

**Corpus Christi Air Monitoring and Surveillance Camera
Installation and Operation Project**

Quarterly Report for the Period

April 1, 2009 through June 30, 2009

Submitted to

**The Honorable Janis Graham Jack
US District Court for the Southern District of Texas
Corpus Christi, Texas**

**Ms. Kathleen Aisling
US Environmental Protection Agency, Region 6
Dallas, Texas**

**Ms. Susan Clewis
Texas Commission on Environmental Quality, Region 14
Corpus Christi, Texas**

Submitted by

**David Allen, Ph.D.
Principal Investigator
Center for Energy and Environmental Resources
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August 28, 2009

I. Introduction

On October 1, 2003, the US District Court for the Southern District of Texas issued an order to the Clerk of the Court to distribute funds in the amount of \$6,700,000, plus interest accrued, to The University of Texas at Austin (UT Austin) to implement the court ordered condition of probation (COCP) project *Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation* (Project). This quarterly report has been prepared pursuant to the requirements of the project and is being submitted to the US District Court, the US Environmental Protection Agency (EPA), and the Texas Commission on Environmental Quality (TCEQ).

II. Project Progress Report

The focus of work during the quarter ending June 30, 2009 has been directed to the following activities.

A. Operations and Maintenance Phase of the Project

A detailed description of the data analyses for this quarter appears in Appendix A, pages 6 through 20, and a summary of these analyses appear in this section.

The Project consists of a network of seven (7) air monitoring stations with air monitoring instruments and surveillance camera equipment. A map showing locations of COCP Project monitoring sites along with TCEQ sites and sites operated by Texas A&M at Kingsville (TAMUK) appears in Figure 1, below. Table 1, page 3, identifies the location and instrumentation found at each of the COCP Project sites. TCEQ and TAMUK sites provide some additional data used in analyses.

Figure 1. Corpus Christi Monitoring Sites

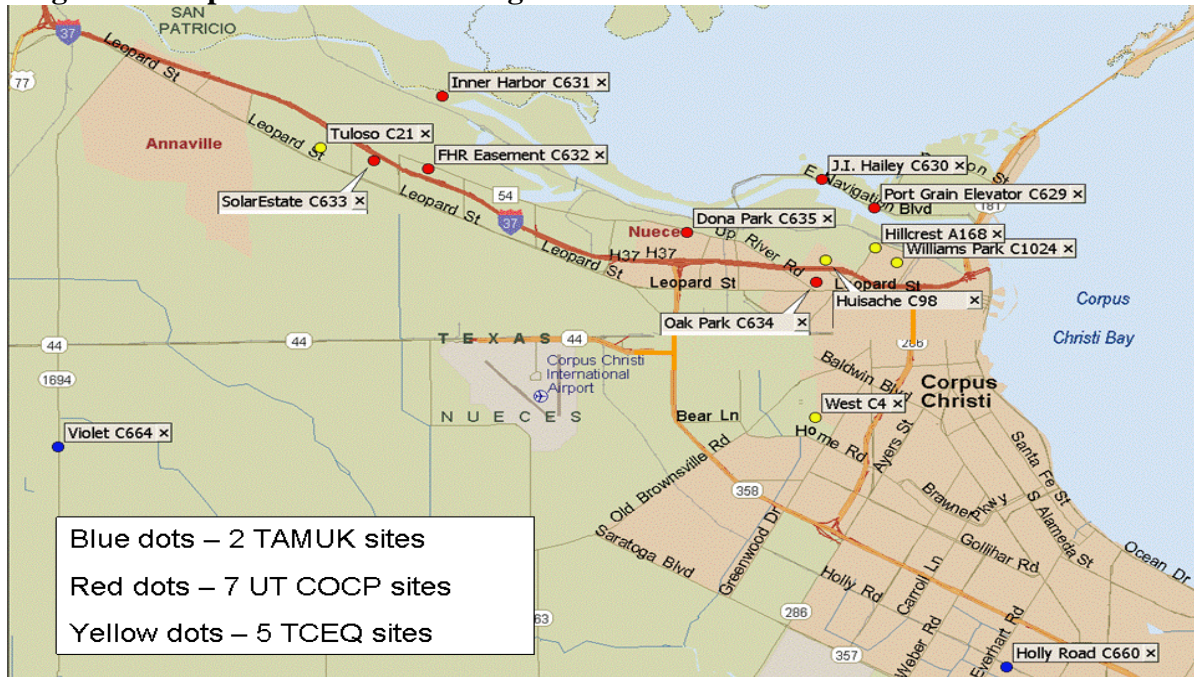


Table 1. Schedule of Air Monitoring Sites, Locations and Major Instrumentation

TCEQ CAMS Nbs.	Description of Site Location	Monitoring Equipment				
		Auto GC	TNMHC(T) & Canister(C)	H2S & SO2	Met Station	Camera
634	Oak Park Recreation Center	Yes	T		Yes	
629	Grain Elevator @ Port of Corpus Christi		T&C	Yes	Yes	
630	J. I. Hailey Site @ Port of Corpus Christi		T&C	Yes	Yes	
635	TCEQ Monitoring Site C199 @ Dona Park		T&C	Yes	Yes	Yes
631	Port of Corpus Christi on West End of CC Inner Harbor		T&C	Yes	Yes	
632	Off Up River Road on Flint Hills Resources Easement		T&C	Yes	Yes	
633	Solar Estates Park at end of Sunshine Road	Yes	T	Yes	Yes	Yes

Legend

- Auto GC automated gas chromatograph
- TNMHC total non-methane hydrocarbon analyzer (all except 634 & 633 also have canister hydrocarbon samplers)
- H₂S hydrogen sulfide analyzer
- SO₂ sulfur dioxide analyzer
- Met Station meteorology station consisting of measurement instruments for wind speed, wind direction, ambient air temperature and relative humidity
- Camera surveillance camera

A discussion of data findings for the quarter appears in Appendix A, pages 6 though 20. Specifically, the appendix contains the following elements:

- **Auto-GC Data Summary** - In examining the first quarter’s hourly auto-GC data from Oak Park and Solar Estates, no measurements were found to have exceeded a short-term Reference Value or ESL. Also, the quarterly averages of all species were below the respective annual ESLs. A summary appears in Appendix A, pages 12 through 14.
- **Benzene Trends at Auto-GC Sites** – This is the first quarter for which five years of data are available to examine trends. Benzene trends appear to have flattened out. Tabulated results are in Appendix A, pages 14 and 15.
- **Update on White Point Emissions** – Fewer elevated TNMHC e-mail alerts have been received this quarter that may be related to oil and natural gas extractions on the White Point peninsula, but a handful were produced from measurements at Dona Park this quarter. A brief summary appears in Appendix A, pages 15 and 16.

- **Case Studies of Pollution Events** – Two canister samples were taken this quarter, and results are discussed in Appendix A, pages 17 through 20.

B. Scheduled Meetings of the Volunteer Advisory Board

The Corpus Christi Project Advisory Board met on March 25, 2009. The meeting notes from that Advisory Board Meeting are found in Appendix B, pages 21 through 25.

C. Project Management and Planning

Project Management and Planning during this period has focused on the following four (4) major activities.

1. **Air Monitoring Operations**

Operations and maintenance of the seven monitoring sites reporting data via the TCEQ LEADS is on-going. The data can be accessed and reviewed at the project website (<http://www.utexas.edu/research/ceer/ccaqp/>).

2. **Communication and Reporting**

The status of the Project has been communicated through the website, which is operational with portions under continual development, quarterly and annual reports, meetings of the Project's Advisory Board and presentations to local community organizations. During this quarter, the following presentations were made.

Date: May 11, 2009 Organization: Coastal Bend Foundation
Presentation: "Corpus Christi Air Quality and Surveillance Camera Project"

Date: June 24, 2009 Organization: Corpus Christi Air Quality Group
Presentation: "Assessing the Impact on Air Quality Associated with Operations of the Proposed Las Brisas Power Plant"

3. **Budget Monitoring**

Budget monitoring during the period has focused on project costs for Phase II - Sites Operation and Maintenance costs. Financial reports for the quarter are included in Appendix B, pages 23 and 24.

4. **Other Contributions**

Equistar Chemicals, LP, (A Lyondell Company) SEP under Agreed Final Judgment and Order Docket No. D-1-GV-06-002509 in the amount of \$400,000 (as a result of violations of the Federal and Texas Clean Air Acts). Subsequent to the March 31, 2009 Quarterly Report to the Court, the TCEQ notified UT Austin that Equistar Chemicals (a subsidiary of LyondellBasell Industries and US affiliate Loyondell Chemical Co.), filed for Chapter 11 bankruptcy on January 6, 2009 and that the \$400,000 ordered to be paid by Equistar for this project might be subject to a collection effort in that proceeding on behalf of the creditors. As a consequence, the funding for the Equistar SEP award is now on indefinite hold. UT Austin will advise the court once the final status of the Equistar SEP funds has been determined.

III. Financial Report

As required, the following financial summary information is provided. Details supporting this financial summary are included in Appendix B, pages 23 and 24.

A. Total Amount of COCP Funds and Other Funds Received Under the Project

The COCP funds received through June 30, 2009 totals \$7,469,426.29. This total includes interest earned through June 30, 2009.

B. Detailed List of the Actual Expenditures Paid from COCP Funds

Expenditures of COCP funds during this quarter totaled \$194,731.73. The detailed breakdown of the actual expenditures is included in Appendix B, page 24. The activities for which these expenditures were used are detailed in Section II, on page 2 of this report.

C. Total Interest Earned on COCP Funds During the Quarter

The interest earned during this quarter totaled \$18,861.10. A report providing detailed calculations of the interest earned on the COCP funds during each month of the quarter is included in Appendix B, pages 23 and 24.

D. Balance as of March 31, 2009, in the COCP Account

The balance in the COCP account, including interest earned totals \$2,680,482.62.

E. Expected Expenditures for the Funds Remaining in the COCP Account

The projected expenditures for the funds remaining totals \$2,680,482.62.

Quarterly Report Distribution List:

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APPENDIX A

Data Analysis for Corpus Christi Quarterly Report

April 1, 2009 through June 30, 2009

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Data Analysis for Corpus Christi Quarterly Report

This technical report describes recent results of monitoring and analysis of data under the Corpus Christi Air Quality Project for the period April 1 through June 30, 2009. The monitoring network is shown in Figure 2, page 8, and is described in Table 1 below. This report contains the following elements:

- a summary of hourly speciated hydrocarbon concentrations measured by automated gas chromatographs (auto-GCs) in two residential areas;
- updated benzene trends at two auto-GC sites;
- an update on concentrations possibly related to White Point oil and natural gas extraction emissions;
- case studies of two canister samples taken this quarter.

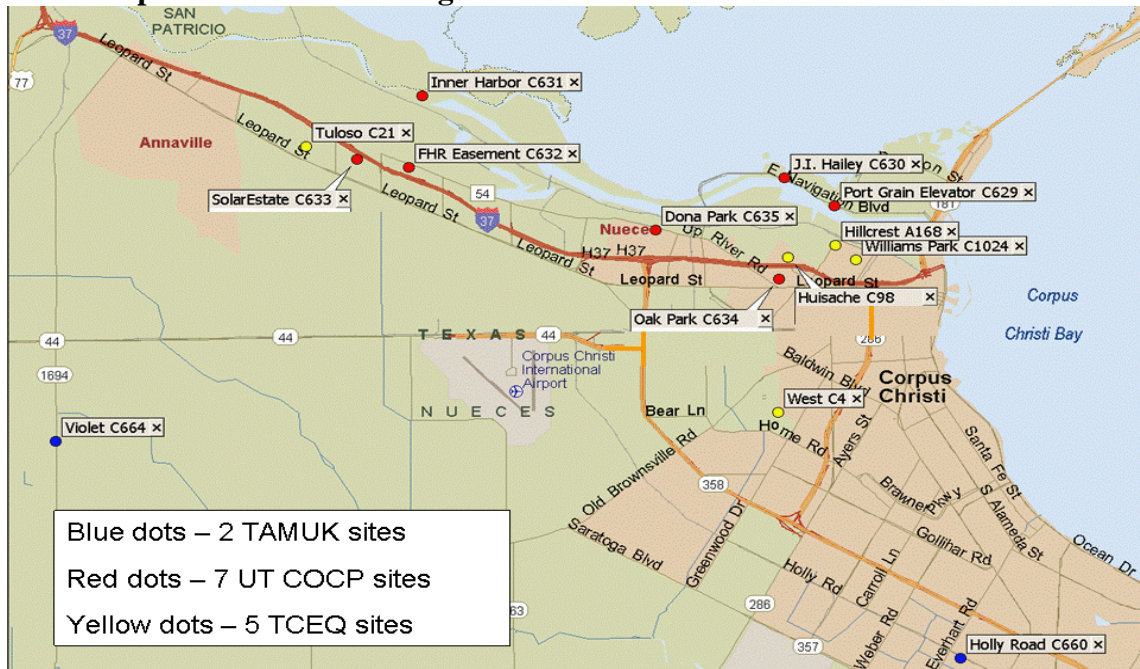
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TCEQ CAMS#	Description of Site Location	Monitoring Equipment				
		Auto GC	TNMHC (T) / Canister (C)	H ₂ S & SO ₂	Met Station	Camera
634	Oak Park Recreation Center (OAK)	Yes	T		Yes	
629	Grain Elevator @ Port of Corpus Christi (CCG)		T&C	Yes	Yes	
630	J. I. Hailey Site @ Port of Corpus Christi (JIH)		T&C	Yes	Yes	
635	TCEQ Monitoring Site C199 @ Dona Park (DPK)		T&C	Yes	Yes	Yes
631	Port of Corpus Christi on West End of CC Inner Harbor (WEH)		T&C	Yes	Yes	
632	Off Up River Road on Flint Hills Resources Easement (FHR)		T&C	Yes	Yes	
633	Solar Estates Park at end of Sunshine Road (SOE)	Yes	T	Yes	Yes	Yes

Legend

Auto GC	automated gas chromatograph
TNMHC	total non-methane hydrocarbon analyzer (all except 633 & 634 also have canister hydrocarbon samplers)
H ₂ S	hydrogen sulfide analyzer
SO ₂	sulfur dioxide analyzer
Met Station	meteorology station consisting of measurement instruments for wind speed, wind direction, ambient air temperature and relative humidity
Camera	surveillance camera

Figure 2. Corpus Christi Monitoring Sites



Glossary of terms

- **Pollutant concentrations** – Concentrations of most gaseous pollutants are expressed in units denoting their “mixing ratio” in air; i.e., the ratio of the number molecules of the pollutant to the total number of molecules per unit volume of air. Because concentrations for all gases other than molecular oxygen, nitrogen, and argon are very low, the mixing ratios are usually scaled to express a concentration in terms of “parts per million” (ppm) or “parts per billion” (ppb). Sometimes the units are explicitly expressed as ppm-volume (ppm_v) or ppb-volume (ppb_v) where 1 ppm_v indicates that one molecule in one million molecules of ambient air is the compound of interest and 1 ppb_v indicates that one molecule in one billion molecules of ambient air is the compound of interest. In general, air pollution standards and health effects screening levels are expressed in ppm_v or ppb_v units. Because hydrocarbon species may have a chemical reactivity related to the number of carbon atoms in the molecule, mixing ratios for these species are often expressed in ppb-carbon (ppb_v times the number of carbon atoms in the molecule), to reflect the ratio

- **Auto-GC** - The automated gas chromatograph collects a sample for 40 minutes, and then automatically analyzes it for some 47 hydrocarbon species. These include benzene and 1,3-butadiene, which are air toxics, various butene species that have relatively low odor thresholds, and a range of gasoline and vehicle exhaust components. Auto-GCs operate at Solar Estates CAMS 633 and Oak Park CAMS 634.
- **Total non-methane hydrocarbons (TNMHC)** – TNMHC represent a large fraction of the total volatile organic compounds released into the air by human and natural processes. TNMHC is an unspciated total of all hydrocarbons, and individual species must be resolved by other means, such as with canisters or auto-GCs. However, the time resolution of the TNMHC instrument is much shorter than the auto-GC, and results are available much faster than with canisters. TNMHC analyzers operate at all seven UT/CEER sites.
- **Canister** – Stainless steel canisters are filled with air samples when an independent sensor detects that elevated (see below) levels of hydrocarbons (TNMHC) are present. Samples are taken for various lengths of time (generally 20 minutes) to try to capture the chemical make-up of the air. In most cases, the first time on any day that the monitored TNMHC concentration exceeds 2000 ppbC at a site for a continuous period of 15 minutes or more, the system will trigger and a sample will be collected. Samples are sent to UT Austin and are analyzed in a lab to resolve some 60 hydrocarbon and 12 chlorinated species. Canister samplers operate at five sites (CAMS 629,630,631,632, and 635).
- **Effects Screening Levels (ESLs) and Reference Values (ReVs)** – The definitions and details about the use of ESLs and ReVs appear in the “RG-442” regulations guidance document *Guidelines to Develop Effects Screening Levels, Reference Values, and Unit Risk Factors*, found at http://www.tceq.state.tx.us/comm_exec/forms_pubs/pubs/rg/rg-442.html (Accessed July, 2009). Extracts from this document appear below:

1.1 Legal Authority and Regulatory Use: The Texas Clean Air Act (Chapter 382 of the Texas Health and Safety Code (THSC)) authorizes the TCEQ to prevent and remedy conditions of air pollution. Section 382.003 of the THSC defines air pollution as

the presence in the atmosphere of one or more air contaminants or combination of air contaminants in such concentration and of such duration that:

- *are or may tend to be injurious to or to adversely affect human health or welfare, animal life, vegetation, or property; or*
- *interfere with the normal use and enjoyment of animal life, vegetation, or property.*

Sections 382.0518 and 382.085 of the THSC specifically mandate the TCEQ to conduct air permit reviews of all new and modified facilities to ensure that the operation of a proposed facility will not cause or contribute to a condition of air pollution. Air permit reviews typically involve evaluations of best available control technology and predicted air concentrations related to proposed emissions from the new or modified facility. In the review of proposed emissions, federal/state standards and chemical-specific **Effects Screening Levels** (ESLs) are used, respectively, for criteria and non-criteria pollutants. Because of the comprehensiveness of the language in the THSC, ESLs are developed for as many air contaminants as possible, even for chemicals with limited toxicity data.

Air contaminants may cause both direct and indirect effects. Direct effects are those that result from direct inhalation and dermal exposures to chemicals in air. Deposition of contaminants on soil and water—and subsequent uptake by plants and animals—may cause indirect effects in humans who consume those plants and animals. However, the THSC authorizes the prevention and remedy of air pollution based on effects and interference from contaminants *present in the atmosphere*, i.e., direct effects. Therefore, during the air permitting process, the TCEQ does not set air emission limits to restrict, or perform analysis to determine, the impacts emissions may have, by themselves or in combination with other contaminants or pathways, after being deposited on land or water or incorporated into the food chain. However, indirect effects are assessed during cleanup efforts under the Risk Reduction and Texas Risk Reduction Program Rules, described below.

The TCEQ also relies upon this authority to evaluate air monitoring data. Texas has the largest ambient air toxics monitoring network in the country, receiving monitoring data for up to 186 air toxics at approximately 57 different locations throughout the state. **Reference Values** (ReVs) and **Unit Risk Factors** (URFs) are used to evaluate measured air toxics concentrations for their potential to cause health and welfare effects, as well as to help the agency prioritize its resources in the areas of permitting, compliance, and enforcement.

Sec. 1.7 Use of ESLs, ReVs, and URFs in TCEQ Program Areas: The TS [Toxicology Section] develops ESLs, ReVs, and URFs to provide toxicological support to multiple program areas within the TCEQ... In the air permit review process, the TS utilize short- and long-term ESLs to evaluate proposed emissions for their potential to adversely affect human health and welfare. For evaluation of ambient air monitoring results, acute and chronic ReVs and URFs are used to assess the potential for exposure to the measured concentrations to cause human health effects. To assess potential welfare effects for monitoring results, the TS uses odor- and vegetation-based ESLs.

The TCEQ Toxicology Section is continuing long-term analysis of these thresholds and persons may subscribe to an e-mail listserv for updates at the Web site <http://www.tceq.state.tx.us/implementation/tox/esl/ESLMain.html> (accessed July 2009).

The current ESLs for benzene are 55.5 ppbV for short term and 1.4 ppbV for long term exposure. TCEQ has recommending using the ReV for short term assessments of benzene concentrations. This number is 180 ppbV. Thus, only when individual auto-GC one-hour values or canister 20-minute values for benzene exceed 180 ppbV will a short-term “exceedance” for benzene be noted.

- **Elevated Concentrations** – In the event that measured pollutant concentrations are above a set threshold they are referred to as “elevated concentrations.” The values for these thresholds are summarized by pollutant below. As a precursor to reviewing the data, the reader should understand the term “*statistical significance*”. In the event that a concentration is higher than one would typically measure over, say, the course of a week, then one might conclude that a specific transient assignable cause may have been the pollution source, because experience shows the probability of such a measurement occurring under normal operating conditions is small. Such an event may be labeled “statistically significant” at level 0.01, meaning the observed event is rare enough that it is not expected to happen more often than once in 100 trials. This does not necessarily imply the occurrence of a violation of a health-based standard. A discussion of “elevated concentrations” and “statistical significance by pollutant type follows:
 - For H₂S or SO₂, any measured concentration greater than the level of the state residential standards, which are 80 ppb for H₂S and 400 ppb for SO₂, is considered “elevated.” Note that the concentrations need not persist long enough to constitute an exceedance of the standard to be so regarded. In addition, any closely spaced values that are statistically significantly (at 0.01 level) greater than the long-run average concentration for a period of one hour or more will be considered “elevated” because of their unusual appearance, as opposed to possible health consequence. The rationale for doing so is that unusually high concentrations at a monitor may suggest the existence of unmonitored concentrations closer to the source area that are potentially above the state’s standards.
 - For TNMHC, any measured concentration greater than the canister triggering threshold of 2000 ppbC is considered “elevated.” Note that the concentrations need not persist long enough to trigger a canister (900 seconds).
 - For benzene and other air toxics in canister samples or auto-GC measurements, any concentration above the ReV is considered “elevated.” Note that 20-minute canister samples and 40-minute auto-GC measurements are both compared with the ReV or ESL, whichever is deemed appropriate by the TCEQ.
 - Some hydrocarbon species measured in canister samples or by the auto-GC generally appear in the air in very low concentrations close to the method detection level. Similar to the case above with H₂S and SO₂, any values that are statistically significantly (at 0.01 level) greater than the long-run average concentration will be considered “elevated” because of their unusual appearance, as opposed to possible health consequence. The rationale for doing so is that unusually high concentrations at a monitor may suggest an unusual emission event in the area upwind of the monitoring site.

1. Auto-GC Data Summaries in Residential Areas

In this section the results of semi-continuous sampling for hydrocarbons at the two auto-GC sites – Solar Estates C633 and Oak Park C634 – are presented. These two sites are located in residential areas generally downwind of industrial emissions under northerly winds. In examining aggregated data one observes similar patterns of hydrocarbons at the two sites, with concentrations averaging higher at Oak Park than at Solar Estates.

Tables 2 and 3, pages 13 and 14, respectively, summarize data from the second quarter of 2009. These tables are available to TCEQ staff at http://rhone.tceq.state.tx.us/cgi-bin/agc_summary.pl (accessed July 2009). The tables show the average concentrations and the maximum one-hour and 24-hour average concentrations for 27 hydrocarbon species of interest over the quarter. Note that not all data have been validated and are thus subject to change. All concentration values in the tables are in ppbV units. No concentrations or averages of concentrations were greater than effects screening levels or reference values during the quarter.

In each table, the “Num Ambient Samples” column includes all ambient samples, including those that are not flagged as validated. The “Mean” is calculated as a weighted average of daily averages and takes into account the number of samples flagged ambient for each day.

The rows for *benzene* are highlighted owing to the concern that the values for this species tend to be closer to the reference and screening values than other species. The current benzene Reference Value used in toxicological evaluations to screen for areas of concern is 180 ppbV. The current short-term benzene ESL, which is only used for permitting purposes, is 55 ppbV. The annual ESL for benzene, which is used for both permitting and toxicological evaluations to screen for areas of concern, is 1.4 ppbV.

Note that some 600 hourly records for three *pentene* species have been invalidated and excluded at Oak Park for the quarter. Most of the data loss occurred May 2 – 27 because of equipment problems.

Table 2. Oak Park 2nd quarter 2009 Auto-GC species of interest, ppbV units

Species	Num Ambient Samples	Mean	Peak 1-Hour Value	Peak 24-Hour Value
Ethane	1953	3.52	74.99	13.2
Ethylene	1953	0.33	36.79	2.25
Propane	1953	1.82	84.66	9.69
Propylene	1953	0.17	11.05	0.83
Isobutane	1953	0.92	268.77	16.01
n-Butane	1953	1.80	681.39	38.77
t-2-Butene	1953	0.03	0.73	0.15
1-Butene	1953	0.02	0.55	0.12
c-2-Butene	1953	0.01	0.61	0.12
Isopentane	1952	1.50	265.29	16.74
n-Pentane	1953	0.98	322.88	18.55
1,3-Butadiene	1953	0.02	2.43	0.25
t-2-Pentene	1255	0.03	2.91	0.22
1-Pentene	1254	0.02	1.37	0.11
c-2-Pentene	1254	0.01	1.52	0.11
n-Hexane	1953	0.24	72.62	4.25
Benzene	1953	0.17	11.68	1.40
Cyclohexane	1953	0.07	5.79	0.45
Toluene	1953	0.28	9.94	1.14
Ethyl Benzene	1953	0.01	0.66	0.08
p-Xylene + m-Xylene	1953	0.06	2.06	0.29
o-Xylene	1953	0.02	0.68	0.09
Isopropyl Benzene - Cumene	1952	0.01	0.75	0.15
1,3,5-Trimethylbenzene	1952	0	0.34	0.05
1,2,4-Trimethylbenzene	1952	0.02	0.62	0.07
n-Decane	1952	0.01	0.79	0.11
1,2,3-Trimethylbenzene	1952	0	0.32	0.04

Table 3. Solar Estates 2nd quarter 2009 Auto-GC species of interest, ppbV units

Species	Num Ambient Samples	Mean	Peak 1-Hour Value	Peak 24-Hour Value
Ethane	1959	4.14	66.36	11.71
Ethylene	1959	0.20	6.04	0.84
Propane	1959	1.92	61.61	8.15
Propylene	1959	0.09	13.15	0.64
Isobutane	1959	0.63	21.67	2.81
n-Butane	1959	0.91	31.35	5.50
t-2-Butene	1959	0.03	0.67	0.15
1-Butene	1959	0.02	0.42	0.10
c-2-Butene	1959	0.01	0.90	0.13
Isopentane	1959	0.63	12.88	2.63
n-Pentane	1959	0.38	8.65	1.39
1,3-Butadiene	1959	0.05	29.21	1.85
t-2-Pentene	1959	0.01	0.65	0.10
1-Pentene	1959	0.01	0.33	0.08
c-2-Pentene	1959	0.01	0.33	0.04
n-Hexane	1959	0.13	2.60	0.49
Benzene	1959	0.14	2.89	0.48
Cyclohexane	1959	0.09	2.86	0.46
Toluene	1959	0.17	4.26	0.81
Ethyl Benzene	1959	0.01	0.38	0.09
p-Xylene + m-Xylene	1959	0.07	3.87	0.67
o-Xylene	1959	0.02	1.77	0.25
Isopropyl Benzene - Cumene	1959	0	0.30	0.06
1,3,5-Trimethylbenzene	1959	0.01	0.35	0.07
1,2,4-Trimethylbenzene	1959	0.02	0.47	0.11
n-Decane	1959	0.01	0.59	0.12
1,2,3-Trimethylbenzene	1959	0	0.23	0.05

2. Benzene Trends at Auto-GC Sites

This quarter is the first for which the project has **five** years of quarterly data. Tables 4 and 5 on page 15, show comparisons between the second quarter averages for benzene at Oak Park CAMS 634 and Solar Estates CAMS 633, from 2005 to 2009. The two tables show the number of samples, the mean concentration for the quarter, and the maximum one-hour and midnight-to-midnight 24-hour average concentrations in ppbV units for the quarter.

Table 4. Summary of 2nd Q benzene at Oak Park 2005-2009, ppbV units

Year	Num Samples	Mean ppbV	Peak 1-hour value	Peak 24-hour value
2Q05	1935	0.20	11.39	1.28
2Q06	1913	0.31	19.99	3.27
2Q07	1956	0.32	16.57	3.74
2Q08	1948	0.14	3.72	0.79
2Q09	1953	0.17	11.68	1.40

Table 5. Summary of 2nd Q benzene at Solar Estates 2005-2009, ppbV units

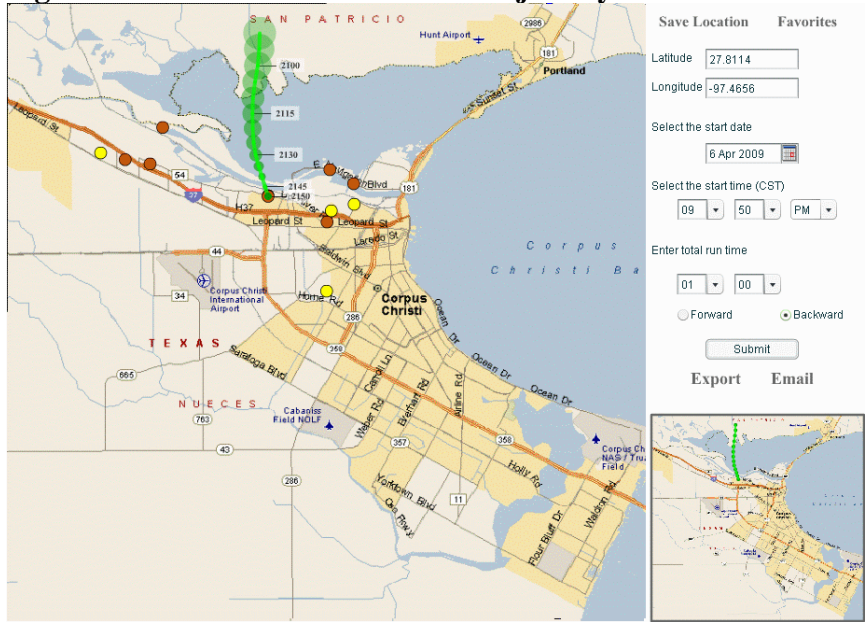
Year	Num Samples	Mean ppbV	Peak 1-hour value	Peak 24-hour value
2Q05	1619	0.25	3.46	0.73
2Q06	1489	0.18	4.97	0.84
2Q07	1307	0.23	3.14	0.92
2Q08	1781	0.13	5.31	0.63
2Q09	1959	0.14	2.89	0.48

Table 4 shows that there was a slight up-tick in the 2009 second quarter compared with 2008 at Oak Park. However, concentrations remained statistically and practically significantly lower than data from 2006 and 2007.

3. Update on White Point Emissions

The last two reports have described the measurements taken at monitors that are related to oil and natural gas extraction activities on the White Point peninsula on the north shore of Nueces Bay in San Patricio County. Naturally, because the frequency of northerly winds is less in the second quarter of the year, fewer elevated TNMHC measurements have recorded that can be related to this source area. Nevertheless, alerts were triggered at Dona Park on April 2, April 5, April 6, and June 24 for which surface back-trajectories crossed the Bay to reach White Point. Two examples are shown in Figures 3 and 4 on page 16. No canisters were triggered for these alerts, however.

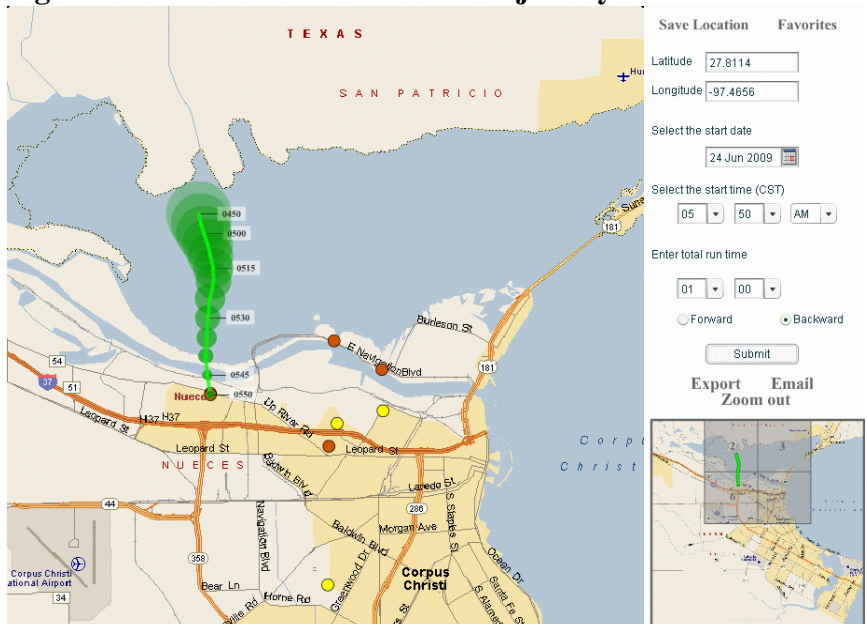
Figure 3. Dona Park surface back-trajectory from alert on 21:50 CST April 6, 2009



Alert ID: emrs_medium_alert_48355003443102_20090406_2150

TNMOC MEDIUM trigger at site Dona Park C635/AF199/F299
 2265.87 >= 2000.00 ppbC (no previous trigger)
 WD = 344 degrees
 WS = 2.8 mph
 time of trigger 21:50 (CST) 2009.04.06

Figure 4. Dona Park surface back-trajectory from alert at 5:00 CST June 24, 2009



Alert ID: emrs_medium_alert_48355003443102_20090624_0550

TNMOC MEDIUM trigger at site Dona Park C635/AF199/F299
 2793.39 >= 2000.00 ppbC (no previous trigger)
 WD = 342 degrees
 WS = 4.4 mph
 time of trigger 5:50 (CST) 2009.06.24

4. Case Studies of Pollution Events

Only two canister samples were taken in the second quarter of 2009. The rate at which canisters have been sampled has remained relatively unchanged over the past three years. Table 6 below shows the counts for the number of canister samples since April 2006 by quarter. The table shows that the fourth quarter of each year has had the most canister-triggering activity, and the second quarter has had the least. The last row is highlighted because it is the most recently concluded quarter.

Table 6. Total number of canister samples at 5 sites by quarter

Quarter/year	Number of 20-minute canister samples
2Q06	7
3Q06	4
4Q06	23
1Q07	10
2Q07	6
3Q07	9
4Q07	40
1Q08	3
2Q08	2
3Q08	6
4Q08	22
1Q09	15
2Q09	2

The location, date-time, concentration summary for the two second quarter 2009 canisters are in Table 7 below. The table also shows the comparison between adding up the individual identified chemical species mass (“Canister sum...”) compared to the approximate coincident 20 minute TNMHC average. Recall that TNMHC is measured in five-minute integrated samples, so in comparing a canister sum taken from 12:38 a.m. to 12:58 a.m. on April 8 at JIH to the 12:35 to 12:55 continuous TNMHC analyzer weighted average some accuracy in the comparison is lost. Nevertheless, the agreement is good for both canisters.

Table 7. Canister samples summary

Site name	Date-time CST	Canister sum of identified species ppbC	Approx. coincident mean TNMHC ppbC
JIH CAMS 630	4/8/09 0:38	5,804	4,697
CCG CAMS 629	4/13/09 4:22	1,263	1,274

The patterns of hydrocarbon species from the two canisters appear side-by-side in Figure 5 on page 18. The short-term surface back-trajectories corresponding to the two events appear in Figure 6 on page 18, where only the first couple of 5-minute time steps are connected by straight lines based on interpolating to 1-minute steps and placed on a Google Earth map.

Figure 5. Two canister samples 2nd Q 2009

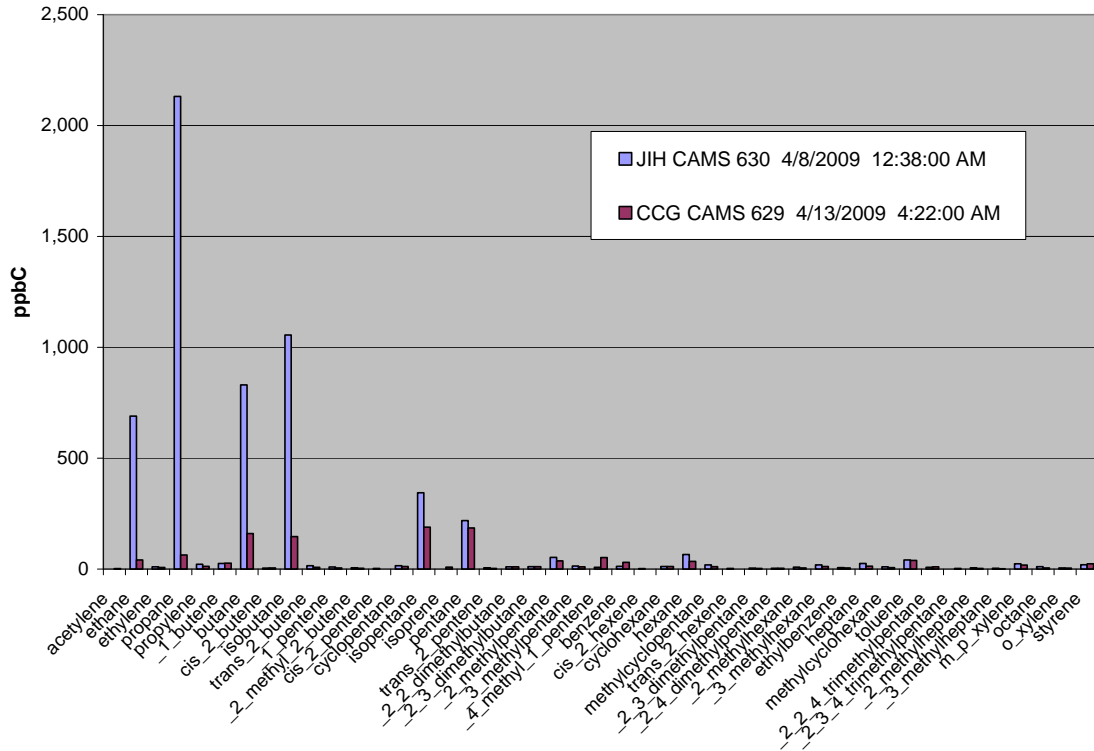


Figure 6. Interpolated 1-minute time steps for surface back-trajectories from JIH on April 8 and CCG on April 13.



A time series of the 5-minute resolution monitoring data from JIH on April 7-8 and from CCG on the morning of April 13 show significant differences. Figure 7 below shows the data from JIH, and features 115 individual 5-minute TNMHC values greater than 1,000 ppbC over a 12 hour period, all coming from the south centered on a 183 degree direction identical to the JIH upwind path in Figure 6 on page 18. The time the canister sampled is at the center of the image in Figure 7 below just after 0:00 (for midnight CST on April 8). Note the coincident increase in methane and sulfur dioxide (SO₂). Hydrogen sulfide (H₂S) concentrations were flat at 0.0.

Figure 7. Data from JIH on April 7-8 (48 hours total).

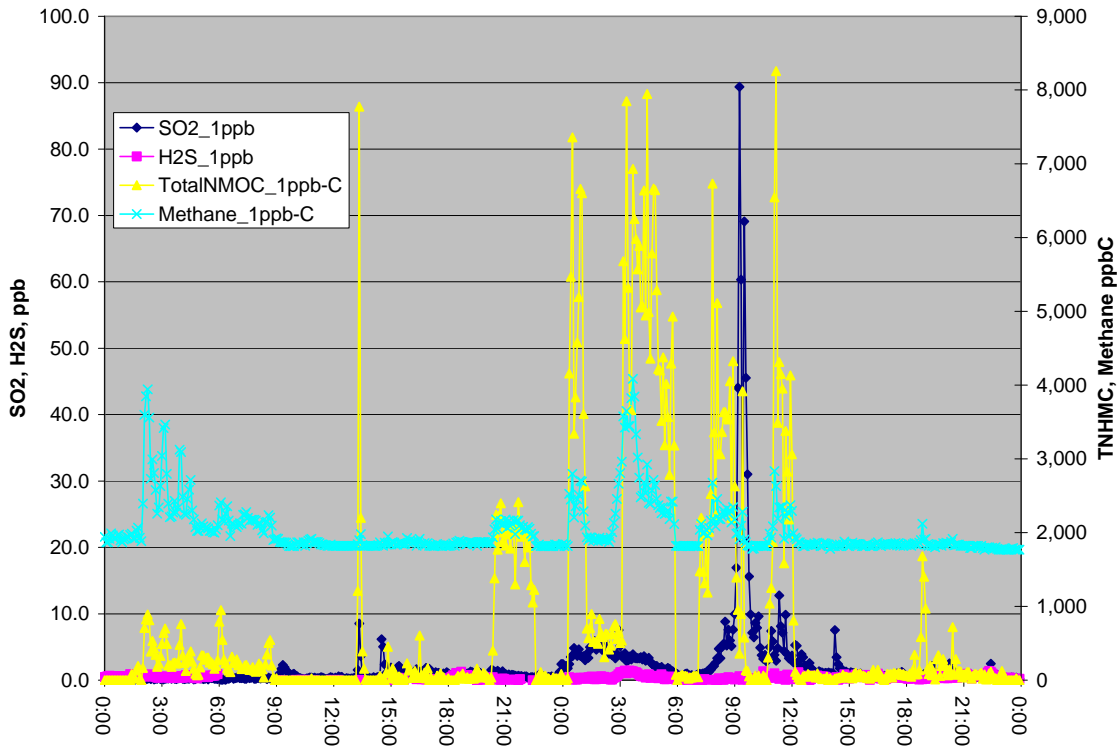
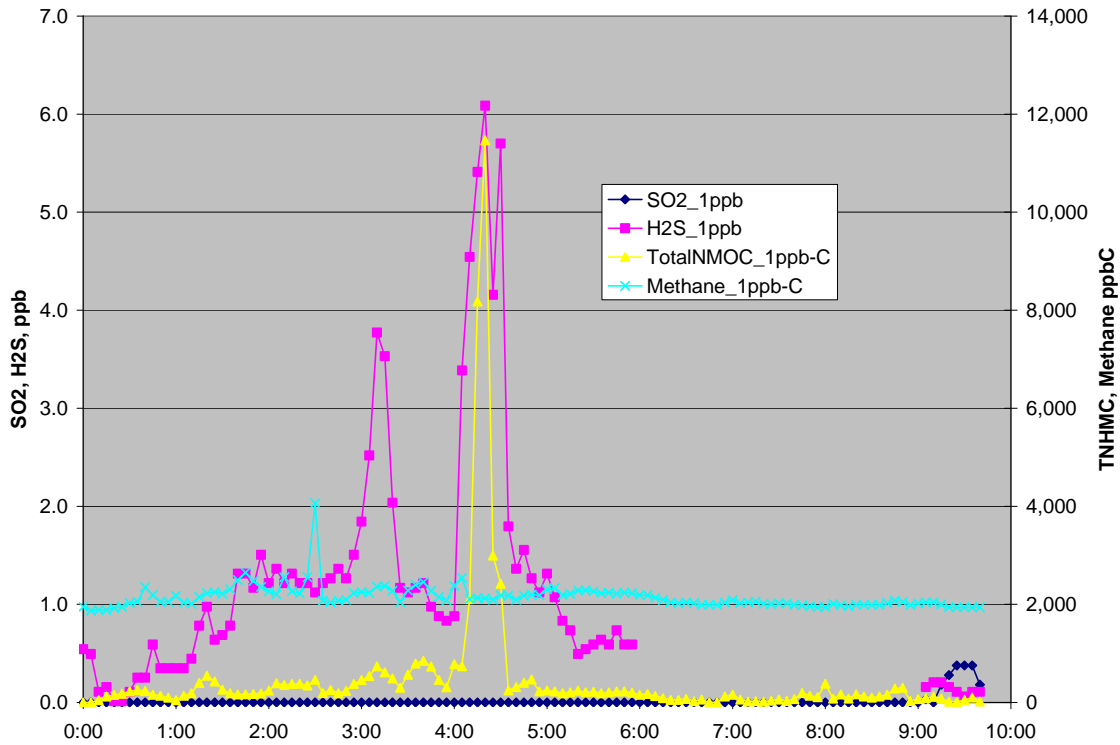


Figure 8 on page 20, shows the data from CCG on April 13, and features a sharp, short-term TNMHC spike. Wind direction was shifting from southeast through south to west to northwest over the course of the morning. The time the canister sampled is near the center of Figure 8 just after 4:00 (for 4 CST on April 13). Note the methane and SO₂ are flat, but H₂S concentrations rose earlier and peaked coincident with TNMHC.

Figure 8. Data from CCG on April 13, midnight – 10 CST.



Based on the difference in surface back-trajectories, the difference in the behavior of continuous 5-minute data, and the difference in the relative ratios of the hydrocarbon species in the canister sample, it is reasonable to conclude that the two events had different sources.

Conclusions from the Second Quarter 2009 Data

In this quarter's report, several findings have been made:

- Periodic air pollution events continue to be measured on a routine basis, but values of hydrocarbons above the reference values and effects screening levels are rarely observed. No measurements exceeded ESLs or Reference Values this quarter in the auto-GC data.
- Benzene concentrations in residential areas were similar in this quarter to the same quarter in 2008, but statistically significantly lower than in the same quarter in 2006 and 2007.
- Emissions from oil and gas explorations and extraction in the White Point area continue to be detected at monitors, but less frequently owing in part to there being fewer northerly winds in the second quarter.

Further analyses will be provided upon request.

APPENDIX B

**March 25, 2009
Advisory Board Meeting Notes**

ADVISORY BOARD MEETING
Corpus Christi Air Monitoring and Surveillance Camera Installation
and Operation Project

Texas A&M University - Corpus Christi

Room 2010, NRC Building

1:30 pm – 3:30 pm

March 25, 2009

Advisory Board Members Present:

Ms. Gretchen Arnold
Ms. Joyce Jarmon
Dr. Glen Kost
Ms. Pat Suter

Corpus Christi Pollution Prevention Partnership TAMUCC
Corpus Christi Community Council
Public Health Awareness
Coastal Bend Sierra Club

Project Personnel Present:

Mr. James Martinez
Mr. Vince Torres
Dr. David Sullivan
Ms. Susan Clewis
Mr. David Kennebeck
Mr. David Turner
Mr. Ken Rozacky
Mr. Edward Michel
Dr. Elena McDonald-Buller
Mr. Gary McGaughey

Probation Office - US District Court
The University of Texas at Austin
The University of Texas at Austin
TCEQ – Region 14
TCEQ – Region 14
TCEQ – Region 14
TCEQ Headquarters - Austin
The University of Texas at Austin
The University of Texas at Austin
The University of Texas at Austin

I. Call to Order and Welcome

Vince Torres called the meeting to order at 1:35 pm.

II. Project Overview and Status

A. Data Collection and Analyses

Dave Sullivan reviewed the location of the seven air monitoring stations, the instrumentation at the sites, and the relevant air quality monitoring terms. He also identified the location of the air monitoring sites that are operated by Texas A&M University Kingsville (TAMUK) and the Texas Commission on Environmental Quality (TCEQ). A map of the Port of Corpus Christi area was used to show the areas of ship loading and unloading operations and its relationship to the monitoring sites.

Dr. Sullivan discussed the monitoring terms and the relationship between the monitoring terms and the data generated from the monitoring network. In particular the term “elevated concentrations” does not represent a violation of a standard, which requires an enforcement action by the TCEQ, rather, this term means the concentration is higher than is normally expected given historical data.

Dr. Sullivan mentioned that during 2008, the benzene concentrations continue to be significantly lower at both the Oak Park and Solar Estates sites than during the first years of operation of the network. He continued that sometime in late 2007, as was previously reported, the Corpus Christi automated alert system began to receive more frequent alerts under northerly winds. He showed that the northerly wind direction “cone” from Dona Park associated with elevated TNMHC concentrations points to White Point, which may have been the location of the emissions causing some of the alerts. Oil and natural gas companies are either reworking or creating new wells in that area. Dr. Kost asked if the fields at White Point are the same as the Saxet Fields. Mr. David Turner responded that he was not sure.

Dr. Kost mentioned that a report published in the USA Today late in 2008, listed wrong information and has misinformed the public about normal emissions from oil and natural gas tanks. He continued that the public is not getting “due diligence” from the Texas Railroad Commission. Dr. Sullivan mentioned that effects screening levels for species in natural gas are higher than for gasoline. Mr. Turner replied that the TCEQ had a helicopter fly the over industrial areas with an IR camera. There was nothing unusual to report except on the north side in the vicinity of White Point.

III. Related Matters

A. Update on approval of installing surveillance cameras at Port of Corpus Christi sites

Mr. Torres updated the Board on acquiring approval to install surveillance cameras at the Port of Christi sites. He made sure the authorities were aware that if we did install the cameras, there would be no live video feeds to a publicly accessible web site. It would be recorded locally (at the site) only. We would use video collected for analysis purposes only. He will continue to work on getting permission to install the cameras. **Action item**

B. Report on Recruiting Participants for the Automated Alert Notification System Project

No companies have signed up to receive automated alerts through the UT system. Mr. Torres has not given up and will continue to try to enlist industry to participate and sign up for the Automated Alert Notification System.

C. Update on the status of SEP Projects

Mr. Torres reported to the Advisory Board that the TCEQ has changed its interpretation of the UT Austin SEP Master Agreement. This change will affect the two newest SEP proposals. In the original SEP Master Agreement, UT was granted a waiver for salaries and other UT personnel related expenses, i.e., fringe benefits, travel and project management expenses. Upon renewal of the SEP Master Agreement, TCEQ has now decided that after a five year period, which ended in January 2009, no funds can be used from SEP awards to support UT Personnel and project related expenses.

The revised or soon to be revised SEP proposals are summarized below.

- 1) TM Corpus Christi Services, Ltd. - \$67,900 – This project has been awarded and will be used for subcontractor fees; purchase of a new camera and/or extend the life of the Corpus Christi Project.
- 2) Equistar Petro Chemicals/Millennium - \$400,000 - Mr. Torres is in the process of submitting a revised proposal to the TCEQ in which the first \$200,000 will be used to purchase and provide training for an IR camera. The second \$200,000 will be used to extend the life of the Corpus Christi Air Monitoring and Surveillance Camera Project. **Action item**

D. Request of the Railroad Commission to make a presentation to the Board Spring 2009 or sooner if possible

Vince Torres will contact the Texas Railroad Commission Regional Director to set up a meeting with the Advisory Board some time possibly in May, if not sooner. **Action item**

E. Report on Annual Meeting before the Honorable Judge Jack

The Honorable Judge Jack expressed her pleasure with the work of the Advisory Board, TCEQ and the personnel. She reiterated that her intentions are that continuation of the Corpus Christi Air Monitoring and Surveillance Camera Project continue for as long as possible with additional funding from any and all sources possible, including SEP Projects. She also clarified her intention that the Advisory Board provides input to UT on projects funded by SEP awards.

IV. Neighborhood Air Toxics Modeling Project

A. Update on Corpus Christi Neighborhood-Scale Air Toxics Modeling Project

Dr. McDonald-Buller reviewed the objectives and accomplishments during the first year of the Neighborhood Air Toxics Modeling Project. The Honorable Judge Jack expressed that she would like the original Corpus Christi Air Monitoring and Surveillance Camera Project to continue for an extended time period. Dr. McDonald-Buller indicated that UT will retain funds from Phase I of the Neighborhood Air Toxics Modeling Project for continued operation of the ambient monitoring network pending Phase II funding. In addition, the air quality modeling and data analysis being conducted under the Neighborhood Air Toxics Modeling Project will be used to investigate and suggest appropriate revisions to the monitoring strategy or network configuration.

Mr. Turner mentioned that there have been discussions about adding a new site or expanding an existing site, with the addition of an auto GC in the Hillcrest Neighborhood. He asked Mr. Torres if the monitoring equipment that was available for use from the Odessa site had been confirmed for use in the Hillcrest Neighborhood. Mr. Turner mentioned that there would be a few possible sites that would benefit from the equipment such as Williams Park and the Hillcrest Neighborhood. Mr. Torres reported that he would talk with and invite a representative from one of these groups about possibly joining this Advisory Board. **Action item** Dr. Kost mentioned that he was friends with Rev. Williams and suggested that Rev. Williams could be used as a contact for the Hillcrest Neighborhood group. Dr. Kost will forward Rev. Williams' contact information to Vince Torres.

Dr. McDonald-Buller also discussed air quality modeling simulations that could be conducted using the models developed for the Corpus Christi Neighborhood Air Toxics project and recent seasonal modeling being developed for the City of Victoria to respond to community questions about the Las Brisas facility. Dr. Kost commented that an educated response from someone that was not directly involved in the process would benefit the community. Both Dr. Kost and Ms. Arnold felt that more information needs to be related to the public. Mr. Turner mentioned that Dr. John from Texas A&M Kingsville had conducted modeling simulations based on emission rates in the permit application. Dr. John used a week-long September 1999 episode. The group briefly discussed Dr. John's results. Dr. McDonald-Buller and the Advisory Board agreed that the UT team would conduct seasonal modeling with an available 2002 episode being developed for the Victoria area to examine the impacts of Las Brisas on concentrations of ozone, sulfate, and oxides of nitrogen. Mr. Turner will put Dr. McDonald-Buller in contact with Randy Hamilton from the TCEQ to obtain input data for the modeling runs.

Ms. Suter asked if there were any special permits required for bulk materials (pet coke) storage. Mr. Kennebeck suggested that some type of special cover may be required. Dr. Kost inquired about whether or not Las Brisas fell under the Public Utilities Commission. Mr. Torres mentioned that he would inquire and report his findings to the Board. **Action item**

In response to the USA Today 2008 article regarding the concentrations of air toxics near U.S. schools, Mr. Turner added that there are at least 10 near-school sites in Texas where further air toxics monitoring is to be conducted. He is not aware of any school location in the Corpus Christi area. Dr. Kost mentioned that Driscoll Middle School may be a candidate for monitoring.

V. Advisory Board

A. Replacement of Advisory Board member

Dr. Kost gave Terri the contact information for a possible Board Member. Her name is Irma Valverde. He said there is also a possibility that a Science Director from the secondary schools in the Tuloaso would be interested in serving on the Board. Vince will follow up with Dr. Kost and to get contact

information for the Tuloso ISD. He will also contact Ms. Valverde, and the Science Director from the Tuloso ISD. **Action item**

B. Possible dates for future meeting of the Advisory Board

The following weeks are being held for possible future 2009 meeting dates: Week of July 20, if Board requested, Week of October 26 or November 2. Possible future 2010 meeting dates are: Week of March 22, Week of July 19, if Board requested, and Week of October 25 or November 1.

C. Recommendations for agenda items for next meeting

VI. Other Issues

None mentioned.

VI I. Adjourn

The meeting was adjourned at 4:15pm.

APPENDIX C

**Financial Report of Expenditures
Financial Report of Interest Earned**

Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation Project

**Accounting Report for the Quarter
04/01/09 - 06/30/09**

A. Total Amount of COCP Funds and Other Funds Received Under This Proposal

Total Grant Amount: \$6,761,718.02
 Total Interest Earned: \$707,708.27
 Total Funds Received: \$7,469,426.29

B. Summary of Expenditures Paid by COCP Funds

	Year 3 Budget	Year 4 Budget	Year 5 Adjustments	Year 6 Budget	Yrs 1-6 Adjusted Budget	Prior Activity	Current Activity 04/01/09 - 06/30/09	Encumbrances	Remaining Balance 6/30/2009
Salaries-Prof	12 \$216,128.63	\$160,652.00	286,279.40	299,633.00	\$962,693.03	(\$796,728.02)	(\$59,455.59)	(\$45,517.14)	\$60,992.28
Salaries-CEER	15 \$19,606.37	\$15,636.00	33,123.00	30,948.00	\$99,313.37	(\$76,159.33)	(\$5,701.25)	(\$5,309.08)	\$12,143.71
Fringe	14 \$47,984.00	\$38,783.00	58,333.00	72,728.00	\$217,828.00	(\$175,546.84)	(\$13,416.12)	(\$8,820.62)	\$20,044.42
Other/C-Analysis	47/68 \$60,474.00	\$73,500.00	(8,656.40)	73,500.00	\$198,817.60	(\$50,210.00)	(\$1,800.00)	\$0.00	\$146,807.60
Supplies	50 \$86,844.00	\$33,500.00	68,676.00	122,682.00	\$314,719.73	(\$257,784.01)	(\$15,432.14)	(\$5,170.75)	\$36,332.83
	51 \$20,300.00	8,000.00			\$22,822.27	(\$16,257.76)	(\$327.26)	(\$380.54)	\$5,856.71
Subcontract	62-64 \$1,965,693.00	\$314,022.00	296,734.00	346,289.00	\$2,922,738.00	(\$2,635,417.91)	(\$71,286.08)	\$0.00	\$216,034.01
Travel	75 \$2,300.00	\$2,000.00	7,719.00	9,000.00	\$23,479.00	(\$18,169.76)	(\$1,913.49)	(\$0.03)	\$3,395.72
Equipment	80 \$0.00	\$0.00	0.00		\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Indirect Costs	90 \$359,855.00	\$96,759.00	112,531.00	143,217.00	\$714,362.00	(\$567,938.31)	(\$25,399.80)	\$0.00	\$121,023.89
TOTALS	\$2,758,885.00	757,152.00	862,739.00	1,037,501.00	\$5,476,773.00	(\$4,594,211.94)	(\$194,731.73)	(\$65,198.16)	\$622,631.17

C. Interest Earned by COCP Funds as of 06/30/09

Prior Interest Earned: \$688,847.17
 Interest Earned This Quarter: \$18,861.10
 Total Interest Earned to Date: \$707,708.27

D. Balance of COCP Funds as of 06/30/09

Total Grant Amount: \$6,761,718.02
 Total Interest Earned: \$707,708.27
 Current Q. Expenses (\$194,731.73)
 Total Expenditures: (\$4,594,211.94)
 Remaining Balance: **\$2,680,482.62**

I certify that the numbers are accurate
 and reflect actual expenditures
 for the quarter



Accounting Certification



CENTER FOR ENERGY AND ENVIRONMENTAL RESOURCES

THE UNIVERSITY OF TEXAS AT AUSTIN

*J. J. Pickle Research Campus • 10100 Burnet Road - MS R7100 • Austin, Texas 78758
512/471-7792 • FAX: 512/471-1720*

September 9, 2009

United States District Court
1133 N. Shoreline, Suite 124
Corpus Christi, TX 78401

Attention: Mr. Joe Jasek, Assistant Deputy Chief US Probation Officer

RE: Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation
Project - Errata Statement to the Quarterly Report dated August 27, 2009

Dear Mr. Jasek:

This letter is written to provide a correction to the Quarterly Report submitted to the U.S. District Court via overnight mail on August 27, 2009. The following section of the Quarterly Report is hereby corrected to state:

On Page 5, Section III. Financial Report the section should read:

D. Balance as of June 30, ~~March 31~~, 2009 in the COCP Account

The balance in the COCP account, including interest earned, totals
\$2,680,482.62.

The Quarterly Report and this errata statement should be considered the document of record for the quarterly reporting period of April 1, 2009 through June 30, 2009 for the Corpus Christi Air Monitoring and Surveillance Camera Project.

We apologize for any inconvenience caused by making these necessary corrections to the Quarterly Report.

If you should need additional information concerning this errata statement, please do not hesitate to contact me at (512) 475-7842 or Mr. Vincent Torres at (512) 471-5803.

Sincerely,

A handwritten signature in cursive script that reads "David Allen".

Dr. David T. Allen, Gertz Regents Professor of Chemical Engineering
and Director, Center for Energy and Environmental Resources

cc: Mr. James Martinez, Supervising US Probation Officer
Mr. Vincent M. Torres, University of Texas at Austin, CEER
Dr. David Sullivan, University of Texas at Austin, CEER
Mr. Lee Smith, University of Texas at Austin, Legal Affairs
Advisory Board Members
Mr. David Kennebeck, TCEQ Region 14
Ms. Rosario Torres, TCEQ Region 14
Ms. Susan Clewis, TCEQ Region 14
Mr. Kathleen Aisling, EPA Dallas Region 6
Ms. Sharon Blue, TCEQ Headquarters
Mr. David Brymer, TCEQ Headquarters