



TCEQ Interoffice Memorandum

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

From: Allison Jenkins, MPH 
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Date: August 30, 2016

Subject: Health Effects Review of 2015 Ambient Air Network Monitoring Data in Region 10, Beaumont

Conclusions

- All reported annual average concentrations for all monitored volatile organic compounds (VOCs) were below their air monitoring comparison values (AMCVs) and would not be expected to cause long-term (chronic) adverse human health or vegetation effects.
- All hourly VOC concentrations gathered from automated gas chromatograph (autoGC) monitoring sites were below their respective short-term AMCVs (including odor thresholds) and would not be expected to cause adverse human health effects.
- All 24-hour concentrations of benzene and 1,3-butadiene from canister samples were below their 24-hour AMCVs and would not be expected to cause adverse health effects.

Background

This memorandum conveys the Toxicology Division's (TD's) evaluation of ambient air sampling conducted at a total of 18 monitoring locations in Region 10-Beaumont from January 1 through December 31, 2015. Information about the locations of the monitoring sites, monitored compounds, and hyperlinks to more information on the sites is provided in Table 1.

The Texas Commission on Environmental Quality (TCEQ) Monitoring Division, the South East Texas Regional Planning Commission (SETRPC), or Flint Hills Resources in Port Arthur 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 1-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 annual averages of these 1-hour data to determine their potential to cause chronic (long-term) adverse health and vegetation effects.

VOC data from 24-hour canister samples taken every sixth- (TCEQ) or 12th-day (SETRPC) were also evaluated. 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. In order to be able to evaluate 24-hour monitoring data more fully, TCEQ has developed 24-hour AMCVs for 1,3-butadiene, benzene, and ethylene dichloride. As such, 24-hour samples were compared to the available TCEQ 24-hour AMCVs for these chemicals. 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 average 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 effects. More information about AMCVs is available online at [TCEQ Air Toxics](#) or by contacting the TD (512-239-1795).

The majority of TCEQ, SETRPC, and Flint Hills monitoring data reviewed met or exceeded TCEQ's 75 percent annual data completeness objective. The following analytes did not meet this objective:

- Acetylene at Nederland High School (5475 1-hour measurements out of a possible 8760 measurements);
- 1,2,3-Trimethylbenzene at Beaumont Downtown (2256 1-hour measurements out of a possible 8760 measurements) and Nederland High School (1542 1-hour measurements out of a possible 8760 measurements);
- 1,3-Butadiene at Flint Hills Resources Levee Road (3633 1-hour measurements out of a possible 8760 measurements);
- All analytes at Beaumont Mary (42 24-hour measurements out of a possible 60 measurements; Beaumont Mary was decommissioned on September 24, 2015);
- All analytes at Port Arthur West (42 24-hour measurements out of a possible 60 measurements).

Meeting the data completeness objective helps to ensure the representativeness of calculated annual average concentrations. Because these analytes did not meet the completeness objective, they were excluded from evaluation of the potential for long-term effects.

Table 1 - Region 10 Sites with Air Toxics Monitoring Data Evaluated in this Memorandum

Site Location	Type of Monitor	EPA Site Number	Network	Monitored Compounds
Beaumont Downtown 1086 Vermont Ave, Beaumont	24-hour every 6 th - day canister & hourly autoGC	48-245-0009	TCEQ	84 VOCs (canister); 46 VOCs (autoGC)
Port Arthur West 800 El Vista Rd, Port Arthur	24-hour, every 6 th - day canister	48-245-0011	TCEQ	84 VOCs
Groves 3355 Grandview Ave & 32 nd St, Port Neches	24-hour, every 6 th - day canister	48-245-0014	TCEQ	84 VOCs
Port Neches Avenue L 605 Avenue L, Port Neches	24-hour, every 6 th - day canister	48-245-0017	TCEQ	84 VOCs
Jefferson County Airport 90 th St, Port Arthur	24-hour, every 6 th - day canister	48-245-0018	TCEQ	84 VOCs
City Service Center/PA 201 H.O. Mills Blvd, Port Arthur	24-hour, every 6 th - day canister	48-245-0019	TCEQ	84 VOCs
Nederland High School 1800 N. 18 th St, Nederland	hourly autoGC	48-245-1035	TCEQ	46 VOCs
Beaumont Mary 414 Mary St, Beaumont (Inactive as of	24-hour, every 6 th - day canister	48-245-1050	TCEQ	84 VOCs

Site Location	Type of Monitor	EPA Site Number	Network	Monitored Compounds
September 24, 2015)				
SETRPC West Orange (30.084, -93.764)	24-hour, every 12 th -day canister	--	SETRPC	53 VOCs
SETRPC 42 Mauriceville , Intersection of Texas Hwys 62 and 12, Port Arthur	24-hour, every 12 th -day canister	48-361-1100	SETRPC	53 VOCs
SETRPC 43 Jefferson Co Airport (29.943, -94.001)	24-hour, every 12 th -day canister	48-245-0102	SETRPC	53 VOCs
SETRPC Beaumont (30.080, -94.094)	24-hour, every 12 th -day canister	--	SETRPC	53 VOCs
SETRPC Port Neches (29.991, -93.953)	24-hour, every 12 th -day canister	--	SETRPC	53 VOCs
SETRPC Cove School (30.071, -93.739)	24-hour, every 12 th -day canister	--	SETRPC	53 VOCs
SETRPC Port Arthur (29.868, -93.951)	24-hour, every 12 th -day canister); hourly AutoGC	48-245-0628	SETRPC	53 VOCs (canister); carbon disulfide, H ₂ S
Port Arthur Memorial School , 220 Jefferson Dr, Port Arthur (29.923, -93.909)	hourly autoGC; H ₂ S	48-245-0021	SETRPC	benzene, 1,3-butadiene, styrene; H ₂ S
Flint Hills Resources , Levee Rd Monitor	hourly autoGC	--	Flint Hills Resources	benzene, 1,3-butadiene

Evaluation

VOCs

All hourly and annual average VOC concentrations from the Beaumont Downtown, Port Arthur Memorial School, Nederland High School, SETRPC Port Arthur, and Flint Hills Resources autoGCs were below their respective short-term and long-term AMCVs (including odor thresholds) and would not be expected to cause adverse health or welfare effects.

All annual average VOC concentrations from 24-hour canister samplers were below their respective long-term AMCVs at all sites and were below a level of potential long-term health or vegetation concern. Although the decommission of the Beaumont Mary canister sampler precluded evaluation of

2015 annual averages, samples collected from the preceding 12 months (from October 2014 through September 2015) did meet the 75% data completeness objective and annual average concentrations of all analytes were below their respective long-term AMCVs. Therefore, adverse health effects would also not be expected to occur at the Beaumont Mary monitoring site prior to its decommission. Finally, 24-hour concentrations of 1,3-butadiene, benzene, and ethylene dichloride were below their 24-hour AMCVs and would not be expected to cause adverse health effects.

H₂S

There were no exceedances of the state regulatory standard for H₂S at either the SETRPC Port Arthur or Port Arthur Memorial School sites in 2015.

If you have any questions regarding the contents of this review, please do not hesitate to contact Allison Jenkins (512-239-0656; Allison.Jenkins@tceq.texas.gov) or Lindsey Jones (512-239-1784; Lindsey.Jones@tceq.texas.gov).

Attachment A

List 1 - Target VOC Analytes in TCEQ 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 (Methylene chloride)	o-Ethyltoluene
2,3,4-Trimethylpentane	Ethane	o-Xylene
2,3-Dimethylbutane	Ethylbenzene	p-Diethylbenzene
2,3-Dimethylpentane	Ethylene	p-Ethyltoluene
2,4-Dimethylpentane	Ethylene dibromide (1,2-Dibromoethane)	Propane
2-Chloropentane	Ethylene dichloride (1,2-Dichloroethane)	Propylene
2-Methyl-2-butene	Isobutane	Styrene
2-Methylheptane	Isopentane (2-Methylbutane)	Tetrachloroethylene
2-Methylhexane	Isoprene	Toluene
2-Methylpentane (Isohexane)	Isopropylbenzene (Cumene)	trans-1-3-Dichloropropene
3-Methyl-1-butene	m-Diethylbenzene	trans-2-Butene
3-Methylheptane	m-Ethyltoluene	trans-2-Hexene
3-Methylhexane		trans-2-Pentene
3-Methylpentane		Trichloroethylene
4-Methyl-1-pentene		Trichlorofluoromethane
Acetylene		Vinyl chloride
Benzene		

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