Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation Project

Quarterly Report for the Period

January 1, 2008 through March 31, 2008

Submitted to

The Honorable Janis Graham Jack
US District Court Judge, 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

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May 9, 2008

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) *Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation Project* (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 March 31, 2008 has been directed to the following activities.

A. Operations and Maintenance Phase of the Project

A detailed description of some data analyses appear in Appendix A, pages 6 through 24, 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 7, 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

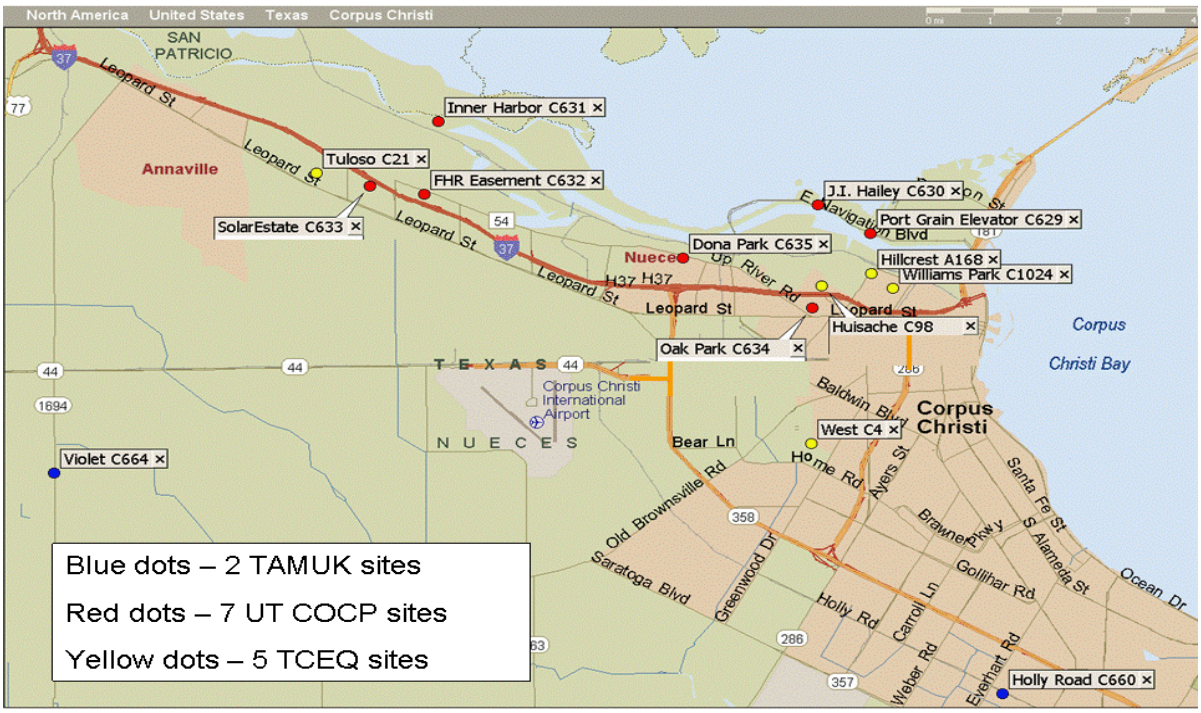

Table 1. Schedule of Air Monitoring Sites, Locations and Major Instrumentation

TCEQ CAMS#	Description of Site Location	Monitoring Equipment				
		Auto GC	TNMHC (T) / Canister (C)	H_2S & 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 634 & 633 also have canister hydrocarbon samplers)
H_2S	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

A discussion of data findings for the quarter appears in Appendix A, pages 6 though 24. Specifically, the appendix contains the following elements:

- **Auto-GC Effects Screening Level 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, as were the rolling averages over the past four quarters. A summary appears in Appendix A, pages 12 though 16.

- **Canister Sampling and Analysis -** During the first quarter of 2008, 3 valid canister samples were collected. This is on a par with the first quarter of past years. One canister contained two compounds whose concentrations exceeded an odor ESL. Two cans were collected in Dec. 2007 that had not been analyzed in time for the last report, and the number of valid canisters for that quarter is revised from 38 to 40. More details about canister sampling appear in Appendix A, pages 17 though 19.

- **Analysis of Two Monitored Air Pollution Events** – These case studies are provided as examples of the use of the data. The data are discussed further in Appendix A, pages 20 though 24.

E. Scheduled Meetings of the Volunteer Advisory Board

There were no meetings of the COCP Advisory Board during this quarter (Jan 1- Mar 31, 2008)

F. 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 System 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, and at meetings of the COCP Project's Advisory Board.

   On January 22, 2008, representatives from the University of Texas at Austin presented the Annual Technical and Financial Project Report for the period of October 1, 2006 through September 30, 2007 before the Honorable Janis Graham Jack, U.S. District Court Judge, Southern District of Texas, Corpus Christi, Texas.

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, page 25.

4. **Other Contributions**
   There were no other contributions awarded during this reporting period.

III. Financial Report

As required, the following financial summary information is provided. Details supporting this financial summary are included in Appendix B, page 25.

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

The COCP funds received through March 31, 2008 totals $7,361,793.89. This total includes interest earned through March 31, 2008.

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

Expenditures of COCP Project funds during this quarter totaled $287,179.85. The detailed breakdown of the actual expenditures is included in Appendix B, page 26. The activities for

which these expenditures were used are detailed in Section II, beginning on page 2 of this report.

C. Total Interest Earned on COCP Project Funds During the Quarter

The interest earned during this quarter totaled $31,424.14. A report providing detailed calculations of the interest earned on the COCP Project funds during each month of the quarter is included in Appendix B, page 26.

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D. Balance as of March 31, 2008, in the COCP Project Account

The balance in the COCP account, including interest earned totals $3,715,136.42.

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

The expected expenditures for the funds remaining totals $3,715,136.42.

Quarterly Report Distribution List:

U.S. District Court
- Ms. Sheila Johnson, Assistant Deputy Chief USPO
- Mr. James Martinez, Supervising USPO

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- Ms. Sharon Blue, Litigation Division – Headquarters
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Environmental Protection Agency
- Ms. Kathleen Aisling, Environmental Engineer, Air Enforcement Section, Dallas Regional Office

Members of the Advisory Board

APPENDIX A

Data Analysis for COCP Project Quarterly Report

January 1, 2008 through March 31, 2008

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Data Analysis for COCP Project Quarterly Report

This technical report describes results of monitoring and analysis of data for the COCP Project over the period from January 1 through March 31, 2008. The monitoring network is shown in Figure 1, 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);
- an update on canister sampling;
- two case studies of the use of data to assess air pollution events.

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

TCEQ CAMS#	Description of Site Location	Monitoring Equipment				
		Auto GC	TNMHC (T) / Canister (C)	H_2S & SO_2	Met Station	Camera
634	Oak Park Recreation Center (**OAK**)	Yes	T		Yes	
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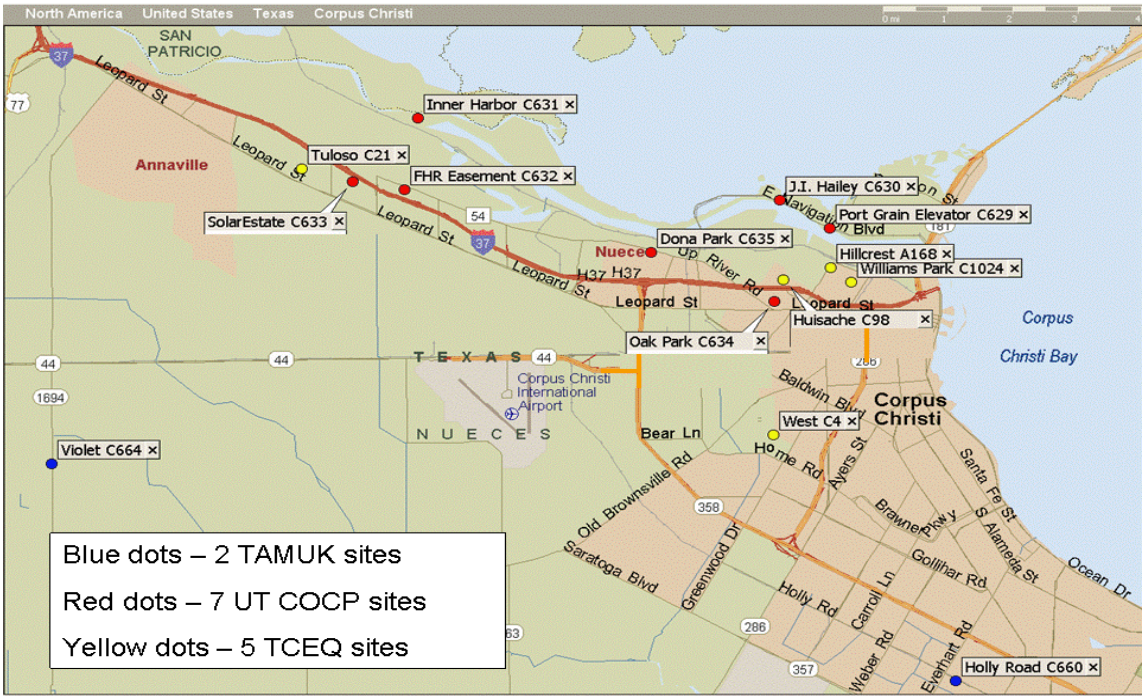
631	Port of Corpus Christi on West End of CC Inner Harbor (**WEH**)		T&C	Yes	Yes	
632	Off Up River Road on Flint Hills Resources Easement (**FHR**)		T&C	Yes	Yes	
633	Solar Estates Park at end of Sunshine Road (**SOE**)	Yes	T	Yes	Yes	Yes

Legend

Auto GC	automated gas chromatograph
TNMHC	total non-methane hydrocarbon analyzer (all except 633 & 634 also have canister hydrocarbon samplers)
H_2S	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 1. 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 (ppmV) or ppb-volume (ppbV) where 1 ppmV indicates that one molecule in one million molecules of ambient air is the compound of interest and 1 ppbV 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 ppmV or ppbV 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 (ppbV times the number of carbon atoms in the molecule), to reflect the ratio of carbon atoms in that species to the total number of molecules in the volume. This is relevant to our measurement of auto-GC species and TNMHC, which are reported in ppbC units. For the purpose of relating hydrocarbons to health effects, this report notes hydrocarbon concentrations in converted ppbV units. However, because TNMHC is a composite of all species with different numbers of carbons, it cannot be converted to ppbV. Pollutant concentration measurements are time-stamped based on the start time of the sample, in Central Standard Time (CST), with sample duration noted.

- **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 unspeciated 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 50 – 55 hydrocarbon species. Canister samplers have operated at all seven UT/CEER sites, but this quarter only at five (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/files/rg-442.pdf_4006501.pdf (Accessed January, 2008). 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 utilizes 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 January 2008).

The current ESLs for benzene are 55.5 ppbV for short term and 1.4 ppbV for long term exposure. TCEQ has recommended 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. The ESLs for benzene had previously been 25ppbV for short term and 1 ppb for long term exposure, and previous reports for this project used these lower mixing ratios in reporting exceedances of ESLs. This and future reports will use the new, higher ESL values, and will report trends using concentrations rather than numbers of hours exceeding an ESL or ReV.

- **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 H_2S or SO_2, any measured concentration greater than the level of the state residential standards, which are 80 ppb for H_2S and 400 ppb for SO_2, 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 then 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 H_2S and SO_2, 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 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 through 5, pages 13 through 16, summarize both the first quarter of 2008 and the most recent rolling four-quarter period for each site. These tables are now available to TCEQ staff at http://rhone.tceq.state.tx.us/cgi-bin/agc_summary.pl (accessed April 2008). Quarterly summaries appear in Table 2, page 13 and Table 3, page 14, which show the average and maximum one-hour concentrations for 27 hydrocarbon species of interest for the quarter, and counts of how many measurements were made above an ESL (zero in this quarter). Rolling four-quarter summaries appear in Table 4, page 15 and Table 5, page 16. All rolling four-quarter averages for all species are below respective long-term ESLs. Note that not all data have been validated and are thus subject to change. All values in the tables are in ppbV units.

As was noted on page 10, the use of a short-term ESL to evaluate hourly benzene concentrations has been replaced with comparisons to a Reference Value. Also, the short-term benzene ESL itself has changed. The current Reference Value is 180 ppbV. The current short-term ESL, which is only used for permitting purposes, is 55 ppbV.

The definitions for the column headers in Tables 2 through 5 are as follows:

- "Total Samples Possible" is calculated from the total number of hours between the starting date/time and the ending date/time and may not represent the actual time the instrument was operational.
- The "Num Ambient Samples" column includes all ambient samples, including those 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 "Over Annual" column is an indication of whether or not the calculated mean is over the established annual effect screening level and may not correspond to an actual annual exceedance.
- The "Num Over 1-Hr" and "Num Over Odor" columns record how many individual observations are larger than the established reference value and may not correspond to an actual annual exceedance.

Cells filled in with “N/A” indicate the species has no ESL or ReV under the respective category.

Table 2. First Quarter 2008 Solar Estates Auto-GC Statistics, ppbV units

Species	Param	Num Ambient Samples	Mean	Peak 1-Hour Value	Peak 24-Hour Value	Num Over 1-Hr	Num Over Veg	Num Over Odor	Over Annual
Ethane	43202	1950	7.63	78.89	18.11	0	N/A	N/A	N/A
Ethylene	43203	1950	0.42	15.91	1.94	0	0	N/A	N/A
Propane	43204	1950	4.45	52.59	11.73	0	N/A	N/A	No
Propylene	43205	1950	0.17	4.92	0.67	0	N/A	N/A	N/A
Isobutane	43214	1950	1.51	40.79	4.37	0	N/A	0	No
n-Butane	43212	1950	2.62	95.36	9.11	0	N/A	N/A	No
t-2-Butene	43216	1950	0.09	2.11	0.27	0	N/A	0	No
1-Butene	43280	1950	0.04	1.58	0.18	0	N/A	0	No
c-2-Butene	43217	1950	0.05	1.80	0.21	0	N/A	0	No
Isopentane	43221	1950	1.33	104.74	5.70	0	N/A	N/A	No
n-Pentane	43220	1950	0.82	80.16	4.19	0	N/A	N/A	No
1,3-Butadiene	43218	1950	0.02	2.14	0.20	0	N/A	N/A	No
t-2-Pentene	43226	1950	0.02	1.21	0.13	0	N/A	0	N/A
1-Pentene	43224	1950	0.01	0.49	0.06	0	N/A	0	N/A
c-2-Pentene	43227	1950	0.01	0.59	0.06	0	N/A	0	N/A
n-Hexane	43231	1950	0.31	15.95	0.96	0	N/A	0	No
Benzene	45201	1950	0.27	3.80	0.65	0	N/A	0	No
Cyclohexane	43248	1950	0.18	3.49	0.67	0	N/A	0	No
Toluene	45202	1950	0.29	7.18	1.51	0	N/A	N/A	No
Ethyl Benzene	45203	1950	0.03	0.47	0.11	0	N/A	0	No
p-Xylene + m-Xylene	45109	1950	0.24	12.72	3.00	0	N/A	0	No
o-Xylene	45204	1950	0.05	1.94	0.40	0	N/A	0	No
Isopropyl Benzene - Cumene	45210	1950	0.01	0.72	0.08	0	N/A	0	No
1,3,5-Trimethylbenzene	45207	1950	0.02	0.69	0.08	0	N/A	N/A	No
1,2,4-Trimethylbenzene	45208	1950	0.04	1.30	0.16	0	N/A	N/A	No
n-Decane	43238	1950	0.03	1.77	0.25	0	N/A	N/A	No
1,2,3-Trimethylbenzene	45225	1950	0.01	0.36	0.06	0	N/A	N/A	No

Table 3. First Quarter 2008 Oak Park Auto-GC Statistics, ppbV units

Species	Param	Num Ambient Samples	Mean	Peak 1-Hour Value	Peak 24-Hour Value	Num Over 1-Hr	Num Over Veg	Num Over Odor	Over Annual
Ethane	43202	1898	9.23	131.95	30.56	0	N/A	N/A	N/A
Ethylene	43203	1898	0.89	56.34	7.97	0	0	N/A	N/A
Propane	43204	1898	5.52	120.07	24.20	0	N/A	N/A	No
Propylene	43205	1898	0.59	44.49	3.05	0	N/A	N/A	N/A
Isobutane	43214	1898	2.46	80.50	9.92	0	N/A	0	No
n-Butane	43212	1898	4.08	84.41	14.95	0	N/A	N/A	No
t-2-Butene	43216	1898	0.22	44.58	2.87	0	N/A	0	No
1-Butene	43280	1898	0.10	2.21	0.47	0	N/A	0	No
c-2-Butene	43217	1898	0.14	7.88	1.61	0	N/A	0	No
Isopentane	43221	1898	2.78	92.24	17.36	0	N/A	N/A	No
n-Pentane	43220	1898	1.59	64.65	12.59	0	N/A	N/A	No
1,3-Butadiene	43218	1898	0.06	1.41	0.19	0	N/A	N/A	No
t-2-Pentene	43226	1898	0.09	2.88	0.41	0	N/A	0	N/A
1-Pentene	43224	1898	0.04	1.47	0.18	0	N/A	0	N/A
c-2-Pentene	43227	1898	0.04	1.23	0.16	0	N/A	0	N/A
n-Hexane	43231	1898	0.45	32.05	2.55	0	N/A	0	No
Benzene	45201	1898	0.48	35.17	2.86	0	N/A	0	No
Cyclohexane	43248	1898	0.21	32.99	2.25	0	N/A	0	No
Toluene	45202	1898	0.65	31.48	3.36	0	N/A	N/A	No
Ethyl Benzene	45203	1898	0.07	30.41	1.99	0	N/A	0	No
p-Xylene + m-Xylene	45109	1898	0.19	58.25	3.85	0	N/A	0	No
o-Xylene	45204	1898	0.07	28.13	1.85	0	N/A	0	No
Isopropyl Benzene - Cumene	45210	1898	0.04	16.29	1.04	0	N/A	0	No
1,3,5-Trimethylbenzene	45207	1898	0.02	20.88	1.35	0	N/A	N/A	No
1,2,4-Trimethylbenzene	45208	1898	0.06	22.29	1.46	0	N/A	N/A	No
n-Decane	43238	1898	0.03	26.12	1.69	0	N/A	N/A	No
1,2,3-Trimethylbenzene	45225	1898	0.02	19.52	1.26	0	N/A	N/A	No

Table 4. Rolling 4-quarter (April 2007-March 2008) Solar Estates Auto-GC Statistics, ppbV units

Species	Param	Num Ambient Samples	Mean	Peak 1-Hour Value	Peak 24-Hour Value	Num Over 1-Hr	Num Over Veg	Num Over Odor	Over Annual
Ethane	43202	7058	7.54	132.94	29.44	0	N/A	N/A	N/A
Ethylene	43203	7058	0.46	17.23	6.93	0	0	N/A	N/A
Propane	43204	7058	4.60	94.64	19.55	0	N/A	N/A	No
Propylene	43205	7058	0.36	51.49	35.42	0	N/A	N/A	N/A
Isobutane	43214	7058	1.66	47.63	8.25	0	N/A	0	No
n-Butane	43212	7058	2.47	95.36	15.23	0	N/A	N/A	No
t-2-Butene	43216	7057	0.08	2.66	0.52	0	N/A	0	No
1-Butene	43280	7057	0.05	4.63	0.36	0	N/A	0	No
c-2-Butene	43217	7057	0.05	7.10	0.63	0	N/A	0	No
Isopentane	43221	7057	1.59	104.74	7.55	0	N/A	N/A	No
n-Pentane	43220	7057	0.97	100.90	6.33	0	N/A	N/A	No
1,3-Butadiene	43218	7057	0.05	25.28	1.86	0	N/A	N/A	No
t-2-Pentene	43226	7057	0.04	2.81	0.30	0	N/A	0	N/A
1-Pentene	43224	7057	0.02	6.25	1.92	0	N/A	0	N/A
c-2-Pentene	43227	7057	0.02	1.35	0.14	0	N/A	0	N/A
n-Hexane	43231	6802	0.36	47.34	2.59	0	N/A	0	No
Benzene	45201	6802	0.28	11.48	1.07	0	N/A	0	No
Cyclohexane	43248	6796	0.23	14.00	1.20	0	N/A	0	No
Toluene	45202	6801	0.35	10.48	1.51	0	N/A	N/A	No
Ethyl Benzene	45203	6802	0.05	1.29	0.19	0	N/A	0	No
p-Xylene + m-Xylene	45109	6802	0.23	13.63	3.00	0	N/A	0	No
o-Xylene	45204	6766	0.06	2.90	0.41	0	N/A	0	No
Isopropyl Benzene - Cumene	45210	6766	0.01	3.19	0.44	0	N/A	0	No
1,3,5-Trimethylbenzene	45207	6766	0.02	8.69	3.48	0	N/A	N/A	No
1,2,4-Trimethylbenzene	45208	6766	0.07	5.67	0.97	0	N/A	N/A	No
n-Decane	43238	6766	0.06	6.75	3.11	0	N/A	N/A	No
1,2,3-Trimethylbenzene	45225	6766	0.03	8.88	1.98	0	N/A	N/A	No

Table 5. Rolling 4-quarter (April 2007-March 2008) Oak Park Auto-GC Statistics, ppbV units

Species	Param	Num Ambient Samples	Mean	Peak 1-Hour Value	Peak 24-Hour Value	Num Over 1-Hr	Num Over Veg	Num Over Odor	Over Annual
Ethane	43202	7594	8.30	359.25	49.27	0	N/A	N/A	N/A
Ethylene	43203	7526	0.91	56.34	7.97	0	0	N/A	N/A
Propane	43204	7526	5.43	804.95	49.18	0	N/A	N/A	No
Propylene	43205	7526	0.59	76.97	6.69	0	N/A	N/A	N/A
Isobutane	43214	7526	2.41	377.81	23.36	0	N/A	0	No
n-Butane	43212	7594	3.75	656.97	67.92	0	N/A	N/A	No
t-2-Butene	43216	7594	0.15	44.58	2.87	0	N/A	0	No
1-Butene	43280	7594	0.09	2.21	0.47	0	N/A	0	No
c-2-Butene	43217	7594	0.11	7.88	2.18	0	N/A	0	No
Isopentane	43221	7592	3.31	682.38	121.16	0	N/A	N/A	No
n-Pentane	43220	7593	2.11	501.38	88.42	0	N/A	N/A	No
1,3-Butadiene	43218	7594	0.07	1.68	0.23	0	N/A	N/A	No
t-2-Pentene	43226	7594	0.10	2.88	0.41	0	N/A	0	N/A
1-Pentene	43224	7594	0.06	3.76	0.37	0	N/A	0	N/A
c-2-Pentene	43227	7594	0.04	1.23	0.18	0	N/A	0	N/A
n-Hexane	43231	7594	0.51	76.42	5.60	0	N/A	0	No
Benzene	45201	7594	0.47	38.15	6.41	0	N/A	0	No
Cyclohexane	43248	7594	0.20	32.99	2.25	0	N/A	0	No
Toluene	45202	7594	0.65	66.44	4.43	0	N/A		No
Ethyl Benzene	45203	7594	0.06	30.41	1.99	0	N/A	0	No
p-Xylene + m-Xylene	45109	7594	0.19	58.25	3.85	0	N/A	0	No
o-Xylene	45204	7594	0.07	28.13	1.85	0	N/A	0	No
Isopropyl Benzene - Cumene	45210	7594	0.03	16.29	1.04	0	N/A	0	No
1,3,5-Trimethylbenzene	45207	7594	0.02	20.88	1.35	0	N/A	N/A	No
1,2,4-Trimethylbenzene	45208	7594	0.07	22.29	1.46	0	N/A	N/A	No
n-Decane	43238	7594	0.03	26.12	1.69	0	N/A	N/A	No
1,2,3-Trimethylbenzene	45225	7594	0.03	19.52	1.26	0	N/A	N/A	No

2. Canister Sampling and Analysis of Results

Only three canisters were collected this quarter, down from 40 last quarter. For comparison, in 2007, seven were collected during the first quarter. In 2006, five were collected in the first quarter, but two of these were at Oak Park and Solar Estates, sites which no longer collect canister sample samples. Over three years, the fourth quarter has produced the most canister samples, with other quarters producing lower levels. Figure 2, below, shows the pattern for collecting canister samples by quarter since January 2006, using only the five sites now collecting samples. Figure 3, page 18, shows the pattern combining all five sites into one graph.

Figure 2. Frequency of canister samples by quarter, by site

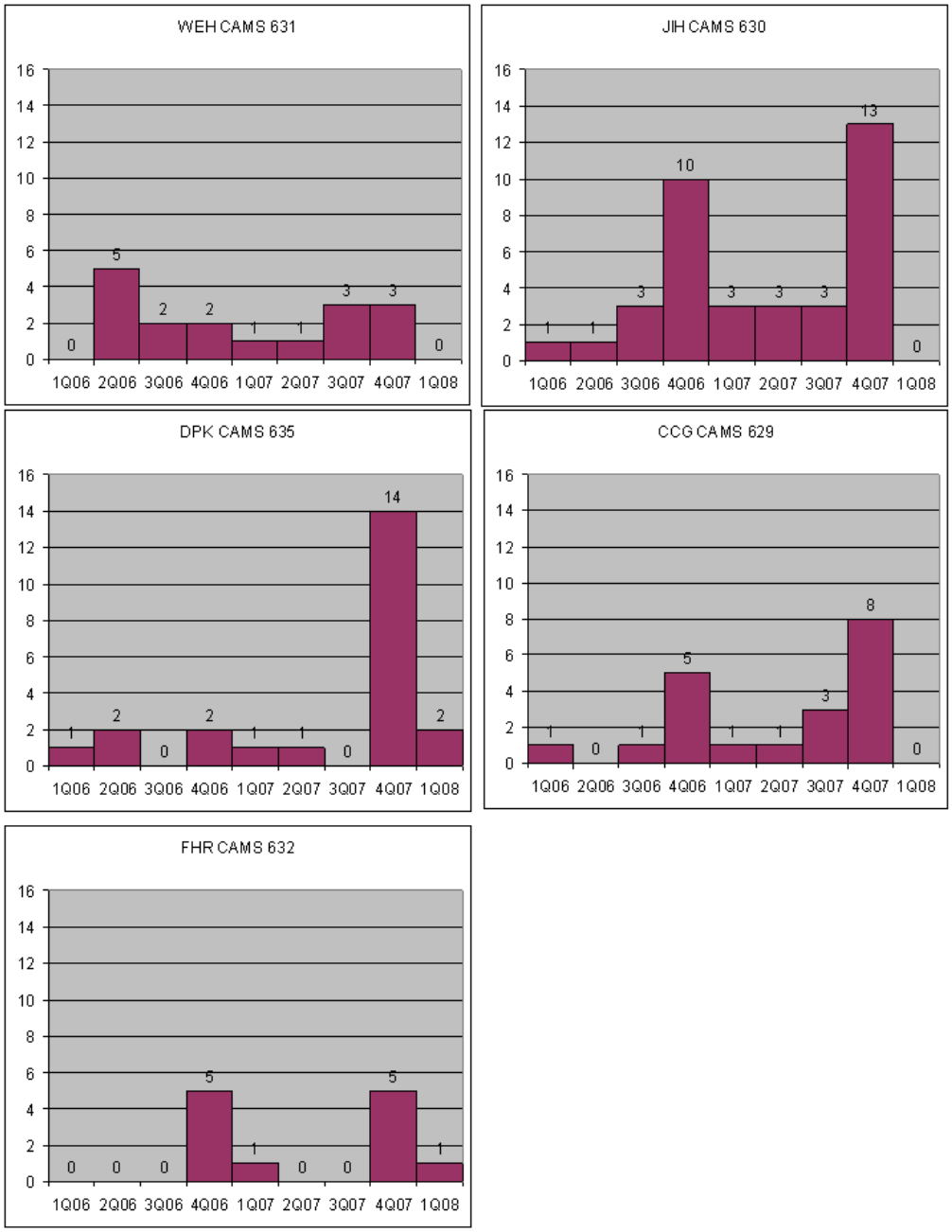
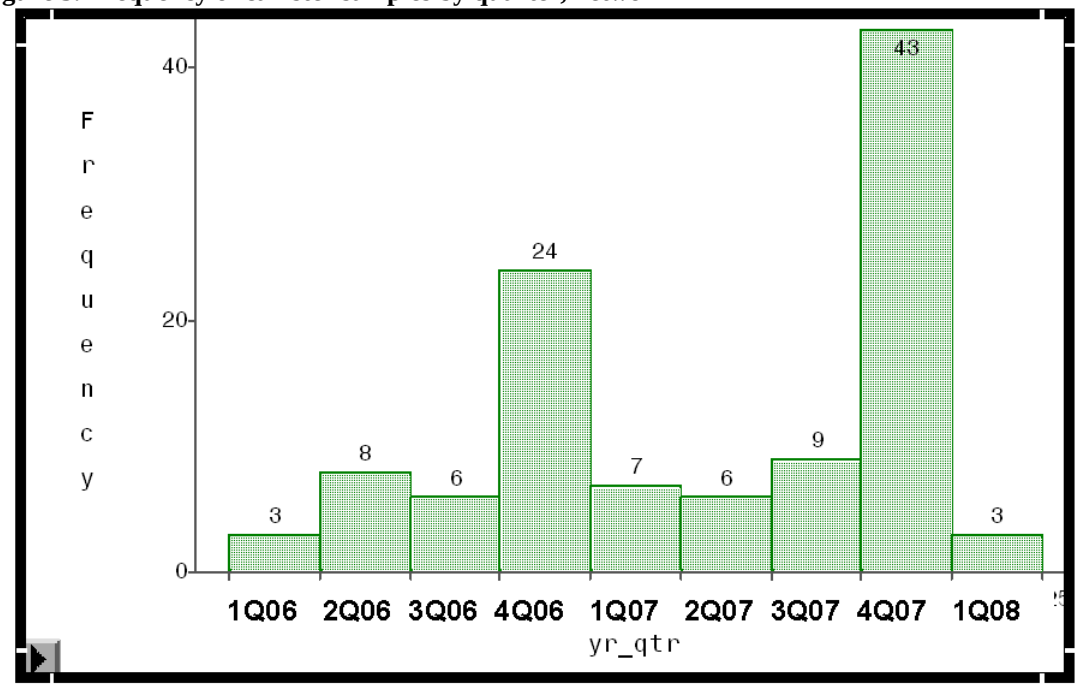
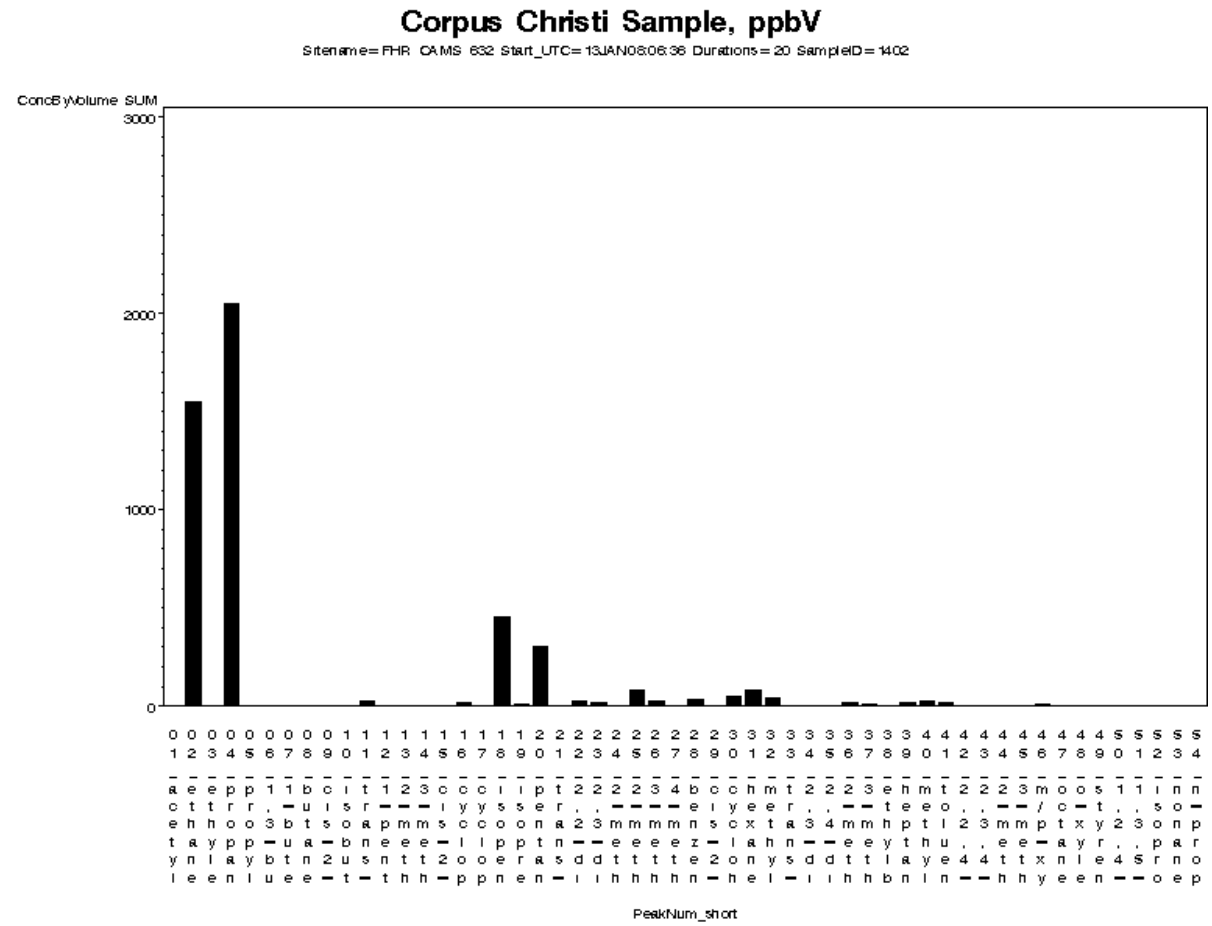


Figure 3. Frequency of canister samples by quarter, network



Two of three samples in this quarter resemble the pattern from the last quarter report labeled "chemical profile A", the most common profile observed in the network, primarily containing ethane, propane, iso-butane, n-butane, iso-pentane, and n-pentane. The canister contents on January 13 are shown in Figure 4, page 19. They are different in two respects: the concentration in this can were among the highest captured to date, and only four prominent species appear: ethane, propane, iso-pentane, and n-pentane. Two species – isoprene (5.9 ppbV)) and 2-methylpentane (84 ppbV) – were measured at concentrations slightly above their odor ESLs (5 ppbV, 83 ppbV, respectively). This can was triggered under northerly winds of about 8 miles per hour, so it was not likely to have come from the nearby small sources to the south. This case is discussed in more detail in the next section, pages 20 to 24.

Figure 4. FHRCAMS 630 sample January 13, 2008 at 0:45 CST



Species in Figure 4 (prominent species highlighted)

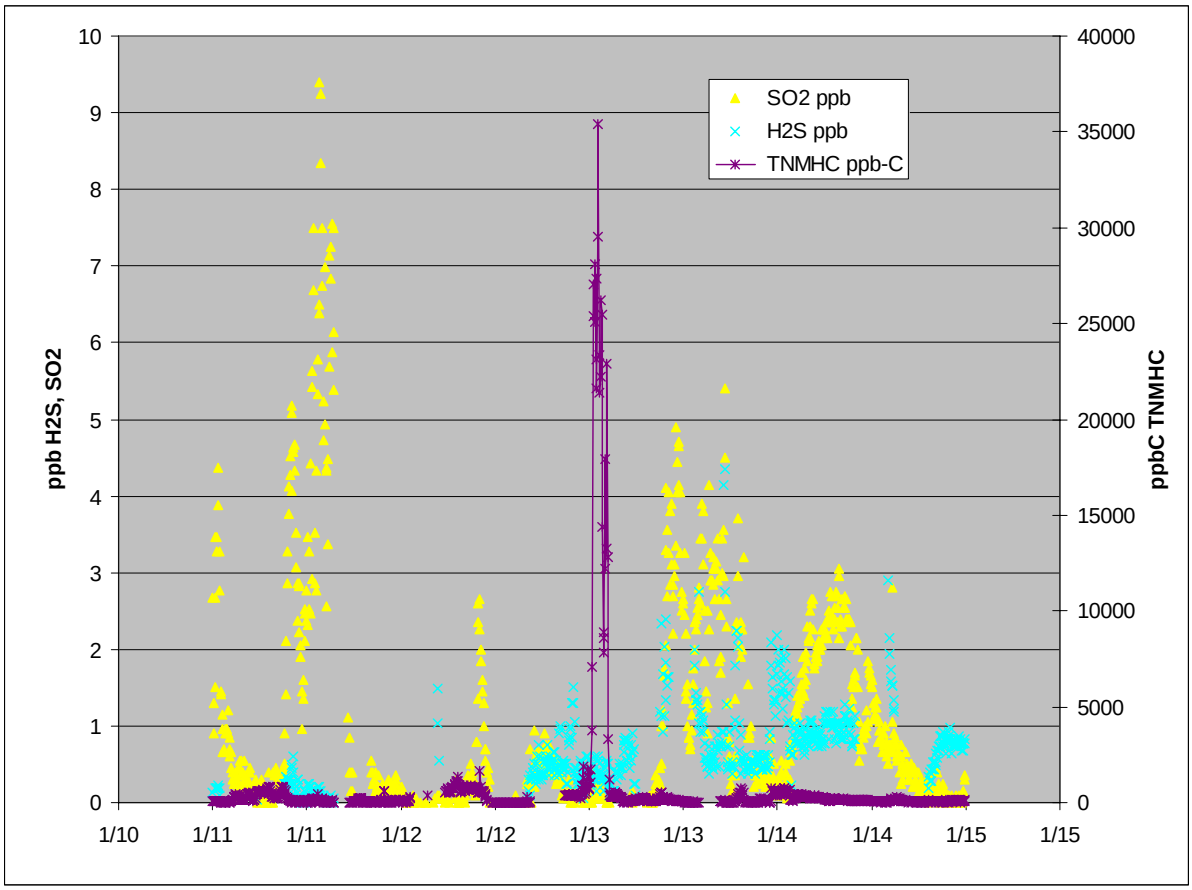
02) ethane 03) ethylene **04) propane** 05) propylene 07) 1-butene 08) butane 09) cis-2-butene
10) isobutane 11) trans-2-butene 12) 1-pentene 14) 3-methyl-1-butene 15) cis-2-pentene
16) cyclopentane 17) cyclopentene **18) isopentane** **20) pentane** 21) trans-2-pentene
22) 2,2-dimethylbutane 23) 2,3-dimethylbutane 24) 2-methyl-1-pentene 25) 2-methylpentane
26) 3-methylpentane 27) 4-methyl-1-pentene 28) benzene
29) cis-2-hexene 30) cyclohexane 31) hexane 32) methylcyclopentane 33) trans-2-hexene
34) 2,3-dimethylpentane 35) 2,4-dimethylpentane 36) 2-methylhexane 37) 3-methylhexane
38) ethylbenzene 39) heptane 40) methylcyclohexane 41) toluene 42) 2,2,4-trimethylpentane
43) 2,3,4-trimethylpentane 44) 2-methylheptane 45) 3-methylheptane 46) m/p-xylene 47) octane
48) o-xylene 49) styrene 50) 1,2,4-trimethylbenzene 51) 1,3,5-trimethybenzene 52) isopropylbenzene
53) nonane 54) n-propylbenzene

3. Two Pollution Event Case Studies

January 13, 2008 at FHR C632

The January 13, 2008 elevated hydrocarbons at FHR C632 peaked above 35 ppmC at 1:10 a.m. CST. The time series for TNMHC and sulfur compounds appears in Figure 5, below. Note that the sulfur compounds do not rise with the TNMHC. Short-term TNMHC concentrations peaked above 35,000 ppbC.

Figure 5. Time series of measurements Jan. 11-14 at FHR C632



The back trajectory of this event appears in Figure 6, page 21. Winds were persistently from northwest through north from 4:00 p.m. CST on January 12 through 9:00 a.m. CST January 13, so no other monitor had a chance to see this "spike." The "spike's" short-lived nature suggests the plume could be characterized as a short puff released nearby upwind. In Figure 7, page 21, there appears the image from Google Earth of the only manufacturing facility upwind, part of the FHR Refinery. No emission event in Nueces County for this day was found in the TCEQ database. No further details are available on this event at this point.

Figure 6. Surface back trajectory, Jan. 13, FHR

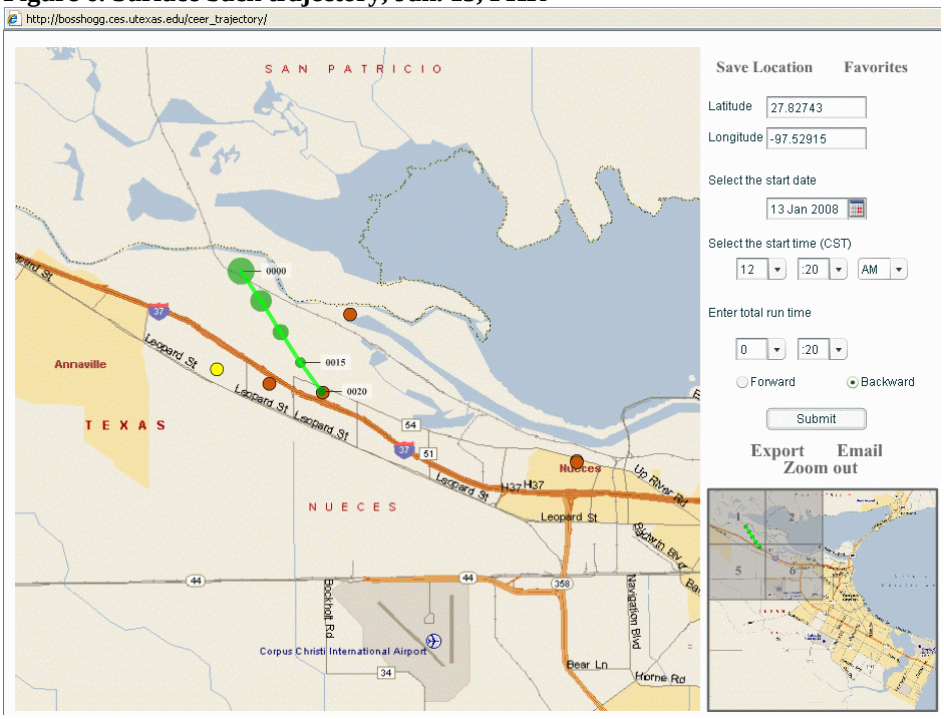


Figure 7. Google Earth image with FHR and 5-minutes back trajectory point

February 22, 2008 at CITGO Refinery

During a maintenance activity at the Citgo plant on February 22, oil particles were released into the air and carried downwind for up to two miles on February. According to press accounts[1]

> "at about 10:40 a.m. on February 22… employees were preparing a crude vacuum unit for an upcoming turnaround when the line ruptured. …
>
> "The oil sprayed from the incident was a combination of sour crude oil and vacuum tower bottom, or residual oil that accumulates at the bottom of the unit's tower. …
>
> "A northerly wind that day did carry crude oil for several miles….
>
> "After the incident, Citgo contacted three local car wash and car detailing companies to help clean the cars affected. As of Monday morning, about 100 cars had been cleaned."

The approximate location of the spill at the Citgo facility is shown in the Google Earth images in Figure 8, below. In the lower right-hand image in this figure the Oak Park C634 site location is shown.

Figure 8. Approximate location of spill

The forward trajectory run at various times of the morning are shown in Figure 9, page 23. The figure shows that the plume that may have originated at the source has a slow movement from east to west in a manner that would sweep it across the Oak Park monitoring site between 11:40 a.m. and 1:00 p.m. Figure 10, page 23, shows a slight rise in TNMHC at Oak Park beginning late morning and peaking at 1:30 p.m. CST. These concentrations are not unusually high, however. An examination of the auto-GC data at the site showed several

[1] Corpus Christi Caller-Times Website, March 4, 2008, reported by Fanny S. Chirinos.

heavier molecular-weight hydrocarbon species had a mid-day peak in the hour from 12:00-12:59 p.m. Were a heavy oil residual atomized into the air, such heavier-weight species might go into a gas phase.

Figure 9. Forward trajectories from spill

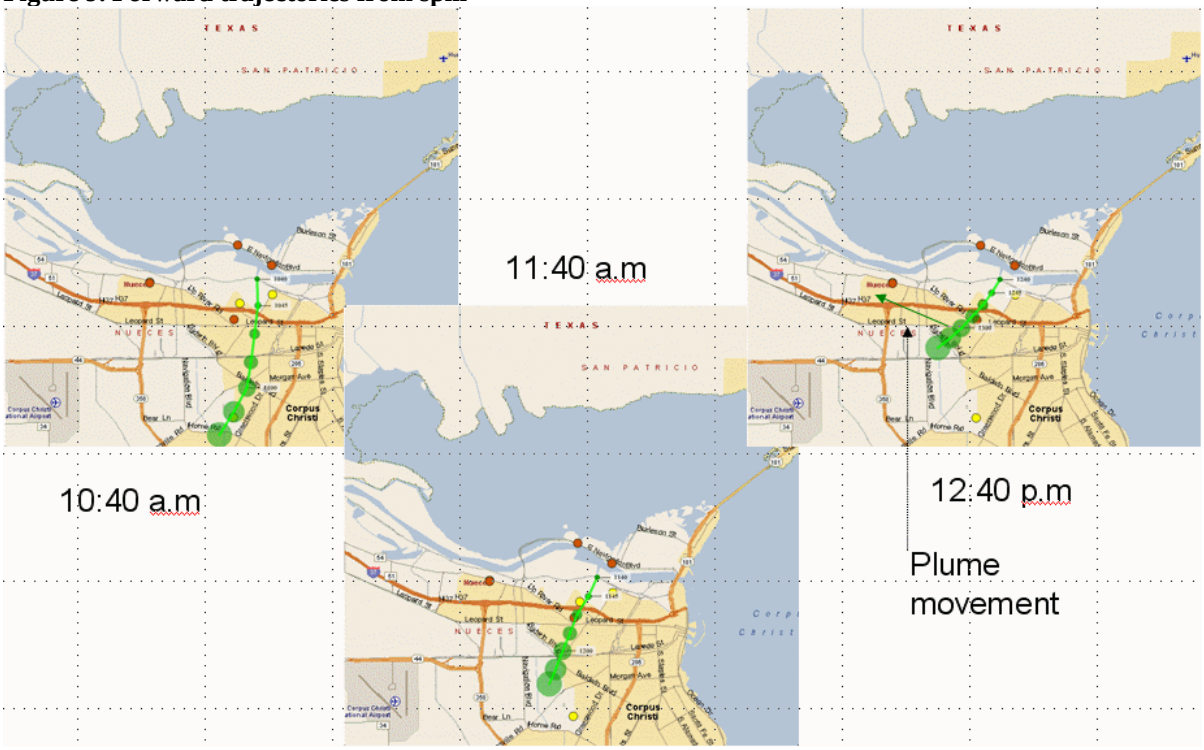
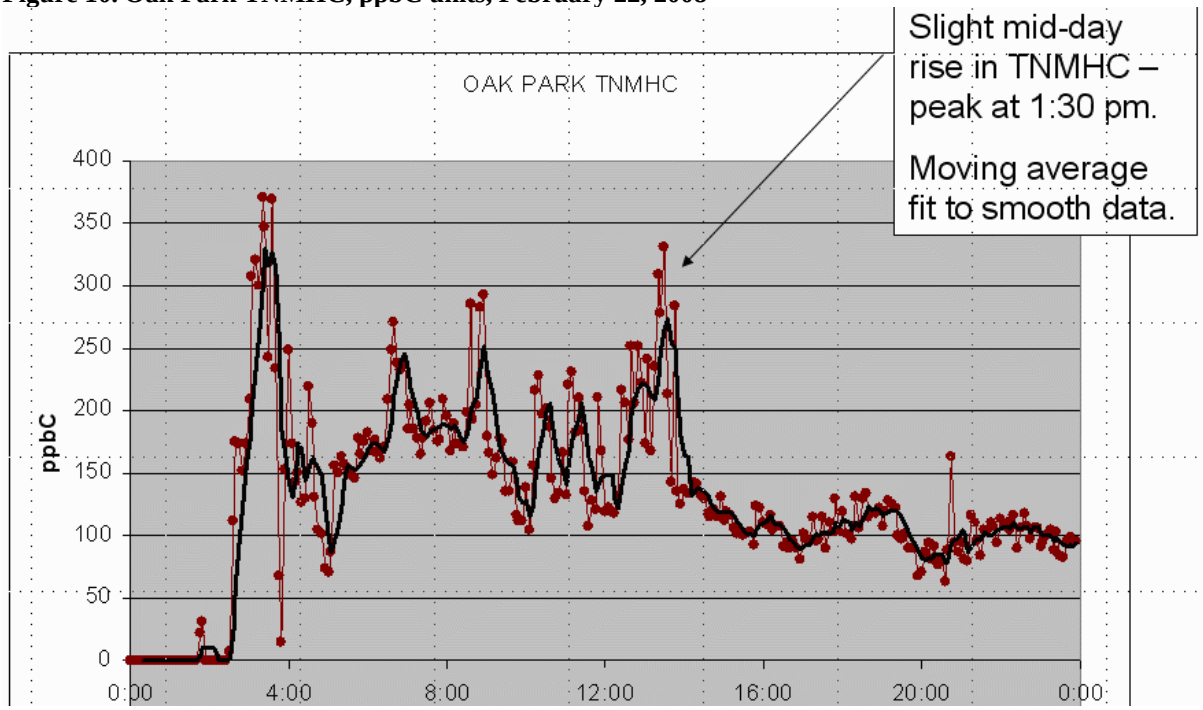


Figure 10. Oak Park TNMHC, ppbC units, February 22, 2008



Even though the event may have been detected, doing so required close scrutiny of the data, and no health ESLs were approached. Because of the low concentrations and lack of corroborating evidence at other monitors, there still exists uncertainty that the slight rise in measured concentrations of several species were related to this event.

Conclusions from the First Quarter 2008 Data

In this quarter's report, one finding has 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. Only one canister sample was found to have values above ESLs in the first quarter of 2008 – that being January 13 canister at J. I. Hailey CAMS 630. Two species – isoprene (5.9 ppbV)) and 2-methylpentane (84 ppbV) – were measured at concentrations slightly above their odor ESLs (5 ppbV, 83 ppbV, respectively).

Further analyses of data collected by the monitoring network will be provided upon request.

APPENDIX B

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
01/01/08 - 03/31/08

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

Total Grant Amount:	$6,761,718.02
Total Interest Earned:	**$600,075.87**
Total Funds Received:	**$7,361,793.89**

B. Summary of Expenditures Paid by COCP Funds

		Year 3 Budget	Year 4 Adjustments	Year 5 Adjustments	Adjusted Budget	Prior Activity	Current Activity 01/01/08 - 03/31/08	Encumbrances	Remaining Balance 3/31/2008
Salaries-Prof	12	$216,128.63	160,652.00	281,842.00	$658,622.63	($436,553.52)	($77,448.91)	($34,558.28)	$110,061.92
Salaries-CEER	15	$19,606.37	15,636.00	33,123.00	$68,365.37	($39,302.84)	($9,582.27)	($6,564.60)	$12,915.66
Fringe	14	$47,984.00	38,783.00	58,333.00	$145,100.00	($94,129.19)	($18,195.93)	($8,784.17)	$23,990.71
Other/C-Analysis	47/68	$60,474.00	73,500.00		$133,974.00	($30,310.00)		$0.00	$103,664.00
Supplies	50	$86,844.00	33,500.00	68,676.00	$189,020.00	($147,637.65)	($20,565.83)	($3,501.43)	$17,315.09
	51		20,300.00	8,000.00	$28,300.00	($14,900.00)	($270.00)	($299.28)	$12,830.72
Subcontract	62-64	$1,965,693.00	314,022.00	296,734.00	$2,576,449.00	($2,183,830.34)	($120,982.97)	$0.00	$271,635.69
Travel	75	$2,300.00	2,000.00	3,500.00	$7,800.00	($5,928.07)	($2,675.69)	($25.02)	-$828.78
Equipment	80	$0.00	0.00		$0.00	$0.00		$0.00	$0.00
Indirect Costs	90	$359,855.00	98,759.00	112,531.00	$571,145.00	($406,886.01)	($37,458.25)	$0.00	$126,800.74
TOTALS		**$2,758,885.00**	**757,152.00**	**862,739.00**	**$4,378,776.00**	**($3,359,477.62)**	**($287,179.85)**	**($53,732.76)**	**$678,385.75**

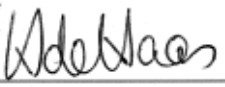
C. Interest Earned by COCP Funds as of 03/31/08

Prior Interest Earned:	$568,651.73
Interest Earned This Quarter:	$31,424.14
Total Interest Earned to Date:	**$600,075.87**

D. Balance of COCP Funds as of 12/31/2007

Total Grant Amount:	$6,761,718.02	
Total Interest Earned:	$600,075.87	
Current Q. Expenses	($287,179.85)	
Total Expenditures:	($3,359,477.62)	
Remaining Balance:	**$3,715,136.42**	*Includes March '08 interest

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



Accounting Certification