2022 Q3 MOBILE MONITORING VAN COMMERCE CITY NORTH DENVER COMMUNITY AIR MONITORING NETWORK COMMERCE CITY, COLORADO

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EXECUTIVE SUMMARY

In response to feedback received by Suncor Energy (U.S.A.) Inc. (Suncor) through community engagement conducted in the fall of 2020, Suncor voluntarily committed to developing a continuous, near real-time air monitoring program to gain insight into air quality for neighborhoods in the vicinity of the Suncor refinery in Commerce City, Colorado. Montrose Environmental Group - Air Quality Services, LLC (Montrose) was contracted by Suncor to deploy, operate and maintain the network in the Commerce City and North Denver (CCND) neighborhoods. Air monitoring was accomplished through three separate technical approaches: (1) continuous, near real-time monitoring for the following analytes[1]: carbon monoxide (CO), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), nitric oxide or nitrogen oxide (NO), nitrogen dioxide (NO_2), particulate matter ($PM_{2.5}$) and total volatile organic compounds (VOCs); (2) periodic collection and laboratory analysis for the presence of specific VOCs from Summa canisters; and (3) periodic real-time air monitoring throughout neighborhoods using a mobile monitoring van to detect the presence of specific VOCs and hydrogen sulfide (H_2S). This report details approach number three, the periodic real-time air monitoring through six neighborhoods with the mobile monitoring van and a screening health risk analysis of the detected chemicals. Continuous real-time air monitoring and Summa canister sampling data are presented in separate reports.

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 select chemicals at sub-parts per billion (ppb) levels and as quickly as one measurement per second. During the monitoring period, the mobile monitoring van followed a dense route through each of the six CCND residential neighborhoods that fall within a three-mile radius around the refinery. Accessible streets in the monitored neighborhoods were traversed at approximately 10 miles per hour (MPH) while collecting a data point for each chemical every 1 second. During the third quarter 2022 sampling period (August 24 – August 26), the mobile monitoring van was in a total of six neighborhoods and collected more than 61,377 data points across three days of monitoring, resulting in approximately 39,783, 1-hour rolling average concentrations. Meteorological conditions were also reported in real time.

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 estimated 1-hour maximum measured concentrations of individual or cumulative (combined) VOCs could potentially pose acute (short-term) health hazards. The air monitoring data and health risk assessment indicate:

- Air monitoring data and health risk assessment indicate all measured individual and combined air concentrations were below their respective acute health reference levels in all neighborhoods.
- Results indicate the measured concentrations are likely to be without any appreciable risk of adverse acute health effects, even for sensitive sub-populations.

[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.

1.0 INTRODUCTION

In response to feedback received by Suncor Energy (U.S.A.) Inc. (Suncor) through community engagement conducted in the fall of 2020, voluntarily committed to developing a continuous, near real-time air monitoring program to gain insight into air quality for neighborhoods in the vicinity of the Suncor refinery in Commerce City, Colorado. Montrose Environmental Group - Air Quality Services, LLC (Montrose) was contracted by Suncor to deploy, operate and maintain the network in the Commerce City and North Denver (CCND) neighborhoods. Air monitoring was accomplished through three separate technical approaches: (1) continuous, near real-time stationary monitoring for the following analytes: carbon monoxide (CO), sulfur dioxide (SO_2), hydrogen sulfide (H_2S), nitric oxide or nitrogen oxide (NO), nitrogen dioxide (NO_2), particulate matter ($PM_{2.5}$) and total volatile organic compounds (VOCs); (2) periodic collection and laboratory analysis for the presence of specific VOCs from Summa canisters; and (3) periodic real-time air monitoring throughout neighborhoods using a mobile monitoring van to detect the 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. This report details approach number three. The continuous real-time community air monitoring and Summa canister sampling data are presented in separate reports. Air monitoring, sampling and analysis from approaches (1) and (2) were conducted in accordance with the Quality Assurance Project Plan (QAPP) that can be found online at ccnd-air.com/documents.

2.0 MOBILE SAMPLING PROGRAM

2.1 Mobile Van Air Sampling Description

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 other incorporated meteorological (MET) sensors.

During the mobile monitoring program, the list of 65 chemicals in Table 2-1 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 1 second. The details of the monitored neighborhoods are listed in Table 2-2 and are shown in Figure 2-1.

TABLE 2-1
MOBILE MONITORING VAN PROGRAM CHEMICALS[2]

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

[2] See Appendix A for isomer analysis details

TABLE 2-2
NEIGHBORHOOD MONITORING PROGRAM DETAILS

Neighborhood	Area (square miles)	Sampling Date	Start Time	End Time	Total Data Points Collected	Total Hourly Rolling Averages Calculated
Adams City	0.41	08/26/22	12:33	15:04	9,053	5,454
Dupont	1.4	08/25/22	9:19	12:37	11,914	8,315
Elyria-Swansea	1.2	08/25/22	13:25	15:36	7,833	4,234
Globeville	0.44	08/24/22	13:38	16:09	9,024	5,425
Pioneer Park	1.7	08/24/22	9:32	12:54	12,130	8,531
Western Hills	1.6	08/26/22	8:45	11:55	11,423	7,824

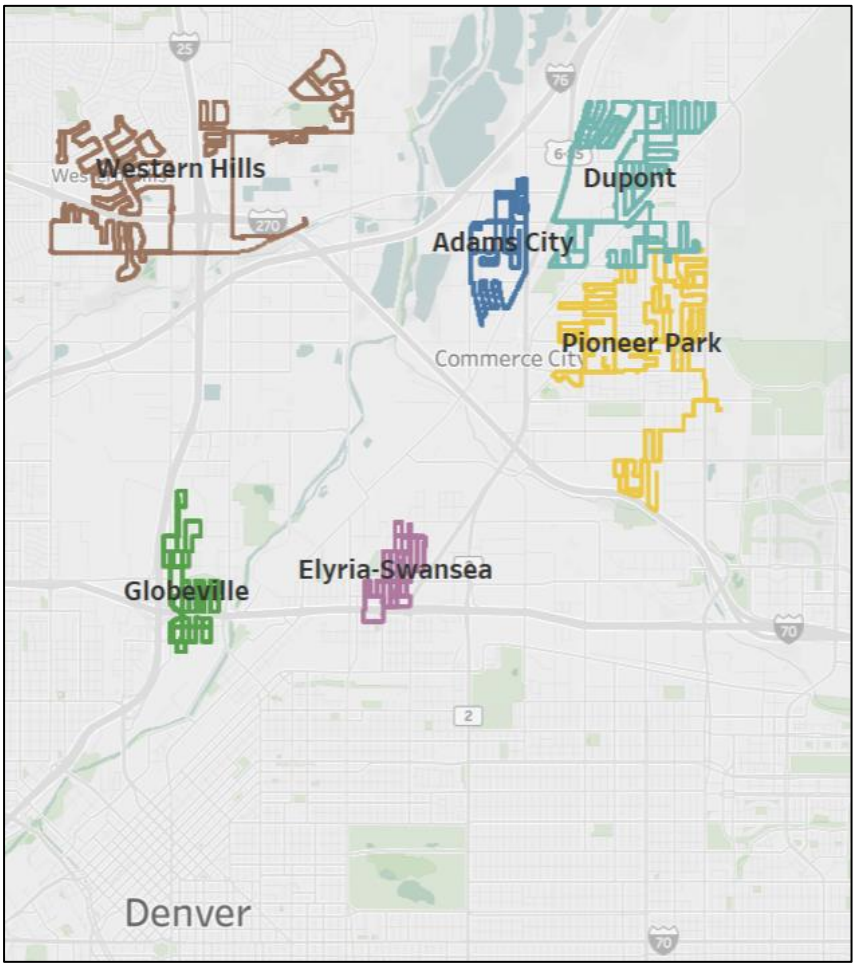
2.2 Mobile Monitoring Van Air Sampling Methods

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

The mobile monitoring van collected continuous measurements throughout each neighborhood following the routes shown in Figure 2-1. 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. See the attached Appendix D for specific PTR-TOF-MS instrument operation conditions.

FIGURE 2-1
MOBILE MONITORING VAN PROGRAM ROUTE THROUGH SIX NEIGHBORHOOD AREAS



2.3 Screening Health Risk Assessment Methods

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

assumptions about exposure that are still simple representations of the real world but are more realistic than the first-tier worst-case assumptions. Each successive tier represents a more complete characterization of exposure variability and/or uncertainty that requires a corresponding increase in calculation complexity and scientific level of effort.

The first tier of this risk assessment process is called a screening-level risk assessment. The conservative assumptions used for this level of risk calculation typically represent exposure conditions higher than would be reasonably expected. As such, an exceedance of an acceptable risk level (defined below) does not necessarily indicate that adverse health effects are likely. The Agency for Toxic Substances and Disease Registry (ATSDR) states, "*when health assessors find exposures higher than the MRLs (ATSDR's specific health-based reference levels), it means that they may want to look more closely at a site*"[3]. In other words, screening-level findings of an estimated exposure to a specific or cumulative set of chemical(s) being higher than its 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.

The screening-level risk assessment reported here includes calculated acute risks from exposure to individually measured chemicals as well as exposure to all measured chemicals at once (cumulative). For individual chemicals, an acute health risk value was calculated as the exposure concentration (EC) divided by the chemical-specific federal or state established acute RL (Equation 1). The result is referred to as the hazard quotient (HQ). Estimates of EC were derived from 1-hour rolling average concentrations of each chemical for the entire measurement time in an individual CCND neighborhood. The RLs used to calculate the HQs are previously established exposure levels below which no adverse effect in humans is expected. If available, RLs adopted by the Colorado Department of Public Health and Environment (CDPHE) were selected for use within this assessment and include ATSDR acute minimum risk levels (MRL), California EPA Office of Environmental Health Hazard Assessment (OEHHA) acute risk levels and Texas Commission on Environmental Quality (TCEQ) acute exposure guideline levels. If the chemical was not listed by CDPHE, a federal and state recommended hierarchy for selection of RLs was used[4]. For chemical isomer groups which were unable to be differentiated the lowest, most health-protective RL of the isomer group was selected for use in this assessment.

Acute HQs were calculated as follows:

Eq. 1 – Hazard Quotient (HQ) Equation

$$HQ = EC / RL$$

Where:

HQ= Hazard Quotient

EC= Maximum 1-hour rolling average air concentration

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

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

[4] https://drive.google.com/file/d/1P2KEvu0MFiyzQAOQtjQUclqR-WGh1bEX/view

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

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

According to the USEPA and ATSDR, the federal agencies that establish these RLs, these values "*are set below levels that, based on current information, might cause adverse health effects in the people most sensitive*."[5] This is because RLs are based on observed toxicity in human or animal studies with an added safety factor to account for uncertainties and variabilities in the toxicity data. For example, ATSDR identified the lowest observed adverse effect level (LOAEL) for acute exposure to benzene as 10,200 parts per billion (ppb), based on a study of mice exposed six hours per day for six days. ATSDR then applied a combined safety factor of 300 to derive the final RL to account for several uncertainties, including differences between mice and humans and for sensitive individuals. Therefore, it is scientifically incorrect to assume that all real-world exposures to a chemical at levels higher than a RL will likely result in an adverse effect.

Using the maximum 1-hour rolling average for the EC conservatively assumes that a hypothetical maximally exposed individual occupies the monitored neighborhood and breathes the maximum 1-hour detected concentration continuously for an hour up to multiple days (an acute exposure). A 1-hour average concentration is more appropriate than a 1-second or 1-minute concentration for use in an acute health risk assessment. This is because 1-second exposures to the chemicals measured in this study do not cause adverse effects unless the levels are extremely high (i.e., tens of thousands to millions of ppb). Guidance values for use in emergency situations with extremely elevated levels of these chemicals are available and are discussed below. Across all neighborhoods, 39,7831-hour rolling averages of chemical concentrations were calculated to derive the estimated ECs (Table 2-2). The range between the average and maximum rolling 1-hour average values provides a robust estimate of plausible outdoor exposures of persons occupying the monitored neighborhood while the mobile monitoring van was present (Figures 3-1 to 3-8).

The USEPA also has established values for use in emergency situations, termed Acute Exposure Guideline Levels (AEGLs). Unlike RLs that can be thousands of times below exposure levels where adverse effects are observed, AEGL values are levels at which different acute adverse health effects may be anticipated to occur. According to USEPA, "*AEGL-1 represent exposure levels that could produce mild and progressively increasing but transient and non-disabling odor, taste and sensory irritation or certain asymptomatic, non-sensory effects. With increasing airborne concentration above each AEGL, there is a progressive increase in the likelihood of occurrence and the severity of effects described for each corresponding AEGL [i.e., AEGL-2 or AEGL-3].*"[6] The AEGL-1 60-minute value, if available for the applicable chemical, was also used for

[5] https://www.atsdr.cdc.gov/mrls/index.html#:~:text=ATSDR%20uses%20the%20no%20observed,to%20such%20substance%2Dinduced%20effects.

[6] https://www.epa.gov/aegl/about-acute-exposure-guideline-levels-aegls

comparison purposes because it is more precautionary (than AEGL-2 or AEGL-3) as the AEGL-1 level reflects protecting against acute health effects that are reversible upon cessation of exposure.

3.0 SUMMARY AND DISCUSSION OF RESULTS

3.1 Summary of Mobile Monitoring Van Results

A summary of mobile monitoring van results by neighborhood can be found in Table 2-2. Over three days, six neighborhoods were monitored for 65 chemicals, collecting more than 61,300 total data points. Individual neighborhood results are detailed in Figures 3-1 through 3-6. Each figure shows a map of the monitoring locations within each neighborhood, the chemicals that resulted in the top five calculated acute HQs and time profiles of the measured levels of these chemicals. The time profiles show all the 1-second data (orange) and calculated 1-hour rolling averages (green) of the monitoring data. Each green 1-hour average data point shown in these profiles reflects all the 1-second measurements collected over the previous hour. Thus, 1-hour rolling average values are shown on the time profiles only after one hour of data collection (Figure 3-1 through 3-6).

Wind roses for each sampling day are provided in Appendix B. The data used to derive the wind roses were collected from the CCND community sensor location most local to the neighborhood being monitored on each day because the stationary source of MET data is more reliable than the MET station on the mobile monitoring van when the lab is moving.

3.2 Screening Health Risk Assessment Results

Acute health risks were calculated for each neighborhood. According to USEPA guidelines, an acute HQ or HI less than or equal to one (1) indicates that exposures are likely to be without any acute adverse health effects, even for sensitive sub-populations.

Maximum 1-hour rolling average concentrations for 65 chemicals measured in each neighborhood were compared to acute RLs to derive HQs. Figures 3-1 through 3-6 show concentrations of chemicals over the sampling time and summaries of results for chemicals resulting in the five highest HQs by neighborhood (if available). The estimated HI values (if available) shown in Figures 3-1 through 3-6 were calculated by summing the HQs of all detected chemicals measured in a given neighborhood. The graphs in these figures indicate whether a maximum HQ was ever greater than one (yellow dots) or less than one (green dots) for any measured chemical. If any measured chemical resulted in a HQ greater than 1, then a separate figure would be shown for that chemical alone. Complete results for HQs for all chemicals detected in each neighborhood are available in Appendix C.

In conclusion, the data collected during this study phase did not indicate a potential for acute adverse health effects from exposure to the measured chemicals, both individually and combined.

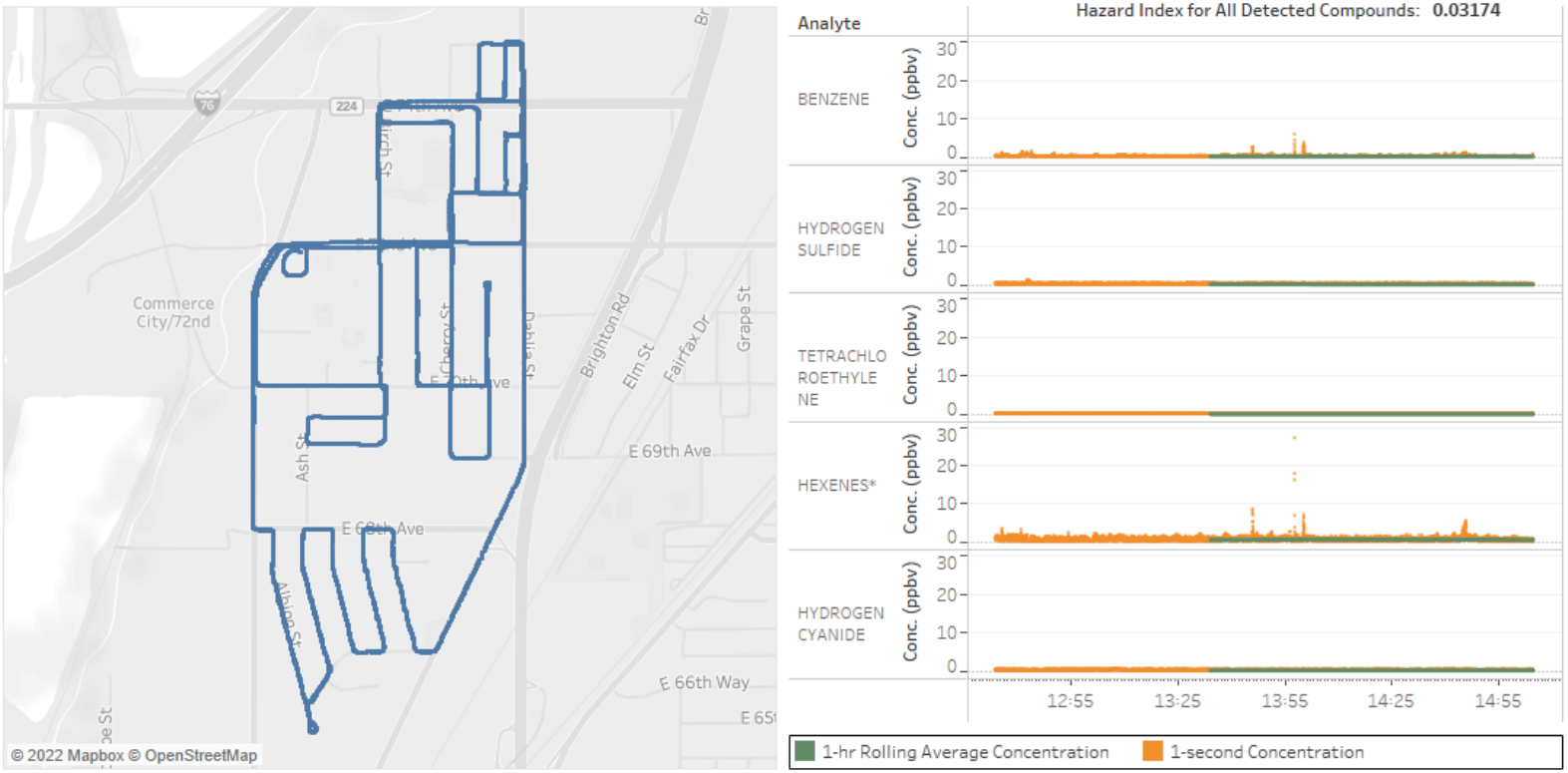
- All HQs were less than one for all detected chemicals, indicating that the maximum 1-hour rolling average concentration for each chemical was below its respective acute RL in all six neighborhoods (Figure 3-1 through 3-6).

- In this quarter, benzene, tetrachloroethylene, hydrogen sulfide, hexene group, hydrogen cyanide and trimethylbenzene group were the chemicals or isomer groupings resulting in the highest HQ in each neighborhood, accounting for over 70% of the total calculated HI values. However, all HI values calculated in all six neighborhoods were below one (Figures 3-1 through 3-6).

- These results indicate that the measured concentrations of chemicals, both individually and cumulative (combined), are likely to be without an appreciable risk of acute adverse health effects, even for sensitive sub-populations.

FIGURE 3-1
ADAMS CITY NEIGHBORHOOD: AUGUST 26, 2022

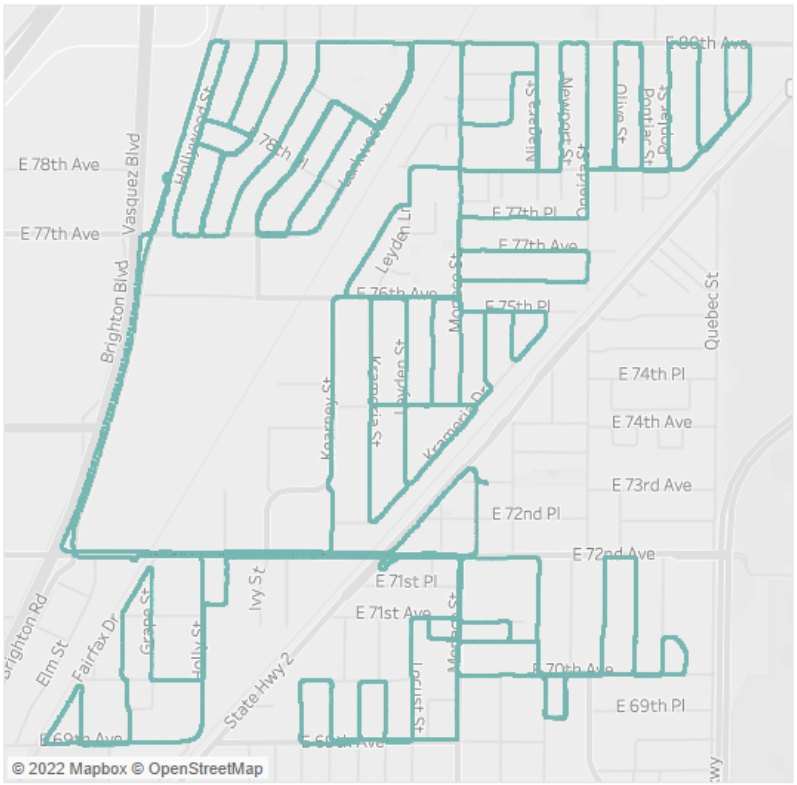
Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	5.81	5,454	0.17	0.19	52,000	9	0.02144
HYDROGEN SULFIDE	1.24	5,454	0.18	0.20	510	70	0.00280
TETRACHLOROETHYLENE	0.10	5,454	0.01	0.01	35,000	6	0.00215
HEXENES*	27.21	5,454	0.61	0.67	NR	500	0.00133
HYDROGEN CYANIDE	0.50	5,454	0.18	0.19	2,000	308	0.00063

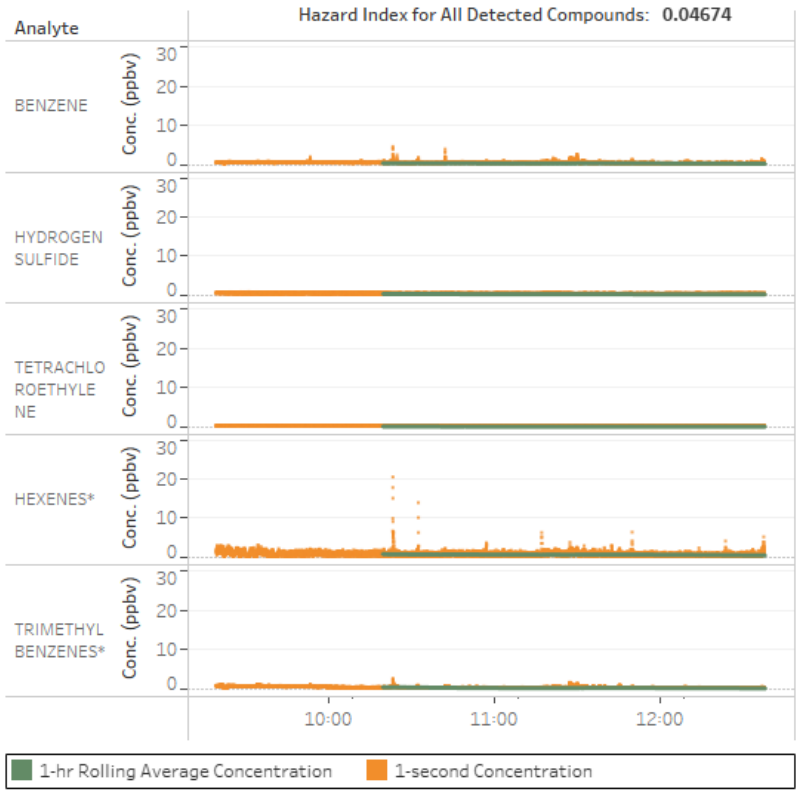


*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomers or groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

FIGURE 3-2
DUPONT NEIGHBORHOOD: AUGUST 25, 2022

Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	4.42	8,315	0.29	0.31	52,000	9	0.03486
HYDROGEN SULFIDE	0.67	8,315	0.19	0.27	510	70	0.00386
TETRACHLOROETHYLENE	0.09	8,315	0.01	0.01	35,000	6	0.00220
HEXENES*	20.41	8,315	0.56	0.71	NR	500	0.00143
TRIMETHYLBENZENES*	2.43	8,315	0.16	0.32	NR	250	0.00129

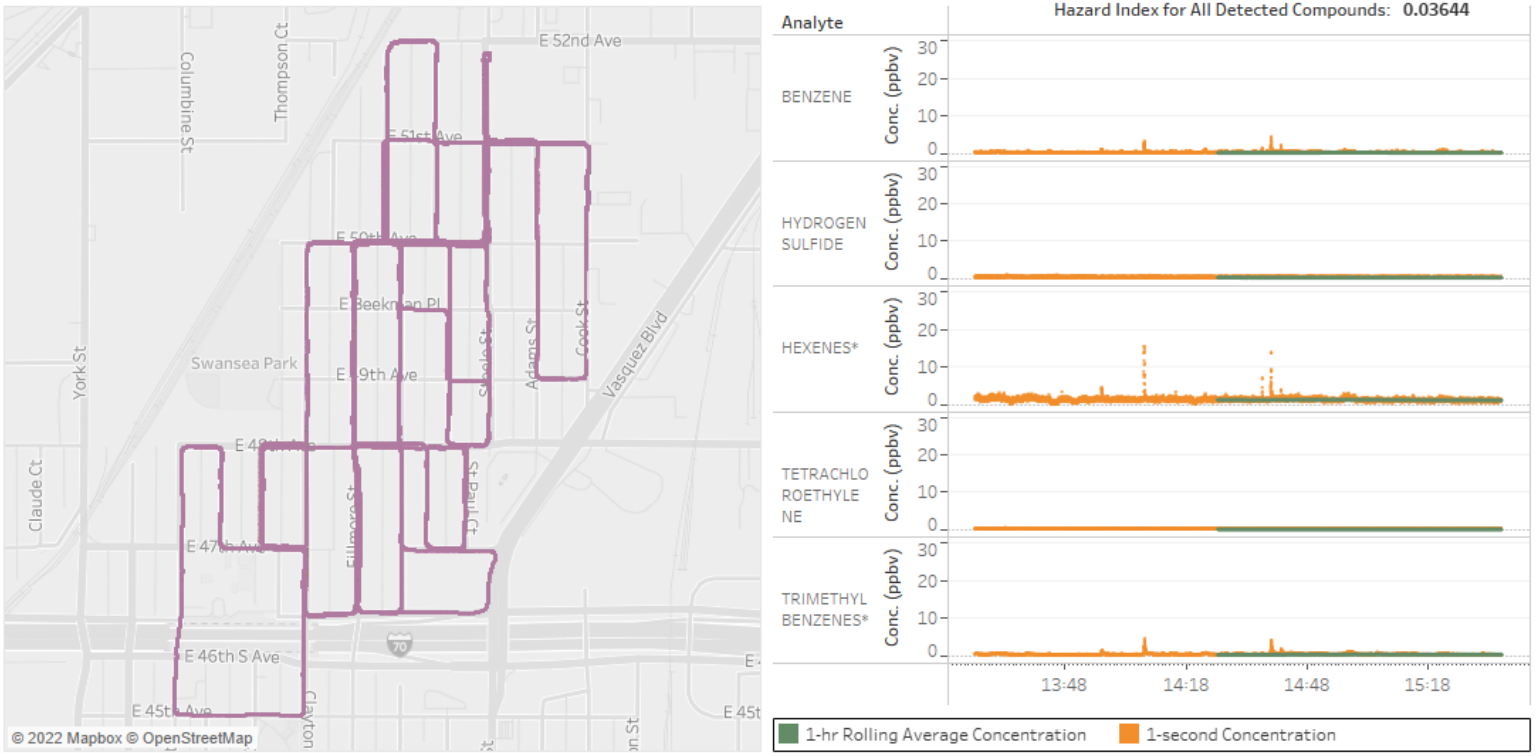




*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomers or groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

FIGURE 3-3
ELYRA-SWANSEA NEIGHBORHOOD: AUGUST 25, 2022

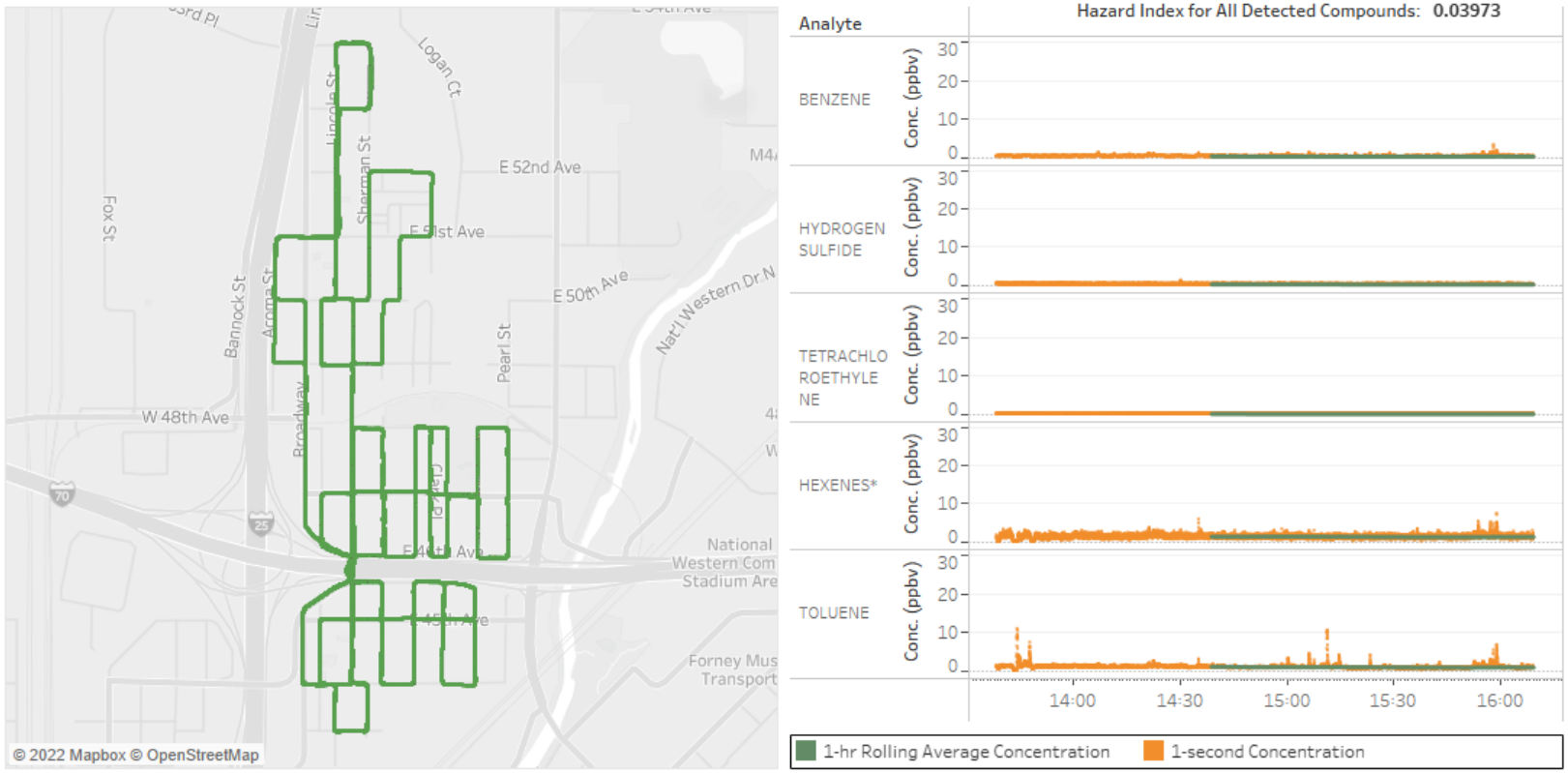
Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	4.22	4,234	0.19	0.21	52,000	9	0.02348
HYDROGEN SULFIDE	0.81	4,234	0.22	0.23	510	70	0.00333
HEXENES*	15.25	4,234	1.21	1.28	NR	500	0.00256
TETRACHLOROETHYLENE	0.31	4,234	0.01	0.02	35,000	6	0.00255
TRIMETHYLBENZENES*	4.45	4,234	0.27	0.31	NR	250	0.00124



*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomers or groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

FIGURE 3-4
GLOBEVILLE NEIGHBORHOOD: AUGUST 24, 2022

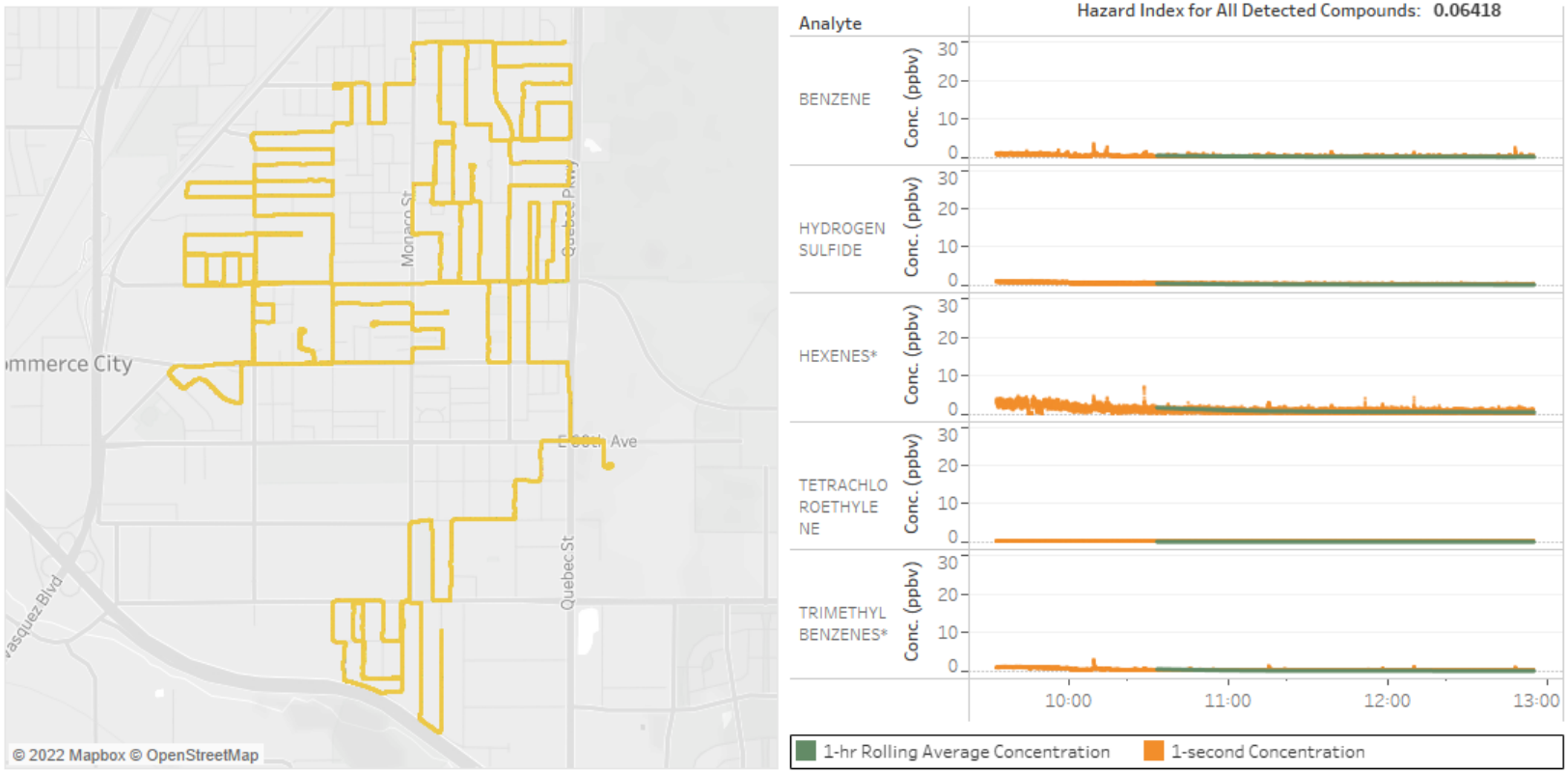
Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	3.20	5,425	0.24	0.25	52,000	9	0.02829
HYDROGEN SULFIDE	1.11	5,425	0.18	0.21	510	70	0.00305
TETRACHLOROETHYLENE	0.06	5,425	0.01	0.02	35,000	6	0.00284
HEXENES*	7.36	5,425	1.28	1.35	NR	500	0.00270
TOLUENE	10.84	5,425	0.90	1.05	67,000	2,000	0.00053



*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomers or groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

FIGURE 3-5
PIONEER PARK NEIGHBORHOOD: AUGUST 24, 2022

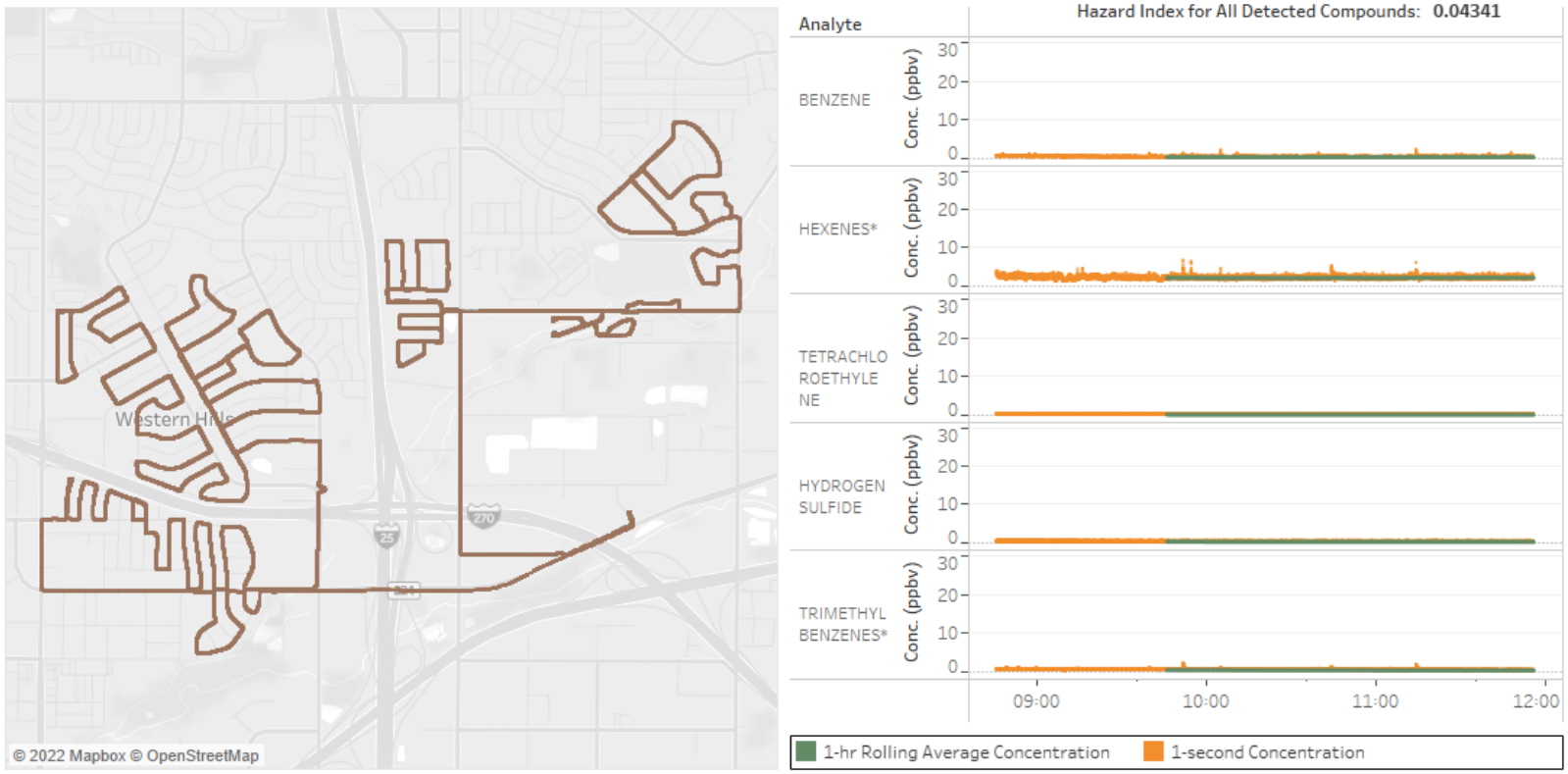
Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	3.40	8,531	0.17	0.41	52,000	9	0.04586
HYDROGEN SULFIDE	1.05	8,531	0.16	0.41	510	70	0.00584
HEXENES*	6.80	8,531	0.74	1.66	NR	500	0.00332
TETRACHLOROETHYLENE	0.07	8,531	0.01	0.02	35,000	6	0.00273
TRIMETHYLBENZENES*	2.70	8,531	0.07	0.41	NR	250	0.00163



*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomers or groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

FIGURE 3-6
WESTERN HILLS NEIGHBORHOOD: AUGUST 26, 2022

Analyte	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value (ppbv)	Health Reference Level (ppbv)	Hazard Quotient
BENZENE	2.07	7,824	0.23	0.25	52,000	9	0.02815
HEXENES*	6.60	7,824	2.05	2.11	NR	500	0.00422
TETRACHLOROETHYLENE	0.11	7,824	0.01	0.02	35,000	6	0.00305
HYDROGEN SULFIDE	0.66	7,824	0.16	0.21	510	70	0.00295
TRIMETHYLBENZENES*	2.06	7,824	0.32	0.38	NR	250	0.00151



*The top 5 hazard quotients are reported in this dashboard. The hazard index represents cumulative risks including all unlisted analytes. The hazard quotient was calculated by comparing the acute health reference level to the maximum 1-hour rolling average. The comparative AEGL value is shown for comparison purposes. NR = According to EPA, the AEGL value is "not recommended due to insufficient data". *For analyte isomers or groups which were unable to be differentiated, the lowest health reference value of the group was selected for use in this assessment (Appendix A).*

3.3 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 acute hazard estimates presented in this assessment are estimates of risk due to a number of assumptions about exposure and toxicity. This screening-level risk assessment relied on a combination of health-protective exposure scenarios and input values (i.e., high-end exposures and conservative selection of lowest reference value per isomer). Because of these assumptions, the estimates of acute hazards are themselves uncertain but likely to be over-estimates of actual risk.

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.

3.4 Program Changes

No program changes occurred during this reporting period.

Respectfully Submitted:

Steven Yuchs, PhD.
Vice President, Technical
Ambient & Emerging Technology
Montrose Air Quality Services

Michael Lumpkin, PhD, DABT
Senior Toxicologist
CTEH®, LLC

APPENDIX A
ISOMER CHEMICAL SAMPLING DETAILS

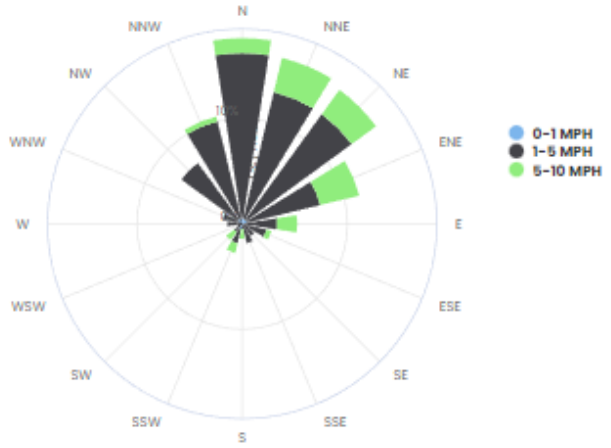
In a real-time PTR-TOF analysis, it is not possible to speciate isomers, or chemical compounds that have the same molecular weight. For example, n-hexane, 2-methyl pentane and 2,2-dimethyl butane all have a molecular mass of 86.178 g/mol. In order to provide the most conservative determination of concentration 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.

Group Name	Specific Isomers
Butenes	1-Butene
	cis-2-Butene
	trans-2-Butene
Butanes	iso-Butane
	n-Butane
Cyclopentanes	Cyclopentane
	1-Pentene
	2-Methyl-2-butene
	cis-2-Pentene
	trans-2-Pentene
Pentanes	iso-Pentane
	n-Pentane
	neo-Pentane
Hexenes	1-Hexene
	Cyclohexane
	Methylcyclopentane
Hexanes	n-Hexane
	2-Methylpentane
	3-Methylpentane
	2,2-Dimethylbutane
	2,3-Dimethylbutane
Heptanes	n-Heptane
	2-Methylhexane
	3-Methylhexane
	2,3-Dimethylpentane
	2,4-Dimethylpentane

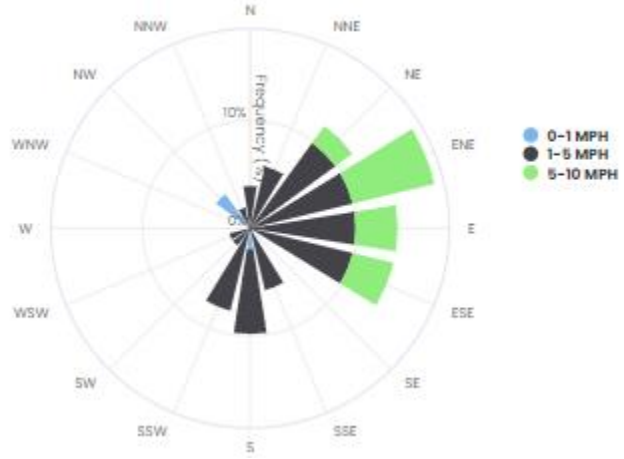
Group Name	Specific Isomers
Xylenes	Ethyl Benzene
	o-Xylene
	m-Xylene
	p-Xylene
Dimethylcyclohexanes	Ethylcyclohexane
	cis-1,3-Dimethylcyclohexane
	trans-1,2-Dimethylcyclohexane
	trans-1,3-Dimethylcyclohexane
Octanes	n-Octane
	2-Methylheptane
	3-Methylheptane
	2,2,4-Trimethylpentane
	2,3,4-Trimethylpentane
Trimethylbenzenes	Cumene
	1,2,4-Trimethylbenzene
	o-Ethyltoluene
	m-Ethyltoluene
	p-Ethyltoluene
	n-Propylbenzene
Diethylbenzenes	o-Diethylbenzene
	m-Diethylbenzene
	p-Diethylbenzene

APPENDIX B
DAILY WIND ROSES

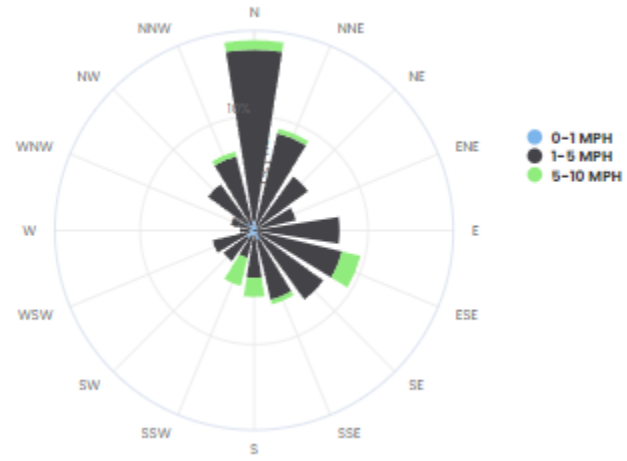
Wind Rose | CM7 (Kearney Middle School) 9:30am – 1:00pm, August 24, 2022



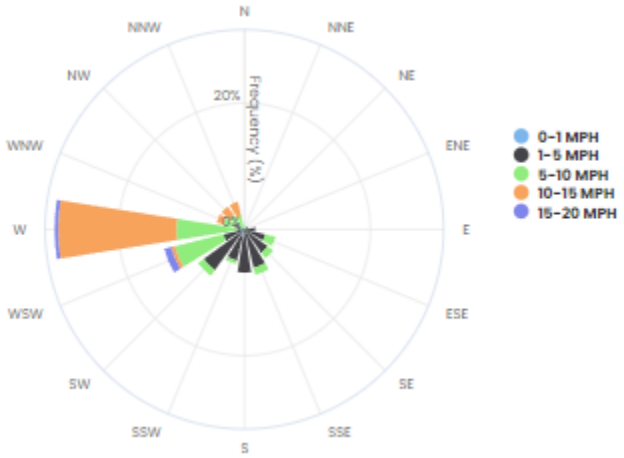
Wind Rose | CM6 (Focus Points Family Resource Center) 1:30pm – 4:30pm, August 24, 2022



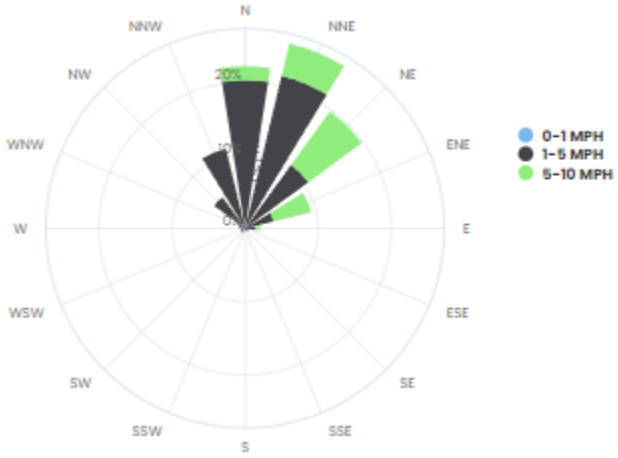
Wind Rose | CM3 (Adams City High School) 9:00am – 1:00pm, August 25, 2022



Wind Rose | CM6 (Focus Points Family Resource Center) 1:00pm – 4:00pm, August 25, 2022



Wind Rose | CM4 (Adams City Middle School) 8:30am – 3:30pm, August 26, 2022



APPENDIX C
SCREENING RISK ASSESSMENT DETAILS
(ALPHABETICAL ORDER BY NEIGHBORHOOD NAME)

CCND Mobile Monitoring Van
2022 Q3

Mobile Laboratory Sampling Data Summary and Risk Assessment

Adams City Neighborhood | August 26, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	9,053	0.22	5,454	0.03	0.03	670,000	298	OEHHA Acute REL	0.00011
ACETYLENE	74-86-2	9,053	0.88	5,454	0.20	0.22	NR	25,000	TCEQ Short-Term AMCV Health	0.00001
BENZENE	71-43-2	9,053	5.81	5,454	0.17	0.19	52,000	9	ATSDR Acute MRL	0.02144
BUTANES*	75-28-5	9,053	116.05	5,454	2.62	3.39	NR	33000	TCEQ Short-Term AMCV Health	0.00010
BUTENES*	590-18-1	9,053	28.80	5,454	1.69	1.77	NR	15000	TCEQ Short-Term AMCV Health	0.00012
CARBON DISULFIDE	75-15-0	9,053	0.06	5,454	0.01	0.01	13,000	1,991	OEHHA Acute REL	0.00000
CYCLOPENTANE	287-92-3	9,053	39.48	5,454	2.75	2.88	NR	5,900	TCEQ Short-Term AMCV Health	0.00049
DECANES	124-18-5	9,053	0.15	5,454	0.06	0.07	NR	1,000	TCEQ Short-Term AMCV Health	0.00007
DIETHYLBENZENES*	141-93-5	9,053	0.09	5,454	0.01	0.01	NR	450	TCEQ Short-Term AMCV Health	0.00003
DIMETHYLCYCLOHEXANES*	638-04-0	9,053	0.32	5,454	0.14	0.14	NR	4,000	CDPHE	0.00004
DODECANES	112-40-3	9,053	0.04	5,454	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	9,053	75.61	5,454	5.45	6.06	NR	500,000	TCEQ Short-Term AMCV Health	0.00001
HEPTANES*	142-82-5	9,053	0.32	5,454	0.08	0.08	NR	8,300	TCEQ Short-Term AMCV Health	0.00001
HEXANES*	110-54-3	9,053	0.38	5,454	0.18	0.19	NR	5,400	TCEQ Short-Term AMCV Health	0.00003
HEXENES*	592-41-6	9,053	27.21	5,454	0.61	0.67	NR	500	TCEQ Short-Term AMCV Health	0.00133
HYDROGEN CYANIDE	74-90-8	9,053	0.50	5,454	0.18	0.19	2,000	308	OEHHA Acute REL	0.00063
HYDROGEN SULFIDE	7783-06-4	9,053	1.24	5,454	0.18	0.20	510	70	ATSDR Acute MRL	0.00280
ISOPRENE	78-79-5	9,053	2.14	5,454	0.50	0.52	NR	1,400	TCEQ Short-Term AMCV Health	0.00037
METHANOL	67-56-1	9,053	22.19	5,454	4.57	4.74	530,000	21,366	OEHHA Acute REL	0.00022
METHYLCYCLOHEXANE	108-87-2	9,053	0.34	5,454	0.09	0.10	NR	4,000	TCEQ Short-Term AMCV Health	0.00002
NONANES	111-84-2	9,053	0.18	5,454	0.09	0.09	NR	3,000	TCEQ Short-Term AMCV Health	0.00003
OCTANES*	111-65-9	9,053	0.34	5,454	0.06	0.07	NR	4,100	TCEQ Short-Term AMCV Health	0.00002
PENTANES*	109-66-0	9,053	0.78	5,454	0.24	0.25	NR	68,000	TCEQ Short-Term AMCV Health	0.00000
PROPYLENE	115-07-1	9,053	5.50	5,454	0.28	0.34	NR	NA	NE	
STYRENE	100-42-5	9,053	0.27	5,454	0.08	0.09	20,000	5,000	ATSDR Acute MRL	0.00002
TETRACHLOROETHYLENE	127-18-4	9,053	0.10	5,454	0.01	0.01	35,000	6	ATSDR Acute MRL	0.00215
TOLUENE	108-88-3	9,053	35.93	5,454	0.93	1.19	67,000	2,000	ATSDR Acute MRL	0.00060
TRIMETHYLBENZENES*	622-96-8	9,053	4.11	5,454	0.13	0.16	50,000	250	TCEQ Short-Term AMCV Health	0.00063
UNDECANES	1120-21-4	9,053	0.07	5,454	0.02	0.02	NR	550	TCEQ Short-Term AMCV Health	0.00003
XYLENES*	1330-20-7	9,053	22.55	5,454	0.80	0.88	130,000	2,000	ATSDR Acute MRL	0.00044
									Hazard Index	0.03174

NR= According to EPA, AEGL is "not recommended due to insufficient data"
NA= Not Available
NC= Not Calculated

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 (See Appendix A)

CCND Mobile Monitoring Van
2022 Q3

Mobile Laboratory Sampling Data Summary and Risk Assessment

Dupont Neighborhood | August 25, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	11,914	0.24	8,315	0.03	0.04	670,000	298	OEHHA Acute REL	0.00013
ACETYLENE	74-86-2	11,914	0.85	8,315	0.10	0.15	NR	25,000	TCEQ Short-Term AMCV Health	0.00001
BENZENE	71-43-2	11,914	4.42	8,315	0.29	0.31	52,000	9	ATSDR Acute MRL	0.03486
BUTANES*	75-28-5	11,914	14.51	8,315	3.43	3.66	NR	33000	TCEQ Short-Term AMCV Health	0.00011
BUTENES*	590-18-1	11,914	23.46	8,315	2.26	2.54	NR	15000	TCEQ Short-Term AMCV Health	0.00017
CARBON DISULFIDE	75-15-0	11,914	0.07	8,315	0.01	0.01	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANE	287-92-3	11,914	29.03	8,315	1.04	1.44	NR	5,900	TCEQ Short-Term AMCV Health	0.00024
DECANES	124-18-5	11,914	0.19	8,315	0.09	0.10	NR	1,000	TCEQ Short-Term AMCV Health	0.00010
DIETHYLBENZENES*	141-93-5	11,914	0.10	8,315	0.04	0.04	NR	450	TCEQ Short-Term AMCV Health	0.00010
DIMETHYLCYCLOHEXANES*	638-04-0	11,914	0.35	8,315	0.02	0.03	NR	4,000	CDPHE	0.00001
DODECANES	112-40-3	11,914	0.07	8,315	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	11,914	10.38	8,315	6.86	6.90	NR	500,000	TCEQ Short-Term AMCV Health	0.00001
HEPTANES*	142-82-5	11,914	0.36	8,315	0.08	0.10	NR	8,300	TCEQ Short-Term AMCV Health	0.00001
HEXANES*	110-54-3	11,914	0.35	8,315	0.05	0.07	NR	5,400	TCEQ Short-Term AMCV Health	0.00001
HEXENES*	592-41-6	11,914	20.41	8,315	0.56	0.71	NR	500	TCEQ Short-Term AMCV Health	0.00143
HYDROGEN CYANIDE	74-90-8	11,914	0.82	8,315	0.27	0.32	2,000	308	OEHHA Acute REL	0.00104
HYDROGEN SULFIDE	7783-06-4	11,914	0.67	8,315	0.19	0.27	510	70	ATSDR Acute MRL	0.00386
ISOPRENE	78-79-5	11,914	0.61	8,315	0.09	0.11	NR	1,400	TCEQ Short-Term AMCV Health	0.00008
METHANOL	67-56-1	11,914	9.71	8,315	1.86	2.01	530,000	21,366	OEHHA Acute REL	0.00009
METHYLCYCLOHEXANE	108-87-2	11,914	0.21	8,315	0.02	0.03	NR	4,000	TCEQ Short-Term AMCV Health	0.00001
NONANES	111-84-2	11,914	0.19	8,315	0.05	0.05	NR	3,000	TCEQ Short-Term AMCV Health	0.00002
OCTANES*	111-65-9	11,914	0.22	8,315	0.08	0.08	NR	4,100	TCEQ Short-Term AMCV Health	0.00002
PENTANES*	109-66-0	11,914	1.73	8,315	1.03	1.05	NR	68,000	TCEQ Short-Term AMCV Health	0.00002
PROPYLENE	115-07-1	11,914	10.02	8,315	0.07	0.32	NR	NA	NE	
STYRENE	100-42-5	11,914	0.27	8,315	0.10	0.12	20,000	5,000	ATSDR Acute MRL	0.00002
TETRACHLOROETHYLENE	127-18-4	11,914	0.09	8,315	0.01	0.01	35,000	6	ATSDR Acute MRL	0.00220
TOLUENE	108-88-3	11,914	15.92	8,315	0.73	0.94	67,000	2,000	ATSDR Acute MRL	0.00047
TRIMETHYLBENZENES*	622-96-8	11,914	2.43	8,315	0.16	0.32	50,000	250	TCEQ Short-Term AMCV Health	0.00129
UNDECANES	1120-21-4	11,914	0.15	8,315	0.06	0.07	NR	550	TCEQ Short-Term AMCV Health	0.00012
XYLENES*	1330-20-7	11,914	14.50	8,315	0.45	0.61	130,000	2,000	ATSDR Acute MRL	0.00030
									Hazard Index	0.04674

NR= According to EPA, AEGL is "not recommended due to insufficient data"
NA= Not Available
NC= Not Calculated

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 (See Appendix A)

CCND Mobile Monitoring Van
2022 Q3

Mobile Laboratory Sampling Data Summary and Risk Assessment

Elyria-Swansea Neighborhood | August 25, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	7,833	0.23	4,234	0.03	0.03	670,000	298	OEHHA Acute REL	0.00012
ACETYLENE	74-86-2	7,833	0.70	4,234	0.09	0.11	NR	25,000	TCEQ Short-Term AMCV Health	0.00000
BENZENE	71-43-2	7,833	4.22	4,234	0.19	0.21	52,000	9	ATSDR Acute MRL	0.02348
BUTANES*	75-28-5	7,833	8.55	4,234	2.27	2.45	NR	33000	TCEQ Short-Term AMCV Health	0.00007
BUTENES*	590-18-1	7,833	24.09	4,234	1.57	1.70	NR	15000	TCEQ Short-Term AMCV Health	0.00011
CARBON DISULFIDE	75-15-0	7,833	0.08	4,234	0.01	0.01	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANE	287-92-3	7,833	27.08	4,234	2.58	2.78	NR	5,900	TCEQ Short-Term AMCV Health	0.00047
DECANES	124-18-5	7,833	0.18	4,234	0.06	0.08	NR	1,000	TCEQ Short-Term AMCV Health	0.00008
DIETHYLBENZENES*	141-93-5	7,833	0.12	4,234	0.03	0.03	NR	450	TCEQ Short-Term AMCV Health	0.00007
DIMETHYLCYCLOHEXANES*	638-04-0	7,833	0.12	4,234	0.04	0.04	NR	4,000	CDPHE	0.00001
DODECANES	112-40-3	7,833	0.01	4,234	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	7,833	6.98	4,234	6.49	6.50	NR	500,000	TCEQ Short-Term AMCV Health	0.00001
HEPTANES*	142-82-5	7,833	0.24	4,234	0.03	0.05	NR	8,300	TCEQ Short-Term AMCV Health	0.00001
HEXANES*	110-54-3	7,833	0.29	4,234	0.10	0.11	NR	5,400	TCEQ Short-Term AMCV Health	0.00002
HEXENES*	592-41-6	7,833	15.25	4,234	1.21	1.28	NR	500	TCEQ Short-Term AMCV Health	0.00256
HYDROGEN CYANIDE	74-90-8	7,833	0.48	4,234	0.19	0.21	2,000	308	OEHHA Acute REL	0.00067
HYDROGEN SULFIDE	7783-06-4	7,833	0.81	4,234	0.22	0.23	510	70	ATSDR Acute MRL	0.00333
ISOPRENE	78-79-5	7,833	1.40	4,234	0.33	0.41	NR	1,400	TCEQ Short-Term AMCV Health	0.00029
METHANOL	67-56-1	7,833	31.05	4,234	4.38	4.90	530,000	21,366	OEHHA Acute REL	0.00023
METHYLCYCLOHEXANE	108-87-2	7,833	0.23	4,234	0.08	0.09	NR	4,000	TCEQ Short-Term AMCV Health	0.00002
NONANES	111-84-2	7,833	0.11	4,234	0.01	0.02	NR	3,000	TCEQ Short-Term AMCV Health	0.00001
OCTANES*	111-65-9	7,833	0.12	4,234	0.01	0.02	NR	4,100	TCEQ Short-Term AMCV Health	0.00001
PENTANES*	109-66-0	7,833	0.14	4,234	0.00	0.00	NR	68,000	TCEQ Short-Term AMCV Health	0.00000
PROPYLENE	115-07-1	7,833	2.75	4,234	0.22	0.27	NR	NA	NE	
STYRENE	100-42-5	7,833	0.26	4,234	0.09	0.09	20,000	5,000	ATSDR Acute MRL	0.00002
TETRACHLOROETHYLENE	127-18-4	7,833	0.31	4,234	0.01	0.02	35,000	6	ATSDR Acute MRL	0.00255
TOLUENE	108-88-3	7,833	16.70	4,234	1.12	1.21	67,000	2,000	ATSDR Acute MRL	0.00060
TRIMETHYLBENZENES*	622-96-8	7,833	4.45	4,234	0.27	0.31	50,000	250	TCEQ Short-Term AMCV Health	0.00124
UNDECANES	1120-21-4	7,833	0.08	4,234	0.01	0.02	NR	550	TCEQ Short-Term AMCV Health	0.00003
XYLENES*	1330-20-7	7,833	19.16	4,234	0.68	0.81	130,000	2,000	ATSDR Acute MRL	0.00041
									Hazard Index	0.03644

NR= According to EPA, AEGL is "not recommended due to insufficient data"
NA= Not Available
NC= Not Calculated

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 (See Appendix A)

CCND Mobile Monitoring Van
2022 Q3

Mobile Laboratory Sampling Data Summary and Risk Assessment

Globeville Neighborhood | August 24, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	9,024	0.28	5,425	0.04	0.05	670,000	298	OEHHA Acute REL	0.00015
ACETYLENE	74-86-2	9,024	0.87	5,425	0.07	0.10	NR	25,000	TCEQ Short-Term AMCV Health	0.00000
BENZENE	71-43-2	9,024	3.20	5,425	0.24	0.25	52,000	9	ATSDR Acute MRL	0.02829
BUTANES*	75-28-5	9,024	18.37	5,425	2.22	2.48	NR	33000	TCEQ Short-Term AMCV Health	0.00008
BUTENES*	590-18-1	9,024	10.67	5,425	1.55	1.75	NR	15000	TCEQ Short-Term AMCV Health	0.00012
CARBON DISULFIDE	75-15-0	9,024	0.29	5,425	0.01	0.01	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANE	287-92-3	9,024	17.50	5,425	1.34	1.55	NR	5,900	TCEQ Short-Term AMCV Health	0.00026
DECANES	124-18-5	9,024	0.23	5,425	0.14	0.15	NR	1,000	TCEQ Short-Term AMCV Health	0.00015
DIETHYLBENZENES*	141-93-5	9,024	0.16	5,425	0.01	0.02	NR	450	TCEQ Short-Term AMCV Health	0.00003
DIMETHYLCYCLOHEXANES*	638-04-0	9,024	0.11	5,425	0.01	0.02	NR	4,000	CDPHE	0.00000
DODECANES	112-40-3	9,024	0.01	5,425	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	9,024	17.21	5,425	6.27	6.31	NR	500,000	TCEQ Short-Term AMCV Health	0.00001
HEPTANES*	142-82-5	9,024	0.32	5,425	0.06	0.08	NR	8,300	TCEQ Short-Term AMCV Health	0.00001
HEXANES*	110-54-3	9,024	0.36	5,425	0.02	0.03	NR	5,400	TCEQ Short-Term AMCV Health	0.00001
HEXENES*	592-41-6	9,024	7.36	5,425	1.28	1.35	NR	500	TCEQ Short-Term AMCV Health	0.00270
HYDROGEN CYANIDE	74-90-8	9,024	0.49	5,425	0.11	0.12	2,000	308	OEHHA Acute REL	0.00040
HYDROGEN SULFIDE	7783-06-4	9,024	1.11	5,425	0.18	0.21	510	70	ATSDR Acute MRL	0.00305
ISOPRENE	78-79-5	9,024	1.23	5,425	0.25	0.29	NR	1,400	TCEQ Short-Term AMCV Health	0.00021
METHANOL	67-56-1	9,024	28.30	5,425	4.75	5.05	530,000	21,366	OEHHA Acute REL	0.00024
METHYLCYCLOHEXANE	108-87-2	9,024	0.22	5,425	0.04	0.04	NR	4,000	TCEQ Short-Term AMCV Health	0.00001
NONANES	111-84-2	9,024	0.11	5,425	0.01	0.02	NR	3,000	TCEQ Short-Term AMCV Health	0.00001
OCTANES*	111-65-9	9,024	1.00	5,425	0.02	0.04	NR	4,100	TCEQ Short-Term AMCV Health	0.00001
PENTANES*	109-66-0	9,024	0.54	5,425	0.06	0.06	NR	68,000	TCEQ Short-Term AMCV Health	0.00000
PROPYLENE	115-07-1	9,024	2.84	5,425	0.47	0.57	NR	NA	NE	
STYRENE	100-42-5	9,024	0.26	5,425	0.02	0.03	20,000	5,000	ATSDR Acute MRL	0.00001
TETRACHLOROETHYLENE	127-18-4	9,024	0.06	5,425	0.01	0.02	35,000	6	ATSDR Acute MRL	0.00284
TOLUENE	108-88-3	9,024	10.84	5,425	0.90	1.05	67,000	2,000	ATSDR Acute MRL	0.00053
TRIMETHYLBENZENES*	622-96-8	9,024	2.20	5,425	0.05	0.08	50,000	250	TCEQ Short-Term AMCV Health	0.00030
UNDECANES	1120-21-4	9,024	0.09	5,425	0.01	0.01	NR	550	TCEQ Short-Term AMCV Health	0.00003
XYLENES*	1330-20-7	9,024	9.22	5,425	0.55	0.61	130,000	2,000	ATSDR Acute MRL	0.00031
									Hazard Index	0.03973

NR= According to EPA, AEGL is "not recommended due to insufficient data"
NA= Not Available
NC= Not Calculated

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 (See Appendix A)

CCND Mobile Monitoring Van
2022 Q3

Mobile Laboratory Sampling Data Summary and Risk Assessment

Pioneer Park Neighborhood | August 24, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	12,130	0.36	8,531	0.01	0.03	670,000	298	OEHHA Acute REL	0.00012
ACETYLENE	74-86-2	12,130	1.02	8,531	0.11	0.23	NR	25,000	TCEQ Short-Term AMCV Health	0.00001
BENZENE	71-43-2	12,130	3.40	8,531	0.17	0.41	52,000	9	ATSDR Acute MRL	0.04586
BUTANES*	75-28-5	12,130	14.44	8,531	2.77	5.36	NR	33000	TCEQ Short-Term AMCV Health	0.00016
BUTENES*	590-18-1	12,130	28.34	8,531	0.92	3.59	NR	15000	TCEQ Short-Term AMCV Health	0.00024
CARBON DISULFIDE	75-15-0	12,130	0.11	8,531	0.01	0.02	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANE	287-92-3	12,130	32.50	8,531	1.37	4.47	NR	5,900	TCEQ Short-Term AMCV Health	0.00076
DECANES	124-18-5	12,130	0.90	8,531	0.23	0.28	NR	1,000	TCEQ Short-Term AMCV Health	0.00028
DIETHYLBENZENES*	141-93-5	12,130	0.13	8,531	0.01	0.04	NR	450	TCEQ Short-Term AMCV Health	0.00009
DIMETHYLCYCLOHEXANES*	638-04-0	12,130	0.19	8,531	0.03	0.06	NR	4,000	CDPHE	0.00001
DODECANES	112-40-3	12,130	0.01	8,531	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	12,130	6.13	8,531	5.41	5.48	NR	500,000	TCEQ Short-Term AMCV Health	0.00001
HEPTANES*	142-82-5	12,130	0.50	8,531	0.06	0.11	NR	8,300	TCEQ Short-Term AMCV Health	0.00001
HEXANES*	110-54-3	12,130	0.52	8,531	0.02	0.06	NR	5,400	TCEQ Short-Term AMCV Health	0.00001
HEXENES*	592-41-6	12,130	6.80	8,531	0.74	1.66	NR	500	TCEQ Short-Term AMCV Health	0.00332
HYDROGEN CYANIDE	74-90-8	12,130	0.94	8,531	0.18	0.38	2,000	308	OEHHA Acute REL	0.00123
HYDROGEN SULFIDE	7783-06-4	12,130	1.05	8,531	0.16	0.41	510	70	ATSDR Acute MRL	0.00584
ISOPRENE	78-79-5	12,130	4.22	8,531	0.21	0.54	NR	1,400	TCEQ Short-Term AMCV Health	0.00038
METHANOL	67-56-1	12,130	19.00	8,531	1.39	1.97	530,000	21,366	OEHHA Acute REL	0.00009
METHYLCYCLOHEXANE	108-87-2	12,130	0.31	8,531	0.05	0.10	NR	4,000	TCEQ Short-Term AMCV Health	0.00002
NONANES	111-84-2	12,130	0.41	8,531	0.06	0.11	NR	3,000	TCEQ Short-Term AMCV Health	0.00004
OCTANES*	111-65-9	12,130	0.60	8,531	0.22	0.26	NR	4,100	TCEQ Short-Term AMCV Health	0.00006
PENTANES*	109-66-0	12,130	0.56	8,531	0.24	0.24	NR	68,000	TCEQ Short-Term AMCV Health	0.00000
PROPYLENE	115-07-1	12,130	4.22	8,531	0.22	0.64	NR	NA	NE	
STYRENE	100-42-5	12,130	0.67	8,531	0.04	0.11	20,000	5,000	ATSDR Acute MRL	0.00002
TETRACHLOROETHYLENE	127-18-4	12,130	0.07	8,531	0.01	0.02	35,000	6	ATSDR Acute MRL	0.00273
TOLUENE	108-88-3	12,130	13.46	8,531	0.35	0.90	67,000	2,000	ATSDR Acute MRL	0.00045
TRIMETHYLBENZENES*	622-96-8	12,130	2.70	8,531	0.07	0.41	50,000	250	TCEQ Short-Term AMCV Health	0.00163
UNDECANES	1120-21-4	12,130	0.16	8,531	0.06	0.08	NR	550	TCEQ Short-Term AMCV Health	0.00014
XYLENES*	1330-20-7	12,130	31.68	8,531	0.29	1.26	130,000	2,000	ATSDR Acute MRL	0.00063
									Hazard Index	0.06418

NR= According to EPA, AEGL is "not recommended due to insufficient data"
NA= Not Available
NC= Not Calculated

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 (See Appendix A)

CCND Mobile Monitoring Van
2022 Q3

Mobile Laboratory Sampling Data Summary and Risk Assessment

Western Hills Neighborhood | August 26, 2022

Analyte	Cas No	Count of 1-second Concentrations (#)	Maximum 1-second Concentration (ppbv)	Count of 1-hr Rolling Averages Derived (#)	Average 1-hr Rolling Average (ppbv)	Maximum 1-hr Rolling Average (ppbv)	AEGL 1 60-min Value	Health Reference Level (ppbv)	Screening Value Source	Hazard Quotient
1,3 BUTADIENE	106-99-0	11,423	0.23	7,824	0.02	0.03	670,000	298	OEHHA Acute REL	0.00010
ACETYLENE	74-86-2	11,423	0.93	7,824	0.24	0.31	NR	25,000	TCEQ Short-Term AMCV Health	0.00001
BENZENE	71-43-2	11,423	2.07	7,824	0.23	0.25	52,000	9	ATSDR Acute MRL	0.02815
BUTANES*	75-28-5	11,423	24.55	7,824	1.95	2.20	NR	33000	TCEQ Short-Term AMCV Health	0.00007
BUTENES*	590-18-1	11,423	11.29	7,824	2.29	2.41	NR	15000	TCEQ Short-Term AMCV Health	0.00016
CARBON DISULFIDE	75-15-0	11,423	0.09	7,824	0.01	0.01	13,000	1,991	OEHHA Acute REL	0.00001
CYCLOPENTANE	287-92-3	11,423	12.86	7,824	1.48	1.89	NR	5,900	TCEQ Short-Term AMCV Health	0.00032
DECANES	124-18-5	11,423	0.19	7,824	0.07	0.08	NR	1,000	TCEQ Short-Term AMCV Health	0.00008
DIETHYLBENZENES*	141-93-5	11,423	0.14	7,824	0.03	0.04	NR	450	TCEQ Short-Term AMCV Health	0.00008
DIMETHYLCYCLOHEXANES*	638-04-0	11,423	0.18	7,824	0.08	0.09	NR	4,000	CDPHE	0.00002
DODECANES	112-40-3	11,423	0.01	7,824	0.00	0.00	NR	1720	CDPHE	0.00000
ETHYLENE	74-85-1	11,423	7.59	7,824	6.01	6.05	NR	500,000	TCEQ Short-Term AMCV Health	0.00001
HEPTANES*	142-82-5	11,423	0.25	7,824	0.07	0.08	NR	8,300	TCEQ Short-Term AMCV Health	0.00001
HEXANES*	110-54-3	11,423	1.10	7,824	0.17	0.18	NR	5,400	TCEQ Short-Term AMCV Health	0.00003
HEXENES*	592-41-6	11,423	6.60	7,824	2.05	2.11	NR	500	TCEQ Short-Term AMCV Health	0.00422
HYDROGEN CYANIDE	74-90-8	11,423	0.65	7,824	0.19	0.26	2,000	308	OEHHA Acute REL	0.00084
HYDROGEN SULFIDE	7783-06-4	11,423	0.66	7,824	0.16	0.21	510	70	ATSDR Acute MRL	0.00295
ISOPRENE	78-79-5	11,423	0.86	7,824	0.33	0.39	NR	1,400	TCEQ Short-Term AMCV Health	0.00028
METHANOL	67-56-1	11,423	22.88	7,824	3.61	3.86	530,000	21,366	OEHHA Acute REL	0.00018
METHYLCYCLOHEXANE	108-87-2	11,423	0.29	7,824	0.08	0.08	NR	4,000	TCEQ Short-Term AMCV Health	0.00002
NONANES	111-84-2	11,423	0.13	7,824	0.05	0.05	NR	3,000	TCEQ Short-Term AMCV Health	0.00002
OCTANES*	111-65-9	11,423	0.31	7,824	0.12	0.12	NR	4,100	TCEQ Short-Term AMCV Health	0.00003
PENTANES*	109-66-0	11,423	0.76	7,824	0.55	0.55	NR	68,000	TCEQ Short-Term AMCV Health	0.00001
PROPYLENE	115-07-1	11,423	5.14	7,824	0.12	0.23	NR	NA	NE	
STYRENE	100-42-5	11,423	0.18	7,824	0.09	0.10	20,000	5,000	ATSDR Acute MRL	0.00002
TETRACHLOROETHYLENE	127-18-4	11,423	0.11	7,824	0.01	0.02	35,000	6	ATSDR Acute MRL	0.00305
TOLUENE	108-88-3	11,423	7.82	7,824	1.08	1.42	67,000	2,000	ATSDR Acute MRL	0.00071
TRIMETHYLBENZENES*	622-96-8	11,423	2.06	7,824	0.32	0.38	50,000	250	TCEQ Short-Term AMCV Health	0.00151
UNDECANES	1120-21-4	11,423	0.13	7,824	0.06	0.06	NR	550	TCEQ Short-Term AMCV Health	0.00010
XYLENES*	1330-20-7	11,423	8.08	7,824	0.69	0.84	130,000	2,000	ATSDR Acute MRL	0.00042
									Hazard Index	0.04341

NR= According to EPA, AEGL is "not recommended due to insufficient data"
NA= Not Available
NC= Not Calculated

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 (See Appendix A)

APPENDIX D
CALIBRATION AND QA/QC DATA

CCND Mobile Monitoring Van
2022 Q3

Initial Instrument Calibration & Verification						
Date	Time	Calibration Gas Component	Calibration Value (ppb v)	Response (ppb v)	Difference (% of value)	Pass/Fail
8/16/2022	9:38	Benzene	250	243	-2.8	Pass
		Toluene	250	248	-0.8	Pass
		Xylenes	500	471	-5.8	Pass
	9:45	Benzene	50	58	16.0	Pass
		Toluene	50	55.6	11.2	Pass
		Xylenes	100	114	14.0	Pass
	9:51	Benzene	20	22	10.0	Pass
		Toluene	20	22.8	14.0	Pass
		Xylenes	40	43.8	9.5	Pass
	9:58	Benzene	5	5.53	10.6	Pass
		Toluene	5	5.4	8.0	Pass
		Xylenes	10	11.7	17.0	Pass
	10:33	Ethylene	100	94.1	-5.9	Pass
		Propylene	100	101	1.0	Pass
		1-Butene	100	101	1.0	Pass
		1-Pentene	100	98.4	-1.6	Pass
		1-Hexene	100	97.4	-2.6	Pass
		1,3-Butadiene	100	96	-4.0	Pass
	10:35	Ethylene	50	52.6	5.2	Pass
		Propylene	50	52.1	4.2	Pass
		1-Butene	50	51.2	2.4	Pass
		1-Pentene	50	50.4	0.8	Pass
		1-Hexene	50	52.4	4.8	Pass
		1,3-Butadiene	50	50.1	0.2	Pass
	10:37	Ethylene	10	11.2	12.0	Pass
		Propylene	10	10.6	6.0	Pass
		1-Butene	10	10.8	8.0	Pass
		1-Pentene	10	10.3	3.0	Pass
		1-Hexene	10	10.2	2.0	Pass
		1,3-Butadiene	10	10.8	8	Pass
	10:52	HCN	50	51.7	3.4	Pass
		HCN	25	27.1	8.4	Pass
		HCN	10	9.3	-7.0	Pass
	10:08	H_2S	500	482	-3.6	Pass
	10:17	H_2S	125	118	-5.6	Pass
	10:20	H_2S	25	24.1	-3.6	Pass
	10:21	H_2S	10	10.8	8.0	Pass
	6:24	H_2S	5	5.26	5.2	Pass
	11:04	Propane	300	308	2.7	Pass
		Butane	300	321	7.0	Pass
		Pentane	300	282	-6.0	Pass
		Hexane	300	289	-3.7	Pass
		Heptane	300	293	-2.3	Pass
	11:06	Propane	100	109	9.0	Pass
		Butane	100	108	8.0	Pass
		Pentane	100	101	1.0	Pass
		Hexane	100	110	10.0	Pass
		Heptane	100	102	2.0	Pass
	11:08	Propane	25	26.6	6.4	Pass
		Butane	25	24.8	-0.8	Pass
		Pentane	25	26.4	5.6	Pass
		Hexane	25	26.3	5.2	Pass
		Heptane	25	22.7	-9.2	Pass

Instrument Calibration Check						
		Calibration	Calibration Value	Response	Difference	
Date	Time	Gas Component	(ppb v)	(ppb v)	(% of value)	Pass/Fail
8/24/2022	8:12	Ethylene	50	53.8	7.6	Pass
		Propylene	50	55.7	11.4	Pass
		1-Butene	50	53.8	7.6	Pass
		1-Pentene	50	54.5	9.0	Pass
		1-Hexene	50	56	12.0	Pass
		1,3-Butadiene	50	52.8	5.6	Pass
	8:02	Benzene	50	52.1	4.2	Pass
		Toluene	50	51.3	2.6	Pass
		Xylenes	100	106	6.0	Pass
	8:09	Benzene	5	5.2	4.0	Pass
		Toluene	5	5.6	12.0	Pass
		Xylenes	10	11.1	11.0	Pass
	8:19	HCN	50	55.6	11.2	Pass
	8:21	HCN	25	27.5	10.0	Pass
	7:55	H_2S	125	118	-5.6	Pass
	7:57	H_2S	10	9.9	-1.0	Pass
	8:15	Propane	100	110	10.0	Pass
		Butane	100	107	7.0	Pass
		Pentane	100	106	6.0	Pass
		Hexane	100	105	5.0	Pass
		Heptane	100	99.1	-0.9	Pass
			.			
	16:40	HCN	25	26.1	4.4	Pass
	16:49	H2S	20	18.1	-9.5	Pass
	16:51	Propane	150	154	2.7	Pass
		Butane	150	150	0.0	Pass
		Pentane	150	153	2.0	Pass
		Hexane	150	146	-2.7	Pass
		Heptane	150	157	4.7	Pass
	16:57	Benzene	50	54.5	9.0	Pass
		Toluene	50	51.6	3.2	Pass
		Xylenes	100	114	14.0	Pass
	17:01	Ethylene	50	54.2	8.4	Pass
		Propylene	50	53.5	7.0	Pass
		1-Butene	50	52	4.0	Pass
		1-Pentene	50	56.7	13.4	Pass
		1-Hexene	50	51.6	3.2	Pass
		1,3-Butadiene	50	49.8	-0.4	Pass

Instrument Calibration Check						
		Calibration	Calibration Value	Response	Difference	
Date	Time	Gas Component	(ppb v)	(ppb v)	(% of value)	Pass/Fail
8/25/2022	7:53	Ethylene	50	56.9	13.8	Pass
		Propylene	50	56.5	13.0	Pass
		1-Butene	50	54.9	9.8	Pass
		1-Pentene	50	53.7	7.4	Pass
		1-Hexene	50	52.6	5.2	Pass
		1,3-Butadiene	50	50	0.0	Pass
	7:56	Benzene	100	103	3.0	Pass
		Toluene	100	97.8	-2.2	Pass
		Xylenes	200	202	1.0	Pass
	8:00	Benzene	20	21.2	6.0	Pass
		Toluene	20	20.6	3.0	Pass
		Xylenes	40	40	0.0	Pass
	8:01	HCN	25	25.1	0.4	Pass
	8:09	H_2S	100	92.2	-7.8	Pass
	8:11	H_2S	20	21.4	7.0	Pass
	8:03	Propane	150	152	1.3	Pass
		Butane	150	155	3.3	Pass
		Pentane	150	162	8.0	Pass
		Hexane	150	159	6.0	Pass
		Heptane	150	148	-1.3	Pass
			.			
	16:07	HCN	25	24.6	-1.6	Pass
	16:13	H_2S	20	20.6	3.0	Pass
	16:15	Propane	150	153	2.0	Pass
		Butane	150	152	1.3	Pass
		Pentane	150	148	-1.3	Pass
		Hexane	150	146	-2.7	Pass
		Heptane	150	143	-4.7	Pass
	16:19	Benzene	50	51.6	3.2	Pass
		Toluene	50	49.3	-1.4	Pass
		Xylenes	100	97.9	-2.1	Pass
	16:24	Ethylene	50	50.4	0.8	Pass
		Propylene	50	51.4	2.8	Pass
		1-Butene	50	51.3	2.6	Pass
		1-Pentene	50	54.8	9.6	Pass
		1-Hexene	50	53.4	6.8	Pass
		1,3-Butadiene	50	50.6	1.2	Pass

Instrument Calibration Check						
		Calibration	Calibration Value	Response	Difference	
Date	Time	Gas Component	(ppb v)	(ppb v)	(% of value)	Pass/Fail
8/26/2022	7:38	Ethylene	50	51.3	2.6	Pass
		Propylene	50	52	4.0	Pass
		1-Butene	50	56.2	12.4	Pass
		1-Pentene	50	55	10.0	Pass
		1-Hexene	50	51.2	2.4	Pass
		1,3-Butadiene	50	48.3	-3.4	Pass
	7:42	Benzene	100	101	1.0	Pass
		Toluene	100	97.5	-2.5	Pass
		Xylenes	200	198	-1.0	Pass
	7:47	Benzene	20	20.3	1.5	Pass
		Toluene	20	19.5	-2.5	Pass
		Xylenes	40	38.7	-3.2	Pass
	7:50	HCN	25	25.8	3.2	Pass
	7:58	H_2S	100	97.8	-2.2	Pass
	7:59		20	20.9	4.5	Pass
	8:02	Propane	150	153	2.0	Pass
		Butane	150	150	0.0	Pass
		Pentane	150	157	4.7	Pass
		Hexane	150	151	0.7	Pass
		Heptane	150	146	-2.7	Pass
			.			
	15:33	HCN	25	25.7	2.8	Pass
	15:42	H_2S	20	18.4	-8.0	Pass
	15:47	Propane	150	149	-0.7	Pass
		Butane	150	150	0.0	Pass
		Pentane	150	150	0.0	Pass
		Hexane	150	142	-5.3	Pass
		Heptane	150	143	-4.7	Pass
	15:50	Benzene	50	51.4	2.8	Pass
		Toluene	50	46.5	-7.0	Pass
		Xylenes	100	95.2	-4.8	Pass
	15:53	Ethylene	50	47.6	-4.8	Pass
		Propylene	50	50.5	1.0	Pass
		1-Butene	50	50.2	0.4	Pass
		1-Pentene	50	50.7	1.4	Pass
		1-Hexene	50	50.8	1.6	Pass
		1,3-Butadiene	50	51.3	2.6	Pass

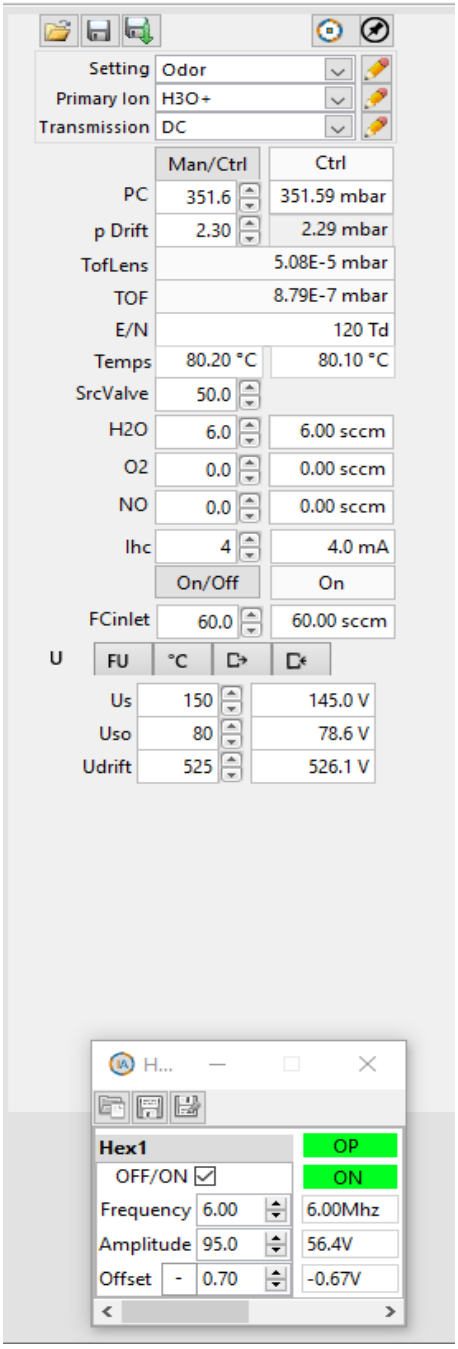
CCND Mobile Monitoring Van
2022 Q3

PTR Operating Parameters

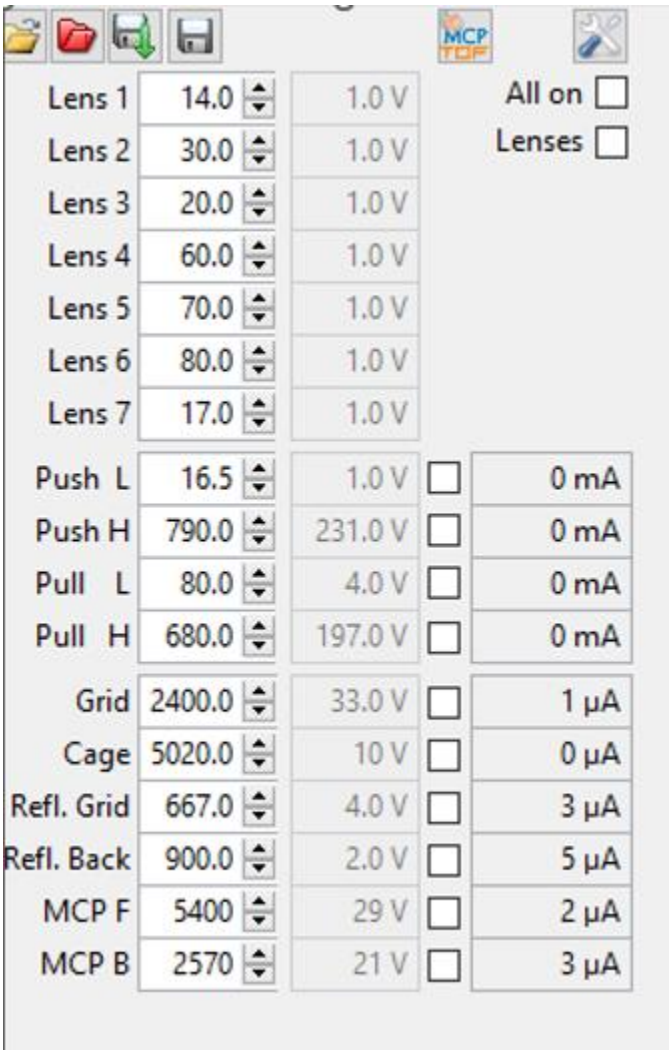
Suncor Screen Shots

3rd Quarter 2022

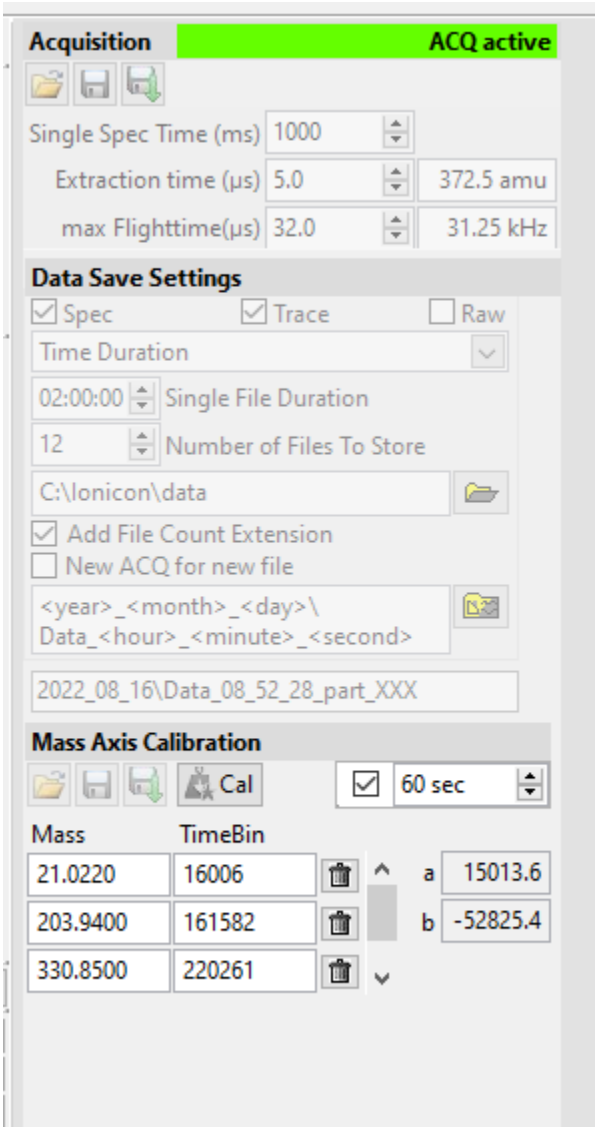
Initial Calibration Checks



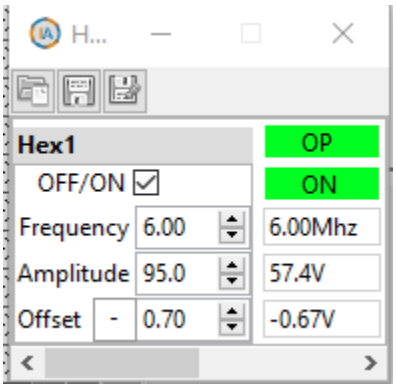
Production Settings



TOF Settings

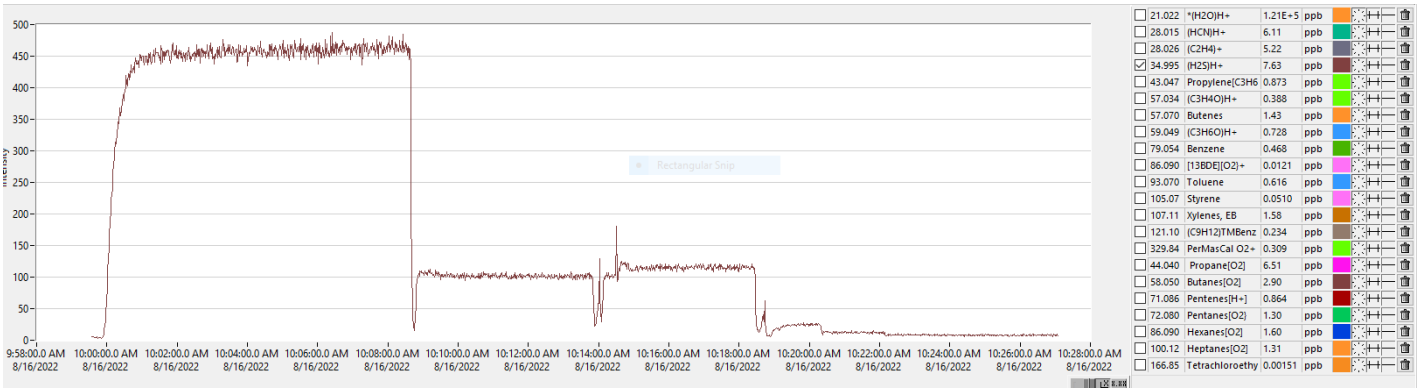


Acquisition Settings

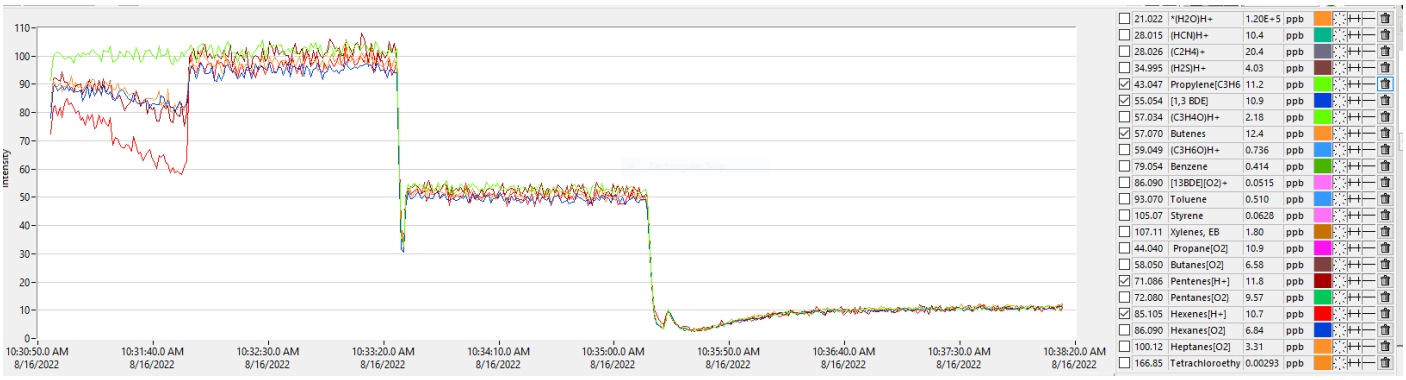


Hexapole Settings

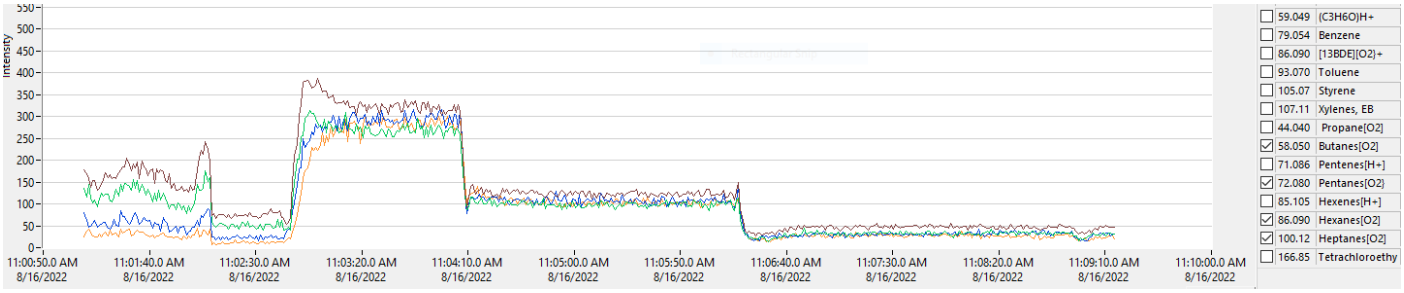
CCND Mobile Monitoring Van
2022 Q3



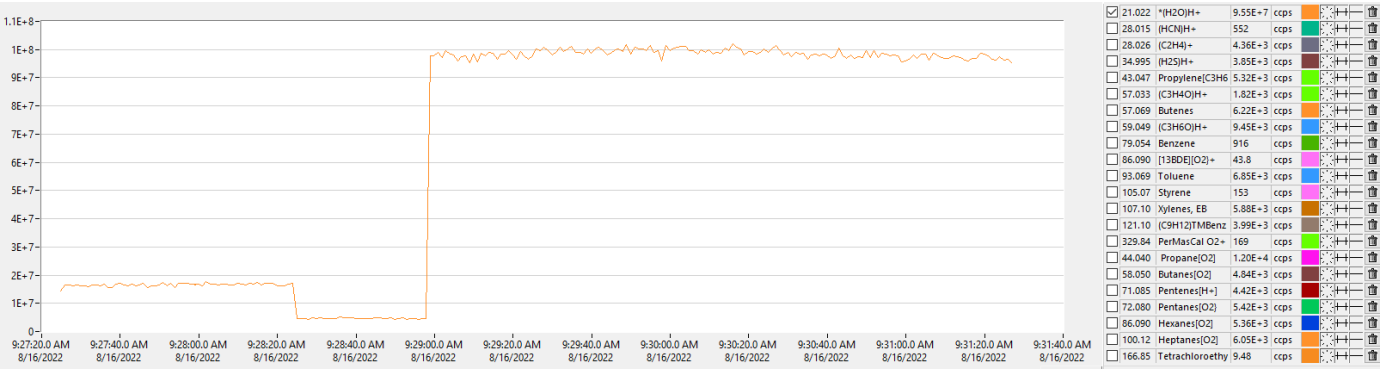
H_2S Calibrations



Alkene Calibrations



Alkane Calibration

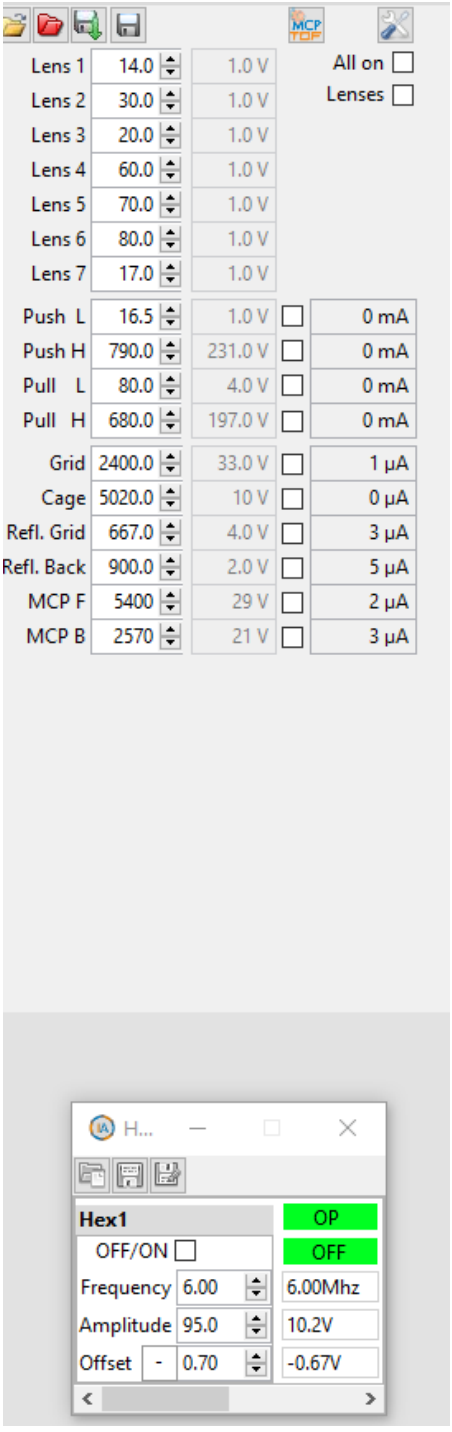


Hydronium Ion Signal

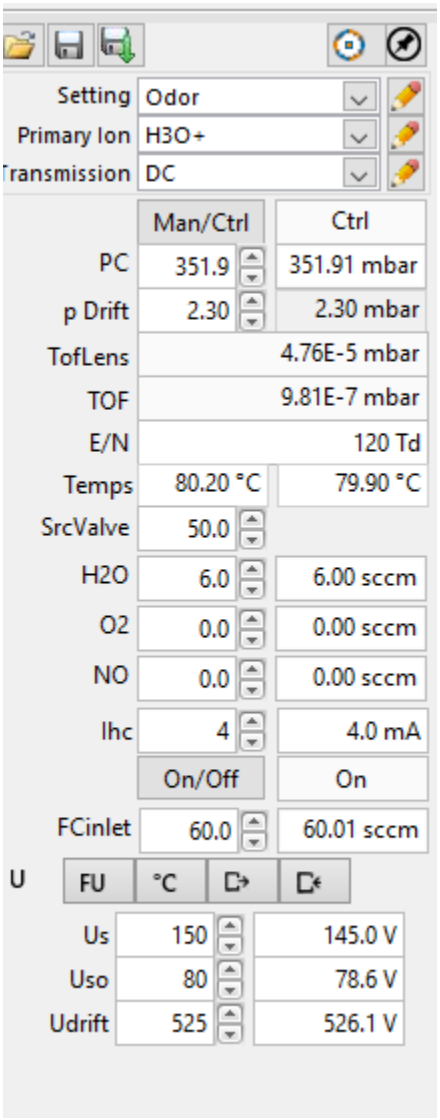
CCND Mobile Monitoring Van
2022 Q3

Field Testing Settings

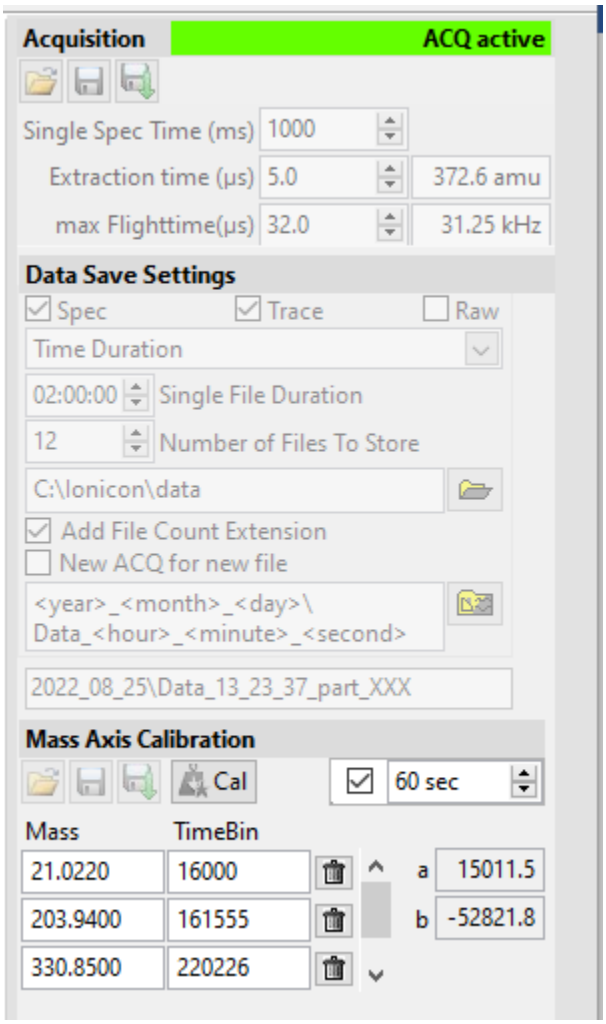
Week of 8-24-22



TOF and Hexapole settings

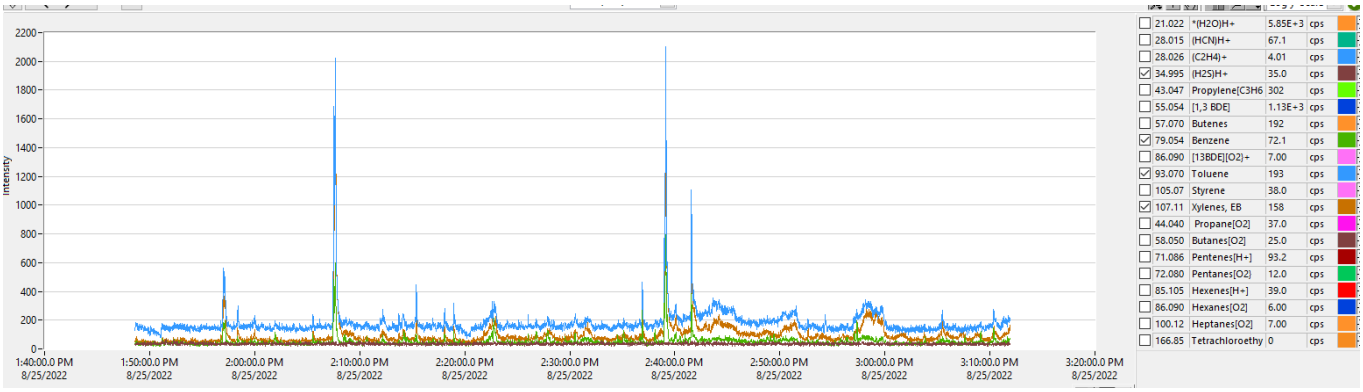


Production Settings



Acquisition Settings

CCND Mobile Monitoring Van
2022 Q3



Swansea Neighborhood

APPENDIX E
CALIBRATION GAS CERTIFICATION SHEETS

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer:	MONTROSE AIR QUALITY SERVICES LLC		
Part Number:	X02NI99C15W0061	Reference Number:	126-402278540-1
Cylinder Number:	CC519990	Cylinder Volume:	144.3 CF
Laboratory:	124 - La Porte Mix - TX	Cylinder Pressure:	2015 PSIG
Analysis Date:	Dec 14, 2021	Valve Outlet:	330
Lot Number:	126-402278540-1		

Expiration Date: Dec 14, 2024

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
HYDROGEN SULFIDE	1.000 PPM	1.084 PPM	+/-5%
NITROGEN	Balance		

Notes:MONTROSE AIR QUALITY SERVICES LLC
PO3: PO018078

Signature on file
Approved for Release

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
616 Miller Cut Off Road
La Porte, TX 77571
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer: *CRYSTAL LAKE , IL* MONTROSE AIR QUALITY SERVICES
Part Number: X06NI99C15A00A3
Cylinder Number: CC344804
Laboratory: 124 - La Porte Mix - TX
Analysis Date: Jul 30, 2021
Lot Number: 126-402159020-1

Reference Number: 126-402159020-1
Cylinder Volume: 144.3 CF
Cylinder Pressure: 2015 PSIG
Valve Outlet: 350

Expiration Date: Jul 30, 2024

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
HEXANE	1.000 PPM	0.9950 PPM	+/- 5%
N BUTANE	1.000 PPM	1.002 PPM	+/- 5%
N HEPTANE	1.000 PPM	1.000 PPM	+/- 5%
N PENTANE	1.000 PPM	1.000 PPM	+/- 5%
PROPANE	1.000 PPM	1.009 PPM	+/- 5%
NITROGEN	Balance		

Notes:

PO # PO-011307

Approved for Release

Airgas
an Air Liquide company

Airgas USA, LLC
4646 Linden Rd
Rockford, IL 61109
Airgas.com

CERTIFICATE OF BATCH ANALYSIS

Grade of Product: ZERO

Part Number:	AI Z15A	Reference Number:	152-402047887-1
Cylinder Analyzed:	CC235228	Cylinder Volume:	146.0 CF
Laboratory:	192 - Rockford IL Fill Plant (N513) - IL	Cylinder Pressure:	2000 PSIG
Analysis Date:	Mar 03, 2021	Valve Outlet:	590
Lot Number:	152-402047887-1		

ANALYTICAL RESULTS

Component	Requested Purity	Certified Concentration
AIR		
THC	< 1.0 PPM	0.043 PPM
Percent Oxygen	20-22 %	20.82 %
Moisture	< 3.0 PPM	0.07 PPM

Cylinders in Batch:

CC235228, XC002876B

Impurities verified against analytical standards traceable to NIST by weight and/or analysis.

Signature on file
Approved for Release

Airgas
an Air Liquide company

Airgas USA, LLC
6141 Easton Road
Bldg 1
Plumsteadville, PA 18949
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer:	MONTROSE ENVIRONMENTAL GROUP		
Part Number:	X02AI99C15AH586	Reference Number:	160-401735121-1
Cylinder Number:	ALM060589	Cylinder Volume:	129.3 CF
Laboratory:	124 - Plumsteadville - PA	Cylinder Pressure:	2016 PSIG
Analysis Date:	Feb 19, 2020	Valve Outlet:	590
Lot Number:	160-401735121-1		

Expiration Date: Feb 19, 2023

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
BENZENE	1.000 PPM	1.055 PPM	+/- 5%
AIR	Balance		

Airgas
an Air Liquide company

Airgas Specialty Gases
Airgas USA, LLC
616 Miller Cut Off Road
La Porte, TX 77571
Airgas.com

CERTIFICATE OF ANALYSIS

Grade of Product: CERTIFIED STANDARD-SPEC

Customer:	MONTROSE AIR QUALITY SERVICES LLC - CRYSTAL LAKE ,		
Part Number:	X07NI99C15A00A9	Reference Number:	126-402159021-1
Cylinder Number:	CC164840	Cylinder Volume:	144.3 CF
Laboratory:	124 - La Porte Mix - TX	Cylinder Pressure:	2015 PSIG
Analysis Date:	Aug 09, 2021	Valve Outlet:	350
Lot Number:	126-402159021-1		

Expiration Date: Aug 09, 2023

Product composition verified by direct comparison to calibration standards traceable to N.I.S.T. weights and/or N.I.S.T. Gas Mixture reference materials.

ANALYTICAL RESULTS

Component	Req Conc	Actual Concentration (Mole %)	Analytical Uncertainty
1 BUTENE	1.000 PPM	0.9918 PPM	+/- 5%
1 HEXENE	1.000 PPM	1.003 PPM	+/- 5%
1 PENTENE	1.000 PPM	1.005 PPM	+/- 5%
1,3 BUTADIENE	1.000 PPM	1.005 PPM	+/- 5%
ETHYLENE	1.000 PPM	1.087 PPM	+/- 5%
PROPYLENE	1.000 PPM	1.006 PPM	+/- 5%
NITROGEN	Balance		

Notes:
MONTROSE AIR QUALITY SERVICES LLC
PO#: PO-011307
NITROGEN BALANCE : 99.99939022%

Approved for Release

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