

Project Title: Local Scale Ambient Air Sampling for Trichloroethylene and Related Toxic Air Compounds in the Pottstown and Collegeville Areas

Project Period Start: 07/01/2007 **Project Period End:** 12/31/2008

Congressional Districts

Estimated Funding

Federal	\$269,166
Applicant	\$0
<i>(For all applicants including states)</i>	
State	\$0
<i>(For state contribution to non-state applicants)</i>	
Local	\$0
Other	\$0
Program Income	\$0
TOTAL	\$269,166

Is the Application subject to review by State Executive Order 12372 Process? Yes - Was Made Available for Review

Available for Review: 04/06/2007

Is the Applicant delinquent on any Federal Debt? No

Authorized Representative

Key Contacts

Budget Summary

Application Attachments

Grants.gov Application:

Notifications History

BUDGET INFORMATION - Non-Construction Programs

SECTION A - BUDGET SUMMARY						
Grant Program Function or Activity (a)	Catalog of Federal Domestic Assistance Number (b)	Estimated Unobligated Funds		New or Revised Budget		Total (g)
		Federal (c)	Non-Federal (d)	Federal (e)	Non-Federal (f)	
1. Local Scale Air Monitoring	66.034			\$269,166.00		\$269,166.00
2.						\$0.00
3.						\$0.00
4.						\$0.00
5. Totals		\$0.00	\$0.00	\$269,166.00	\$0.00	\$269,166.00
SECTION B - BUDGET CATEGORIES						
6. Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY					
	(1) Local Scale Air Monitoring	(2)	(3)	(4)	Total (5)	
a. Personnel	\$34,262.00					\$34,262.00
b. Fringe Benefits	\$13,428.00					\$13,428.00
c. Travel	\$11,745.00					\$11,745.00
d. Equipment	\$20,000.00					\$20,000.00
e. Supplies	\$18,265.00					\$18,265.00
f. Contractual	\$152,800.00					\$152,800.00
g. Construction	\$0.00					\$0.00
h. Other	\$0.00					\$0.00
i. Total Direct Charges (sum of 6a-6h)	\$250,500.00		\$0.00	\$0.00	\$0.00	\$250,500.00
j. Indirect Charges	\$18,666.00					\$18,666.00
k. TOTALS (sum of 6i and 6j)	\$269,166.00		\$0.00	\$0.00	\$0.00	\$269,166.00
7. Program Income						\$0.00

SECTION C - NON-FEDERAL RESOURCES				
(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8. Local Scale Air Monitoring				\$0.00
9.				\$0.00
10.				\$0.00
11.				\$0.00
12. TOTAL (sum of lines 8-11)	\$0.00	\$0.00	\$0.00	\$0.00

SECTION D - FORECASTED CASH NEEDS				
Total for 1st Year	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter
13. Federal	\$269,166.00	\$67,291.50	\$67,291.50	\$67,291.50
14. Non-Federal	\$0.00			
15. TOTAL (sum of lines 13 and 14)	\$269,166.00	\$67,291.50	\$67,291.50	\$67,291.50

SECTION E - BUDGET ESTIMATES OF FEDERAL FUNDS NEEDED FOR BALANCE OF THE PROJECT				
(a) Grant Program	FUTURE FUNDING PERIODS (Years)			
	(b) First	(c) Second	(d) Third	(e) Fourth
16.				
17.				
18.				
19.				
20. TOTAL (sum of lines 16-19)	\$0.00	\$0.00	\$0.00	\$0.00

21. Direct Charges: \$250,500
 22. Indirect Charges: \$ 18,666

23. Remarks: The proposed indirect rate beginning 7/1/07 is 39.14%. This rate has been applied to the Personnel and Benefits categories. If the approved indirect rate should change, revised budget pages will be submitted.

Pennsylvania Department of Environmental Protection
Bureau of Air Quality
April 3, 2007

Ambient Air Sampling Project for Trichloroethylene and Other Toxic Air
Compounds in the Collegeville Area

Project Category:

This application is a community-scale monitoring grant proposal with an emphasis on developing baseline reference concentrations of Hazardous Air Pollutants (HAPs) to support estimates of community exposure and to track long-term measurements of air toxics following the implementation of an emission reduction strategy in the Collegeville area.

Points of Contact:

Pennsylvania Department of Environmental Protection
400 Market Street
Harrisburg PA 17105-8468
Fax (717) 772-2303

Nicholas E Lazor
NLAZOR@STATE.PA.US
(717) 772-3958

Gary La Belle
GLABELLE@STATE.PA.US
(717) 787-9480

Donald Torsello
DTORSELLO@STATE.PA.US
(717) 772-3959

Eligibility:

The Pennsylvania Department of Environmental Protection (PADEP), Bureau of Air Quality (BAQ) is the sole statewide air- monitoring agency. The PADEP meets the definition of the term "Air Pollution Control Agency" as defined in Section 302 (b)(1) the federal Clean Air Act ("CAA") 42 U.S.C.A. Section 7602 (relating to definitions). As defined in Section 302(b)(1) of the CAA, the term "Air Pollution Control Agency" includes, but is not limited to: "A single State agency designated by the Governor of that State as the official State air pollution control agency for purposes of this chapter [Chapter 85 (relating to Air Pollution Prevention and Control)]."

Funding Requested:

\$ 269,166

Project Goals:

The main goal of this study is to expand current sampling efforts in the Collegeville area to determine if planned reductions in trichloroethylene (TCE) emissions by two local sources are effective in reducing the residual cancer risk to the citizens of the area. This strategy will be based on quality data collected prior to and during this project, thorough data analysis and the use of proven modeling techniques.

The primary objectives of the proposed study are to:

1. Continue to assess the potential health risk to residents of the College area from exposure to air toxics.
2. Compare emissions data from the two major steel tube manufacturing facilities in the Collegeville area with the monitored data to determine if there is a relationship, especially in light of voluntary TCE emission reductions that will be achieved from the installation of controls.
3. Conduct perimeter monitoring of the two major steel tube manufacturing facilities in the Collegeville area.
4. Evaluate the contribution of air strippers in the Collegeville area to ambient TCE concentrations. .

Project Period:

The project period of this grant request will be 18 months. This project period will allow PADEP to perform 12 months of sampling and provide 6 months for data reduction, data analysis and report production. The length of this sampling period will capture data reflecting a variety of seasonal environmental sampling conditions. If the U.S. Environmental Protection Agency (EPA) awards the requested funds, the sampling period would begin no later than January 1, 2008 and end December 31, 2008. Data would be submitted to the EPA AIRS database 90 days after the end of the sampling quarter. The final report would be available no later than July 1, 2009.

Project Background:

Collegeville is best known as the home of Ursinus University, but it does have its share of industry in the surrounding area. Currently, two large steel tube manufacturers operate near Collegeville. Superior Tube is located on Germantown Pike in Lower Providence Township, and Accellent is located in

Trappe. The owners/operators of both facilities use TCE to degrease steel tubing they manufacture. While the owners/operators of both facilities have taken steps to reduce their TCE emissions over the years, and are in compliance with existing regulations and permit restrictions, their actual emissions are still significant. In 2005, Superior Tube emitted 68.8 tons of TCE; Accellent emitted 58.4 tons. Air strippers are operated at both facilities to mitigate TCE-contaminated groundwater caused by past industrial practices at both facilities. In fact, it was discovered in the 1970s that groundwater contamination was widespread throughout the area, not just in the vicinity of these two companies. Consequently, the Collegeville-Trappe Joint Water Authority, the local water company, also operates air strippers. All of the air strippers in the immediate Collegeville area are uncontrolled, so that the TCE stripped from the groundwater is emitted directly into the atmosphere.

After a multi-year study beginning in 2002 in the Pottstown area, the PADEP expanded its' monitoring into the Collegeville area, installing samplers in Trappe and Evansburg in December 2004. After a year of sampling, the excess lifetime cancer risks calculated using EPA Region 3 guideline values for cancer potency slope factors, and based on the average of over one year of 1-in-6 day sampling, were 2.4 in 10,000 for Evansburg and 3.1 in 10,000 for Trappe, compared to less than 2.0 in 10,000 for other DEP sites. The releases of TCE reported in the 2003 Toxic Release Inventory for zip code 19426, which includes Collegeville and portions of the surrounding townships, were 247,357 pounds to the air from point sources and 11,057 pounds of fugitive air releases. This constitutes 25.9% of the total 2003 statewide TCE releases to the air. The following table summarizes the inhalation risk for the Pa. air toxics monitoring sites from 2002 through 2005.

Site	Excess Lifetime Cancer Risk per 10,000 (Total VOC)			
	2002	2003	2004	2005
Arendtsville	0.73	1.2	1.3	1.6
Chester	0.82	1.3	1.5	1.8
Erie	0.79	1.2	1.3	1.7
Evansburg	-----	-----	-----	2.4
Lancaster	0.79	1.3	1.4	1.7
Lewisburg	-----	-----	1.4	1.7
Marcus Hook	0.93	1.3	1.4	1.8
Pottstown	2.00	1.6	1.5	1.9
Swarthmore	0.81	1.3	1.4	1.8
Trappe	-----	-----	-----	3.1

The sampling sites in Collegeville are located in the Evansburg State Park in Lower Providence Township, and at the College Street School Community Building in Trappe. Air samples are collected, every-sixth-day at both sites, in evacuated steel canisters that are analyzed by the PADEP's laboratory for 55

VOC's using EPA Compendium Method TO-15. A weather tower was installed at the Trappe site to monitor for meteorological conditions such as wind speed and direction.

This proposal seeks funding to continue and expand this monitoring initiative. In addition to continuing 24-hour sampling every-sixth-day at the two existing sites, PADEP proposes to install a new background site, conduct several intensive short-term sampling events, and use GIS and modeling to relate ambient measurements to sources. The primary goal will be to better characterize the magnitude and geographic extent of areas with a higher calculated health risk, and provide information needed for enforcement and permitting staff to prioritize their actions to mitigate the risk.

Scope of Work:

1. Install a new upwind VOC monitoring site to provide a "background" comparison.
2. Collect 24-hour canister samples on the standard particulate network one-in-six day schedule and collect one additional canister sample per month on a random schedule at three sites.
3. Analyze canister samples for 55 volatile organic compounds using EPA Method TO-15.
4. Submit the monitoring data to EPA AIRS AQS.
5. Analyze the monitoring data to estimate annual average concentrations, upper confidence limits, and associated cancer and non-cancer health risks.
6. Relocate the sampler and meteorological tower from the roof of the College Street School Community building in Trappe due to sale of the building. PADEP is currently in the process of relocating the Trappe site to the campus of Ursinus College.
7. Conduct four intensive sampling events during which multiple short-term samples will be collected. This sampling will utilize passive canister samplers that can be deployed without a shelter or AC power. Two or more of the intensive sampling events will include PADEP's MAU, which is equipped with a Tandem Mass Spectrometer and open-path FTIR.
8. Subcontract with an academic researcher for data analysis, risk assessment and modeling to estimate the contribution and relative impact of local and regional sources.
9. Develop strategies to reduce public exposure and health risk, consistent with federal and state air pollution regulations.
10. Inform the local community of study findings through a written report, a public meeting and the PADEP's web site.

Transferability:

TCE is a widely used solvent in many industries. In addition to the two facilities mentioned previously there are two additional active and one recently closed tubing companies in Montgomery County. There is also a fabric coating facility nearby emitting 50 to 60 tons per year of TCE and several small vapor-degreasing facilities also contributing to local TCE emissions. PADEP believes that this project will provide insight into TCE air concentrations in other communities of the Commonwealth that have diverse industrial bases covering industries using TCE and similar chemicals. TCE's widespread use is best demonstrated by its presence in at least 852 of the 1,430 National Priorities List sites identified by the EPA.

History of Project:

April 2002 – PADEP began TO-15 canister sampling every sixth day at one site located on the Pottstown High School campus. This site was selected because it met siting criteria for the distance to obstructions and it is centrally located in the community.

June 2003 – PADEP began particulate sampling in Pottstown for the toxic metals: arsenic, beryllium, cadmium, total chromium, lead, manganese, nickel and zinc.

November 2003 – A short-term study by PADEP MAU used an open-path FTIR to monitor for TCE and other volatile organics. Additional studies using open-path FTIR were conducted in January and March 2004. Open-path monitoring in Collegeville detected higher levels of TCE than in Pottstown.

June 2004 – A report was released to the public, followed by a public meeting in Pottstown. The report included a risk assessment for excess cancer risk and non-cancer health risks. Data were also reviewed by the Pennsylvania Department of Health.

December 2004 – PADEP began canister sampling in Trappe and Evansburg, which are west and east of Collegeville, respectively. The Trappe site also monitors wind speed, wind direction, rainfall and solar radiation.

January 2007 - PADEP issued a final report for the Pottstown area study and the initial report for the Collegeville area study.

February 2007 – PADEP held a public meeting to discuss the results from the first year of sampling. Citizens of the area strongly urged continued and expanded monitoring.

Work Plan:

The PADEP's Bureau of Air Quality (BAQ) will coordinate the project work with the PADEP Bureau of Laboratories and PADEP Southeast Regional Office. The BAQ proposes using a subcontractor affiliated with an academic institution for additional modeling and health risk assessment. It is anticipated that the project will last a total of 18 months including initial planning, 12 months of monitoring, data analysis and preparation of a final report.

The BAQ proposes to operate three primary monitoring stations that collect 24-hour samples on a one-in-six day schedule with additional monthly samples on a random schedule. Each station is equipped with an automated, flow-controlled canister sampler (Andersen AVOCS or RM Environmental 910PC). Weather data from sensors on a three-meter tower are recorded and processed by a Campbell CR10X datalogger. The Trappe equipment will be relocated to the Ursinus university campus. The proposed work includes relocating this site to rooftop of the campus library.

The PADEP Bureau of Laboratories, following their standard operating procedure based on EPA Method TO-15, will analyze the canister samples. The lab is equipped with two Entech concentrator GC/MS systems. PADEP chemists have extensive experience with air analysis for VOC's. The PADEP lab started using TO-15 in 2001, and previously used EPA Methods TO-1 and TO-14a for many years. Results will be entered into the EPA AIRS AQS system within 90 days after each calendar quarter.

The measured concentrations will be used to estimate health risks from long-term exposure. The risk analysis for excess lifetime cancer risk includes TCE and 15 other compounds that have cancer unit risk factors.

Data will also be compared to EPA National Air Toxics Assessment estimates and other PADEP monitoring sites, such as the Lancaster site. The Lancaster monitoring site, which is a PADEP and EPA Region 3 cooperative site, collects collocated canister samples. One canister is analyzed by Maryland Department of the Environment laboratory and the other by the PADEP laboratory, providing a comparison between the two laboratories. This comparison will help assure that the quality of the Colledgeville project's laboratory analysis are consistent with other air toxics monitoring sites.

Intensive studies:

The proposed study will include four intensive study periods. The additional short-term canister samples collected during these intensives will be used to study the impact of major facilities, air strippers and other sources on local (micro-scale) ambient concentrations. Up to 24 canister samples will be collected during each intensive over a two to three day period. The use of passive flow controllers

will allow more flexibility in locating the monitoring sites. Sampling will focus on major facilities and air strippers, but also consider other TCE sources. Perimeter sampling around major facilities will be correlated with production activities. Indoor exposure to TCE from infiltration due to contaminated groundwater may be measured with samples collected inside or near homes, schools or businesses, if this route of exposure is suspected to be significant. The MAU will use open-path FTIR to measure TCE near sources of fugitive emissions. These studies will combine air quality monitoring program staff, regional staff familiar with local area, and MAU personnel.

List of Target Analytes

CAS	Compound	CAS	Compound
71-55-6	1,1,1-Trichloroethane	75-01-4	Chloroethene
79-34-5	1,1,2,2-Tetrachloroethane	67-66-3	Chloroform
79-00-5	1,1,2-Trichloroethane	74-87-3	Chloromethane
76-13-1	1,1,2-Trichlorotrifluoroethane	156-59-2	cis-1,2-Dichloroethene
75-34-3	1,1-Dichloroethane	10061-01-5	cis-1,3-Dichloropropene
75-35-4	1,1-Dichloroethene	110-82-7	Cyclohexane
120-82-1	1,2,4-Trichlorobenzene	124-48-1	Dibromochloromethane
95-63-6	1,2,4-Trimethylbenzene	75-71-8	Dichlorodifluoromethane
106-93-4	1,2-Dibromoethane	100-41-4	Ethylbenzene
95-50-1	1,2-Dichlorobenzene	87-68-3	Hexachlorobutadiene
107-06-2	1,2-Dichloroethane	108-38-3	m/p-Xylene
78-87-5	1,2-Dichloropropane	78-93-3	MEK
76-14-2	1,2-Dichlorotetrafluoroethane	1634-04-4	Methyl Tert-Butyl Ether
108-67-8	1,3,5-Trimethylbenzene	75-09-2	Methylene Chloride
106-99-0	1,3-Butadiene	108-10-1	MIBK
541-73-1	1,3-Dichlorobenzene	142-82-5	n-Heptane
106-46-7	1,4-Dichlorobenzene	110-54-3	n-Hexane
622-96-8	1-Ethyl-4-methylbenzene	95-47-6	o-Xylene
591-78-6	2-Hexanone	115-07-1	Propene
67-64-1	Acetone	100-42-5	Styrene
71-43-2	Benzene	127-18-4	Tetrachloroethene
75-27-4	Bromodichloromethane	109-99-9	Tetrahydrofuran
75-25-2	Bromoform	108-88-3	Toluene
74-83-9	Bromomethane	156-60-5	trans-1,2-Dichloroethene
75-15-0	Carbon Disulfide	10061-02-6	trans-1,3-Dichloropropene
56-23-5	Carbon Tetrachloride	79-01-6	Trichloroethene
108-90-7	Chlorobenzene	75-69-4	Trichlorofluoromethane
75-00-3	Chloroethane		

Qualifications and Roles:

The PADEP BAQ Air Quality Monitoring Division has been performing statewide ambient air quality monitoring for criteria pollutants since the enactment of the original Clean Air Act in the 1970's. This length of experience has provided the knowledge to properly plan, develop, implement and analyze the results of complicated monitoring studies. The following personnel in the Toxics Monitoring Section of the Air Quality Monitoring Division, who are the primary investigators, have decades of cumulative experience in air toxics sampling:

Nick Lazor, Chief, Toxic Monitoring Section

Mr. Lazor will be the primary point of contact and coordinator for this project. Mr. Lazor has over 10 years of environmental sampling experience and has been the section chief since February 2005. Prior to his appointment as Section Chief, Mr. Lazor's primary duties were as the PM_{2.5} Program Manager.

Gary La Belle, Air Pollution Control Engineer III

Mr. La Belle will be one of the primary investigators on this project. He brings decades of air toxics sampling experience to this project. He has designed the sampling framework currently in place for this project and implemented numerous other toxic sampling projects.

Donald Torsello, Air Quality Program Specialist

Mr. Torsello is the second of our lead investigators for this project. He has designed and implemented numerous toxic sampling projects as well as overseeing the PADEP Acid Rain and Mercury Deposition program.

We are currently in discussions with professors from the Pennsylvania State University and the University of Pennsylvania to provide PADEP with data reduction, advanced data analysis and dispersion modeling support.

Budget:

A detailed budget is provided in the attached document.

Local Scale Air Toxics Monitoring

BUDGET INFORMATION FY '07

SEE SECTION B, LINE 6 (a) & (b)

BUDGET CATEGORY - 01 & 02

PERSONNEL

FY 2007

Average Bi-Weekly Salary 07/1/07	2,255
.38 WORK YEAR OF EFFORT	0.38
Total Salaries	857
7/1/07 thru 12/31/07 - 13 pay periods	11,140
Average Bi-weekly Salary 1/1/08 (2.25% pay increase)	2,306
.38 WORK YEAR OF EFFORT	0.38
Total Salaries	876
1/1/08 thru 6/30/08 - 13 pay periods	11,390
Average Bi-weekly Salary 7/1/08 (3% General pay increase)	2,375
.38 WORK YEAR OF EFFORT	0.38
Total Salaries	902
7/1/08 thru 12/31/08 - 13 pay periods	11,732
TOTAL SALARIED COSTS	\$ 34,262

EMPLOYEE BENEFITS

Benefit Percentage	39.19%
TOTAL BENEFITS	\$ 13,428

The bi-weekly salary is based on the average of the 5 positions targeted for work effort on this grant.