

# **AIR QUALITY RESEARCH PROGRAM**

**Texas Commission on Environmental Quality  
Contract Number 582-10-94300  
Awarded to The University of Texas at Austin**

**Quarterly Report  
March 1, 2012 through May 31, 2012**

**Submitted to**

**David Brymer  
Texas Commission on Environmental Quality  
12100 Park 35 Circle  
Austin, TX 78753**

**Prepared by**

**David T. Allen, Principal Investigator  
The University of Texas at Austin  
10100 Burnet Rd. MC R7100  
Austin, TX 78758**

**June 4, 2012**

## **Texas Air Quality Research Program**

### **Quarterly Progress Report**

**June 4, 2012**

#### **Overview**

The goals of the State of Texas Air Quality Research Program (AQRP) are:

- (i) to support scientific research related to Texas air quality, in the areas of emissions inventory development, atmospheric chemistry, meteorology and air quality modeling,
- (ii) to integrate AQRP research with the work of other organizations, and
- (iii) to communicate the results of AQRP research to air quality decision-makers and stakeholders.

On April 30, 2010, the Texas Commission on Environmental Quality (TCEQ) contracted with the University of Texas at Austin to administer the AQRP. For the 2010-2011 biennium, the AQRP had approximately \$4.9 million in funding available. Following discussions with the TCEQ and an Independent Technical Advisory Committee (ITAC) concerning research priorities, the AQRP released a call for proposals in May, 2010. Forty-five proposals, requesting \$12.9 million in research funding were received by the due date of June 25, 2010. These proposals were reviewed by the ITAC for technical merit, and by the TCEQ for relevancy to the State's air quality research needs. The results of these reviews were forwarded to the AQRP's Advisory Council, which made final funding decisions in late August, 2010. Successful proposers were notified, subcontracts were put in place, and the research was initiated. As of November 30, 2011, all projects have been completed. Final reports on all but one project have been posted to the AQRP website. A summary of each project funded in FY 2010 - 2011 is described in this progress report.

In June 2011, the TCEQ renewed the AQRP for the 2012-2013 biennium. Funding of \$1,000,000 for the FY 2012 period was awarded in February 2012. Funding for FY 2013 is pending and is expected to be awarded in June 2012. A call for proposals was released in May 2012.

## Background

Section 387.010 of HB 1796 (81<sup>st</sup> Legislative Session), directs the Texas Commission on Environmental Quality (TCEQ, Commission) to establish the Texas Air Quality Research Program (AQRP).

Sec. 387.010. AIR QUALITY RESEARCH. (a) The commission shall contract with a nonprofit organization or institution of higher education to establish and administer a program to support research related to air quality.

(b) The board of directors of a nonprofit organization establishing and administering the research program related to air quality under this section may not have more than 11 members, must include two persons with relevant scientific expertise to be nominated by the commission, and may not include more than four county judges selected from counties in the Houston-Galveston-Brazoria and Dallas-Fort Worth nonattainment areas. The two persons with relevant scientific expertise to be nominated by the commission may be employees or officers of the commission, provided that they do not participate in funding decisions affecting the granting of funds by the commission to a nonprofit organization on whose board they serve.

(c) The commission shall provide oversight as appropriate for grants provided under the program established under this section.

(d) A nonprofit organization or institution of higher education shall submit to the commission for approval a budget for the disposition of funds granted under the program established under this section.

(e) A nonprofit organization or institution of higher education shall be reimbursed for costs incurred in establishing and administering the research program related to air quality under this section. Reimbursable administrative costs of a nonprofit organization or institution of higher education may not exceed 10 percent of the program budget.

(f) A nonprofit organization that receives grants from the commission under this section is subject to Chapters 551 and 552, Government Code.

The University of Texas at Austin was selected by the TCEQ to administer the program. A contract for the administration of the AQRP was established between the TCEQ and the University of Texas at Austin on April 30, 2010. Consistent with the provisions in HB 1796, up to 10% of the available funding is to be used for program administration; the remainder (90%) of the available funding is to be used for research projects, individual project management activities, and meeting expenses associated with an Independent Technical Advisory Committee (ITAC).

## Research Project Cycle

The Research Program is being implemented through an 8 step cycle. The steps in the cycle are described from project concept generation to final project evaluation for a single project cycle.

- 1.) The project cycle is initiated by developing (in year 1) or updating (in subsequent years) the strategic research priorities. The AQRP Director, in consultation with the ITAC, and the TCEQ develop research priorities; the research priorities are released along with a Request for Proposals. The Request for Proposals can be found at <http://aqrp.ceer.utexas.edu/>.
- 2.) Project proposals relevant to the research priorities are solicited.
- 3.) The Independent Technical Advisory Committee (ITAC) performs a scientific and technical evaluation of the proposals.
- 4.) The project proposals and ITAC recommendations are forwarded to the TCEQ. The TCEQ evaluates the project recommendations from the ITAC and comments on the relevancy of the projects to the State's air quality research needs.
- 5.) The recommendations from the ITAC and the TCEQ are presented to the Council for their approval. The Council also provides comments on the strategic research priorities.
- 6.) All Investigators are notified of the status of their proposals, either funded, not funded, or not funded at this time, but being held for possible reconsideration if funding becomes available.
- 7.) Funded projects are assigned a Project Manager at UT-Austin and a Project Liaison at TCEQ. The project manager at UT-Austin is responsible for ensuring that project objectives are achieved in a timely manner and that effective communication is maintained among investigators involved in multi-institution projects. The Project Manager has responsibility for documenting progress toward project measures of success for each project. The Project Manager works with the researchers, and the TCEQ to create an approved work plan for the project. The Project Manager also works with the researchers, TCEQ and the Program's Quality Assurance officer to develop an approved QAPP for each project. The Project Manager reviews monthly, annual and final reports from the researchers and works with the researchers to address deficiencies.
- 8.) The AQRP Director and the Project Manager for each project describes progress on the project in the ITAC and Council meetings dedicated to on-going project review.
- 9.) The project findings are communicated through multiple mechanisms. Final reports are posted to the Program web site; research briefings are developed for the public and air quality decision makers; and a bi-annual research conference/data workshop is held.

Steps 1 – 9 have all been completed for the initial (2010-2011) biennium. Steps 1 – 2 have been completed for the 2012 – 2013 biennium. Details of the processes undertaken are described below.

## **FY 2010 – 2011 Funding Cycle Review**

### **1<sup>st</sup> Quarter March – May 2010**

During the first quarter of AQRP operation, steps 1 and 2 of the Research Project Cycle were completed. The ITAC and Council membership was finalized. The initial Request for Proposals was released on May 25, 2010. Proposals were due by June 25, 2010.

### **2<sup>nd</sup> Quarter June – August 2010**

During the second quarter, responses to the RFP were received. An initial Strategic Plan was released in July, 2010. A total of Forty-five proposals, requesting \$12.9 million in funding, were received by the deadline. The ITAC reviewed the proposals in conference calls and in a meeting held in Austin, Texas. The reviews were completed on July 22, 2010. Twelve proposals were highly recommended for funding; twelve proposals were recommended for funding, and 21 proposals were not recommended for funding. The TCEQ rated, as highly recommended, the same 12 research projects that were highly recommended by the ITAC. The TCEQ also recommended for funding the same 12 proposals that the ITAC recommended, however, the rank ordering of these 12 recommended proposals differed between the two groups. The Council met in early August 2011 and approved for funding all of the projects that were highly recommended by both the ITAC and TCEQ (12 projects). In addition, the Council approved for funding several projects in the recommended category, which were highly ranked within the recommended category by both the ITAC and TCEQ. All respondents to the RFP were notified of their award status. A Project Manager was assigned to each project and contact made with their PIs. TCEQ assigned a TCEQ Project Liaison to each project. Sub-agreements for most projects were established and Task Orders began to be initiated (step 6 and parts of step 7).

### **3<sup>rd</sup> Quarter September – November 2010**

In the third quarter, the final sub-agreements were executed and Task Orders were initiated for the majority of the projects.

### **4<sup>th</sup> Quarter December 2010 – February 2011,**

### **5<sup>th</sup> Quarter March 2011 – May 2011, and**

### **6<sup>th</sup> Quarter June 2011 – August 2011**

In the fourth quarter, Task Orders were finalized for the remaining Projects and work was in progress on every Project. During the fifth quarter, work progressed on all projects and the DFW Field Study began. On August 31, 2011, six (6) projects were completed and the remaining projects were issued a 90-day contract extension.

### **7<sup>th</sup> Quarter September 2011 – November 2011**

All projects were reviewed by the ITAC at a Data Workshop held in Austin on September 27 and 28, 2011. On November 30, 2011, the remaining projects were completed and reports were submitted.

### **8<sup>th</sup> Quarter December 2011 – February 2012**

Final Reports for projects were completed and reviewed. Final invoices were paid and projects were closed out. Final reports were posted to the AQRP website at

<http://aqrp.ceer.utexas.edu/projects.cfm>.

**9<sup>th</sup> Quarter March 2012 – May 2012**

At this point the Funding Cycle is starting over with new funding for the 2012-2-13 biennium. The strategic research priorities have been developed and released along with a Request for Proposals. These can both be found on the AQRP website at <http://aqrp.ceer.utexas.edu>

## **RESEARCH PROJECTS**

During the ninth quarter of operation, Program Administration focused on the final close-out and payment of invoices, as well as the completion of reporting activities for the last few projects. The Final Report for each project, with the exception of one, is posted on the AQRP website at <http://aqrp.ceer.utexas.edu/projects.cfm>.

The State of the Science project was completed in April to determine the high priority scientific and technical issues that could be addressed in the 2012-2013 biennium and a Request for Proposals for 2012-2013 funding was released.

A summary of the status of the projects approved for funding for FY 2010-2011 follows.

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**Project 10-006**

**STATUS: Active – February 16, 2011**

**Completed - November 30, 2011**

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***Quantification of Industrial Emissions of VOCs, NO<sub>2</sub> and SO<sub>2</sub> by SOF and Mobile DOAS***

Chalmers University – Johan Mellqvist  
University of Houston – Bernhard Rappenglück

AQRP Project Manager – Dave Sullivan  
TCEQ Project Liaison – John Jolly

**Funded Amount:** \$484,662  
(\$262,179 Chalmers, \$222,483 UH)

**Expended Amount:** \$480,128.11  
(\$262,179 Chalmers, \$217,949.11 UH)

**Amount Returned to AQRP:** \$4,533.89  
(\$0 Chalmers, \$4,533.89 UH)

**Project Status:**

Project 10-006 is complete and the Final Report is posted to the AQRP website.

As a future activity, the project Investigators plan to submit 2 or 3 papers to the Journal of Geophysical Research utilizing results from this campaign. The papers are currently in the early stages of development.

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**Project 10-008**

**STATUS: Active – October 21, 2010**

**Completed - September 30, 2011**

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***Factors Influencing Ozone-Precursor Response in Texas Attainment Modeling***

Rice University – Daniel Cohan  
ENVIRON International – Greg Yarwood

AQRP Project Manager – Elena McDonald-Buller  
TCEQ Project Liaison – Jim Smith

**Funded Amount:** \$178,796  
(\$128,851 Rice, \$49,945 ENVIRON)

**Expended Amount:** \$176,567.10  
(\$126,622.32 Rice, \$49,944.78 Environ)

**Amount Returned to AQRP:** \$2,228.90  
(\$2,228.68 Rice, \$0.22 Environ)

**Project Status:**

Project 10-008 is complete and the Final Report is posted to the AQRP website.

*Constraining ozone-precursor responsiveness using ambient measurements*

A. Digar, D.S. Cohan, X. Xiao, K.M. Foley, B. Koo, G. Yarwood  
Submitted to Journal of Geophysical Research, May 2012



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**Project 10-009**

**STATUS: Active – September 8, 2010**

**Completed - November 30, 2011**

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***Additional Flare Test Days for TCEQ Comprehensive Flare Study***

University of Texas at Austin – Vincent Torres

AQRP Project Manager – Cyril Durrenberger  
TCEQ Project Liaison – Russell Nettles

**Funded Amount:** \$591,332

**Expended Amount:** \$591,306.66

**Amount Returned to AQRP:** \$25.34

**Project Status:**

Project 10-009 is complete and the Final Report is posted to the AQRP website.

The following papers were submitted to Industrial & Engineering Chemistry Research for a Special Issue on Industrial Flaring. The paper edition of this special edition will come out in Fall 2012, but the online versions are available now.

*Emissions of Nitrogen Oxides from Flares Operating at Low Flow Conditions*

Torres, Vince; Herndon, Scott; Wood, Ezra; Al-Fadhli, Fahad; Allen, David  
Status: Published Online

*Impacts Of Emission Variability and Flare Combustion Efficiency on Ozone Formation in the Houston-Galveston-Brazoria Area*

Pavlovic, Radovan; Al-Fadhli, Fahad; Kimura, Yosuke; Allen, David; McDonald-Buller, Elena  
Status: Published Online

*Comparison of remote sensing and extractive sampling measurements of flare combustion efficiency*

Wormhoudt, Joda; Herndon, Scott; Franklin, Jonathan; Wood, Ezra; Knighton, W.; Evans, Scott; Laush, Curtis; Sloss, Mark; Spellacy, Robert  
Status: Published Online

*Direct measurement of volatile organic compound emissions from industrial flares using real-time on-line techniques: Proton Transfer Reaction Mass Spectrometry and Tunable Infrared Laser Differential Absorption Spectroscopy.*

Knighton, W.; Herndon, Scott; Franklin, Jon; Wood, Ezra; Wormhoudt, Joda; Brooks, William; Fortner, Edward; Allen, David  
Status: Published Online

*Particulate Emissions Measured During the TCEQ Comprehensive Flare Emission Study*  
Fortner, Edward; Brooks, William; Onasch, Timothy; Canagaratna, Manjula; Massoli, Paola;  
Jayne, John; Franklin, Jon; Knighton, W.; Wormhoudt, Joda; Worsnop, Douglas; Kolb, Charles;  
Herndon, Scott  
Status: Published Online

*Industrial flare performance at low flow conditions: Part 1. Study Overview*  
Torres, Vince; Herndon, Scott; Kodesh, Zach; Allen, David  
Status: Published Online

*Industrial flare performance at low flow conditions: Part 2. Steam- and Air-Assisted Flares*  
Torres, Vince; Herndon, Scott; Allen, David  
Status: Published Online

*Application of the carbon balance method to flare emissions characteristics*  
Herndon, Scott; Nelson, David; Wood, Ezra; Knighton, W.; Kolb, Charles; Kodesh, Zach;  
Torres, Vince; Allen, David  
Status: Published Online

*Impact of flare destruction efficiency and products of incomplete combustion on ozone formation  
in Houston, Texas*  
Al-Fadhli, Fahad; Kimura, Yosuke; McDonald-Buller, Elena; Allen, David  
Status: Published Online

*Multivariate Image Analysis (MIA) for Industrial Flare Combustion Control*  
Castineira, David; Rawlings, Blake; Edgar, Thomas  
Status: Published Online

The following presentations will be given at the Air & Waste Management Association June  
2012 Conference, and papers will be published in the Conference Proceedings:

*Overview of the Texas Commission on Environmental Quality 2010 Flare Study*  
Torres, Allen, Herndon, Kodesh

*NOx Emissions from Industrial Flaring*  
Torres, Fahad M. Al-Fadhli, Allen, Herndon, Ezra Wood

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**Project 10-015**

**STATUS: Active – March 4, 2011**

**Completed - November 30, 2011**

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***An Assessment of Nitryl Chloride Formation Chemistry and its Importance in Ozone Non-attainment areas in Texas***

ENVIRON International – Greg Yarwood

AQRP Project Manager – Elena McDonald-Buller  
TCEQ Project Liaison – Mark Estes

**Funded Amount: \$201,280**

**Expended Amount: \$201,278.63**

**Amount Returned to AQRP: \$1.37**

**Project Status:**

Project 10-015 is complete and the Final Report is posted to the AQRP website.

The following papers are currently under development:

***Measurements of Nitryl Chloride in Several Metropolitan Areas and Comparison with Regional Models***

J.M. Roberts, H. Osthoff, E.J. Williams, B. Lerner, J.A. Neuman, J.B. Nowak, S.B. Brown, W.P. Dube, N.L. Wagner, T.B. Ryerson, I.B. Pollack, J.S. Holloway, A. Middlebrook, R. Bahreini, B. Koo, G. Yarwood

In preparation for Journal of Geophysical Research

***Hydrochloric acid at the Pasadena ground site during CalNex 2010 and its role as a source of aerosol chloride***

J.M. Roberts, P.R. Veres, A.K. Cochran, C. Warneke, J. de Gouw, R. Weber, R. Ellis, T. Vandenboer, J. Murphy, B. Koo, G. Yarwood

In preparation for Journal of Geophysical Research

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**Project 10-020**

**STATUS: Active – March 5, 2011**

**Completed - November 30, 2011**

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***NO<sub>x</sub> Reactions and Transport in Nighttime Plumes and Impact on Next-Day Ozone***

ENVIRON International – Greg Yarwood

AQRP Project Manager – Elena McDonald-Buller  
TCEQ Project Liaison – Dick Karp

**Funded Amount:** \$202,498

**Expended Amount:** \$202,493.48

**Amount Returned to AQRP:** \$4.52

**Project Status:**

Project 10-020 is complete and the Final Report is posted to the AQRP website.

Several papers are expected to be published based on this Project. Their titles and current status are below:

Accepted in Journal of Geophysical Research:

*The Effects of NO<sub>x</sub> Control and Plume Mixing on Nighttime Chemical Processing of Plumes from Coal-Fired Power Plants.*

Steven S. Brown, William P. Dubé, Prakash Karamchandani, Greg Yarwood, Jeff Peischl, Thomas B. Ryerson, J. Andrew Neuman, John B. Nowak, John S. Holloway, Rebecca A. Washenfelder, Charles A. Brock, Gregory J. Frost, Michael, Trainer, David D. Parrish, Frederick C. Fehsenfeld and A. R. Ravishankara

In preparation for Journal of Geophysical Research:

*Biogenic VOC Oxidation and Organic Aerosol Formation within an Urban Nocturnal Boundary Layer – Aircraft Vertical Profiles in Houston, TX.*

Steven S. Brown, William P. Dubé, Roya Bahreini, Ann M. Middlebrook, Charles A. Brock, Carsten Warneke, Joost A. de Gouw, Rebecca A. Washenfelder, Elliot Atlas, Jeff Peischl, Thomas B. Ryerson, J. Andrew Neuman, Jonathan B. Nowak, Michael Trainer, David D. Parrish, Frederick C. Feshenfeld and A. R. Ravishankara

In preparation for Atmosphere:

*Reactive Plume Modeling to Investigate NO<sub>x</sub> Reactions and Transport at Night*

Prakash Karamchandani, Shu-Yun Chen, Greg Yarwood, Steven S. Brown, David Parrish

In preparation for Atmosphere:

*Modeling Overnight Power Plant Plume Impacts on Next-Day Ozone Using a Plume-in-Grid Technique*

Greg Yarwood, Chris Emery, Steven S. Brown, David Parrish

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**Project 10-021**

**STATUS: Active – October 11, 2010**

**Completed - August 31, 2011**

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***Dry Deposition of Ozone to Built Environment Surfaces***

University of Texas at Austin – Richard Corsi

AQRP Project Manager – Gary McGaughey  
TCEQ Project Liaison – Jim Smith

**Funded Amount:** \$248,786

**Expended Amount:** \$248,786.41

**Amount Returned to AQRP:** -\$0.41

**Project Status:**

Project 10-021 is complete and the Final Report is posted to the AQRP website.

The Project Investigators plan to present findings from this project at the Air & Waste Management Association June 2012 Conference. The title of the submitted abstract is *Dry Deposition of Ozone to Built Environment Surfaces* and the authors are Yosuke Kimura, Dustin Poppendeck, Erin Darling, Elena McDonald-Buller, and Richard Corsi

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**Project 10-022**

**STATUS: Active – February 16, 2011**

**Completed - November 30, 2011**

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***Development of Speciated Industrial Flare Emission Inventories for Air Quality Modeling in Texas***

Lamar University – Daniel Chen

AQRP Project Manager – Vincent Torres  
TCEQ Project Liaison – Jim MacKay

**Funded Amount:** \$150,000

**Expended Amount:** \$132,790.80

**Amount Returned to AQRP:** \$17,209.20

**Project Status:**

Project 10-022 is complete and the Final Report is posted to the AQRP website.

The following paper was submitted to Industrial & Engineering Chemistry Research for a Special Issue on Industrial Flaring:

Helen H. Lou, Daniel Chen, Christopher B. Martin, Xianchang Li, Kuyen Li, Hitesh Vaid, Kanwar Devesh Singh, Preeti Gangadharan, "Optimal Reduction of the C1-C3 Combustion Mechanism for the Simulation of Flaring," Publication Date (Web): February 13, 2012, Industrial & Engineering Chemistry Research, Industrial flares special issue, DOI: 10.1021/ie2027684.

Kanwar Devesh Singh, Tanaji Dabade, Hitesh Vaid, Preeti Gangadharan, Daniel Chen, Helen H. Lou, Xianchang Li, Kuyen Li, Christopher B. Martin, "Computational Fluid Dynamics Modeling of Industrial Flares Operated in Stand-By Mode," submitted to the special issue of Industrial & Engineering Chemistry Research: Flares.

H. Lou, C. Martin, D. Chen, X. Li, K. Li, H. Vaid, A. Tula, K. Singh, "Validation of a Reduced Combustion Mechanism for Light Hydrocarbons," Clean Technologies and Environmental Policy, 14(1) 1-12, 2012. Published online Dec 27, 2011. DOI 10.1007/s10098-011-0441-6.

Helen H. Lou, Christopher B. Martin, Daniel Chen, Xianchang Li, Kuyen Li, Hitesh Vaid, Anjan Tula Kumar, Kanwar Devesh Singh, & Doyle P. Bean, "A reduced reaction mechanism for the simulation in ethylene flare combustion," Clean Technologies and Environmental Policy, published on line, June 14, 2011. doi:10.1007/s10098-011-0394-9

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**Project 10-024**

**STATUS: Active – February 16, 2011**

**Completed - September 30, 2011**

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*Surface Measurements and One-Dimensional Modeling Related to Ozone Formation in the Suburban Dallas-Fort Worth Area*

Rice University – Robert Griffin  
University of Houston – Barry Lefer  
University of New Hampshire – Jack Dibb  
University of Michigan – Allison Steiner  
NCAR – Withdrawn

AQRP Project Manager – Vincent Torres  
TCEQ Project Liaison – Doug Boyer

**Funded Amount:** \$458,957

(\$225,662 Rice, \$98,134 Houston, \$70,747 New Hampshire \$64,414 Michigan)

**Expended Amount:** \$444,001.74

(\$223,769.99 Rice, \$88,914.46 Houston, \$70,719.78 New Hampshire, \$60,597.51 Michigan)

**Amount Returned to AQRP:** \$14,955.26

(\$1,892.01 Rice, \$9,219.54 Houston, \$27.22 New Hampshire, \$3,816.49 Michigan)

**Project Status:**

Project 10-024 is complete and the Final Report is posted to the AQRP website.

The Project Investigators plan to submit articles to the following journals:

Environmental Science & Technology  
Atmospheric Environment

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**Project 10-029**

**STATUS: Active – December 1, 2010**

**Completed - November 30, 2011**

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***Wind Modeling Improvements with the Ensemble Kalman Filter***

Texas A&M University – John Nielsen-Gammon      AQRP Project Manager – Gary McGaughey  
TCEQ Project Liaison – Bright Dornblaser

**Funded Amount:** \$80,108

**Expended Amount:** \$78,276.97

**Amount Returned to AQRP:** \$1,831.03

**Project Status:**

A Draft Final Report has been submitted for review. The Project Investigator has reported a problem with the model being developed under this project. The team is currently working to correct the problem and will submit an updated draft of the Final Report once the model has been updated.



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**Project 10-032**

**STATUS: Active - February 9, 2011  
Completed - November 30, 2011**

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***SHARP Data Analysis: Radical Budget and Ozone Production***

University of Houston – Barry Lefer  
UCLA – Jochen Stutz  
University of New Hampshire – Jack Dibb

AQRP Project Manager – Cindy Murphy  
TCEQ Project Liaison – John Jolly

**Funded Amount:** \$248,652  
(\$176,314 UH, \$23,054 New Hampshire, \$49,284 UCLA)

**Expended Amount:** \$242,335.97  
(\$176,314 UH, \$18,850.65 New Hampshire, \$47,171.32 UCLA)

**Amount Returned to AQRP:** \$6,316.03  
(\$0.00 UH, \$4,203.35 New Hampshire, \$2,112.68 UCLA)

**Project Status:**

Project 10-032 is complete and the Final Report is posted to the AQRP website.

The following article is currently undergoing review in Atmospheric Environment:

*Atmospheric Oxidation Chemistry and Ozone Production: Results from SHARP 2009 in Houston, Texas*

Xinrong Ren, Diana van Duin, Maria Cazorla, Shuang Chen, Jingqiu Mao, William H. Brune, James H. Flynn, Nicole Grossberg, Barry L. Lefer, Bernhard Rappenglück, Kam W. Wong, Catalina Tsai, Jochen Stutz, Jack E. Dibb, B. Thomas Jobson, Winston T. Luke, and Paul Kelley

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**Project 10-034**

**STATUS: Active – February 2, 2011**

**Completed - November 30, 2011**

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*Dallas Measurements of Ozone Production*

University of Houston – Barry Lefer

AQRP Project Manager – Dave Sullivan  
TCEQ Project Liaison – Doug Boyer

**Funded Amount:** \$195,054

**Expended Amount:** \$186,657.54

**Amount Returned to AQRP:** \$8,396.46

**Project Status:**

Project 10-034 is complete and the Final Report is posted to the AQRP website.

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**Project 10-042**

**STATUS: Active – October 8, 2010**

**Completed - November 30, 2011**

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***Environmental Chamber Experiments to Evaluate NO<sub>x</sub> Sinks and Recycling in Atmospheric Chemical Mechanisms***

ENVIRON International – Greg Yarwood

AQRP Project Manager – Elena McDonald-Buller  
TCEQ Project Liaison – Mark Estes

**Funded Amount:** \$237,481

**Expended Amount:** \$237,479.31

**Amount Returned to AQRP:** \$1.69

**Project Status:**

Project 10-042 is complete and the Final Report is posted to the AQRP website.

The following articles are in progress:

In preparation for Atmospheric Environment: *Development of version 6 of the carbon bond (CB6) chemical mechanism*

Greg Yarwood, Gookyoung Heo, Elena C. McDonald-Buller, David T. Allen, Gary Z. Whitten

In preparation for Atmospheric Environment: *Environmental chamber experiments to evaluate NO<sub>x</sub> removal and recycling represented in atmospheric mechanisms for air quality modeling*

Gookyoung Heo, William Carter, Greg Yarwood, Gary Z. Whitten, David T. Allen

In preparation for Atmospheric Environment: *Evaluation of mechanisms for modeling ozone formation from isoprene in SAPRC-07 and CB6 using environmental chamber data with low initial NO<sub>x</sub>*

Gookyoung Heo, William Carter, Greg Yarwood

In preparation for Atmospheric Environment: *Evaluation of CB05, CB6 and SAPRC-07 using EUPHORE chamber data: evaluation of mechanisms for modeling ozone formation from toluene*

Gookyoung Heo, William Carter, Greg Yarwood, Gary Z. Whitten

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**Project 10-044**

**STATUS: Active – March 25, 2011**

**Completed - November 30, 2011**

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*Airborne Measurements to Investigate Ozone Production and Transport in the Dallas-Fort Worth (DFW) Area during the 2011 Ozone Season*

University of Houston – Maxwell Shauck

AQRP Project Manager – Gary McGaughey  
TCEQ Project Liaison – Erik Gribbin

**Funded Amount:** \$279,642

**Expended Amount:** \$277,846.38

**Amount Returned to AQRP:** \$1,795.62

**Project Status:**

Project 10-044 is complete and the Final Report is posted to the AQRP website.

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**Project 10-045**

**STATUS: Active - January 22, 2011**

**Completed - September 30, 2011**

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***Quantification of Hydrocarbon, NO<sub>x</sub>, and SO<sub>2</sub> emissions from Petrochemical Facilities in Houston: Interpretation of the 2009 FLAIR dataset***

UCLA – Jochen Stutz  
UNC - Chapel Hill – William Vizueté  
Aerodyne – Scott Herndon  
Washington State University – George Mount

AQRP Project Manager – Cindy Murphy  
TCEQ Project Liaison – Marvin Jones

**Funded Amount:** \$398,042

(\$149,773 UCLA, \$33,281 UNC, \$164,988 Aerodyne, \$50,000 Washington State)

**Expended Amount:** \$391,199.38

(\$142,930.28 UCLA, \$33,281 UNC, \$164,988.10 Aerodyne, \$50,000 Washington State)

**Amount Returned to AQRP:** \$6,842.62

(\$6,842.72 UCLA, \$0.00 UNC, -\$0.10 Aerodyne, \$0.00 Washington State)

**Project Status:**

Project 10-045 is complete and the Final Report is posted to the AQRP website.

The following papers were submitted to Industrial & Engineering Chemistry Research for a Special Issue on Industrial Flaring. The paper edition of this special edition will come out in Fall 2012, but the online versions are available now.

Knighton, W.; Herndon, Scott; Wood, Ezra; Fortner, Edward; Onasch, Timothy; Wormhoudt, Joda; Kolb, Charles; Lee, Ben; Zavala, Miguel; Molina, Luisa; Jones, Marvin, “*Detecting fugitive emissions of 1,3-butadiene and styrene from a petrochemical facility: An application of a mobile laboratory and a modified proton transfer reaction mass spectrometer - NO<sub>x</sub> PTR-MS*”  
Status: Published Online

Wood, E.; Herndon, S.; Fortner, E. C.; Onasch, T.; Wormhoudt, J.; Kolb, C. E.; Knighton, W. B.; Lee, B.; Zavala, M.; Molina, L.; Jones, M., “*Combustion and Destruction/Removal efficiencies of in-use chemical flares in the greater Houston area*”.  
Status: Published Online

This project has also resulted in the following publications:

Olga Pikelnaya, Catalina Tsai, Barry Lefer, James H. Flynn, Dejian Fu, and Jochen Stutz, "*Imaging DOAS: a tool for monitoring of emission fluxes from small individual sources*", in preparation for Journal of Geophysical Research

Olga Pikelnaya, Jochen Stutz, Scott Herdon, Ezra Wood, Oluwayemisi Oluwole, George Mount, Elena Spinei, William Vizuetta, Evan Causo, "*Formaldehyde and Olefin from Large Industrial Sources (FLAIR) in Houston, TX – Campaign Overview*", in preparation for Journal of Geophysical Research

Olga Pikelnaya, George Mount, Elena Spinei, and Jochen Stutz, "*Dual MAX-DOAS approach to determine facility-averaged emissions of pollutants from petrochemical facilities*", under development.

Olga Pikelnaya, Scott Herrdon, Ezra Wood, and Jochen Stutz, "*Observations of emissions from ships in the Houston Ship Channel during 2009 FLAIR campaign*," under development.

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**Project 10-DFW & 11-DFW**

**STATUS: Active - February 1, 2011**

**Completed - August 31, 2011**

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*Dallas – Fort Worth Field Study*

UT-Austin – Vincent Torres

AQRP Project Manager – Jim Thomas  
TCEQ Project Liaison – Raj Nadkarni

**Funding Awarded:** \$88,809

(\$37,857 10-DFW (FY 10 Funds) \$50,952 11-DFW (FY 11 Funds))

**Expended Amount:** \$66,951.17

(\$37,689.42 10-DFW, \$29,261.75 11-DFW)

**Amount Returned to AQRP:** \$21,857.83

(\$267.68 10-DFW, \$21,690.36 11-DFW)

**Project Status:**

Project 10-DFW and 11-DFW are complete and the Final Report is posted to the AQRP website.

***Dallas – Fort Worth Field Study***

UT-Austin – David Allen

AQRP Project Manager – David Sullivan  
TCEQ Project Liaison – Mark Estes**Funded Amount:** \$36,000**Executive Summary:**

A State of the Science assessment has been prepared for the AQRP program. The Assessment consists of 3 parts: (i) an overview of the current understanding of key scientific and technical issues, relevant to Texas, in emissions inventory development, atmospheric chemistry, meteorology and air quality modeling; (ii) a summary of AQRP activities in the 2010-2011 biennium and how those activities improved understand of key scientific and technical issues; and (iii) identification of a set of high priority scientific and technical issues that could be addressed in the 2012-2013 biennium. The draft document will be reviewed by TCEQ, and after TCEQ comments are addressed, the assessment will be forwarded to the AQRP's Technical Advisory Committee (ITAC) for their comments. After ITAC comments are addressed, the document will be posted on the AQRP web site. Investigators planning to respond to AQRP requests for proposals during the 2012-2013 biennium will be directed to the assessment for guidance in identifying research areas in which proposals are sought.

**Project Description:**

The assessment document has been completed and TCEQ has reviewed and provided comments. Final revisions are currently in progress. The priority research areas have been identified and have been posted to the AQRP website.



## **Financial Status Report**

Initial funding for fiscal year 2010 was established at \$2,732,071.00. In late May 2010 an amendment was issued increasing the budget by \$40,000. Funding for fiscal year 2011 was established at \$2,106,071, for a total award of \$4,878,142 for the FY 2010/2011 biennium. As of May 31, 2012, \$72,141.63 remains unspent. These funds will be used in conjunction with the FY 2012 and 2013 funds and will be fully expended by April 2013.

In February 2012, funding of \$1,000,000 was awarded for FY 2012. In May 2012, an additional \$160,000 was awarded in FY 2012 funds and \$1,000,000 was awarded in FY 2013 funds, for a total of \$2,160,000 in funding for the FY 2012/2013 biennium.

All of these funds were distributed across several different reporting categories as required under the contract with TCEQ. The reporting categories are:

Program Administration – limited to 10% of the overall funding (per Fiscal Year)

This category includes all staffing, materials and supplies, and equipment needed to administer the overall AQRP. It also includes the costs for the Council meetings.

### ITAC

These funds are to cover the costs, largely travel expenses, for the ITAC meetings.

Project Management – limited to 8.5% of the funds allocated for Research Projects

Each research project will be assigned a Project Manager to ensure that project objectives are achieved in a timely manner and that effective communication is maintained among investigators in multi-institution projects. These funds are to support the staffing and performance of project management.

Research Projects / Contractual

These are the funds available to support the research projects that are selected for funding.

## **Program Administration**

Program Administration includes salaries and fringe benefits for those overseeing the program as a whole, as well as, materials and supplies, travel, equipment, and other expenses. This category allows indirect costs in the amount of 10% of salaries and wages.

During the reporting period six staff members were involved in the administration of the AQRP. Dr. David Allen, Principal Investigator and AQRP Director, is responsible for the overall administration of the AQRP. James Thomas, AQRP Manager, is responsible for assisting Dr. Allen in the program administration. Maria Stanzione, AQRP Grant Manager, with assistance from Rachael Bushn and Melanie Allbritton assisted with program organization and financial management. This included assisting with the contracting process, invoice review and payment, and other invoicing functions. Denzil Smith is responsible for the AQRP Web Page development and for data management.

Table 1: AQRP Administration Budget

**Administration Budget (includes Council Expenses)  
FY 2010/2011**

<b>Budget Category</b>	<b>FY10 Budget</b>	<b>FY11 Budget</b>	<b>Total</b>	<b>Expenses</b>	<b>Pending Expenses</b>	<b>Remaining Balance</b>
Personnel/Salary	\$202,816.67	\$163,121.22	\$365,937.89	\$365,936.91	\$0	\$.98
Fringe Benefits	\$38,665.65	\$31,173.36	\$69,839.01	\$69,838.68	\$0	\$.33
Travel	\$346.85	\$0	\$346.85	\$346.85		\$0
Supplies	\$15,096.14	\$0	\$15,096.14	\$15,096.14		\$0
Equipment	\$0	\$0	\$0			\$0
<b>Total Direct Costs</b>	<b>\$256,925.31</b>	<b>\$194,294.58</b>	<b>\$451,219.89</b>	<b>\$451,218.58</b>	<b>\$0</b>	<b>\$1.31</b>
Authorized Indirect Costs	\$20,281.69	\$16,313.42	\$36,595.11	\$36,591.91		\$3.20
10% of Salaries and Wages						
<b>Total Costs</b>	<b>\$277,207</b>	<b>\$210,608</b>	<b>\$487,815</b>	<b>\$487,810.49</b>	<b>\$0</b>	<b>\$4.51</b>
Fringe Rate	22%	22%		19%		

**Administration Budget (includes Council Expenses)  
FY 2012/2013**

<b>Budget Category</b>	<b>FY12 Budget</b>	<b>FY13 Budget</b>	<b>Total</b>	<b>Expenses</b>	<b>Pending Expenses</b>	<b>Remaining Balance</b>
Personnel/Salary	\$80,440	\$70,040	\$150,480	\$4,404.33	\$0	\$146,075.67
Fringe Benefits	\$14,666	\$12,606	\$27,272	\$73.41	\$0	\$27,198.59
Travel	\$350	\$350	\$700	\$0		\$700.00
Supplies	\$10,000	\$10,000	\$20,000	\$0		\$20,000.00
Equipment	\$0	\$0	\$0			\$0
<b>Total Direct Costs</b>	<b>\$105,456</b>	<b>\$92,996</b>	<b>\$198,452</b>	<b>\$4,477.74</b>	<b>\$0</b>	<b>\$193,974.26</b>
Authorized Indirect Costs	\$8,044	\$7,004	\$15,048	\$94.56		\$14,953.44
10% of Salaries and Wages						
<b>Total Costs</b>	<b>\$113,500</b>	<b>\$100,000</b>	<b>\$213,500</b>	<b>\$4,572.30</b>	<b>\$0</b>	<b>\$208,927.70</b>
Fringe Rate	22%	22%		%		

Fringe benefits for the Administration of the AQRP were initially budgeted to be 22% of salaries and wages across the term of the project. It should be noted that this was an estimate, and actual fringe benefit expenses have been reported for each month. The fringe benefit amount and percentage fluctuate each month depending on the individuals being paid from the account, their salary, their FTE percentage, the selected benefit package, and other variables. For example, the amount of fringe benefits are greater for a person with family medical insurance versus a person with individual medical insurance. At the end of the project, the overall total of fringe benefit expensed is expected to be at or below 22% of the total salaries and wages. Actual fringe benefit expenses for the months of March through May are included in the spreadsheets above.

Indirect costs for the months of March through May are included in Table 1.

As discussed in previous Quarterly Reports, the AQRP Administration requested and received permission to utilize the FY 10 funds during FY 11. This is for all classes of funds including Administration, ITAC, Project Management, and Contractual. The intent is to fully expend (or encumber, in the case of the contractual funds) the FY 10 funds, and then begin spending the FY 11 funds. This same procedure will be followed for the FY 12 funds.

In June 2011, UT-Austin received a Contract Extension for the AQRP. This extension will continue the program through the end of the 2012/2013 biennium, and will allow the AQRP to utilize the FY 10 funds through April 30, 2012, and the FY 11 funds through April 30, 2013.

## ITAC

There were no new ITAC expenses incurred during the quarter ending May 2012. Charges that posted during this period were final travel expenses from the ITAC meeting held in September 2011 and transfers of expenses from FY 2011 funds to FY 2010 funds.

At the end of April, \$1,445.19 remained unspent in FY 10 ITAC funds. No additional ITAC expenses were anticipated until June 2012, so in order to fully expend the FY 10 funds the FY 10 ITAC account was reduced by \$1,445.19 and the FY 10 Contractual account was increased by the same amount. These funds were then utilized to cover a portion of the Data Storage costs.

In order to keep the amount budgeted for ITAC across FY 10 and 11 the same, the FY 11 Contractual budget was reduced by \$1445.19 and the FY 11 ITAC budget was increased by the same amount.

Table 2: ITAC Budget

### ITAC Budget FY 2010/2011

Budget Category	FY10 Budget	FY11 Budget	Total Budget	Expenses	Pending Expenses	Remaining Balance
Personnel/Salary						
Fringe Benefits						
Travel	\$16,385.47	\$16,714.53	\$33,100	\$16,385.47	\$0	\$16,714.53
Supplies	\$1,033.34	\$4,130.66	\$5,164	\$1,033.34		\$4,130.66
Total Direct Costs	\$17,418.81	\$20,845.19	\$38,264	\$17,418.81	\$0	\$20,845.19
Authorized Indirect Costs						
10% of Salaries and Wages						
<b>Total Costs</b>	<b>\$17,418.81</b>	<b>\$20,845.19</b>	<b>\$38,264</b>	<b>\$17,418.81</b>	<b>\$0</b>	<b>\$20,845.19</b>

**ITAC Budget  
FY 2012/2013**

<b>Budget Category</b>	<b>FY12 Budget</b>	<b>FY13 Budget</b>	<b>Total Budget</b>	<b>Expenses</b>	<b>Pending Expenses</b>	<b>Remaining Balance</b>
Personnel/Salary						
Fringe Benefits						
Travel	\$10,000	\$0	\$10,000	\$0	\$0	\$10,000
Supplies	\$500	\$0	\$500	\$0		\$500
<b>Total Direct Costs</b>	<b>\$10,500</b>	<b>\$0</b>	<b>\$10,500</b>	<b>\$0</b>	<b>\$0</b>	<b>\$10,500</b>
Authorized Indirect Costs						
10% of Salaries and Wages						
<b>Total Costs</b>	<b>\$10,500</b>	<b>\$0</b>	<b>\$10,500</b>	<b>\$0</b>	<b>\$0</b>	<b>\$10,500</b>

## Project Management

Project Management activities decreased significantly in the quarter ending May 2012. Project Managers completed the final reviews of the last project reports and approved them for posting to the AQRP webpage. The State of the Science project was the only active project in that period.

Efforts were made to fully expend the FY 10 Project Management account. Funds remaining at the end of April (\$382.74) were transferred to the FY 10 Contractual account and were used to partially fund the Data Storage. This caused an overall reduction in the FY 10 funds budgeted to Project Management.

In order to fully fund the DFW Field Study Logistics project, funds were moved from the FY 11 Project Management account to the FY 11 Contractual account. Once all expenses had posted for that project, there were enough funds remaining to return those funds to the Project Management account. During the period being reported \$345.75 of the FY 11 Contractual funds were returned to the FY 11 Project Management account. The remaining funds will be returned in June 2012.

Table 3: Project Management Budget

### Project Management Budget FY 2010/2011

Budget Category	FY10 Budget	FY11 Budget	Total Budget	Expenses	Pending Expenses	Remaining Balance
Personnel/Salary	\$145,337.70	\$89,330.22	\$234,667.92	\$228,834.28		\$5,833.64
Fringe Benefits	\$28,967.49	\$18,029.31	\$46,996.80	\$44,835.37	\$190.84	\$1,970.59
Travel	\$0	\$0	\$0	\$0		\$0
Supplies	\$778.30	\$260.00	\$1,038.30	\$1,041.98		-\$3.68
<b>Total Direct Costs</b>	<b>\$175,083.49</b>	<b>\$107,619.53</b>	<b>\$282,703.02</b>	<b>\$274,711.63</b>	<b>\$190.84</b>	<b>\$7,800.55</b>
Authorized Indirect Costs	\$14,533.77	\$10,690.22	\$25,223.99	\$22,883.42		\$2,340.57
10% of Salaries and Wages						
<b>Total Costs</b>	<b>\$189,617.26</b>	<b>\$118,309.75</b>	<b>\$307,927.01</b>	<b>\$297,595.05</b>	<b>\$190.84</b>	<b>\$10,141.12</b>

**Project Management Budget  
FY 2012/2013**

<b>Budget Category</b>	<b>FY12 Budget</b>	<b>FY13 Budget</b>	<b>Total Budget</b>	<b>Expenses</b>	<b>Pending Expenses</b>	<b>Remaining Balance</b>
Personnel/Salary	\$60,700	\$46,000	\$106,700	\$0		\$106,700
Fringe Benefits	\$11,230	\$8,400	\$19,630	\$0		\$19,630
Travel	\$500	\$0	\$500	\$0		\$500
Supplies	\$7,500	\$6,000	\$13,500	\$0		\$13,500
<b>Total Direct Costs</b>	<b>\$79,930</b>	<b>\$60,400</b>	<b>\$140,330</b>	<b>\$0</b>	<b>\$0</b>	<b>\$140,330</b>
Authorized Indirect Costs	\$6,070	\$4,600	\$10,670	\$0		\$10,670
10% of Salaries and Wages						
<b>Total Costs</b>	<b>\$86,000</b>	<b>\$65,000</b>	<b>\$151,000</b>	<b>\$0</b>	<b>\$0</b>	<b>\$151,000</b>

## **Research Projects**

As of May 31, 2012, all projects had ended and the remaining final reports were posted to the AQRP website, with the exception of Project 10-029. Table 4 on the following 2 pages illustrates the funding awarded to each project and the total expenses reported on each project as of May 31, 2012. Please note for the State of the Science project that this reflects expenses that have posted to the UT-Austin accounting system as of May 31, 2012. There are additional expenses pending in the amount of \$6.18 that will not post until the following month.

As of the end of May there was \$40,042.52 available in Research Project funding (\$18,352.27 of the original Research funds and \$21,690.25 transferred from Project Management to fully fund the 11-DFW Project.). Funds in the amount of \$21,690.25 will be transferred/returned to the Project Management category. This will leave \$18,352.27 remaining in the Research category.

Transfers to and from the Contractual account have been detailed in the ITAC and Project Management descriptions. Please review those sections for more detailed information.

The FY 10 Contractual budget was originally funded at \$2,286,000. After all transfers, it has been increased by \$1,827.93. The FY 11 Contractual budget was originally funded at \$1,736,063. After all transfers, including the one to take place in June 2012, it will be decreased by \$1,445,19 (the amount transferred to ITAC). This is an overall net increase of \$382.74 to the Contractual funds (and net reduction in Project Management funds).

A spreadsheet is not included in this report for FY 2012 and 2013 funds, as no expenditures have yet occurred. FY 2012 funds in the amount of \$950,000 and FY 2013 funds in the amount of \$835,000 are budgeted for Research.



Table 4: Contractual Expenses

<b>Contractual Expenses</b>				
<b>FY 10 Contractual Funding</b>		\$2,286,000		
<b>FY 10 Contractual Funding Transfers</b>		\$1,827.93		
<b>FY 10 Total Contractual Funding</b>		<b>\$2,287,827.93</b>		
Project Number		Amount Awarded (Budget)	Cumulative Expenditures	Remaining Balance
10-008	Rice University	\$128,851	\$126,622.32	\$2,228.68
10-008	Environ International	\$49,945	\$49,944.78	\$0.22
10-009	UT-Austin	\$591,332	\$591,306.66	\$25.34
10-021	UT-Austin	\$248,786	\$248,786.41	-\$0.41
10-022	Lamar University	\$150,000	\$132,790.80	\$17,209.20
10-032	University of Houston	\$176,314	\$176,314	\$0
10-032	University of New Hampshire	\$23,054	\$18,850.65	\$4,203.35
10-032	UCLA	\$49,284	\$47,171.32	\$2,112.68
10-034	University of Houston	\$195,054	\$186,657.54	\$8,396.46
10-042	Environ International	\$237,481	\$237,479.31	\$1.69
10-045	UCLA	\$149,773	\$142,930.28	\$6,842.72
10-045	UNC - Chapel Hill	\$33,281	\$33,281	\$0
10-045	Aerodyne Research Inc.	\$164,988	\$164,988.10	-\$0.10
10-045	Washington State University	\$50,000	\$50,000	\$0
10-DFW	UT-Austin	\$37,857	\$37,689.42	\$167.58
FY 10 Total Contractual Funding Awarded		\$2,286,000		
FY 10 Contractual Funding Expended (Init. Projects)			\$2,244,812.59	
FY 10 Contractual Funds Remaining Unspent after Project Completion				\$41,187.41
FY 10 Additional Projects				
	Data Storage	\$7,015.34	\$7,015.34	\$0
10-SOS	State of the Science	\$36,000.00	\$35,993.82	\$6.18
FY 10 Contractual Funds Expended to Date*			\$2,287,821.75	
FY 10 Contractual Funds Remaining to be Spent				\$6.18

<b>FY 11 Contractual Funding</b>		<b>\$1,736,063</b>		
<b>FY 11 Contractual Funding Transfers</b>		<b>\$20,245.06</b>		
<b>FY 11 Total Contractual Funding</b>		<b>\$1,756,308.06</b>		
<b>Project Number</b>		<b>Amount Awarded (Budget)</b>	<b>Cumulative Expenditures</b>	<b>Remaining Balance</b>
10-006	Chalmers University of Tech	\$262,179	\$262,179	\$0
10-006	University of Houston	\$222,483	\$217,949.11	\$4,533.89
10-015	Environ International	\$201,280	\$201,278.63	\$1.37
10-020	Environ International	\$202,498	\$202,493.48	\$4.52
10-024	Rice University	\$225,662	\$223,769.99	\$1,892.01
10-024	University of New Hampshire	\$70,747	\$70,719.78	\$27.22
10-024	University of Michigan	\$64,414	\$60,597.51	\$3,816.49
10-024	University of Houston	\$98,134	\$88,914.46	\$9,219.54
10-029	Texas A&M University	\$80,108	\$78,276.97	\$1,831.03
10-044	University of Houston	\$279,642	\$277,846.38	\$1,795.62
11-DFW	UT-Austin	\$50,952	\$29,261.75	\$21,690.25
<b>FY 11 Total Contractual Funding Awarded</b>		<b>\$1,758,099</b>		
<b>FY 11 Contractual Funds Expended (Init. Projects)</b>			<b>\$1,713,287.06</b>	
<b>FY 11 Contractual Funds Remaining Unspent after Project Completion</b>				<b>\$44,811.94</b>
<b>FY 11 Additional Projects</b>				
	Data Storage	\$2,984.66	\$2,984.66	\$0.00
<b>FY 11 Contractual Funds Expended to Date*</b>			<b>\$1,716,271.72</b>	
<b>FY 11 Contractual Funds Remaining to be Spent</b>				<b>\$40,036.34</b>
<b>Total Contractual Funding</b>		<b>\$4,044,099</b>		
<b>Total Contractual Funding Transfers</b>		<b>\$22,072.99</b>		
<b>Total Contractual Funding Available</b>		<b>\$4,044,135.99</b>		
<b>Total Contractual Funds Expended to Date*</b>			<b>\$4,004,093.47</b>	
<b>Total Contractual Funds Remaining</b>				<b>\$40,042.52</b>
<b>Funds to be Returned to Project Management</b>		<b>-\$21,690.25</b>		
<b>Remaining Contractual Funds</b>				<b>\$18,352.27</b>

\*(Expenditures Reported as of May 31, 2012.)

## **Conclusion**

The Program Administration staff has focused on ensuring that all FY 10 funds are expended. The FY 10 funds currently remaining should be fully expended when the final charges for May 2012 post.

The ITAC FY 11 budget has \$20,845.19 remaining. These funds will be utilized for ITAC meetings during the current 2012-2013 biennium. It is anticipated that some portion of these funds may be moved to support research projects in the 2012-2013 biennium. The amount will be determined during the next quarter.

The Project Management FY 11 budget will have approximately \$32,000 remaining after all adjustments are made. These funds will be used to cover Project Management expenses through April 30, 2013. Use of these funds may allow the release of FY 12 Project Management funds to be used for Research projects. This will be assessed during the next quarter.

The Research/Contractual category has approximately \$18,000 remaining. These funds will be used to fund research projects in the FY 2012-13 biennium (though they will be fully expended by April 30, 2013.) It should be noted that all FY 10-11 Research funds were allocated to projects, and an additional \$22,036 was moved from Project Management to Research to cover additional expenses related to the DFW Field Study. Several projects returned funds to the AQRP when they concluded, thus the remaining balance. As these funds were committed to Research projects until the projects ended, the AQRP was unable to utilize the funds for any other purpose.

The AQRP fully expects the remaining FY 10 funds to be fully expended when the final May 2012 charges post. The FY 11 funds are expected to be fully expended by April 30, 2013.

## **Appendix**

### **Financial Reports by Fiscal Year**

(Expenditures reported as of May 31, 2012.)

**Administration Budget (includes Council Expenses)**

**FY 2010**

<b>Budget Category</b>	<b>FY10 Budget</b>	<b>Cumulative Expenditures</b>	<b>Pending Expenditures</b>	<b>Remaining Balance</b>
Personnel/Salary	\$202,816.67	\$202,816.67		\$0
Fringe Benefits	\$38,665.65	\$38,665.65		\$0
Travel	\$346.85	\$346.85		\$0
Supplies	\$15,096.14	\$15,096.14		\$0
Equipment	\$0			\$0
Other				
Contractual				
<b>Total Direct Costs</b>	<b>\$256,925.31</b>	<b>\$256,925.31</b>		<b>\$0</b>
Authorized Indirect Costs	\$20,281.69	\$20,281.69		\$0
10% of Salaries and Wages				
<b>Total Costs</b>	<b>\$277,207</b>	<b>\$277,207.00</b>	<b>\$0</b>	<b>\$0</b>

**Administration Budget (includes Council Expenses)**

**FY 2011**

<b>Budget Category</b>	<b>FY11 Budget</b>	<b>Cumulative Expenditures</b>	<b>Pending Expenditures</b>	<b>Remaining Balance</b>
Personnel/Salary	\$163,121.22	\$163,120.24	\$0	\$0.98
Fringe Benefits	\$31,173.36	\$31,173.03	\$0	\$.33
Travel	\$0			\$0
Supplies	\$0			\$0
Equipment				
Other	\$0			\$0
Contractual				
<b>Total Direct Costs</b>	<b>\$194,294.58</b>	<b>\$194,293.27</b>	<b>\$0</b>	<b>\$1.31</b>
Authorized Indirect Costs	\$16,313.42	\$16,310.22		\$3.20
10% of Salaries and Wages				
<b>Total Costs</b>	<b>\$210,608</b>	<b>\$210,603.49</b>	<b>\$0</b>	<b>\$4.51</b>

**ITAC Budget  
FY 2010**

<b>Budget Category</b>	<b>FY10 Budget</b>	<b>Cumulative Expenditures</b>	<b>Pending Expenditures</b>	<b>Remaining Balance</b>
Personnel/Salary				
Fringe Benefits				
Travel	\$16,385.47	\$16,385.47	\$0	\$0
Supplies	\$1,033.34	\$1,033.34		\$0
Equipment				
Other				
<b>Total Direct Costs</b>	<b>\$17,418.81</b>	<b>\$17,418.81</b>	<b>\$0</b>	<b>\$0</b>
Authorized Indirect Costs				
10% of Salaries and Wages				
<b>Total Costs</b>	<b>\$17,418.81</b>	<b>\$17,418.81</b>	<b>\$0</b>	<b>\$0</b>

**ITAC Budget  
FY 2011**

<b>Budget Category</b>	<b>FY11 Budget</b>	<b>Cumulative Expenditures</b>	<b>Pending Expenditures</b>	<b>Remaining Balance</b>
Personnel/Salary				
Fringe Benefits				
Travel	\$16,714.53	\$0	\$0	\$16,714.53
Supplies	\$4,130.66			\$4,130.66
Equipment				
Other				
<b>Total Direct Costs</b>	<b>\$20,845.19</b>	<b>\$0</b>	<b>\$0</b>	<b>\$20,845.19</b>
Authorized Indirect Costs				
10% of Salaries and Wages				
<b>Total Costs</b>	<b>\$20,845.19</b>	<b>\$0</b>	<b>\$0</b>	<b>\$20,845.19</b>

**Project Management Budget  
FY 2010**

<b>Budget Category</b>	<b>FY10 Budget</b>	<b>Cumulative Expenditures</b>	<b>Pending Expenditures</b>	<b>Remaining Balance</b>
Personnel/Salary	\$145,337.70	\$145,337.70		\$0
Fringe Benefits	\$28,967.49	\$28,967.49		\$0
Travel	\$0	\$0		\$0
Supplies	\$778.30	\$778.30		\$0
Equipment				
Other				
<b>Total Direct Costs</b>	<b>\$175,083.49</b>	<b>\$175,083.49</b>	<b>\$0</b>	<b>\$0</b>
Authorized Indirect Costs	\$14,533.77	\$14,533.77		\$0
10% of Salaries and Wages				
<b>Total Costs</b>	<b>\$189,617.26</b>	<b>\$189,617.26</b>	<b>\$0</b>	<b>\$0</b>

**Project Management Budget  
FY 2011**

<b>Budget Category</b>	<b>FY11 Budget</b>	<b>Cumulative Expenditures</b>	<b>Pending Expenditures</b>	<b>Remaining Balance</b>
Personnel/Salary	\$89,330.22	\$83,496.58	\$0	\$5,833.64
Fringe Benefits	\$18,029.3	\$15,867.88	\$190.84	\$1,970.59
Travel	\$0			\$0
Supplies	\$260.00	\$263.68		-\$3.68
Equipment				
Other				
<b>Total Direct Costs</b>	<b>\$107,619.53</b>	<b>\$99,628.14</b>	<b>\$190.84</b>	<b>\$7,800.55</b>
Authorized Indirect Costs	\$10,690.22	\$8,349.65		\$2,340.57
10% of Salaries and Wages				
<b>Total Costs</b>	<b>\$118,309.75</b>	<b>\$107,977.79</b>	<b>\$190.84</b>	<b>\$10,141.12</b>

**AQRP Budget**

**FY 2010**

<b>Budget Category</b>	<b>FY10 Budget</b>	<b>Cumulative Expenditures</b>	<b>Pending Expenditures</b>	<b>Remaining Balance</b>
Personnel/Salary	\$202,816.67	\$202,816.67	\$0.00	\$0.00
Fringe Benefits	\$38,665.65	\$38,665.65	\$0.00	\$0.00
Travel	\$346.85	\$346.85	\$0.00	\$0.00
Supplies	\$15,096.14	\$15,096.14	\$0.00	\$0.00
Equipment	\$0	\$0.00	\$0.00	\$0.00
Other	\$0	\$0.00	\$0.00	\$0.00
Contractual	\$2,287,827.93	\$2,287,821.75	\$0.00	\$6.18
ITAC	\$17,418.81	\$17,418.81	\$0.00	\$0.00
Project Management	\$189,617.26	\$189,617.26	\$0.00	\$0.00
<b>Total Direct Costs</b>	<b>\$2,751,789.31</b>	<b>\$2,751,783.13</b>	<b>\$0.00</b>	<b>\$6.18</b>
Authorized Indirect Costs 10% of Salaries and Wages	\$20,281.69	\$20,281.69	\$0.00	\$0.00
<b>Total Costs</b>	<b>\$2,772,071.00</b>	<b>\$2,772,064.82</b>	<b>\$0.00</b>	<b>\$6.18</b>



**AQRP Budget**

**FY 2011**

<b>Budget Category</b>	<b>FY11 Budget</b>	<b>Cumulative Expenditures</b>	<b>Pending Expenditures</b>	<b>Remaining Balance</b>
Personnel/Salary	\$163,121.22	\$163,120.24	\$0.00	\$0.98
Fringe Benefits	\$31,173.36	\$31,173.03	\$0.00	\$.33
Travel	\$0	\$0.00	\$0.00	\$0
Supplies	\$0	\$0.00	\$0.00	\$0
Equipment	\$0	\$0.00	\$0.00	\$0
Other	\$0	\$0.00	\$0.00	\$0
Contractual	\$1,756,308.06	\$1,716,271.72	\$0.00	\$40,036.34
ITAC	\$20,845.19	\$0.00	\$0.00	\$20,845.19
Project Management	\$118,309.75	\$107,977.79	\$190.84	\$10,141.12
<b>Total Direct Costs</b>	<b>\$2,089,757.58</b>	<b>\$2,018,542.78</b>	<b>\$190.84</b>	<b>\$71,023.96</b>
Authorized Indirect Costs	\$16,313.42	\$16,310.22	\$0.00	\$3.20
10% of Salaries and Wages				
<b>Total Costs</b>	<b>\$2,106,071.00</b>	<b>\$2,034,853.00</b>	<b>\$190.84</b>	<b>\$71,027.16</b>