

Q3 2021 – Q2 2024 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 analytes¹: carbon monoxide (CO), sulfur dioxide (SO₂), hydrogen sulfide (H₂S), nitric oxide or nitrogen oxide (NO), nitrogen dioxide (NO₂), 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 (H₂S).

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 478,950 one-hour rolling average concentration measurements and 239 Summa canister samples were collected in six CCND Air Monitoring neighborhoods using two specific data collection platforms. Fifty-seven Summa canister samples were also collected in identical fashion from three reference sites 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 twelve quarters (third quarter of 2021 through second quarter of 2024) 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 or sampling site. 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 one in 10,000 to one 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 (between seven in a million to two in 100,000 excess cases) were comparable to the risks calculated for the three reference sites (nine in a million to one in 100,000), suggesting similar estimated excess cancer risks for an individual spending an entire lifetime in a CCND neighborhood or at 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 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 (SO₂), hydrogen sulfide (H₂S), nitric oxide or nitrogen oxide (NO), nitrogen dioxide (NO₂), 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. The acute risk assessments were based on data collected during a specific calendar quarter and published on a quarterly basis. Data collected using approach #1 was not included because the analytes measured for approach #1 (except for H₂S) do not have established health reference levels or cancer potency factors needed to perform a screening level health risk assessment. Risk associated with potential H₂S exposure was addressed in the assessment of the mobile monitoring van data. The risk assessments were developed assuming short-term (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 (both non-cancer and cancer endpoints) of potential chronic exposures in CCND neighborhoods to VOCs and H₂S, 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 periodically over the twelve-quarter period (third quarter of 2021 through the second quarter of 2024). The definition of chronic human exposure varies across regulatory agencies and scientific bodies. In general, toxicologists define chronic human exposures as repeated exposures occurring for many months to years². The risk assessment presented herein provides estimates of lifetime inhalation non-cancer and cancer risks for CCND communities based on data collected on a quarterly basis for three years and based on the

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

assumption that data from these sampling periods represent airborne chemical levels 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 second quarter of 2024. 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 periodically over a twelve-quarter period. 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 CAMP which relocated in Q1 2024 to National Jewish Hospital; Brighton, CO; junction of E470 and I-25 (JUNC)) 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 1-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 canister 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.

A total of 239 air samples were collected within the CCND neighborhoods (206 planned and 33 sensor-triggered). Planned samples included 1-hour and 7-day sample durations. An additional 57 samples were collected across three non-CCND community monitoring reference sites (1-hour and 7-day samples). In Q1 2023, the 7-day sample at JUNC location was not collected at the request of the property owner and a new location was therefore determined. In Q1 2024, the 7-day sample at the downtown location was relocated to National Jewish Hospital. Additionally, in Q4 2023, the 7-day sample at the Monroe sampling location was unable to be analyzed due to canister pressure malfunctions. All air samples were collected using Summa canisters and sent

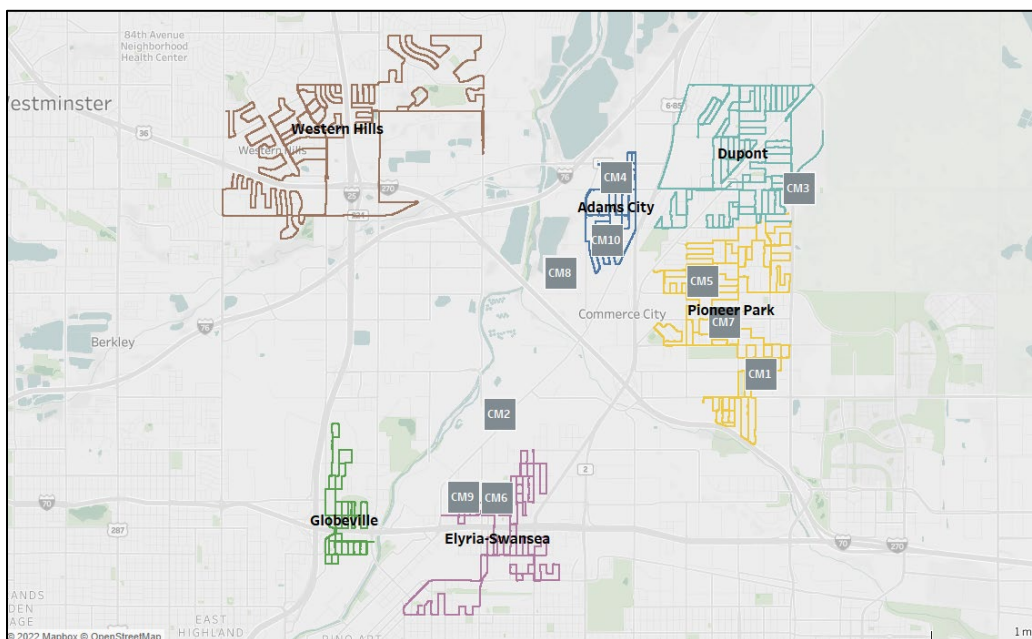
to an accredited laboratory for analysis of 59 VOCs in accordance with the USEPA methods TO-15 and TO-14. Individual analytes are documented in Appendix A (Table A-3).

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 H₂S) at sub-parts per billion (ppb) levels and as quickly as one measurement per second. During the twelve 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 ten miles per hour while collecting a data point for each chemical every second. From 2021 through 2024, the mobile monitoring van sampled a total of six neighborhoods on a quarterly basis, and collected over 758,638 data points, resulting in approximately 478,950 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).

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 twelve quarters at each

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

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 twelve quarters were calculated using Equation 2, per USEPA guidance⁴.

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 twelve 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 twelve 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 1-hour rolling average concentration collected across twelve 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.

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 used⁵. 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 twelve quarters

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

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>

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 three 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.

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

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.

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

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 exposure 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 proliferation. A person's inherited ability to correct damage to cell genetics may also impact their risk of developing cancer by chance or from chemical exposure.

Scientists studying chemical carcinogenesis (the ability of a chemical to cause cancer) have debated for decades whether certain chemical carcinogens have a threshold exposure below which genetic loss of control (and, thus, cancer) will not happen. For this reason, risk assessment methods used by regulatory bodies conservatively assume that a risk exists for a carcinogen to cause cancer to develop, even at extremely low exposure levels. For environmental exposures, such assumed risks from ppb-levels of inhalation exposures would take decades of exposure to result in cancer. Cancer risks are calculated not by comparing exposure to a health reference level to see if an exceedance has occurred, but by multiplying by a cancer potency factor to estimate a likelihood of cancer occurring over a lifetime. Cancer potency factors for inhaled carcinogens have been determined by USEPA and other federal and state regulatory agencies. 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 guidance⁹) was used to calculate each chemical-specific cancer risk.

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

Eq. 3 – Excess Cancer Risk Estimate Equation

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

Where:

Cancer Risk = Excess risk of an individual developing cancer over a lifetime, or URE (unit risk estimate).

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 is the cancer potency factor 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 one 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 one 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 as 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 assessments¹⁰) and their sources, follow:

- Benzene: 7.8×10^{-6} per $\mu\text{g}/\text{m}^3 = 2.5 \times 10^{-5}$ per ppb (USEPA IRIS)
- 1,3-Butadiene: 3.0×10^{-5} per $\mu\text{g}/\text{m}^3 = 6.7 \times 10^{-5}$ per ppb (USEPA IRIS)
- Ethylbenzene: 2.5×10^{-6} per $\mu\text{g}/\text{m}^3 = 1.1 \times 10^{-5}$ per ppb (Cal EPA OEHHA)
- Tetrachloroethane: 2.6×10^{-7} per $\mu\text{g}/\text{m}^3 = 1.7 \times 10^{-6}$ per ppb (USEPA IRIS)
- Isoprene: 2.2×10^{-8} per $\mu\text{g}/\text{m}^3 = 6.1 \times 10^{-8}$ per ppb (TCEQ)

It is important to understand that the conservative nature of IURs should *not* be interpreted as meaning one in one million people *will* get cancer if the risk of 1×10^{-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

¹⁰CDPHE (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>

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

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 twelve 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 36-month risk assessment is the average of each of the twelve 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 twelve 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.

3.0 RESULTS

3.1 NON-CANCER RISK

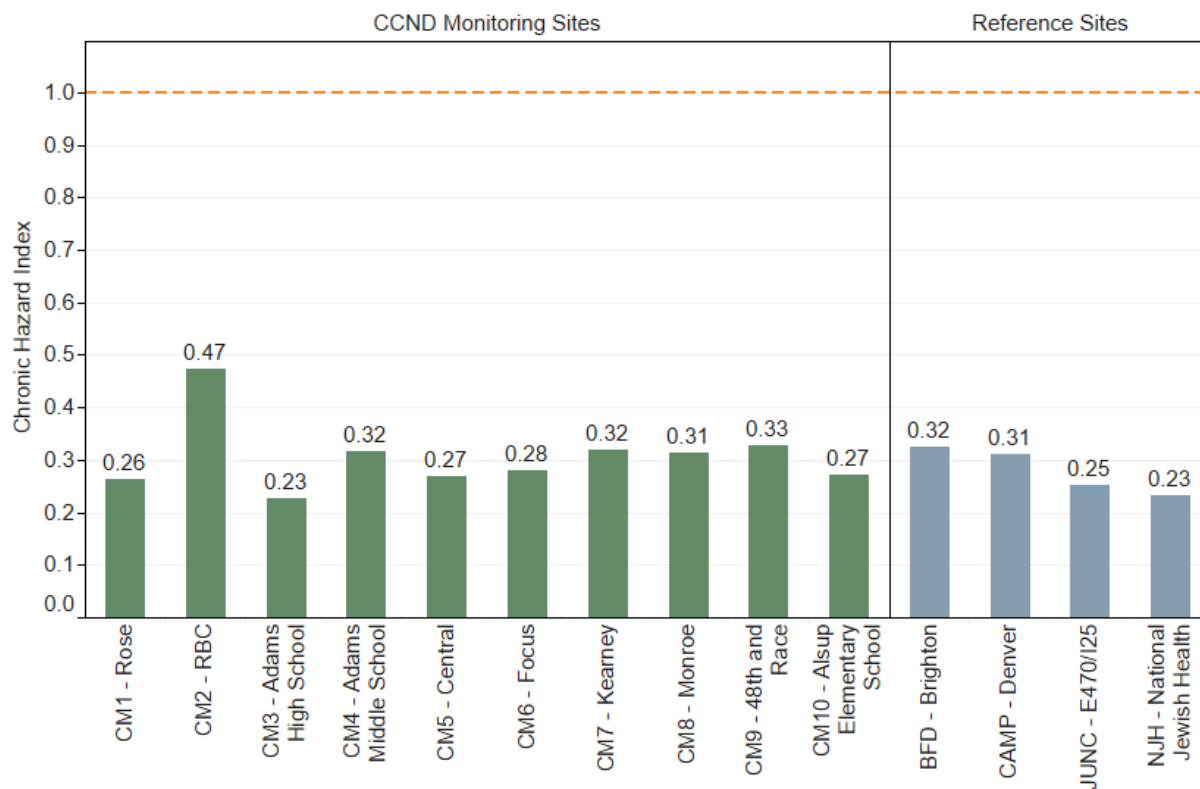
The time-weighted average concentration (Summa canister data) or 1-hour rolling average concentrations (mobile monitoring van data) were calculated from data collected across twelve quarters for each neighborhood, sampling location, and reference site. These calculated values were compared to chronic 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 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.

TABLE 3-1

Number of Measurements and Chronic Non-Cancer Hazard Indices from Mobile Monitoring Van and Corresponding Summa Canister Sampling sites (Q3 2021 – Q2 2024)

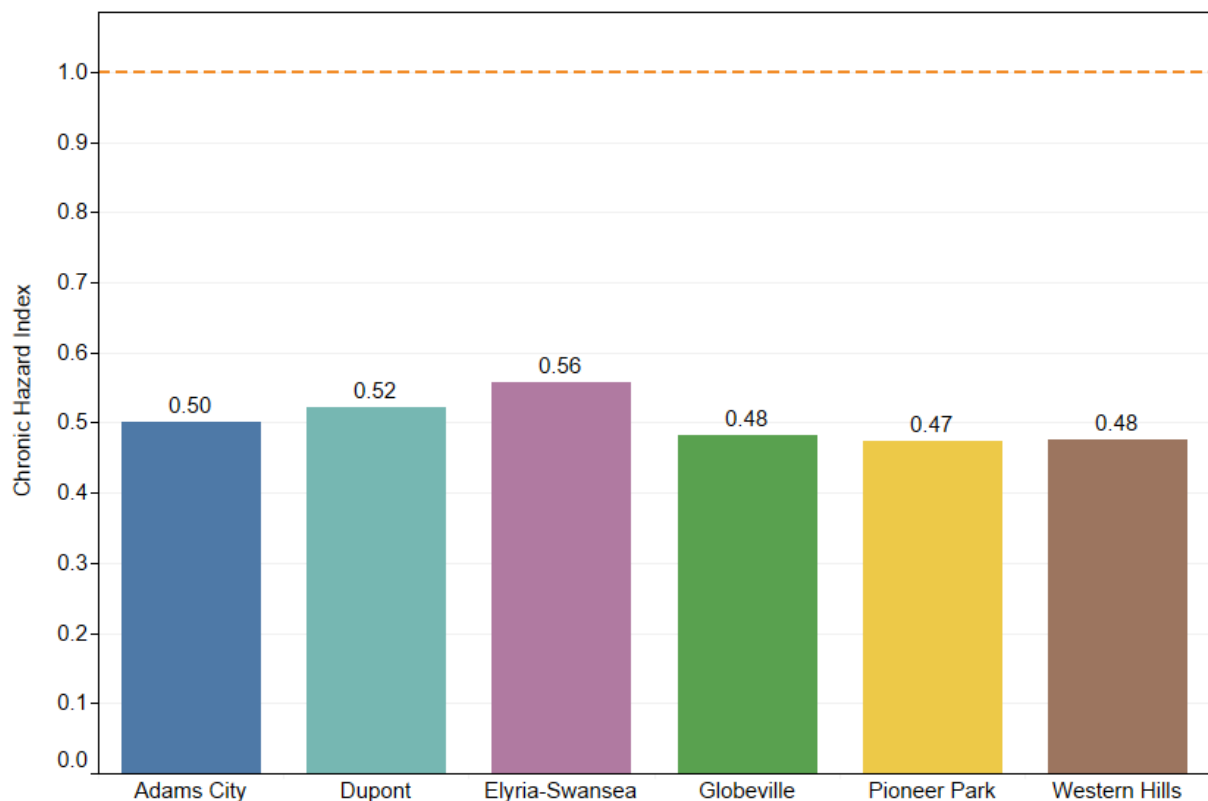
Mobile Van Sampling Neighborhood	No. of mobile van sampling readings (rolling one-hour averages)	Chronic Non-Cancer Hazard Index	CCND Monitoring Sites	Total no. of analytical samples	Chronic Non-Cancer Hazard Index
Adams City	62,488	0.50	CM-4 Adams Middle School	25	0.32
			CM-8 Monroe	20	0.31
			CM-10 Alsup	21	0.27
Dupont	100,238	0.52	CM-3 Adams High School	31	0.23
Pioneer Park	116,816	0.47	CM-1 Rose	25	0.26
			CM-5 Central	26	0.27
			CM-7 Kearney	24	0.32
Elyria-Swansea	53,080	0.56	CM-2 Suncor RBC	23	0.47
			CM-6 Focus	22	0.28
			CM-9- 48 th and Race	22	0.33
Globeville	51,746	0.48	-	-	-
Western Hills	94,582	0.48	-	-	-

FIGURE 3-1
Chronic Non-Cancer Hazard Indices for CCND Sampling Locations and Reference
Sampling Locations (Summa Canisters Q3 2021 – Q2 2024)



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 – Q2 2024)**



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

Cancer risks were estimated for five chemicals which have IUR values available. 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: 6.7×10^{-5}	Benzene IUR: 2.5×10^{-5}	Ethylbenzene IUR: 1.1×10^{-5}	Isoprene IUR: 6.1×10^{-8}	Tetrachloro-ethene IUR: 1.7×10^{-6}	Total Risk Estimate
CCND Sampling Sites	CM1 – Rose	2.3E-06	5.0E-06	7.6E-07	1.8E-09	6.5E-08	8.1E-06
	CM2 – RBC	5.8E-06	1.0E-05	1.5E-06	2.0E-09	1.5E-07	1.8E-05
	CM3 – Adams High School	1.7E-06	4.7E-06	6.6E-07	2.0E-09	6.2E-08	7.1E-06
	CM4 – Adams Middle School	4.0E-06	6.7E-06	9.6E-07	1.8E-09	9.0E-08	1.2E-05
	CM5 – Central	3.2E-06	5.8E-06	8.8E-07	1.8E-09	1.0E-07	1.0E-05
	CM6 – Focus	2.4E-06	5.5E-06	1.0E-06	2.5E-09	3.9E-08	8.9E-06
	CM7 – Kearney	3.3E-06	6.6E-06	9.2E-07	1.5E-09	1.7E-07	1.1E-05
	CM8 – Monroe	3.3E-06	6.3E-06	7.7E-07	1.5E-09	7.9E-08	1.0E-05
	CM9 – 48 th and Race	3.0E-06	6.3E-06	1.4E-06	1.6E-09	6.4E-08	1.1E-05
	CM10 – Alsup Elementary	2.8E-06	6.1E-06	9.8E-07	2.6E-09	5.7E-08	9.9E-06
Reference Sites	BFD – Brighton	2.5E-06	8.8E-06	8.3E-07	2.6E-09	5.3E-08	1.2E-05
	CAMP – Denver	3.9E-06	7.7E-06	7.7E-07	2.0E-09	5.8E-08	1.2E-05
	JUNC – E470/I25	2.4E-06	5.9E-06	8.4E-07	1.5E-09	4.8E-08	9.2E-06
	NJH – National Jewish Hospital	1.6E-06	5.7E-06	1.3E-06	1.6E-09	6.2E-08	8.7E-06

Inhalation unit risk (IUR) value is converted to per ppb. One tenth is displayed for consistency with EPA's reporting of IUR's.

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: 6.7×10^{-5}	Benzene IUR: 2.5×10^{-5}	Ethylbenzene* IUR: 1.1×10^{-5}	Isoprene IUR: 6.1×10^{-8}	Tetrachloroethene IUR: 1.7×10^{-6}	Total Risk Estimate
Adams City	1.5E-06	6.4E-06	9.9E-06	1.5E-08	1.4E-08	1.8E-05
Dupont	1.7E-06	6.2E-06	6.2E-06	9.9E-09	1.1E-08	1.4E-05
Elyria-Swansea	2.2E-06	6.6E-06	9.8E-06	1.2E-08	2.3E-08	1.9E-05
Globeville	1.8E-06	7.5E-06	1.0E-05	1.3E-08	1.3E-08	1.9E-05
Pioneer Park	2.0E-06	5.0E-06	6.8E-06	1.2E-08	1.3E-08	1.4E-05
Western Hills	1.8E-06	5.8E-06	8.8E-06	1.1E-08	1.8E-08	1.6E-05

Inhalation unit risk (IUR) value is converted to per ppb. One tenth 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.

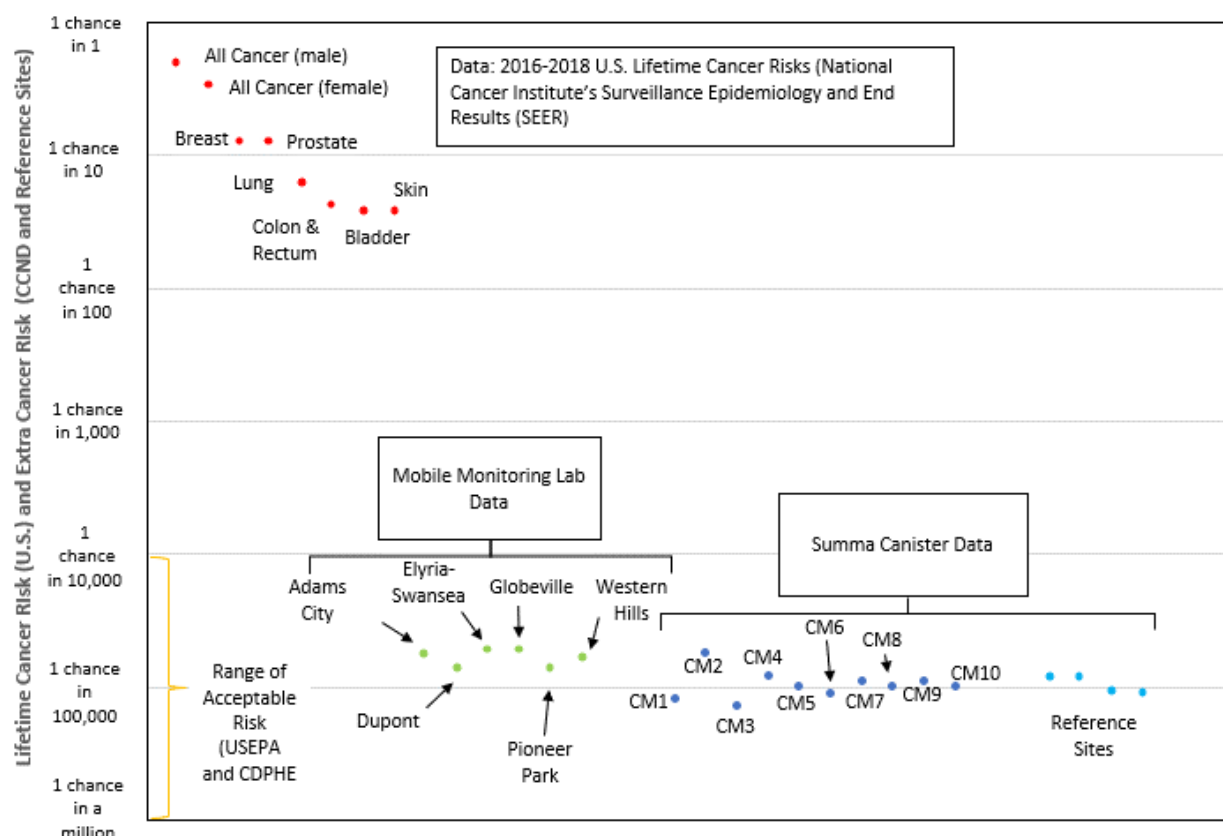
It is helpful to understand the cancer risks calculated in this report in the context of typical background cancer risks in the United States (U.S.) For federal regulatory agencies in the U.S., a 10^{-4} excess cancer risk level is the upper end of the generally acceptable risk range of 10^{-6} (one 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 300.430¹². 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 2017 through 2019, 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 women¹³. 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 36 Months of CCND Air Program Data



¹² 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>

¹³ <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 overestimate actual risk.

The chronic non-cancer and cancer risk assessments for the 36-month period are based on data collected on specific dates using the Summa canister and mobile monitoring van platforms. This assumes that the samples collected over a 36-month period represent estimated EC that a person 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. Chronic HQ calculations from mobile van data were based on isomer mixtures, and the most stringent health-based RL of any isomer in the mixture was assumed to be the RL for the entire isomer mixture, 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. However, without a suitable method to separate ethylbenzene from the mobile monitoring van's xylenes measurements, the conservative assumption is that the isomer measurements are completely ethylbenzene. Thus, this instrument limitation led to the overestimate of 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 but at a concentration below the MDL. The use of ½ MDL as a surrogate concentration is recommended by USEPA.¹⁴

¹⁴ 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 toxicological data that require a variety of assumptions for application in human health risk estimates, such as extrapolations from animal studies to human health, from experimental high-doses to low-doses, or from other similar chemicals to the chemical of interest. 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 of analytes in CCND air.

5.0 CONCLUSIONS

In conclusion, the data collected during this twelve-quarter study phase did not indicate a potential for chronic non-cancer adverse health effects from exposure to the measured chemicals, individually nor cumulatively. 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 at 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 are typically one in two for men and one in three for women in the U.S.

Respectfully Submitted:



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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:

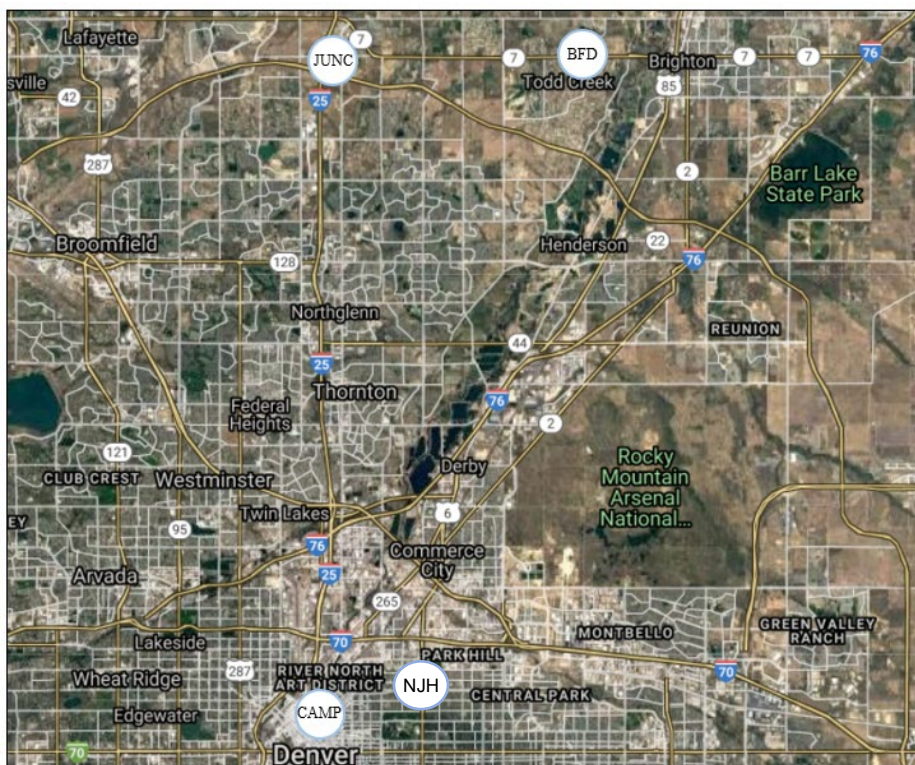
- Historical wind pattern data,
- Proximity to the refinery and non-refinery sources,
- Existing infrastructure, as well as site access and safety,
- Community feedback

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), the Colorado Department of Health and Environment (CDPHE) CAMP air monitoring station (CAMP), and the National Jewish Hospital (NJH). 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 CDPHE¹⁵. Due to additional sources of VOCs identified in the vicinity of the CAMP location, the third reference site was moved to NJH in the first quarter of 2024.

FIGURE A-2
MAP OF FOUR NON-CCND COMMUNITY MONITORING (URBAN AND RURAL BACKGROUND) SITES: E470/I25 (JUNC), BRIGHTON FIRE DEPARTMENT (BFD), NATIONAL JEWISH HEALTH (NJH) AND COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE) CAMP AIR MONITORING STATION (CAMP)



¹⁵ CDPHE describes CAMP as Urban in many reports. As an example, this description can be found on page 6 of the [2020 Ambient Air Monitoring Network Assessment](https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2020_CO_5yr_Network_Assessment.pdf):
https://www.colorado.gov/airquality/tech_doc_repository.aspx?action=open&file=2020_CO_5yr_Network_Assessment.pdf

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. 58 th 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. 72 nd Ave. & Quebec Pkwy, Commerce City
CM4	Adams City Middle School	39.82893, -104.93499	1.9	Birch St. & E. 72 nd Ave., Commerce City
CM5	Central Elementary School	39.81457, -104.91928	1.7	Holly St. & E 64 th Ave., Commerce City
CM6	Focus Points Family Resource Center	39.78436, -104.95663	1.4	Columbine St. & 48 th Ave., Denver
CM7	Kearney Middle School	39.80888, -104.91545	1.7	E. 62 nd Ave. & Kearney St., Commerce City
CM8	Monroe	39.81560, -104.94503	0.85	Monroe St. & E. 64 th Ave., Denver
CM9	48 th and Race	39.78455, -104.96264	1.7	East 48 th Ave. & Race St., Denver
CM10	Alsup Elementary School	39.82026, -104.93663	1.3	East 68 th 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 (ending Q3 of 2023)	39.75111, -104.98766	4.2	Champa St. & N. Broadway, Denver
JUNC	E470/I25	39.98614, -104.98468	12.8	E. 160 th & Washington St., Thornton
NJH	National Jewish Health (beginning Q1 of 2024)	39.73904, -104.94215	4.10	Colorado Blvd. & East 14th Ave
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 based on the typical set of compounds monitored for in urban and industrial areas and laboratory analysis capabilities (Table A-3).

TABLE A-3
SELECTED ANALYTES FOR 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, groups of chemical isomers (Table A-5) that include the list of 65 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 non-cancer risk assessment calculations, risks from the isomer groups are calculated based on the lowest 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

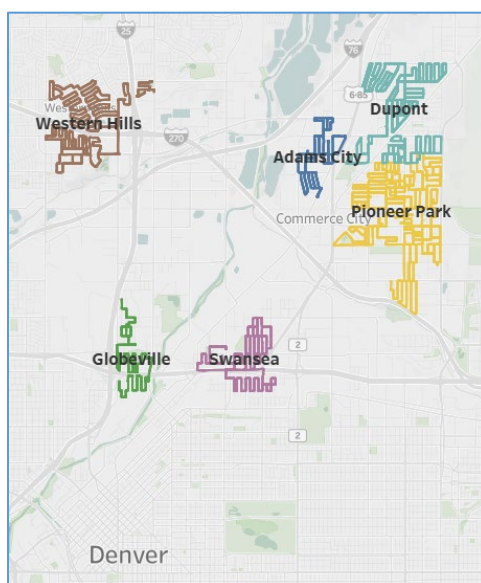
Group Name	Specific Isomers	Group Name	Specific Isomers
<i>Butenes</i>	1-Butene cis-2-Butene trans-2-Butene	<i>Xylenes</i>	Ethyl Benzene o-Xylene m-Xylene p-Xylene
<i>Butanes</i>	iso-Butane n-Butane	<i>Dimethylcyclohexanes</i>	Ethylcyclohexane cis-1,3-Dimethylcyclohexane trans-1,2-Dimethylcyclohexane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

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 sampling event. Drift can cause an increase or decrease in the measured chemical concentrations, which can lead to either positive or 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

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment CM1 - Rose | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	25	14	5.7595	0.2166	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	25	1	0.1320	0.0235	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	25	6	0.3090	0.0247	560	TCEQ Long-Term AMCV	0.0000
1,2,3-Trimethylbenzene	526-73-8	25	9	1.0100	0.0551	12	EPA Inhalation RfCi	0.0045
1,2,4-Trimethylbenzene	95-63-6	25	17	2.9000	0.0612	12	EPA Inhalation RfCi	0.0050
1,3-Butadiene	106-99-0	25	12	0.2240	0.0342	0.95	EPA RSL Non-Cancer	0.0360
1,3-Diethylbenzene	141-93-5	25	5	0.1700	0.0687	45	TCEQ Long-Term AMCV	0.0015
1,3,5-Trimethylbenzene	108-67-8	25	5	0.8910	0.0275	12	EPA Inhalation RfCi	0.0023
1,4-Diethylbenzene	105-05-5	25	12	0.9040	0.0737	45	TCEQ Long-Term AMCV	0.0016
2-Ethyltoluene	611-14-3	25	3	0.3690	0.0346	25	TCEQ Long-Term AMCV	0.0014
2-Methylheptane	592-27-8	25	6	0.4670	0.0285	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	25	13	0.9450	0.0431	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	25	24	2.6100	0.2367	190	TCEQ Long-Term AMCV	0.0012
2,2-Dimethylbutane	75-83-2	25	4	0.6200	0.0246	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	25	18	0.4790	0.0959	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	25	9	0.6870	0.0591	190	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylpentane	565-59-3	25	15	0.4760	0.0394	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	25	3	0.1940	0.024	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	25	11	0.4380	0.0447	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	25	11	0.8950	0.0516	25	TCEQ Long-Term AMCV	0.0021
3-Methylheptane	589-81-1	25	10	0.4130	0.0667	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	25	20	1.0200	0.1867	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	25	22	2.0400	0.1502	190	TCEQ Long-Term AMCV	0.0008
4-Ethyltoluene	622-96-8	25	4	0.3300	0.0326	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	25	25	3.5200	0.7233	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	25	24	0.9960	0.1992	3	ATSDR Chronic MRL	0.0664
Butane	106-97-8	25	25	27.6000	1.881	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	25	8	0.3030	0.0563	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	25	6	0.2090	0.0283	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	25	3	0.3090	0.023	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	25	21	1.0000	0.0797	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	25	12	0.5072	0.034	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	25	10	0.5830	0.0459	190	TCEQ Long-Term AMCV	0.0002
Dodecane	112-40-3	25	13	108.0000	0.1896	3.8	CDPHE Chronic	0.0499
Ethane	74-84-0	25	25	21.8000	9.2908	NA	NA	
Ethylbenzene	100-41-4	25	21	1.5600	0.0701	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	25	25	4.4100	1.3219	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	25	23	0.8180	0.114	98	EPA Inhalation RfCi	0.0012
Hexane	110-54-3	25	25	1.6000	0.2675	199	EPA Inhalation RfCi	0.0013
Isobutane	75-28-5	25	25	6.0100	0.729	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	25	24	7.4500	1.0236	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	25	6	7.8359	0.0302	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	25	4	0.1970	0.0241	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3..	25	25	6.6000	0.1847	23	EPA RSL Non-Cancer	0.0080
Methylcyclohexane	108-87-2	25	15	0.7860	0.0648	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	25	19	1.6300	0.1658	75	TCEQ Long-Term AMCV	0.0022
n-Octane	111-65-9	25	13	0.7280	0.0391	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	25	1	2.4000	0.0292	0.57	EPA Inhalation RfCi	0.0510
Nonane	111-84-2	25	5	2.0200	0.0253	3.8	EPA Inhalation RfCi	0.0066
o-Xylene	95-47-6	25	21	2.1400	0.0792	23	EPA RSL Non-Cancer	0.0034
Pentane	109-66-0	25	24	6.7868	0.6988	338	EPA Inhalation RfCi	0.0021
Propane	74-98-6	25	25	51.9000	3.5736	NA	NA	
Propylbenzene	103-65-1	25	4	0.2990	0.0279	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	25	25	1.0500	0.2633	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	25	8	0.3700	0.0374	5.9	EPA Inhalation RfCi	0.0063
Toluene	108-88-3	25	25	5.1200	0.4816	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	25	4	0.3460	0.0279	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	25	7	0.6580	0.0275	560	TCEQ Long-Term AMCV	0.0000
Undecane	1120-21-4	25	13	6.5900	0.0611	55	TCEQ Long-Term AMCV	0.0011
Hazard Index								0.2626

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment CM2 - RBC | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	23	16	0.2580	0.0729	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	23	1	0.5274	0.0243	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	23	13	0.7727	0.0536	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	23	11	0.1011	0.0478	12	EPA Inhalation RfCi	0.0039
1,2,4-Trimethylbenzene	95-63-6	23	18	0.5200	0.1325	12	EPA Inhalation RfCi	0.0109
1,3-Butadiene	106-99-0	23	9	0.4100	0.0873	0.95	EPA RSL Non-Cancer	0.0920
1,3-Diethylbenzene	141-93-5	23	5	0.0940	0.0448	45	TCEQ Long-Term AMCV	0.0010
1,3,5-Trimethylbenzene	108-67-8	23	5	0.3800	0.0736	12	EPA Inhalation RfCi	0.0060
1,4-Diethylbenzene	105-05-5	23	12	0.1800	0.0761	45	TCEQ Long-Term AMCV	0.0017
2-Ethyltoluene	611-14-3	23	3	0.2100	0.0297	25	TCEQ Long-Term AMCV	0.0012
2-Methylheptane	592-27-8	23	6	0.0920	0.0381	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	23	16	0.2400	0.1275	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	23	22	12.2428	0.3557	190	TCEQ Long-Term AMCV	0.0019
2,2-Dimethylbutane	75-83-2	23	9	2.2430	0.0298	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	23	18	9.3200	0.1612	380	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylbutane	79-29-8	23	12	5.8296	0.0841	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	23	15	2.1288	0.0747	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	23	5	0.2590	0.0341	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	23	10	0.3900	0.0589	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	23	11	0.3100	0.0489	25	TCEQ Long-Term AMCV	0.0020
3-Methylheptane	589-81-1	23	12	0.4400	0.1173	380	TCEQ Long-Term AMCV	0.0003
3-Methylhexane	589-34-4	23	20	0.4900	0.276	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	23	22	7.2120	0.2499	190	TCEQ Long-Term AMCV	0.0013
4-Ethyltoluene	622-96-8	23	4	0.3500	0.0733	25	TCEQ Long-Term AMCV	0.0029
Acetylene	74-86-2	23	23	2.2800	0.7036	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	23	22	2.2000	0.4069	3	ATSDR Chronic MRL	0.1356
Butane	106-97-8	23	23	26.7503	2.9636	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	23	10	0.4900	0.1293	225	EPA Inhalation RfCi	0.0006
Cis-2-Butene	590-18-1	23	8	0.8368	0.0442	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	23	3	1.4242	0.0243	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	23	18	11.1000	0.1772	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	23	18	2.2843	0.1435	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	23	16	0.1101	0.0669	190	TCEQ Long-Term AMCV	0.0004
Dodecane	112-40-3	23	14	0.1978	0.1133	3.8	CDPHE Chronic	0.0298
Ethane	74-84-0	23	23	23.0000	9.9529	NA	NA	
Ethylbenzene	100-41-4	23	17	0.5280	0.1349	230	EPA Inhalation RfCi	0.0006
Ethylene	74-85-1	23	23	3.0500	1.1297	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	23	22	2.2600	0.236	98	EPA Inhalation RfCi	0.0024
Hexane	110-54-3	23	23	9.0500	0.5046	199	EPA Inhalation RfCi	0.0025
Isobutane	75-28-5	23	23	4.7847	1.3022	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	23	23	97.2967	1.7585	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	23	7	0.2506	0.0334	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	23	4	0.3500	0.0681	81	EPA Inhalation RfCi	0.0008
m,p-Xylenes	108-38-3..	23	21	1.8500	0.3432	23	EPA RSL Non-Cancer	0.0149
Methylcyclohexane	108-87-2	23	16	0.2800	0.1249	400	TCEQ Long-Term AMCV	0.0003
Methylcyclopentane	96-37-7	23	19	0.3950	0.229	75	TCEQ Long-Term AMCV	0.0031
n-Octane	111-65-9	23	16	0.3820	0.0752	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	23	6	0.2300	0.0628	0.57	EPA Inhalation RfCi	0.1097
Nonane	111-84-2	23	12	0.1294	0.0566	3.8	EPA Inhalation RfCi	0.0148
o-Xylene	95-47-6	23	17	0.5830	0.1476	23	EPA RSL Non-Cancer	0.0064
Pentane	109-66-0	23	23	32.2527	1.3826	338	EPA Inhalation RfCi	0.0041
Propane	74-98-6	23	23	14.6000	4.2765	NA	NA	
Propylbenzene	103-65-1	23	4	0.3500	0.0696	203	EPA Inhalation RfCi	0.0003
Propylene	115-07-1	23	23	0.9000	0.2837	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	23	8	0.4000	0.0855	5.9	EPA Inhalation RfCi	0.0145
Toluene	108-88-3	23	23	7.5000	1.5593	1,327	EPA Inhalation RfCi	0.0012
Trans-2-Butene	624-64-6	23	9	1.1033	0.0528	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	23	7	3.6620	0.036	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	23	14	0.1600	0.0845	55	TCEQ Long-Term AMCV	0.0015
Hazard Index								0.4731

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment CM3 - Adams High School | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	31	24	2.1000	0.0551	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	31	4	0.5600	0.0247	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	31	7	4.4763	0.0367	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	31	13	0.1334	0.0271	12	EPA Inhalation RfCi	0.0022
1,2,4-Trimethylbenzene	95-63-6	31	22	0.2180	0.0519	12	EPA Inhalation RfCi	0.0043
1,3-Butadiene	106-99-0	31	13	0.3000	0.0253	0.95	EPA RSL Non-Cancer	0.0267
1,3-Diethylbenzene	141-93-5	31	8	0.1600	0.059	45	TCEQ Long-Term AMCV	0.0013
1,3,5-Trimethylbenzene	108-67-8	31	4	0.1410	0.0212	12	EPA Inhalation RfCi	0.0017
1,4-Diethylbenzene	105-05-5	31	16	0.1940	0.0556	45	TCEQ Long-Term AMCV	0.0012
2-Ethyltoluene	611-14-3	31	4	0.1000	0.0334	25	TCEQ Long-Term AMCV	0.0013
2-Methylheptane	592-27-8	31	7	0.4086	0.025	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	31	17	2.2326	0.1075	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	31	29	20.0000	0.2377	190	TCEQ Long-Term AMCV	0.0013
2,2-Dimethylbutane	75-83-2	31	7	4.3000	0.0304	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	31	21	1.5000	0.0664	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	31	10	18.1862	0.0534	190	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylpentane	565-59-3	31	15	1.5000	0.0362	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	31	7	0.3816	0.0534	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	31	13	1.3669	0.039	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	31	15	0.4212	0.0381	25	TCEQ Long-Term AMCV	0.0015
3-Methylheptane	589-81-1	31	15	0.4900	0.139	380	TCEQ Long-Term AMCV	0.0004
3-Methylhexane	589-34-4	31	25	2.3000	0.2477	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	31	28	11.0000	0.1973	190	TCEQ Long-Term AMCV	0.0010
4-Ethyltoluene	622-96-8	31	4	0.1540	0.0271	25	TCEQ Long-Term AMCV	0.0011
Acetylene	74-86-2	31	31	16.0000	0.6706	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	31	30	3.8700	0.1865	3	ATSDR Chronic MRL	0.0622
Butane	106-97-8	31	29	440.0000	2.2631	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	31	14	1.1100	0.0754	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	31	6	6.1105	0.0345	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	31	3	4.7134	0.0308	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	31	22	4.4000	0.0764	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	31	11	6.0125	0.0467	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	31	17	0.2920	0.0281	190	TCEQ Long-Term AMCV	0.0001
Dodecane	112-40-3	31	18	1.1500	0.1061	3.8	CDPHE Chronic	0.0279
Ethane	74-84-0	31	31	64.0000	9.0255	NA	NA	
Ethylbenzene	100-41-4	31	23	0.4000	0.061	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	31	31	6.3000	1.2018	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	31	30	1.9000	0.1151	98	EPA Inhalation RfCi	0.0012
Hexane	110-54-3	31	31	13.0000	0.2887	199	EPA Inhalation RfCi	0.0015
Isobutane	75-28-5	31	31	98.0000	0.8991	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	31	30	170.0000	1.223	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	31	8	0.3304	0.0331	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	31	2	0.1400	0.0204	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3..	31	25	1.1700	0.1693	23	EPA RSL Non-Cancer	0.0074
Methylcyclohexane	108-87-2	31	16	1.5000	0.037	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	31	28	7.5000	0.1896	75	TCEQ Long-Term AMCV	0.0025
n-Octane	111-65-9	31	19	0.2920	0.0337	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	31	4	0.2500	0.0284	0.57	EPA Inhalation RfCi	0.0496
Nonane	111-84-2	31	13	0.2300	0.0501	3.8	EPA Inhalation RfCi	0.0131
o-Xylene	95-47-6	31	23	0.3500	0.0658	23	EPA RSL Non-Cancer	0.0029
Pentane	109-66-0	31	31	71.0000	0.926	338	EPA Inhalation RfCi	0.0027
Propane	74-98-6	31	31	33.0000	3.5749	NA	NA	
Propylbenzene	103-65-1	31	4	0.1590	0.0208	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	31	31	6.7000	0.2727	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	31	8	0.3950	0.0356	5.9	EPA Inhalation RfCi	0.0060
Toluene	108-88-3	31	31	4.9500	0.5777	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	31	5	5.3000	0.0335	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	31	5	9.4614	0.0704	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	31	18	0.1540	0.0355	55	TCEQ Long-Term AMCV	0.0006
Hazard Index								0.2267

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment CM4 - Adams Middle School | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	25	18	1.7000	0.0921	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	25	1	0.4000	0.0289	50	TCEQ Long-Term AMCV	0.0006
1-Pentene	109-67-1	25	9	1.6000	0.0312	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	25	12	0.2400	0.0506	12	EPA Inhalation RfCi	0.0041
1,2,4-Trimethylbenzene	95-63-6	25	22	0.2800	0.0773	12	EPA Inhalation RfCi	0.0063
1,3-Butadiene	106-99-0	25	12	0.3000	0.06	0.95	EPA RSL Non-Cancer	0.0632
1,3-Diethylbenzene	141-93-5	25	5	0.5900	0.0465	45	TCEQ Long-Term AMCV	0.0010
1,3,5-Trimethylbenzene	108-67-8	25	7	0.1450	0.0357	12	EPA Inhalation RfCi	0.0029
1,4-Diethylbenzene	105-05-5	25	13	0.1600	0.0443	45	TCEQ Long-Term AMCV	0.0010
2-Ethyltoluene	611-14-3	25	4	0.2400	0.0288	25	TCEQ Long-Term AMCV	0.0012
2-Methylheptane	592-27-8	25	9	0.2600	0.0297	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	25	14	0.9700	0.1145	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	25	21	9.2000	0.3076	190	TCEQ Long-Term AMCV	0.0016
2,2-Dimethylbutane	75-83-2	25	9	1.2000	0.0305	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	25	20	0.5500	0.0913	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	25	12	2.2000	0.0616	190	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylpentane	565-59-3	25	21	0.5000	0.1037	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	25	3	0.1764	0.0431	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	25	12	0.4600	0.072	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	25	11	0.1900	0.0397	25	TCEQ Long-Term AMCV	0.0016
3-Methylheptane	589-81-1	25	12	0.1600	0.0726	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	25	19	1.1000	0.226	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	25	20	5.1000	0.2002	190	TCEQ Long-Term AMCV	0.0011
4-Ethyltoluene	622-96-8	25	3	0.1340	0.0315	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	25	25	4.6400	0.7581	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	25	24	1.9000	0.2667	3	ATSDR Chronic MRL	0.0889
Butane	106-97-8	25	25	180.0000	2.7634	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	25	10	0.6210	0.0977	225	EPA Inhalation RfCi	0.0004
Cis-2-Butene	590-18-1	25	8	3.6000	0.0334	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	25	6	1.7000	0.0295	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	25	22	1.8000	0.1133	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	25	13	1.9000	0.1011	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	25	15	0.7700	0.0675	190	TCEQ Long-Term AMCV	0.0004
Dodecane	112-40-3	25	14	0.5984	0.1205	3.8	CDPHE Chronic	0.0317
Ethane	74-84-0	25	25	52.2000	11.4316	NA	NA	
Ethylbenzene	100-41-4	25	21	0.4600	0.0885	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	25	25	6.5700	1.3662	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	25	23	1.0000	0.1754	98	EPA Inhalation RfCi	0.0018
Hexane	110-54-3	25	25	7.5000	0.4219	199	EPA Inhalation RfCi	0.0021
Isobutane	75-28-5	25	25	52.0000	1.1234	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	25	24	68.0000	1.8604	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	25	6	0.2500	0.0296	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	25	5	0.1360	0.034	81	EPA Inhalation RfCi	0.0004
m,p-Xylenes	108-38-3..	25	23	1.5000	0.2223	23	EPA RSL Non-Cancer	0.0097
Methylcyclohexane	108-87-2	25	15	0.7400	0.0945	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	25	19	3.1000	0.1972	75	TCEQ Long-Term AMCV	0.0026
n-Octane	111-65-9	25	16	0.2200	0.0646	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	25	4	0.1280	0.0331	0.57	EPA Inhalation RfCi	0.0578
Nonane	111-84-2	25	10	0.4200	0.0444	3.8	EPA Inhalation RfCi	0.0116
o-Xylene	95-47-6	25	22	0.6900	0.0973	23	EPA RSL Non-Cancer	0.0042
Pentane	109-66-0	25	23	39.0000	1.2948	338	EPA Inhalation RfCi	0.0038
Propane	74-98-6	25	25	51.6000	4.765	NA	NA	
Propylbenzene	103-65-1	25	5	0.1360	0.0343	203	EPA Inhalation RfCi	0.0002
Propylene	115-07-1	25	25	3.2800	0.3301	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	25	9	0.1970	0.0518	5.9	EPA Inhalation RfCi	0.0088
Toluene	108-88-3	25	25	12.0000	0.6794	1,327	EPA Inhalation RfCi	0.0005
Trans-2-Butene	624-64-6	25	9	4.5000	0.0333	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	25	9	3.4000	0.0355	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	25	16	0.2973	0.0653	55	TCEQ Long-Term AMCV	0.0012
Hazard Index								0.3164

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment CM5 - Central | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	26	18	10.0000	0.0679	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	26	2	2.4000	0.0252	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	26	8	13.0000	0.0401	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	26	8	0.2800	0.0381	12	EPA Inhalation RfCi	0.0031
1,2,4-Trimethylbenzene	95-63-6	26	19	0.9100	0.0657	12	EPA Inhalation RfCi	0.0054
1,3-Butadiene	106-99-0	26	13	1.1000	0.0473	0.95	EPA RSL Non-Cancer	0.0498
1,3-Diethylbenzene	141-93-5	26	6	0.4200	0.0418	45	TCEQ Long-Term AMCV	0.0009
1,3,5-Trimethylbenzene	108-67-8	26	5	0.2900	0.0262	12	EPA Inhalation RfCi	0.0021
1,4-Diethylbenzene	105-05-5	26	11	0.3400	0.0464	45	TCEQ Long-Term AMCV	0.0010
2-Ethyltoluene	611-14-3	26	3	0.1900	0.0263	25	TCEQ Long-Term AMCV	0.0011
2-Methylheptane	592-27-8	26	6	1.2000	0.029	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	26	19	5.3000	0.0983	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	26	25	53.0000	0.3426	190	TCEQ Long-Term AMCV	0.0018
2,2-Dimethylbutane	75-83-2	26	5	4.3000	0.028	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	26	20	0.9400	0.0837	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	26	10	11.0000	0.0487	190	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylpentane	565-59-3	26	16	2.4000	0.0632	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	26	3	0.4000	0.0241	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	26	11	2.4000	0.0568	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	26	14	0.6000	0.0457	25	TCEQ Long-Term AMCV	0.0018
3-Methylheptane	589-81-1	26	12	0.9700	0.1291	380	TCEQ Long-Term AMCV	0.0003
3-Methylhexane	589-34-4	26	23	6.9000	0.2346	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	26	24	30.0000	0.2286	190	TCEQ Long-Term AMCV	0.0012
4-Ethyltoluene	622-96-8	26	4	0.2700	0.0316	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	26	26	2.9000	0.7665	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	26	25	8.4000	0.2308	3	ATSDR Chronic MRL	0.0769
Butane	106-97-8	26	26	1400.0000	3.6819	10000	TCEQ Long-Term AMCV	0.0004
Carbon disulfide	75-15-0	26	6	0.2670	0.06	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	26	6	29.0000	0.0604	700	TCEQ Long-Term AMCV	0.0001
Cis-2-Pentene	627-20-3	26	4	14.0000	0.0363	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	26	21	7.9000	0.0973	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	26	12	9.2000	0.0391	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	26	8	0.2700	0.0418	190	TCEQ Long-Term AMCV	0.0002
Dodecane	112-40-3	26	11	0.2479	0.0691	3.8	CDPHE Chronic	0.0182
Ethane	74-84-0	26	26	69.0000	10.2256	NA	NA	
Ethylbenzene	100-41-4	26	19	1.3000	0.0805	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	26	26	11.0000	1.3656	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	26	24	5.4000	0.1468	98	EPA Inhalation RfCi	0.0015
Hexane	110-54-3	26	25	37.0000	0.3553	199	EPA Inhalation RfCi	0.0018
Isobutane	75-28-5	26	26	490.0000	1.3924	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	26	26	400.0000	1.7134	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	26	8	0.8300	0.029	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	26	3	0.0893	0.0241	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3..	26	25	4.7000	0.2163	23	EPA RSL Non-Cancer	0.0094
Methylcyclohexane	108-87-2	26	15	4.6000	0.0783	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	26	22	18.0000	0.191	75	TCEQ Long-Term AMCV	0.0025
n-Octane	111-65-9	26	16	0.9500	0.0523	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	26	3	0.1980	0.0321	0.57	EPA Inhalation RfCi	0.0561
Nonane	111-84-2	26	11	0.4600	0.0356	3.8	EPA Inhalation RfCi	0.0093
o-Xylene	95-47-6	26	20	1.5000	0.0892	23	EPA RSL Non-Cancer	0.0039
Pentane	109-66-0	26	25	170.0000	1.0024	338	EPA Inhalation RfCi	0.0030
Propane	74-98-6	26	26	69.0000	4.1905	NA	NA	
Propylbenzene	103-65-1	26	4	0.1700	0.026	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	26	26	6.5000	0.287	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	26	6	0.2500	0.059	5.9	EPA Inhalation RfCi	0.0100
Toluene	108-88-3	26	26	17.0000	0.5717	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	26	7	41.0000	0.0711	700	TCEQ Long-Term AMCV	0.0001
Trans-2-Pentene	646-04-8	26	7	26.0000	0.0524	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	26	15	0.1502	0.0458	55	TCEQ Long-Term AMCV	0.0008
Hazard Index								0.2691

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment CM6 - Focus | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	22	13	0.2310	0.0522	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	22	0	< 0.0637	0.0236	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	22	5	0.1017	0.0331	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	22	5	0.1200	0.0376	12	EPA Inhalation RfCi	0.0031
1,2,4-Trimethylbenzene	95-63-6	22	16	0.1030	0.0687	12	EPA Inhalation RfCi	0.0056
1,3-Butadiene	106-99-0	22	7	0.1690	0.0354	0.95	EPA RSL Non-Cancer	0.0373
1,3-Diethylbenzene	141-93-5	22	6	0.1300	0.0523	45	TCEQ Long-Term AMCV	0.0012
1,3,5-Trimethylbenzene	108-67-8	22	2	0.0906	0.0238	12	EPA Inhalation RfCi	0.0020
1,4-Diethylbenzene	105-05-5	22	9	0.0940	0.0359	45	TCEQ Long-Term AMCV	0.0008
2-Ethyltoluene	611-14-3	22	1	0.0740	0.0234	25	TCEQ Long-Term AMCV	0.0009
2-Methylheptane	592-27-8	22	3	0.3000	0.0242	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	22	16	0.2100	0.104	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	22	20	0.5240	0.295	190	TCEQ Long-Term AMCV	0.0016
2,2-Dimethylbutane	75-83-2	22	5	0.0833	0.0241	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	22	18	0.1800	0.0813	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	22	7	0.1160	0.0392	190	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylpentane	565-59-3	22	12	0.1330	0.0636	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	22	1	0.0637	0.024	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	22	8	0.5400	0.0414	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	22	10	0.2000	0.0562	25	TCEQ Long-Term AMCV	0.0022
3-Methylheptane	589-81-1	22	11	0.4500	0.1429	380	TCEQ Long-Term AMCV	0.0004
3-Methylhexane	589-34-4	22	19	0.4300	0.2519	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	22	19	0.6423	0.2277	190	TCEQ Long-Term AMCV	0.0012
4-Ethyltoluene	622-96-8	22	2	0.0923	0.0295	25	TCEQ Long-Term AMCV	0.0012
Acetylene	74-86-2	22	22	2.5200	0.7622	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	22	21	0.4000	0.2166	3	ATSDR Chronic MRL	0.0722
Butane	106-97-8	22	22	7.1000	2.0462	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	22	8	0.1440	0.0452	225	EPA Inhalation RfCi	0.0002
Cis-2-Butene	590-18-1	22	3	0.1260	0.0243	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	22	0	< 0.0637	0.0229	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	22	18	0.3150	0.0838	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	22	13	0.4370	0.041	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	22	9	0.6900	0.0483	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	22	12	0.2000	0.0691	3.8	CDPHE Chronic	0.0182
Ethane	74-84-0	22	22	21.0000	11.1584	NA	NA	
Ethylbenzene	100-41-4	22	18	0.1639	0.0919	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	22	22	2.8700	1.2366	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	22	21	0.3180	0.1398	98	EPA Inhalation RfCi	0.0014
Hexane	110-54-3	22	22	0.6330	0.3286	199	EPA Inhalation RfCi	0.0017
Isobutane	75-28-5	22	22	1.7200	0.8509	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	22	21	2.6000	0.96	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	22	7	0.4600	0.041	140	TCEQ Long-Term AMCV	0.0003
Isopropylbenzene	98-82-8	22	1	0.0887	0.0201	81	EPA Inhalation RfCi	0.0002
m,p-Xylenes	108-38-3..	22	22	0.6290	0.2831	23	EPA RSL Non-Cancer	0.0123
Methylcyclohexane	108-87-2	22	14	0.1660	0.0802	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	22	20	0.3916	0.2165	75	TCEQ Long-Term AMCV	0.0029
n-Octane	111-65-9	22	12	0.2000	0.0509	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	22	4	0.1900	0.0485	0.57	EPA Inhalation RfCi	0.0848
Nonane	111-84-2	22	8	0.1900	0.0414	3.8	EPA Inhalation RfCi	0.0109
o-Xylene	95-47-6	22	18	0.1634	0.0985	23	EPA RSL Non-Cancer	0.0043
Pentane	109-66-0	22	22	2.3022	1.1081	338	EPA Inhalation RfCi	0.0033
Propane	74-98-6	22	22	18.0000	4.0121	NA	NA	
Propylbenzene	103-65-1	22	2	0.0978	0.0232	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	22	22	0.5650	0.2724	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	22	2	1.0000	0.0228	5.9	EPA Inhalation RfCi	0.0039
Toluene	108-88-3	22	22	1.1000	0.5109	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	22	3	0.1400	0.0275	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	22	4	0.5080	0.0676	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	22	11	0.1461	0.0476	55	TCEQ Long-Term AMCV	0.0009
Hazard Index								0.2791

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment CM7 - Kearney | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	24	15	4.5000	0.1907	2300	TCEQ Long-Term AMCV	0.0001
1-Hexene	592-41-6	24	1	0.9800	0.0242	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	24	6	0.9600	0.033	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	24	8	0.2000	0.0335	12	EPA Inhalation RfCi	0.0027
1,2,4-Trimethylbenzene	95-63-6	24	19	0.3480	0.0678	12	EPA Inhalation RfCi	0.0056
1,3-Butadiene	106-99-0	24	12	8.2000	0.0494	0.95	EPA RSL Non-Cancer	0.0520
1,3-Diethylbenzene	141-93-5	24	5	0.1400	0.0544	45	TCEQ Long-Term AMCV	0.0012
1,3,5-Trimethylbenzene	108-67-8	24	4	0.0917	0.0258	12	EPA Inhalation RfCi	0.0021
1,4-Diethylbenzene	105-05-5	24	12	0.1200	0.0535	45	TCEQ Long-Term AMCV	0.0012
2-Ethyltoluene	611-14-3	24	4	0.0990	0.0266	25	TCEQ Long-Term AMCV	0.0011
2-Methylheptane	592-27-8	24	5	0.0880	0.0385	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	24	16	0.2300	0.1241	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	24	23	1.5000	0.2811	190	TCEQ Long-Term AMCV	0.0015
2,2-Dimethylbutane	75-83-2	24	7	0.3200	0.0278	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	24	17	0.2330	0.0895	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	24	8	0.3066	0.0534	190	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylpentane	565-59-3	24	15	0.3140	0.0659	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	24	3	0.3500	0.0798	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	24	9	0.6681	0.0491	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	24	12	0.2838	0.0443	25	TCEQ Long-Term AMCV	0.0018
3-Methylheptane	589-81-1	24	11	0.6200	0.1359	380	TCEQ Long-Term AMCV	0.0004
3-Methylhexane	589-34-4	24	20	0.9800	0.3119	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	24	22	0.8349	0.2007	190	TCEQ Long-Term AMCV	0.0011
4-Ethyltoluene	622-96-8	24	4	0.0970	0.0316	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	24	24	83.0000	0.8301	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	24	23	56.0000	0.2611	3	ATSDR Chronic MRL	0.0870
Butane	106-97-8	24	24	8.1000	2.2037	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	24	5	0.6330	0.1041	225	EPA Inhalation RfCi	0.0005
Cis-2-Butene	590-18-1	24	7	0.9100	0.0294	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	24	4	0.3800	0.0232	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	24	20	0.6790	0.0943	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	24	10	0.3340	0.0289	590	TCEQ Long-Term AMCV	0.0000
Decane	124-18-5	24	10	0.2430	0.0646	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	24	12	0.2477	0.0733	3.8	CDPHE Chronic	0.0193
Ethane	74-84-0	24	24	46.0000	10.0285	NA	NA	
Ethylbenzene	100-41-4	24	20	0.9800	0.0843	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	24	24	290.0000	1.6096	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	24	23	0.5200	0.1772	98	EPA Inhalation RfCi	0.0018
Hexane	110-54-3	24	24	1.1000	0.3793	199	EPA Inhalation RfCi	0.0019
Isobutane	75-28-5	24	24	2.5000	0.8375	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	24	24	3.0129	1.3498	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	24	4	1.6000	0.0251	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	24	3	0.0814	0.024	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3..	24	24	1.4000	0.2309	23	EPA RSL Non-Cancer	0.0100
Methylcyclohexane	108-87-2	24	16	0.1800	0.0941	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	24	20	0.5200	0.1685	75	TCEQ Long-Term AMCV	0.0022
n-Octane	111-65-9	24	13	0.2570	0.078	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	24	5	9.4000	0.0453	0.57	EPA Inhalation RfCi	0.0792
Nonane	111-84-2	24	11	0.1931	0.0559	3.8	EPA Inhalation RfCi	0.0147
o-Xylene	95-47-6	24	19	0.5400	0.0937	23	EPA RSL Non-Cancer	0.0041
Pentane	109-66-0	24	23	2.5000	0.8953	338	EPA Inhalation RfCi	0.0026
Propane	74-98-6	24	24	14.0000	4.055	NA	NA	
Propylbenzene	103-65-1	24	4	0.0948	0.0258	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	24	24	36.0000	0.2987	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	24	5	0.5500	0.0957	5.9	EPA Inhalation RfCi	0.0162
Toluene	108-88-3	24	24	11.0000	0.6061	1,327	EPA Inhalation RfCi	0.0005
Trans-2-Butene	624-64-6	24	6	1.4000	0.0293	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	24	5	0.5500	0.0274	560	TCEQ Long-Term AMCV	0.0000
Undecane	1120-21-4	24	15	0.1500	0.063	55	TCEQ Long-Term AMCV	0.0011
Hazard Index								0.3182

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment CM8 - Monroe | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	20	15	0.6300	0.0754	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	20	0	< 0.0631	0.0238	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	20	10	0.3190	0.0425	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	20	11	0.2000	0.0863	12	EPA Inhalation RfCi	0.0071
1,2,4-Trimethylbenzene	95-63-6	20	15	0.3050	0.0723	12	EPA Inhalation RfCi	0.0059
1,3-Butadiene	106-99-0	20	7	0.2200	0.049	0.95	EPA RSL Non-Cancer	0.0516
1,3-Diethylbenzene	141-93-5	20	6	0.1800	0.0694	45	TCEQ Long-Term AMCV	0.0015
1,3,5-Trimethylbenzene	108-67-8	20	4	0.1120	0.0283	12	EPA Inhalation RfCi	0.0023
1,4-Diethylbenzene	105-05-5	20	9	0.3000	0.114	45	TCEQ Long-Term AMCV	0.0025
2-Ethyltoluene	611-14-3	20	4	0.1500	0.0554	25	TCEQ Long-Term AMCV	0.0022
2-Methylheptane	592-27-8	20	9	0.2500	0.0453	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	20	14	0.7290	0.136	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	20	18	3.4800	0.39	190	TCEQ Long-Term AMCV	0.0021
2,2-Dimethylbutane	75-83-2	20	7	0.3590	0.0331	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	20	15	0.3200	0.0706	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	20	13	0.7560	0.0968	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	20	17	0.2870	0.0833	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	20	2	0.0780	0.0242	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	20	12	0.6400	0.0628	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	20	12	0.1900	0.0873	25	TCEQ Long-Term AMCV	0.0035
3-Methylheptane	589-81-1	20	13	0.6720	0.1029	380	TCEQ Long-Term AMCV	0.0003
3-Methylhexane	589-34-4	20	16	0.7240	0.2545	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	20	19	2.0500	0.2747	190	TCEQ Long-Term AMCV	0.0014
4-Ethyltoluene	622-96-8	20	4	0.1180	0.0314	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	20	20	2.1000	0.621	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	20	19	1.1100	0.2486	3	ATSDR Chronic MRL	0.0829
Butane	106-97-8	20	19	29.0000	2.6331	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	20	9	0.2810	0.0698	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	20	7	1.1500	0.0315	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	20	4	0.3200	0.0236	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	20	16	1.4200	0.1061	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	20	15	0.8760	0.1009	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	20	15	0.1960	0.0879	190	TCEQ Long-Term AMCV	0.0005
Dodecane	112-40-3	20	8	0.4900	0.1704	3.8	CDPHE Chronic	0.0448
Ethane	74-84-0	20	20	30.0000	8.4855	NA	NA	
Ethylbenzene	100-41-4	20	15	0.2960	0.0711	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	20	20	4.5000	1.1115	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	20	18	0.7600	0.1633	98	EPA Inhalation RfCi	0.0017
Hexane	110-54-3	20	20	3.2600	0.4664	199	EPA Inhalation RfCi	0.0023
Isobutane	75-28-5	20	20	13.0000	1.1788	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	20	20	17.9000	1.9281	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	20	4	0.0910	0.0243	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	20	1	0.0976	0.0204	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3..	20	18	1.0900	0.1903	23	EPA RSL Non-Cancer	0.0083
Methylcyclohexane	108-87-2	20	15	0.6090	0.1127	400	TCEQ Long-Term AMCV	0.0003
Methylcyclopentane	96-37-7	20	16	1.3300	0.2187	75	TCEQ Long-Term AMCV	0.0029
n-Octane	111-65-9	20	12	0.2930	0.0692	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	20	1	0.0776	0.0276	0.57	EPA Inhalation RfCi	0.0482
Nonane	111-84-2	20	15	0.3320	0.0677	3.8	EPA Inhalation RfCi	0.0178
o-Xylene	95-47-6	20	15	0.3670	0.0816	23	EPA RSL Non-Cancer	0.0035
Pentane	109-66-0	20	20	11.8000	1.6445	338	EPA Inhalation RfCi	0.0049
Propane	74-98-6	20	20	38.3000	7.756	NA	NA	
Propylbenzene	103-65-1	20	4	0.1150	0.0264	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	20	20	2.3200	0.3182	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	20	6	0.1210	0.0456	5.9	EPA Inhalation RfCi	0.0077
Toluene	108-88-3	20	20	2.1600	0.6263	1,327	EPA Inhalation RfCi	0.0005
Trans-2-Butene	624-64-6	20	5	1.2100	0.0307	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	20	7	0.6890	0.038	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	20	15	0.2200	0.1064	55	TCEQ Long-Term AMCV	0.0019
Hazard Index								0.3149

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment CM9 - 48th and Race | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	22	15	2.9000	0.066	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	22	2	0.0949	0.0254	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	22	8	0.1010	0.0481	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	22	10	0.4580	0.0525	12	EPA Inhalation RfCi	0.0043
1,2,4-Trimethylbenzene	95-63-6	22	21	1.4000	0.1211	12	EPA Inhalation RfCi	0.0099
1,3-Butadiene	106-99-0	22	10	0.2430	0.0452	0.95	EPA RSL Non-Cancer	0.0476
1,3-Diethylbenzene	141-93-5	22	4	0.4200	0.0511	45	TCEQ Long-Term AMCV	0.0011
1,3,5-Trimethylbenzene	108-67-8	22	6	0.4977	0.0338	12	EPA Inhalation RfCi	0.0028
1,4-Diethylbenzene	105-05-5	22	8	0.2170	0.0566	45	TCEQ Long-Term AMCV	0.0013
2-Ethyltoluene	611-14-3	22	3	0.3700	0.0254	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	22	5	0.2340	0.0335	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	22	12	0.5790	0.1183	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	22	22	1.5800	0.3029	190	TCEQ Long-Term AMCV	0.0016
2,2-Dimethylbutane	75-83-2	22	6	0.2110	0.0261	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	22	21	0.7190	0.1029	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	22	6	0.3810	0.0594	190	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylpentane	565-59-3	22	14	0.3260	0.0773	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	22	1	0.1410	0.0258	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	22	10	0.8150	0.0508	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	22	14	0.5500	0.0828	25	TCEQ Long-Term AMCV	0.0033
3-Methylheptane	589-81-1	22	12	0.3400	0.1103	380	TCEQ Long-Term AMCV	0.0003
3-Methylhexane	589-34-4	22	19	0.6410	0.2405	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	22	21	1.5600	0.2745	190	TCEQ Long-Term AMCV	0.0014
4-Ethyltoluene	622-96-8	22	6	0.4250	0.0395	25	TCEQ Long-Term AMCV	0.0016
Acetylene	74-86-2	22	22	2.6700	0.7701	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	22	22	0.5590	0.2516	3	ATSDR Chronic MRL	0.0839
Butane	106-97-8	22	21	49.7000	2.5625	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	22	5	0.3960	0.0668	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	22	5	0.1650	0.0305	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	22	3	0.1290	0.0248	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	22	18	1.2270	0.1331	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	22	12	0.5250	0.0684	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	22	15	1.5400	0.1075	190	TCEQ Long-Term AMCV	0.0006
Dodecane	112-40-3	22	17	0.2658	0.12	3.8	CDPHE Chronic	0.0316
Ethane	74-84-0	22	22	63.0000	29.7998	NA	NA	
Ethylbenzene	100-41-4	22	21	2.6500	0.1301	230	EPA Inhalation RfCi	0.0006
Ethylene	74-85-1	22	22	11.0000	1.8717	5300	TCEQ Long-Term AMCV	0.0004
Heptane	142-82-5	22	22	1.0710	0.179	98	EPA Inhalation RfCi	0.0018
Hexane	110-54-3	22	22	1.8900	0.4197	199	EPA Inhalation RfCi	0.0021
Isobutane	75-28-5	22	22	32.1000	1.1096	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	22	22	56.2000	2.5743	8100	TCEQ Long-Term AMCV	0.0003
Isoprene	78-79-5	22	2	0.2290	0.026	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	22	3	0.1100	0.0267	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3..	22	22	11.7000	0.3672	23	EPA RSL Non-Cancer	0.0160
Methylcyclohexane	108-87-2	22	13	0.7390	0.0913	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	22	16	0.9970	0.182	75	TCEQ Long-Term AMCV	0.0024
n-Octane	111-65-9	22	16	1.3000	0.0671	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	22	4	0.1300	0.039	0.57	EPA Inhalation RfCi	0.0682
Nonane	111-84-2	22	12	0.8780	0.0644	3.8	EPA Inhalation RfCi	0.0169
o-Xylene	95-47-6	22	21	2.9300	0.1407	23	EPA RSL Non-Cancer	0.0061
Pentane	109-66-0	22	22	61.1000	3.0194	338	EPA Inhalation RfCi	0.0089
Propane	74-98-6	22	22	107.0000	5.5578	NA	NA	
Propylbenzene	103-65-1	22	6	0.3710	0.0326	203	EPA Inhalation RfCi	0.0002
Propylene	115-07-1	22	22	0.9850	0.3136	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	22	4	0.1280	0.0369	5.9	EPA Inhalation RfCi	0.0063
Toluene	108-88-3	22	22	23.8000	1.0209	1,327	EPA Inhalation RfCi	0.0008
Trans-2-Butene	624-64-6	22	5	0.1790	0.0296	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	22	3	0.5090	0.0294	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	22	15	0.6620	0.0892	55	TCEQ Long-Term AMCV	0.0016
Hazard Index								0.3289

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment CM10 - Alsip Elementary School | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	21	14	1.3000	0.0595	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	21	1	0.0669	0.0242	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	21	11	0.1600	0.041	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	21	8	0.2200	0.0383	12	EPA Inhalation RfCi	0.0031
1,2,4-Trimethylbenzene	95-63-6	21	15	0.2100	0.0627	12	EPA Inhalation RfCi	0.0051
1,3-Butadiene	106-99-0	21	10	0.2500	0.0422	0.95	EPA RSL Non-Cancer	0.0445
1,3-Diethylbenzene	141-93-5	21	4	0.1800	0.0378	45	TCEQ Long-Term AMCV	0.0008
1,3,5-Trimethylbenzene	108-67-8	21	6	0.1120	0.0285	12	EPA Inhalation RfCi	0.0023
1,4-Diethylbenzene	105-05-5	21	7	0.5100	0.0417	45	TCEQ Long-Term AMCV	0.0009
2-Ethyltoluene	611-14-3	21	4	0.2400	0.0281	25	TCEQ Long-Term AMCV	0.0011
2-Methylheptane	592-27-8	21	10	0.6137	0.1094	380	TCEQ Long-Term AMCV	0.0003
2-Methylhexane	591-76-4	21	15	0.4300	0.1215	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	21	20	1.2000	0.3481	190	TCEQ Long-Term AMCV	0.0018
2,2-Dimethylbutane	75-83-2	21	6	0.1400	0.0335	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	21	17	0.2700	0.0958	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	21	11	0.3135	0.0596	190	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylpentane	565-59-3	21	14	0.2100	0.0637	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	21	4	0.1400	0.0395	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	21	10	0.4900	0.0477	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	21	11	0.4200	0.0606	25	TCEQ Long-Term AMCV	0.0024
3-Methylheptane	589-81-1	21	12	0.4500	0.1146	380	TCEQ Long-Term AMCV	0.0003
3-Methylhexane	589-34-4	21	17	0.5000	0.2828	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	21	19	0.7600	0.2067	190	TCEQ Long-Term AMCV	0.0011
4-Ethyltoluene	622-96-8	21	5	0.1140	0.0318	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	21	21	2.4000	0.7534	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	21	20	0.8400	0.2413	3	ATSDR Chronic MRL	0.0804
Butane	106-97-8	21	21	19.0000	2.4501	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	21	8	0.2920	0.0638	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	21	4	0.5800	0.0254	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	21	4	0.1300	0.0237	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	21	17	0.4700	0.1013	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	21	14	0.2900	0.0758	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	21	12	0.1300	0.0532	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	21	10	0.3900	0.0698	3.8	CDPHE Chronic	0.0184
Ethane	74-84-0	21	21	29.0000	9.5756	NA	NA	
Ethylbenzene	100-41-4	21	16	3.4000	0.0903	230	EPA Inhalation RfCi	0.0004
Ethylene	74-85-1	21	21	4.5000	1.3177	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	21	20	0.5500	0.1695	98	EPA Inhalation RfCi	0.0017
Hexane	110-54-3	21	21	1.6000	0.4073	199	EPA Inhalation RfCi	0.0021
Isobutane	75-28-5	21	21	6.6000	0.956	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	21	21	290.0000	1.6745	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	21	6	0.2941	0.0419	140	TCEQ Long-Term AMCV	0.0003
Isopropylbenzene	98-82-8	21	2	0.0952	0.0205	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3..	21	21	13.0000	0.2562	23	EPA RSL Non-Cancer	0.0111
Methylcyclohexane	108-87-2	21	15	0.4300	0.1012	400	TCEQ Long-Term AMCV	0.0003
Methylcyclopentane	96-37-7	21	16	0.6400	0.2065	75	TCEQ Long-Term AMCV	0.0028
n-Octane	111-65-9	21	15	0.1900	0.0768	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	21	3	0.0797	0.0326	0.57	EPA Inhalation RfCi	0.0570
Nonane	111-84-2	21	10	0.1600	0.0482	3.8	EPA Inhalation RfCi	0.0126
o-Xylene	95-47-6	21	17	3.0000	0.0959	23	EPA RSL Non-Cancer	0.0042
Pentane	109-66-0	21	20	4.8000	1.0188	338	EPA Inhalation RfCi	0.0030
Propane	74-98-6	21	21	36.0000	5.7377	NA	NA	
Propylbenzene	103-65-1	21	5	0.1100	0.0261	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	21	21	1.4000	0.3937	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	21	5	0.1130	0.0332	5.9	EPA Inhalation RfCi	0.0056
Toluene	108-88-3	21	21	3.6300	0.6257	1,327	EPA Inhalation RfCi	0.0005
Trans-2-Butene	624-64-6	21	5	0.8400	0.0301	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	21	6	0.2400	0.032	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	21	14	0.2200	0.0687	55	TCEQ Long-Term AMCV	0.0012
Hazard Index								0.2712

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment BFD - Brighton | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	20	7	4.1000	0.0479	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	20	2	0.3600	0.069	50	TCEQ Long-Term AMCV	0.0014
1-Pentene	109-67-1	20	3	0.1700	0.0401	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	20	6	1.4000	0.0322	12	EPA Inhalation RfCi	0.0026
1,2,4-Trimethylbenzene	95-63-6	20	13	0.3800	0.0427	12	EPA Inhalation RfCi	0.0035
1,3-Butadiene	106-99-0	20	7	0.1700	0.0382	0.95	EPA RSL Non-Cancer	0.0402
1,3-Diethylbenzene	141-93-5	20	4	3.4000	0.0496	45	TCEQ Long-Term AMCV	0.0011
1,3,5-Trimethylbenzene	108-67-8	20	4	0.1200	0.0277	12	EPA Inhalation RfCi	0.0023
1,4-Diethylbenzene	105-05-5	20	10	0.2400	0.0601	45	TCEQ Long-Term AMCV	0.0013
2-Ethyltoluene	611-14-3	20	2	1.1000	0.0274	25	TCEQ Long-Term AMCV	0.0011
2-Methylheptane	592-27-8	20	4	0.3500	0.0682	380	TCEQ Long-Term AMCV	0.0002
2-Methylhexane	591-76-4	20	9	1.9000	0.2805	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	20	16	4.4000	0.7512	190	TCEQ Long-Term AMCV	0.0040
2,2-Dimethylbutane	75-83-2	20	3	0.3100	0.0631	190	TCEQ Long-Term AMCV	0.0003
2,2,4-Trimethylpentane	540-84-1	20	10	2.8000	0.2314	380	TCEQ Long-Term AMCV	0.0006
2,3-Dimethylbutane	79-29-8	20	8	1.5000	0.1602	190	TCEQ Long-Term AMCV	0.0008
2,3-Dimethylpentane	565-59-3	20	10	0.8400	0.1386	2200	TCEQ Long-Term AMCV	0.0001
2,3,4-Trimethylpentane	565-75-3	20	1	0.5500	0.0929	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	20	9	0.8000	0.1233	2200	TCEQ Long-Term AMCV	0.0001
3-Ethyltoluene	620-14-4	20	5	1.1000	0.0406	25	TCEQ Long-Term AMCV	0.0016
3-Methylheptane	589-81-1	20	9	0.3700	0.1173	380	TCEQ Long-Term AMCV	0.0003
3-Methylhexane	589-34-4	20	16	2.5000	0.4493	2200	TCEQ Long-Term AMCV	0.0002
3-Methylpentane	96-14-0	20	16	2.9000	0.49	190	TCEQ Long-Term AMCV	0.0026
4-Ethyltoluene	622-96-8	20	3	0.0902	0.0307	25	TCEQ Long-Term AMCV	0.0012
Acetylene	74-86-2	20	19	2.4300	0.4971	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	20	19	1.5000	0.3474	3	ATSDR Chronic MRL	0.1158
Butane	106-97-8	20	19	8.9000	2.8276	10000	TCEQ Long-Term AMCV	0.0003
Carbon disulfide	75-15-0	20	8	1.5000	0.0571	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	20	2	0.2200	0.0277	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	20	1	0.2200	0.0509	560	TCEQ Long-Term AMCV	0.0001
Cyclohexane	110-82-7	20	17	0.8100	0.1445	1,743	EPA Inhalation RfCi	0.0001
Cyclopentane	287-92-3	20	10	3.5000	0.1343	590	TCEQ Long-Term AMCV	0.0002
Decane	124-18-5	20	11	2.5000	0.0566	190	TCEQ Long-Term AMCV	0.0003
Dodecane	112-40-3	20	11	0.3300	0.147	3.8	CDPHE Chronic	0.0387
Ethane	74-84-0	20	20	38.0000	10.4151	NA	NA	
Ethylbenzene	100-41-4	20	13	1.8000	0.0766	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	20	20	3.2000	0.9178	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	20	19	1.2000	0.2487	98	EPA Inhalation RfCi	0.0025
Hexane	110-54-3	20	20	2.9000	0.6278	199	EPA Inhalation RfCi	0.0032
Isobutane	75-28-5	20	19	28.0000	1.0473	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	20	20	70.0000	1.8232	8100	TCEQ Long-Term AMCV	0.0002
Isoprene	78-79-5	20	2	20.0000	0.0422	140	TCEQ Long-Term AMCV	0.0003
Isopropylbenzene	98-82-8	20	1	0.0860	0.0226	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3..	20	15	4.1000	0.1932	23	EPA RSL Non-Cancer	0.0084
Methylcyclohexane	108-87-2	20	11	0.7600	0.1305	400	TCEQ Long-Term AMCV	0.0003
Methylcyclopentane	96-37-7	20	15	2.2000	0.3971	75	TCEQ Long-Term AMCV	0.0053
n-Octane	111-65-9	20	12	0.4800	0.0718	380	TCEQ Long-Term AMCV	0.0002
Naphthalene	91-20-3	20	1	0.0910	0.0319	0.57	EPA Inhalation RfCi	0.0557
Nonane	111-84-2	20	9	0.2000	0.0376	3.8	EPA Inhalation RfCi	0.0099
o-Xylene	95-47-6	20	14	1.6000	0.0787	23	EPA RSL Non-Cancer	0.0034
Pentane	109-66-0	20	20	12.0000	1.2644	338	EPA Inhalation RfCi	0.0037
Propane	74-98-6	20	20	23.0000	5.9167	NA	NA	
Propylbenzene	103-65-1	20	3	0.0986	0.023	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	20	20	0.6530	0.1868	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	20	5	0.4700	0.0306	5.9	EPA Inhalation RfCi	0.0052
Toluene	108-88-3	20	19	34.0000	0.6485	1,327	EPA Inhalation RfCi	0.0005
Trans-2-Butene	624-64-6	20	3	0.5000	0.0269	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	20	3	0.4400	0.0821	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	20	15	0.5300	0.0755	55	TCEQ Long-Term AMCV	0.0014
Hazard Index								0.3235

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment
CAMP- Denver | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	14	9	2.5000	0.5351	2300	TCEQ Long-Term AMCV	0.0002
1-Hexene	592-41-6	14	0	< 0.0632	0.0247	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	14	4	0.0890	0.0407	560	TCEQ Long-Term AMCV	0.0001
1,2,3-Trimethylbenzene	526-73-8	14	6	0.1560	0.0378	12	EPA Inhalation RfCi	0.0031
1,2,4-Trimethylbenzene	95-63-6	14	10	0.1950	0.0813	12	EPA Inhalation RfCi	0.0067
1,3-Butadiene	106-99-0	14	9	0.2090	0.0587	0.95	EPA RSL Non-Cancer	0.0618
1,3-Diethylbenzene	141-93-5	14	3	0.1500	0.0624	45	TCEQ Long-Term AMCV	0.0014
1,3,5-Trimethylbenzene	108-67-8	14	3	0.1410	0.0324	12	EPA Inhalation RfCi	0.0027
1,4-Diethylbenzene	105-05-5	14	5	0.1300	0.0408	45	TCEQ Long-Term AMCV	0.0009
2-Ethyltoluene	611-14-3	14	0	< 0.0632	0.0245	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	14	4	0.0940	0.0253	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	14	8	0.3000	0.0919	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	14	13	0.7300	0.2422	190	TCEQ Long-Term AMCV	0.0013
2,2-Dimethylbutane	75-83-2	14	4	0.0753	0.0252	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	14	10	0.2500	0.0721	380	TCEQ Long-Term AMCV	0.0002
2,3-Dimethylbutane	79-29-8	14	7	0.2883	0.0907	190	TCEQ Long-Term AMCV	0.0005
2,3-Dimethylpentane	565-59-3	14	10	0.2031	0.0817	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	14	0	< 0.0632	0.025	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	14	10	0.4600	0.1029	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	14	8	0.1400	0.044	25	TCEQ Long-Term AMCV	0.0018
3-Methylheptane	589-81-1	14	4	0.2200	0.0649	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	14	10	0.4500	0.2135	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	14	11	0.5390	0.133	190	TCEQ Long-Term AMCV	0.0007
4-Ethyltoluene	622-96-8	14	3	0.1330	0.035	25	TCEQ Long-Term AMCV	0.0014
Acetylene	74-86-2	14	14	1.6000	0.8642	2500	TCEQ Long-Term AMCV	0.0003
Benzene	71-43-2	14	13	0.8420	0.3069	3	ATSDR Chronic MRL	0.1023
Butane	106-97-8	14	14	5.2900	1.6182	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	14	8	0.5620	0.0475	225	EPA Inhalation RfCi	0.0002
Cis-2-Butene	590-18-1	14	1	0.0815	0.0253	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	14	0	< 0.0632	0.0241	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	14	10	0.3760	0.0838	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	14	8	0.2100	0.042	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	14	5	0.1000	0.0414	190	TCEQ Long-Term AMCV	0.0002
Dodecane	112-40-3	14	7	0.0968	0.0675	3.8	CDPHE Chronic	0.0178
Ethane	74-84-0	14	14	19.2000	9.2045	NA	NA	
Ethylbenzene	100-41-4	14	10	0.3300	0.0709	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	14	14	3.6433	2.1677	5300	TCEQ Long-Term AMCV	0.0004
Heptane	142-82-5	14	11	0.4160	0.1168	98	EPA Inhalation RfCi	0.0012
Hexane	110-54-3	14	13	1.1600	0.2378	199	EPA Inhalation RfCi	0.0012
Isobutane	75-28-5	14	14	1.6200	0.6673	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	14	14	2.3700	1.0935	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	14	2	0.0861	0.033	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	14	3	0.1160	0.0282	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3..	14	13	1.0000	0.1716	23	EPA RSL Non-Cancer	0.0075
Methylcyclohexane	108-87-2	14	9	0.3100	0.0626	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	14	10	0.4200	0.1447	75	TCEQ Long-Term AMCV	0.0019
n-Octane	111-65-9	14	8	0.1900	0.0474	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	14	4	0.1800	0.0375	0.57	EPA Inhalation RfCi	0.0655
Nonane	111-84-2	14	6	0.1060	0.0451	3.8	EPA Inhalation RfCi	0.0118
o-Xylene	95-47-6	14	10	0.3000	0.076	23	EPA RSL Non-Cancer	0.0033
Pentane	109-66-0	14	14	2.0200	0.8854	338	EPA Inhalation RfCi	0.0026
Propane	74-98-6	14	14	9.7300	2.9777	NA	NA	
Propylbenzene	103-65-1	14	3	0.1410	0.0303	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	14	14	0.5556	0.3491	1,801	EPA RSL Non-Cancer	0.0002
Tetrachloroethene	127-18-4	14	4	0.1540	0.0336	5.9	EPA Inhalation RfCi	0.0057
Toluene	108-88-3	14	14	1.0700	0.4394	1,327	EPA Inhalation RfCi	0.0003
Trans-2-Butene	624-64-6	14	0	< 0.0632	0.0244	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	14	1	0.2490	0.0274	560	TCEQ Long-Term AMCV	0.0000
Undecane	1120-21-4	14	9	0.1100	0.0557	55	TCEQ Long-Term AMCV	0.0010
Hazard Index								0.3103

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment
JUNC - E470/I25 | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	19	11	0.9300	0.0341	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	19	1	0.2100	0.0247	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	19	3	0.1800	0.0255	560	TCEQ Long-Term AMCV	0.0000
1,2,3-Trimethylbenzene	526-73-8	19	3	0.2150	0.0296	12	EPA Inhalation RfCi	0.0024
1,2,4-Trimethylbenzene	95-63-6	19	14	0.1310	0.0577	12	EPA Inhalation RfCi	0.0047
1,3-Butadiene	106-99-0	19	7	0.1260	0.0362	0.95	EPA RSL Non-Cancer	0.0381
1,3-Diethylbenzene	141-93-5	19	2	0.1600	0.0331	45	TCEQ Long-Term AMCV	0.0007
1,3,5-Trimethylbenzene	108-67-8	19	2	0.1100	0.0276	12	EPA Inhalation RfCi	0.0023
1,4-Diethylbenzene	105-05-5	19	5	0.2000	0.0357	45	TCEQ Long-Term AMCV	0.0008
2-Ethyltoluene	611-14-3	19	1	0.2000	0.0244	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	19	5	0.2600	0.0479	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	19	8	0.5700	0.1307	2200	TCEQ Long-Term AMCV	0.0001
2-Methylpentane	107-83-5	19	16	0.9500	0.3174	190	TCEQ Long-Term AMCV	0.0017
2,2-Dimethylbutane	75-83-2	19	3	0.3880	0.0331	190	TCEQ Long-Term AMCV	0.0002
2,2,4-Trimethylpentane	540-84-1	19	15	0.5800	0.1347	380	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylbutane	79-29-8	19	5	0.2500	0.0849	190	TCEQ Long-Term AMCV	0.0004
2,3-Dimethylpentane	565-59-3	19	8	0.3000	0.0695	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	19	2	0.2900	0.0632	380	TCEQ Long-Term AMCV	0.0002
2,4-Dimethylpentane	108-08-7	19	9	0.4700	0.065	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	19	5	0.1900	0.0294	25	TCEQ Long-Term AMCV	0.0012
3-Methylheptane	589-81-1	19	10	0.2700	0.0885	380	TCEQ Long-Term AMCV	0.0002
3-Methylhexane	589-34-4	19	16	1.5100	0.2938	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	19	17	0.9050	0.2348	190	TCEQ Long-Term AMCV	0.0012
4-Ethyltoluene	622-96-8	19	2	0.1030	0.0322	25	TCEQ Long-Term AMCV	0.0013
Acetylene	74-86-2	19	19	1.2700	0.473	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	19	18	0.5300	0.234	3	ATSDR Chronic MRL	0.0780
Butane	106-97-8	19	19	4.7000	1.7504	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	19	6	0.2300	0.0625	225	EPA Inhalation RfCi	0.0003
Cis-2-Butene	590-18-1	19	0	< 0.2300	0.0251	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	19	1	0.1600	0.0278	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	19	16	0.4160	0.0862	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	19	7	0.2130	0.0523	590	TCEQ Long-Term AMCV	0.0001
Decane	124-18-5	19	9	0.8100	0.0394	190	TCEQ Long-Term AMCV	0.0002
Dodecane	112-40-3	19	12	0.3200	0.0781	3.8	CDPHE Chronic	0.0206
Ethane	74-84-0	19	19	17.6000	7.1549	NA	NA	
Ethylbenzene	100-41-4	19	15	0.1900	0.0769	230	EPA Inhalation RfCi	0.0003
Ethylene	74-85-1	19	19	2.3000	1.023	5300	TCEQ Long-Term AMCV	0.0002
Heptane	142-82-5	19	17	0.4000	0.1527	98	EPA Inhalation RfCi	0.0016
Hexane	110-54-3	19	18	0.8230	0.3478	199	EPA Inhalation RfCi	0.0018
Isobutane	75-28-5	19	19	1.8900	0.6768	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	19	19	2.4400	1.0151	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	19	2	0.2000	0.0252	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	19	2	0.0938	0.0211	81	EPA Inhalation RfCi	0.0003
m,p-Xylenes	108-38-3..	19	17	0.4400	0.1896	23	EPA RSL Non-Cancer	0.0082
Methylcyclohexane	108-87-2	19	11	0.2700	0.0796	400	TCEQ Long-Term AMCV	0.0002
Methylcyclopentane	96-37-7	19	14	0.6000	0.2261	75	TCEQ Long-Term AMCV	0.0030
n-Octane	111-65-9	19	9	0.3700	0.0453	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	19	1	0.0767	0.0287	0.57	EPA Inhalation RfCi	0.0502
Nonane	111-84-2	19	7	1.3000	0.0659	3.8	EPA Inhalation RfCi	0.0173
o-Xylene	95-47-6	19	15	0.1470	0.0795	23	EPA RSL Non-Cancer	0.0035
Pentane	109-66-0	19	19	3.3700	0.8902	338	EPA Inhalation RfCi	0.0026
Propane	74-98-6	19	19	10.0000	3.4924	NA	NA	
Propylbenzene	103-65-1	19	2	0.1220	0.0267	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	19	19	0.4650	0.2105	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	19	4	0.1130	0.0278	5.9	EPA Inhalation RfCi	0.0047
Toluene	108-88-3	19	19	1.3000	0.5416	1,327	EPA Inhalation RfCi	0.0004
Trans-2-Butene	624-64-6	19	1	0.2600	0.0244	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	19	3	0.3070	0.0429	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	19	12	0.2300	0.0475	55	TCEQ Long-Term AMCV	0.0009
Hazard Index								0.2533

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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

CCND Community Air Monitoring Chronic Risk Assessment NJH - National Jewish Health | Q3 2021 - Q2 2024

Compound Name	Cas No.	# Samples	# Detections	Maximum Detections	Time-weighted Average (ppb)	Health Reference Level (ppb)	Screening Value Source	Hazard Quotient
1-Butene	106-98-9	4	3	0.4500	0.046	2300	TCEQ Long-Term AMCV	0.0000
1-Hexene	592-41-6	4	0	< 0.2100	0.0257	50	TCEQ Long-Term AMCV	0.0005
1-Pentene	109-67-1	4	1	0.1800	0.0267	560	TCEQ Long-Term AMCV	0.0000
1,2,3-Trimethylbenzene	526-73-8	4	1	0.2000	0.0244	12	EPA Inhalation RfCi	0.0020
1,2,4-Trimethylbenzene	95-63-6	4	3	0.0790	0.0604	12	EPA Inhalation RfCi	0.0049
1,3-Butadiene	106-99-0	4	1	0.0650	0.0243	0.95	EPA RSL Non-Cancer	0.0256
1,3-Diethylbenzene	141-93-5	4	1	0.1600	0.0527	45	TCEQ Long-Term AMCV	0.0012
1,3,5-Trimethylbenzene	108-67-8	4	0	< 0.0500	0.0205	12	EPA Inhalation RfCi	0.0017
1,4-Diethylbenzene	105-05-5	4	3	0.1800	0.0638	45	TCEQ Long-Term AMCV	0.0014
2-Ethyltoluene	611-14-3	4	0	< 0.2000	0.0252	25	TCEQ Long-Term AMCV	0.0010
2-Methylheptane	592-27-8	4	0	< 0.2000	0.0262	380	TCEQ Long-Term AMCV	0.0001
2-Methylhexane	591-76-4	4	2	0.1600	0.054	2200	TCEQ Long-Term AMCV	0.0000
2-Methylpentane	107-83-5	4	3	0.3000	0.1266	190	TCEQ Long-Term AMCV	0.0007
2,2-Dimethylbutane	75-83-2	4	0	< 0.2000	0.026	190	TCEQ Long-Term AMCV	0.0001
2,2,4-Trimethylpentane	540-84-1	4	4	0.1400	0.1039	380	TCEQ Long-Term AMCV	0.0003
2,3-Dimethylbutane	79-29-8	4	0	< 0.1900	0.0262	190	TCEQ Long-Term AMCV	0.0001
2,3-Dimethylpentane	565-59-3	4	2	0.1800	0.0467	2200	TCEQ Long-Term AMCV	0.0000
2,3,4-Trimethylpentane	565-75-3	4	0	< 0.2000	0.0262	380	TCEQ Long-Term AMCV	0.0001
2,4-Dimethylpentane	108-08-7	4	0	< 0.1600	0.0259	2200	TCEQ Long-Term AMCV	0.0000
3-Ethyltoluene	620-14-4	4	2	0.2000	0.0576	25	TCEQ Long-Term AMCV	0.0023
3-Methylheptane	589-81-1	4	3	0.3700	0.2174	380	TCEQ Long-Term AMCV	0.0006
3-Methylhexane	589-34-4	4	3	0.3200	0.2294	2200	TCEQ Long-Term AMCV	0.0001
3-Methylpentane	96-14-0	4	2	0.2000	0.0911	190	TCEQ Long-Term AMCV	0.0005
4-Ethyltoluene	622-96-8	4	0	< 0.0590	0.0265	25	TCEQ Long-Term AMCV	0.0011
Acetylene	74-86-2	4	4	1.2000	0.5916	2500	TCEQ Long-Term AMCV	0.0002
Benzene	71-43-2	4	4	0.2600	0.225	3	ATSDR Chronic MRL	0.0750
Butane	106-97-8	4	4	3.4000	1.5423	10000	TCEQ Long-Term AMCV	0.0002
Carbon disulfide	75-15-0	4	0	< 0.0500	0.02	225	EPA Inhalation RfCi	0.0001
Cis-2-Butene	590-18-1	4	0	< 0.2300	0.0265	700	TCEQ Long-Term AMCV	0.0000
Cis-2-Pentene	627-20-3	4	0	< 0.1700	0.0244	560	TCEQ Long-Term AMCV	0.0000
Cyclohexane	110-82-7	4	2	0.0880	0.0572	1,743	EPA Inhalation RfCi	0.0000
Cyclopentane	287-92-3	4	1	0.1900	0.0246	590	TCEQ Long-Term AMCV	0.0000
Decane	124-18-5	4	1	0.1800	0.0383	190	TCEQ Long-Term AMCV	0.0002
Dodecane	112-40-3	4	4	0.1000	0.0632	3.8	CDPHE Chronic	0.0166
Ethane	74-84-0	4	4	17.0000	9.7018	NA	NA	
Ethylbenzene	100-41-4	4	4	0.1900	0.1237	230	EPA Inhalation RfCi	0.0005
Ethylene	74-85-1	4	4	2.4000	1.351	5300	TCEQ Long-Term AMCV	0.0003
Heptane	142-82-5	4	4	0.1600	0.1149	98	EPA Inhalation RfCi	0.0012
Hexane	110-54-3	4	4	0.4200	0.26	199	EPA Inhalation RfCi	0.0013
Isobutane	75-28-5	4	3	1.4000	0.8883	10000	TCEQ Long-Term AMCV	0.0001
Isopentane	78-78-4	4	4	1.3000	0.8945	8100	TCEQ Long-Term AMCV	0.0001
Isoprene	78-79-5	4	0	< 0.2100	0.0265	140	TCEQ Long-Term AMCV	0.0002
Isopropylbenzene	98-82-8	4	0	< 0.0500	0.02	81	EPA Inhalation RfCi	0.0002
m,p-Xylenes	108-38-3..	4	4	0.5600	0.354	23	EPA RSL Non-Cancer	0.0154
Methylcyclohexane	108-87-2	4	0	< 0.2000	0.026	400	TCEQ Long-Term AMCV	0.0001
Methylcyclopentane	96-37-7	4	2	0.1900	0.0912	75	TCEQ Long-Term AMCV	0.0012
n-Octane	111-65-9	4	1	0.1800	0.0258	380	TCEQ Long-Term AMCV	0.0001
Naphthalene	91-20-3	4	0	< 0.0740	0.0307	0.57	EPA Inhalation RfCi	0.0536
Nonane	111-84-2	4	1	0.1900	0.0258	3.8	EPA Inhalation RfCi	0.0068
o-Xylene	95-47-6	4	4	0.2100	0.1331	23	EPA RSL Non-Cancer	0.0058
Pentane	109-66-0	4	4	1.4000	0.5915	338	EPA Inhalation RfCi	0.0017
Propane	74-98-6	4	4	5.1000	3.2485	NA	NA	
Propylbenzene	103-65-1	4	0	< 0.0500	0.02	203	EPA Inhalation RfCi	0.0001
Propylene	115-07-1	4	3	0.4300	0.2253	1,801	EPA RSL Non-Cancer	0.0001
Tetrachloroethene	127-18-4	4	1	0.0500	0.0359	5.9	EPA Inhalation RfCi	0.0061
Toluene	108-88-3	4	4	1.4000	1.0762	1,327	EPA Inhalation RfCi	0.0008
Trans-2-Butene	624-64-6	4	0	< 0.2600	0.025	700	TCEQ Long-Term AMCV	0.0000
Trans-2-Pentene	646-04-8	4	0	< 0.1700	0.0304	560	TCEQ Long-Term AMCV	0.0001
Undecane	1120-21-4	4	2	0.0810	0.0257	55	TCEQ Long-Term AMCV	0.0005
Hazard Index								0.2331

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

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

Mobile Sampling Van Data Summary and Risk Assessment Adams City Neighborhood | Q3 2021 - Q2 2024

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	107,043	62,488	0.07	0.02	0.95	EPA RSL Non-Cancer	0.0231
ACETYLENE	74-86-2	107,043	62,488	0.47	0.17	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	107,043	62,488	0.64	0.25	3	ATSDR Chronic MRL	0.0846
BUTANES*	75-28-5	107,043	62,488	3.39	2.01	10000	TCEQ Long-Term AMCV Health	0.0002
BUTENES*	590-18-1	107,043	62,488	2.98	1.55	700	TCEQ Long-Term AMCV Health	0.0022
CARBON DISULFIDE	75-15-0	107,043	62,488	0.01	0.00	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	107,043	62,488	2.88	1.79	590	TCEQ Long-Term AMCV Health	0.0030
DECANES	124-18-5	107,043	62,488	0.27	0.04	190	TCEQ Long-Term AMCV Health	0.0002
DIETHYLBENZENES*	141-93-5	107,043	62,488	0.17	0.06	45	TCEQ Long-Term AMCV Health	0.0014
DIMETHYLCYCLOHEXANES*	638-04-0	107,043	62,488	0.14	0.06	400	CDPHE	0.0002
DODECANES	112-40-3	107,043	62,488	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	107,043	62,488	11.29	6.08	5300	TCEQ Long-Term AMCV Health	0.0011
HEPTANES*	142-82-5	107,043	62,488	0.10	0.06	98	EPA Inhalation RfCi	0.0006
HEXANES*	110-54-3	107,043	62,488	0.31	0.12	199	EPA Inhalation RfCi	0.0006
HEXENES*	592-41-6	107,043	62,488	1.40	0.60	50	TCEQ Long-Term AMCV Health	0.0121
HYDROGEN CYANIDE	74-90-8	107,043	62,488	0.30	0.15	0.75	EPA RSL Non-Cancer	0.2037
HYDROGEN SULFIDE	7783-06-4	107,043	62,488	0.27	0.15	1.4	EPA Inhalation RfCi	0.1041
ISOPRENE	78-79-5	107,043	62,488	0.94	0.25	140	TCEQ Long-Term AMCV Health	0.0018
METHANOL	67-56-1	107,043	62,488	9.58	5.60	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	107,043	62,488	0.11	0.05	400	TCEQ Long-Term AMCV Health	0.0001
NONANES	111-84-2	107,043	62,488	0.09	0.03	3.8	EPA Inhalation RfCi	0.0083
OCTANES*	111-65-9	107,043	62,488	0.09	0.05	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	107,043	62,488	0.55	0.19	339	EPA Inhalation RfCi	0.0006
PROPYLENE	115-07-1	107,043	62,488	0.75	0.33	1801	EPA RSL Non-Cancer	0.0002
STYRENE	100-42-5	107,043	62,488	0.23	0.07	235	EPA Inhalation RfCi	0.0003
TETRACHLOROETHYLENE	127-18-4	107,043	62,488	0.04	0.01	5.9	EPA Inhalation RfCi	0.0014
TOLUENE	108-88-3	107,043	62,488	1.95	0.71	1327	EPA Inhalation RfCi	0.0005
TRIMETHYLBENZENES*	622-96-8	107,043	62,488	0.58	0.23	25	TCEQ Long-Term AMCV Health	0.0093
UNDECANES	1120-21-4	107,043	62,488	0.06	0.02	55	TCEQ Long-Term AMCV Health	0.0004
XYLENES*	1330-20-7	107,043	62,488	2.32	0.91	23	EPA Inhalation RfCi	0.0396
Hazard Index								0.5005

*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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

Mobile Sampling Van Data Summary and Risk Assessment Dupont Neighborhood | Q3 2021 - Q2 2024

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	148,917	100,238	0.08	0.03	0.95	EPA RSL Non-Cancer	0.0272
ACETYLENE	74-86-2	148,917	100,238	0.26	0.13	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	148,917	100,238	0.52	0.25	3	ATSDR Chronic MRL	0.0817
BUTANES*	75-28-5	148,917	100,238	4.75	2.90	10000	TCEQ Long-Term AMCV Health	0.0003
BUTENES*	590-18-1	148,917	100,238	7.61	1.90	700	TCEQ Long-Term AMCV Health	0.0027
CARBON DISULFIDE	75-15-0	148,917	100,238	0.05	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	148,917	100,238	5.81	1.61	590	TCEQ Long-Term AMCV Health	0.0027
DECANES	124-18-5	148,917	100,238	0.20	0.04	190	TCEQ Long-Term AMCV Health	0.0002
DIETHYLBENZENES*	141-93-5	148,917	100,238	0.16	0.05	45	TCEQ Long-Term AMCV Health	0.0011
DIMETHYLCYCLOHEXANES*	638-04-0	148,917	100,238	0.10	0.03	400	CDPHE	0.0001
DODECANES	112-40-3	148,917	100,238	0.04	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	148,917	100,238	9.39	6.34	5300	TCEQ Long-Term AMCV Health	0.0012
HEPTANES*	142-82-5	148,917	100,238	0.12	0.06	98	EPA Inhalation RfCi	0.0006
HEXANES*	110-54-3	148,917	100,238	0.61	0.12	199	EPA Inhalation RfCi	0.0006
HEXENES*	592-41-6	148,917	100,238	2.27	0.83	50	TCEQ Long-Term AMCV Health	0.0166
HYDROGEN CYANIDE	74-90-8	148,917	100,238	0.79	0.19	0.75	EPA RSL Non-Cancer	0.2545
HYDROGEN SULFIDE	7783-06-4	148,917	100,238	0.47	0.13	1.4	EPA Inhalation RfCi	0.0912
ISOPRENE	78-79-5	148,917	100,238	0.72	0.16	140	TCEQ Long-Term AMCV Health	0.0012
METHANOL	67-56-1	148,917	100,238	11.51	3.92	15261	EPA Inhalation RfCi	0.0003
METHYLCYCLOHEXANE	108-87-2	148,917	100,238	0.23	0.06	400	TCEQ Long-Term AMCV Health	0.0002
NONANES	111-84-2	148,917	100,238	0.07	0.02	3.8	EPA Inhalation RfCi	0.0047
OCTANES*	111-65-9	148,917	100,238	0.10	0.04	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	148,917	100,238	1.54	0.72	339	EPA Inhalation RfCi	0.0021
PROPYLENE	115-07-1	148,917	100,238	1.33	0.22	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	148,917	100,238	0.17	0.05	235	EPA Inhalation RfCi	0.0002
TETRACHLOROETHYLENE	127-18-4	148,917	100,238	0.03	0.01	5.9	EPA Inhalation RfCi	0.0011
TOLUENE	108-88-3	148,917	100,238	1.47	0.60	1327	EPA Inhalation RfCi	0.0005
TRIMETHYLBENZENES*	622-96-8	148,917	100,238	0.78	0.15	25	TCEQ Long-Term AMCV Health	0.0058
UNDECANES	1120-21-4	148,917	100,238	0.08	0.02	55	TCEQ Long-Term AMCV Health	0.0004
XYLENES*	1330-20-7	148,917	100,238	2.33	0.57	23	EPA Inhalation RfCi	0.0246
Hazard Index								0.5223

*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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

Mobile Sampling Van Data Summary and Risk Assessment Elyria-Swansea Neighborhood | Q3 2021 - Q2 2024

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	98,615	53,080	0.11	0.03	0.95	EPA RSL Non-Cancer	0.0347
ACETYLENE	74-86-2	98,615	53,080	0.33	0.18	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	98,615	53,080	0.48	0.26	3	ATSDR Chronic MRL	0.0873
BUTANES*	75-28-5	98,615	53,080	4.83	2.40	10000	TCEQ Long-Term AMCV Health	0.0002
BUTENES*	590-18-1	98,615	53,080	3.66	1.70	700	TCEQ Long-Term AMCV Health	0.0024
CARBON DISULFIDE	75-15-0	98,615	53,080	0.05	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	98,615	53,080	3.19	1.58	590	TCEQ Long-Term AMCV Health	0.0027
DECANES	124-18-5	98,615	53,080	0.09	0.04	190	TCEQ Long-Term AMCV Health	0.0002
DIETHYLBENZENES*	141-93-5	98,615	53,080	0.12	0.06	45	TCEQ Long-Term AMCV Health	0.0013
DIMETHYLCYCLOHEXANES*	638-04-0	98,615	53,080	0.07	0.03	400	CDPHE	0.0001
DODECANES	112-40-3	98,615	53,080	0.02	0.00	3.8	CDPHE	0.0003
ETHYLENE	74-85-1	98,615	53,080	10.19	7.30	5300	TCEQ Long-Term AMCV Health	0.0014
HEPTANES*	142-82-5	98,615	53,080	0.15	0.06	98	EPA Inhalation RfCi	0.0006
HEXANES*	110-54-3	98,615	53,080	0.32	0.15	199	EPA Inhalation RfCi	0.0008
HEXENES*	592-41-6	98,615	53,080	2.47	0.87	50	TCEQ Long-Term AMCV Health	0.0174
HYDROGEN CYANIDE	74-90-8	98,615	53,080	0.41	0.17	0.75	EPA RSL Non-Cancer	0.2257
HYDROGEN SULFIDE	7783-06-4	98,615	53,080	0.39	0.18	1.4	EPA Inhalation RfCi	0.1224
ISOPRENE	78-79-5	98,615	53,080	0.44	0.20	140	TCEQ Long-Term AMCV Health	0.0014
METHANOL	67-56-1	98,615	53,080	11.62	5.62	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	98,615	53,080	0.15	0.08	400	TCEQ Long-Term AMCV Health	0.0002
NONANES	111-84-2	98,615	53,080	0.06	0.02	3.8	EPA Inhalation RfCi	0.0057
OCTANES*	111-65-9	98,615	53,080	0.14	0.05	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	98,615	53,080	0.90	0.23	339	EPA Inhalation RfCi	0.0007
PROPYLENE	115-07-1	98,615	53,080	0.94	0.41	1801	EPA RSL Non-Cancer	0.0002
STYRENE	100-42-5	98,615	53,080	0.11	0.05	235	EPA Inhalation RfCi	0.0002
TETRACHLOROETHYLENE	127-18-4	98,615	53,080	0.14	0.01	5.9	EPA Inhalation RfCi	0.0022
TOLUENE	108-88-3	98,615	53,080	2.06	0.84	1327	EPA Inhalation RfCi	0.0006
TRIMETHYLBENZENES*	622-96-8	98,615	53,080	0.45	0.20	25	TCEQ Long-Term AMCV Health	0.0081
UNDECANES	1120-21-4	98,615	53,080	0.08	0.03	55	TCEQ Long-Term AMCV Health	0.0005
XYLENES*	1330-20-7	98,615	53,080	1.98	0.90	23	EPA Inhalation RfCi	0.0390
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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

Mobile Sampling Van Data Summary and Risk Assessment Globeville Neighborhood | Q3 2021 - Q2 2024

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	96,675	51,746	0.11	0.03	0.95	EPA RSL Non-Cancer	0.0280
ACETYLENE	74-86-2	96,675	51,746	0.39	0.17	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	96,675	51,746	0.63	0.30	3	ATSDR Chronic MRL	0.0990
BUTANES*	75-28-5	96,675	51,746	6.63	2.81	10000	TCEQ Long-Term AMCV Health	0.0003
BUTENES*	590-18-1	96,675	51,746	3.39	1.70	700	TCEQ Long-Term AMCV Health	0.0024
CARBON DISULFIDE	75-15-0	96,675	51,746	0.05	0.01	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	96,675	51,746	2.91	1.47	590	TCEQ Long-Term AMCV Health	0.0025
DECANES	124-18-5	96,675	51,746	0.15	0.06	190	TCEQ Long-Term AMCV Health	0.0003
DIETHYLBENZENES*	141-93-5	96,675	51,746	0.14	0.07	45	TCEQ Long-Term AMCV Health	0.0015
DIMETHYLCYCLOHEXANES*	638-04-0	96,675	51,746	0.07	0.03	400	CDPHE	0.0001
DODECANES	112-40-3	96,675	51,746	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	96,675	51,746	11.60	7.35	5300	TCEQ Long-Term AMCV Health	0.0014
HEPTANES*	142-82-5	96,675	51,746	0.24	0.07	98	EPA Inhalation RfCi	0.0007
HEXANES*	110-54-3	96,675	51,746	0.36	0.12	199	EPA Inhalation RfCi	0.0006
HEXENES*	592-41-6	96,675	51,746	2.00	0.86	50	TCEQ Long-Term AMCV Health	0.0173
HYDROGEN CYANIDE	74-90-8	96,675	51,746	0.25	0.12	0.75	EPA RSL Non-Cancer	0.1618
HYDROGEN SULFIDE	7783-06-4	96,675	51,746	0.26	0.15	1.4	EPA Inhalation RfCi	0.1058
ISOPRENE	78-79-5	96,675	51,746	0.44	0.22	140	TCEQ Long-Term AMCV Health	0.0015
METHANOL	67-56-1	96,675	51,746	9.63	5.82	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	96,675	51,746	0.13	0.07	400	TCEQ Long-Term AMCV Health	0.0002
NONANES	111-84-2	96,675	51,746	0.06	0.02	3.8	EPA Inhalation RfCi	0.0063
OCTANES*	111-65-9	96,675	51,746	0.12	0.05	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	96,675	51,746	0.38	0.16	339	EPA Inhalation RfCi	0.0005
PROPYLENE	115-07-1	96,675	51,746	1.28	0.52	1801	EPA RSL Non-Cancer	0.0003
STYRENE	100-42-5	96,675	51,746	0.14	0.06	235	EPA Inhalation RfCi	0.0002
TETRACHLOROETHYLENE	127-18-4	96,675	51,746	0.02	0.01	5.9	EPA Inhalation RfCi	0.0013
TOLUENE	108-88-3	96,675	51,746	6.31	0.98	1327	EPA Inhalation RfCi	0.0007
TRIMETHYLBENZENES*	622-96-8	96,675	51,746	0.49	0.19	25	TCEQ Long-Term AMCV Health	0.0078
UNDECANES	1120-21-4	96,675	51,746	0.08	0.03	55	TCEQ Long-Term AMCV Health	0.0006
XYLENES*	1330-20-7	96,675	51,746	2.02	0.93	23	EPA Inhalation RfCi	0.0404
Hazard Index								0.4823

*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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

Mobile Sampling Van Data Summary and Risk Assessment Pioneer Park Neighborhood | Q3 2021 - Q2 2024

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	167,900	116,816	0.10	0.03	0.95	EPA RSL Non-Cancer	0.0318
ACETYLENE	74-86-2	167,900	116,816	0.40	0.14	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	167,900	116,816	0.41	0.20	3	ATSDR Chronic MRL	0.0662
BUTANES*	75-28-5	167,900	116,816	5.36	2.32	10000	TCEQ Long-Term AMCV Health	0.0002
BUTENES*	590-18-1	167,900	116,816	7.23	1.09	700	TCEQ Long-Term AMCV Health	0.0016
CARBON DISULFIDE	75-15-0	167,900	116,816	0.02	0.00	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	167,901	116,817	6.25	1.23	590	TCEQ Long-Term AMCV Health	0.0021
DECANES	124-18-5	167,900	116,816	0.32	0.08	190	TCEQ Long-Term AMCV Health	0.0004
DIETHYLBENZENES*	141-93-5	167,900	116,816	0.23	0.05	45	TCEQ Long-Term AMCV Health	0.0012
DIMETHYLCYCLOHEXANES*	638-04-0	167,900	116,816	0.39	0.04	400	CDPHE	0.0001
DODECANES	112-40-3	167,900	116,816	0.00	0.00	3.8	CDPHE	0.0002
ETHYLENE	74-85-1	167,900	116,816	11.22	6.32	5300	TCEQ Long-Term AMCV Health	0.0012
HEPTANES*	142-82-5	167,900	116,816	0.21	0.09	98	EPA Inhalation RfCi	0.0009
HEXANES*	110-54-3	167,900	116,816	0.18	0.09	199	EPA Inhalation RfCi	0.0005
HEXENES*	592-41-6	167,900	116,816	5.02	0.65	50	TCEQ Long-Term AMCV Health	0.0131
HYDROGEN CYANIDE	74-90-8	167,900	116,816	0.41	0.14	0.75	EPA RSL Non-Cancer	0.1901
HYDROGEN SULFIDE	7783-06-4	167,900	116,816	0.41	0.17	1.4	EPA Inhalation RfCi	0.1206
ISOPRENE	78-79-5	167,900	116,816	0.58	0.19	140	TCEQ Long-Term AMCV Health	0.0014
METHANOL	67-56-1	167,900	116,816	11.54	3.73	15261	EPA Inhalation RfCi	0.0002
METHYLCYCLOHEXANE	108-87-2	167,900	116,816	0.34	0.04	400	TCEQ Long-Term AMCV Health	0.0001
NONANES	111-84-2	167,900	116,816	0.12	0.03	3.8	EPA Inhalation RfCi	0.0070
OCTANES*	111-65-9	167,900	116,816	0.26	0.05	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	167,900	116,816	0.32	0.18	339	EPA Inhalation RfCi	0.0005
PROPYLENE	115-07-1	167,900	116,816	1.97	0.26	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	167,900	116,816	1.57	0.06	235	EPA Inhalation RfCi	0.0003
TETRACHLOROETHYLENE	127-18-4	167,900	116,816	0.09	0.01	5.9	EPA Inhalation RfCi	0.0013
TOLUENE	108-88-3	167,900	116,816	1.72	0.52	1327	EPA Inhalation RfCi	0.0004
TRIMETHYLBENZENES*	622-96-8	167,900	116,816	0.41	0.12	25	TCEQ Long-Term AMCV Health	0.0048
UNDECANES	1120-21-4	167,900	116,816	0.08	0.03	55	TCEQ Long-Term AMCV Health	0.0005
XYLENES*	1330-20-7	167,900	116,816	1.31	0.62	23	EPA Inhalation RfCi	0.0269
Hazard Index								0.4739

*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.

CCND Community Air Monitoring Chronic Risk Assessment 2021-2023

Mobile Sampling Van Data Summary and Risk Assessment Western Hills Neighborhood | Q3 2021 - Q2 2024

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	139,488	94,582	0.08	0.03	0.95	EPA RSL Non-Cancer	0.0278
ACETYLENE	74-86-2	139,488	94,582	0.36	0.17	2500	TCEQ Long-Term AMCV Health	0.0001
BENZENE	71-43-2	139,488	94,582	0.49	0.23	3	ATSDR Chronic MRL	0.0772
BUTANES*	75-28-5	139,488	94,582	4.91	2.30	10000	TCEQ Long-Term AMCV Health	0.0002
BUTENES*	590-18-1	139,488	94,582	3.23	1.70	700	TCEQ Long-Term AMCV Health	0.0024
CARBON DISULFIDE	75-15-0	139,488	94,582	0.02	0.00	225	EPA Inhalation RfCi	0.0000
CYCLOPENTANES*	287-92-3	139,488	94,582	3.49	1.61	590	TCEQ Long-Term AMCV Health	0.0027
DECANES	124-18-5	139,488	94,582	0.11	0.04	190	TCEQ Long-Term AMCV Health	0.0002
DIETHYLBENZENES*	141-93-5	139,488	94,582	0.72	0.08	45	TCEQ Long-Term AMCV Health	0.0018
DIMETHYLCYCLOHEXANES*	638-04-0	139,488	94,582	0.15	0.06	400	CDPHE	0.0001
DODECANES	112-40-3	139,488	94,582	0.02	0.00	3.8	CDPHE	0.0003
ETHYLENE	74-85-1	139,488	94,582	12.13	6.85	5300	TCEQ Long-Term AMCV Health	0.0013
HEPTANES*	142-82-5	139,488	94,582	0.10	0.05	98	EPA Inhalation RfCi	0.0005
HEXANES*	110-54-3	139,488	94,582	0.18	0.08	199	EPA Inhalation RfCi	0.0004
HEXENES*	592-41-6	139,488	94,582	2.48	0.91	50	TCEQ Long-Term AMCV Health	0.0183
HYDROGEN CYANIDE	74-90-8	139,488	94,582	0.37	0.14	0.75	EPA RSL Non-Cancer	0.1863
HYDROGEN SULFIDE	7783-06-4	139,488	94,582	0.26	0.14	1.4	EPA Inhalation RfCi	0.0994
ISOPRENE	78-79-5	139,488	94,582	1.13	0.19	140	TCEQ Long-Term AMCV Health	0.0013
METHANOL	67-56-1	139,488	94,582	11.06	5.39	15261	EPA Inhalation RfCi	0.0004
METHYLCYCLOHEXANE	108-87-2	139,488	94,582	0.18	0.06	400	TCEQ Long-Term AMCV Health	0.0001
NONANES	111-84-2	139,488	94,582	0.05	0.02	3.8	EPA Inhalation RfCi	0.0049
OCTANES*	111-65-9	139,488	94,582	0.12	0.05	380	TCEQ Long-Term AMCV Health	0.0001
PENTANES*	109-66-0	139,488	94,582	0.55	0.17	339	EPA Inhalation RfCi	0.0005
PROPYLENE	115-07-1	139,488	94,582	0.81	0.23	1801	EPA RSL Non-Cancer	0.0001
STYRENE	100-42-5	139,488	94,582	0.46	0.09	235	EPA Inhalation RfCi	0.0004
TETRACHLOROETHYLENE	127-18-4	139,488	94,582	0.12	0.01	5.9	EPA Inhalation RfCi	0.0018
TOLUENE	108-88-3	139,488	94,582	2.45	0.79	1327	EPA Inhalation RfCi	0.0006
TRIMETHYLBENZENES*	622-96-8	139,488	94,582	2.25	0.27	25	TCEQ Long-Term AMCV Health	0.0109
UNDECANES	1120-21-4	139,488	94,582	0.07	0.03	55	TCEQ Long-Term AMCV Health	0.0006
XYLENES*	1330-20-7	139,488	94,582	1.61	0.81	23	EPA Inhalation RfCi	0.0352
Hazard Index								0.4761

*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.