMCV	0.0002
BUTENES	106-98-9	27,859	14,876	0.51	0.29	2300	TCEQ Long-Term AMCV	0.0001
CARBON DISULFIDE	75-15-0	27,859	14,876	0.02	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANE	287-92-3	27,859	14,876	0.72	0.31	590	TCEQ Long-Term AMCV	0.0005
DECANES	124-18-5	27,859	14,876	0.07	0.01	190	TCEQ Long-Term AMCV	0.0001
DIETHYLBENZENES	141-93-5	27,859	14,876	0.72	0.15	45	TCEQ Long-Term AMCV	0.0033
DIMETHYLCYCLOHEXANES	590-66-9	27,859	14,876	0.11	0.03	400	CDPHE	0.0001
DODECANES	112-40-3	27,859	14,876	0.00	0.00	3.8	CDPHE	0.0001
ETHYLENE	74-85-1	27,859	14,876	12.13	8.61	5300	TCEQ Long-Term AMCV	0.0016
HEPTANES	142-82-5	27,859	14,876	0.04	0.02	98	EPA Inhalation RfCi	0.0002
HEXANES	110-54-3	27,859	14,876	0.07	0.03	199	EPA Inhalation RfCi	0.0002
HEXENES	592-41-6	27,859	14,876	0.51	0.13	50	TCEQ Long-Term AMCV	0.0027
HYDROGEN CYANIDE	74-90-8	27,859	14,876	0.37	0.14	0.75	EPA RSL Non-Cancer	0.1881
HYDROGEN SULFIDE	7783-06-4	27,859	14,876	0.24	0.10	1.4	EPA Inhalation RfCi	0.0721
ISOPRENE	78-79-5	27,859	14,876	1.13	0.26	140	TCEQ Long-Term AMCV	0.0019
METHANOL	67-56-1	27,859	14,876	11.06	8.79	15261	EPA Inhalation RfCi	0.0006
METHYLCYCLOHEXANE	108-87-2	27,859	14,876	0.18	0.04	400	TCEQ Long-Term AMCV	0.0001
NONANES	111-84-2	27,859	14,876	0.03	0.02	3.8	EPA Inhalation RfCi	0.0043
OCTANES	111-65-9	27,859	14,876	0.10	0.02	380	TCEQ Long-Term AMCV	0.0000
PENTANES	109-66-0	27,859	14,876	0.04	0.03	339	EPA Inhalation RfCi	0.0001
PROPYLENE	115-07-1	27,859	14,876	0.81	0.23	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	27,859	14,876	0.46	0.09	235	EPA Inhalation RfCi	0.0004
TETRACHLOROETHYLENE	127-18-4	27,859	14,876	0.12	0.03	5.9	EPA Inhalation RfCi	0.0043
TOLUENE	108-88-3	27,859	14,876	2.45	0.86	1327	EPA Inhalation RfCi	0.0006
TRIMETHYLBENZENES	526-73-8	27,859	14,876	2.25	0.51	12	EPA Inhalation RfCi	0.0421
UNDECANES	1120-21-4	27,859	14,876	0.07	0.01	55	TCEQ Long-Term AMCV	0.0003
XYLENES	1330-20-7	27,859	14,876	1.57	0.47	23	EPA Inhalation RfCi	0.0206
							Hazard Index	**0.5086**