


TCEQ Interoffice Memorandum

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Date: June 24, 2013

Subject: Health Effects Review of 2012 Ambient Air Network Monitoring Data in Region 10, Beaumont

Conclusions

- Exposure to the 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 short-term or long-term (chronic) adverse human health or vegetation effects.
- The annual average benzene concentration for the last three years, at the Port Arthur City Service Center (Site# [1003](#)) is below the long-term AMCV for benzene. This data demonstrate sufficient achievements in reducing ambient air concentration such that the reported levels are no longer of concern for potential long-term, adverse health effects. This determination should be considered in context with the [APWL protocol](#).

Background

This memorandum conveys the Toxicology Division's (TD's) evaluation of ambient air sampling conducted at eight sites in Region 10-Beaumont from January 1 through December 31, 2012. Information about the locations of the monitoring sites, monitored compounds, and a hyperlink to more information on the sites is provided in Table 1.

The TCEQ Field Operations Support Division reported the data for all chemicals evaluated in this memorandum. The TD reviewed air monitoring summary results for up to 46 VOCs from three automated gas chromatograph (autoGC) sites and 84 VOCs from seven canister samplers. All reviewed data met or exceeded TCEQ's 75 percent annual data completeness requirement. Meeting this requirement helps to ensure the representativeness of calculated annual average concentrations. Lists of all target analytes at these monitoring locations are included in Attachment A.

Hourly VOC concentrations collected from the three autoGC samplers, Beaumont Downtown, Port Arthur Memorial High School, and the Nederland High School, were evaluated for their potential to cause acute (short-term) adverse health effects and welfare (odor potential and vegetation effects).

In addition, the TD evaluated annual average VOC concentrations to determine their potential to cause chronic (long-term) adverse health and vegetation effects.

Data collected from 24-hour samples taken every sixth day from seven sampling sites measuring 84 VOCs were also evaluated. These 24-hour air samples are designed to provide representative long-term average concentrations of the aforementioned analytes in air. Thus, annual averages from 24-hour samples were evaluated for potential chronic health concerns.

Chemicals were evaluated individually by comparing the reported concentrations to their respective AMCVs. TD compared the measured hourly concentrations for 46 VOCs from the two autoGC monitoring sites to their respective short-term AMCVs. TD compared annual average concentrations of all VOCs to their respective long-term AMCVs. More information about AMCVs is available online at [TCEQ Air Toxics](#) or by contacting the TD (512-239-3900).

Table 1 - Region 10 Sites that Provided Air Toxics Monitoring Data Evaluated in this Memorandum ([TAMIS](#))

City and Site Location	County	EPA Site ID	Monitored Compounds
Beaumont, Downtown 1086 Vermont Avenue	Jefferson	48-245-0009	VOCs (24-hour canister & hourly autoGC)
Port Arthur, West 800 El Vista Rd	Jefferson	48-245-0011	VOCs (24-hour canister)
Port Neches, Groves 3355 Grandview Avenue & 32nd Street	Jefferson	48-245-0014	VOCs (24-hour canister)
Port Neches Avenue L ¹	Jefferson	48-245-0017	VOCs (24-hour canister)
Port Arthur, Jefferson County Airport 90 th Street	Jefferson	48-245-0018	VOCs (24-hour canister)
Port Arthur, City Service Center / PA 201 H.O. Mills Blvd	Jefferson	48-245-0019	VOCs (24-hour canister)
Port Arthur Memorial School 2200 Jefferson Drive	Jefferson	48-245-0021	VOCs (hourly autoGC)
Crosby, Nederland High School Seattle St	Jefferson	48-245-1035	VOCs (hourly autoGC)
Beaumont Mary 414 Mary St	Jefferson	48-245-1050	VOCs (24-hour canister)

¹ This monitor (EPA ID 48-245-0017) was previously located at: 1225 Merriman Street.

Evaluation

VOCs

All hourly and annual VOC concentrations gathered from the autoGCs at the Beaumont Downtown, Port Arthur Memorial School, and Nederland High School sites were below their respective short-term and long-term AMCVs (including odor thresholds) and would not be expected to cause adverse effects.

All reported annual average concentrations of VOC's from 24-hour canister samplers were below their respective long-term AMCVs at all sites. Thus, the annual average VOC concentrations at all sites were below a level of potential long-term health or vegetation concern.

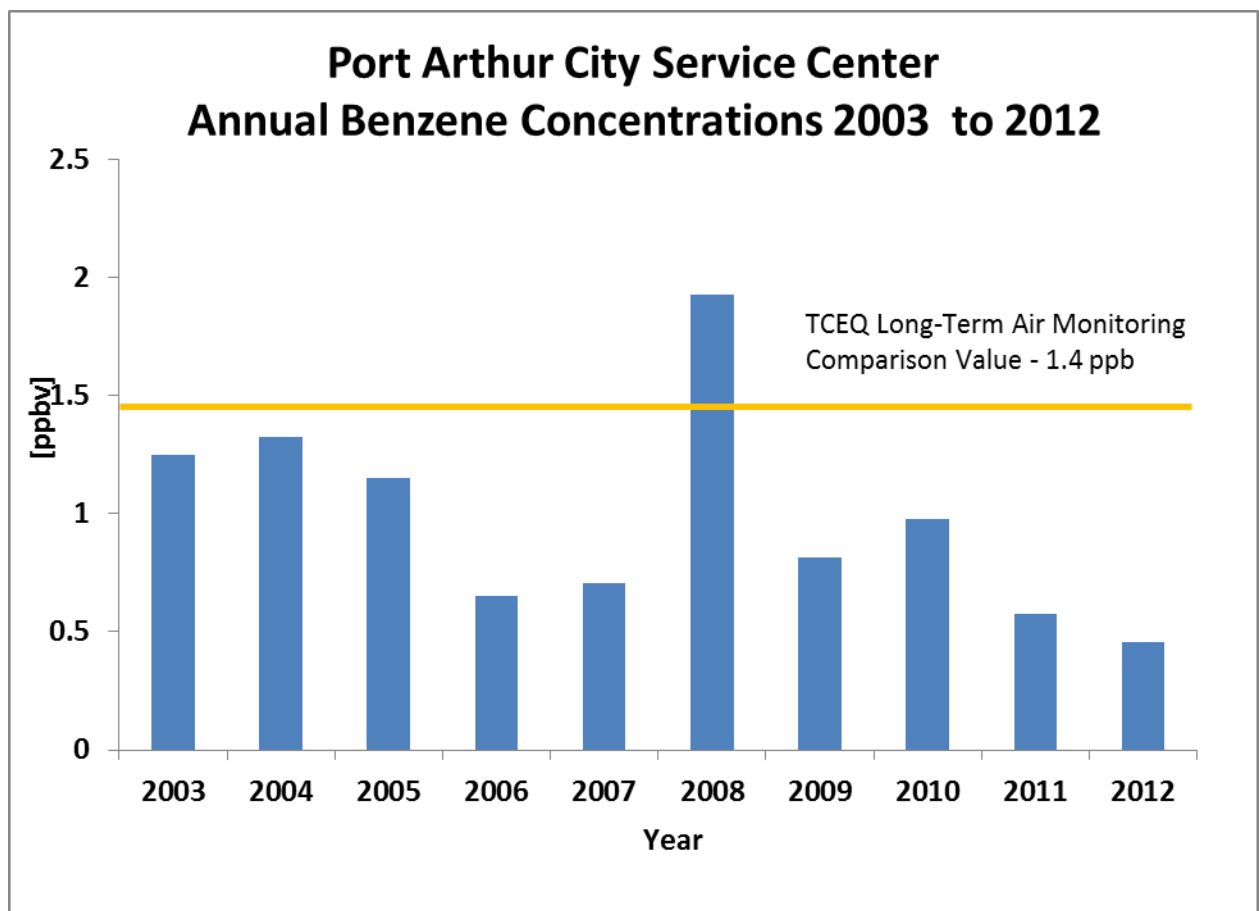


Figure 1 – Ten-year Annual Average Benzene Concentrations – Port Arthur, City Service Center

Port Arthur City Service Center

The reported 2012 average benzene concentration at the City Service Center site, based on every sixth-day 24-hour canister samples, was 0.45 ppbv. Annual average benzene concentrations at this site have decreased significantly from 2008 (1.9 ppbv) to 2012 (0.45 ppbv); and currently are not considered a potential health concern.

Air Pollutant Watch List (APWL) Areas

There are three APWL areas ([1001](#), [1002](#), and [1003](#)) in Region 10. These areas are discussed in detail in the 2012 annual APWL report¹.

Evadale (APWL 1001) has not had any hydrogen sulfide (H₂S) monitoring since 2008 and therefore there is no data to evaluate. This area has known potential sources for H₂S and past levels were in exceedance of the standard. However, in order to provide a complete review, additional data concerning air levels of H₂S are necessary.

At Beaumont (APWL 1002), sulfur dioxide was detected at 92 ppb at one sampling period (1-hour) on June 17, 2012; all other measurements were less than 80 ppb; TD would not consider these values to be a health concern.

Port Arthur (APWL 1003) has continued to have reduced measured levels of benzene (0.45 ppb_v) in relationship to the AMCV of 1.4 ppb_v. Although this area is currently on the APWL, data from recent years (2009 to date) demonstrate sufficient achievements in reducing ambient air concentration such that the reported levels are no longer of concern for potential long-term, adverse health effects. This determination should be considered in context with the [APWL protocol](#).

If you have any questions regarding the contents of this review, please do not hesitate to contact me at (512-239-1804) or via email at ross.jones@tceq.texas.gov.

cc (via email):

Mr. Ruben Casso – EPA Region 6, Dallas

Dr. Richard Beauchamp – Department of State Health Services

Dr. Carrie Bradford – Department of State Health Services

¹ Report on the Air Pollutant Watch List Areas in Texas; Prepared by the Texas Commission on Environmental Quality, February 2012.

Attachment A

List 1 - Target VOC Analytes in Canister Samples

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

List 2 - 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	