Q3 2021 - Q3 2022 CHRONIC RISK ASSESSMENT
COMMERCE CITY NORTH DENVER
COMMUNITY AIR MONITORING NETWORK

COMMERCE CITY, COLORADO

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EXECUTIVE SUMMARY

In response to feedback received by Suncor Energy (U.S.A.) Inc. (Suncor) through community engagement conducted in the fall of 2020, Suncor voluntarily committed to developing a continuous, near real-time air monitoring program to gain insight into air quality for neighborhoods in the vicinity of the Suncor refinery in Commerce City, Colorado. Montrose Environmental Group - Air Quality Services, LLC (Montrose) was contracted by Suncor to deploy, operate, and maintain the network in the Commerce City and North Denver (CCND) neighborhoods. Air monitoring was accomplished through three separate technical approaches: (1) 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 180,500 one-hour rolling average concentration measurements and 84 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 (n=18) approximately 4 to 13 miles away from the Suncor facility to compare with the CCND neighborhood sample data. For each neighborhood, sampling location or reference site, the time weighted average (Summa canister data) or average (mobile monitoring van) concentration measured across five calendar quarters (15 months) were compared to chronic non-cancer 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. Additionally, excess cancer risks were evaluated.

The non-cancer 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 cumulative, in either the CCND neighborhoods or the reference sites.

[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.

  - 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.

The cancer risk assessment showed the following:

- For 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 (cumulative) excess cancer risks fell between the USEPA and CDPHE-acceptable range of 1 in 10,000 to 1 in a million chances of excess risk for 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.

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.

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) and chronic (lifetime) exposures to specific chemicals in the CCND community air. These acute risk assessments were based on data collected during a specific calendar quarter (third and fourth quarter of 2021 and first through third quarters 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 H_2S exposure was addressed in the assessment of the mobile monitoring van data. The risk assessments were developed assuming short-term (one to four hours) 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 H_2S, building upon the previous chronic risk assessment with an additional two quarters worth of data. 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 15-month period (third quarter of 2021 through third 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 15 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 third quarter of 2021 through the third quarter of 2022. The following discussion briefly describes the two different air monitoring processes. Detailed air monitoring methods are provided in Appendix A.

Summa Canister Methods

Planned and VOC sensor-triggered air samples were collected during the third and fourth quarters of 2021, and the first through third quarter of 2022. During that period, there were originally eight CCND locations, but that number expanded to ten (CM-1 through CM-10 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 samples were collected for all 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. Beginning in the third quarter of 2022, a single 7-day Summa cannister sample was collected from each of the ten sampling locations and reference locations. The decision to add a quarterly 7-day sample to the program was based on the need to better discriminate typical airborne VOC levels at a given location from atypical, transient levels of VOCs that may be observed in the shorter 1-hour planned or triggered samples, as described in the following paragraph. The addition of 7-day Summa canister samples to the program also provides data spanning a much longer time period than the quarterly planned or triggered 1-hour samples, which results in a more robust estimate of typical VOC levels over longer time periods and, subsequently, a more representative estimate of lifetime exposure concentrations and chronic risk assessment. Both the 1-hour and 7-day samples were used together to calculate chronic noncancer and cancer health risks, as described in Sections 2.2 and 2.3.

On May 24, 2022, a 1-hour planned sample was collected at CM1 (Rose Hill Elementary) containing higher levels of several hydrocarbons than seen in previous samples, including dodecane at approximately 1,000-times higher than previously measured. As a result, two additional samples were collected at CM1 and two additional samples were collected nearby at CM3 on July 8 and 11, 2022, to determine if an ongoing change to the VOC levels at these sampling locations was occurring. Although these additional four samples contained dodecane and other VOC levels on par with the levels seen prior to May 24th, the additional 7-day sampling was instituted to provide better perspective on whether VOC levels such as those seen in the May 24th sample were outliers that do not represent long-term exposure levels.

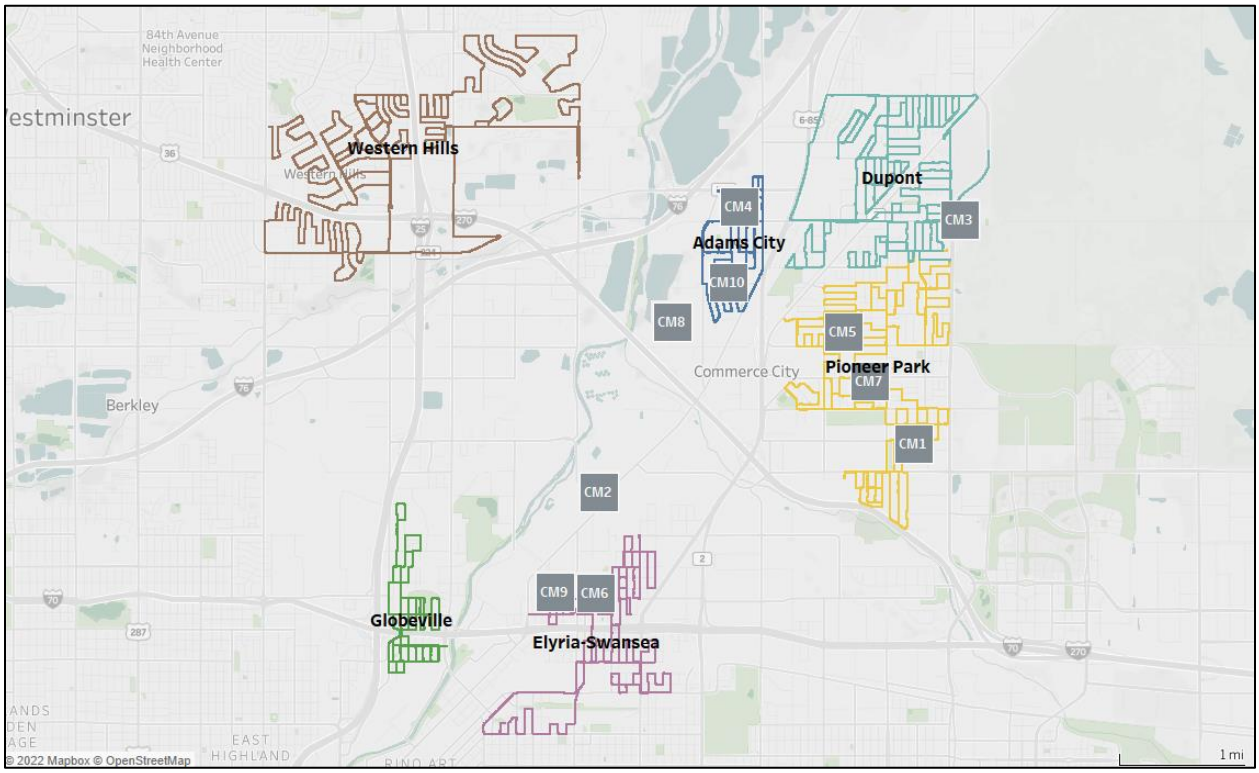
A total of 84 air samples were collected at eight and ten locations within the CCND neighborhoods (67 planned and 17 sensor-triggered). Planned samples included 1-hour and 7-day sample durations. An additional 18 samples were collected across three non-CCND community monitoring reference sites (1-hour and 7-day samples). 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.

Mobile Monitoring Van Methods

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 five 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 the third quarter of 2021 through the third quarter of 2022, the mobile monitoring van sampled a total of six neighborhoods and collected over 311,769 data points, resulting in approximately 180,539 one-hour rolling average concentrations.

FIGURE 2-1

Mobile Monitoring Van Program Route and Summa Canister Sampling 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 combined 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).

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

Eq. 1 – Hazard Quotient (HQ) Equation

HQ= EC / RL

Where:

HQ= Hazard Quotient

EC= Summa canister time-weighted-average air concentration or mobile monitoring van average air concentration of the chemical.

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 time-weighted average concentration of all 1-hour and 7-day samples collected across five quarters at each location. Time-weighted averaging of airborne chemical concentrations is a method of combining air data sampled at different sampling durations. It allows for a more accurate estimate of airborne chemical levels over a longer time period while preventing sample results from shorter duration samples (1-hour samples in the case of the CCND program) to inappropriately dominate the average levels for the chronic duration assessment period. Time-weighted averages of VOC concentrations measured in all of the 1-hour planned and triggered samples and 7-day planned samples collected over five quarters were calculated using Equation 2, per USEPA guidance[4].

Eq. 2 – Time-Weighted Average Exposure Concentration for Summa Canister Data

$$EC_{TWA} = \frac{\sum_1^n (C_j \times t_j)}{T}$$

Where:

EC_{TWA}= Time-weighted average exposure concentration over five quarters at a single location

C_i = Chemical concentration from a single 1-hour or 7-day Summa canister sample

t_i = Sampling duration from a single 1-hour or 7-day Summa canister sample

T = Total sampling averaging time from all 1-hour and 7-day Summa canister samples over five quarters at a single 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 five quarters in an individual CCND neighborhood. A time-weighted average concentration is not calculated for the mobile monitoring van data because the 1-hour rolling averages used as the basis for EC are already equally weighted in terms of exposure duration. Use of the Summa canister EC_{TWA} 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.

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

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 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[5]. 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. 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 five 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*."[6] 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 (mobile monitoring van data) or EC_{TWA} (Summa canister data) 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)[7].

[5] 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
[6]https://www.atsdr.cdc.gov/mrls/index.html#:~:text=ATSDR%20uses%20the%20no%20observed,to%20such%20substance%2Dinduced%20effects.
[7] Casarett & Doull's Toxicology: The Basic Science of Poisons. 7th Edition.

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 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)"* [8].

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

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

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. 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 3 (from USEPA guidance[9]) was used to calculate each chemical-specific cancer risk.

Eq. 3 – Excess Cancer Risk Estimate Equation

$$\text{Cancer Risk} = EC \text{ (or } EC_{TWA}) \times IUR$$

Where:

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

EC= Summa canister time-weighted-average air concentration (eq. 2), or mobile monitoring van average air concentration of the chemical.

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^{-4} 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[10]) 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)

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

- Ethylbenzene: 2.5 x 10^{-6} per µg/m^3 = 1.1 x 10^{-5} per ppb (Cal EPA OEHHA)
- Tetrachloroethane: 2.6 x 10^{-7} per µg/m^3 = 1.7 x 10^{-6} per ppb (USEPA IRIS)
- 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*."[11]

This risk assessment examined the excess cancer risk for each neighborhood, Summa canister sampling site, and reference site. The variation in chemical levels measured in Summa samples (comparing 1-hour with 1-hour samples and comparing 7-day samples to other 7-day samples) was small across the study period. The mobile monitoring van data set for the five quarters of the study period consists of thousands of one-hour concentrations of each chemical in each neighborhood. In the original 9-month chronic risk assessment, the exposure metric for the risk calculations was the average of each of the three quarters' maximum 1-hour mobile van averages for each neighborhood. The metric used for the present 15-month risk assessment is the average of each of the five quarter's 1-hour averages. The reason for the change in exposure metric is because an extra measure of conservatism was warranted for extrapolating three quarters of exposure data to lifetime excess cancer risk. Secondly, with five quarters and thousands of additional hourly rolling average monitoring van data, using the average of 1-hour averages provides for a more realistic estimate of neighborhood-wide exposure conditions.

While the Summa canisters include data for both day and night conditions, the mobile monitoring van data were collected during morning to midday hours. This makes the cancer risks from the van data likely to be representative of times when airborne chemical levels increase due to diurnal meteorology, compared to the risks calculated form the Summa canister data. Thus, cancer risks calculated from the mobile monitoring van data were used to represent the upper bound of cancer risks for this assessment.

3.0 RESULTS

3.1 NON-CANCER RISK

The time-weighted average concentration (Summa canister data) or 1-hour rolling average concentration (mobile monitoring van data) were calculated from data collected across five quarters for each neighborhood, sampling locations, and reference sites. These calculated values were compared to chronic RLs to derive chronic HQs for each chemical of interest. To evaluate cumulative risk, the estimated HI values were calculated by adding together the HQs of all detected chemicals measured. 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 non-cancer adverse

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

health effects, even for sensitive sub-populations. Overall, all calculated HQs (Appendix B) and HIs (Table 3-1 and Figures 3-1 and 3-2) in each neighborhood, sampling site and reference site were below one.

The HI values for each CCND neighborhood and sampling location collected periodically over a 15-month period of Summa canister data were compared with those based on data collected periodically across a 9-month time period (reported previously[12]). Some 15-month HIs derived from the Summa canister data increased as compared to the 9-month HIs, while some decreased. This change is likely due to the introduction of 7-day continuous sample data into time-weighted average exposure concentration calculations. The 9-month HIs were calculated using only 1-hour samples for each neighborhood, while the 15-month HIs included a 7-day (168-hour sample) in addition to the 1-hour samples. The 7-day sampling focused not only on morning hours (as for the 1-hour quarterly planned samples), but also included afternoon and evening hours, which account for daily variation in airborne chemical levels caused by multiple factors, including meteorology and emission sources. This change was not observed for the 9-month and 15-month mobile monitoring van HIs, which were similar. The reason for the similarity in mobile monitoring van data is that the monitoring in each neighborhood was conducted at similar times of day and did not capture diurnal variations in airborne chemical levels caused by day/night meteorological differences. However, the tight similarities between the 9-month and 15-month HIs from the mobile monitoring van suggests that short-term (two to four hour) airborne levels of measured chemicals in the CCND neighborhoods are very consistent over time.

The differences in HI between CCND locations and reference sites (figure 3-1) do not suggest that health risks in some sampling locations are different than others. Rather, all locations have calculated non-cancer health risk well below levels of concern.

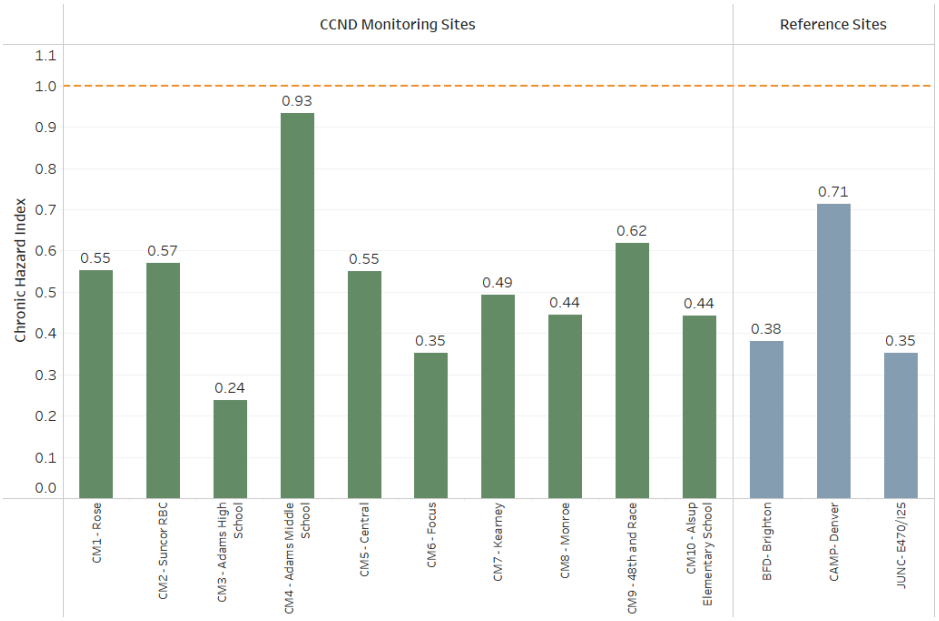
[12] Q3 2021 - Q1 2022 Chronic Risk Assessment, Commerce City North Denver Community Air Monitoring Network, Revision 1. Montrose Air Quality Services

TABLE 3-1

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

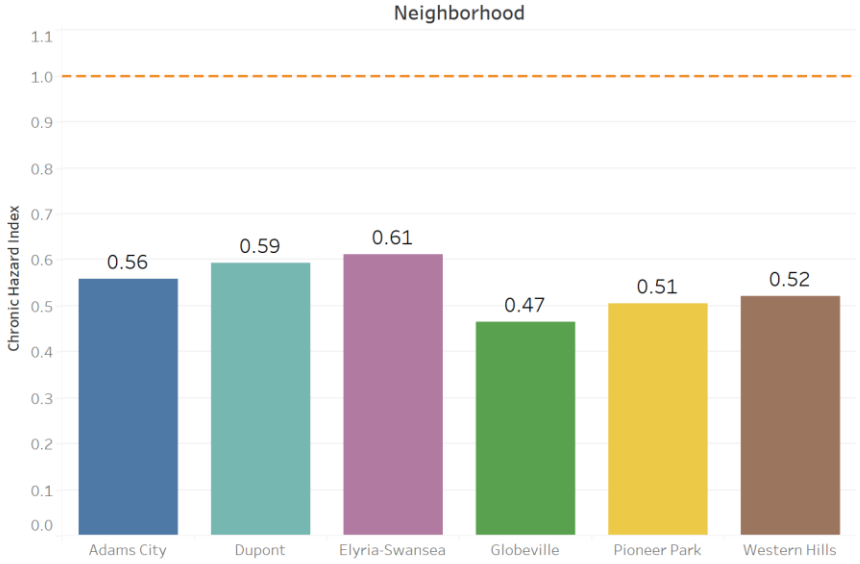
Mobile Van Sampling Neighborhood	No. of mobile van sampling hours (rolling one-hour averages)	Chronic Hazard Index	CCND Monitoring Sites	Total no. of analytical samples	Chronic Hazard Index
Adams City	19,515	0.56	**CM-4 Adams Middle School**	9	0.93
			CM-8 Monroe	7	0.44
			CM-10 Alsup	6	0.44
Dupont	43,105	0.59	**CM-3 Adams High School**	12	0.24
Pioneer Park	45,760	0.51	**CM-1 Rose**	11	0.55
			CM-5 Central	10	0.55
			CM-7 Kearney	8	0.49
Elyria-Swansea	19,844	0.61	**CM-2 Suncor RBC**	8	0.57
			CM-6 Focus	7	0.35
			CM-9- 48th and Race	6	0.62
Globeville	18,021	0.47	-	-	-
Western Hills	34,294	0.52	-	-	-

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



Hazard Index (HI) is the sum of all combined hazard quotients (HQ). According to EPA, a HI less than or equal to one (orange line) indicates that exposures are likely to be without any appreciable risk of adverse health effects, even for sensitive sub-populations.

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



Hazard Index (HI) is the sum of all combined hazard quotients (HQ). According to EPA, a HI less than or equal to one (orange line) indicates that exposures are likely to be without any appreciable risk of adverse health effects, even for sensitive sub-populations.

3.2 CANCER RISK

The total (cumulative) cancer 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 and in Figure 3-3.

TABLE 3-2
Chemical-Specific and Total Cancer Risk Estimates by Sampling Site from Summa Canister Data

Cancer 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**
CCNDSampling Sites	**CM1 – Rose**	6.2E-06	5.3E-06	1.5E-06	4.9E-09	1.7E-07	**1.3E-05**
	CM2 – RBC	1.1E-05	8.2E-06	1.5E-06	2.0E-09	1.9E-07	**2.1E-05**
	CM3 – Adams High School	2.3E-06	4.8E-06	7.9E-07	2.1E-09	5.9E-08	**8.0E-06**
	CM4 – Adams Middle School	1.9E-05	1.3E-05	2.4E-06	3.9E-09	3.3E-07	**3.5E-05**
	CM5 – Central	1.2E-05	5.6E-06	1.5E-06	2.0E-09	1.6E-07	**1.9E-05**
	CM6 – Focus	7.6E-06	4.3E-06	1.1E-06	2.0E-09	5.5E-08	**1.3E-05**
	CM7 – Kearney	9.0E-06	5.7E-06	1.4E-06	1.9E-09	1.6E-07	**1.6E-05**
	CM8 – Monroe	8.8E-06	7.8E-06	1.3E-06	1.9E-09	1.9E-07	**1.8E-05**
	CM9- 48th and Race	1.1E-05	5.8E-06	2.4E-06	2.0E-09	1.8E-07	**1.9E-05**
	CM10- Alsup Elementary	9.3E-06	5.6E-06	1.3E-06	2.0E-09	1.7E-07	**1.6E-05**
Reference Sites	**BFD- Brighton**	7.2E-06	4.7E-06	1.0E-06	1.9E-09	1.3E-07	**1.3E-05**
	CAMP- Denver	1.1E-05	2.1E-05	1.4E-06	1.9E-09	1.4E-07	**3.4E-05**
	JUNC- E470/I25	6.2E-06	4.7E-06	1.1E-06	1.9E-09	1.1E-07	**1.2E-05**

TABLE 3-3
Chemical-Specific and Total Cancer Risk Estimates by Neighborhood from Mobile Monitoring Van Data

Cancer Risk Estimates						
CCND 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	3.0E-06	5.8E-06	8.1E-06	2.2E-08	2.7E-08	**1.7E-05**
Dupont	2.9E-06	6.8E-06	3.8E-06	1.5E-08	1.4E-08	**1.4E-05**
Elyria-Swansea	4.0E-06	7.3E-06	5.3E-06	1.3E-08	4.9E-08	**1.7E-05**
Globeville	3.7E-06	7.9E-06	6.0E-06	1.7E-08	2.0E-08	**1.8E-05**
Pioneer Park	3.0E-06	5.0E-06	4.0E-06	1.3E-08	2.3E-08	**1.2E-05**
Western Hills	3.0E-06	7.3E-06	7.0E-06	1.7E-08	3.8E-08	**1.7E-05**

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.

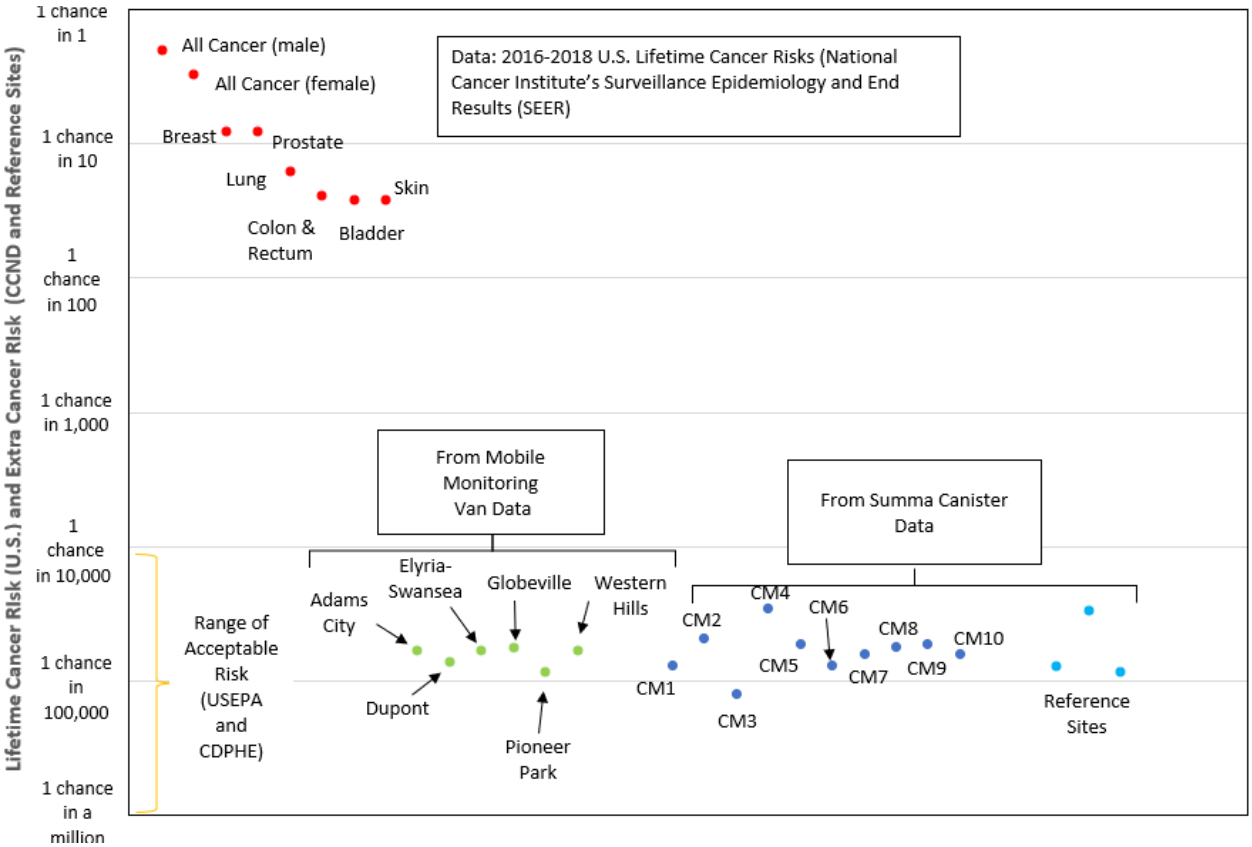
It is helpful to understand the cancer risks calculated in this report in the context of typical background cancer risks in the United States (U.S.) For federal regulatory agencies in the U.S.,

a 10^{-4} excess cancer risk level is the upper end of the generally acceptable risk range of 10^{-6} (one in 1,000,000 excess cancers) to 10^{-4} (one in 10,000 excess cancers) above background, as discussed in the National Contingency Plan (NCP), 40 CFR 300.430[13]. 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[14]. Thus, an additional one in 10,000 to one in 1,000,000 cancer risk does not add appreciable risk to an individual's overall chance of developing cancer over a lifetime.

The total excess cancer risks from the chemicals measured in the different CCND neighborhoods/ sampling sites are within the EPA acceptable risk range and similar to the reference sites (Table 3-2 and Figure 3-3). Based on these data, lifetime cancer risks are similar between the CCND and reference sites.

FIGURE 3-3

Comparison of Lifetime Cancer Risks in the U.S. with Estimated Excess Cancer Risk Based on 15 Months of CCND Air Program Data



[13] 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
[14] https://www.cancer.org/healthy/cancer-causes/general-info/lifetime-probability-of-developing-or-dying-from-cancer.html

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 non-cancer hazards and cancer risks are themselves uncertain but likely to over-estimate actual risk.

The chronic non-cancer and cancer risk assessments for a 15-month period is based on data collected on specific dates using the Summa canister and mobile monitoring van platforms. This assumes that the samples collected over a 15-month period represent estimated EC that a person that would breathe continuously over a lifetime (24 hours a day, 7 days a week).

In addition, risks calculated from the 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.

The inclusion of concentration values for non-detected chemicals in Summa canister samples introduces some level of uncertainty into the estimated EC. For CCND acute risk assessments, non-detection measurements are conservatively treated by using the laboratory's method detection limit (MDL: the lowest concentration that an instrument may reliably identify a chemical) as a surrogate concentration, assuming that the chemical did, in fact, exist in the sampled air at just below the MDL concentration. However, for chronic risk assessment, the use of a chemical's MDL for all the non-detected chemicals may disproportionately add uncertainty because of time-weighted averaging of numerous samples over a long period of time that have non-detects. To balance additional uncertainty with adequate public health protection, non-detected chemicals in the chronic risk assessment are represented in the EC_{TWA} as one-half of the MDL. This choice represents the fact that there is as much likelihood that the chemical is not present at all (actually zero) as there is that the chemical is in the sample at just under the MDL. The use of ½ MDL as a surrogate concentration is recommended by USEPA.[15]

[15] USEPA Data Quality Assessment: Statistical Methods for Practitioners https://www.epa.gov/sites/default/files/2015-08/documents/g9s-final.pdf

Additional uncertainty related to health-based reference levels or carcinogen inhalation unit risk values is also present. For many analytes, these values are derived from a limited set of data and are derived using a variety of assumptions, such as information from animal studies, extrapolations from experimental high-doses to low-doses, or data from other similar chemicals. However, all derivations ensure a margin of safety and as such, are intentionally conservative.

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 15-month study phase did not indicate a potential for chronic non-cancer adverse health effects from exposure to the measured chemicals, both individually and cumulative. 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. These conclusions were drawn from two different types of data collection platforms (Summa canister sampling and mobile monitoring van sampling).

Cancer risks for individual and combined chemicals were below EPA's upper acceptable cancer risk range and were similar to risk estimates from measurements at 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 the CCND neighborhoods.

Further, the chemical-specific and total (cumulative) estimates of lifetime excess cancer risk from exposure to the five potential carcinogens that were measured in the CCND neighborhoods, sampling locations and reference sites all fell between the range of 1 in 10,000 to 1 in a million 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.

Respectfully Submitted:

Michael Lumpkin, PhD, DABT
Senior Toxicologist
CTEH, LLC

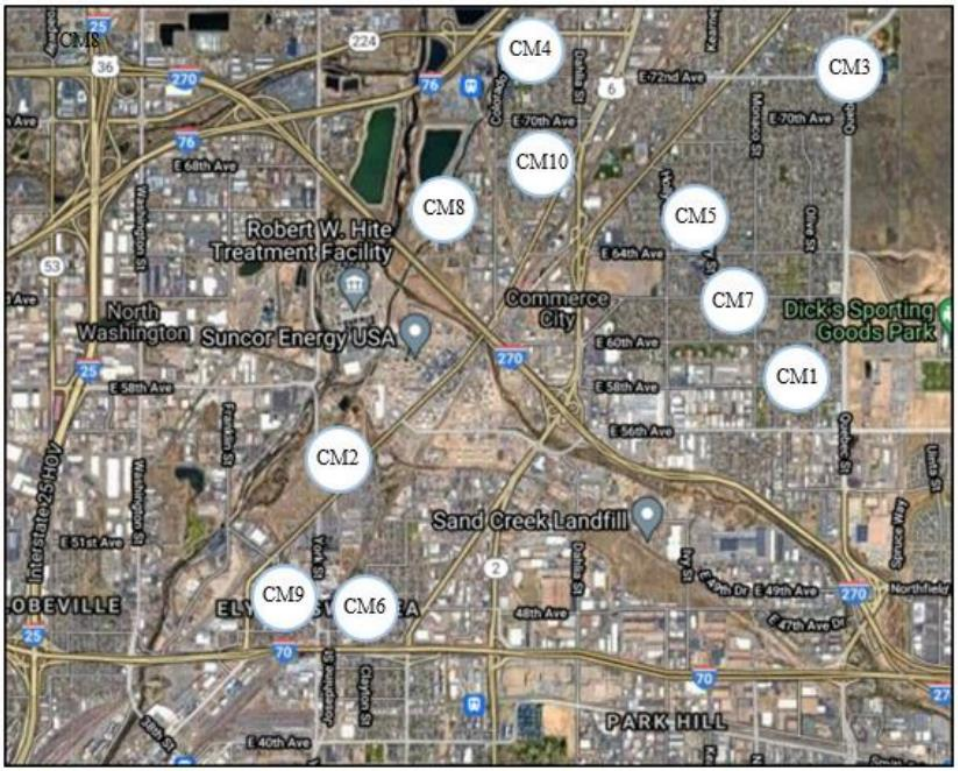
Appendix A – Air Monitoring Collection Method Details

Summa Canister Collection Methods

Ten 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:

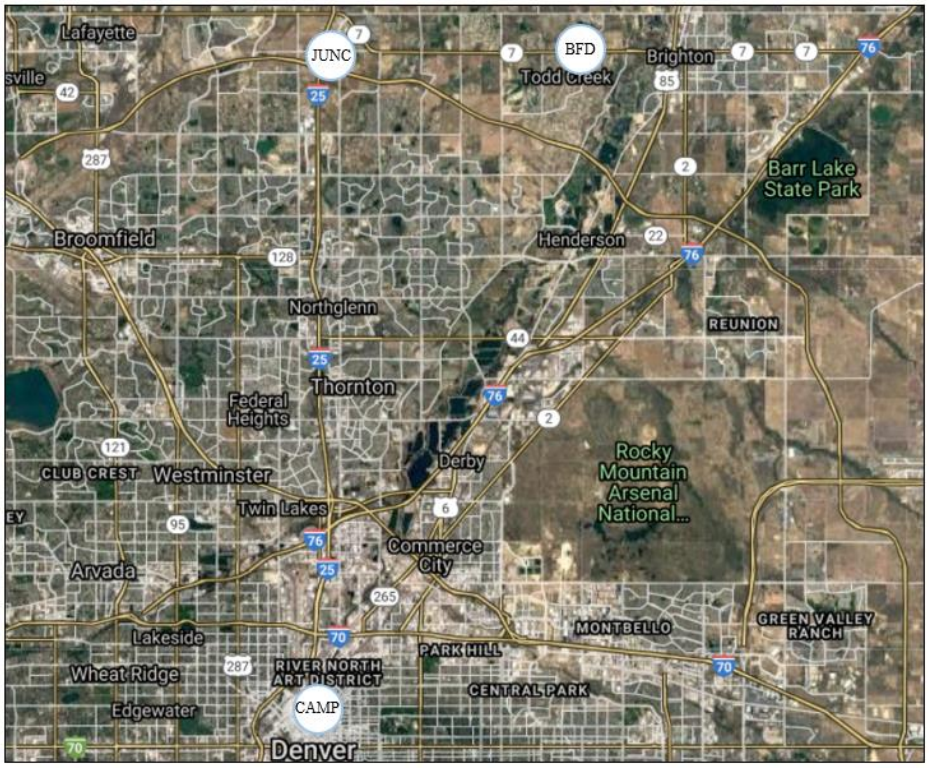
- Historical wind pattern data,
- Proximity to the refinery and non-refinery sources,
- Existing infrastructure, as well as site access and safety,
- Community feedback

FIGURE A-1
MAP OF TEN CCND MONITOR LOCATIONS



Additional planned air samples were collected at non-CCND community sampling 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[16].

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)



[16] 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 Hill Elementary School	39.80164, -104.90882	2.0	E. 58th Ave. & Oneida St., Commerce City
CM2	Suncor Refinery Business Center	39.79619, -104.95732	0.70	Brighton Blvd. & York St., Commerce City
CM3	Adams City High School	39.82736, -104.90193	2.9	E. 72nd Ave. & Quebec Pkwy, Commerce City
CM4	Adams City Middle School	39.82893, -104.93499	1.9	Birch St. & E. 72nd Ave., Commerce City
CM5	Central Elementary School	39.81457, -104.91928	1.7	Holly St. & E 64th Ave., Commerce City
CM6	Focus Points Family Resource Center	39.78436, -104.95663	1.4	Columbine St. & 48th Ave., Denver
CM7	Kearney Middle School	39.80888, -104.91545	1.7	E. 62nd Ave. & Kearney St., Commerce City
CM8	Monroe	39.81560, -104.94503	0.85	Monroe St. & E. 64th Ave., Denver
CM9	48th and Race	39.78455, -104.96264	1.7	East 48th Ave. & Race St., Denver
CM10	Alsup Elementary School	39.82026, -104.93663	1.3	East 68th Ave. & Birch St., Commerce City

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

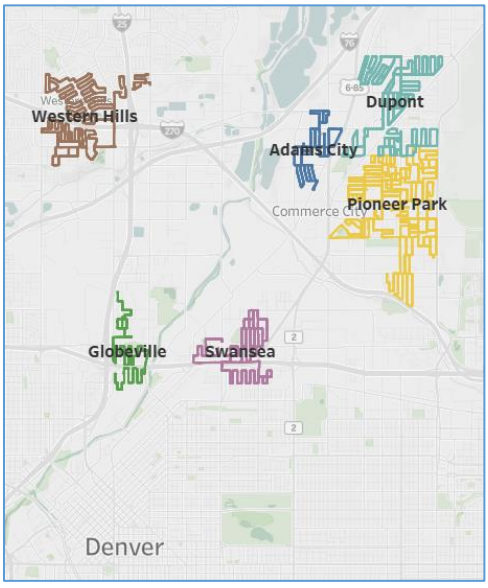
Group Name	Specific Isomers
Xylenes	Ethyl Benzene
	o-Xylene
	m-Xylene
	p-Xylene
Dimethylcyclohexanes	Ethylcyclohexane
	cis-1,3-Dimethylcyclohexane
	trans-1,2-Dimethylcyclohexane
	trans-1,3-Dimethylcyclohexane
Octanes	n-Octane
	2-Methylheptane
	3-Methylheptane
	2,2,4-Trimethylpentane
	2,3,4-Trimethylpentane
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 Data Summary and Risk Assessment
CM1 - Rose | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	11	6	5.7595	0.0908	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	11	1	0.1320	0.032	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	11	6	0.3090	0.0353	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	11	6	1.0100	0.1463	12	EPA Inhalation RfCi	0.0120
1,2,4-Trimethylbenzene	95-63-6	11	5	2.9000	0.1045	12	EPA Inhalation RfCi	0.0086
1,3-Butadiene	106-99-0	11	6	0.2240	0.0932	0.95	EPA RSL Non-Cancer	0.0982
1,3,5-Trimethylbenzene	108-67-8	11	4	0.8910	0.0835	12	EPA Inhalation RfCi	0.0068
2-Ethyltoluene	611-14-3	11	2	0.3690	0.0343	25	TCEQ Long-Term AMCV	0.0014
2-Methylheptane	592-27-8	11	3	0.4670	0.0348	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	11	5	0.9450	0.0409	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	11	10	2.6100	0.1205	190	TCEQ Long-Term AMCV	0.0006
2,2-Dimethylbutane	75-83-2	11	2	0.3090	0.0336	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	11	6	0.4790	0.1867	380	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylbutane	79-29-8	11	7	0.6870	0.2359	190	TCEQ Long-Term AMCV	0.0012
2,3-Dimethylpentane	565-59-3	11	8	0.4760	0.101	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	11	3	0.1940	0.0331	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	11	8	0.4380	0.1893	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	11	5	0.8950	0.0726	25	TCEQ Long-Term AMCV	0.0029
3-Methylheptane	589-81-1	11	3	0.4130	0.0344	380	TCEQ Long-Term AMCV	0.0001
3-Methylhexane	589-34-4	11	6	1.0200	0.0711	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	11	9	2.0400	0.1727	190	TCEQ Long-Term AMCV	0.0009
4-Ethyltoluene	622-96-8	11	4	0.3300	0.0794	25	TCEQ Long-Term AMCV	0.0032
Acetylene	74-86-2	11	11	3.5200	0.5033	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	11	11	0.9960	0.2095	3	ATSDR Chronic MRL	0.0698
Butane	106-97-8	11	11	27.6000	1.3245	10000	TCEQ Long-Term AMCV	0.0001
Carbon disulfide	75-15-0	11	6	0.3030	0.2906	225	EPA Inhalation RfCi	0.0013
Cis-2-Butene	590-18-1	11	5	0.2090	0.0338	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	11	3	0.3090	0.0336	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	11	11	1.0000	0.1225	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	11	8	0.5072	0.0417	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	11	5	0.5830	0.1199	190	TCEQ Long-Term AMCV	0.0006
Dodecane	112-40-3	11	6	108.0000	0.7663	3.8	CDPHE Chronic	0.2017
Ethane	74-84-0	11	11	21.8000	4.9428	NA	NA	
Ethylbenzene	100-41-4	11	8	1.5600	0.1399	230	EPA Inhalation RfCi	0.0006
Ethylene	74-85-1	11	11	4.4100	0.713	5300	TCEQ Long-Term AMCV	0.0001
Heptane	142-82-5	11	10	0.8180	0.1741	98	EPA Inhalation RfCi	0.0018
Hexane	110-54-3	11	11	1.6000	0.2757	199	EPA Inhalation RfCi	0.0014
Isobutane	75-28-5	11	11	6.0100	0.5229	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	11	10	7.4500	1.8701	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	11	4	7.8359	0.08	140	TCEQ Long-Term AMCV	0.0006
Isopropylbenzene	98-82-8	11	4	0.1970	0.0627	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3..	11	11	6.6000	0.2748	23	EPA RSL Non-Cancer	0.0119
m-Diethylbenzene	141-93-5	11	0	< 0.0658	0.0315	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	11	4	0.7860	0.0413	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	11	5	1.6300	0.0489	75	TCEQ Long-Term AMCV	0.0007
n-Octane	111-65-9	11	6	0.7280	0.0806	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	11	4	0.2990	0.0902	203	EPA Inhalation RfCi	0.0004
Naphthalene	91-20-3	11	1	2.4000	0.0448	0.57	EPA Inhalation RfCi	0.0783
Nonane	111-84-2	11	4	2.0200	0.0456	3.8	EPA Inhalation RfCi	0.0120
o-Xylene	95-47-6	11	8	2.1400	0.1642	23	EPA RSL Non-Cancer	0.0071
p-Diethylbenzene	105-05-5	11	4	0.9040	0.0386	45	TCEQ Long-Term AMCV	0.0009
Pentane	109-66-0	11	11	6.7868	0.7974	338	EPA Inhalation RfCi	0.0024
Propane	74-98-6	11	11	51.9000	2.7949	NA	NA	
Propylene	115-07-1	11	11	1.0500	0.2374	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	11	4	0.1230	0.101	5.9	EPA Inhalation RfCi	0.0171
Toluene	108-88-3	11	11	5.1200	0.6905	1,327	EPA Inhalation RfCi	0.0005
Trans-2-Butene	624-64-6	11	3	0.3460	0.0348	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	11	5	0.6580	0.0388	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	11	6	6.5900	0.1586	55	TCEQ Long-Term AMCV	0.0029
							Hazard Index	0.5526

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
CM2 - Suncor RBC | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	8	6	0.2580	0.1375	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	8	1	0.5274	0.0336	50	TCEQ Long-Term AMCV	0.0007
1-Pentene	109-67-1	8	3	0.7727	0.0359	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	8	4	0.1011	0.0841	12	EPA Inhalation RfCi	0.0069
1,2,4-Trimethylbenzene	95-63-6	8	5	0.2270	0.1103	12	EPA Inhalation RfCi	0.0090
1,3-Butadiene	106-99-0	8	5	0.1670	0.1633	0.95	EPA RSL Non-Cancer	0.1720
1,3,5-Trimethylbenzene	108-67-8	8	3	0.0956	0.0765	12	EPA Inhalation RfCi	0.0063
2-Ethyltoluene	611-14-3	8	1	0.0724	0.031	25	TCEQ Long-Term AMCV	0.0012
2-Methylheptane	592-27-8	8	2	0.0743	0.0313	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	8	3	0.2090	0.0327	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	8	7	12.2428	0.1963	190	TCEQ Long-Term AMCV	0.0010
2,2-Dimethylbutane	75-83-2	8	3	2.2430	0.0443	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	8	5	9.3200	0.1983	380	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylbutane	79-29-8	8	5	5.8296	0.2806	190	TCEQ Long-Term AMCV	0.0015
2,3-Dimethylpentane	565-59-3	8	6	2.1288	0.1489	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	8	2	0.0960	0.0709	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	8	5	0.3170	0.2649	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	8	4	0.2524	0.0667	25	TCEQ Long-Term AMCV	0.0027
3-Methylheptane	589-81-1	8	3	0.2395	0.1133	380	TCEQ Long-Term AMCV	0.0003
3-Methylhexane	589-34-4	8	5	0.3249	0.1327	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	8	7	7.2120	0.3326	190	TCEQ Long-Term AMCV	0.0018
4-Ethyltoluene	622-96-8	8	3	0.0922	0.0819	25	TCEQ Long-Term AMCV	0.0033
Acetylene	74-86-2	8	8	2.2800	0.3959	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	8	8	2.2000	0.3242	3	ATSDR Chronic MRL	0.1081
Butane	106-97-8	8	8	26.7503	2.4673	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	8	4	0.2850	0.2766	225	EPA Inhalation RfCi	0.0012
Cis-2-Butene	590-18-1	8	3	0.8368	0.0362	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	8	2	1.4242	0.039	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	8	7	11.1000	0.2285	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	8	6	2.2843	0.1834	590	TCEQ Long-Term AMCV	0.0003
Decane	124-18-5	8	4	0.1101	0.1078	190	TCEQ Long-Term AMCV	0.0006
Dodecane	112-40-3	8	2	0.1978	0.1915	3.8	CDPHE Chronic	0.0504
Ethane	74-84-0	8	8	18.5845	5.6153	NA	NA	
Ethylbenzene	100-41-4	8	5	0.5280	0.1364	230	EPA Inhalation RfCi	0.0006
Ethylene	74-85-1	8	8	3.0500	0.8838	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	8	8	2.2600	0.2692	98	EPA Inhalation RfCi	0.0028
Hexane	110-54-3	8	8	9.0500	0.4984	199	EPA Inhalation RfCi	0.0025
Isobutane	75-28-5	8	8	4.7847	0.9126	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	8	8	97.2967	3.002	8100	TCEQ Long-Term AMCV	0.0004
Isoprene	78-79-5	8	3	0.2506	0.0331	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	8	2	0.0839	0.0811	81	EPA Inhalation RfCi	0.0010
m-/p-Xylenes	108-38-3..	8	7	1.8500	0.2677	23	EPA RSL Non-Cancer	0.0116
m-Diethylbenzene	141-93-5	8	0	< 0.0637	0.0308	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	8	2	0.1537	0.0321	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	8	5	0.3950	0.0383	75	TCEQ Long-Term AMCV	0.0005
n-Octane	111-65-9	8	5	0.3820	0.1437	380	TCEQ Long-Term AMCV	0.0004
n-Propylbenzene	103-65-1	8	2	0.0997	0.077	203	EPA Inhalation RfCi	0.0004
Naphthalene	91-20-3	8	3	0.0727	0.0687	0.57	EPA Inhalation RfCi	0.1201
Nonane	111-84-2	8	5	0.1294	0.0942	3.8	EPA Inhalation RfCi	0.0247
o-Xylene	95-47-6	8	5	0.5830	0.1502	23	EPA RSL Non-Cancer	0.0065
p-Diethylbenzene	105-05-5	8	4	0.0991	0.0633	45	TCEQ Long-Term AMCV	0.0014
Pentane	109-66-0	8	8	32.2527	1.7617	338	EPA Inhalation RfCi	0.0052
Propane	74-98-6	8	8	14.6000	3.8629	NA	NA	
Propylene	115-07-1	8	8	0.5780	0.2828	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	8	3	0.1220	0.1115	5.9	EPA Inhalation RfCi	0.0189
Toluene	108-88-3	8	8	5.6300	0.7226	1,327	EPA Inhalation RfCi	0.0005
Trans-2-Butene	624-64-6	8	3	1.1033	0.0376	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	8	3	3.6620	0.0533	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	8	3	0.1204	0.1174	55	TCEQ Long-Term AMCV	0.0021
							Hazard Index	0.5705

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
CM3 - Adams High School | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	12	11	0.8931	0.0834	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	12	2	0.3664	0.0332	50	TCEQ Long-Term AMCV	0.0007
1-Pentene	109-67-1	12	3	4.4763	0.0568	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	12	5	0.1334	0.0327	12	EPA Inhalation RfCi	0.0027
1,2,4-Trimethylbenzene	95-63-6	12	7	0.2180	0.0344	12	EPA Inhalation RfCi	0.0028
1,3-Butadiene	106-99-0	12	7	0.2090	0.035	0.95	EPA RSL Non-Cancer	0.0369
1,3,5-Trimethylbenzene	108-67-8	12	3	0.1410	0.0321	12	EPA Inhalation RfCi	0.0026
2-Ethyltoluene	611-14-3	12	1	0.0813	0.0313	25	TCEQ Long-Term AMCV	0.0013
2-Methylheptane	592-27-8	12	3	0.4086	0.0335	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	12	4	2.2326	0.0452	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	12	11	0.6720	0.2544	190	TCEQ Long-Term AMCV	0.0013
2,2-Dimethylbutane	75-83-2	12	5	2.2300	0.0446	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	12	6	1.3900	0.042	380	TCEQ Long-Term AMCV	0.0001
2,3-Dimethylbutane	79-29-8	12	7	18.1862	0.1639	190	TCEQ Long-Term AMCV	0.0009
2,3-Dimethylpentane	565-59-3	12	5	1.3917	0.0416	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	12	2	0.3816	0.0331	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	12	7	1.3669	0.1283	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	12	8	0.4212	0.0683	25	TCEQ Long-Term AMCV	0.0027
3-Methylheptane	589-81-1	12	1	0.3427	0.0327	380	TCEQ Long-Term AMCV	0.0001
3-Methylhexane	589-34-4	12	6	2.1226	0.1313	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	12	9	10.2662	0.2848	190	TCEQ Long-Term AMCV	0.0015
4-Ethyltoluene	622-96-8	12	3	0.1540	0.0322	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	12	12	1.6800	0.5645	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	12	12	3.8700	0.1919	3	ATSDR Chronic MRL	0.0640
Butane	106-97-8	12	12	73.4023	1.5577	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	12	6	1.1100	0.082	225	EPA Inhalation RfCi	0.0004
Cis-2-Butene	590-18-1	12	4	6.1105	0.066	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	12	1	4.7134	0.0571	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	12	9	2.4500	0.0509	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	12	6	6.0125	0.1297	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	12	8	0.2920	0.0358	190	TCEQ Long-Term AMCV	0.0002
Dodecane	112-40-3	12	7	1.1500	0.0728	3.8	CDPHE Chronic	0.0192
Ethane	74-84-0	12	12	12.8000	5.6116	NA	NA	
Ethylbenzene	100-41-4	12	9	0.3520	0.0725	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	12	12	2.6500	0.7893	5300	TCEQ Long-Term AMCV	0.0001
Heptane	142-82-5	12	12	1.3600	0.1168	98	EPA Inhalation RfCi	0.0012
Hexane	110-54-3	12	12	7.9700	0.2451	199	EPA Inhalation RfCi	0.0012
Isobutane	75-28-5	12	12	10.0503	0.5273	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	12	11	136.5058	0.8962	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	12	3	0.3304	0.0336	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	12	1	0.1400	0.0316	81	EPA Inhalation RfCi	0.0004
m-/p-Xylenes	108-38-3..	12	10	1.1700	0.1826	23	EPA RSL Non-Cancer	0.0079
m-Diethylbenzene	141-93-5	12	1	0.0692	0.0668	45	TCEQ Long-Term AMCV	0.0015
Methylcyclohexane	108-87-2	12	6	1.4736	0.0418	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	12	9	6.9197	0.2396	75	TCEQ Long-Term AMCV	0.0032
n-Octane	111-65-9	12	6	0.2920	0.0346	380	TCEQ Long-Term AMCV	0.0001
n-Propylbenzene	103-65-1	12	3	0.1590	0.0323	203	EPA Inhalation RfCi	0.0002
Naphthalene	91-20-3	12	2	0.1060	0.0316	0.57	EPA Inhalation RfCi	0.0552
Nonane	111-84-2	12	7	0.2242	0.0345	3.8	EPA Inhalation RfCi	0.0090
o-Xylene	95-47-6	12	9	0.3380	0.0729	23	EPA RSL Non-Cancer	0.0032
p-Diethylbenzene	105-05-5	12	6	0.1940	0.0682	45	TCEQ Long-Term AMCV	0.0015
Pentane	109-66-0	12	12	45.9298	1.1427	338	EPA Inhalation RfCi	0.0034
Propane	74-98-6	12	12	7.7972	2.6177	NA	NA	
Propylene	115-07-1	12	12	0.6870	0.2014	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	12	3	0.3950	0.034	5.9	EPA Inhalation RfCi	0.0058
Toluene	108-88-3	12	12	4.9500	0.4739	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	12	3	3.9651	0.0548	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	12	3	9.4614	0.3004	560	TCEQ Long-Term AMCV	0.0005
Undecane	1120-21-4	12	8	0.1540	0.0642	55	TCEQ Long-Term AMCV	0.0012
							Hazard Index	0.2370

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
CM4 - Adams Middle School | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	9	6	0.7560	0.3326	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	9	0	< 0.1275	0.0624	50	TCEQ Long-Term AMCV	0.0012
1-Pentene	109-67-1	9	3	0.2660	0.0652	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	9	6	0.2136	0.2073	12	EPA Inhalation RfCi	0.0170
1,2,4-Trimethylbenzene	95-63-6	9	7	0.2800	0.162	12	EPA Inhalation RfCi	0.0133
1,3-Butadiene	106-99-0	9	6	0.3000	0.2907	0.95	EPA RSL Non-Cancer	0.3063
1,3,5-Trimethylbenzene	108-67-8	9	4	0.1450	0.141	12	EPA Inhalation RfCi	0.0116
2-Ethyltoluene	611-14-3	9	1	0.1275	0.0626	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	9	2	0.1770	0.0639	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	9	1	0.5640	0.0654	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	9	5	2.8900	0.091	190	TCEQ Long-Term AMCV	0.0005
2,2-Dimethylbutane	75-83-2	9	3	0.2530	0.0649	190	TCEQ Long-Term AMCV	0.0003
2,2,4-Trimethylpentane	540-84-1	9	6	0.2260	0.1496	380	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylbutane	79-29-8	9	5	0.5710	0.233	190	TCEQ Long-Term AMCV	0.0012
2,3-Dimethylpentane	565-59-3	9	8	0.4100	0.3623	2200	TCEQ Long-Term AMCV	0.0002
2,3,4-Trimethylpentane	565-75-3	9	2	0.1764	0.17	380	TCEQ Long-Term AMCV	0.0004
2,4-Dimethylpentane	108-08-7	9	5	0.3920	0.3585	2200	TCEQ Long-Term AMCV	0.0002
3-Ethyltoluene	620-14-4	9	5	0.1900	0.0652	25	TCEQ Long-Term AMCV	0.0026
3-Methylheptane	589-81-1	9	2	0.1450	0.1356	380	TCEQ Long-Term AMCV	0.0004
3-Methylhexane	589-34-4	9	3	0.6110	0.1868	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	9	4	1.8100	0.0751	190	TCEQ Long-Term AMCV	0.0004
4-Ethyltoluene	622-96-8	9	2	0.1340	0.0635	25	TCEQ Long-Term AMCV	0.0025
Acetylene	74-86-2	9	9	4.6400	0.4304	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	9	9	0.8520	0.5163	3	ATSDR Chronic MRL	0.1721
Butane	106-97-8	9	9	13.8000	1.8406	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	9	4	0.6210	0.5956	225	EPA Inhalation RfCi	0.0026
Cis-2-Butene	590-18-1	9	4	0.8080	0.0708	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	9	2	0.1610	0.0638	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	9	9	1.0400	0.2287	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	9	4	0.8290	0.3966	590	TCEQ Long-Term AMCV	0.0007
Decane	124-18-5	9	6	0.3184	0.3077	190	TCEQ Long-Term AMCV	0.0016
Dodecane	112-40-3	9	5	0.5984	0.5741	3.8	CDPHE Chronic	0.1511
Ethane	74-84-0	9	9	52.2000	6.0367	NA	NA	
Ethylbenzene	100-41-4	9	7	0.2650	0.219	230	EPA Inhalation RfCi	0.0010
Ethylene	74-85-1	9	9	6.5700	1.48	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	9	8	0.7200	0.3278	98	EPA Inhalation RfCi	0.0034
Hexane	110-54-3	9	9	3.0500	0.5402	199	EPA Inhalation RfCi	0.0027
Isobutane	75-28-5	9	9	6.8000	1.221	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	9	8	13.5000	4.3467	8100	TCEQ Long-Term AMCV	0.0005
Isoprene	78-79-5	9	2	0.1275	0.0632	140	TCEQ Long-Term AMCV	0.0005
Isopropylbenzene	98-82-8	9	2	0.1360	0.1319	81	EPA Inhalation RfCi	0.0016
m-/p-Xylenes	108-38-3..	9	8	0.7810	0.3906	23	EPA RSL Non-Cancer	0.0170
m-Diethylbenzene	141-93-5	9	0	< 0.1275	0.0624	45	TCEQ Long-Term AMCV	0.0014
Methylcyclohexane	108-87-2	9	2	0.5560	0.0661	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	9	3	1.3300	0.0722	75	TCEQ Long-Term AMCV	0.0010
n-Octane	111-65-9	9	6	0.2160	0.2113	380	TCEQ Long-Term AMCV	0.0006
n-Propylbenzene	103-65-1	9	3	0.1360	0.1322	203	EPA Inhalation RfCi	0.0006
Naphthalene	91-20-3	9	3	0.1280	0.0634	0.57	EPA Inhalation RfCi	0.1108
Nonane	111-84-2	9	6	0.1750	0.1582	3.8	EPA Inhalation RfCi	0.0415
o-Xylene	95-47-6	9	7	0.2730	0.2439	23	EPA RSL Non-Cancer	0.0106
p-Diethylbenzene	105-05-5	9	4	0.1275	0.0633	45	TCEQ Long-Term AMCV	0.0014
Pentane	109-66-0	9	8	12.0000	3.2423	338	EPA Inhalation RfCi	0.0096
Propane	74-98-6	9	9	51.6000	3.6246	NA	NA	
Propylene	115-07-1	9	9	3.2800	0.432	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	9	5	0.1970	0.1908	5.9	EPA Inhalation RfCi	0.0324
Toluene	108-88-3	9	9	1.7400	1.1823	1,327	EPA Inhalation RfCi	0.0009
Trans-2-Butene	624-64-6	9	5	0.7620	0.0717	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	9	3	0.4990	0.0666	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	9	6	0.2973	0.2876	55	TCEQ Long-Term AMCV	0.0052
							Hazard Index	0.9338

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
CM5 - Central | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	10	6	0.4270	0.0352	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	10	0	< 0.0654	0.0307	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	10	2	0.1180	0.0317	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	10	3	0.1140	0.1102	12	EPA Inhalation RfCi	0.0090
1,2,4-Trimethylbenzene	95-63-6	10	5	0.1250	0.0777	12	EPA Inhalation RfCi	0.0064
1,3-Butadiene	106-99-0	10	7	0.1840	0.1786	0.95	EPA RSL Non-Cancer	0.1882
1,3,5-Trimethylbenzene	108-67-8	10	2	0.0867	0.0726	12	EPA Inhalation RfCi	0.0059
2-Ethyltoluene	611-14-3	10	0	< 0.0654	0.0307	25	TCEQ Long-Term AMCV	0.0012
2-Methylheptane	592-27-8	10	1	0.1190	0.0312	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	10	5	0.3600	0.0354	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	10	9	0.9510	0.0943	190	TCEQ Long-Term AMCV	0.0005
2,2-Dimethylbutane	75-83-2	10	1	0.1030	0.0315	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	10	6	0.2070	0.1115	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	10	5	0.1830	0.0696	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	10	6	0.2390	0.1275	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	10	1	0.0674	0.0309	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	10	5	0.3100	0.1974	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	10	6	0.1320	0.0733	25	TCEQ Long-Term AMCV	0.0029
3-Methylheptane	589-81-1	10	2	0.0760	0.07	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	10	8	0.4030	0.0903	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	10	8	0.5871	0.1849	190	TCEQ Long-Term AMCV	0.0010
4-Ethyltoluene	622-96-8	10	2	0.0909	0.0709	25	TCEQ Long-Term AMCV	0.0028
Acetylene	74-86-2	10	10	1.9300	0.4965	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	10	10	0.4050	0.2229	3	ATSDR Chronic MRL	0.0743
Butane	106-97-8	10	10	6.2000	1.3923	10000	TCEQ Long-Term AMCV	0.0001
Carbon disulfide	75-15-0	10	3	0.2670	0.2559	225	EPA Inhalation RfCi	0.0011
Cis-2-Butene	590-18-1	10	1	0.1890	0.0316	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	10	1	0.0667	0.0309	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	10	8	0.4450	0.1283	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	10	7	0.2250	0.0353	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	10	3	0.1424	0.1376	190	TCEQ Long-Term AMCV	0.0007
Dodecane	112-40-3	10	4	0.2479	0.238	3.8	CDPHE Chronic	0.0626
Ethane	74-84-0	10	10	17.6000	5.29	NA	NA	
Ethylbenzene	100-41-4	10	5	0.1790	0.1405	230	EPA Inhalation RfCi	0.0006
Ethylene	74-85-1	10	10	3.4600	0.706	5300	TCEQ Long-Term AMCV	0.0001
Heptane	142-82-5	10	8	0.4440	0.2166	98	EPA Inhalation RfCi	0.0022
Hexane	110-54-3	10	10	0.8300	0.336	199	EPA Inhalation RfCi	0.0017
Isobutane	75-28-5	10	10	1.9600	0.5223	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	10	10	3.9000	1.765	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	10	4	0.2030	0.0332	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	10	2	0.0893	0.0632	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3..	10	10	0.4770	0.298	23	EPA RSL Non-Cancer	0.0130
m-Diethylbenzene	141-93-5	10	1	0.0722	0.0309	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	10	4	0.4160	0.0344	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	10	6	0.7980	0.0405	75	TCEQ Long-Term AMCV	0.0005
n-Octane	111-65-9	10	5	0.1470	0.1001	380	TCEQ Long-Term AMCV	0.0003
n-Propylbenzene	103-65-1	10	2	0.1010	0.0748	203	EPA Inhalation RfCi	0.0004
Naphthalene	91-20-3	10	1	0.0673	0.0655	0.57	EPA Inhalation RfCi	0.1145
Nonane	111-84-2	10	4	0.1130	0.0997	3.8	EPA Inhalation RfCi	0.0262
o-Xylene	95-47-6	10	6	0.1570	0.1491	23	EPA RSL Non-Cancer	0.0065
p-Diethylbenzene	105-05-5	10	3	0.0853	0.0314	45	TCEQ Long-Term AMCV	0.0007
Pentane	109-66-0	10	10	2.5400	0.8439	338	EPA Inhalation RfCi	0.0025
Propane	74-98-6	10	10	7.1437	3.1479	NA	NA	
Propylene	115-07-1	10	10	0.6940	0.1923	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	10	3	0.1210	0.0949	5.9	EPA Inhalation RfCi	0.0161
Toluene	108-88-3	10	10	1.1300	0.5833	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	10	2	0.2290	0.0327	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	10	3	0.3860	0.0363	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	10	6	0.1502	0.1459	55	TCEQ Long-Term AMCV	0.0027
							Hazard Index	0.5499

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
CM6 - Focus | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	7	3	0.2310	0.0332	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	7	0	< 0.0637	0.0314	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	7	3	0.1017	0.0997	560	TCEQ Long-Term AMCV	0.0002
1,2,3-Trimethylbenzene	526-73-8	7	1	0.0812	0.0795	12	EPA Inhalation RfCi	0.0065
1,2,4-Trimethylbenzene	95-63-6	7	3	0.1030	0.0698	12	EPA Inhalation RfCi	0.0057
1,3-Butadiene	106-99-0	7	3	0.1690	0.1134	0.95	EPA RSL Non-Cancer	0.1195
1,3,5-Trimethylbenzene	108-67-8	7	1	0.0906	0.0317	12	EPA Inhalation RfCi	0.0026
2-Ethyltoluene	611-14-3	7	0	< 0.0637	0.0314	25	TCEQ Long-Term AMCV	0.0013
2-Methylheptane	592-27-8	7	0	< 0.0637	0.0314	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	7	3	0.1240	0.0327	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	7	5	0.3970	0.2909	190	TCEQ Long-Term AMCV	0.0015
2,2-Dimethylbutane	75-83-2	7	3	0.0833	0.0321	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	7	5	0.1540	0.0653	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	7	5	0.1160	0.0781	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	7	4	0.1330	0.1177	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	7	0	< 0.0637	0.0314	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	7	3	0.2435	0.1135	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	7	4	0.1260	0.0711	25	TCEQ Long-Term AMCV	0.0028
3-Methylheptane	589-81-1	7	1	0.0809	0.0317	380	TCEQ Long-Term AMCV	0.0001
3-Methylhexane	589-34-4	7	4	0.1456	0.1431	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	7	4	0.3580	0.0949	190	TCEQ Long-Term AMCV	0.0005
4-Ethyltoluene	622-96-8	7	1	0.0923	0.0317	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	7	7	2.5200	0.4387	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	7	7	0.3710	0.1698	3	ATSDR Chronic MRL	0.0566
Butane	106-97-8	7	7	4.1300	1.0683	10000	TCEQ Long-Term AMCV	0.0001
Carbon disulfide	75-15-0	7	2	0.1300	0.0951	225	EPA Inhalation RfCi	0.0004
Cis-2-Butene	590-18-1	7	2	0.1260	0.0322	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	7	0	< 0.0637	0.0314	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	7	7	0.2480	0.0702	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	7	6	0.4370	0.0875	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	7	2	0.1119	0.1094	190	TCEQ Long-Term AMCV	0.0006
Dodecane	112-40-3	7	3	0.1510	0.1013	3.8	CDPHE Chronic	0.0267
Ethane	74-84-0	7	7	15.5000	6.4049	NA	NA	
Ethylbenzene	100-41-4	7	5	0.1639	0.1055	230	EPA Inhalation RfCi	0.0005
Ethylene	74-85-1	7	7	2.8700	0.7762	5300	TCEQ Long-Term AMCV	0.0001
Heptane	142-82-5	7	7	0.3180	0.2054	98	EPA Inhalation RfCi	0.0021
Hexane	110-54-3	7	7	0.5880	0.301	199	EPA Inhalation RfCi	0.0015
Isobutane	75-28-5	7	7	1.4000	0.4762	10000	TCEQ Long-Term AMCV	0.0000
Isopentane	78-78-4	7	6	1.6034	0.0715	8100	TCEQ Long-Term AMCV	0.0000
Isoprene	78-79-5	7	2	0.1070	0.0321	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	7	1	0.0887	0.0317	81	EPA Inhalation RfCi	0.0004
m-/p-Xylenes	108-38-3..	7	7	0.6290	0.3144	23	EPA RSL Non-Cancer	0.0137
m-Diethylbenzene	141-93-5	7	0	< 0.0637	0.0314	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	7	3	0.1340	0.0327	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	7	5	0.2660	0.2208	75	TCEQ Long-Term AMCV	0.0029
n-Octane	111-65-9	7	3	0.1310	0.1072	380	TCEQ Long-Term AMCV	0.0003
n-Propylbenzene	103-65-1	7	1	0.0978	0.0318	203	EPA Inhalation RfCi	0.0002
Naphthalene	91-20-3	7	2	0.0717	0.0318	0.57	EPA Inhalation RfCi	0.0556
Nonane	111-84-2	7	3	0.1106	0.1086	3.8	EPA Inhalation RfCi	0.0285
o-Xylene	95-47-6	7	5	0.1634	0.1276	23	EPA RSL Non-Cancer	0.0055
p-Diethylbenzene	105-05-5	7	2	0.0822	0.032	45	TCEQ Long-Term AMCV	0.0007
Pentane	109-66-0	7	7	1.4400	0.9714	338	EPA Inhalation RfCi	0.0029
Propane	74-98-6	7	7	8.7800	3.1103	NA	NA	
Propylene	115-07-1	7	7	0.5650	0.2157	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	7	1	0.1250	0.0319	5.9	EPA Inhalation RfCi	0.0054
Toluene	108-88-3	7	7	0.5520	0.5134	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	7	1	0.0675	0.0316	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	7	3	0.5080	0.351	560	TCEQ Long-Term AMCV	0.0006
Undecane	1120-21-4	7	2	0.1461	0.1125	55	TCEQ Long-Term AMCV	0.0020
							Hazard Index	0.3531

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
CM7 - Kearney | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	8	4	0.1650	0.0325	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	8	0	< 0.0640	0.0308	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	8	2	0.0908	0.0313	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	8	4	0.1290	0.0707	12	EPA Inhalation RfCi	0.0058
1,2,4-Trimethylbenzene	95-63-6	8	6	0.3480	0.1012	12	EPA Inhalation RfCi	0.0083
1,3-Butadiene	106-99-0	8	5	0.1590	0.1354	0.95	EPA RSL Non-Cancer	0.1426
1,3,5-Trimethylbenzene	108-67-8	8	3	0.0917	0.0706	12	EPA Inhalation RfCi	0.0058
2-Ethyltoluene	611-14-3	8	1	0.0888	0.0311	25	TCEQ Long-Term AMCV	0.0012
2-Methylheptane	592-27-8	8	1	0.0813	0.0793	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	8	2	0.1221	0.0317	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	8	7	1.0626	0.1739	190	TCEQ Long-Term AMCV	0.0009
2,2-Dimethylbutane	75-83-2	8	3	0.1432	0.032	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	8	5	0.2330	0.1073	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	8	7	0.3066	0.196	190	TCEQ Long-Term AMCV	0.0010
2,3-Dimethylpentane	565-59-3	8	5	0.3140	0.099	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	8	1	0.1536	0.1487	380	TCEQ Long-Term AMCV	0.0004
2,4-Dimethylpentane	108-08-7	8	4	0.6681	0.1828	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	8	4	0.2838	0.0334	25	TCEQ Long-Term AMCV	0.0013
3-Methylheptane	589-81-1	8	2	0.1747	0.1691	380	TCEQ Long-Term AMCV	0.0004
3-Methylhexane	589-34-4	8	4	0.1326	0.0688	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	8	6	0.8349	0.2797	190	TCEQ Long-Term AMCV	0.0015
4-Ethyltoluene	622-96-8	8	3	0.0970	0.0718	25	TCEQ Long-Term AMCV	0.0029
Acetylene	74-86-2	8	8	1.9700	0.3847	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	8	8	0.4600	0.2251	3	ATSDR Chronic MRL	0.0750
Butane	106-97-8	8	8	4.2300	1.0926	10000	TCEQ Long-Term AMCV	0.0001
Carbon disulfide	75-15-0	8	2	0.6330	0.6095	225	EPA Inhalation RfCi	0.0027
Cis-2-Butene	590-18-1	8	3	0.2570	0.0325	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	8	2	0.0864	0.0314	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	8	8	0.6790	0.1095	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	8	4	0.3340	0.034	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	8	4	0.2430	0.1721	190	TCEQ Long-Term AMCV	0.0009
Dodecane	112-40-3	8	4	0.2477	0.2404	3.8	CDPHE Chronic	0.0633
Ethane	74-84-0	8	8	15.2000	5.1076	NA	NA	
Ethylbenzene	100-41-4	8	7	0.3850	0.1289	230	EPA Inhalation RfCi	0.0006
Ethylene	74-85-1	8	8	3.2100	0.6594	5300	TCEQ Long-Term AMCV	0.0001
Heptane	142-82-5	8	8	0.4760	0.1653	98	EPA Inhalation RfCi	0.0017
Hexane	110-54-3	8	8	0.9990	0.2683	199	EPA Inhalation RfCi	0.0014
Isobutane	75-28-5	8	7	1.3100	0.5225	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	8	8	3.0129	1.9644	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	8	1	0.0798	0.0311	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	8	2	0.0814	0.0621	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3..	8	8	0.9620	0.2813	23	EPA RSL Non-Cancer	0.0122
m-Diethylbenzene	141-93-5	8	0	< 0.0640	0.0308	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	8	2	0.1060	0.0316	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	8	4	0.3870	0.0372	75	TCEQ Long-Term AMCV	0.0005
n-Octane	111-65-9	8	5	0.2570	0.0872	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	8	3	0.0948	0.074	203	EPA Inhalation RfCi	0.0004
Naphthalene	91-20-3	8	2	0.0743	0.0629	0.57	EPA Inhalation RfCi	0.1099
Nonane	111-84-2	8	5	0.1931	0.0776	3.8	EPA Inhalation RfCi	0.0204
o-Xylene	95-47-6	8	6	0.3580	0.143	23	EPA RSL Non-Cancer	0.0062
p-Diethylbenzene	105-05-5	8	5	0.0958	0.0632	45	TCEQ Long-Term AMCV	0.0014
Pentane	109-66-0	8	8	2.4129	0.7042	338	EPA Inhalation RfCi	0.0021
Propane	74-98-6	8	8	8.2200	2.8213	NA	NA	
Propylene	115-07-1	8	8	0.6030	0.172	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	8	2	0.1090	0.0922	5.9	EPA Inhalation RfCi	0.0156
Toluene	108-88-3	8	8	1.7300	0.5117	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	8	2	0.2080	0.0321	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	8	2	0.4340	0.0348	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	8	5	0.1494	0.1221	55	TCEQ Long-Term AMCV	0.0022
							Hazard Index	0.4936

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
CM8 - Monroe | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	7	5	0.5750	0.1651	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	7	0	< 0.0631	0.0313	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	7	3	0.3190	0.0344	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	7	5	0.1929	0.1392	12	EPA Inhalation RfCi	0.0114
1,2,4-Trimethylbenzene	95-63-6	7	4	0.3050	0.1253	12	EPA Inhalation RfCi	0.0103
1,3-Butadiene	106-99-0	7	3	0.1580	0.1317	0.95	EPA RSL Non-Cancer	0.1387
1,3,5-Trimethylbenzene	108-67-8	7	3	0.1120	0.0805	12	EPA Inhalation RfCi	0.0066
2-Ethyltoluene	611-14-3	7	1	0.1495	0.032	25	TCEQ Long-Term AMCV	0.0013
2-Methylheptane	592-27-8	7	2	0.2500	0.0328	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	7	2	0.7290	0.0356	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	7	5	3.4800	0.1147	190	TCEQ Long-Term AMCV	0.0006
2,2-Dimethylbutane	75-83-2	7	2	0.3590	0.0336	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	7	4	0.2370	0.0799	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	7	6	0.7560	0.3111	190	TCEQ Long-Term AMCV	0.0016
2,3-Dimethylpentane	565-59-3	7	6	0.2870	0.1471	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	7	1	0.0631	0.0315	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	7	6	0.3310	0.258	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	7	4	0.1490	0.0684	25	TCEQ Long-Term AMCV	0.0027
3-Methylheptane	589-81-1	7	3	0.2370	0.1343	380	TCEQ Long-Term AMCV	0.0004
3-Methylhexane	589-34-4	7	3	0.7240	0.1179	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	7	6	2.0500	0.271	190	TCEQ Long-Term AMCV	0.0014
4-Ethyltoluene	622-96-8	7	3	0.1180	0.0659	25	TCEQ Long-Term AMCV	0.0026
Acetylene	74-86-2	7	7	1.9900	0.4388	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	7	7	1.1100	0.3097	3	ATSDR Chronic MRL	0.1032
Butane	106-97-8	7	7	14.7000	2.3009	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	7	4	0.2810	0.2265	225	EPA Inhalation RfCi	0.0010
Cis-2-Butene	590-18-1	7	2	1.1500	0.0396	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	7	2	0.2860	0.0331	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	7	6	1.4200	0.1461	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	7	4	0.8760	0.0406	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	7	5	0.1960	0.1522	190	TCEQ Long-Term AMCV	0.0008
Dodecane	112-40-3	7	3	0.1573	0.1114	3.8	CDPHE Chronic	0.0293
Ethane	74-84-0	7	7	20.2000	5.6115	NA	NA	
Ethylbenzene	100-41-4	7	4	0.2960	0.1187	230	EPA Inhalation RfCi	0.0005
Ethylene	74-85-1	7	7	2.9300	0.884	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	7	6	0.7600	0.1963	98	EPA Inhalation RfCi	0.0020
Hexane	110-54-3	7	7	3.2600	0.5026	199	EPA Inhalation RfCi	0.0025
Isobutane	75-28-5	7	7	5.9600	0.9526	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	7	7	17.9000	2.5564	8100	TCEQ Long-Term AMCV	0.0003
Isoprene	78-79-5	7	2	0.0910	0.0318	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	7	1	0.0976	0.0317	81	EPA Inhalation RfCi	0.0004
m-/p-Xylenes	108-38-3..	7	6	1.0900	0.2484	23	EPA RSL Non-Cancer	0.0108
m-Diethylbenzene	141-93-5	7	1	0.1197	0.0318	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	7	3	0.6090	0.036	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	7	3	1.3300	0.0414	75	TCEQ Long-Term AMCV	0.0006
n-Octane	111-65-9	7	4	0.2930	0.1022	380	TCEQ Long-Term AMCV	0.0003
n-Propylbenzene	103-65-1	7	3	0.1150	0.0699	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	7	1	0.0776	0.0316	0.57	EPA Inhalation RfCi	0.0552
Nonane	111-84-2	7	5	0.2130	0.086	3.8	EPA Inhalation RfCi	0.0226
o-Xylene	95-47-6	7	4	0.3670	0.1384	23	EPA RSL Non-Cancer	0.0060
p-Diethylbenzene	105-05-5	7	4	0.1431	0.0723	45	TCEQ Long-Term AMCV	0.0016
Pentane	109-66-0	7	7	11.8000	1.6017	338	EPA Inhalation RfCi	0.0047
Propane	74-98-6	7	7	38.3000	7.9049	NA	NA	
Propylene	115-07-1	7	7	2.3200	0.2346	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	7	2	0.1210	0.1088	5.9	EPA Inhalation RfCi	0.0184
Toluene	108-88-3	7	7	2.1600	0.5922	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	7	2	1.2100	0.0405	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	7	3	0.6890	0.0376	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	7	5	0.1669	0.1303	55	TCEQ Long-Term AMCV	0.0024
							Hazard Index	0.4449

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
CM9 - 48th and Race | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	6	4	2.1289	0.0461	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	6	1	0.0712	0.0324	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	6	3	0.1010	0.0333	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	6	4	0.1480	0.1264	12	EPA Inhalation RfCi	0.0104
1,2,4-Trimethylbenzene	95-63-6	6	5	1.3060	0.207	12	EPA Inhalation RfCi	0.0170
1,3-Butadiene	106-99-0	6	5	0.2430	0.1581	0.95	EPA RSL Non-Cancer	0.1666
1,3,5-Trimethylbenzene	108-67-8	6	3	0.4977	0.1022	12	EPA Inhalation RfCi	0.0084
2-Ethyltoluene	611-14-3	6	1	0.0923	0.0325	25	TCEQ Long-Term AMCV	0.0013
2-Methylheptane	592-27-8	6	0	< 0.0691	0.0322	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	6	1	0.1367	0.0328	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	6	6	1.4100	0.1011	190	TCEQ Long-Term AMCV	0.0005
2,2-Dimethylbutane	75-83-2	6	3	0.1360	0.0336	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	6	5	0.7190	0.136	380	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylbutane	79-29-8	6	4	0.3480	0.2045	190	TCEQ Long-Term AMCV	0.0011
2,3-Dimethylpentane	565-59-3	6	4	0.2330	0.1809	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	6	0	< 0.0691	0.0322	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	6	4	0.8150	0.2233	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	6	4	0.3210	0.112	25	TCEQ Long-Term AMCV	0.0045
3-Methylheptane	589-81-1	6	0	< 0.0691	0.0322	380	TCEQ Long-Term AMCV	0.0001
3-Methylhexane	589-34-4	6	3	0.2008	0.0341	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	6	5	0.7580	0.2286	190	TCEQ Long-Term AMCV	0.0012
4-Ethyltoluene	622-96-8	6	3	0.4250	0.0862	25	TCEQ Long-Term AMCV	0.0034
Acetylene	74-86-2	6	6	2.6700	0.4009	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	6	6	0.5590	0.2319	3	ATSDR Chronic MRL	0.0773
Butane	106-97-8	6	6	25.8908	2.4405	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	6	3	0.3960	0.3872	225	EPA Inhalation RfCi	0.0017
Cis-2-Butene	590-18-1	6	3	0.1530	0.0335	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	6	2	0.1110	0.0329	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	6	5	1.2270	0.1504	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	6	4	0.5250	0.0385	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	6	4	0.1786	0.1757	190	TCEQ Long-Term AMCV	0.0009
Dodecane	112-40-3	6	5	0.2658	0.2615	3.8	CDPHE Chronic	0.0688
Ethane	74-84-0	6	6	42.8000	23.056	NA	NA	
Ethylbenzene	100-41-4	6	5	2.6500	0.2156	230	EPA Inhalation RfCi	0.0009
Ethylene	74-85-1	6	6	4.4400	0.6902	5300	TCEQ Long-Term AMCV	0.0001
Heptane	142-82-5	6	6	1.0710	0.2068	98	EPA Inhalation RfCi	0.0021
Hexane	110-54-3	6	6	1.8900	0.362	199	EPA Inhalation RfCi	0.0018
Isobutane	75-28-5	6	6	7.1775	0.8701	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	6	6	26.3798	7.3021	8100	TCEQ Long-Term AMCV	0.0009
Isoprene	78-79-5	6	0	< 0.0691	0.0322	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	6	2	0.0952	0.0731	81	EPA Inhalation RfCi	0.0009
m-/p-Xylenes	108-38-3..	6	6	10.5000	0.583	23	EPA RSL Non-Cancer	0.0253
m-Diethylbenzene	141-93-5	6	0	< 0.0691	0.0322	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	6	2	0.1210	0.033	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	6	1	0.4560	0.0347	75	TCEQ Long-Term AMCV	0.0005
n-Octane	111-65-9	6	5	0.8630	0.1201	380	TCEQ Long-Term AMCV	0.0003
n-Propylbenzene	103-65-1	6	3	0.3710	0.0966	203	EPA Inhalation RfCi	0.0005
Naphthalene	91-20-3	6	3	0.1300	0.0732	0.57	EPA Inhalation RfCi	0.1279
Nonane	111-84-2	6	4	0.1640	0.082	3.8	EPA Inhalation RfCi	0.0215
o-Xylene	95-47-6	6	5	2.7800	0.2524	23	EPA RSL Non-Cancer	0.0110
p-Diethylbenzene	105-05-5	6	2	0.0871	0.0857	45	TCEQ Long-Term AMCV	0.0019
Pentane	109-66-0	6	6	61.1000	11.6481	338	EPA Inhalation RfCi	0.0344
Propane	74-98-6	6	6	69.2857	6.1528	NA	NA	
Propylene	115-07-1	6	6	0.9850	0.2827	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	6	3	0.1280	0.1049	5.9	EPA Inhalation RfCi	0.0178
Toluene	108-88-3	6	6	23.8000	1.3701	1,327	EPA Inhalation RfCi	0.0010
Trans-2-Butene	624-64-6	6	3	0.1760	0.0337	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	6	2	0.4180	0.036	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	6	4	0.1814	0.1788	55	TCEQ Long-Term AMCV	0.0033
							Hazard Index	0.6190

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
CM10 - Alsup Elementary School | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	6	3	0.1561	0.0622	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	6	0	< 0.0669	0.0308	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	6	2	0.1497	0.0319	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	6	2	0.1275	0.1251	12	EPA Inhalation RfCi	0.0103
1,2,4-Trimethylbenzene	95-63-6	6	2	0.1080	0.0316	12	EPA Inhalation RfCi	0.0026
1,3-Butadiene	106-99-0	6	3	0.1610	0.1389	0.95	EPA RSL Non-Cancer	0.1463
1,3,5-Trimethylbenzene	108-67-8	6	2	0.1120	0.0698	12	EPA Inhalation RfCi	0.0057
2-Ethyltoluene	611-14-3	6	1	0.0669	0.0619	25	TCEQ Long-Term AMCV	0.0025
2-Methylheptane	592-27-8	6	2	0.6137	0.5973	380	TCEQ Long-Term AMCV	0.0016
2-Methylhexane	591-76-4	6	1	0.3637	0.0327	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	6	5	0.8565	0.0958	190	TCEQ Long-Term AMCV	0.0005
2,2-Dimethylbutane	75-83-2	6	1	0.1209	0.0313	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	6	4	0.1590	0.0983	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	6	4	0.3135	0.1744	190	TCEQ Long-Term AMCV	0.0009
2,3-Dimethylpentane	565-59-3	6	3	0.1862	0.1005	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	6	1	0.0713	0.0311	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	6	6	0.2500	0.2084	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	6	2	0.1705	0.1248	25	TCEQ Long-Term AMCV	0.0050
3-Methylheptane	589-81-1	6	2	0.0954	0.0939	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	6	2	0.4185	0.0753	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	6	4	0.7203	0.0365	190	TCEQ Long-Term AMCV	0.0002
4-Ethyltoluene	622-96-8	6	2	0.1140	0.067	25	TCEQ Long-Term AMCV	0.0027
Acetylene	74-86-2	6	6	1.1820	0.4178	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	6	6	0.3870	0.2226	3	ATSDR Chronic MRL	0.0742
Butane	106-97-8	6	6	4.2000	1.2548	10000	TCEQ Long-Term AMCV	0.0001
Carbon disulfide	75-15-0	6	2	0.2920	0.2851	225	EPA Inhalation RfCi	0.0013
Cis-2-Butene	590-18-1	6	1	0.1847	0.0317	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	6	1	0.0794	0.0311	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	6	5	0.2650	0.1395	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	6	4	0.2066	0.2034	590	TCEQ Long-Term AMCV	0.0003
Decane	124-18-5	6	3	0.1173	0.1155	190	TCEQ Long-Term AMCV	0.0006
Dodecane	112-40-3	6	4	0.2646	0.2591	3.8	CDPHE Chronic	0.0682
Ethane	74-84-0	6	6	15.3000	4.8565	NA	NA	
Ethylbenzene	100-41-4	6	3	0.1420	0.1236	230	EPA Inhalation RfCi	0.0005
Ethylene	74-85-1	6	6	1.8603	0.8211	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	6	6	0.2980	0.1612	98	EPA Inhalation RfCi	0.0017
Hexane	110-54-3	6	6	0.6320	0.3123	199	EPA Inhalation RfCi	0.0016
Isobutane	75-28-5	6	6	1.3800	0.5292	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	6	6	3.4322	1.7818	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	6	2	0.2941	0.033	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	6	1	0.0952	0.0312	81	EPA Inhalation RfCi	0.0004
m-/p-Xylenes	108-38-3..	6	6	0.4240	0.2428	23	EPA RSL Non-Cancer	0.0106
m-Diethylbenzene	141-93-5	6	0	< 0.0669	0.0308	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	6	2	0.2669	0.0328	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	6	1	0.5154	0.0336	75	TCEQ Long-Term AMCV	0.0004
n-Octane	111-65-9	6	3	0.1360	0.0919	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	6	2	0.1100	0.0729	203	EPA Inhalation RfCi	0.0004
Naphthalene	91-20-3	6	1	0.0797	0.0311	0.57	EPA Inhalation RfCi	0.0543
Nonane	111-84-2	6	2	0.1161	0.065	3.8	EPA Inhalation RfCi	0.0170
o-Xylene	95-47-6	6	4	0.1730	0.121	23	EPA RSL Non-Cancer	0.0053
p-Diethylbenzene	105-05-5	6	1	0.0883	0.0867	45	TCEQ Long-Term AMCV	0.0019
Pentane	109-66-0	6	6	2.3448	0.828	338	EPA Inhalation RfCi	0.0024
Propane	74-98-6	6	6	8.8000	3.4697	NA	NA	
Propylene	115-07-1	6	6	0.4478	0.1959	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	6	3	0.1130	0.0964	5.9	EPA Inhalation RfCi	0.0163
Toluene	108-88-3	6	6	3.6300	0.5941	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	6	1	0.1724	0.0316	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	6	1	0.1049	0.0312	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	6	3	0.1504	0.1479	55	TCEQ Long-Term AMCV	0.0027
							Hazard Index	**0.4428**

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
BFD- Brighton | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	6	3	0.2320	0.0683	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	6	1	0.0869	0.0316	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	6	1	0.1670	0.0321	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	6	3	0.1580	0.0721	12	EPA Inhalation RfCi	0.0059
1,2,4-Trimethylbenzene	95-63-6	6	5	0.1140	0.0328	12	EPA Inhalation RfCi	0.0027
1,3-Butadiene	106-99-0	6	3	0.1700	0.1085	0.95	EPA RSL Non-Cancer	0.1143
1,3,5-Trimethylbenzene	108-67-8	6	2	0.0888	0.0642	12	EPA Inhalation RfCi	0.0053
2-Ethyltoluene	611-14-3	6	0	< 0.0628	0.0313	25	TCEQ Long-Term AMCV	0.0013
2-Methylheptane	592-27-8	6	1	0.0733	0.0315	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	6	1	0.1690	0.0321	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	6	2	0.6370	0.0375	190	TCEQ Long-Term AMCV	0.0002
2,2-Dimethylbutane	75-83-2	6	1	0.0923	0.0316	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	6	4	0.1310	0.0328	380	TCEQ Long-Term AMCV	0.0001
2,3-Dimethylbutane	79-29-8	6	4	0.1540	0.0822	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	6	4	0.1800	0.0844	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	6	0	< 0.0628	0.0313	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	6	5	0.3270	0.1778	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	6	1	0.0998	0.0317	25	TCEQ Long-Term AMCV	0.0013
3-Methylheptane	589-81-1	6	1	0.0718	0.0315	380	TCEQ Long-Term AMCV	0.0001
3-Methylhexane	589-34-4	6	3	0.1890	0.0681	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	6	4	0.5020	0.2593	190	TCEQ Long-Term AMCV	0.0014
4-Ethyltoluene	622-96-8	6	1	0.0902	0.0317	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	6	5	2.4300	0.2932	2500	TCEQ Long-Term AMCV	0.0001
Benzene	71-43-2	6	6	0.3980	0.1869	3	ATSDR Chronic MRL	0.0623
Butane	106-97-8	6	5	5.7300	1.923	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	6	4	0.1870	0.1839	225	EPA Inhalation RfCi	0.0008
Cis-2-Butene	590-18-1	6	1	0.0676	0.0315	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	6	0	< 0.0628	0.0313	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	6	6	0.3050	0.1252	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	6	3	0.3230	0.1043	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	6	4	0.4540	0.1232	190	TCEQ Long-Term AMCV	0.0006
Dodecane	112-40-3	6	2	0.2466	0.2414	3.8	CDPHE Chronic	0.0635
Ethane	74-84-0	6	6	22.6000	7.0866	NA	NA	
Ethylbenzene	100-41-4	6	5	0.1160	0.0929	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	6	6	3.2000	0.4787	5300	TCEQ Long-Term AMCV	0.0001
Heptane	142-82-5	6	6	0.2810	0.1778	98	EPA Inhalation RfCi	0.0018
Hexane	110-54-3	6	6	0.6860	0.3246	199	EPA Inhalation RfCi	0.0016
Isobutane	75-28-5	6	5	2.3500	0.765	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	6	6	2.5300	1.3781	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	6	1	0.0945	0.0317	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	6	1	0.0860	0.0317	81	EPA Inhalation RfCi	0.0004
m-/p-Xylenes	108-38-3..	6	6	0.2780	0.2311	23	EPA RSL Non-Cancer	0.0100
m-Diethylbenzene	141-93-5	6	0	< 0.0628	0.0313	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	6	1	0.1760	0.0321	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	6	2	0.3830	0.0348	75	TCEQ Long-Term AMCV	0.0005
n-Octane	111-65-9	6	5	0.1210	0.1024	380	TCEQ Long-Term AMCV	0.0003
n-Propylbenzene	103-65-1	6	1	0.0986	0.0318	203	EPA Inhalation RfCi	0.0002
Naphthalene	91-20-3	6	1	0.0698	0.0316	0.57	EPA Inhalation RfCi	0.0552
Nonane	111-84-2	6	4	0.1300	0.0777	3.8	EPA Inhalation RfCi	0.0204
o-Xylene	95-47-6	6	5	0.1420	0.1402	23	EPA RSL Non-Cancer	0.0061
p-Diethylbenzene	105-05-5	6	3	0.0967	0.0953	45	TCEQ Long-Term AMCV	0.0021
Pentane	109-66-0	6	6	2.2200	0.7813	338	EPA Inhalation RfCi	0.0023
Propane	74-98-6	6	6	10.3000	4.3228	NA	NA	
Propylene	115-07-1	6	6	0.6530	0.1922	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	6	3	0.1140	0.0729	5.9	EPA Inhalation RfCi	0.0124
Toluene	108-88-3	6	6	0.5860	0.4594	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	6	1	0.1150	0.0318	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	6	1	0.2320	0.0325	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	6	4	0.1444	0.1423	55	TCEQ Long-Term AMCV	0.0026
							Hazard Index	0.3814

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
CAMP- Denver | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	6	4	0.3580	0.0837	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	6	0	< 0.0632	0.031	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	6	0	< 0.0632	0.031	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	6	4	0.1560	0.0652	12	EPA Inhalation RfCi	0.0053
1,2,4-Trimethylbenzene	95-63-6	6	3	0.1950	0.1101	12	EPA Inhalation RfCi	0.0090
1,3-Butadiene	106-99-0	6	4	0.2090	0.1714	0.95	EPA RSL Non-Cancer	0.1806
1,3,5-Trimethylbenzene	108-67-8	6	2	0.1410	0.0796	12	EPA Inhalation RfCi	0.0065
2-Ethyltoluene	611-14-3	6	0	< 0.0632	0.031	25	TCEQ Long-Term AMCV	0.0012
2-Methylheptane	592-27-8	6	1	0.0661	0.0312	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	6	1	0.2080	0.032	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	6	5	0.6360	0.1353	190	TCEQ Long-Term AMCV	0.0007
2,2-Dimethylbutane	75-83-2	6	2	0.0753	0.0315	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	6	3	0.2270	0.1078	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	6	2	0.2883	0.2816	190	TCEQ Long-Term AMCV	0.0015
2,3-Dimethylpentane	565-59-3	6	4	0.2031	0.2	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	6	0	< 0.0632	0.031	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	6	6	0.4390	0.3099	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	6	4	0.0729	0.0722	25	TCEQ Long-Term AMCV	0.0029
3-Methylheptane	589-81-1	6	0	< 0.0632	0.031	380	TCEQ Long-Term AMCV	0.0001
3-Methylhexane	589-34-4	6	2	0.2620	0.0739	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	6	3	0.5390	0.0349	190	TCEQ Long-Term AMCV	0.0002
4-Ethyltoluene	622-96-8	6	2	0.1330	0.0676	25	TCEQ Long-Term AMCV	0.0027
Acetylene	74-86-2	6	6	1.3700	0.4631	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	6	6	0.8420	0.8263	3	ATSDR Chronic MRL	0.2754
Butane	106-97-8	6	6	5.2900	1.4837	10000	TCEQ Long-Term AMCV	0.0001
Carbon disulfide	75-15-0	6	5	0.5620	0.0984	225	EPA Inhalation RfCi	0.0004
Cis-2-Butene	590-18-1	6	1	0.0815	0.0313	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	6	0	< 0.0632	0.031	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	6	5	0.3760	0.1681	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	6	3	0.2060	0.0333	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	6	2	0.0903	0.076	190	TCEQ Long-Term AMCV	0.0004
Dodecane	112-40-3	6	3	0.0968	0.0855	3.8	CDPHE Chronic	0.0225
Ethane	74-84-0	6	6	19.2000	7.4373	NA	NA	
Ethylbenzene	100-41-4	6	3	0.2260	0.127	230	EPA Inhalation RfCi	0.0006
Ethylene	74-85-1	6	6	3.6433	3.5775	5300	TCEQ Long-Term AMCV	0.0007
Heptane	142-82-5	6	3	0.4160	0.2319	98	EPA Inhalation RfCi	0.0024
Hexane	110-54-3	6	6	1.1600	0.4039	199	EPA Inhalation RfCi	0.0020
Isobutane	75-28-5	6	6	1.6200	0.6253	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	6	6	2.3700	2.1174	8100	TCEQ Long-Term AMCV	0.0003
Isoprene	78-79-5	6	1	0.0861	0.0313	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	6	2	0.1160	0.0621	81	EPA Inhalation RfCi	0.0008
m-/p-Xylenes	108-38-3..	6	6	0.4700	0.2573	23	EPA RSL Non-Cancer	0.0112
m-Diethylbenzene	141-93-5	6	0	< 0.0632	0.031	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	6	2	0.2290	0.0326	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	6	2	0.3710	0.0334	75	TCEQ Long-Term AMCV	0.0004
n-Octane	111-65-9	6	3	0.1900	0.1079	380	TCEQ Long-Term AMCV	0.0003
n-Propylbenzene	103-65-1	6	2	0.1410	0.0709	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	6	3	0.1010	0.0761	0.57	EPA Inhalation RfCi	0.1330
Nonane	111-84-2	6	3	0.1060	0.0839	3.8	EPA Inhalation RfCi	0.0220
o-Xylene	95-47-6	6	3	0.2040	0.1278	23	EPA RSL Non-Cancer	0.0055
p-Diethylbenzene	105-05-5	6	1	0.0696	0.0312	45	TCEQ Long-Term AMCV	0.0007
Pentane	109-66-0	6	6	2.0200	1.3611	338	EPA Inhalation RfCi	0.0040
Propane	74-98-6	6	6	9.7300	3.1904	NA	NA	
Propylene	115-07-1	6	6	0.5556	0.5491	1,801	EPA RSL Non-Cancer	0.0003
Tetrachloroethene	127-18-4	6	2	0.1540	0.0792	5.9	EPA Inhalation RfCi	0.0134
Toluene	108-88-3	6	6	1.0700	0.5625	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	6	0	< 0.0632	0.031	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	6	1	0.2490	0.0323	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	6	3	0.1022	0.0714	55	TCEQ Long-Term AMCV	0.0013
							Hazard Index	0.7125

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Summa Canister Data Summary and Risk Assessment
JUNC- E470/I25 | Q3 2021 - Q3 2022

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotients
1-Butene	106-98-9	6	3	0.1020	0.0317	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	6	1	0.0733	0.031	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	6	2	0.0680	0.0311	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	6	2	0.2150	0.0702	12	EPA Inhalation RfCi	0.0058
1,2,4-Trimethylbenzene	95-63-6	6	4	0.1310	0.0867	12	EPA Inhalation RfCi	0.0071
1,3-Butadiene	106-99-0	6	5	0.1260	0.0935	0.95	EPA RSL Non-Cancer	0.0985
1,3,5-Trimethylbenzene	108-67-8	6	2	0.1100	0.0715	12	EPA Inhalation RfCi	0.0059
2-Ethyltoluene	611-14-3	6	0	< 0.0627	0.0307	25	TCEQ Long-Term AMCV	0.0012
2-Methylheptane	592-27-8	6	1	0.0848	0.031	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	6	1	0.1870	0.0316	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	6	3	0.6160	0.0369	190	TCEQ Long-Term AMCV	0.0002
2,2-Dimethylbutane	75-83-2	6	1	0.3880	0.0328	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	6	4	0.1610	0.0725	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	6	4	0.2230	0.2192	190	TCEQ Long-Term AMCV	0.0012
2,3-Dimethylpentane	565-59-3	6	5	0.0917	0.0681	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	6	0	< 0.0627	0.0307	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	6	6	0.2690	0.1582	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	6	1	0.0944	0.0311	25	TCEQ Long-Term AMCV	0.0012
3-Methylheptane	589-81-1	6	2	0.0753	0.0742	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	6	3	1.5100	0.103	2200	TCEQ Long-Term AMCV	0.0000
3-Methylpentane	96-14-0	6	5	0.9050	0.1755	190	TCEQ Long-Term AMCV	0.0009
4-Ethyltoluene	622-96-8	6	2	0.1030	0.0638	25	TCEQ Long-Term AMCV	0.0026
Acetylene	74-86-2	6	6	1.2700	0.2964	2500	TCEQ Long-Term AMCV	0.0001
Benzene	71-43-2	6	6	0.5250	0.1881	3	ATSDR Chronic MRL	0.0627
Butane	106-97-8	6	6	4.7000	1.5298	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	6	4	0.2300	0.1902	225	EPA Inhalation RfCi	0.0008
Cis-2-Butene	590-18-1	6	0	< 0.0627	0.0307	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	6	0	< 0.0627	0.0307	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	6	6	0.4160	0.1082	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	6	3	0.2130	0.0329	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	6	5	0.8100	0.0936	190	TCEQ Long-Term AMCV	0.0005
Dodecane	112-40-3	6	3	0.2395	0.2353	3.8	CDPHE Chronic	0.0619
Ethane	74-84-0	6	6	17.6000	5.6593	NA	NA	
Ethylbenzene	100-41-4	6	4	0.1440	0.1053	230	EPA Inhalation RfCi	0.0005
Ethylene	74-85-1	6	6	1.9500	0.7115	5300	TCEQ Long-Term AMCV	0.0001
Heptane	142-82-5	6	5	0.3500	0.1686	98	EPA Inhalation RfCi	0.0017
Hexane	110-54-3	6	6	0.8230	0.2617	199	EPA Inhalation RfCi	0.0013
Isobutane	75-28-5	6	6	1.8900	0.6519	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	6	6	2.4400	1.1071	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	6	2	0.1125	0.0314	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	6	2	0.0938	0.0313	81	EPA Inhalation RfCi	0.0004
m-/p-Xylenes	108-38-3..	6	6	0.3210	0.2256	23	EPA RSL Non-Cancer	0.0098
m-Diethylbenzene	141-93-5	6	0	< 0.0627	0.0307	45	TCEQ Long-Term AMCV	0.0007
Methylcyclohexane	108-87-2	6	3	0.1890	0.0326	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	6	2	0.4060	0.0334	75	TCEQ Long-Term AMCV	0.0004
n-Octane	111-65-9	6	4	0.1740	0.0814	380	TCEQ Long-Term AMCV	0.0002
n-Propylbenzene	103-65-1	6	2	0.1220	0.0687	203	EPA Inhalation RfCi	0.0003
Naphthalene	91-20-3	6	1	0.0767	0.031	0.57	EPA Inhalation RfCi	0.0542
Nonane	111-84-2	6	3	0.0867	0.0314	3.8	EPA Inhalation RfCi	0.0082
o-Xylene	95-47-6	6	4	0.1470	0.1394	23	EPA RSL Non-Cancer	0.0061
p-Diethylbenzene	105-05-5	6	2	0.1300	0.0315	45	TCEQ Long-Term AMCV	0.0007
Pentane	109-66-0	6	6	3.3700	0.6791	338	EPA Inhalation RfCi	0.0020
Propane	74-98-6	6	6	9.7500	3.2744	NA	NA	
Propylene	115-07-1	6	6	0.4650	0.1871	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	6	4	0.1130	0.0646	5.9	EPA Inhalation RfCi	0.0110
Toluene	108-88-3	6	6	0.7640	0.4509	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	6	0	< 0.0627	0.0307	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	6	1	0.3070	0.0323	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	6	4	0.1357	0.11	55	TCEQ Long-Term AMCV	0.0020
							Hazard Index	0.3532

All results presented in parts per billion by volume (ppbv).
NA= Health reference level not available.
Results averaged using EPA time-weighted average (TWA) equation (see methods).
Laboratory non-detections are reported as less than ("<") the method detection limit (MDL) as maximum detection and 1/2 MDL in the time-weighted average calculation.

Appendix C

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

Mobile Sampling Van Data Summary and Risk Assessment
Adams City Neighborhood | Q3 2021 - Q3 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	39,309	19,515	0.07	0.04	0.95	EPA RSL Non-Cancer	0.0473
ACETYLENE	74-86-2	39,309	19,515	0.47	0.17	2500	TCEQ Long-Term AMCV	0.0001
BENZENE	71-43-2	39,309	19,515	0.48	0.23	3	ATSDR Chronic MRL	0.0770
BUTANES*	75-28-5	39,309	19,515	3.39	1.34	10000	TCEQ Long-Term AMCV	0.0001
BUTENES*	590-18-1	39,309	19,515	2.98	1.27	700	TCEQ Long-Term AMCV	0.0018
CARBON DISULFIDE	75-15-0	39,309	19,515	0.01	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANE	287-92-3	39,309	19,515	2.88	1.14	590	TCEQ Long-Term AMCV	0.0019
DECANES	124-18-5	39,309	19,515	0.27	0.08	190	TCEQ Long-Term AMCV	0.0004
DIETHYLBENZENES*	141-93-5	39,309	19,515	0.04	0.02	45	TCEQ Long-Term AMCV	0.0005
DIMETHYLCYCLOHEXANES*	638-04-0	39,309	19,515	0.14	0.05	400	CDPHE	0.0001
DODECANES	112-40-3	39,309	19,515	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	39,309	19,515	11.29	6.40	5300	TCEQ Long-Term AMCV	0.0012
HEPTANES*	142-82-5	39,309	19,515	0.09	0.04	98	EPA Inhalation RfCi	0.0004
HEXANES*	110-54-3	39,309	19,515	0.19	0.08	199	EPA Inhalation RfCi	0.0004
HEXENES*	592-41-6	39,309	19,515	1.40	0.46	50	TCEQ Long-Term AMCV	0.0093
HYDROGEN CYANIDE	74-90-8	39,309	19,515	0.30	0.19	0.75	EPA RSL Non-Cancer	0.2464
HYDROGEN SULFIDE	7783-06-4	39,309	19,515	0.27	0.16	1.4	EPA Inhalation RfCi	0.1132
ISOPRENE	78-79-5	39,309	19,515	0.94	0.37	140	TCEQ Long-Term AMCV	0.0026
METHANOL	67-56-1	39,309	19,515	9.58	5.79	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	39,309	19,515	0.10	0.05	400	TCEQ Long-Term AMCV	0.0001
NONANES	111-84-2	39,309	19,515	0.09	0.04	3.8	EPA Inhalation RfCi	0.0099
OCTANES*	111-65-9	39,309	19,515	0.09	0.04	380	TCEQ Long-Term AMCV	0.0001
PENTANES*	109-66-0	39,309	19,515	0.25	0.08	339	EPA Inhalation RfCi	0.0002
PROPYLENE	115-07-1	39,309	19,515	0.35	0.19	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	39,309	19,515	0.23	0.09	235	EPA Inhalation RfCi	0.0004
TETRACHLOROETHYLENE	127-18-4	39,309	19,515	0.04	0.02	5.9	EPA Inhalation RfCi	0.0026
TOLUENE	108-88-3	39,309	19,515	1.19	0.68	1327	EPA Inhalation RfCi	0.0005
TRIMETHYLBENZENES*	622-96-8	39,309	19,515	0.29	0.17	25	TCEQ Long-Term AMCV	0.0068
UNDECANES	1120-21-4	39,309	19,515	0.06	0.03	55	TCEQ Long-Term AMCV	0.0005
XYLENES*	1330-20-7	39,309	19,515	1.52	0.75	23	EPA Inhalation RfCi	0.0324
							Hazard Index	0.5571

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.

Mobile Sampling Van Data Summary and Risk Assessment
Dupont Neighborhood | Q3 2021 - Q3 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	67,059	43,105	0.08	0.04	0.95	EPA RSL Non-Cancer	0.0463
ACETYLENE	74-86-2	67,059	43,105	0.26	0.11	2500	TCEQ Long-Term AMCV	0.0000
BENZENE	71-43-2	67,059	43,105	0.43	0.27	3	ATSDR Chronic MRL	0.0904
BUTANES*	75-28-5	67,059	43,105	4.75	3.42	10000	TCEQ Long-Term AMCV	0.0003
BUTENES*	590-18-1	67,059	43,105	2.82	1.51	700	TCEQ Long-Term AMCV	0.0022
CARBON DISULFIDE	75-15-0	67,059	43,105	0.05	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANE	287-92-3	67,059	43,105	2.96	1.40	590	TCEQ Long-Term AMCV	0.0024
DECANES	124-18-5	67,059	43,105	0.20	0.06	190	TCEQ Long-Term AMCV	0.0003
DIETHYLBENZENES*	141-93-5	67,059	43,105	0.05	0.01	45	TCEQ Long-Term AMCV	0.0003
DIMETHYLCYCLOHEXANES*	638-04-0	67,059	43,105	0.06	0.02	400	CDPHE	0.0000
DODECANES	112-40-3	67,059	43,105	0.04	0.00	3.8	CDPHE	0.0001
ETHYLENE	74-85-1	67,059	43,105	9.39	6.92	5300	TCEQ Long-Term AMCV	0.0013
HEPTANES*	142-82-5	67,059	43,105	0.12	0.05	98	EPA Inhalation RfCi	0.0006
HEXANES*	110-54-3	67,059	43,105	0.61	0.19	199	EPA Inhalation RfCi	0.0010
HEXENES*	592-41-6	67,059	43,105	1.86	0.81	50	TCEQ Long-Term AMCV	0.0161
HYDROGEN CYANIDE	74-90-8	67,059	43,105	0.79	0.23	0.75	EPA RSL Non-Cancer	0.3076
HYDROGEN SULFIDE	7783-06-4	67,059	43,105	0.36	0.13	1.4	EPA Inhalation RfCi	0.0911
ISOPRENE	78-79-5	67,059	43,105	0.72	0.25	140	TCEQ Long-Term AMCV	0.0018
METHANOL	67-56-1	67,059	43,105	11.51	4.67	15261	EPA Inhalation RfCi	0.0003
METHYLCYCLOHEXANE	108-87-2	67,059	43,105	0.09	0.04	400	TCEQ Long-Term AMCV	0.0001
NONANES	111-84-2	67,059	43,105	0.07	0.02	3.8	EPA Inhalation RfCi	0.0055
OCTANES*	111-65-9	67,059	43,105	0.08	0.04	380	TCEQ Long-Term AMCV	0.0001
PENTANES*	109-66-0	67,059	43,105	1.54	0.91	339	EPA Inhalation RfCi	0.0027
PROPYLENE	115-07-1	67,059	43,105	0.40	0.17	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	67,059	43,105	0.17	0.04	235	EPA Inhalation RfCi	0.0002
TETRACHLOROETHYLENE	127-18-4	67,059	43,105	0.03	0.01	5.9	EPA Inhalation RfCi	0.0014
TOLUENE	108-88-3	67,059	43,105	1.47	0.75	1327	EPA Inhalation RfCi	0.0006
TRIMETHYLBENZENES*	622-96-8	67,059	43,105	0.32	0.09	25	TCEQ Long-Term AMCV	0.0037
UNDECANES	1120-21-4	67,059	43,105	0.08	0.03	55	TCEQ Long-Term AMCV	0.0005
XYLENES*	1330-20-7	67,059	43,105	0.89	0.35	23	EPA Inhalation RfCi	0.0151
							Hazard Index	0.5921

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.

Mobile Sampling Van Data Summary and Risk Assessment
Elyria-Swansea Neighborhood | Q3 2021 - Q3 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	40,654	19,844	0.11	0.06	0.95	EPA RSL Non-Cancer	0.0637
ACETYLENE	74-86-2	40,654	19,844	0.33	0.15	2500	TCEQ Long-Term AMCV	0.0001
BENZENE	71-43-2	40,654	19,844	0.48	0.29	3	ATSDR Chronic MRL	0.0971
BUTANES*	75-28-5	40,654	19,844	4.83	2.55	10000	TCEQ Long-Term AMCV	0.0003
BUTENES*	590-18-1	40,654	19,844	2.91	1.22	700	TCEQ Long-Term AMCV	0.0017
CARBON DISULFIDE	75-15-0	40,654	19,844	0.05	0.01	225	EPA Inhalation RfCi	0.0001
CYCLOPENTANE	287-92-3	40,654	19,844	2.78	1.30	590	TCEQ Long-Term AMCV	0.0022
DECANES	124-18-5	40,654	19,844	0.08	0.04	190	TCEQ Long-Term AMCV	0.0002
DIETHYLBENZENES*	141-93-5	40,654	19,844	0.08	0.03	45	TCEQ Long-Term AMCV	0.0006
DIMETHYLCYCLOHEXANES*	638-04-0	40,654	19,844	0.06	0.03	400	CDPHE	0.0001
DODECANES	112-40-3	40,654	19,844	0.02	0.00	3.8	CDPHE	0.0005
ETHYLENE	74-85-1	40,654	19,844	10.19	7.34	5300	TCEQ Long-Term AMCV	0.0014
HEPTANES*	142-82-5	40,654	19,844	0.10	0.05	98	EPA Inhalation RfCi	0.0005
HEXANES*	110-54-3	40,654	19,844	0.11	0.06	199	EPA Inhalation RfCi	0.0003
HEXENES*	592-41-6	40,654	19,844	2.47	0.83	50	TCEQ Long-Term AMCV	0.0166
HYDROGEN CYANIDE	74-90-8	40,654	19,844	0.41	0.20	0.75	EPA RSL Non-Cancer	0.2605
HYDROGEN SULFIDE	7783-06-4	40,654	19,844	0.39	0.18	1.4	EPA Inhalation RfCi	0.1270
ISOPRENE	78-79-5	40,654	19,844	0.44	0.22	140	TCEQ Long-Term AMCV	0.0016
METHANOL	67-56-1	40,654	19,844	11.62	6.86	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	40,654	19,844	0.12	0.07	400	TCEQ Long-Term AMCV	0.0002
NONANES	111-84-2	40,654	19,844	0.04	0.01	3.8	EPA Inhalation RfCi	0.0038
OCTANES*	111-65-9	40,654	19,844	0.13	0.04	380	TCEQ Long-Term AMCV	0.0001
PENTANES*	109-66-0	40,654	19,844	0.06	0.01	339	EPA Inhalation RfCi	0.0000
PROPYLENE	115-07-1	40,654	19,844	0.58	0.28	1801	EPA RSL Non-Cancer	0.0002
STYRENE	100-42-5	40,654	19,844	0.11	0.05	235	EPA Inhalation RfCi	0.0002
TETRACHLOROETHYLENE	127-18-4	40,654	19,844	0.14	0.03	5.9	EPA Inhalation RfCi	0.0048
TOLUENE	108-88-3	40,654	19,844	1.85	0.94	1327	EPA Inhalation RfCi	0.0007
TRIMETHYLBENZENES*	622-96-8	40,654	19,844	0.35	0.14	25	TCEQ Long-Term AMCV	0.0057
UNDECANES	1120-21-4	40,654	19,844	0.08	0.02	55	TCEQ Long-Term AMCV	0.0004
XYLENES*	1330-20-7	40,654	19,844	1.42	0.48	23	EPA Inhalation RfCi	0.0210
							Hazard Index	0.6119

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.

Mobile Sampling Van Data Summary and Risk Assessment
Globeville Neighborhood | Q3 2021 - Q3 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	38,189	18,021	0.11	0.06	0.95	EPA RSL Non-Cancer	0.0591
ACETYLENE	74-86-2	38,189	18,021	0.28	0.13	2500	TCEQ Long-Term AMCV	0.0001
BENZENE	71-43-2	38,189	18,021	0.63	0.31	3	ATSDR Chronic MRL	0.1049
BUTANES*	75-28-5	38,189	18,021	6.63	2.90	10000	TCEQ Long-Term AMCV	0.0003
BUTENES*	590-18-1	38,189	18,021	1.79	1.15	700	TCEQ Long-Term AMCV	0.0016
CARBON DISULFIDE	75-15-0	38,189	18,021	0.05	0.02	225	EPA Inhalation RfCi	0.0001
CYCLOPENTANE	287-92-3	38,189	18,021	1.55	0.91	590	TCEQ Long-Term AMCV	0.0015
DECANES	124-18-5	38,189	18,021	0.15	0.08	190	TCEQ Long-Term AMCV	0.0004
DIETHYLBENZENES*	141-93-5	38,189	18,021	0.08	0.03	45	TCEQ Long-Term AMCV	0.0007
DIMETHYLCYCLOHEXANES*	638-04-0	38,189	18,021	0.05	0.02	400	CDPHE	0.0001
DODECANES	112-40-3	38,189	18,021	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	38,189	18,021	11.60	7.61	5300	TCEQ Long-Term AMCV	0.0014
HEPTANES*	142-82-5	38,189	18,021	0.10	0.05	98	EPA Inhalation RfCi	0.0005
HEXANES*	110-54-3	38,189	18,021	0.09	0.04	199	EPA Inhalation RfCi	0.0002
HEXENES*	592-41-6	38,189	18,021	1.35	0.70	50	TCEQ Long-Term AMCV	0.0140
HYDROGEN CYANIDE	74-90-8	38,189	18,021	0.17	0.10	0.75	EPA RSL Non-Cancer	0.1387
HYDROGEN SULFIDE	7783-06-4	38,189	18,021	0.26	0.15	1.4	EPA Inhalation RfCi	0.1023
ISOPRENE	78-79-5	38,189	18,021	0.44	0.28	140	TCEQ Long-Term AMCV	0.0020
METHANOL	67-56-1	38,189	18,021	9.63	6.86	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	38,189	18,021	0.10	0.05	400	TCEQ Long-Term AMCV	0.0001
NONANES	111-84-2	38,189	18,021	0.04	0.02	3.8	EPA Inhalation RfCi	0.0053
OCTANES*	111-65-9	38,189	18,021	0.07	0.04	380	TCEQ Long-Term AMCV	0.0001
PENTANES*	109-66-0	38,189	18,021	0.06	0.03	339	EPA Inhalation RfCi	0.0001
PROPYLENE	115-07-1	38,189	18,021	0.61	0.36	1801	EPA RSL Non-Cancer	0.0002
STYRENE	100-42-5	38,189	18,021	0.04	0.01	235	EPA Inhalation RfCi	0.0001
TETRACHLOROETHYLENE	127-18-4	38,189	18,021	0.02	0.01	5.9	EPA Inhalation RfCi	0.0020
TOLUENE	108-88-3	38,189	18,021	6.31	1.33	1327	EPA Inhalation RfCi	0.0010
TRIMETHYLBENZENES*	622-96-8	38,189	18,021	0.30	0.07	25	TCEQ Long-Term AMCV	0.0030
UNDECANES	1120-21-4	38,189	18,021	0.06	0.03	55	TCEQ Long-Term AMCV	0.0006
XYLENES*	1330-20-7	38,189	18,021	1.32	0.55	23	EPA Inhalation RfCi	0.0240
							Hazard Index	0.4650

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.

Mobile Sampling Van Data Summary and Risk Assessment
Pioneer Park Neighborhood | Q3 2021 - Q3 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	72,083	45,760	0.10	0.04	0.95	EPA RSL Non-Cancer	0.0473
ACETYLENE	74-86-2	72,083	45,760	0.26	0.12	2500	TCEQ Long-Term AMCV	0.0000
BENZENE	71-43-2	72,083	45,760	0.41	0.20	3	ATSDR Chronic MRL	0.0659
BUTANES*	75-28-5	72,083	45,760	5.36	2.09	10000	TCEQ Long-Term AMCV	0.0002
BUTENES*	590-18-1	72,083	45,760	3.59	0.70	700	TCEQ Long-Term AMCV	0.0010
CARBON DISULFIDE	75-15-0	72,083	45,760	0.02	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANE	287-92-3	72,084	45,761	4.47	0.67	590	TCEQ Long-Term AMCV	0.0011
DECANES	124-18-5	72,083	45,760	0.32	0.14	190	TCEQ Long-Term AMCV	0.0007
DIETHYLBENZENES*	141-93-5	72,083	45,760	0.06	0.03	45	TCEQ Long-Term AMCV	0.0006
DIMETHYLCYCLOHEXANES*	638-04-0	72,083	45,760	0.06	0.02	400	CDPHE	0.0000
DODECANES	112-40-3	72,083	45,760	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	72,083	45,760	11.22	7.13	5300	TCEQ Long-Term AMCV	0.0013
HEPTANES*	142-82-5	72,083	45,760	0.11	0.05	98	EPA Inhalation RfCi	0.0005
HEXANES*	110-54-3	72,083	45,760	0.06	0.03	199	EPA Inhalation RfCi	0.0002
HEXENES*	592-41-6	72,083	45,760	1.66	0.29	50	TCEQ Long-Term AMCV	0.0058
HYDROGEN CYANIDE	74-90-8	72,083	45,760	0.38	0.17	0.75	EPA RSL Non-Cancer	0.2236
HYDROGEN SULFIDE	7783-06-4	72,083	45,760	0.41	0.18	1.4	EPA Inhalation RfCi	0.1258
ISOPRENE	78-79-5	72,083	45,760	0.54	0.21	140	TCEQ Long-Term AMCV	0.0015
METHANOL	67-56-1	72,083	45,760	11.54	4.70	15261	EPA Inhalation RfCi	0.0003
METHYLCYCLOHEXANE	108-87-2	72,083	45,760	0.10	0.03	400	TCEQ Long-Term AMCV	0.0001
NONANES	111-84-2	72,083	45,760	0.11	0.02	3.8	EPA Inhalation RfCi	0.0063
OCTANES*	111-65-9	72,083	45,760	0.26	0.07	380	TCEQ Long-Term AMCV	0.0002
PENTANES*	109-66-0	72,083	45,760	0.24	0.09	339	EPA Inhalation RfCi	0.0003
PROPYLENE	115-07-1	72,083	45,760	0.64	0.17	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	72,083	45,760	1.57	0.08	235	EPA Inhalation RfCi	0.0003
TETRACHLOROETHYLENE	127-18-4	72,083	45,760	0.09	0.01	5.9	EPA Inhalation RfCi	0.0022
TOLUENE	108-88-3	72,083	45,760	0.90	0.37	1327	EPA Inhalation RfCi	0.0003
TRIMETHYLBENZENES*	622-96-8	72,083	45,760	0.41	0.07	25	TCEQ Long-Term AMCV	0.0028
UNDECANES	1120-21-4	72,083	45,760	0.08	0.03	55	TCEQ Long-Term AMCV	0.0006
XYLENES*	1330-20-7	72,083	45,760	1.26	0.36	23	EPA Inhalation RfCi	0.0158
							Hazard Index	0.5052

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.

Mobile Sampling Van Data Summary and Risk Assessment
Western Hills Neighborhood | Q3 2021 - Q3 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	54,475	34,294	0.08	0.05	0.95	EPA RSL Non-Cancer	0.0480
ACETYLENE	74-86-2	54,475	34,294	0.36	0.21	2500	TCEQ Long-Term AMCV	0.0001
BENZENE	71-43-2	54,475	34,294	0.49	0.29	3	ATSDR Chronic MRL	0.0966
BUTANES*	75-28-5	54,475	34,294	4.91	2.57	10000	TCEQ Long-Term AMCV	0.0003
BUTENES*	590-18-1	54,475	34,294	3.23	1.59	700	TCEQ Long-Term AMCV	0.0023
CARBON DISULFIDE	75-15-0	54,475	34,294	0.02	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANE	287-92-3	54,475	34,294	2.07	0.98	590	TCEQ Long-Term AMCV	0.0017
DECANES	124-18-5	54,475	34,294	0.11	0.05	190	TCEQ Long-Term AMCV	0.0003
DIETHYLBENZENES*	141-93-5	54,475	34,294	0.72	0.10	45	TCEQ Long-Term AMCV	0.0021
DIMETHYLCYCLOHEXANES*	638-04-0	54,475	34,294	0.11	0.04	400	CDPHE	0.0001
DODECANES	112-40-3	54,475	34,294	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	54,475	34,294	12.13	6.51	5300	TCEQ Long-Term AMCV	0.0012
HEPTANES*	142-82-5	54,475	34,294	0.09	0.05	98	EPA Inhalation RfCi	0.0005
HEXANES*	110-54-3	54,475	34,294	0.18	0.06	199	EPA Inhalation RfCi	0.0003
HEXENES*	592-41-6	54,475	34,294	2.48	1.24	50	TCEQ Long-Term AMCV	0.0249
HYDROGEN CYANIDE	74-90-8	54,475	34,294	0.37	0.15	0.75	EPA RSL Non-Cancer	0.2007
HYDROGEN SULFIDE	7783-06-4	54,475	34,294	0.24	0.12	1.4	EPA Inhalation RfCi	0.0820
ISOPRENE	78-79-5	54,475	34,294	1.13	0.28	140	TCEQ Long-Term AMCV	0.0020
METHANOL	67-56-1	54,475	34,294	11.06	6.43	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	54,475	34,294	0.18	0.05	400	TCEQ Long-Term AMCV	0.0001
NONANES	111-84-2	54,475	34,294	0.05	0.02	3.8	EPA Inhalation RfCi	0.0063
OCTANES*	111-65-9	54,475	34,294	0.12	0.05	380	TCEQ Long-Term AMCV	0.0001
PENTANES*	109-66-0	54,475	34,294	0.55	0.14	339	EPA Inhalation RfCi	0.0004
PROPYLENE	115-07-1	54,475	34,294	0.81	0.22	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	54,475	34,294	0.46	0.13	235	EPA Inhalation RfCi	0.0006
TETRACHLOROETHYLENE	127-18-4	54,475	34,294	0.12	0.02	5.9	EPA Inhalation RfCi	0.0038
TOLUENE	108-88-3	54,475	34,294	2.45	0.97	1327	EPA Inhalation RfCi	0.0007
TRIMETHYLBENZENES*	622-96-8	54,475	34,294	2.25	0.39	25	TCEQ Long-Term AMCV	0.0156
UNDECANES	1120-21-4	54,475	34,294	0.07	0.04	55	TCEQ Long-Term AMCV	0.0006
XYLENES*	1330-20-7	54,475	34,294	1.57	0.64	23	EPA Inhalation RfCi	0.0278
							Hazard Index	0.5198

*For analyte isomer groups which were unable to be differentiated, the lowest health reference value of the isomer group was selected for use in this assessment.