

Texas Commission on Environmental Quality

INTEROFFICE MEMORANDUM

To: Leroy Biggers, Director, R5
Charles Murray, Air Section Manager, R5
Frank Espino, North Central Texas Area Director

Date: May 18, 2007

From: Valerie E. Meyers, Ph.D.
Toxicology Section, Chief Engineer's Office

Subject: Health Effects Review of 2006 Ambient Air Network Monitoring Sites in Region 5-Tyler

Conclusions

The annual average concentrations of all 95 volatile organic compounds (VOCs) and two speciated metals from particulate matter less than 10 microns in diameter (PM₁₀) were well below their respective long-term Effects Screening Levels (ESLs) and would not be expected to cause adverse health or vegetative effects. Of the 17 carbonyls reported at the Karnack site, only formaldehyde was detected. The reported annual average concentration of formaldehyde exceeded the long-term ESL but was not a health concern.

Background

Ambient air sampling conducted at monitoring network sites in Region 5-Tyler during 2006 was evaluated by the Toxicology Section (TS). Table 1 indicates the location and monitored compounds at the two Community Air Toxics Monitoring Network (CATMN) sites in Region 5-Tyler. Figures 1 and 2 are street level maps indicating the specific locations of each of the two monitoring sites. The TS reviewed air monitoring summary results for VOCs and carbonyls from 24-hour samples collected every sixth day and speciated metals data from 24-hour PM₁₀ samples collected every sixth day. For a complete list of all chemicals examined, please see Table 2.

Table 1: Monitoring Site Information for TCEQ Region 5

County	City and Site Location	EPA Site ID	Monitored Compounds
Gregg	Longview, Gregg County Airport	48-183-0001	VOCs
Harrison	Karnack, Highway 143 and Spur 449	48-203-0002	VOCs, carbonyls, and metals (PM ₁₀)

The TCEQ Monitoring Operations Division reported the data for all chemicals evaluated. All data collected for VOCs, carbonyls, and PM₁₀ metals in Region 5 met TCEQ's data completeness objective of 75 percent data return, or 45 valid samples per year, except for MEK/methacrolein. As a result, data for MEK/methacrolein were not evaluated. Air samples collected over a 24-hour period are designed to provide representative long-term average concentrations. Therefore, the TS evaluated the reported annual

Leroy Biggers, et al.

Page 2 of 5

May 18, 2007

average concentrations for each target analyte for potential chronic health and vegetative concerns by comparing measured chemical concentrations to TCEQ long-term ESLs. Information on the ESLs can be obtained by contacting the TS 512-239-1795 or visiting the following website: <http://www.tceq.state.tx.us/implementation/tox/esl/ESLMain.html>.

Evaluation

VOCs

Of the 95 VOCs reported at each of the two monitoring sites in the region for 2006, 62 were not detected at the Longview Site, and 69 were not detected at the Karnack site. Concentrations of the compounds that were detected were well below long-term ESLs, and therefore do not present chronic human health or vegetative concerns.

Carbonyls

Of the 17 carbonyls reported at the Karnack site, only formaldehyde was detected. The annual average concentration of formaldehyde did exceed the long-term ESL. However, these concentrations do not present a human health concern, as discussed below.

Formaldehyde

The 2006 annual average formaldehyde concentration of 1.9 ppb_v slightly exceeded the current long-term ESL of 1.2 ppb_v and the 2005 annual average concentration of 1.3 ppb_v. However, use of a new, scientifically-defensible risk factor (published in 2004) that incorporates more recent toxicological research affecting formaldehyde carcinogenicity (e.g., anatomical differences between rat and human nasal passages, regional dosimetry throughout the human respiratory tract, mode of action information) results in an approximate excess cancer risk 1.3 in 10 million for lifetime exposure to formaldehyde at these levels. Therefore, lifetime exposure to formaldehyde at these concentrations is not expected to significantly increase cancer risk over background levels.

Metals

Of the 60 samples collected at Karnack, arsenic was only detected in one sample. Chromium was detected in all 60 samples. All detected concentrations were well below their respective long-term ESLs and would not be expected to cause adverse health effects.

If you have any questions regarding this evaluation, please contact me at 512-239-1336 or vmeyers@tceq.state.tx.us.

cc (via email):

Casso, Ruben
Prosperie, Susan

Table 2: Target Analyte List

VOCs (CATMN)	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	Carbonyls
1,3,5-Trimethylbenzene	Isopropylbenzene	2,5-Dimethylbenzaldehyde
1,3-Butadiene	Methyl Butyl Ketone (MBK)	Acetaldehyde
1-Butene	Methyl t-Butyl Ether (MTBE)	Acetone
1-Hexene+2-methyl-1-pentene	Methylcyclohexane	Acrolein
1-Pentene	Methylcyclopentane	Benzaldehyde
2,2,4-Trimethylpentane	Methylene Chloride	Butyraldehyde
2,2-Dimethylbutane - Neohexane	Methylisobutylketone	Crotonaldehyde – 2-Butenal
2,3,4-Trimethylpentane	Propane	Formaldehyde
2,3-Dimethylbutane	Propylene	Heptaldehyde
2,3-Dimethylpentane	Styrene	Hexanaldehyde
2,4-Dimethylpentane	Tetrachloroethylene	Isovaleraldehyde
2-Butanone	Toluene	MEK/Methacrolein*
2-Chloropentane	Trichloroethylene	Propanal – Propionaldehyde
2-Methyl-2-Butene	Trichlorofluoromethane	Valeraldehyde
2-Methylheptane	Vinyl Chloride	m-Tolualdehyde
2-Methylhexane	c-2-Butene	o-Tolualdehyde
2-Methylpentane - Isohexane	c-2-Hexene	p-Tolualdehyde
2-Methyl-3-Hexanone	c-2-Pentene	
3-Methyl-1-Butene	Dichlorodifluoromethane	Metals
3-Methylheptane	Isobutyraldehyde	Arsenic
3-Methylhexane	m-Diethylbenzene	Chromium
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	

*MEK/Methacrolein did not meet data quality objectives and therefore was not evaluated.

Figure 1. Longview Monitoring Site, Gregg County

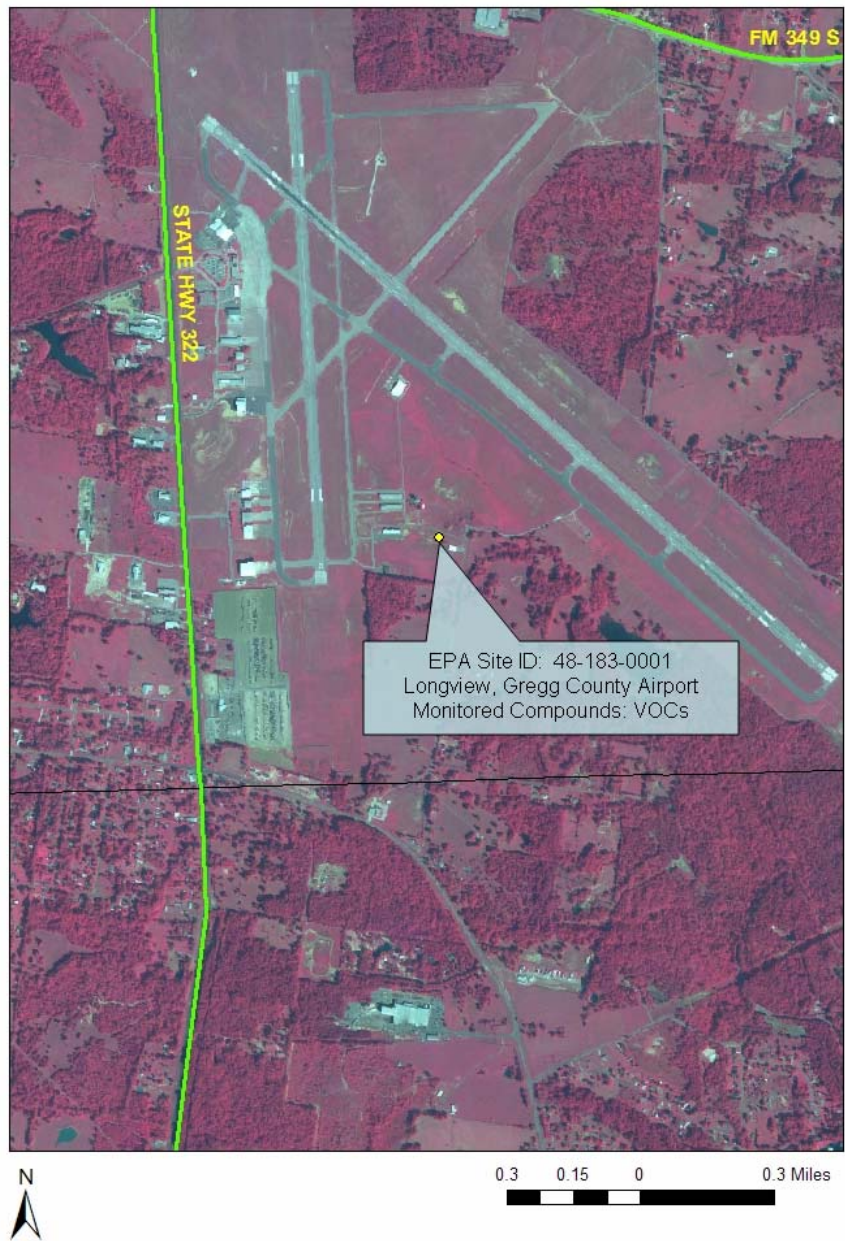


Figure 2. Karnack Monitoring Site, Harrison County

