TCEQ Interoffice Memorandum

To: Ryan Slocum, Regional Director, R7

From: Nnamdi Nnoli, Ph.D. NN
Toxicology, Risk Assessment, and Research Division, Office of the Executive Director

Date: May 9, 2025

Subject: Health Effects Review of 2023 Ambient Air Network Monitoring Data in Region 7, Midland

Conclusions

- All measured 24-hour and annual average concentrations of the 84 volatile organic compounds (VOCs) monitored were below their respective Texas Commission on Environmental Quality (TCEQ) air monitoring comparison values (AMCVs) and would not be expected to cause adverse health or welfare effects.

- All measured hourly and annual average concentrations of the 48 VOCs monitored were below their respective AMCVs and would not be expected to cause adverse health effects, vegetation effects, or odor concerns.

- Reported 30-minute concentrations of hydrogen sulfide (H_2S) exceeded the numerical value of the 30-minute H_2S state standard for residential areas (i.e., 80 ppb) 3- and 350-times at the Odessa Westmark Street and Goldsmith Street monitoring sites, respectively. The measured levels of H_2S could result in the perception of odors if exposure were to occur. However, the measured levels do not represent an immediate threat to human health or wellness as the lowest concentration that has shown H_2S-specific health effects in people (i.e., mild respiratory effects in 2 out of 10 asthmatic individuals exposed for 30-minutes) is 2,000 ppb.

Background

Ambient air sampling data collected at three monitoring network sites in Region 7, Midland, during 2023 were evaluated by the Toxicology, Risk Assessment, and Research Division (TD). The TD reviewed air monitoring summary results for VOCs from 1-hour and 24-hour samples collected continuously and every-sixth day, respectively. TCEQ Region 7 monitoring site information is presented in Table 1, along with hyperlinks to detailed information regarding the monitoring sites and their maps. Lists 1 and 2, which can be found in Attachment A, provide the target analytes for the monitoring sites. The TCEQ Monitoring Division reported the data for all chemicals evaluated in this memorandum. All data collected met the data completeness objective of 75 percent data return, except for n-decane at Odessa Westmark Street and

acetylene at Midland Avalon Drive as well as for 1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene, 1,3,5-trimethylbenzene, n-decane and acetylene at both Goldsmith Street monitoring sites. 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. Rather, 24-hour air samples collected every-sixth day for a year are intended to provide representative long-term average concentrations. Therefore, the TD evaluated the reported annual average concentrations from 24-hour samples for each target analyte for potential chronic health and welfare concerns by comparing measured chemical concentrations to long-term AMCVs. One-hour autoGC VOC samples were compared to TCEQ's short-term AMCVs, while H_2S samples were compared to the 30-minute state regulatory standard for H_2S (i.e., 80 ppb). To enable evaluation of 24-hour monitoring data more fully, TCEQ has also developed 24-hour acute AMCVs for specific chemicals. As such, 24-hour samples were compared to the available TCEQ 24-hour AMCVs for 1,3-butadiene; 2,2-dimethylbutane; 2,3-dimethylbutane; 2-methylpentane; 3-methylpentane; benzene; carbon tetrachloride; ethylene dibromide; ethylene dichloride; and n-hexane. More information about AMCVs is available online at: https://www.tceq.texas.gov/toxicology/amcv/about.

Table 1. Monitoring Sites Located in TCEQ Region 7

Site Name and Location	County	Monitor ID	Monitored Compounds
Odessa-Hays Elementary School Barrett and Monahans Streets	Ector	48-135-0003	VOCs (24-h canister)
Odessa Westmark Street 11695 West Westmark Street	Ector	48-135-1092	VOCs (autoGC), H_2S
Goldsmith Street 520 North Goldsmith Street	Ector	48-135-1093	VOCs (autoGC), H_2S
Midland Avalon Drive 5510-U Avalon Drive	Midland	48-329-1095	VOCs (autoGC), H_2S

Evaluation

VOCs

All the measured 24-hour concentrations of the 84 monitored VOCs evaluated at the Odessa-Hays Elementary School site and all the measured 1- hour concentrations of the 48 VOCs evaluated at the Odessa Westmark Street, Goldsmith Street, and Midland Avalon Drive sites were below their respective short-term AMCVs and would not be expected to cause short-term adverse health or welfare effects. All the reported annual average concentrations of the 84 monitored VOCs evaluated at the Odessa-Hays Elementary School site and of the 48 VOCs evaluated at the Odessa Westmark Street, Goldsmith Street, and Midland Avalon Drive sites were below their respective long-term AMCVs and would not be expected to cause long-term adverse health or welfare effects.

H_2S

Of the 30-minute H_2S samples collected at the Odessa Westmark Street, Goldsmith Street, and Midland Avalon Drive monitoring sites, 3 and 350 individual samples collected at Odessa Westmark Street and Goldsmith Street monitoring sites, respectively, exceeded the numerical value of the 30-minute H_2S state regulatory standard of 80 ppb. The highest reported 30-minute concentration was 81.7 ppb at Odessa Westmark Street and 513.4 ppb at Goldsmith Street monitoring sites. Because the odor range for H_2S is 0.5-300 ppb, these measured levels of H_2S could result in the perception of odors if exposure were to occur. Overall, the exceedances of the state regulatory standard are much lower than concentrations that are known to produce adverse health effects; the lowest concentration that has shown H_2S-specific health effects in people (i.e., mild respiratory effects in 2 out of 10 asthmatic individuals exposed for 30 minutes) is 2,000 ppb. Adverse health effects would not be expected due to exposure to these concentrations. However, the TD encourages H_2S reductions in the area, if possible.

If you have any questions about this evaluation, please contact Nnamdi Nnoli at nnamdi.nnoli@tceq.texas.gov or (512) 239-1785.

Attachment A

List 1 Target VOC Analytes in Canister Samples

1,1,2,2-Tetrachloroethane	Acetylene	Toluene
1,1,2-Trichloroethane	Benzene	Trichloroethylene
1,1-Dichloroethane	Bromomethane	Trichlorofluoromethane
1,1-Dichloroethylene	Carbon Tetrachloride	Vinyl Chloride
1,2,3-Trimethylbenzene	Chlorobenzene	cis-1,3-Dichloropropene
1,2,4-Trimethylbenzene	Chloroform	cis-2-Butene
1,2-Dichloropropane	Chloromethane	cis-2-Hexene
1,3,5-Trimethylbenzene	Cyclohexane	cis-2-Pentene
1,3-Butadiene	Cyclopentane	m-Diethylbenzene
1-Butene	Cyclopentene	m-Ethyl toluene
1-Hexene & 2-Methyl-1-Pentene	Dichlorodifluoromethane	m/p Xylene
1-Pentene	Dichloromethane	n-Butane
2,2,4-Trimethylpentane	Ethane	n-Decane
2,2-Dimethylbutane	Ethylbenzene	n-Heptane
2,3,4-Trimethylpentane	Ethylene	n-Hexane
2,3-Dimethylbutane	Ethylene Dibromide	n-Nonane
2,3-Dimethylpentane	Ethylene Dichloride	n-Octane
2,4-Dimethylpentane	Isobutane	n-Pentane
2-Chloropentane	Isopentane	n-Propyl benzene
2-Methyl-2-Butene	Isoprene	n-Undecane
2-Methylheptane	Isopropyl benzene	o-Ethyl toluene
2-Methylhexane	Methyl Chloroform	o-Xylene
2-Methylpentane	Methylcyclohexane	p-Diethylbenzene
3-Methyl-1-Butene	Methyl cyclopentane	p-Ethyl toluene
3-Methylheptane	Propane	trans-1,3-Dichloropropene
3-Methylhexane	Propylene	trans-2-Butene
3-Methylpentane	Styrene	trans-2-Hexene
4-Methyl-1-Pentene	Tetrachloroethylene	trans-2-Pentene

List 2 Target VOC Analytes in AutoGC

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-Propyl benzene
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 - Cumene	Styrene
2,4-Dimethylpentane	Methylcyclohexane	t-2-Butene
3-Methylheptane	Methyl cyclopentane	t-2-Pentene
3-Methylhexane	n-Butane	Toluene
Acetylene		