TCEQ Interoffice Memorandum

To: Lorinda Gardner, Regional Director, Region 6

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Subject: Health Effects Review of 2020 Ambient Air Network Monitoring Data in Region 6, El Paso

Conclusions

- Reported 1-hour concentrations of volatile organic compounds (VOCs) were below their respective short-term air monitoring comparison values (AMCVs) and would not be expected to cause adverse acute health effects, vegetation effects, or odors.
- Reported twenty-four-hour concentrations of VOCs and metals were below their respective 24-hour AMCVs and would not be expected to cause adverse health effects.
- Reported long-term concentrations of lead, reported as total suspended particulate (TSP) or particulate matter with aerodynamic diameter of 2.5 microns or less ($PM_{2.5}$), were below the comparison value of 0.15 µg/m^3.
- Reported annual average concentrations of VOCs and metals reported as $PM_{2.5}$ were below their respective AMCVs and would not be expected to cause long-term adverse human health or vegetation effects.
- In 2020, the reported 30-minute concentrations of hydrogen sulfide (H_2S) were above the numerical value of the 30-minute state H_2S standard for residential areas (80 ppb) 341 times. These data indicate that H_2S levels at the El Paso Lower Valley monitor could have been odorous at times.

Background

This memorandum conveys the Toxicology, Risk Assessment, and Research Division's (TD) evaluation of ambient air sampling conducted at seven monitoring sites in Region 6, El Paso during 2020. TCEQ Region 6 monitoring site information is presented in Table 1 along with hyperlinks to detailed information regarding the monitoring sites and their maps. List 1, List 2, and List 3, which can be found in Attachment A, display the target analytes for seven monitoring sites. The TD reviewed air monitoring summary results from 1-hour automated gas chromatography (autoGC) VOC samples, VOC canister samples collected on a 24-hour every sixth-day schedule, every sixth-day lead TSP (Total Suspended Particles) samples, 24-hour metals sampled on every sixth-day, and 30-minute hydrogen sulfide (H_2S) samples.

The TCEQ Monitoring Division reported the data for all chemicals evaluated in this memorandum. Data discussed in this evaluation for all monitoring sites includes the following:

84 VOCs from canister samples, 46 VOCs from autoGC, 15 metals, and H_2S. Table 2 summarizes the site data completeness, an objective that is met when there is 75 percent data return over the one-year evaluation period.

Short-term samples collected over a 1- or 24-hour duration were compared to their respective chemical-specific AMCVs for the potential to adversely affect human health or welfare during an acute exposure duration. Because short-term or peak concentrations may be significantly different than 24-hour sample concentrations, daily (24-hour) concentrations have limited use in evaluating the potential for more acute (e.g., 30-60 minute) health effects, unlike the shorter-term data reviewed herein (e.g., 1-hour autoGC data, 30-minute H_2S data). In order to be able to evaluate 24-hour monitoring data more fully, TCEQ has developed 24-hour AMCVs for the following:

- 1,3-butadiene
- 2,2-dimethylbutane
- 2,3-dimethylbutane
- 2-methylpentane
- 3-methylpentane
- acrolein
- benzene
- cadmium
- chromium
- cobalt
- crotonaldehyde
- ethylene dibromide
- ethylene dichloride
- formaldehyde
- manganese
- n-hexane

As such, 24-hour samples were compared to the available TCEQ 24-hour AMCVs.

Lead is a criteria pollutant and lead levels (i.e., 24-hour values) were compared to the appropriate National Ambient Air Quality Standards (NAAQS) comparison value (0.15 $\mu g/m^3$). Annual average lead concentrations were also evaluated since they are more representative of long-term lead exposure from a health perspective.

Since 24-hour samples collected using the every sixth-day schedule are designed to provide a representative long-term, ambient concentration for chemicals of concern, annual averages from all 24-hour samples were evaluated using appropriate long-term AMCVs for the potential to adversely impact long-term human health and vegetation effects. Thus, annual average concentrations of metals and VOCs (collected via canister samples), were compared to their respective long-term AMCVs. Annual average concentrations of VOCs collected via autoGC were also compared to their respective long-term AMCV. Additional information regarding the derivation and application of AMCVs is available here: https://www.tceq.texas.gov/toxicology/amcv/about.

The El Paso Lower Valley monitor measures ambient concentrations of hydrogen sulfide (H_2S) and elevated levels of this chemical have been reported at this monitoring site since 2004. Further information regarding historical data collected at this monitoring site and subsequent evaluations of collected data are available from the Air Pollutant Watch List here: https://www.tceq.texas.gov/toxicology/apwl/apwl.html.

Table 1. Monitoring Sites Located in TCEQ Region 6

Site Location and Monitor Name	County	Monitor ID	Monitored Compounds
800 S. San Marcial Street (El Paso Chamizal)	El Paso	48-141-0044	VOCs (autoGC), Metals ($PM_{2.5}$)
6700 Delta Drive (El Paso Delta) [a]	El Paso	48-141-1011	VOCs (autoGC)
250 Rim Road (El Paso UTEP)	El Paso	48-141-0037	Lead (TSP)
8470 Plant Rd (El Paso Lower Valley)	El Paso	48-141-0054	H_2S
6767 Ojo De Agua (Ojo De Agua)	El Paso	48-141-1021	Lead (TSP)
320 Old Hueco Tanks Road (Socorro Hueco)	El Paso	48-141-0057	VOCs (canister)
Clark & Cleveland Streets (Womble)	El Paso	48-141-0047	VOCs (canister)

[a] In 2020, this monitoring site switched to collecting samples seasonally, samples are no longer collected November – April.

Table 2. Data Completeness TCEQ Region 6

Site Name	Parameter	Notes
El Paso Chamizal	VOCs (autoGC)	The following analytes did not meet data completeness objective of 75% return in 2020: 1,2,3-trimethylbenzene, 1,2,4-trimethylbenzene, 1-pentene, 2,4-dimethylpentane, acetylene, cyclopentane, isopentane, methylcyclopentane, and n-nonane.
El Paso Delta	VOCs (autoGC)	Because this site collects samples seasonally, none of the analytes met data completeness of 75% return in 2020.
Ojo De Agua	Lead (TSP)	This monitor was deactivated 10/31/20.
El Paso UTEP	Lead (TSP)	This monitor was deactivated 10/31/20

Evaluation

VOCs

Hourly average concentrations of the 46 VOCs were below their respective short-term AMCVs. Thus, exposure to the reported hourly average concentrations would not be expected to cause adverse human health or welfare effects.

All 24-hour VOC concentrations were below their respective 24-hour AMCVs and would not be expected to cause adverse health effects.

The annual average concentrations for all 84 VOCs collected as 24-hour canister samples and 46 VOCs collected as 1-hr autoGC samples were well below their respective long-term AMCVs. Thus, adverse human health or vegetation effects would not be expected to occur as a result of long-term exposure to the reported levels of these chemicals at these monitoring sites.

Metals

Reported 24-hour- and annual average concentrations for all 15 metals ($PM_{2.5}$) measured at the Chamizal monitoring site were below their respective short- and long-term AMCVs and would not be considered of concern to human health. In the case of lead (TSP), reported annual average concentrations collected at the El Paso UTEP and Ojo De Agua sites were below the applicable comparison value. Thus, none of the reported long-term, average concentrations for these 15 metals ($PM_{2.5}$ or TSP) would be of concern to human health.

H_2S

Of the H_2S samples collected at the El Paso Lower Valley site in 2020, 341 individual, 30-minute samples exceeded the numerical value of the 30-minute H_2S state regulatory standard of 80 ppb. The highest measured concentration of H_2S at this monitor in 2020 was 492 ppb. Since the odor range for H_2S is 0.5-300 ppb, the measured levels of H_2S were likely odorous. Overall, the exceedances of the value of the state regulatory standard 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 (mild respiratory effects in 2/10 asthmatic individuals exposed for 30-minutes) is 2,000 ppb. It is our understanding that the primary source of H_2S detections is a wastewater treatment plant located in Ciudad Juarez, which is a city in Chihuahua, Mexico. The Toxicology Division encourages H_2S reductions in the area, if possible.

If you have any questions or comments regarding this evaluation, please feel free to contact Tiffany Bredfeldt at (512) 239-1799 or tiffany.bredfeldt@tceq.texas.gov or Tracie Phillips at (512)239-2269 or tracie.phillips@tceq.texas.gov.

Attachment A

List 1. Target VOC Analytes in Canister Samples

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

List 2. Target Metal Analytes

Aluminum ($PM_{2.5}$)	Chromium ($PM_{2.5}$)	Molybdenum ($PM_{2.5}$)
Antimony ($PM_{2.5}$)	Cobalt ($PM_{2.5}$)	Nickel ($PM_{2.5}$)
Arsenic ($PM_{2.5}$ or TSP)	Copper ($PM_{2.5}$)	Selenium ($PM_{2.5}$)
Barium ($PM_{2.5}$)	Lead ($PM_{2.5}$ or TSP)	Tin ($PM_{2.5}$)
Cadmium ($PM_{2.5}$)	Manganese ($PM_{2.5}$)	Zinc ($PM_{2.5}$

List 3. Target VOC Analytes in AutoGC

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