

# Texas Commission on Environmental Quality

## INTEROFFICE MEMORANDUM

**To:** Leroy Biggers, Regional Director  
Michelle Baetz, Air Section Manager  
David Bower, Coastal and East Texas  
Area Director

**Date:** October 7, 2008

**From:** Roberta L. Grant, Ph.D.  
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**Subject:** Health Effects Review of 2007 Ambient Air Network Monitoring Data in  
Region 5, Tyler

### Conclusions

- Annual average concentrations of arsenic and chromium from particulate matter less than 10 microns in diameter (PM<sub>10</sub>), all volatile organic compounds (VOCs), and all carbonyls at the Karnack monitoring site were below their long-term appropriate comparison values and are not a health concern.
- The reported annual average concentration for benzene exceeded the long-term appropriate comparison value at the Gregg County Airport in Longview, Texas. Although these concentrations are not a health concern from a long-term perspective, benzene reductions are recommended because continued elevated annual concentrations may contribute to elevated long-term average benzene concentrations of concern. Annual average concentrations of all other 94 VOCs were below their appropriate comparison values and are not a health concern.

### Background

This memorandum conveys the Toxicology Section's evaluation of ambient air sampling conducted at two monitoring network sites in Region 5—Tyler during 2007. Summary results for 24-hour VOCs and carbonyls collected every sixth day and two speciated metals, arsenic and chromium, from 24-hour PM<sub>10</sub> filter samples collected every third day from a site located at Highway 143 and Spur 449 in Karnack, Texas, as well as 24-hour VOCs collected every sixth day from a site located at Gregg County Airport in Longview, Texas, were evaluated on a chemical-by-chemical basis. Information about the Region 5 monitoring sites is presented in Table 1. The specific chemicals evaluated are listed in Table 2 and the locations of the sites are shown in Figures 1 and 2.

<b>Table 1. Monitoring Sites Located in TCEQ Region 5</b>				
<b>City and Site Location</b>	<b>County</b>	<b>Monitor ID</b>	<b>Monitored Compounds</b>	<b>Begin Date</b>
<a href="#"><u>Longview, Gregg County Airport</u></a>	Gregg	481830001	VOCs	November 5, 1997
<a href="#"><u>Karnack, Highway 143 and Spur 449</u></a>	Harrison	482030002	VOCs, carbonyls, and metals (PM <sub>10</sub> )	August 28, 2001

The Texas Commission on Environmental Quality (TCEQ) Monitoring Operations Division reported data for all chemicals evaluated in this memorandum. The data return for the Karnack monitor met completeness requirements for estimating annual average concentrations for all VOCs, carbonyls, and the two speciated metals. The data return for the Longview monitor met completeness requirements for estimating annual average concentrations for all VOCs. For all VOCs, carbonyls, and speciated metals that met completeness requirements, annual average concentrations were compared to their respective long-term appropriate comparison values. Because 24-hour air samples are designed to provide representative long-term average concentrations, annual averages from 24-hour samples were evaluated for potential chronic health concerns. Short-term or peak concentrations are not captured by 24-hour samples; therefore, daily maximum concentrations have limited use in evaluating the potential for acute health effects.

## **Evaluation**

### **Karnack, Highway 143 and Spur 449 Site**

Arsenic, chromium, and 82 of 95 reported VOCs were not detected at the Karnack site. All reported annual average concentrations of VOCs and chromium and arsenic were below their appropriate comparison values and would not be expected to cause long-term adverse health effects. Of the 16 reported carbonyls, 6 were not detected. All annual average concentrations of carbonyls were below their appropriate comparison values and would not be expected to cause adverse long-term health effects.

### **Longview, Gregg County Airport Site**

Of 95 reported VOCs, 77 were not detected at the Longview site. With the exception of benzene, all annual average concentrations of VOCs were below their appropriate comparison values and would not be expected to cause adverse health effects. Although benzene exceeded its appropriate comparison value at the Longview monitoring site, the concentration was not of a health concern from a long-term perspective for reasons discussed below.

## **Benzene at the Longview Monitoring Site**

The 2007 annual average benzene concentration of 1.5 ppb<sub>v</sub> slightly exceeded the appropriate

comparison value of 1.4 ppb<sub>v</sub>. In the past year, multiple oil and gas wells were drilled in the area, and the collection tanks are located approximately 900 feet south, southwest of the monitoring site. Quarterly measurements for benzene were 1.3 ppb<sub>v</sub>, 1.8 ppb<sub>v</sub>, 1.9 ppb<sub>v</sub>, and 1.0 ppb<sub>v</sub> for the 1<sup>st</sup>, 2<sup>nd</sup>, 3<sup>rd</sup>, and 4<sup>th</sup> quarter, respectively. Exposure to the reported benzene concentrations would not be expected to cause short-term adverse health effects, but may contribute to elevated long-term benzene concentrations of concern.

Figure 3 shows the annual average concentration of benzene at the Longview Monitoring Site from 1998 through 2007. Benzene concentrations in the past in this area were typically low and below benzene's appropriate comparison value. The ten-year annual average benzene concentration of 0.71 ppb<sub>v</sub> is well below the TCEQ appropriate comparison value of 1.4 ppb<sub>v</sub>. Therefore, the 2007 annual average benzene concentration is not a long-term health concern. Even though the ten-year annual average benzene concentration is below appropriate comparison levels, benzene reductions are recommended because elevated short-term concentrations may contribute to elevated long-term benzene concentrations of concern. Information on oil and gas wells and their emissions is being collected by TCEQ staff as part of a state-wide effort, and potential pollution prevention measures will be recommended as part of these efforts. Central office TCEQ staff plan to visit company representatives that operate the oil and gas wells and tanks near the Longview monitor in the near future to encourage pollution prevention measures. If this fails, regional investigations may be warranted.

Information on appropriate comparison values for air monitoring can be obtained by contacting the TCEQ Toxicology Section (512-239-1795). If you have any questions about this evaluation, please call me at (512) 239-4115 or e-mail me at [rgrant@tceq.state.tx.us](mailto:rgrant@tceq.state.tx.us).

cc (via email):

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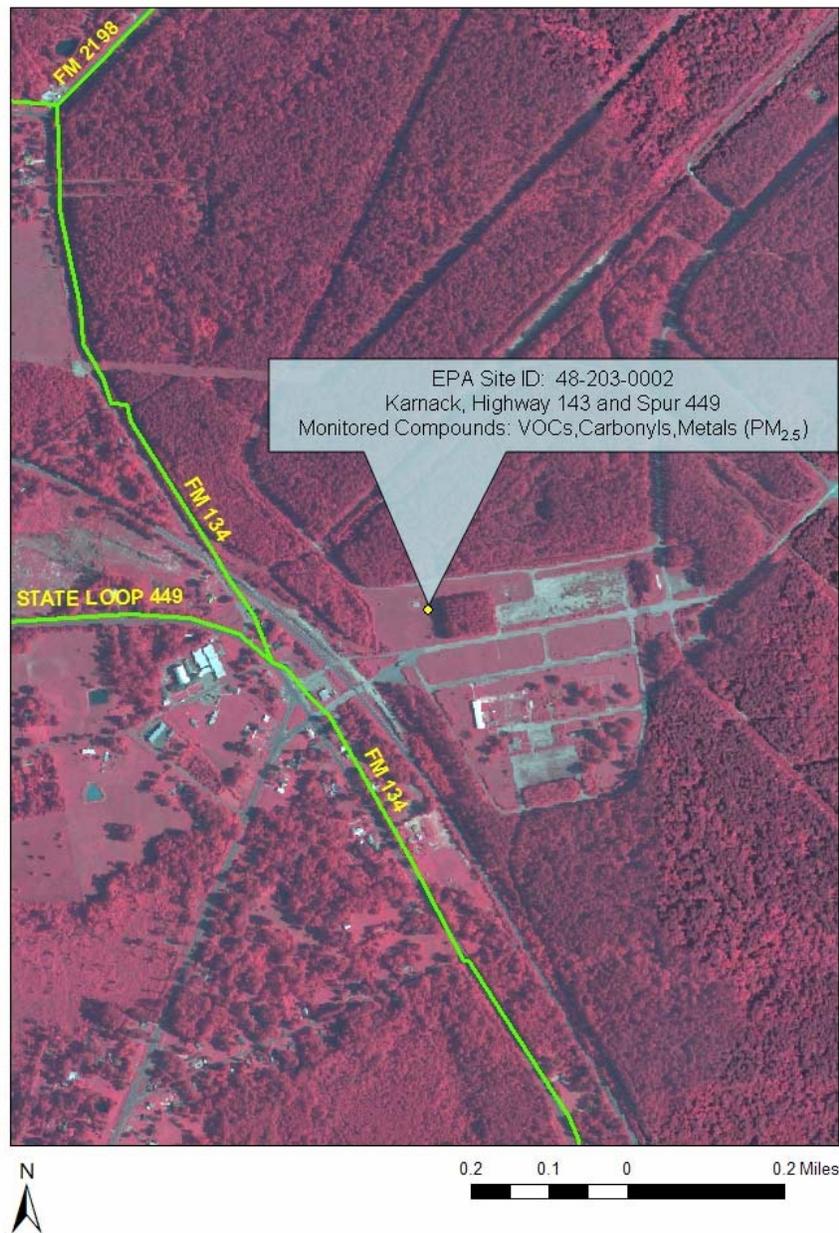
**Table 2 Target Analyte List**

<b>VOCs (CATMN)</b>	Chloroform	o-Ethyltoluene
1,1,1-Trichloroethane	Cyclohexane	o-Xylene
1,1,2,2-Tetrachloroethane	Cyclopentane	p-Diethylbenzene
1,1,2-Trichloroethane	Cyclopentene	p-Ethyltoluene
1,1-Dichloroethane	Ethane	p-Xylene + m-Xylene
1,1-Dichloroethylene	Ethyl Acetate	t-2-Butene
1,2,3-Trimethylbenzene	Ethyl Benzene	t-2-Hexene
1,2,4-Trimethylbenzene	Ethylene	t-2-Pentene
1,2-Dibromoethane	Isobutane	trans-1-3-Dichloropropylene
1,2-Dichloroethane	Isopentane	
1,2-Dichloropropane	Isoprene	<b>Carbonyls</b>
1,3,5-Trimethylbenzene	Isopropylbenzene	2,5-Dimethylbenzaldehyde
1,3-Butadiene	Methyl Butyl Ketone (MBK)	Acetaldehyde
1-Butene	Methyl Isobutyl Ketone	Acrolein
1-Hexene+2-Methyl-1-Pentene	Methyl t-Butyl Ether (MTBE)	Benzaldehyde
1-Pentene	Methylcyclohexane	Butyraldehyde
2,2,4-Trimethylpentane	Methylcyclopentane	Crotonaldehyde – 2-Butenal
2,2-Dimethylbutane - Neohexane	Methylene Chloride	Formaldehyde
2,3,4-Trimethylpentane	Propane	Heptaldehyde
2,3-Dimethylbutane	Propylene	Hexanaldehyde
2,3-Dimethylpentane	Styrene	Isovaleraldehyde
2,4-Dimethylpentane	Tetrachloroethylene	m-Tolualdehyde
2-Butanone	Toluene	Propanal – Propionaldehyde
2-Chloropentane	Trichloroethylene	Valeraldehyde
2-Methyl-2-Butene	Trichlorofluoromethane	o-Tolualdehyde
2-Methylheptane	Vinyl Chloride	p-Tolualdehyde
2-Methylhexane	c-2-Butene	
2-Methylpentane - Isohexane	c-2-Hexene	<b>Metals</b>
2-Methyl-3-Hexanone	c-2-Pentene	Arsenic
3-Methyl-1-Butene	Dichlorodifluoromethane	Chromium
3-Methylheptane	Isobutyraldehyde	
3-Methylhexane	m-Diethylbenzene	
3-Methylpentane	m-Ethyltoluene	
3-Hexanone	Methyl Chloride	
3-Pentanone	n-Butane	
4-Methyl-1-Pentene	n-Decane	
Acetylene	n-Heptane	
Benzene	n-Hexane	
Bromomethane	n-Nonane	
Butyl Acetate	n-Octane	
cis 1,3-Dichloropropylene	n-Pentane	
Carbon Tetrachloride	n-Propyl Acetate	
Chlorobenzene	n-Propylbenzene	
	n-Undecane	

**Figure 1. Longview Monitoring Site, Gregg County  
Gregg County Airport**



**Figure 2. Karnack Monitoring Site, Harrison County  
Highway 143 and Spur 449**



**Figure 3. Annual Average Benzene Concentrations at Longview Monitor (CAMS 19)**

