Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation Project

Quarterly Report for the Period

April 1, 2007 through June 30, 2007

Submitted to

Judge 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

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August 20, 2007

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, 2007 has been directed to the following activities.

A. <u>Operations and Maintenance Phase of the Project</u>

A detailed description of some data analyses appear in Appendix B, page 11 and a summary of these analyses appears in this section.

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

Figure 1 Corpus Christi Monitoring Sites

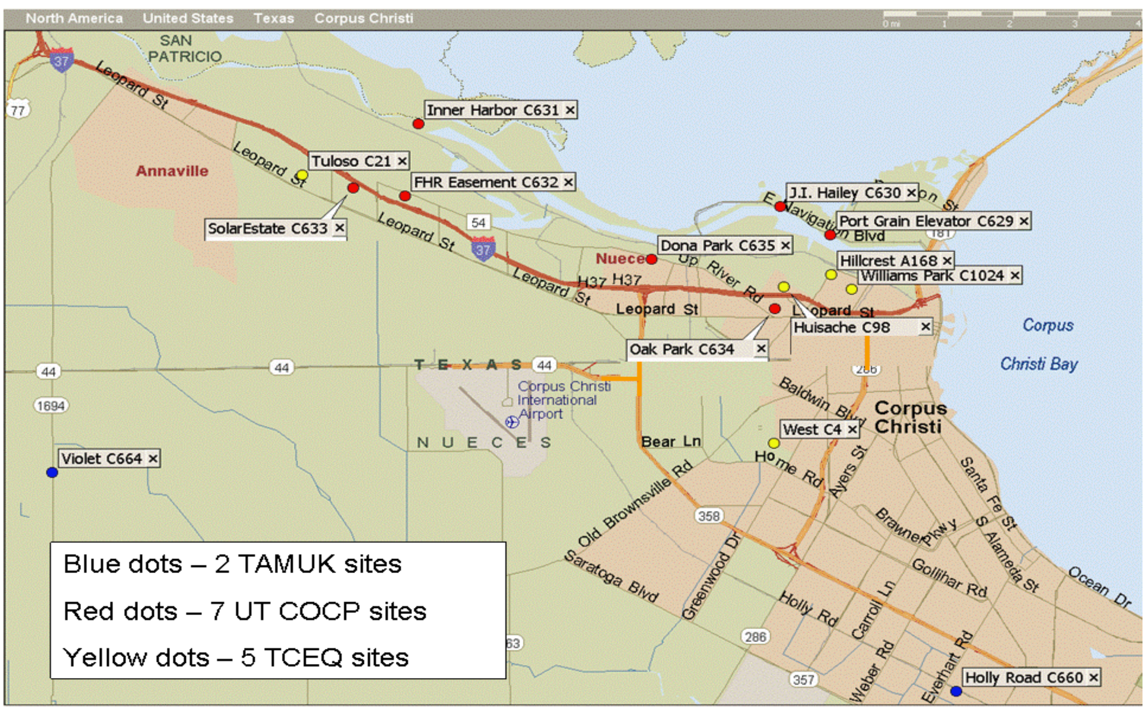

Table 1. Schedule of COCP Air Monitoring Sites, Locations and Major Instrumentation

TCEQ CAMS Nos.	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)
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

During the second quarter of 2007, a handful of notable pollution events were monitored and a discussion appears in the appendix. Specifically, the appendix contains the following elements:

- an update on canister sampling and analysis of results;
- a summary of hourly speciated hydrocarbon concentrations measured by automated gas chromatographs (auto-GCs) compared with health effects screening levels;
- a case study of a hydrogen sulfide (H_2S) event on May 3, 2007.
- update on canister analysis data from the first quarter 2007 report.

Canister Sampling and Analysis - During the second quarter of 2007, 6 valid canister samples were triggered.

One sample taken at Corpus Christi Grain CAMS 629 had a 20-min. average benzene concentration of 196 parts per billion volume, which is higher than the TCEQ's short-term Effects Screening Level (ESL) of 25 ppbv. More details about this event appear in the appendix.

Auto-GC Effects Screening Level Summary - In comparing this quarter's hourly auto-GC data from Oak Park and Solar Estates to ESLs, no measurement exceeded an hourly

ESL. Also, the quarterly averages of all species were below the respective annual ESLs, as are the rolling average over the past four quarters. A summary appears in the appendix.

Analysis at an H_2S/SO_2 Event at JIH - On May 3, 2007, mid-day readings of H_2S and TNMHC were measured at the JIH C630 site that triggered automated alerts. Over the course of that day SO_2 concentrations were statistically significantly high. No assignable cause has been found. More details appear in the appendix.

B. <u>Scheduled Meetings of the Volunteer Advisory Board</u>

During this quarter the Advisory Board met on April 3, 2007. A copy of the notes from that meeting is attached to this report as Appendix A, page 6.

C. <u>Project Management and Planning</u>

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

1. **Project Schedule**
   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 Advisory Board.

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 at Appendix C, page 28.

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 C, page 28.

A. <u>Total Amount of COCP Funds and Other Funds Received Under the Project</u>
The COCP funds received through June 30, 2007 totals $7,260,470.39. This total includes interest earned through June 30, 2007.

B. <u>Detailed List of the Actual Expenditures Paid from COCP Funds</u>
Expenditures of COCP funds during this quarter totaled $140,630.21. The detailed breakdown of the actual expenditures is included in Appendix C, page 29. 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 Funds During the Quarter

The interest earned during this quarter totaled $36,407.47. A report providing detailed calculations of the interest earned on the COCP funds during each month of the quarter is included in Appendix C, page 29.

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D. Balance as of March 31, 2007, in the COCP Account

The balance in the COCP account, including interest earned totals $4,351,174.31.

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

The expected expenditures for the funds remaining totals $4,351,174.31.

Quarterly Report Distribution List:

U.S. District Court

- Ms. Shirley Johnson, Assistant Deputy Chief USPO
- Mr. James Martinez, Supervising USPO

Texas Commission on Environmental Quality

- Ms. Sharon Blue, Litigation Division – Headquarters
- Mr. David Brymer, Laboratory and Mobile Monitoring – Headquarters
- Ms. Susan Clewis, Director – Region 14
- Mr. David Turner, Air Monitoring Section – Region 14
- Mr. David Kennebeck, Field Operations – Region 14

Environmental Protection Agency

- Ms. Kathleen Aisling, Environmental Engineer, Air Enforcement Section, Dallas Regional Office

Members of the Advisory Board

APPENDIX A

Volunteer Advisory Board
April 3, 2007 Meeting Notes

ADVISORY BOARD MEETING

Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation Project

Texas A&M University - Corpus Christi
Room 1003, NRC Building
1:30 pm – 3:30 pm
April 3, 2007

Advisory Board Members Present:

Ms. Gretchen Arnold	Corpus Christi Pollution Prevention Partnership – TAMUCC
Mr. Ron Barnard	City of Corpus Christi
Dr. William Burgin	Corpus Christi-Nueces County Public Health District
Ms. Joyce Jarmon	Corpus Christi Community Council
Dr. Glen Kost	Public Health Awareness
Ms. Pat Suter	Coastal Bend Sierra Club

Project Personnel Present:

Mr. James Martinez	Probation Office - US District Court
Mr. Vince Torres	The University of Texas at Austin
Dr. David Sullivan	The University of Texas at Austin
Mr. David Brymer	TCEQ Headquarters – Austin
Ms. Susan Clewis	TCEQ – Region 14
Mr. David Kennebeck	TCEQ – Region 14
Mr. David Turner	TCEQ – Region 14
Mr. Ken Rozacky	TCEQ Headquarters – Austin
Mr. Cyril Durrenberger	The University of Texas at Austin
Mr. Edward Michel	The University of Texas at Austin
Ms. Sarah Kowalski	Port of Corpus Christi

I. Call to Order and Welcome

Vince Torres called the meeting to order at 1:35 pm. He introduced Ms. Sarah Kowalski from the Port of Corpus Christi, who was a presenter at the Board Meeting.

II. Project Overview and Status

A. <u>Annual Report to the US District Court</u>

Mr. Torres updated the Board on the December 2006 presentation of the 2006 Annual Project Report to Judge Janice Graham Jack, U.S. District Court. Gretchen Arnold, Ron Barnard and David Turner updated the Board on their presentations to Judge Jack as spokespersons for the Board and the representative of the Texas Commission on Environmental Quality, respectively. Everyone who attended the presentation agreed that Judge Jack seemed very pleased with the status of the project and the work being produced.

During the Annual Report presentation, Judge Jack mentioned that as a result of a law suit decided in a Houston case, funds may be available to support additional air quality research. Dr. Allen has been in touch with the attorney in this case, whose name was provided by Judge Jack. She will oversee the distribution of the funds. To date, UT Austin has not heard from the attorneys or the Court about a decision on how these funds will be used or if they will be available to augment the work being conducted under the Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation Project

B. Data Collection and Analyses

Dave Sullivan reviewed with the attendees the location of the seven air monitoring stations, the instrumentation at the sites, and some relevant air quality monitoring terms. He also identified the location of the air monitoring sites in the area that are operated by the Texas Commission on Environmental Quality.

Dr. Sullivan presented an update on and analysis of the data collected at the seven monitoring stations focusing on the fourth quarter (October, November and December) of 2006. He discussed the wind patterns prevalent at the J.I. Haley (JIH) site when canisters were triggered during this quarter. The westerly direction of these winds and the concentrations indicate the source(s) to be close to the J.I. Hailey site and probably related to the shipping-related operations to the west of this site.

Ron Barnard theorized that the source of the 3 elevated concentrations that triggered canisters at the Grain Elevator, Flint Hills and J.I. Hailey sites early on November 18, 2006 within the same time period was probably a refinery. Dr Kost expressed concern with the small sources of pollution. David Turner informed attendees that the TCEQ can now relate air monitoring data to industry reports of events. He also reported that the TCEQ has implemented a new policy that requires new permits for start-ups and shut downs at the refineries, which may have contributed to these elevated concentrations.

David Turner announced that the TCEQ is now using infra-red cameras to locate emission sources.

Dr. Kost mentioned that perhaps our project could make use of such technology. It was determined that the cost of infrared cameras (between $80,000 and $100,000) is prohibitive for this project to fund from available money. David Turner mentioned that training of TCEQ personnel on the use of the equipment is effort intensive and limited to only a few persons in the Agency.

In a discussion about the elevated readings on December 12, 2006 at JIH, Dr. Kost asked if any of those elevated readings would have the potential for health risks. David Turner assured the group that the event did not pose a risk as the levels were not at a level determined to be “high risk.” Additionally, in the area of the elevated readings, there are no residences and no outside workers were present when collection of a canister was triggered. The annual average ESL value for benzene is less than 1 PPBV and the one hour average ESL is 25 PPBV. When the can triggered, the benzene value was recorded at 133 PPBV. Canisters collect a twenty minute sample. So it is felt that canister data is comparable to one hour ESL values.

Discussion continued on the area directly west of J.I. Hailey with ships loading and unloading; barge and ship cleaning; possible other service industries that could have caused a can to trigger. Were there any pipelines that were broken or any work conducted on the pipelines? Were flares being studied by the TCEQ Mobile Lab a possible source? It did not appear that the elevated concentrations were due to these possible sources. Shipping operations will require closer monitoring. The addition of a camera at one or more of these sites would be desirable.

Dr Kost asked if there was a safety issue – possibly of a spark causing an explosion. David Turner said not really a safety issue. Dave Sullivan replied the more significant issue is prolonged exposure on an annual average. Individual hourly benzene concentrations at or above the ESL generally do not constitute a short term problem, but are of concern nonetheless because they contribute to raising the annual average. Benzene that was measured in the residential areas to the south of the refinery row area during the 4^{th} quarter was carried to the area by the northerly winds that occur at this time of the year. The maximum one hour values (28 PPBV) in this quarter do not cause the annual average to exceed the annual ESL.

There was an H_2S case study on 1/22/07 that showed that a hydrogen sulfide source that triggered alerts was closer to Flint Hills than Solar Estates. The likely source was a sulfur recovery unit from a refinery north of Flint Hills. H_2S, NOx and hydrocarbons were reported in the release. Dave Sullivan maintains that the monitors continue to provide assistance in diagnosing sources of pollution.

David Turner and Dave Sullivan mentioned that the emissions data collected by Texas A&M Kingsville (TAMUK) are available, and that the sources of pollutants affecting the FHR CAMS 632 site appear to be from a rotary rig and a tank battery. Per David Turner, TCEQ has measured a couple of sources of contaminants near the Flint Hills site. He mentioned that he would try to get accurate maps from TAMUK. He also mentioned that there is still no headway on finding methane sources. Dave Sullivan will work with David Turner to obtain the TAMUK data for UT Austin to review. (UT Austin Action Item)

III. Related Matters

A. <u>The Port of Corpus Christi</u>

Vince Torres reported to the Board on a February 15, 2007 meeting that he and Ron Barnard had with representatives of the Port of Corpus Christi Authority to update them on the University's air monitoring activities at the seven (7) air monitor stations in Corpus Christi.
Vince Torres then introduced Ms. Sarah Kowalski who is the Environmental Compliance Specialist with the Port of Corpus Christi. Ms. Kowalski provided a presentation on the environmental management responsibilities in the Port Area.

Questions concerning contaminants from ships while in the channel were addressed. Ms. Kowalski reported that international shipping companies, using Corpus Christi ports, are monitored. International shipping companies do appear to have the same level of oversight and concerns with regard to environmental matters as US shipping companies.

Ms. Suter asked who has jurisdiction over things that occur while a ship is docked in the harbor. The attendees voiced concerns over the pollutants resulting from ships starting up, pollution caused while ships are docked and running, dumping ballast water, improper handling of waste, other illegal dumping and spills. Ms. Kowalski explained that the port tenants sign leases, which contain the Port of Corpus Christi environmental policies and spill notification procedures. The Port of Corpus Christi has established an Environmental Management System, a set of processes and procedures to reduce environmental impacts of harbor activities. They are working to implement this System with various regional and local groups.

It was suggested that Sarah be sent notices to extend invitations to the Advisory Board meeting.

B. Update on the SEP Project Activities

Vince Torres provided the following update on the SEP Project activities:

1) Enhancements to the automated trajectory tool should be completed and ready for testing this summer. We are hoping to interface with TCEQ in September after the industry notification tool is in place.
2) Power loss software has been installed and is operating as intended.
3) Canister analysis activities are on going.
4) Source directionality filter at Flint Hills Up River Rd. Site has been installed and is operating as intended.

IV. Advisory Board

Vince reported on a tour of two sites given to new Advisory Board members in December.

Vince asked when the Board wanted to meet next. It was decided that the Board would not meet until October, in preparation for the next Annual Report to the Court. However, should additional funds become available through a SEP, Ms. Suter suggested that we call a meeting of the Board to discuss the use of the funds.

Vince asked for any additional discussion items from the audience.

Hearing none, the meeting was adjourned at 3:45 pm.

APPENDIX B

Data Analysis for Corpus Christi Quarterly Report

April 1, 2007 through June 30, 2007

The University of Texas at Austin
Center for Energy & Environmental Resources
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(512) 914-4710 cell

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 over the period from April 1 through June 30, 2007. The monitoring network is shown in Figure 1 on the following page and is described in Table 1 below. This report contains the following elements:

- an update on canister sampling and analysis of results;
- a summary of hourly speciated hydrocarbon concentrations measured by automated gas chromatographs (auto-GCs) compared with health effects screening levels;
- updated TNMHC directionality work, in which a comparison is made between direct measurements from the TNMHC instrument and indirect measurements from the two auto-GCs;
- a case study of a hydrogen sulfide (H_2S) event on May 3, 2007.

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	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)
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

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 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) –** From the TCEQ Web site: **"**Effects Screening Levels are used to evaluate the potential for effects to occur as a result of exposure to concentrations of constituents in the air. ESLs are based on data concerning health effects, the potential for odors to be a nuisance, effects on vegetation, and corrosive effects. They are not ambient air standards. If predicted or measured airborne levels of a constituent do not exceed the screening level, adverse health or welfare effects are not expected. **If ambient levels of constituents in air exceed the screening levels, it does not necessarily indicate a problem but rather triggers a review in more depth**." (Emphasis added.) (Accessed on January 22, 2007) http://www.tceq.state.tx.us/implementation/tox/esl/ESLMain.html

Summaries of the canister samples from the most recent quarter are shown in Table 2, page 15. The concentrations for the sum of identified species in the canister are shown in the "Sum Pol ppbC" row, while the simultaneous TNMHC concentration average over the sampling period is shown in the "TNMHC ppbC" row. Where there is disagreement, the likely cause is a significant amount of unidentifiable hydrocarbon material in the canister. The benzene concentration in the canister is shown in parts per billion volume units for comparison to the short term effects screening level of 25 ppbV. The 196 ppbV benzene 20-minute concentration at Port Grain CCG 629 on May 10 (highlighted in bold) suggests that levels in the area were higher than the short term ESL.

Table 2 Canister Samples, 2Q07

	CCG C 629	DPK C635	JIH C630	JIH C630	JIH C630	WEH C631
	5/10/07 4:48	6/30/07 5:39	4/2/07 6:56	5/13/07 0:19	6/10/07 0:44	6/13/07 1:18
Sum Pol ppbC	6114	976	46837	2565	1861	3701
TNMHC ppbC	7368	2153	27501	1645	1809	4010
Wind direction	253	175	165	213	136	147
Wind speed mph	8	2	7	2	12	6
Benzene ppbV	**196**	1	14	5	4	12

Figures 2-7, found on pages 16–21, contain the near-surface back-trajectories for the six triggered canisters, with start times just after the onset of canister-filling. In several cases, TNMHC concentrations may have been higher prior to canister triggering, but the wind direction and speed had little variation, so whatever triggered the can was likely in the upwind direction shown. Each of the back-trajectories shown is a 30-minute trace back in time, except for Figure 3, page 17, which shows a 2.5 hour back trajectory. The images in Figures 2-7, pages 16-21, show one of the recent augmentations of the UT back-trajectory tool: the points along the trajectory become larger as one moves back in time, reflecting the increasing size of the area upwind that could contribute to the measured concentrations at the monitoring site.

The following observations can be made from these back trajectories and the analysis of their respective canister samples:

- In three of the six cases, a refinery was clearly upwind: Figures 2, 4, and 5, pages 16, 18 and 19 respectively.
- The sample in Figure 2, page 16, for CCG 629 5/10 is rich in C5-C7 hydrocarbons, including the above-ESL benzene value.
- In Figure 3, page 17, the 2.5 hour back-trajectory from Dona Park does not appear to reach to an upwind industrial source area, and the large majority of identified mass in this sample is propane.
- The sample in Figure 4, page 18, JIH 4/2, contains the highest ethane, propane, butanes, pentanes, and hexane in 2007 to date.
- The JIH 5/13 sample in Figure 5, page 19, is similar, at lower concentrations.
- In Figure 6, page 20, the back-trajectory appears to follow the ship channel, but the JIH 6/10 sample is similar in composition to the previous two.
- The sample in Figure 7, page 21, WEH 6/13, may be the result of nearby dockside emissions and is composed mostly of pentanes.

Figure 2 30-min back-trajectory May 10 4:50a.m. CC Grain and measured canister concentrations

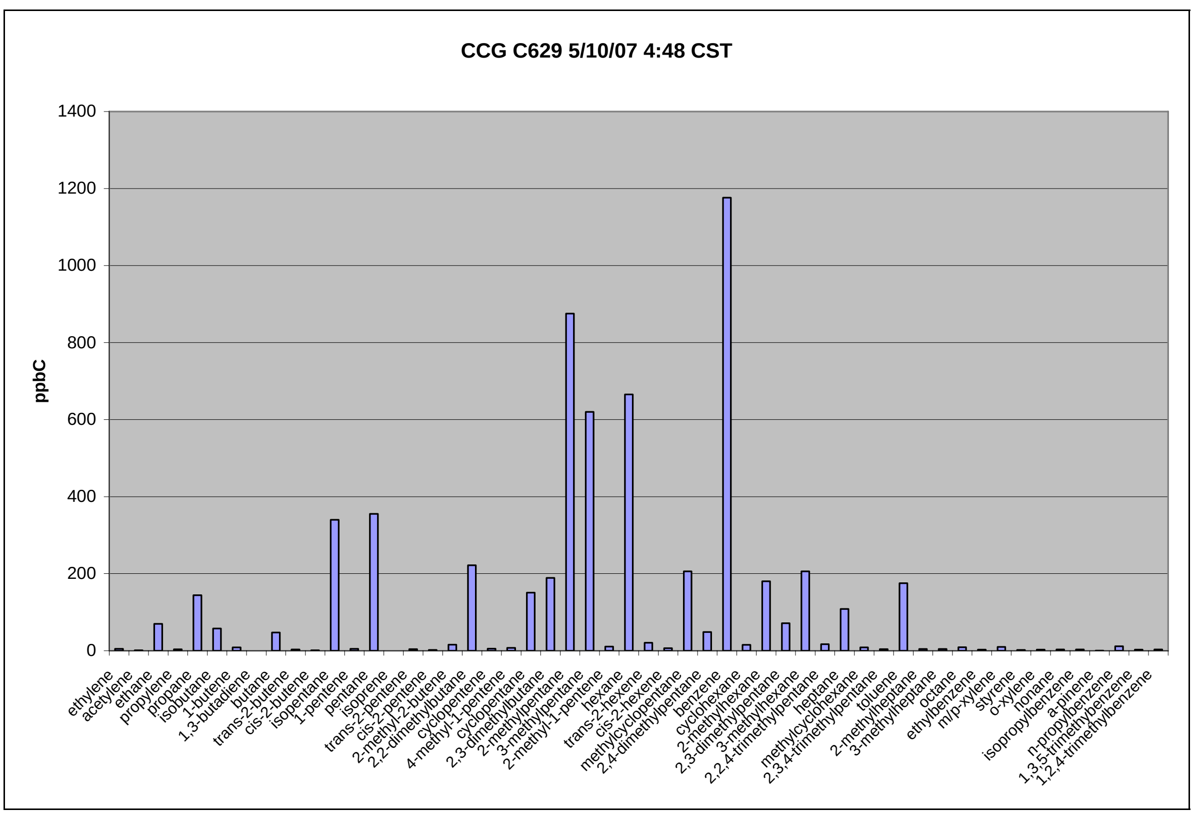
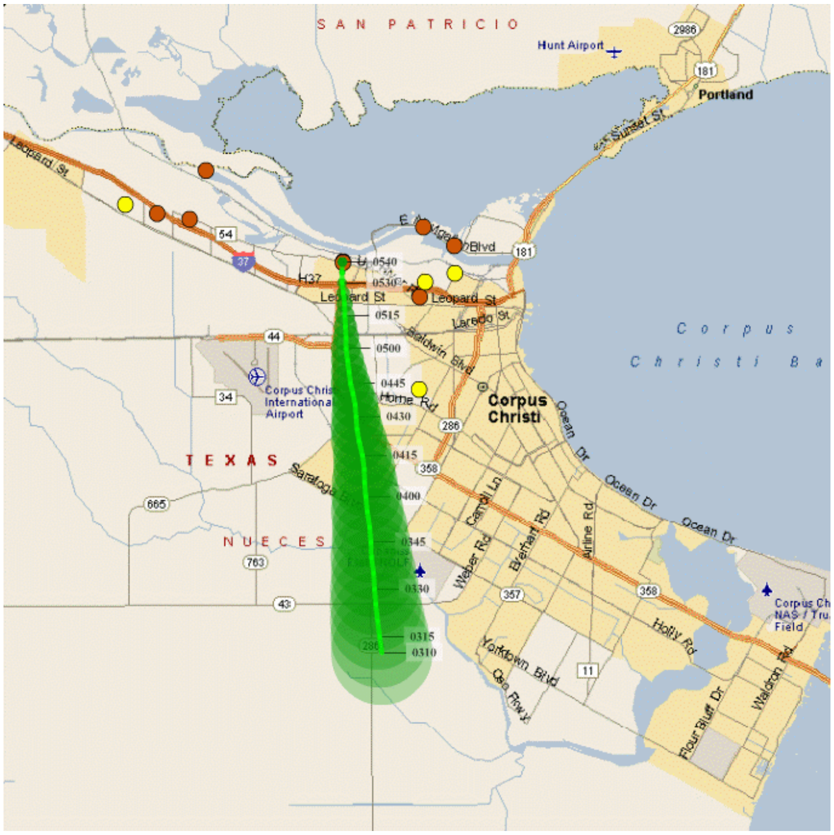


Figure 3 2.5 hour back-trajectory June 30 5:40a.m. Dona Park, and measured canister concentrations



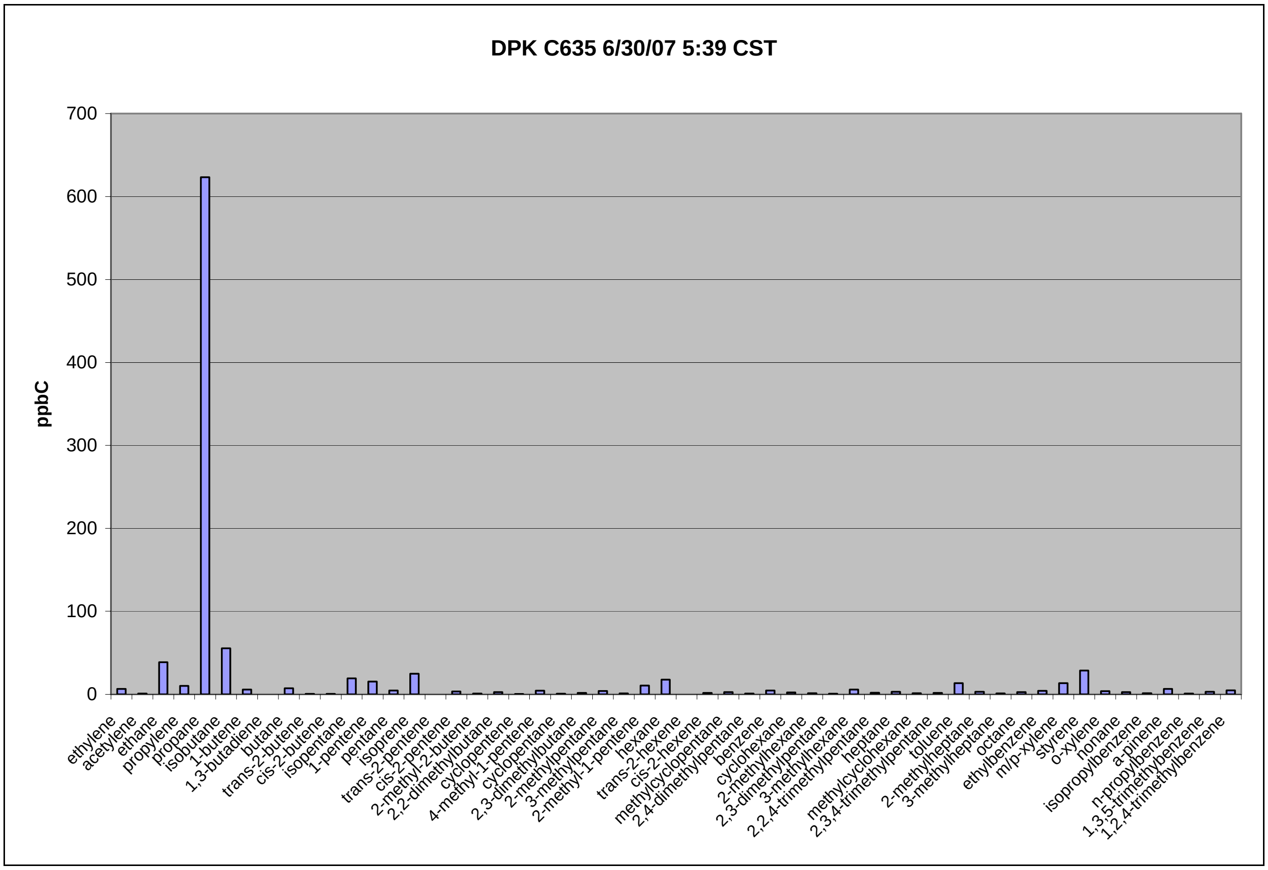
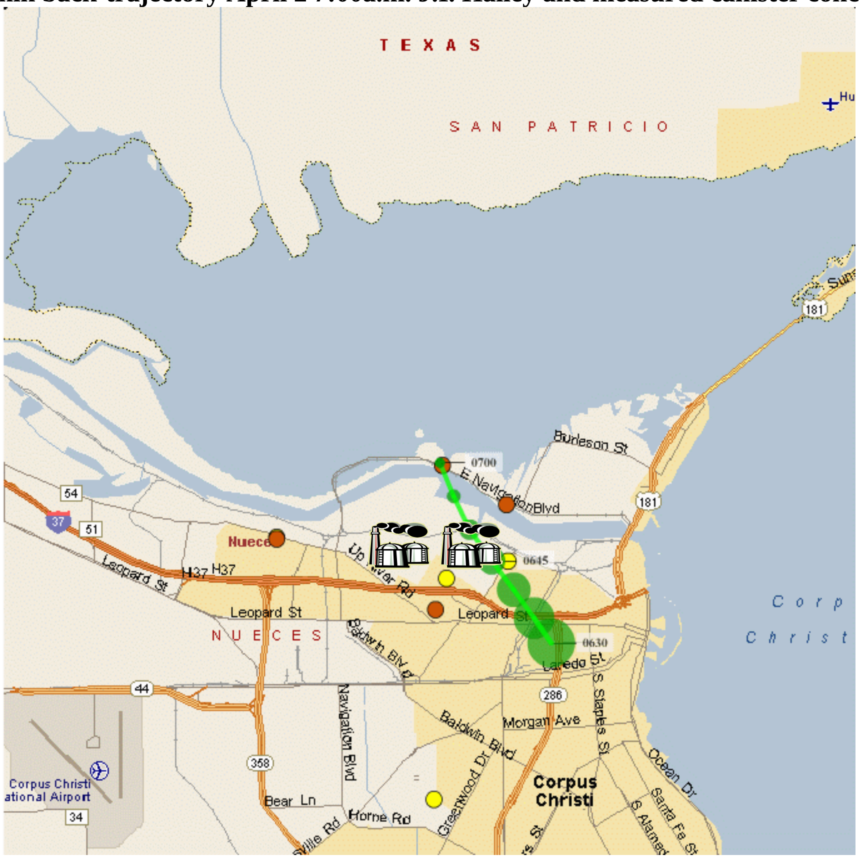


Figure 4 30-min back-trajectory April 2 7:00a.m. J.I. Hailey and measured canister concentrations



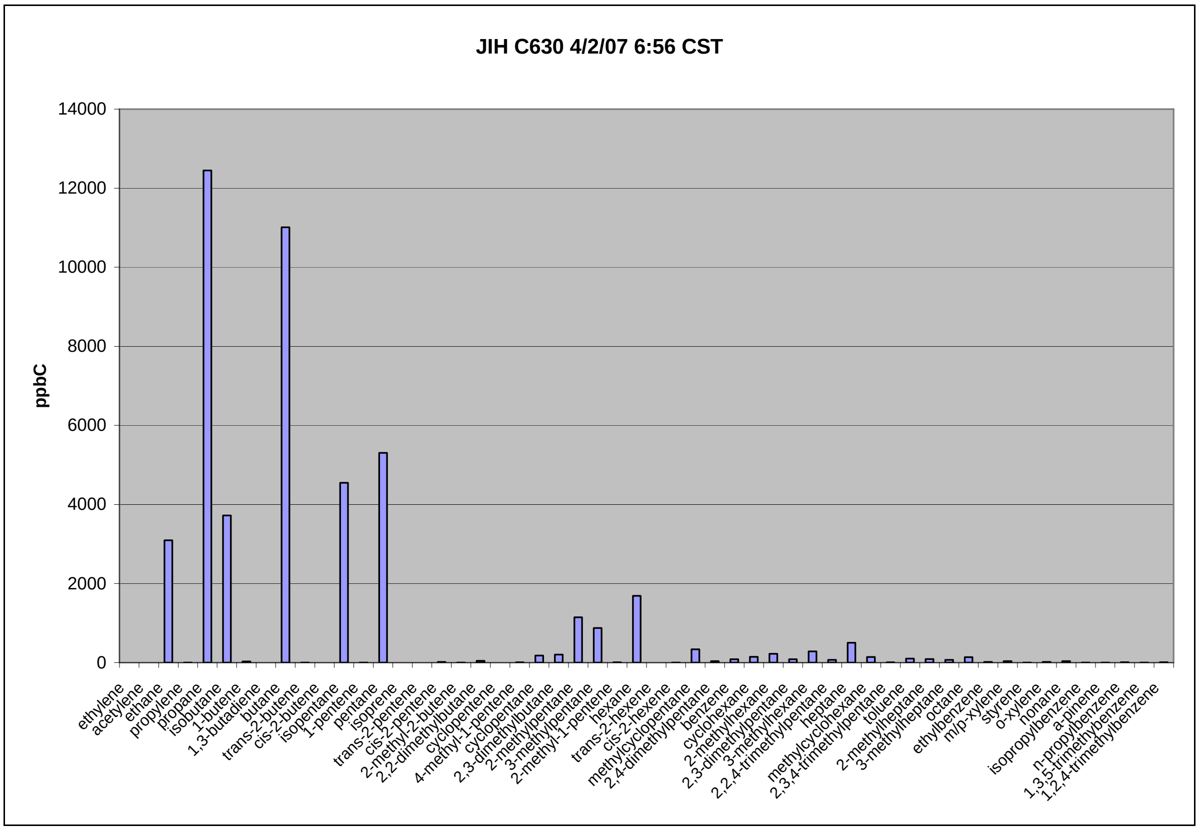


Figure 5 30-min back-trajectory May 13 12:20a.m. JIH and measured canister concentrations

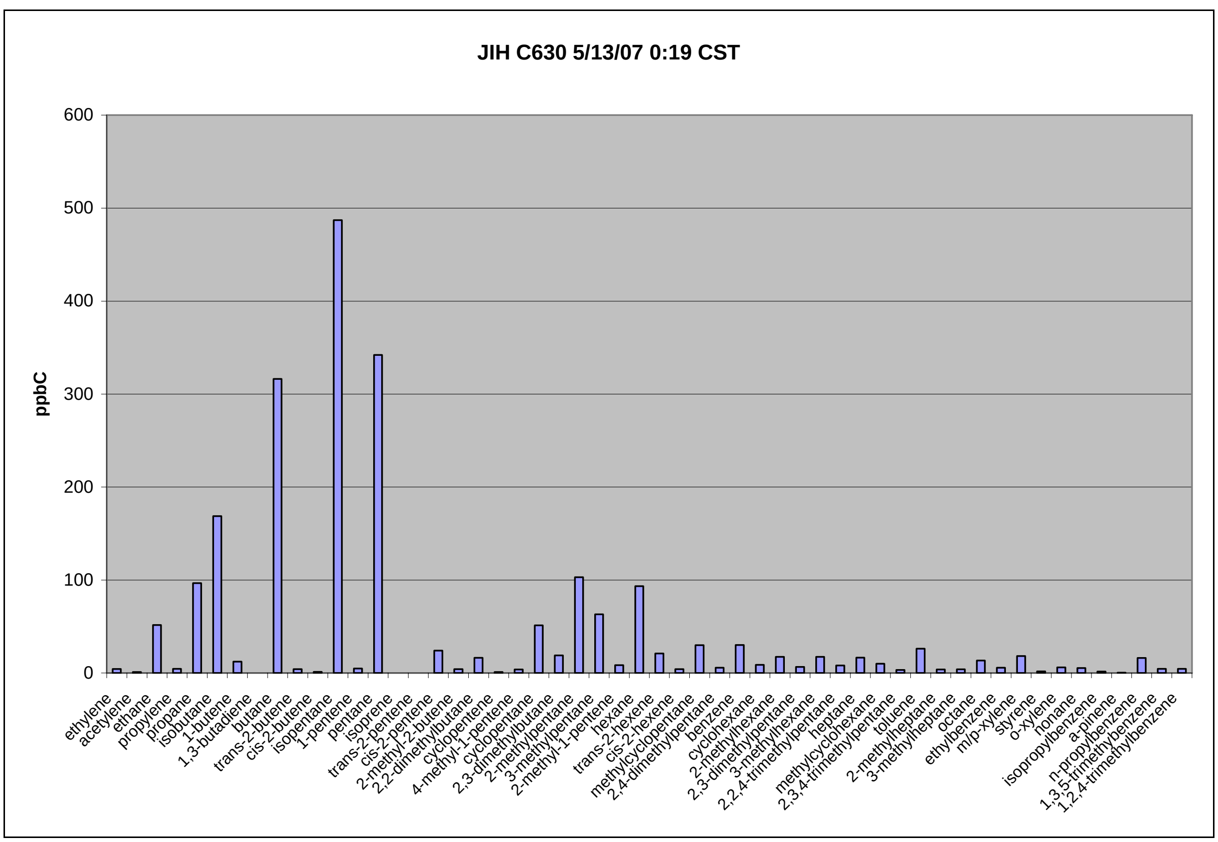
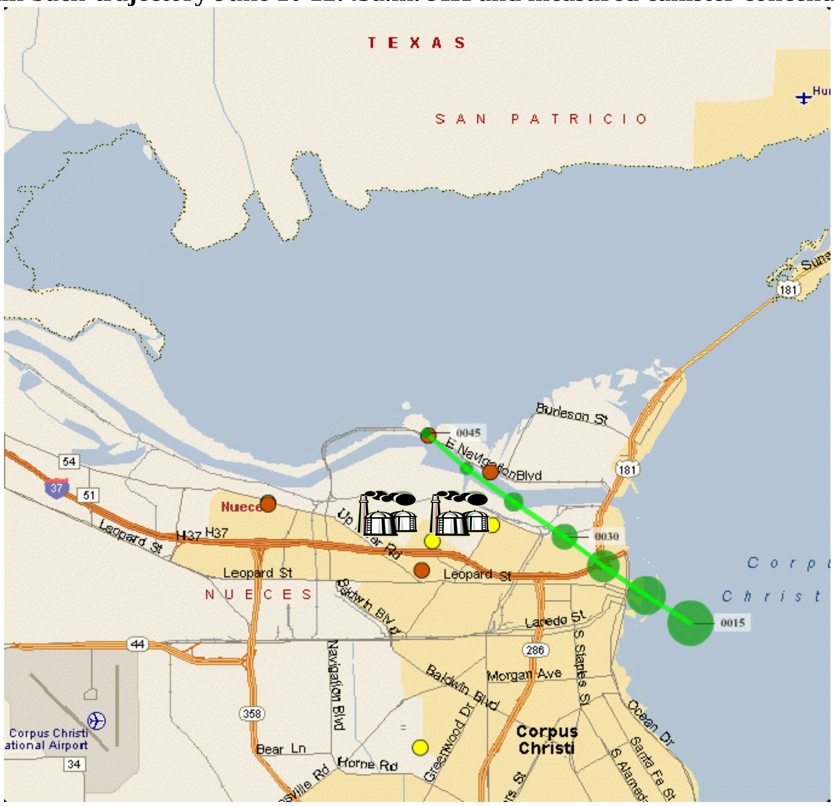


Figure 6 30-min back-trajectory June 10 12:45a.m. JIH and measured canister concentrations



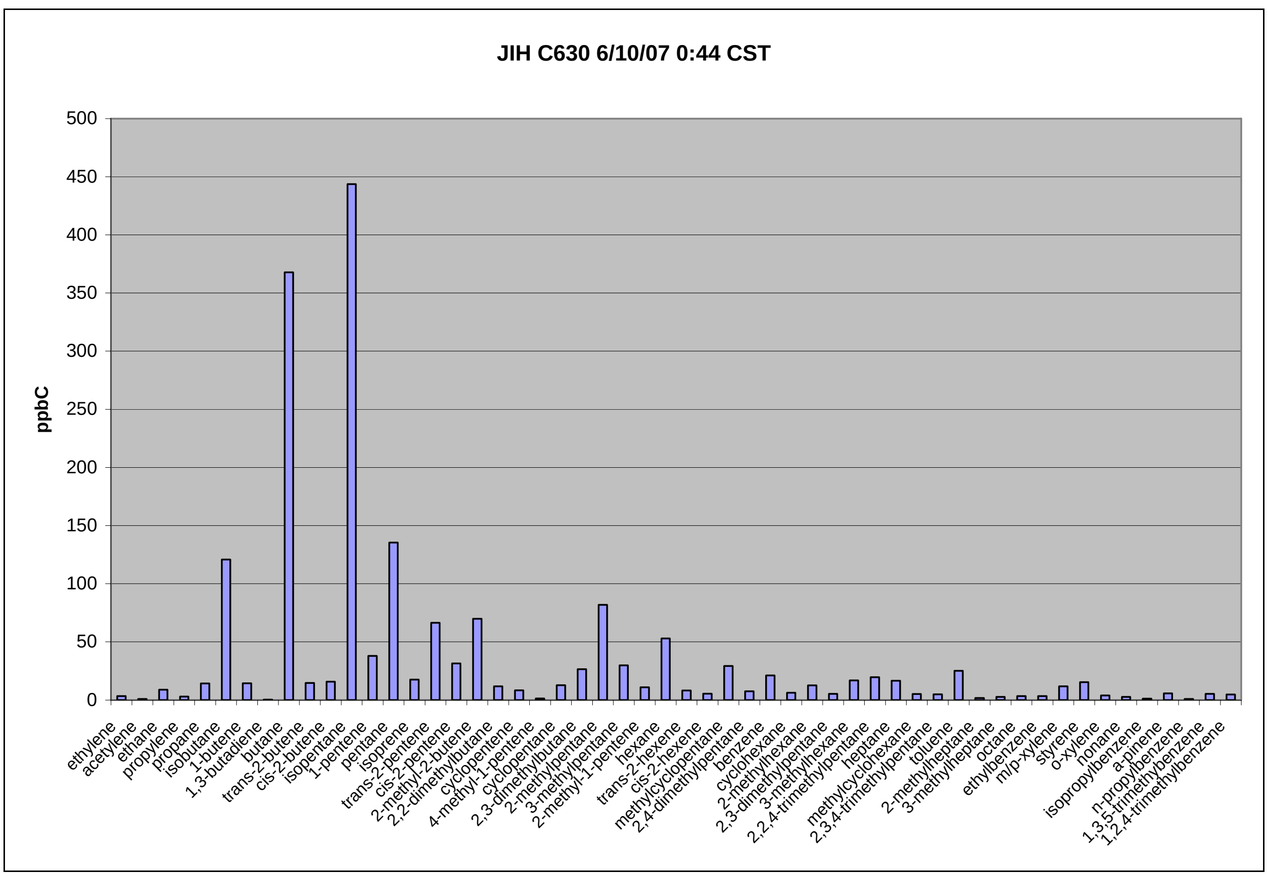
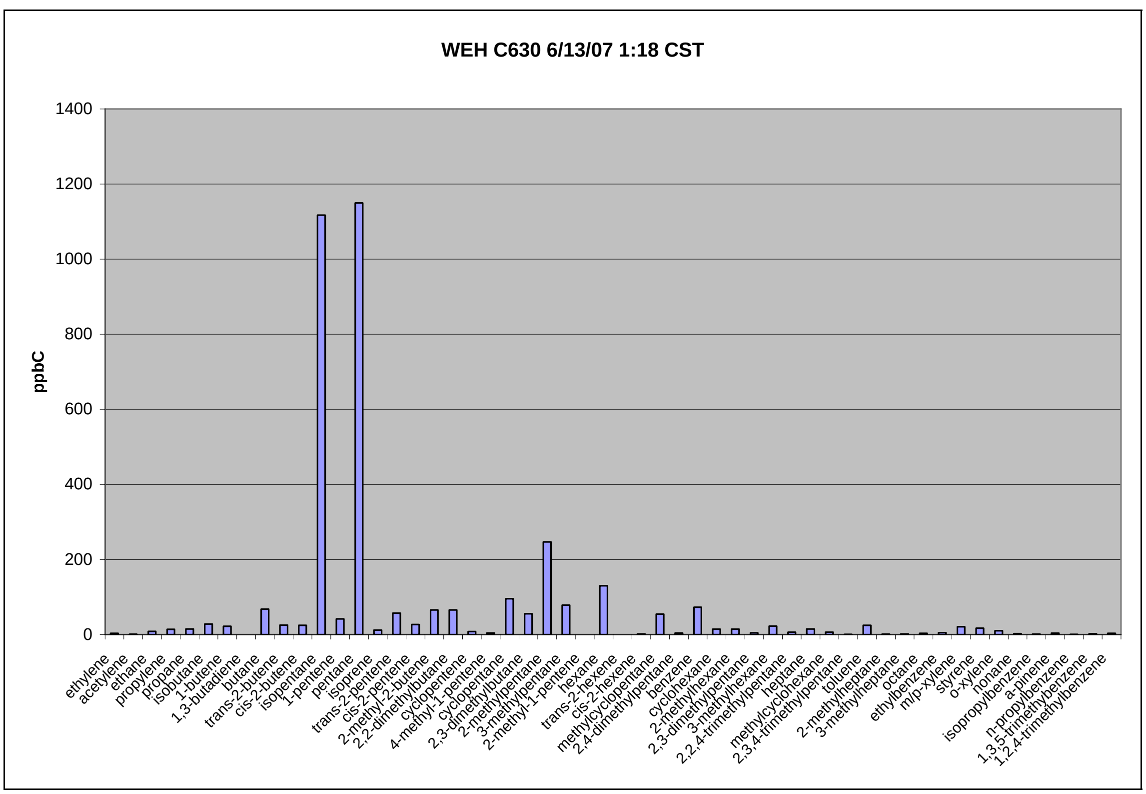


Figure 7 30-min back-trajectory June 13 1:20a.m. WEH and measured canister concentrations



Auto-GC Effects Screening Level Summary

In this section the results of sampling for hydrocarbons at the two auto-GC sites – Oak Park C634 and Solar Estates C633 – are presented.

The contents of this paragraph are a summary of a TCEQ Web page on Effects Screening Levels (ESLs) accessed at http://www.tceq.state.tx.us/implementation/tox/esl/list_main.html on January 23, 2007. The TCEQ establishes ESLs to evaluate the potential for effects to occur as a result of exposure to concentrations of constituents in the air. The ESLs are based on data concerning health effects, potential for odors to be a nuisance, effects on vegetation, and corrosive effects, but ESLs are not ambient air standards. If predicted or measured airborne levels of a constituent do not exceed ESL, adverse health or welfare effects are not expected. If ambient levels of constituents in air exceed ESL, it does not necessarily indicate a problem but rather triggers a review in more depth.

Tables 3 through 6, page 23 and 24, summarize both the second quarter of 2007 and the most recent rolling four-quarter (annual) period for each site. Each table shows the arithmetic mean of all observations (approx. 2000 quarterly, 8000 annual), the annual ESL, the 90th and 95th percentiles for observed values, the maximum measured value, and the one-hour ESL. Note that not all data have been validated and are thus subject to change. All values in the following tables are in ppbV units. Several ESLs are odor related. There were no measurements or averages higher than an ESL during the most recent quarter. However, over the past year (four quarters), there have been seven measurements on five days with benzene greater than the one-hour ESL at Oak Park, with the maximum of 120 ppbV shown in Table 5, page 24. This measurement was made under northeast winds on Jan. 27, 2007.

Table 3 Statistics, 2Q 2007, Auto-GC at Oak Park , 24 compounds of interest, ppbV units

Oak Park 2Q 2007	Mean	Annual ESL	p 90	p 95	Max	1-hour ESL
124_trimethylmbenzene	0.05	25	0.11	0.17	1.00	250
13Butadiene	0.06	5	0.09	0.13	1.68	50
1Butene	0.06	7	0.11	0.23	1.64	70
1Pentene	0.04	3	0.09	0.13	1.77	30
Benzene	0.32	1	0.68	1.18	16.57	25
Cumene	0.01	10	0.01	0.08	0.86	100
Cyclohexane	0.10	42	0.32	0.60	8.21	420
Ethane	5.13	1000	11.67	17.83	89.24	10000
Ethyl_Benzene	0.03	46	0.08	0.13	1.94	460
Ethylene	0.58	102	1.15	2.06	49.67	1022
Isobutane	1.27	800	3.33	5.85	59.11	8000
Isopentane	1.65	120	3.82	5.66	216.75	1200
Propane	3.13	1000	8.19	13.77	79.93	10000
Propylene	0.38	---	0.81	1.62	13.95	68100
Toluene	0.39	50	0.94	1.53	18.47	500
c2Butene	0.04	60	0.06	0.11	1.11	600
c2Pentene	0.03	3	0.07	0.12	1.02	30
mpXylene	0.12	48	0.28	0.52	8.58	480
nButane	1.76	800	4.35	7.34	168.68	8000
nHexane	0.30	50	0.67	1.07	76.42	500
nPentane	0.95	120	1.87	3.41	135.08	1200
oXylene	0.04	85	0.10	0.16	2.76	850
t2Butene	0.09	60	0.12	0.26	1.52	600
t2Pentene	0.07	3	0.14	0.25	1.98	30

Table 4 Statistics, 2Q 2007, Auto-GC at Solar Estates , 24 compounds of interest, ppbV units

Solar Estates 2Q 2007	Mean	Annual ESL	p 90	p 95	Max	1-hour ESL
124_trimethylmbenzene	0.09	25	0.14	0.18	5.89	250
13Butadiene	0.07	5	0.05	0.09	18.35	50
1Butene	0.03	7	0.06	0.08	1.45	70
1Pentene	0.03	3	0.04	0.06	6.25	30
Benzene	0.23	1	0.53	0.71	3.19	25
Cumene	0.01	10	0.02	0.03	0.43	100
Cyclohexane	0.19	42	0.50	0.69	5.43	420
Ethane	5.90	1000	13.59	18.63	59.62	10000
Ethyl_Benzene	0.05	46	0.12	0.15	0.36	460
Ethylene	0.40	102	0.93	1.38	3.94	1022
Isobutane	1.27	800	3.22	4.72	22.32	8000
Isopentane	1.20	120	3.02	3.85	11.68	1200
Propane	3.43	1000	8.81	12.25	52.53	10000
Propylene	0.42	---	0.91	1.04	11.36	68100
Toluene	0.30	50	0.65	0.91	2.61	500
c2Butene	0.03	60	0.05	0.08	3.05	600
c2Pentene	0.01	3	0.03	0.05	0.31	30
mpXylene	0.18	48	0.39	0.51	2.12	480
nButane	1.55	800	3.92	5.50	24.42	8000
nHexane	0.28	50	0.71	0.99	6.55	500
nPentane	0.70	120	1.76	2.45	8.31	1200
oXylene	0.06	85	0.14	0.17	0.54	850
t2Butene	0.04	60	0.07	0.10	0.70	600
t2Pentene	0.02	3	0.05	0.09	0.63	30

Table 5 Statistics, July 1, 2006-June 30, 2007, Auto-GC at Oak Park , 24 compounds, ppbV units

Oak Park 3Q06-2Q07	Mean	Annual ESL	p 90	p 95	max	1hour ESL
124_trimethylmbenzene	0.08	25	0.18	0.28	8.20	250
13Butadiene	0.07	5	0.12	0.17	11.16	50
1Butene	0.15	7	0.32	0.62	15.36	70
1Pentene	0.06	3	0.14	0.22	2.77	30
Benzene	0.76	1	1.54	3.18	120.16	25
Cumene	0.03	10	0.08	0.23	2.88	100
Cyclohexane	0.22	42	0.69	1.06	9.29	420
Ethane	8.42	1000	20.19	28.69	380.08	10000
Ethyl_Benzene	0.07	46	0.16	0.24	2.24	460
Ethylene	0.96	102	2.22	3.77	61.39	1022
Isobutane	2.53	800	6.74	11.61	110.33	8000
Isopentane	2.72	120	6.90	11.15	216.75	1200
Propane	6.31	1000	16.78	27.32	303.60	10000
Propylene	0.93	---	2.08	4.40	118.21	68100
Toluene	0.74	50	1.72	2.59	58.52	500
c2Butene	0.13	60	0.24	0.54	6.73	600
c2Pentene	0.06	3	0.12	0.22	7.72	30
mpXylene	0.23	48	0.57	0.83	8.58	480
nButane	3.62	800	9.56	14.90	353.35	8000
nHexane	0.59	50	1.53	2.52	122.55	500
nPentane	1.78	120	4.60	7.77	142.94	1200
oXylene	0.08	85	0.18	0.27	2.76	850
t2Butene	0.21	60	0.40	0.77	9.26	600
t2Pentene	0.12	3	0.25	0.42	21.95	30

Table 6 Statistics, July 1, 2006-June 30, 2007, Auto-GC at Solar Estates, 24 compounds, ppbV units

Solar Estates 3Q06-2Q07	Mean	Annual ESL	p 90	p 95	max	1hour ESL
124_trimethylmbenzene	0.07	25	0.16	0.22	5.89	250
13Butadiene	0.09	5	0.09	0.13	19.89	50
1Butene	0.06	7	0.13	0.22	3.26	70
1Pentene	0.03	3	0.08	0.13	6.25	30
Benzene	0.40	1	0.88	1.37	11.66	25
Cumene	0.03	10	0.03	0.07	88.69	100
Cyclohexane	0.30	42	0.72	1.06	6.33	420
Ethane	8.75	1000	18.98	25.53	170.06	10000
Ethyl_Benzene	0.06	46	0.14	0.20	3.82	460
Ethylene	0.53	102	1.28	1.82	9.02	1022
Isobutane	1.98	800	4.62	6.86	44.58	8000
Isopentane	1.78	120	4.18	5.97	37.70	1200
Propane	5.43	1000	12.16	16.94	122.36	10000
Propylene	0.34	---	0.79	1.07	51.13	68100
Toluene	0.45	50	0.98	1.36	136.43	500
c2Butene	0.08	60	0.15	0.26	3.15	600
c2Pentene	0.03	3	0.07	0.12	1.43	30
mpXylene	0.36	48	0.64	1.29	27.48	480
nButane	2.94	800	6.81	10.09	80.82	8000
nHexane	0.44	50	1.02	1.45	8.84	500
nPentane	1.12	120	2.65	3.66	28.99	1200
oXylene	0.07	85	0.16	0.22	20.05	850
t2Butene	0.16	60	0.30	0.40	4.07	600
t2Pentene	0.06	3	0.13	0.24	3.22	30

Elevated Hydrogen Sulfide Case Study May 3, 2007 JIH

During the afternoon on May 3, 2007, the JIH site measured 30-minute concentrations of hydrogen sulfide (H_2S) that were greater than the State's standard for one source's contribution to downwind concentrations in a residential area. The State has a separate standard for H_2S concentration contributions in nonresidential areas. The former standard is 80 ppb and the latter is 120 ppb, and the peak 30-min. concentration on May 3 was 113 ppb, with a shorter term 5-minute maximum concentration of 461 ppb at of H_2S at 2:05 p.m. CST. Coincident with the peak short term H_2S concentrations, TNMHC also had a sudden short term spike above 50 parts per million. These short term elevated concentrations were measured in the midst of a longer 6-hour period from 10:20a.m. to 4:20p.m. CST during which the SO_2 monitor measured statistically significantly elevated concentrations. During this period, SO_2 levels varied between 0 and 77 ppb, as the wind shifted from southwest to southeast. The time series for these data appears in Figure 8, below. No upsets were reported in the TCEQ upset/maintenance database. Figure 9 on the following page shows a 30-minute back-trajectory from 2:05 p.m. CST at JIH. Although the trajectory passes over an industrial source area, during the longer 6-hour period that the wind was shifting, the back-trajectories appear to "sweep" across the two refineries as well as across the ship channel on which barge operations may have been underway.

Figure 8 Time series of data at JIH, May 3, 2007

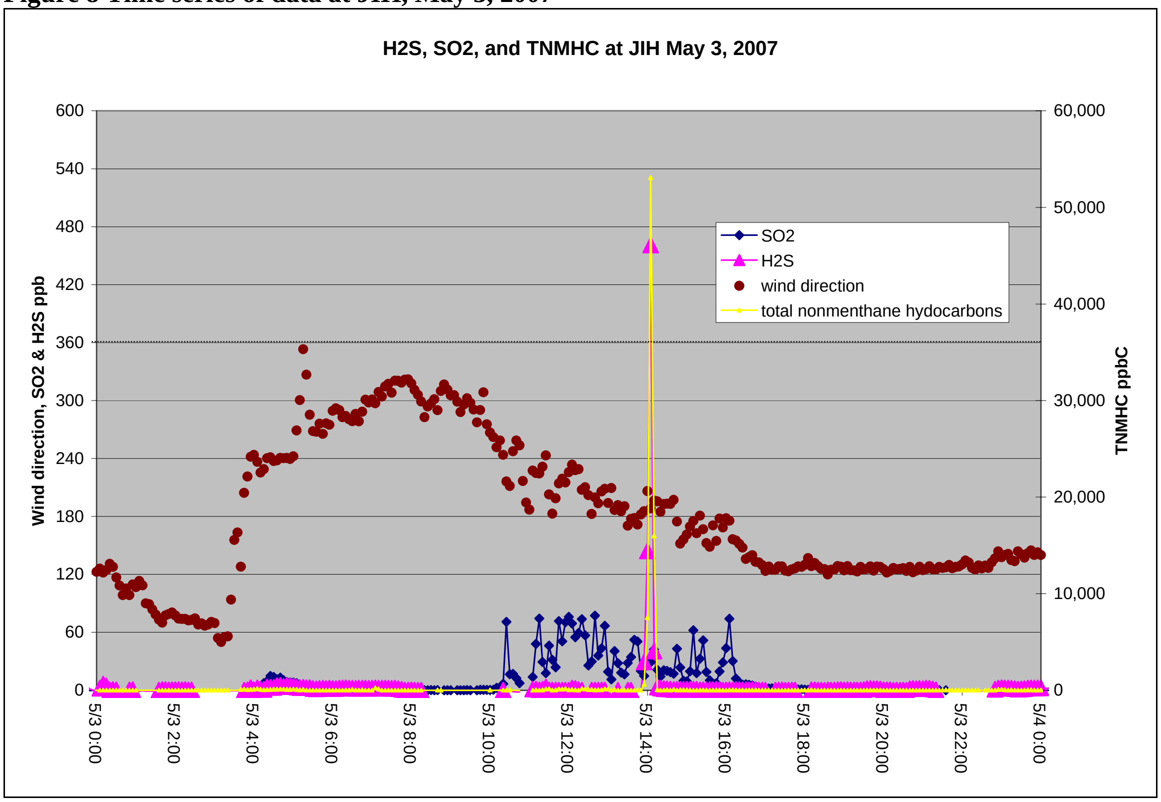


Figure 9 30-minute back-trajectory JIH, May 3, 2:05 p.m.

Update on Canister Sample with Benzene > ESL on March 6, 2007

On Dec. 12, Jan. 27, and March 6 canisters triggered at J. I. Hailey C630 (JIH) and were found to contain benzene concentrations higher than the TCEQ's short-term ESL of 25 ppbV. The data on these cans were reported in the Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation Project Quarterly Report for the Period January 1, 2007 through March 31, 2007. In each of these cases the wind was from the west, which is in the lowest frequency wind sector for the region. Table 7 below, taken from the earlier report, shows the times and wind data for each sample.

Table 7 Recent canister samples at JIH with benzene > ESL

Site	Date	Time CST	Winds
JIH	12/12/06	18:16	WNW, 6mph
JIH	1/27/07	18:41	W, 4mph
JIH	3/6/07	4:02	W, 4mph

The canister contents in each of the three samples showed some similarity in that most of the mass in the cans was in hydrocarbons in the range of 5-7 carbon atoms (e.g., pentanes, hexane, benzene, and substituted aromatics), although the ratios among compounds varied among the samples. In the earlier report there was a hypothesis stated that nearby marine terminal emissions of some refined product other than gasoline could have been responsible. It has now been learned that the TCEQ Mobile Lab measured elevated hydrocarbons including benzene from a flare experiencing incomplete combustion several miles away on March 6. As shown in Figure 10, page 27, a near-surface back-trajectory from JIH at 4:00 p.m. on this date passes over the location investigated by the TCEQ. No other information is available to update the Dec. 12 or

Jan. 27 canisters. Figure 11 below shows the 1-hour back-trajectories for the times at which these canisters were triggered.

Figure 10 One-hour back-trajectory 4 a.m. 3/6/07 JIH and possible source area

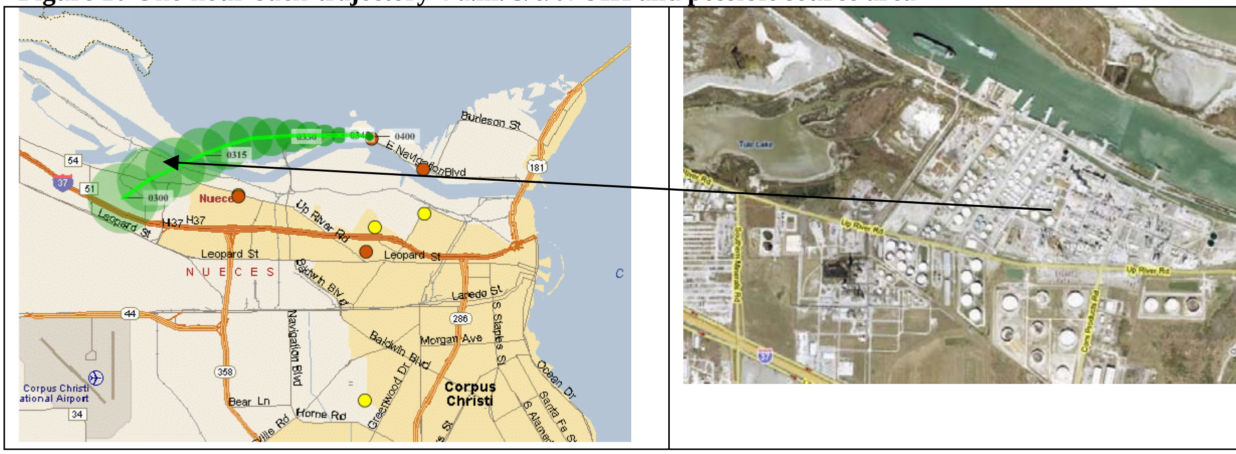
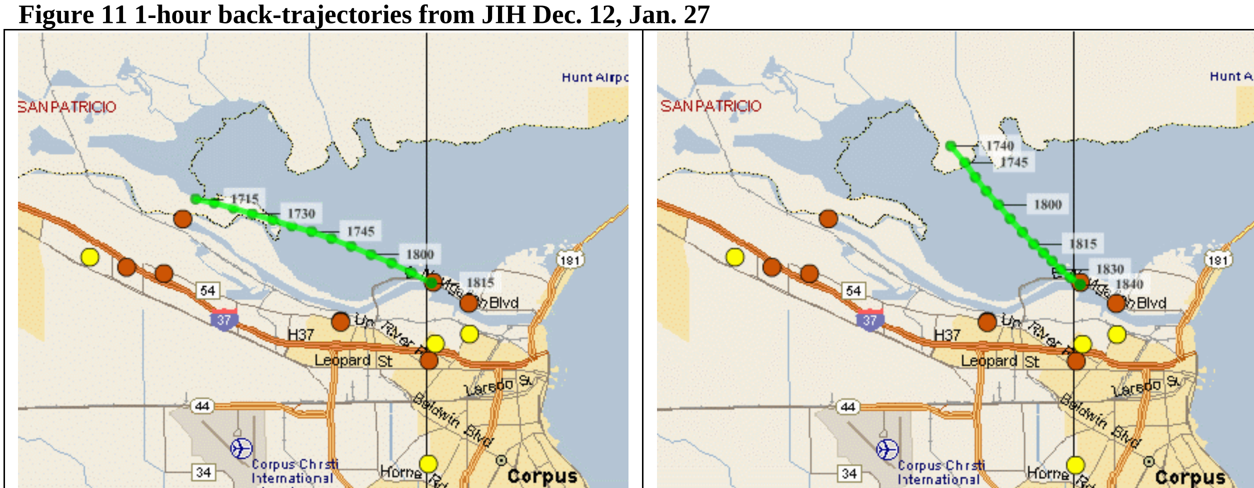


Figure 11 1-hour back-trajectories from JIH Dec. 12, Jan. 27



Dec. 12, 2006, 6:15 p.m.

Jan. 27, 2007, 6:40 p.m.

APPENDIX C

Financial Report of Expenditures
Financial Report of Interest Earned

DRAFT

Corpus Christi Air Monitoring and Surveillance Camera Installation and Operation Project

Accounting Report for the Quarter
04/01/07-06/30/07

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

Total Grant Amount:	$6,761,718.02
Total Interest Earned:	$498,752.37
Total Funds Received:	**$7,260,470.39**

B. Summary of Expenditures Paid by COCP Funds

		Year 3 Budget	Year 4 Adjustments	Adjusted Budget	Prior Activity	Current Activity 04/01/07-06/30/07	Encumbrances	Remaining Balance 6/30/2007
Salaries-Prof	12	$216,128.63	160,652.00	$376,780.63	($249,061.31)	($44,732.84)	($30,279.17)	$52,707.31
Salaries-CEER	15	$19,606.37	15,636.00	$35,242.37	($28,062.98)	($3,500.36)	($2,343.15)	$1,335.88
Fringe	14	$47,984.00	38,783.00	$86,767.00	($54,948.75)	($10,324.86)	($5,594.81)	$15,898.58
Supplies	47/68	$60,474.00	73,500.00	$133,974.00	($30,310.00)	$0.00	$0.00	$103,664.00
Other	50	$86,844.00	33,500.00	$120,344.00	($88,568.04)	($10,068.49)	($993.59)	$20,713.88
	51		20,300.00	$20,300.00	($13,140.00)	$0.00	$0.00	$7,160.00
Subcontract	62-64	$1,965,693.00	314,022.00	$2,279,715.00	($1,961,552.84)	($55,973.42)	$0.00	$262,188.74
Travel	75	$2,300.00	2,000.00	$4,300.00	($3,676.59)	($865.61)	$0.00	-$242.20
Equipment	80	$0.00	0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Indirect Costs	90	$359,855.00	98,759.00	$458,614.00	($339,345.36)	($15,164.63)	$0.00	$104,104.01
TOTALS		**$2,758,885.00**	**757,152.00**	**$3,516,037.00**	**($2,768,665.87)**	**($140,630.21)**	**($39,210.72)**	**$567,530.20**

C. Interest Earned by COCP Funds as of 06/30/07

Prior Interest Earned:	$462,344.90
Interest Earned This Quarter:	$36,407.47
Total Interest Earned to Date:	**$498,752.37**

D. Balance of COCP Funds as of 06/30/07

Total Grant Amount:	$6,761,718.02	
Total Interest Earned:	$498,752.37	
Current Q. Expenses	($140,630.21)	
Total Expenditures:	($2,768,665.87)	
Remaining Balance:	**$4,351,174.31**	*includes interest

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

Cheryl S. Lubetter

Accounting Certification