

## TCEQ Interoffice Memorandum

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**To:** Heather Feldman, Regional Director, Region 10 Beaumont  
Kathryn Saucedo, Air Section Manager, Region 10 Beaumont  
Kelly Keel, Coastal & East Texas Area Director  
Tara Capobianco, Air Pollutant Watch List Coordinator

**From:** Ross Jones, M.S., M.P.H., Ph.D. *arf*  
Toxicology Division, Office of the Executive Director

**Date:** October 9, 2012

**Subject:** Health Effects Review of 2011 Ambient Air Network Monitoring Data in Region 10, Beaumont

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### 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 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, 2011. 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 46 VOCs from two 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 two autoGC samplers, Beaumont Downtown and the Nederland High School, were evaluated for their potential to cause acute (short-term) adverse health effects (e.g., irritation) and welfare (odor potential and vegetation effects). In addition, the

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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**

City and Site Location	County	EPA Site ID	Monitored Compounds
Beaumont, <a href="#">Downtown</a> 1086 Vermont Avenue	Jefferson	48-245-0009	VOCs (24-hour canister & hourly autoGC)
<a href="#">Port Arthur, West</a> 800 El Vista Rd	Jefferson	48-245-0011	VOCs (24-hour canister)
Port Neches, <a href="#">Groves</a> 3355 Grandview Avenue & 32nd Street	Jefferson	48-245-0014	VOCs (24-hour canister)
<a href="#">Port Neches</a> 1225 Merriman Street	Jefferson	48-245-0017	VOCs (24-hour canister)
<a href="#">Port Arthur, Jefferson County Airport</a> 90 <sup>th</sup> Street	Jefferson	48-245-0018	VOCs (24-hour canister)
<a href="#">Port Arthur, City Service Center</a> 201 H.O. Mills Blvd	Jefferson	48-245-0019	VOCs (24-hour canister)
<a href="#">Crosby, Nederland High School</a> Seattle St	Jefferson	48-245-1035	VOCs (24-hour canister)
<a href="#">Beaumont Mary</a> 414 Mary St	Jefferson	48-245-1050	VOCs (24-hour canister)

## Evaluation

### VOCs

All hourly and annual VOC concentrations gathered from the autoGCs at the Beaumont, Downtown, Nederland High School, and Hamshire 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.

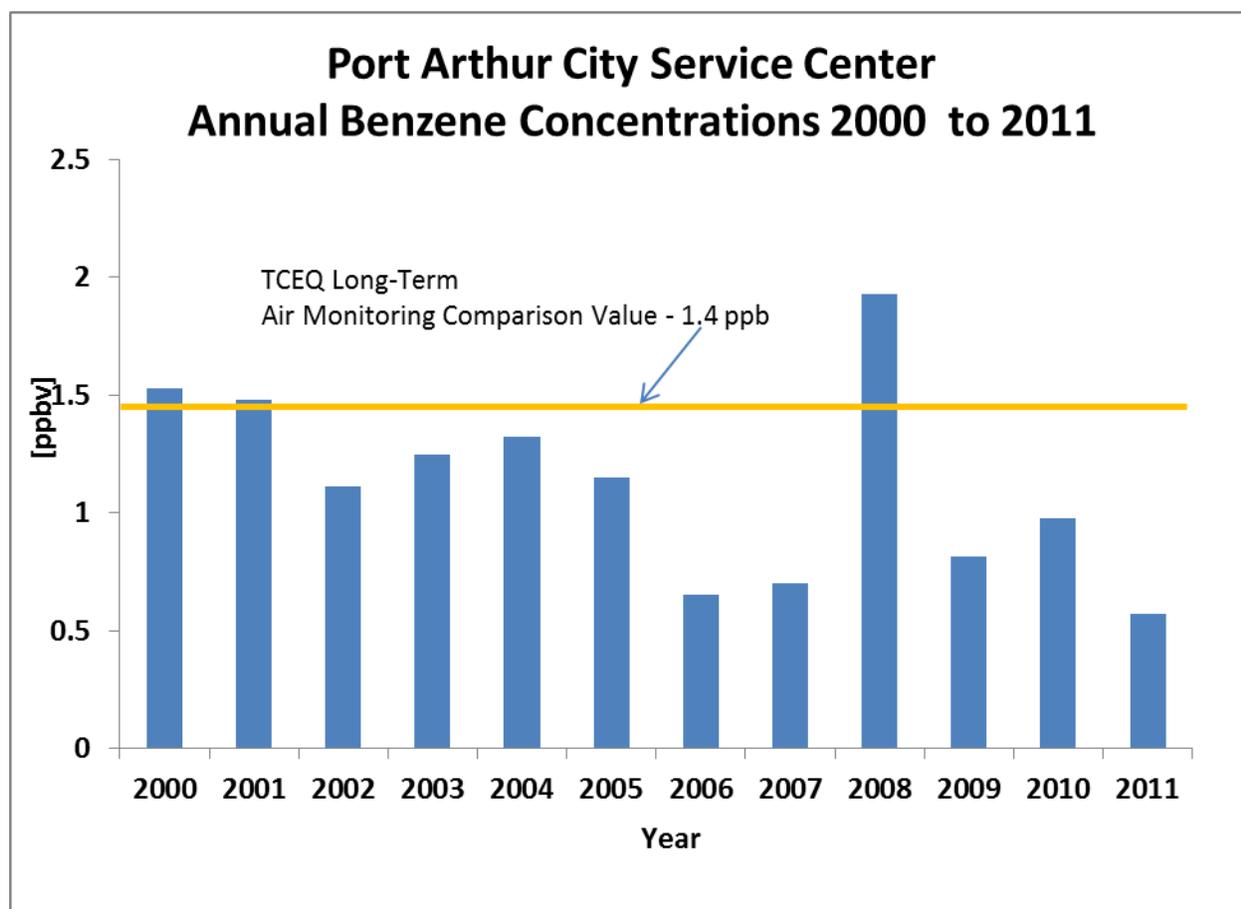


Figure 1. Annual Average Benzene Concentrations – Port Arthur, City Service Center

### Port Arthur City Service Center

The reported 2011 average benzene concentration at the City Service Center site, based on every sixth-day 24-hour canister samples, was 0.57 ppbv. Annual average benzene concentrations at this site have decreased significantly from 2000 (1.5 ppbv) to 2007 (0.7 ppbv). The average benzene

concentration in 2008 was 2.0 ppbv. However, since 2009, the annual average concentrations decreased to less than those observed in 2007 and 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 report<sup>1</sup>.

Evadale (APWL 1001) has not had any monitoring since 2008 and therefore there is no data to evaluate. This area has known potential sources for hydrogen sulfide and past levels were in exceedance of the standard. During 2011 one odor complaint was received, investigated, and no citation was issued. However, in order to provide a complete review, additional data concerning air levels of hydrogen sulfide are necessary.

At Beaumont (APWL 1002), sulfur dioxide was detected over an hour and twenty minute period on one day during 2011. During this period sulfur dioxide averaged 0.41 ppm<sub>v</sub> and ranged from 0.32 to 0.53 ppm<sub>v</sub>, which was in exceedance of the 1 hour standard (0.32 ppm<sub>v</sub>). Because of the extremely short period of exceedance and the fact that the levels were only slightly above the standard, we would not consider these values to be a health concern.

Port Arthur (APWL 1003) has continued to have reduced measured levels of benzene (0.57 ppb<sub>v</sub>) in relationship to the AMCV of 1.4 ppb<sub>v</sub>. 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](mailto:ross.jones@tceq.texas.gov).

cc (via email):

Casso, Ruben – EPA Region 6, Dallas

Prosperie, Susan – Department of State Health Services

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<sup>1</sup> 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 (Neoheptane)	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 (Isoheptane)	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	