




## TCEQ Interoffice Memorandum

---

**To:** Kathryn Saucedo, Regional Director, Region 10

**From:** Stanley Aniagu, Ph.D.   
Brooke Niederhaus, MSc.   
Allison Jenkins, MPH   
Toxicology, Risk Assessment, and Research Division  
Office of the Executive Director

**Date:** February 25, 2022

**Subject:** Health Effects Review of 2020 Ambient Air Network Monitoring Data in Region 10, Beaumont

---

### Conclusions

- All reported annual average concentrations of volatile organic compounds (VOCs) were below their respective long-term air monitoring comparison values (AMCVs) and would not be expected to cause chronic adverse human health or vegetation effects.
- All measured hourly VOC concentrations were below their respective short-term AMCVs and would not be expected to cause acute adverse human health or vegetation effects, or odor concerns.
- All measured 24-hour VOC concentrations were below their respective 24-hour AMCVs and would not be expected to cause acute adverse health effects.
- All reported concentrations of H<sub>2</sub>S were below the numerical value of the 30-minute residential state standard.

### Background

This memorandum conveys the Toxicology, Risk Assessment, and Research Division's (TD's) evaluation of ambient air sampling conducted at monitoring sites in Region 10-Beaumont for 2020. Information about the locations of the monitoring sites, monitored compounds, and hyperlinks to more information on the sites is provided in Table 1.

A brief summary of the monitoring sites is provided below:

- 1-hour autoGC VOC monitoring at 3 sites
- Every sixth-day 24-hour canister VOC sampling at 6 sites
- Every 12th-day 24-hour canister VOC sampling at 6 sites
- H<sub>2</sub>S monitoring at two sites

The Texas Commission on Environmental Quality (TCEQ) Monitoring Division and the South East Texas Regional Planning Commission (SETRPC) operated the air monitoring sites and reported the data for all chemicals evaluated in this memorandum. Lists of all target analytes at these monitoring locations are included in Attachment A.

Chemicals were evaluated individually by comparing the reported concentrations to their respective AMCVs. All one-hour concentrations collected from the ambient air monitoring sites in Table 1 were evaluated for their potential to cause acute (short-term) adverse health and welfare (odor potential and vegetation) effects. The TD calculated the annual averages of these one-hour data to determine their potential to cause chronic (long-term) adverse health and vegetation effects.

Data from 24-hour canister samples taken every 6<sup>th</sup>- (TCEQ) or 12<sup>th</sup>-day (SETRPC) were also evaluated and are designed to provide representative long-term average concentrations. In order to be able to evaluate 24-hour monitoring data more fully, TCEQ has developed 24-hour AMCVs for specific chemicals, including 1,3-butadiene; 2,2-dimethylbutane; 2,3-dimethylbutane; 2-methylpentane; 3-methylpentane; benzene; ethylene dibromide; ethylene dichloride; and n-hexane. As such, 24-hour samples were compared to the available TCEQ 24-hour AMCVs. However, because short-term or peak concentrations are not necessarily captured by 24-hour samples, daily concentrations have limited use in evaluating the potential for acute health effects. When averaged over at least one year, these 24-hour air samples are representative of long-term average concentrations in air. Therefore, the TD compared annual concentrations calculated from 24-hour samples for each target analyte to their respective long-term AMCVs to evaluate the potential for chronic health and vegetation concerns. More information about AMCVs is available on the Toxicology's AMCV webpage (<https://www.tceq.texas.gov/toxicology/amcv/about>). H<sub>2</sub>S samples were compared to the numerical value of the 30-minute residential state standard for H<sub>2</sub>S.

Meeting the data completeness objective helps to ensure the representativeness of calculated annual average concentrations. All of the SETRPC and majority of the TCEQ monitoring data reviewed met or exceeded TCEQ's 75 percent data completeness objective except for the following:

- Beaumont Downtown: 1,2,3-trimethylbenzene
- Nederland High School: 1,2,3-trimethylbenzene, 2,4-dimethylpentane, acetylene and methylcyclopentane
- SETRPC 49 Port Arthur: H<sub>2</sub>S, CS<sub>2</sub>

**Table 1. Monitoring Sites Located in TCEQ Region 10 Evaluated in this Memorandum**

| Site Name and Location  | Type of Monitor   | EPA Site Number | Network | Monitored Compounds                   |
|---|---|-----------------|---------|---------------------------------------|
| <a href="#">Beaumont Downtown</a><br>1086 Vermont Ave,<br>Beaumont                                    | 24-hour every 6 <sup>th</sup> -<br>day canister & hourly<br>autoGC  | 48-245-0009     | TCEQ    | 84 VOCs(canister);<br>46 VOCs(autoGC) |
| <a href="#">Port Arthur West</a><br>623 Ellias St, Port Arthur  | 24-hour, every 6 <sup>th</sup> -<br>day canister                    | 48-245-0011     | TCEQ    | 84 VOCs                               |
| <a href="#">Groves</a><br>3355 Grandview Ave &<br>32 <sup>nd</sup> St, Port Neches                    | 24-hour, every 6 <sup>th</sup> -<br>day canister                    | 48-245-0014     | TCEQ    | 84 VOCs                               |
| <a href="#">Port Neches Avenue L</a><br>605 Avenue L, Port Neches                                     | 24-hour, every 6 <sup>th</sup> -<br>day canister                    | 48-245-0017     | TCEQ    | 84 VOCs                               |
| <a href="#">Jefferson County Airport</a><br>End of 90 <sup>th</sup> St, Port Arthur                   | 24-hour, every 6 <sup>th</sup> -<br>day canister                    | 48-245-0018     | TCEQ    | 84 VOCs                               |
| <a href="#">Beaumont Mary</a><br>598 Craig Street,<br>Beaumont  | 24-hour, every 6 <sup>th</sup> day<br>canister and H <sub>2</sub> S | 48-245-1050     | TCEQ    | 84 VOCs, H <sub>2</sub> S             |
| <a href="#">Nederland High School</a><br>1800 N. 18 <sup>th</sup> St, Nederland                       | hourly autoGC   | 48-245-1035     | TCEQ    | 46 VOCs                               |
| SETRPC 41 West Orange<br>2811 Austin Ave, Orange  | 24-hour, every 12 <sup>th</sup> -<br>day canister                   | --              | SETRPC  | 53 VOCs                               |
| <a href="#">SETRPC 42 Mauriceville</a><br>10691 TX-62, Orange   | 24-hour, every 12 <sup>th</sup> -<br>day canister                   | 48-361-1100     | SETRPC  | 53 VOCs                               |
| <a href="#">SETRPC 43 Jefferson Co<br/>Airport</a><br>West End of 90 <sup>th</sup> St, Port<br>Neches | 24-hour, every 12 <sup>th</sup> -<br>day canister                   | 48-245-0102     | SETRPC  | 53 VOCs                               |
| SETRPC 44 Beaumont,<br>1149 Pearl St, Beaumont  | 24-hour, every 12 <sup>th</sup> -<br>day canister                   | --              | SETRPC  | 53 VOCs                               |
| SETRPC 45 Port Neches<br>Fire Station<br>1209 Merriman St, Port<br>Neches                             | 24-hour, every 12 <sup>th</sup> -<br>day canister                   | --              | SETRPC  | 53 VOCs                               |

| Site Name and Location  | Type of Monitor   | EPA Site Number | Network | Monitored Compounds                        |
|---|---|-----------------|---------|--|
| SETRPC 48 Old Cove School<br>1214 Dupont, Orange  | 24-hour, every 12 <sup>th</sup> -<br>day canister   | --              | SETRPC  | 53 VOCs                                    |
| <a href="#">SETRPC 49 Port Arthur</a> <sup>a</sup><br>6956 James Gamble Dr,<br>Port Arthur        | 24-hour, every 12 <sup>th</sup> -<br>day canister, hourly<br>H <sub>2</sub> S and CS <sub>2</sub> | 48-245-0628     | SETRPC  | 53 VOCs, H <sub>2</sub> S, CS <sub>2</sub> |
| <a href="#">Port Arthur Memorial<br/>School</a> ,<br>SETRPC 50, 2200 Jefferson<br>Dr, Port Arthur | hourly autoGC   | 48-245-0021     | SETRPC  | benzene, 1,3-<br>butadiene, styrene        |

<sup>a</sup> H<sub>2</sub>S and CS<sub>2</sub> data were invalidated for all of 2020 due to ongoing instrument instability and poor data quality.

## Evaluation

### AutoGC Data

All measured hourly and annual average VOC concentrations from the Beaumont Downtown, Port Arthur Memorial School and Nederland High School autoGC monitors were below their respective short-term and long-term AMCVs. Therefore, acute or chronic adverse health effects, odorous conditions, or vegetation effects would not be expected to occur as a result of exposure to the reported levels of VOCs at these monitoring sites.

### Canister Data

All measured 24-hour VOC concentrations were below their 24-hour AMCVs and would not be expected to cause adverse health effects. All annual average VOC concentrations from 24-hour canister samplers were below their respective long-term AMCVs at all sites and would not be expected to result in long-term health or vegetation effects.

### Hydrogen Sulfide (H<sub>2</sub>S)

All reported concentrations of H<sub>2</sub>S were below the numerical value of the 30-minute residential state regulatory standard (80 ppb).

If you have any questions regarding this review, please contact Stanley Aniagu by phone at 512-239-0558 or email at [Stanley.Aniagu@tceq.texas.gov](mailto:Stanley.Aniagu@tceq.texas.gov), or Allison Jenkins by phone at 512-239-0656 or email at [Allison.Jenkins@tceq.texas.gov](mailto:Allison.Jenkins@tceq.texas.gov).

## Attachment A

### List 1. Target VOC Analytes in TCEQ Canister Samples

|                                |  |   |
|--------------------------------|--|---|
| 1,1,2,2-Tetrachloroethane      | Acetylene                                | m-Ethyltoluene                            |
| 1,1,2-Trichloroethane          | Benzene                                  | Methyl Chloroform (1,1,1-Trichloroethane) |
| 1,1-Dichloroethane             | Bromomethane                             | Methylcyclohexane                         |
| 1,1-Dichloroethylene           | Carbon Tetrachloride                     | Methylcyclopentane                        |
| 1,2,3-Trimethylbenzene         | Chlorobenzene                            | n-Butane                                  |
| 1,2,4-Trimethylbenzene         | Chloroform                               | n-Decane                                  |
| 1,2-Dichloropropane            | Chloromethane (Methyl Chloride)          | n-Heptane                                 |
| 1,3,5-Trimethylbenzene         | cis-1,3-Dichloropropene                  | n-Hexane                                  |
| 1,3-Butadiene                  | cis-2-Butene                             | n-Nonane                                  |
| 1-Butene                       | cis-2-Hexene                             | n-Octane                                  |
| 1-Hexene+2-Methyl-1-Pentene    | cis-2-Pentene                            | n-Pentane                                 |
| 1-Pentene                      | Cyclohexane                              | n-Propylbenzene                           |
| 2,2,4-Trimethylpentane         | Cyclopentane                             | n-Undecane                                |
| 2,2-Dimethylbutane (Neohexane) | Cyclopentene                             | o-Ethyltoluene                            |
| 2,3,4-Trimethylpentane         | Dichlorodifluoromethane                  | o-Xylene                                  |
| 2,3-Dimethylbutane             | Dichloromethane (Methylene Chloride)     | p-Diethylbenzene                          |
| 2,3-Dimethylpentane            | Ethane                                   | p-Ethyltoluene                            |
| 2,4-Dimethylpentane            | Ethylbenzene                             | Propane                                   |
| 2-Chloropentane                | Ethylene                                 | Propylene                                 |
| 2-Methyl-2-Butene              | Ethylene Dibromide (1,2-Dibromoethane)   | Styrene                                   |
| 2-Methylheptane                | Ethylene Dichloride (1,2-Dichloroethane) | Tetrachloroethylene                       |
| 2-Methylhexane                 | Isobutane                                | Toluene                                   |
| 2-Methylpentane (Isohexane)    | Isopentane (2-Methylbutane)              | trans-1-3-Dichloropropene                 |
| 3-Methyl-1-Butene              | Isoprene                                 | trans-2-Butene                            |
| 3-Methylheptane                | Isopropylbenzene (Cumene)                | trans-2-Hexene                            |
| 3-Methylhexane                 | m-Diethylbenzene                         | trans-2-Pentene                           |
| 3-Methylpentane                |  | Trichloroethylene                         |
| 4-Methyl-1-Pentene             |  | Trichlorofluoromethane                    |
|                                |  | Vinyl Chloride                            |

**List 2. Target VOC Analytes in AutoGC Samples**

|                        |                     |                     |
|------------------------|---------------------|---------------------|
| 1-Butene               | Benzene             | n-Decane            |
| 1-Pentene              | c-2-Butene          | n-Heptane           |
| 1,2,3-Trimethylbenzene | c-2-Pentene         | n-Hexane            |
| 1,2,4-Trimethylbenzene | Cyclohexane         | n-Nonane            |
| 1,3-Butadiene          | Cyclopentane        | n-Octane            |
| 1,3,5-Trimethylbenzene | Ethane              | n-Pentane           |
| 2-Methylheptane        | Ethyl Benzene       | n-Propylbenzene     |
| 2-Methylhexane         | Ethylene            | o-Xylene            |
| 2,2-Dimethylbutane     | Isobutane           | p-Xylene + m-Xylene |
| 2,2,4-Trimethylpentane | Isopentane          | Propane             |
| 2,3-Dimethylpentane    | Isoprene            | Propylene           |
| 2,3,4-Trimethylpentane | Isopropyl Benzene - | Styrene             |
| 2,4-Dimethylpentane    | Cumene              | t-2-Butene          |
| 3-Methylheptane        | Methylcyclohexane   | t-2-Pentene         |
| 3-Methylhexane         | Methylcyclopentane  | Toluene             |
| Acetylene              | n-Butane            |                     |

**List 3. Target VOC Analytes in SETRPC Canister Samples**

|                        |                      |                        |
|------------------------|----------------------|------------------------|
| 1,1,1-Trichloroethane  | Butyl acrylate       | Naphthalene            |
| 1,2,4-Trimethylbenzene | Carbon disulfide     | n-Butane               |
| 1,2-Dichloroethane     | Carbon tetrachloride | n-Decane               |
| 1,3-Butadiene          | Chlorobenzene        | n-Hexane               |
| 1-Butanol              | Chloroform           | n-Octane               |
| 1-Hexene               | Cumene               | n-Pentane              |
| 1-Octene               | Cyclohexane          | o-Xylene               |
| 1-Pentene              | Ethane               | Propane                |
| 2,2,4-Trimethylpentane | Ethylbenzene         | Propylene              |
| 2-Butanone             | Ethylene             | p-Xylene + m-Xylene    |
| 2-Methyl- 1-pentene    | Hexanal              | Styrene                |
| 3-Methylpentane        | Isobutene + 1-Butene | t-Butylbenzene         |
| Acetaldehyde           | Isohexane            | Toluene                |
| Acetone (+)            | Isopentane           | Trichloroethylene      |
| Acetonitrile           | Isoprene             | Trichlorofluoromethane |
| a-Pinene               | Methanol (+)         | Vinyl acetate          |
| Benzene                | Methyl-t-butylether  | Vinyl chloride         |
| b-Pinene               | Methylcyclohexane    |                        |
|                        | Methylene chloride   |                        |