

Louisville Metro Air Pollution Control District
March, 2023 Board Meeting
Volatile Organic Compound Data Summary for November, 2022

The data below are part of a pilot project by the Louisville Metro Air Pollution Control District to provide air toxics concentrations using a field-deployable automated Gas Chromatograph. The concentrations are produced by new applications of technology that continue to be evaluated. This report summarizes monitored data from select compounds collected by APCD's Automated Gas Chromatograph instrument located at the Algonquin Parkway site. Hourly measurements are summarized as monthly averages and maximum 24-hour concentrations in parts per billion by volume (ppbV) for the month of interest. Longer term averages^L may also be provided for comparison.

APCD will use its air toxics monitoring data in routine monthly screenings for potential impacts from air toxics. Monitoring data will be compared to Benchmark Ambient Concentrations (BACs) under the Strategic Toxic Air Reduction (STAR) program and may be used to investigate emission sources and in future risk assessments, like the West Louisville Air Toxics Study (WLATS). A risk assessment may help determine how residents living, working, and going to school in the area may be exposed to harmful levels of ambient air toxics concentrations; identify what if any increased health risks they may face; and identify if additional emission reductions may be necessary. In some cases, APCD may conduct additional air toxics monitoring as part of a special study.

This data summary is based on preliminary data. The data are subject to change based on findings in subsequent data validation evaluation. As a result, compounds may be added or removed based on the assessed data quality via the QA process. **Compounds shown in green contain higher confidence in data quality while those shown in yellow^T have lower confidence.** All values are reported to two decimal places using standard rounding conventions; the % data recovered is provided as an initial indicator of representativeness for the intended time period.

| Compound ^T | Ambient Data Summary | | | | STAR BACs | |
|-----------------------|------------------------------|--------------|-----------------|--------------------------------|---|---|
| | Monthly Summary ^D | | | Long Term Average ^L | STAR Cancer BAC _C [*] | STAR Chronic NonCancer BAC _{NC} [*] |
| | Monthly Average | Max 24hr Avg | % Data Recovery | | | |
| 1,3 Butadiene | 0.13 | 0.33 | 86.1 | 0.14 | 0.02 | 0.90 |
| 1,4-Dichlorobenzene | 0.02 | 0.07 | 73.5 | 0.14 | 0.02 | 133.10 |
| Acrylonitrile | NA | NA | 0.0 | 0.02 | 0.01 | 0.92 |
| Benzene | 0.20 | 0.38 | 84.0 | 0.23 | 0.14 | 9.40 |
| Bromoform | 0.00 | 0.00 | 85.4 | 0.00 | 0.09 | 6.77 |
| Carbon_Tetrachloride | NA | NA | 0.0 | 0.33 | 0.03 | 0.02 |
| Chloroform | 0.00 | 0.02 | 83.2 | 0.02 | 0.01 | 61.48 |
| Ethyl_Acrylate | 0.00 | 0.01 | 36.0 | 0.03 | N/A | 7.33 |
| Ethylbenzene | 0.08 | 0.17 | 85.4 | 0.09 | 0.09 | 230.00 |
| Methyl_Methacrylate | 0.01 | 0.07 | 81.1 | 0.07 | N/A | 171.00 |
| Styrene | 0.04 | 0.30 | 83.8 | 0.04 | 0.40 | 234.75 |
| Tetrachloroethylene | 0.08 | 0.18 | 77.9 | 0.04 | 0.57 | 5.90 |
| Toluene | 0.67 | 1.46 | 85.6 | 0.81 | N/A | 1327.60 |
| Trichloroethylene | 0.00 | 0.01 | 83.6 | 0.00 | 0.04 | 0.37 |
| Vinyl_Chloride | 0.00 | 0.04 | 85.7 | 0.01 | 0.09 | 39.14 |

^T Compounds in yellow have lower confidence in data quality due to interference or contamination concerns.

^L Long Term Average represents the average for the most recent 12 month period of validated data. In this case, the long term average represents the period August 2020 to July 2021. It should be noted that due to improvements in the data validation process for 2021 data, additional evaluation may be needed for some compounds when comparing long term averages to the monthly average.

^D See Notes section for further explanation & details associated with current month's data summary.

Notes:

*As used in the Strategic Toxic Air Reduction (STAR) Program, "benchmark ambient concentration" (BAC) means the concentration of a toxic air contaminant (TAC) that is determined pursuant to Regulation 5.20 to meet the environmental acceptability goals of Regulation 5.21. BACs are reported in micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). The BACs above have been converted from micrograms per cubic meter ($\mu\text{g}/\text{m}^3$) to parts per billion (ppb) at 25 degrees Celsius and 1 atmosphere.

The BAC for a carcinogen (BAC_C) is the concentration of a TAC that represents an additional lifetime cancer risk of one in one million (1×10^{-6}). The BAC_C is averaged on an annual basis.

The BAC for the noncarcinogenic effects of a TAC (BAC_{NC}) is the concentration of a TAC at or below which no adverse effects are expected. The BAC_{NC} represents a Hazard Quotient of 1.0. With the exception of ethyl acrylate, the BAC_{NC} is averaged on an annual basis; ethyl acrylate is averaged on a 24-hour basis.

A table of BACs used in the STAR program is available at www.louisvilleky.gov/document/20190103-bac-listpdf.

Compounds are "Category 1" TAC under the STAR Program except Ethylbenzene, which is a Category 2 TAC, and Styrene, Methyl methacrylate, and ethyl acrylate, which are Category 4 TACs.

Additional Explanation and Details for Current Month's Data Summary

A gap in data reporting (from August, 2021 to July 2022) exists due to efforts to re-prioritize data validation for more recent data collection. APCD will put forth best efforts to catch up on data validation backlog stemming from complex post processing needs and large volume of data (as staffing and resources allow).

Confident identification of Carbon Tetrachloride and Acrylonitrile continue to be a challenge due to coelution with unidentified compounds. This often results in the inability to accurately measure ambient concentrations. As such, Carbon Tetrachloride and Acrylonitrile may be excluded from future reports.

Ethyl Acrylate contained low data recovery due to the instrument exceeding data quality thresholds when comparing against the Ethyl Acrylate standard.

Improvements were made to the data collection and data validation process for 1,4-Dichlorobenzene so that data quality issues related to interference / carryover from the routine standards were minimized. As such, data recovery for 1,4-Dichlorobenzene has improved.