

**Neighborhood Air Toxics Modeling Project
For
Houston and Corpus Christi – Stage 1**

**Quarterly Report for the Period
October 1, 2010 through December 31, 2010**

Submitted to

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

Submitted by

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February 16, 2011

I. Introduction

On February 1, 2008, the Court entered an Order (D.E. 981, Order (pp.1, 7-11)) regarding unclaimed settlement funds in Lease Oil Antitrust Litigation (No.11) Docket No. MDL No.1206. The Court requested a detailed project proposal from Dr. David Allen, the Gertz Regents Professor in Chemical Engineering and the Director of the Center for Energy and Environmental Resources at The University of Texas at Austin (UT Austin), regarding the use of \$9,643,134.80 in the Settlement Fund. The proposal was for a project titled “Neighborhood Air Toxics Modeling Project for Houston and Corpus Christi” (hereinafter “Air Toxics Project”). The Air Toxics Project was proposed in two stages. In Stage 1, UT Austin will develop, apply, demonstrate and make publicly available, neighborhood-scale air quality modeling tools for toxic air pollutants in the Corpus Christi, Texas and will extend the operation of the air quality monitoring network in Corpus Christi, Texas. In Stage 2, subject to the availability of funds, UT Austin will extend the modeling to the Houston, Texas ship channel region, develop a mobile monitoring station that can be deployed in Corpus Christi and in other regions of Texas and/or further extend the operating life of the existing stationary network in the same or a modified spatial configuration. If a mobile monitoring station is deployed, it will be used to map the spatial distributions of air pollutant concentrations and to inform the public. All ambient monitoring results will be used in synergy with the neighborhood-scale models to improve the understanding of emissions and the spatial distribution of air toxics in the region.

On February 21, 2008, 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 \$4,586,014.92, plus accrued interest, to UT Austin for the purposes of implementing Stage 1 of the Air Toxics Project as described in the detailed proposal submitted to the Court by UT Austin on February 15, 2008 (D.E. 998).

Under the Order to Distribute Funds in MDL No. 1206, on March 3, 2008, at the direction of the Settlement Administrator, \$4,602,598.66 was disbursed to UT Austin for Stage 1 of the Project. This amount includes the interest accrued prior to distribution from the MDL No. 1206 Settlement Fund. Stage 2 funding has not been awarded by the US District Court.

This Stage 1 quarterly report has been prepared pursuant to the requirements of the Air Toxics Project and is being submitted to the US District Court.

II. Air Toxics Project – Stage 1 - Phase 1A Overview

A. Scope and Objectives

The objective of Stage I - Phase 1A of The Air Toxics Project for UT Austin and its subcontractors is to develop, apply, and make publicly available, neighborhood-scale air quality modeling tools for toxic air pollutants in the Corpus Christi area. Stage 1 – Phase 1A of the Air Toxics Project will provide significant and discernible environmental benefits to the Corpus Christi area by providing analyses of air pollutant concentrations experienced by the community, and providing post-event evaluation of pollutants emitted during releases. UT Austin is performing this work in collaboration with subcontractors at Texas A&M University and ENVIRON International Corporation.

B. Major Tasks

The major tasks for Stage I, Phase IA include:

1. *Development of a conceptual model of meteorological conditions likely to lead to high concentrations of air toxics in the Corpus Christi area.*

This task will identify meteorological conditions (seasons, temperatures, wind speeds, wind directions, frontal passages and other parameters) and air quality conditions that are most likely to lead to high concentrations of air toxics in populated regions of Corpus Christi. The conceptual model will be used to identify historical periods that can be used to develop and test air toxics modeling systems for Corpus Christi.

2. *Development of emissions inventory and land cover input information.*

These data will be developed at a spatial resolution that will allow the neighborhood scale air quality models to operate with a resolution of a few hundred meters.

3. *Application of dispersion models to estimate the neighborhood-scale concentrations of air toxics in Corpus Christi.*

Dispersion models represent the current best practice for estimating air toxics concentrations in urban areas. Using emissions, land cover, and meteorological data, a dispersion model will be used to estimate concentrations of air toxics in plumes from sources identified in the emissions inventory and during historical meteorological conditions identified during the conceptual model development

4. *Development of improved meteorological models of air pollutant dispersion in the Corpus Christi area.*

A more rigorous combined plume and gridded model able to characterize the complex coastal meteorology in the region will also be developed and applied in order to address uncertainties in predicted concentrations obtained from the dispersion model. A state-of-the-science meteorological model will be used to simulate the three-dimensional weather conditions in the Corpus Christi area, with a focus on the replication of historical weather patterns identified in the conceptual model. Simulation of local circulation features will be carefully assessed, and additional analyses will customize the model for best performance in the Corpus Christi area.

5. *Development of combined gridded and plume models to estimate neighborhood-scale concentrations of air toxics in Corpus Christi:*

The combined gridded and plume model will predict three-dimensional concentrations of selected air toxic pollutants throughout the Corpus Christi area using the meteorological modeling, emission inventory and land cover data described above. An evaluation framework will be developed to compare predicted and observed concentrations during specific historical episodes and to refine the modeling approach and performance.

6. *Application of the combined dispersion and gridded modeling tools to estimate concentrations of air toxics in Corpus Christi.*

The combined dispersion and gridded modeling tools will be applied to estimate concentrations of air toxics in Corpus Christi under a variety of meteorological conditions for routine emissions and when monitoring data has indicated higher concentrations of air toxics than would be expected under routine emission conditions; spatial mappings of the estimated air toxics concentrations will be made available on a Project website.

C. Project Milestone Schedule

The meteorological and air quality modeling is on-going as described below.

D. Scheduled Project Presentations and Meetings

The Corpus Christi Air Monitoring and Surveillance Camera Project Advisory Board met on November 18, 2010 on the campus of Texas A&M University in Corpus Christi, Texas. Dr. McDonald-Buller presented an overview of the results of dispersion modeling of air toxics in Corpus Christi. The meeting notes from the Advisory Board Meeting are found in Appendix A, page 7.

III. Air Toxics Project – Stage 1 - Phase 1B Overview

A. Scope and Objectives

The initial workplan for the Stage I funding called for application of the modeling tools to the Houston Ship Channel region after their demonstration in Corpus Christi with the goal of demonstrating that the neighborhood-scale air toxics modeling framework is applicable to other urban areas. The area surrounding the Ship Channel in east Harris County, Texas was to be used for this demonstration, and the period to be modeled will be August 15-September 15, 2006, which corresponds to the period of the Second Texas Air Quality Study (TexAQS II).

The initial workplan for Stage I has been restructured and Phase 1B of the project reserves approximately 50% of Stage 1 project funds, approximately \$2.3 million, to extend the operation of the Corpus Christi ambient monitoring network. As a result the modeling of the Houston Ship Channel region will be deferred pending availability of Stage 2 funds.

B. Goals

Under Phase 1B the project team will use the air quality modeling results in synergy with the data collected from the ambient network to help develop recommendations for future changes in the geographic configuration and/or instrumentation for the network that might facilitate better characterization of the air toxics exposure patterns.

IV. Stage 1 – Phase 1A Project Progress Report

A. Meteorological Team

Dr. Nielsen-Gammon's group at Texas A&M University completed the development and evaluation of the September 2005 - February 2006 and September 2008 – February 2009 Weather Research and Forecast (WRF) meteorological modeling simulations at a 1-km spatial resolution. A report on the results was submitted to UT Austin for review.

B. Modeling Team

Dispersion modeling simulations of benzene and 1,3-butadiene concentrations using AERMOD and CALPUFF were completed by UT Austin. The interim report on the results of all dispersion modeling was completed and submitted to the Project

Advisory Board and the TCEQ for review. The report includes descriptions of the modeling methodology, comparisons of the dispersion modeling results to ambient observations, maps of predicted spatial distribution of benzene and 1,3-butadiene concentrations, and discussions of key findings and recommendations for the region.

ENVIRON completed CAMx photochemical modeling simulations of air toxics using the WRF meteorological model output generated by Dr. Nielsen-Gammon's group. ENVIRON submitted a report to UT Austin for review.

During the analysis of the ambient data from the CCAQP network. UT Austin noted that one site, J.I. Hailey, is currently not in compliance with the new National Ambient Air Quality Standard (NAAQS) for SO₂. With the consent of the Project Advisory Board, UT Austin is performing a reconciliation of the SO₂ emission inventory with the ambient monitoring data.

V. Collaborative Relationships and Leveraging of the Air Toxics Project

None during this reporting period.

VI. Financial Summary

A. Financial Report

Details of the following financial summary information are included in Appendix B, beginning on page 11.

1. Detailed List of the Actual Expenditures Paid from Air Toxics Project Funds through December 31, 2010
Expenditures of Air Toxics Project funds during this quarter totaled \$77,143.94. The breakdown of expenditures can be found in Appendix B, page 12. The activities for which these expenditures were used are detailed in this report.
2. Total Interest Earned on Air Toxics Project Funds through December 31, 2010
The interest earned during this quarter totaled \$19,814.39. A report providing detailed calculations of the interest earned on the Air Toxics Project funds is included in Appendix B, page 12.
3. Balance as of December 31, 2010, in the Air Toxics Project Account
The balance in the Air Toxics Project account, including interest earned totals \$3,106,641.53.
4. Anticipated Expenditures for the Funds Remaining in the Air Toxics Project Account
The anticipated expenditures for the remaining funds will total \$3,106,641.53.

Quarterly Report Distribution List:

U.S. District Court

Ms. Marianne Serpa, Assistant Deputy-In-Charge, District Court Operations
for distribution to the Honorable Janis Graham Jack

cc: The University of Texas at Austin

Mr. Lee Smith, Associate Vice President for Legal Affairs

Dr. Elena McDonald-Buller, Center for Energy & Environmental Resources

Mr. Gary McGaughey, Center for Energy and Environmental Resources

Mr. Vincent M. Torres, Center for Energy and Environmental Resources

Dr. David Sullivan, Center for Energy and Environmental Resources

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Ms. Susan Clewis, Regional Director, Region 14

Mr. David Kennebeck, Air Section Manager, Region 14

Mr. Ken Rozacky, Monitoring Operations Division, Headquarters

Mr. Keith Sheedy, Chief Engineer's Office, Headquarters

Ms. Rosario Torres, Air Section Work Leader, Region 14

Members of the Advisory Board of the *Corpus Christi Air Monitoring and
Surveillance Camera Project*

APPENDIX A

November 18, 2010

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

November 18, 2010

Advisory Board Members Present:

Ms. Gretchen Arnold
Ms. Joyce Jarmon
Dr. Glen Kost
Ms. Pat Suter
Dr. Eugene Billiot
Rev. Henry Williams

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

Guest Present:

Ms. Jaclyn Uresti

Chief of Staff for State Representative Abel Herrero

Ex-Officio Members of the Board

Mr. James Martinez
Ms. Rosario Torres
Ms. Susan Clewis
Mr. Ken Rozacky
Mr. Chris Owen

Probation Office - US District Court
TCEQ – Region 14
TCEQ – Region 14
TCEQ
TCEQ

Project Personnel Present:

Dr. David Allen
Mr. Vince Torres
Dr. Dave Sullivan
Dr. Elena McDonald-Buller
Mr. Gary McGaughey
Ms. Terri Mulvey

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I. Call to Order and Welcome

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

II. Project Overview and Status

A. Data Collection and Analyses

Dr. Dave Sullivan gave his presentation, “Air Monitoring Data for Corpus Christi, November 18, 2010.” He provided copies of the presentation to the Advisory Board members. He explained the new EPA sulfur dioxide standard and summarized how CoCP monitor readings compare with the standard. One site, J.I. Hailey, does not comply with the new sulfur dioxide standard, and can be described as being in a state of “noncompliance.” He also showed how 1,3-butadiene concentrations had significantly declined at Solar Estates.

III. Neighborhood Air Toxics Modeling Project

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

Dr. Elena McDonald-Buller gave her presentation, “Dispersion Modeling of Air Toxics in Corpus Christi.” She provided copies of the presentation to the Advisory Board members. This presentation summarized the results of the dispersion modeling of benzene and 1,3-butadiene using the EPA regulatory models, AERMOD and CALPUFF. The modeling results were discussed in comparison with observations from the CCAQP network. Air quality modeling allows pollutant concentrations to be

estimated in areas without monitors and can provide insights into emissions inventories for the region. In addition, it can indicate areas of interest for future investigation and monitoring.

After the completion of the 2 presentations time for questions and answers was provided. Rev. Williams inquired if the Hillcrest site was one of the monitoring sites. Dr. Sullivan responded that it was one of the TCEQ's sites, and it was not a site operated by the University of Texas.

IV. Discussion of Development of Plan for Continued Operation of Monitoring Network

A. Overview of Approach to Develop Path Forward

Mr. Torres transitioned the meeting from data analysis and monitoring operations, to a discussion on the Development of a Plan for Continued Operation of the Monitoring Network after Sept. 30, 2011, when the Court Order Condition of Probation Project funding will run out.

The development of the plan will require the project team to focus on technical issues as well as financial issues. Mr. Torres also stated the plan will be developed with Advisory Board input and approval prior to submittal of the proposed plan during the Annual Report presentation to the Honorable Judge Jack in Spring 2011.

Mr. Torres began the discussion with 5 technical guiding questions that must be considered.

- 1) Should we continue monitoring for the same chemicals?
- 2) Should we consider adding any chemicals to the list?
- 3) Should we continue to operate all seven sites?
- 4) Should we relocate any monitoring stations?
- 5) When will we need to replace equipment?

B. Technical Issues

Mr. Torres introduced Dr. David Allen, who gave his presentation, "Revisions to the National Ambient Air Quality Standards (NAAQS) and Implications for Air Quality Monitoring in Corpus Christi." The presentation highlighted the change to the SO₂ NAAQS and the anticipated changes to the ozone NAAQS. These 2 changes to the NAAQS have the potential to change the ability of the Corpus Christi region to meet all of the standards. In particular the J.I. Hailey monitor is currently in non-compliance with the new SO₂ NAAQS. Following Dr. Allen's presentation the Advisory Board asked questions and a discussion ensued.

Dr. Allen explained that co-location of NO_x monitors near VOC monitoring stations could be helpful in obtaining information regarding ozone formation. Ms. Pat Suter inquired about the expense of NO_x monitors? Mr. Torres replied that they are approximately \$25,000 each installed plus operating costs.

Dr. Glen Kost inquired if we had access to mobile sampling. Dr. Allen replied that The University of Texas at Austin does have the capability for mobile sampling.

Ms. Suter inquired about whether The University of Texas at Austin believes there are one or more sites that aren't providing needed information? Dr. Allen responded that Flint Hills Easement (FHR) could potentially be such a site. A pump jack and tank battery are located near the site, which dominate the results when the winds blow from that direction. Ms. Sutter suggested that UT remove the least informative site(s).

Dr. Allen returned to the topic of the new NAAQS for SO₂. The new primary standard was set to reduce exposure to high short-term (5-minutes to 24-hours) concentrations of SO₂, which have been associated with adverse respiratory effects. The J.I. Hailey site, in Corpus Christi is currently not in compliance with the new SO₂ NAAQS. Therefore, UT recommends the following actions with respect to sulfur measurements:

- 1) Retain current sulfur monitors
- 2) Perform reconciliation of the emission inventory with the ambient monitoring data
- 3) Assess modeling needs after quality assurance of the emission inventory; report to Advisory Board at next meeting – **Action Item**

After addressing questions and the discussion that followed, Dr. Allen invited the Advisory Board to submit questions and ideas on network configuration options, i.e., addition or removal of sites, to Mr. Torres. These changes and/or suggestions will be addressed and information provided at the next board meeting, when UT will present one or more scenarios for continued operation of the network to the Advisory Board for review, discussion, and action. – **Action Item**

The goal is to have a Board approved plan to submit to the Honorable Judge Jack at the annual report in the spring.

Dr. Allen asked the Advisory Board for approval to conduct the SO₂ evaluation. Dr. Kost moved approval of the request and Ms. Suter seconded the motion. The motion was approved unanimously by all Advisory Board Members present.

The project team will develop the Plan in coordination with the City of Corpus Christi, both regional and state TCEQ offices, the Corpus Christi Pollution Prevention Partnership and the Corpus Christi Community as represented by the Advisory Board.

V. Follow up on Old Business/Action Items

VI. Preplanning for the Annual Report before the Honorable Judge Jack

Mr. Torres suggested that we tentatively consider having the annual report presentation in March 2011.

VII. Advisory Board

B. Schedule for the next meeting of the Advisory Board

Mr. Torres suggested that we try to coordinate the next Advisory Board meeting to coincide with the ATSDR report on or about January 27, 2011, or shortly thereafter.

VIII. Other Issues

Invite the Port of Corpus Christi to the next Advisory Board meeting – **Action Item**

IX. Adjourn

The meeting was adjourned at 3:45 pm.

APPENDIX B

FINANCIAL REPORT of Expenditures and Interest Earned

Neighborhood Air Toxics Modeling Project for Houston and Corpus Christi - Stage 1 Phase 1A

Accounting Report for the Quarter 10/01/2010 - 12/31/2010

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

Total Grant Amount:	\$4,608,452.90
Total Interest Earned:	\$290,599.60
Total Funds Received:	\$4,899,052.50

B. Summary of Expenditures Paid by Air Toxics Funds

		Yr 1 and Yr2 Budget	Year 3 Budget	Adjustments this Quarter	Adjusted Budget	Prior Activity	Current Activity 10/01/10 - 12/31/10	Encumbrances	Remaining Balance 12/31/2010
Salaries-Prof	12	\$616,882.00	\$228,508.00	\$0.00	\$845,390.00	(\$732,619.93)	(\$12,882.81)	\$0.00	\$99,887.26
Salaries-CEER	15	\$66,780.00	\$24,045.00	\$0.00	\$90,825.00	(\$74,562.93)	(\$1,810.37)	(\$1,202.42)	\$13,249.28
Fringe	14	\$149,185.00	\$55,852.00	\$0.00	\$205,037.00	(\$177,295.66)	(\$3,540.77)	(\$283.50)	\$23,917.07
Supplies	50	\$61,991.00	-\$4,031.00	(\$1,800.00)	\$56,160.00	(\$33,965.63)	(\$405.00)	\$0.00	\$21,789.37
Contingency	51	\$6,746.00	\$27,805.00	\$0.00	\$34,551.00	\$0.00	\$0.00	\$0.00	\$34,551.00
Consultants	60	\$22,500.00	\$2,500.00	\$0.00	\$25,000.00	\$0.00	\$0.00	\$0.00	\$25,000.00
Subcontracts	61-63	\$600,000.00	\$0.00	\$0.00	\$600,000.00	(\$445,648.46)	(\$46,642.74)	\$0.00	\$107,708.80
Modeling/Computer Sv	67	\$46,500.00	\$12,500.00	\$0.00	\$59,000.00	\$0.00	\$0.00	\$0.00	\$59,000.00
Computation Center	68	\$0.00	\$0.00	\$1,800.00	\$1,800.00	\$0.00	(\$1,800.00)	\$0.00	\$0.00
Tuition	71	\$17,727.00	\$0.00	\$0.00	\$17,727.00	(\$17,602.00)	\$0.00	\$0.00	\$125.00
Travel	75	\$15,000.00	\$5,000.00	\$0.00	\$20,000.00	(\$2,596.97)	\$0.00	\$0.00	\$17,403.03
Equipment	80	\$17,500.00	\$7,500.00	\$0.00	\$25,000.00	(\$7,245.00)	\$0.00	\$0.00	\$17,755.00
Indirect Costs	90	\$243,122.00	\$53,952.00	\$0.00	\$297,074.00	(\$223,730.45)	(\$10,062.25)	\$0.00	\$63,281.30
TOTALS		\$1,863,933.00	\$413,631.00	\$0.00	\$2,277,564.00	(\$1,715,267.03)	(\$77,143.94)	(\$1,485.92)	\$483,667.11

C. Interest Earned by COCP Funds as of 12/31/2010

Prior Interest Earned:	\$270,785.21
Interest Earned This Quarter:	\$19,814.39
Total Interest Earned to Date:	\$290,599.60

D. Balance of COCP Funds as of 12/31/2010

Total Grant Amount:	\$4,608,452.90
Total Interest Earned:	\$290,599.60
Total Expenditures:	(\$1,792,410.97)
Remaining Balance:	\$3,106,641.53

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



Accounting Certification