

SF-424 Application for Federal Assistance

Version 7/03

APPLICATION FOR FEDERAL ASSISTANCE

1. TYPE OF SUBMISSION:

Application

Construction

Non-Construction

Preapplication

Construction

Non-Construction

2. DATE SUBMITTED April 13, 2007	Applicant Identifier
3. DATE RECEIVED BY STATE	State Application Identifier
4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

5. APPLICANT INFORMATION	
Legal Name: Houston Department of Health and Human Services	Organizational Unit: Department: Houston Department of Health and Human Services
Organizational DUNS: 19 458 6517	Division: Environmental Health – Bureau of Air Quality Control
Address: Street: 7411 Park Place Blvd.	
City: Houston	Name and telephone number of the person to be contacted on matters involving this application (give area code): Prefix: First Name: Daniel
County: Harris	Middle Name: Wayne
State: Texas	ZIP: 77087-4441
Country: Harris	Last Name: Hoyt
Suffix: P.E.	
6. EMPLOYER IDENTIFICATION NUMBER (EIN):	
7 4 - 6 0 0 1 1 6 4	Phone Number (give area code): 713-640-4365
	FAX Number (give area code): 713-640-4343
8. TYPE OF APPLICATION:	
<input checked="" type="checkbox"/> New <input type="checkbox"/> Continuation <input type="checkbox"/> Revision	
If Revision, enter appropriate letter(s) in box(es): (See back of form for description of letters)	
Other (specify):	
7. TYPE OF APPLICANT: (See back of form for Application Types):	
C. Municipal	
Other (Specify):	
9. NAME OF FEDERAL AGENCY:	
Environmental Protection Agency	
10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER:	
6 6 - 0 3 4	
TITLE: (Name of Program): Surveys, Studies, Investigations, Demonstrations and Special Purpose Activities Relating to the Clean Air Act	
11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:	
Measurement and Analysis of Benzene and VOC Emissions in the Houston Ship Channel Area and Selected Surrounding Major Stationary Sources Using DIAL (Differential Absorption Light Detection and Ranging) Technology to Support Ambient HAP Concentrations Reductions in the Community	
12. AREAS AFFECTED BY PROJECT (cities, counties, states, etc.):	
Houston and Harris County	
13. PROPOSED PROJECT:	
Start Date July 15, 2007	Ending Date June 15, 2008
14. CONGRESSIONAL DISTRICTS OF:	
a. Applicant 25 th	b. Project
15. ESTIMATED FUNDING:	
a. Federal	\$ 671,221.00
b. Applicant	\$ 63,834.00
c. State	\$
d. Local	\$
e. Other	\$
f. Program Income	\$
g. TOTAL	\$ 735,055.00
16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?	
a. <input checked="" type="checkbox"/> YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON: DATE with final application	
b. <input type="checkbox"/> NO. PROGRAM IS NOT COVERED BY E.O. 12372 OR PROGRAM HAS NOT BEEN SELECTED STATE FOR REVIEW	
17. IS APPLICATION DELINQUENT ON ANY FEDERAL DEBT?	
<input type="checkbox"/> YES If "Yes," attach an explanation. <input checked="" type="checkbox"/> No	
18. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.	
a. Authorized Representative	
Prefix Mr.	First Name Stephen
Last Name Williams	Middle Name L.
b. Title Director	Suffix M.Ed., M.P.A.
c. Telephone Number (give area code) 713-794-9311	e. Date Signed 4/14/2007
d. Signature of Authorized Representative 	

Budget Information – Non Construction Programs

OMB Approval No.0348-0044

Section A – Budget Summary						
Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	Total (g)
1. Community-Scale Air Toxics Ambient Monitoring	66.034			\$671,221.00	\$63,834.00	\$735,055.00
2.						
3.						
4.						
5. Totals				\$671,221.00	\$63,834.00	\$735,055.00
Section B –Budget Categories						
6. Object Class Categories	Grant Program, Function or Activity (\$)				Total (\$)	
	(1)Federal	(2)Applicant	(3)	(4)	(5)	
a. Personnel	\$0.00	\$43,041.00			\$43,041.00	
b. Fringe Benefits	\$0.00	\$18,293.00			\$18,293.00	
c. Travel	\$5,000.00	\$0.00			\$5,000.00	
d. Equipment	\$46,221.00	\$0.00			\$46,221.00	
e. Supplies	\$0.00	\$2,500			\$2,500.00	
f. Contractual	\$620,000.00	\$0.00			\$620,000.00	
g. Construction	\$0.00	\$0.00			\$0.00	
h. Other	\$0.00	\$0.00			\$0.00	
i. Total Direct Charges (sum of 6a- 6h)	\$671,221.00	\$63,834.00			\$735,055.00	
j. Indirect Charges	\$0.00	\$0.00			\$0.00	
k. Totals (sum of 6i and 6j)	\$671,221.00	\$63,834.00			\$735,055.00	
7. Program Income	\$0.00	\$0.00			\$0.00	

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Section C - Non-Federal Resources					
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) Totals	
8. Community Scale Air Toxics Ambient Monitoring	\$63,834.00				\$63,834.00
9.					
10.					
11.					
12. Totals (sum of lines 8 -11)	\$63,834.00				\$63,834.00
Section D –Forecasted Cash Needs					
	Total for 1 st Year	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
13. Federal	\$671,221.00	\$60,000.00	\$611,221.00	\$0.00	\$0.00
14. Non-Federal	\$63,834.00	\$0.00	\$0.00	\$63,834.00	\$0.00
15. Total (sum of lines 13 and 14)	\$735,055.00	\$60,000.00	\$611,221.00	\$63,834.00	\$0.00
Section E –Budget Estimates of Federal Funds Needed for Balance of the Project					
(a) Grant Program	Future Funding Periods (Years)				
	(b) First	(d) Second	(d) Third	(e) Fourth	
16. Community Scale Air Toxics Ambient Monitoring	\$0.00	\$0.00	\$0.00		\$0.00
17.					
18.					
19.					
20. Total (sum of lines 16–19)	\$0.00	\$0.00	\$0.00		\$0.00
Section F –Other Budget Information					
21. Direct Charges: \$671,221.00			22. Indirect Charges \$0.00		
23. Remarks					

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Narrative Proposal

a. Project Title: Measurement and Analysis of Benzene and VOC Emissions in the Houston Ship Channel Area and Selected Surrounding Major Stationary Sources Using DIAL (Differential Absorption Light Detection and Ranging) Technology to Support Ambient HAP Concentrations Reductions in the Community

The Houston Department of Health and Human Services (HDHHS) through the Bureau of Air Quality Control (BAQC) will apply DIAL, a proven remote sensing methodology, to measure the mass flux of benzene and volatile organic compounds (VOC) emissions from some of the largest individual sources of benzene and VOC emissions in the Houston Ship Channel area. Feasible emissions reductions strategies will be identified with the goal of improving ambient air quality in the community.

b. Category: 2) Methods development / evaluation.

c. Application Information:

Applicant: Houston Department of Health and Human Services
Contact Person: Daniel Hoyt, P. E.
Bureau of Air Quality Control
7411 Park Place Blvd.
Houston, Texas 77087-4441
Phone: 713-640-4365
Fax: 713-640-4343
dan.hoyt@cityofhouston.net

d. Funding Request:

HDHHS is requesting \$671,221.00 from U.S. EPA.

e. Total Project Cost:

The total cost for the grant project period will be \$735,055.00 HDHHS will contribute \$63,834.00 to cover the salaries of the three Chemists, who will operate a mobile ambient air monitoring laboratory (MAAML) and a Supervising Engineer who will provide project management oversight. HDHHS will also contribute to the project through covering operating costs incurred related to MAAML supplies, such as fuel and calibration gases.

f. Project Period:

The project will begin July 15, 2007 and end June 15, 2008.

g. Description of How the Proposed Project Meets the Established Guidelines

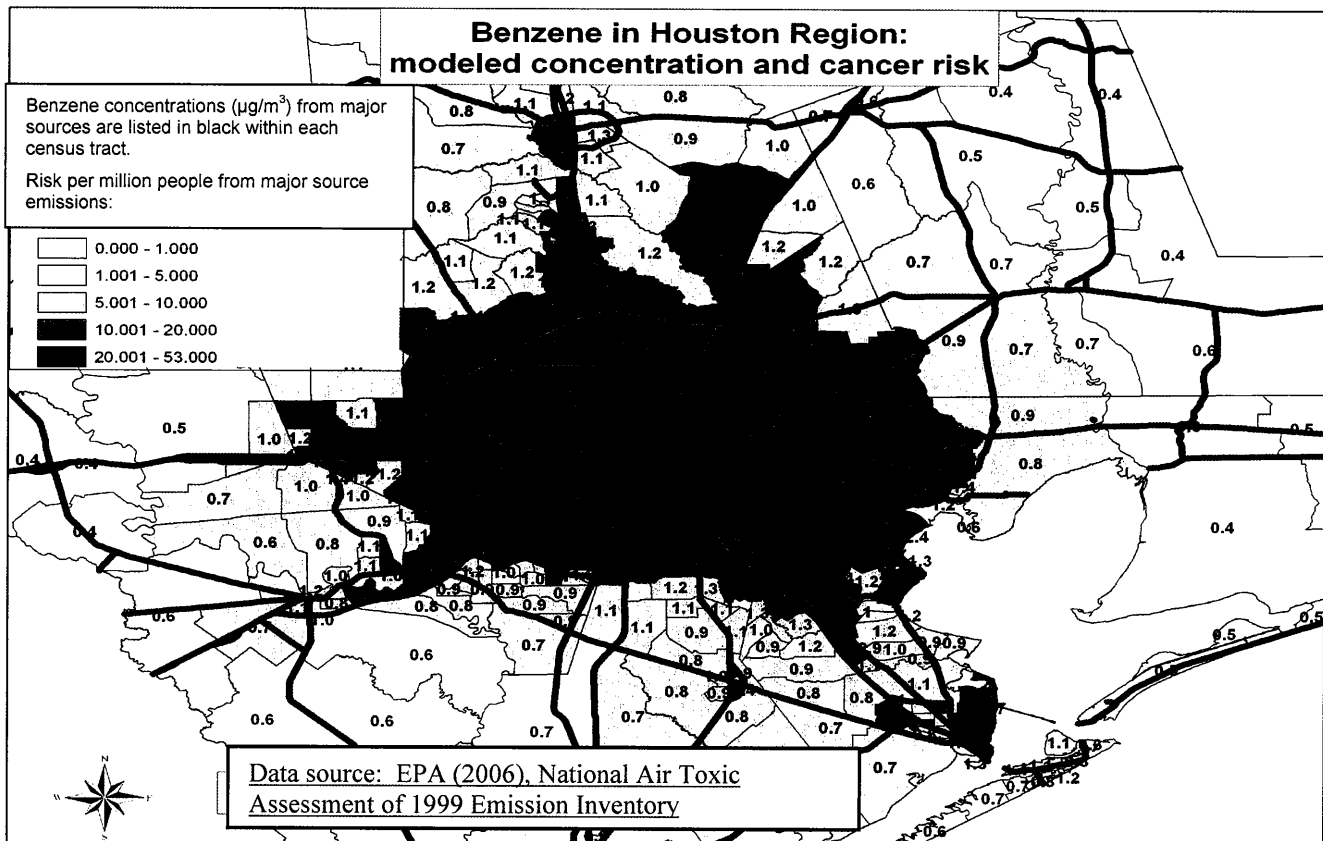
g.1. Background Information:

Section 112 of the Clean Air Act (CAA), as amended in 1990, lists 188 hazardous air pollutants (HAPs) that are regulated by the U.S. EPA. HAPs (also known as "air toxics") are substances that can cause acute and/or chronic health effects such as short-term nausea, difficulty in breathing, and cancer; along with immunological, neurological, reproductive, developmental, and respiratory effects upon exposure to excessive concentrations.

Recently, toxicology reports from the Texas Commission on Environmental Quality (TCEQ)¹, the U.S. EPA's 1999 National-Scale Air Toxics Assessment (NATA)², the Mayor's Health Effects of Air Pollution Task Force³, as well as studies conducted by Rice University⁴ and the Houston Endowment, Inc.⁵ indicate that ambient air concentrations of the carcinogenic hazardous air pollutant benzene, exceed acceptable health levels in the Houston area. Houston faces particularly difficult air toxic challenges due to the significant air emissions from one of the largest petrochemical complexes in the world. Harris County, home to Houston, was exposed to over 19 million pounds of hazardous air pollutants in 2003, including 750,325 pounds of benzene according to the EPA's 2003 Toxic Release Inventory (TRI) report. As such, benzene concentrations pose serious health risks to the City's population. The City of Houston (COH) and Mayor Bill White have set forth an initiative in response to this documented problem to reduce ambient benzene concentrations through benzene and other VOC emissions reductions from the largest known stationary sources⁶ which pose the greatest health risk to the community according to both measured and modeled data.

In order to protect public health, the EPA has compiled probability risk data for benzene and other HAP carcinogens that estimate the number of people per million of population who are expected to develop cancer as a result of exposure to particular concentrations⁷. The following map (Fig. 1) shows the modeled ambient air concentrations of benzene and corresponding cancer risks by census tract for the Houston area from benzene emissions reported by major stationary sources⁶.

Figure 1 - Benzene concentrations exceed the level corresponding to the acceptable cancer risk limit of 1 case in 1 million people (EPA, National Air Toxic Assessment, 2006).

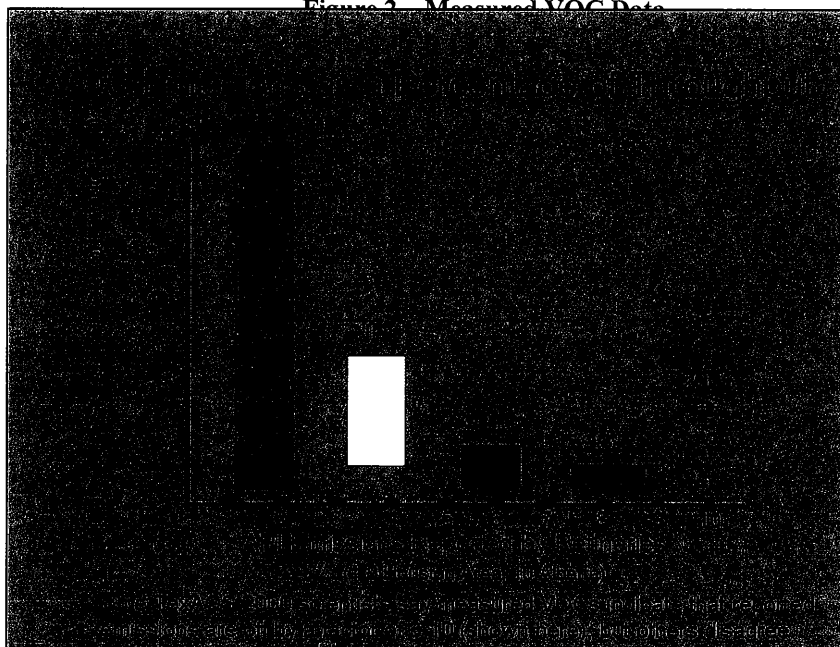


The largest major stationary sources of benzene, as well as the largest number of benzene monitors, are located in the east Houston/east Harris County/Houston Ship Channel (HSC) area. According to the Texas Emissions Inventory, emissions of benzene from these industrial sources are comprised as follows: wastewater (10%), cooling towers (6.5%), flares (13.3 %), fugitive-not including cooling towers, wastewater or tanks (34%) and miscellaneous loading, unloading, vents (36.1%).⁶ Further quantification, beyond the self reported emission inventory, is necessary to identify additional unknown emission release locations, to prioritize reduction locations and to design and implement effective emission reduction strategies.

The detailed identification and quantification of emissions from individual stationary sources is especially salient in light of the results of the Texas Air Quality Study⁸ which measured ambient VOC concentrations in the HSC area at levels six-times greater than modeling of estimates reported to the TCEQ's emissions inventory predicted. Quantitative measurements would therefore not only form the basis of a successful community-scale air pollution reduction effort, but would provide empirical ground truthing of emissions inventory estimates. The accuracy of the emissions inventory directly impacts the quality of many environmental initiatives such as air modeling, human health risk assessments, and ozone attainment strategies.

The Texas Air Quality Study used DIAL to measure ozone mass flux from the HSC area. DIAL has been extensively used to measure mass flux of benzene and VOC from refineries and other benzene sources in Canada and Europe. The results from the use of DIAL in Canada and Europe indicate VOC mass fluxes 5 to 20 times higher than reported by the same refineries using standard emission factors and estimating techniques⁹. Figure 2 compares DIAL measurement results from Spectrasyne and NPL and other remote sensing measurement results (SOF or Solar Occultations Flux) from Europe and Canada to self-reported emissions estimates for an Alberta refinery and 9 Houston area refineries¹⁰. The use of DIAL in other places has led to the identification of unknown/underestimated emission sources (e.g., coker operations) and the prioritization of emission reduction measures within a facility based on emission magnitude and downwind ambient concentration impact. This project will demonstrate that traditional emissions estimation techniques are inadequate to predict air contaminant concentrations accurately. This project will also identify emission control strategies and pollution reduction opportunities.

Figure 2. Measured VOC Data



* Compiled by Alex Cuclis of HARC¹⁰.

BAQC proposes using DIAL to assess mass emission rates of benzene and VOC, in and around the major emission sources in the HSC area. DIAL is a powerful instrument used to measure quantities of specific VOC species across a wide physical area, without the limitations of non-mobile stationary sensors. The results of the DIAL measurements will be used to identify unknown/underestimated emission sources, prioritize emission reduction measures, validate emissions estimates and assess attainment of authorized emissions limits. Sites where significant and unanticipated sources of benzene or VOC are discovered will be encouraged to assess the feasibility of emissions reductions options, reduce emissions and re-measure using DIAL after emissions reductions strategies have been implemented.

In contrast to DIAL, traditional single point sensors can only measure analytes of interest at the precise time and location at which the sample is taken. Due to the constantly changing nature of meteorological conditions, the traditional point sensor method of sample collection limits the sensor's field-of-vision. DIAL uses laser light in conjunction with the unique chemical properties of ambient air pollutants to identify and quantify VOC concentrations through large air masses with a working range of over one kilometer.

The density of refineries and petrochemical complexes within the HSC area makes source emission identification very difficult. Many of these sites share common fencelines, and fixed site monitors cannot adequately collect enough information to propose backtrajectory modeling to discover exact point sources. DIAL's range and scope can identify and quantitate the emission air masses traveling between fencelines to determine individual pollution contributions of specific chemical complexes.

Another positive attribute of DIAL is the ability to identify and measure multiple air contaminants in a single analytical measurement. DIAL can identify and quantitate multiple compounds during a single area sweep. Accurate, defensible, and thorough environmental measurements are crucial for the COH to identify opportunities for emissions reductions, improve air quality, and sustain a healthy quality of life for citizens of the COH.

g.2. Project Objectives

The following elements define the project objectives for this Category 2 (Methods Development /Evaluation) project:

- 1) Develop, improve and demonstrate DIAL System emissions measurement methods for estimating the mass flux of benzene and volatile organic compounds (VOC) from individual emissions sources at a variety of selected Houston area refineries and petrochemical facilities with significant benzene emissions,
- 2) Evaluate and verify the DIAL system benzene and VOC measurements using the COH's Mobile Ambient Air Monitoring Laboratory (MAAML), canister sampling, and other monitoring/open path measurement techniques,
- 3) Identify unanticipated/underestimated sources of benzene and VOC,
- 4) Evaluate emission estimation techniques currently utilized to determine VOC and benzene emission rates by comparing DIAL measurements with estimated emissions,
- 5) Assess the feasibility of emissions reduction strategies based on the measured impact from the most significant individual benzene emissions sources identified at the selected Houston area sites,
- 6) Assess the cost effectiveness of the DIAL system based on project costs, estimated emissions reduction strategies costs and the estimated cost savings to be realized through preventing the loss of valuable products, intermediates and/or raw materials via the proposed emissions reduction strategies.

g.3. Project tasks, deliverables, and timeline

Specific Actions and Methods to be Undertaken	Responsible Institution	Est. time for completion
Write up the grants package	HDHHS	2/15/2007 – 4/1/2007
Submit the grants package	HDHHS	4/13/2007
Preliminary work to identify and select industrial facilities to monitor	HDHHS	4/13/2007 – 7/15/2007
Initiate and implement the bid process for potential contractor(s)	HDHHS	7/15/2007 – 9/1/2007
Review bids and award a contract	HDHHS	9/1/2007 – 10/1/2007
Evaluate industrial facilities to determine survey requirements and make final site selections.	Contractor(s) & HDHHS	10/1/2007 – 11/1/2007
Configure COH mobile lab for validation sampling.	HDHHS	11/1/2007 – 12/15/2007
Perform start-up and testing of DIAL system. Dry run to coordinate monitoring and validation procedures.	Contractor(s) & HDHHS	1/2/2008 – 1/17/2008
Gather and interpret data from surveyed industrial facilities.	Contractor(s) & HDHHS	1/17/2008 – 4/17/2008
Compile and submit final report	Contractor(s) & HDHHS	4/17/2008 – 6/15/2008

Deliverables as follows:

- 1) An EPA Quality System (QAPP, QMP, and DQO's),
- 2) Quarterly AQS Data Reporting – Data from VOC and benzene monitoring activities will be provided to the EPA for input into the AQS Database,
- 3) Quarterly progress reports – A technical progress summary and summary of expenditures for the preceding quarter and a planned activities report for the next quarter will be submitted to the EPA,
- 4) Final Report – A final report detailing project activities and achievements, technical aspects, quality assurance results, and outcomes will be submitted to the EPA,
- 5) Presentation of project results at a national EPA monitoring conference or workshop.

g.4. Environmental Outputs / Outcomes

Outputs

The anticipated outputs include the following:

- 1) Benzene and VOC emissions data from some of the largest benzene emissions sources in the Houston area, based upon actual measurements, which will be provided for inclusion in EPA's Air Quality System database,
- 2) Benzene and VOC emissions data from a variety of individual sources at selected refineries and petrochemical facilities, including flares, storage tanks, wastewater systems, cooling water systems, and miscellaneous processes,
- 3) Documentation of unanticipated/underestimated emissions sources of benzene and VOC, including radial plume mapping and infrared camera images of detected emissions,
- 4) Comparative analyses of measured emissions to benzene and VOC emissions estimation methodologies and authorizations for refineries and petrochemical facilities,
- 5) Quarterly reports including benzene and VOC emissions measurements from DIAL, ambient VOC monitoring data collected using the COH's Mobile Ambient Air Monitoring Laboratory (MAAML), canister sampling, other available monitoring/open path measurement techniques, and measured meteorological parameters,

- 6) Final report documenting methodology, field monitoring, data analyses, measurement accuracy, comparison of measured benzene and VOC emissions rates to authorizations and emission rates reported for emissions inventories, the feasibility of proposed emissions reduction strategies and cost effectiveness of DIAL System measurements,
- 7) Manuscripts for publication in journals.

Outcomes

The scope of this project includes the acquisition and implementation of a DIAL system to obtain measurements of benzene and VOC emissions from selected Houston area major benzene emissions sources.

The first outcome will be to identify cost effective opportunities for benzene and VOC emissions reductions at individual sites. Site representatives will be encouraged to implement feasible emissions reduction strategies based on the DIAL measurement results, and re-measure with DIAL to demonstrate that the identified emissions reduction strategies were successfully implemented. These results will lead to general benzene and VOC emissions reduction strategies that can be applied at similar facilities. The DIAL results will also provide data in terms of benzene and VOC emissions per throughput that will allow for emissions performance comparisons of similar sites.

A secondary outcome will be to confirm that there is a problem with the current quantification methodologies for benzene and VOC emissions from large stationary emissions sources. Measured benzene and VOC emission rates will be compared to rates based on current emission estimation methodologies, including: EPA's TANKS model for estimating emissions from storage tanks, the EPA's wastewater model estimates, flare combustion efficiency, speciation devices on flare headers, and steam-assisted flares.

The comparison of measured VOC and benzene to the currently accepted emissions estimation techniques will lead to action by state and/or local policy makers to require DIAL measurements for large stationary source facilities. The DIAL results can improve the existing emissions estimation methodologies for sites not actively monitored by the DIAL instrument. Accurate emissions data will also lead to improved ozone modeling and assessment of pollution health effects across communities.

Cost benefit analyses may indicate that large refineries and petrochemical facilities gain a financial benefit from conducting DIAL surveys at their sites, especially when unexpected/underestimated emissions sources can be identified and mitigated. Large refineries and petrochemical facilities may determine that from a financial and environmental liability standpoint, DIAL monitoring at their sites is in their best interest. Cost savings will be achieved and safety issues will be addressed where unexpected/underreported sources of emissions like equipment leaks are identified and mitigated. Costs will be reduced because losses of valuable raw materials, intermediates and products will be minimized. Employee safety issues will be addressed because potentially dangerous equipment leaks will be identified and corrected.

The long-term anticipated outcome of this project will be to reduce benzene and VOC emissions from major stationary sources. Reductions in benzene and VOC emissions will lead to corollary reductions in emissions of other HAPs emitted by the same processes. The emissions reductions will result in reduced ambient benzene and other HAPs concentrations, reducing human exposure and the adverse health effects from atmospheric exposure.

g.5. A description of the roles of the applicant and partners

In the interest of conserving space, BAQC did not request letters of support from the listed partners below; however, BAQC has offered this partial list to indicate the number and variety of potential partners and the

wide scope of applications available for project data. Upon request, BAQC will furnish formal letters of support from these and other potential partners.

Air pollution control authorities from two neighboring counties, Harris County and Galveston County, are key partners interested in applying the project results. Harris County represents an important partner because many petrochemical plants lie just outside Houston's city limits, within Harris County, significantly affecting Houston's air quality. Galveston County is another important partner to HDHHS because they also have a large-scale concentrated petrochemical complex, and face similar problems with elevated HAPs in the ambient air. Galveston County anticipates utilizing the data collected in this project to support emission reductions from sources within their jurisdiction.

Experts from two Houston academic institutions, The University of Houston and Rice University, are key partners in advising and providing technical support during data collection and interpretation. The University of Houston provides specialized expertise in chemical and meteorological measurements as well as air quality modeling. Rice University provides specialized expertise in air pollution analytical measurement and statistical interpretation of the empirical data.

The EPA, Office of Research and Development, National Risk Management Research Laboratory, Air Pollution Prevention and Control Division will become an important partner. HDHHS has discussed with EPA Researcher Eben Thoma ways to identify how HDHHS can implement EPA programs, standards, and other technologies to measure air toxics at the ppbV level and below, in the context of verifying DIAL results with the MAAML.

The EPA, Office of Air Quality Planning and Standards, Sector Policies and Programs Division, Measurement Policy Group will also become an important partner. John Bosch of the EPA's Measurement Policy Group has expressed interest in facilitating the demonstration of effective use of the DIAL technology at sites in the US.

TCEQ has successfully operated eight (8) mobile ambient air monitoring vans equipped with a variety of analytical instrumentation for over 17 years and will be implementing a DIAL project later this year. Their experience, procedures, and protocols for their proposed DIAL project and mobile monitoring vans provide crucial input for the successful implementation of this proposed project. The capabilities of the MAAML serve as an extension of the TCEQ's prior studies in the greater Houston area by incorporating community-scale monitoring with point source emissions identification and characterization to yield community health risk assessments. In addition to their advisory capability, TCEQ also functions as an agency of reference regarding emissions inventories issues and any enforcement actions that may arise from air toxics data collected and point source emissions identified. TCEQ has indicated significant interest in the data this project will generate.

The Houston Advanced Research Center (HARC) can provide HDHHS with technical direction, contacts, and coordinate research studies with a variety of partners with interest in performing related studies. HARC manages \$10-12 million each year in air quality related research projects funded by the State of Texas. HARC has numerous contacts with regulatory agencies for counties, the State of Texas, EPA, university researchers, non-governmental organizations (NGO's), and industry. HARC will provide consulting assistance to HDHHS for help in the planning, sample gathering, and execution of this project.

Environment Canada (EC) was a primary funding agency for DIAL projects in Alberta, Canada that were successfully executed in 2003 and 2004 involving five gas plants and in 2005 involving a refinery. EC has indicated significant interest in this proposed project and has offered to provide support. EC's experience related to selecting project sites, developing site plans, implementing procedures and protocols and interpreting results will allow for EC to provide crucial input for the successful implementation of this proposed project.

g.6. Biographical information of key personnel

The following list identifies key project personnel with biographical information to show their qualifications to develop, plan, and implement the project as described from concept to the final EPA report.

Daniel Hoyt, P.E., Supervising Engineer, BAQC, HDHHS, Project Manager

Eleven years of experience working at HDHHS in the Environmental Health Division including eight years at HDHHS in air regulations, permitting, compliance, enforcement, air toxics emission inventory, emission events, process equipment leaks, emission investigation, emission reduction and data analysis, air dispersion modeling, geographical information system application, planning, and management of engineering projects and programs.

M.S. Environmental Engineering, 1997, University of Houston

Arturo J. Blanco, M.P.A., Bureau Chief, BAQC, HDHHS

Twelve years working at TCEQ and HDHHS in field investigation, permitting, compliance, enforcement, environmental policy and management, community outreach, state and local government air quality functions, and management of grants and contracts.

MPA, 1993, Troy State University; B.S. Professional Aeronautics, 1991, Embry-Riddle Aeronautical University

Patricia Beltz, Continuous Air Monitoring Section Supervisor and Quality Assurance Officer, BAQC, HDHHS

Sixteen years experience working at TCEQ and COH's BAQC including fifteen years in Houston ambient air monitoring, laboratory operation and management, quality assurance, data validation, instrument purchase, maintenance and repairs, and project management.

B.S. Biochemistry and Biophysical Sciences, 1982, University of Houston

Wei-Yeong Wang, Ph.D., P.E., Technical Services Section Chief, BAQC, HDHHS

Twenty-five years of experience working at chemical industries (Union Carbide and Dow Chemical) and COH's BAQC in air monitoring, laboratory analysis, laboratory operation and management, quality assurance, air toxics studies, regulation, permitting, compliance, emission abatement, engineering, research and development, and management of environmental projects and programs.

Ph.D. Chemical Engineering, 1981, City University of New York

James Rhubottom, Jr., Operations Leader and Chemist IV, BAQC, HDHHS

Eleven years of experience working in private (BFI, PSI) and public sector environmental laboratories (Harris County, BAQC) as an analytical chemist trained in field and analytical laboratory operation and management; project/client management; data validation; analytical instrumentation maintenance, repairs, and methods development; quality assurance; safety officer; purchasing/procurement; and technical writing.

B.S. Chemistry, 1988, University of Texas at San Antonio

Youjun Qin, Ph.D., Chemist IV, BAQC, HDHHS

Twenty-one years of experience at academic institutions (Zhongshan University, China, Hong Kong Polytechnic University, Hong Kong, University of California Riverside, Clarkson University) and public sector environmental agencies (TCEQ, BAQC) in air monitoring, GIS applications, laboratory analysis, air quality model development, receptor model application, environmental impact assessment, and environmental control strategy and data analysis.

Ph.D. Environmental Engineering, 2002, University of Abertay, Dundee, UK

Ben Cieslinski, Chemist IV, BAQC, HDHHS

Nine years experience working in private (Severn Trent Laboratories - Austin) and public sector environmental laboratories (BAQC) as an organic and analytical chemist specializing in ambient air analysis, analytical laboratory management, project and client management, instrumentation research, analytical methods development, data validation, quality assurance, maintenance and repairs, safety officer, public liaison, and technical writing.

B.S. Chemistry, 1998, Texas A&M University

Loren Hopkins Raun, Senior Environmental Analyst, Mayor's Office of Environmental Programming, City of Houston. Her work at the City has focused on air pollution reduction measures through efforts such as a voluntary benzene reduction plan for industry and incorporation of hazardous air pollutant control through a city ordinance. She has 20 years of experience in the environmental field as a consultant for private industry, academician, and government contractor/employee. Her expertise lies in environmental statistics, human-health risk assessment and contaminant modeling. Dr. Raun is a member of the faculty in the statistics department at Rice University where she teaches applied environmental statistics and has published numerous academic papers.

B.S. Geophysics, 1985, University of Texas, M.S. Environmental Science, Rice University, 1988, Ph.D. Environmental Science, Rice University, 1998.

Alex Cuclis, Research Scientist, Houston Advanced Research Center (HARC).

Sixteen years working at Shell Oil Company's Deer Park Refinery, working as a chemical engineer. Duties included specifying, installing and providing technical support for on-line analyzers, including those used to measure pollutants from stationary sources for regulatory purposes. Three years working on air quality projects for the University of Houston before he began working as a Project Manager at HARC. While working as a Program Manager at HARC, has been involved in assessments of remote sensing applications, including DIAL.

B.S. Chemical Engineering, University of Texas, MS Analytical Chemistry, University of Illinois.

h. Detailed Itemized Budget

h.1. Personnel

Total Personnel Costs	\$0
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h.2. Fringe Benefits

Total Fringe Benefit Costs	\$0
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h.3. Contractual Costs

Project Manager	\$60,000
DIAL Subcontractor (7 weeks of measurements)	<u>\$560,000</u>
Total Contractual Costs	\$620,000

h.4. Travel

Out of town travel to discuss/present results with other governmental agencies	<u>\$5,000</u>
Total Travel Costs	\$5,000

h.5. Equipment

Silco Canisters (5 at \$795 each)	\$3,975
Canister Replacement Valves (5 at \$262 each)	\$1,310
Canister Pressure/Vacuum Gauges (13 at \$89 each)	\$1,157
Canister Cleaning System (Single Oven)	\$15,900
Canister Cleaning Humidification Chamber	\$170
XDS10 Oil-Free Rough Pump for canister cleaning	\$5,219

Gauge-Compound Test Gauge for canister cleaning	\$3,000
Gauge-Pressure Test 150 psig for canister cleaning	\$2,000
ppbRAE Handheld PID Monitor (2 at \$6,745 each)	<u>\$13,490</u>
Total Equipment Costs	\$46,221

The above noted equipment, including canisters, canister cleaning apparatus and PID monitor will be used beyond the duration of the grant, to support continued air sampling and analyses. The noted equipment will be used to support various types of investigative work by BAQC, including investigations related to elevated monitored levels of air contaminants, complaints and other special initiative investigations where VOC sampling is appropriate.

h.6. Supplies

Total Supply Costs	\$0
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h.7. Other

Total Other Costs	\$0
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h.8. Total Direct Costs

Total Direct Costs	\$671,221
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h.9. Total Indirect Costs

Total Indirect Costs	\$0
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h.10. Total Cost

Total Cost	\$671,221
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i. Environmental Results Past Performance

BAQC has received the following three federally funded assistance agreements during the past three years:

- 1) Local Air Toxics Monitoring Grant (XA-96620501) received May 22, 2006 for \$499,657.00
- 2) 105 Pass Through Monitoring Grant with a yearly amount of \$388,427.00
- 3) 103 PM2.5 Monitoring Grant with a yearly amount of \$68,000.00

As these three grants represent ongoing projects, no final reports of environmental impact exist; however, BAQC has attained notable milestones for each project. At this time, funds from the Air Toxics Grant support project development along with construction for mobile laboratory and support buildings for the MLP. In addition, three full-time staff chemists have begun drafting the operations and monitoring plans for the MLP. Moreover, MLP chemists have given presentations on the MLP at EPA conferences in Research Triangle Park, NC and Albuquerque, NM in line with grant objectives. Finally, BAQC has tentatively targeted deployment of the MAAML for mid-July 2007.

The 105 Grant serves as the major funding source for the COH's Continuous Air Monitoring System (CAMS). Six staff scientists perform calibrations and maintenance on eight fixed-site monitoring stations located throughout the City. These stations collect continuous meteorological data and measurements of ozone and EPA "criteria" ozone precursors with current data capture rates of around 95% efficiency. TCEQ's database along with EPA's AQS and AIRNOW databases receive the transmitted data from the CAMS stations and use the data to help determine national, state, and local air quality standards. The collected data also generates the COH's Air Quality Index, giving Houstonians vital air quality information regarding daily potential health risks.

The 103 Grant allows for the collection of PM2.5 particulates at three fixed-site stations around the COH. As with the 105 Grant, BAQC staff maintains a data capture rate of around 95% efficiency. In addition, both the TCEQ and EPA use the collected data in the determination of national, state, and local air quality standards.

j. Programmatic capability

BAQC has received the following three federally funded assistance agreements during the past three years:

- 1) Local Air Toxics Monitoring Grant (XA-96620501) received 22May07 in the amount of \$499,657.00
- 2) 105 Pass Through Monitoring Grant with a yearly amount of approximately \$500,000.00
- 3) 103 PM2.5 Monitoring Grant with a yearly amount of approximately \$70,000.00

For all three grants, BAQC has consistently provided proper, timely documentation of grant progress. BAQC has continually submitted project-specific reports to the EPA in a manner consistent with stated timeframes. For the Local Air Toxics Grant, project personnel have ensured that required quarterly reports and quality assurance documents reached the EPA Project Manager before stated cut-off dates. As this grant has not yet reached its halfway point, BAQC has maintained good communication of all contractors involved in the project to guarantee meeting specified project timelines while ensuring the completion and appropriate submission of all project-mandated quarterly reports. BAQC realizes that though this particular grant does not yet require a final technical report, time and funds management remain top priorities in assuring the completion of all project-related tasks.

BAQC has performed similarly on the 105 Pass Through Grant by closing out grant disbursement reports within project timeframes. As with the Air Toxics Grant, BAQC submitted project reports as per project guidelines including final reports. TCEQ continues to praise through their auditing process BAQC staff performance of project duties detailing how well they have met and exceeded project goals and objectives. Like the Local Air Toxics Grant and the 105 Pass Through Grant, BAQC has also continued to demonstrate exceptional performance concerning project management and completion for the 103 PM2.5 Monitoring Grant as reflected in part by the timeliness of pertinent report submission.

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