

State of Wisconsin \ DEPARTMENT OF NATURAL RESOURCES

Jim Doyle, Governor
Scott Hassett, Secretary

101 S. Webster St.
Box 7921
Madison, Wisconsin 53707-7921
Telephone 608-266-2621
FAX 608-267-3579
TTY Access via relay - 711

August 18, 2005

Mr. Michael N. Jones
U.S. Environmental Protection Agency (D243-02)
EMAD/AAMG
Research Triangle Park, NC 27711

Subject: Local-Scale Air Toxics Ambient Monitoring Assistance Agreement Proposal
Request for Applications No. EMAD-05-16

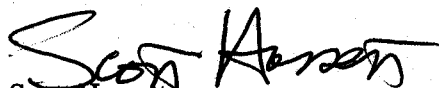
Dear Mr. Jones:

The Wisconsin Department of Natural Resources (WDNR) is pleased to apply for Local-Scale Air Toxics Ambient Monitoring funding to support our proposal, *Benzene Exposure Toxics*. Our application has been enclosed for review and approval.

The funding will enable the department to evaluate two new techniques that can be used for roadway monitoring. The passive methods will be useful for evaluating emission on the roadways and the diffusion of the benzene into adjoining area. The monitoring technique should provide data for ground thruthing emission models and risk models. The technique will also be useful in evaluating shifting emission patterns that may result from the extensive highway reconstruction planned for the Marquette interchange in Milwaukee, Wisconsin.

I look forward to your favorable response.

Sincerely,


Scott Hassett
Secretary

cc: Lloyd Eagan – AM/7
Sheralynn Stach – AM/7
Jon Heinrich – AM/7

Terri Burns – FN/1
Dan Derr – FN/1
Mark Allen – AM/7

Enclosures

APPLICATION FOR FEDERAL ASSISTANCE

		2. DATE SUBMITTED	Applicant Identifier
1. TYPE OF SUBMISSION: Application	Pre-application	3. DATE RECEIVED BY STATE	State Application Identifier
<input type="checkbox"/> Construction <input checked="" type="checkbox"/> Non-Construction	<input type="checkbox"/> Construction <input type="checkbox"/> Non-Construction	4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

5. APPLICANT INFORMATION

Legal Name: Wisconsin Department of Natural Resources		Organizational Unit: Department: Wisconsin Department of Natural Resources	
Organizational DUNS: 809-611-247		Division: Air & Waste	
Address: P.O. Box 7921		Name and telephone number of person to be contacted on matters involving this application (give area code)	
Street: 101 S. Webster Street		Prefix: Ms	First Name: Sheralynn
City: Madison		Middle Name: Susan	
County: Dane		Last Name: Stach	
State: WI	Zip Code: 53707-7921	Suffix:	
Country: U.S.A.		Email: Sheralynn.stach@dnr.state.wi.us	

6. EMPLOYER IDENTIFICATION NUMBER (EIN):

3	9	-	6	0	0	6	4	3	6
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Phone Number (give area code) (608) 264-6292	Fax Number (give area code) (608) 267-0560
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8. TYPE OF APPLICATION:

 New Continuation Revision

If Revision, enter appropriate letter(s) in box(es)
(See back of form for description of letters.)

<input type="checkbox"/>	<input type="checkbox"/>
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Other (specify)

7. TYPE OF APPLICANT: (See back of form for Application Types)	
<input type="checkbox"/> A Other (specify):	
9. NAME OF FEDERAL AGENCY: U.S. Environmental Protection Agency	

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER:

TITLE (Name of Program):

6	6	-	0	3	4
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 Surveys-Studies-Investigations-Demonstrations and Special Purpose Activities
 Relating to the Clean Air Act (B)

12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc):
Milwaukee, WI (urban area)

13. PROPOSED PROJECT

Start Date: 10/01/2005 Ending Date: 12/31/2006

15. ESTIMATED FUNDING:

a. Federal	\$79,211.00
b. Applicant	.00
c. State	
d. Local	
e. Other	
f. Program Income	
g. TOTAL	\$79,211.00

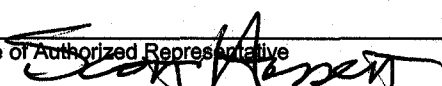
16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?

- a. Yes THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON DATE: _____
- b. No PROGRAM IS NOT COVERED BY E. O. 12372
 OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW

17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT?
 Yes if "Yes" attach an explanation. 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 P.	Middle Name Scott
Last Name Hassett		Suffix
b. Title Secretary		c. Telephone Number (give area code) (608) 266-2121
d. Signature of Authorized Representative 		e. Date 8/18/03

INSTRUCTIONS FOR THE SF-424

Public reporting burden for this collection of information is estimated to average 45 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0043), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET, SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

This is a standard form used by applicants as a required face sheet for pre-applications and applications submitted for Federal assistance. It will be used by Federal agencies to obtain applicant certification that States which have established a review and comment procedure in response to Executive Order 12372 and have selected the program to be included in their process, have been given an opportunity to review the applicant's submission.

Item:	Entry:	Item:	Entry:
1.	Select Type of Submission.	11.	Enter a brief descriptive title of the project. If more than one program is involved, you should append an explanation on a separate sheet. If appropriate (e.g., construction or real property projects), attach a map showing project location. For preapplications, use a separate sheet to provide a summary description of this project.
2.	Date application submitted to Federal agency (or State if applicable) and applicant's control number (if applicable)	12.	List only the largest political entities affected (e.g., State, counties, cities).
3.	State use only (if applicable).	13.	Enter the proposed start date and end date of the project.
4.	Enter Date Received by Federal Agency Federal Identifier number: If this application is a continuation or revision to an existing award, enter the present Federal Identifier number. If for a new project, leave blank.	14.	List the applicant's Congressional District and any District(s) affected by the program or project
5.	Enter legal name of applicant, name of primary organizational unit (including division, if applicable), which will undertake the assistance activity, enter the organization's DUNS number (received from Dun and Bradstreet), enter the complete address of the applicant (including country), and name, telephone number, e-mail and fax of the person to contact on matters related to this application.	15.	Amount requested or to be contributed during the first funding/budget period by each contributor. Value of in kind contributions should be included on appropriate lines as applicable. If the action will result in a dollar change to an existing award, indicate only the amount of the change. For decreases, enclose the amounts in parentheses. If both basic and supplemental amounts are included, show breakdown on an attached sheet. For multiple program funding, use totals and show breakdown using same categories as item 15.
6.	Enter Employer Identification Number (EIN) as assigned by the Internal Revenue Service.	16.	Applicants should contact the State Single Point of Contact (SPOC) for Federal Executive Order 12372 to determine whether the application is subject to the State intergovernmental review process.
7.	Select the appropriate letter in the space provided. <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>A. State</p> <p>B. County</p> <p>C. Municipal</p> <p>D. Township</p> <p>E. Interstate</p> <p>F. Intermunicipal</p> <p>G. Special District</p> <p>H. Independent School District</p> </div> <div style="width: 45%;"> <p>I. State Controlled Institution of Higher Learning</p> <p>J. Private University</p> <p>K. Indian Tribe</p> <p>L. Individual</p> <p>M. Profit Organization</p> <p>N. Other (Specify)</p> <p>O. Not for Profit Organization</p> </div> </div>	17.	This question applies to the applicant organization, not the person who signs as the authorized representative. Categories of debt include delinquent audit disallowances, loans and taxes.
8.	Select the type from the following list: <ul style="list-style-type: none"> • "New" means a new assistance award. • "Continuation" means an extension for an additional funding/budget period for a project with a projected completion date. • "Revision" means any change in the Federal Government's financial obligation or contingent liability from an existing obligation. If a revision enter the appropriate letter: <div style="display: flex; justify-content: space-between; margin-top: 5px;"> <div style="width: 45%;"> <p>A. Increase Award</p> <p>C. Increase Duration</p> </div> <div style="width: 45%;"> <p>B. Decrease Award</p> <p>D. Decrease Duration</p> </div> </div> 	18.	To be signed by the authorized representative of the applicant. A copy of the governing body's authorization for you to sign this application as official representative must be on file in the applicant's office. (Certain Federal agencies may require that this authorization be submitted as part of the application.)
9.	Name of Federal agency from which assistance is being requested with this application.		
10.	Use the Catalog of Federal Domestic Assistance number and title of the program under which assistance is requested.		

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.	66.034	\$ 0.00	\$ 0.00	\$ 79,211.00	\$ 0.00	\$ 79,211.00
2.						0.00
3.						0.00
4.						0.00
5. Totals		\$ 0.00	\$ 0.00	\$ 79,211.00	\$ 0.00	\$ 79,211.00

SECTION B - BUDGET CATEGORIES

Object Class Categories	GRANT PROGRAM, FUNCTION OR ACTIVITY				Total (5)
	(1)	(2)	(3)	(4)	
a. Personnel			\$ 35,765.00		\$ 35,765.00
b. Fringe Benefits			\$ 10,964.00		\$ 10,964.00
c. Travel			\$ 2,632.00		\$ 2,632.00
d. Equipment			\$ 0.00		\$ 0.00
e. Supplies			\$ 17,200.00		\$ 17,200.00
f. Contractual			\$ 4,832.00		\$ 4,832.00
g. Construction			\$ 0.00		\$ 0.00
h. Other			\$ 0.00		\$ 0.00
i. Total Direct Charges (sum of 6a-6h)	0.00		\$ 71,393.00	0.00	\$ 71,393.00
j. Indirect Charges			\$ 7,818.00		\$ 7,818.00
k. TOTALS (sum of 6i and 6j)	\$ 0.00	\$ 0.00	\$ 79,211.00	\$ 0.00	\$ 79,211.00
7. Program Income	\$	\$	\$	\$	\$ 0.00

SECTION C - NON-FEDERAL RESOURCES

(a) Grant Program	(b) Applicant	(c) State	(d) Other Sources	(e) TOTALS
8.				\$ 0.00
9.				\$ 0.00
10.				\$ 0.00
11.				\$ 0.00
12. Total (SUM OF LINES 8-11)				

SECTION D - FORECASTED CASH NEEDS

	Total for 1 st Year	1 st Quarter	2 nd Quarter	3 rd Quarter	4 th Quarter
	13. Federal	\$ 0.00	\$	\$	\$
14. Non-Federal	0.00				
15. TOTAL (sum of lines 13 and 14)					

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)				

SECTION F - OTHER BUDGET INFORMATION

21. Direct Charges:	22. Indirect Charges: (Salary + Fringe Benefits) x 16.73 %
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23. Remarks:

INSTRUCTIONS FOR THE SF-424A

Public reporting burden for this collection of information is estimated to average 180 minutes per response, including time for reviewing instructions, searching existing data sources, gathering, and maintaining the data needed, and completing and reviewing the collection of information. Send comment regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0044), Washington, DC 20503.

PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

General Instructions

This form is designed so that application can be made for funds from one or more grant programs. In preparing the budget, adhere to any existing Federal grantor agency guidelines which prescribe how and whether budgeted amounts should be separately shown for different functions or activities within the program. For some programs, grantor agencies may require budgets to be separately shown by function or activity. For other programs, grantor agencies may require a breakdown by function or activity. Sections A, B, C, and D should include budget estimates for the whole project except when applying for assistance which requires Federal authorization in annual or other funding period increments. In the latter case, Sections A, B, C, and D should provide the budget for the first budget period (usually a year) and Section E should present the need for Federal assistance in the subsequent budget periods. All applications should contain a breakdown by the object class categories shown in Lines a-k of Section B.

Section A. Budget Summary Lines 1-4 Columns (a) and (b)

For applications pertaining to a single Federal grant program (Federal Domestic Assistance Catalog number) and not requiring a functional or activity breakdown, enter on Line 1 under Column (a) the Catalog program title and the Catalog number in Column (b).

For applications pertaining to a single program requiring budget amounts by multiple functions or activities, enter the name of each activity or function on each line in Column (a), and enter the Catalog number in Column (b). For applications pertaining to multiple programs where none of the programs require a breakdown by function or activity, enter the Catalog program title on each line in Column (a) and the respective Catalog number on each line in Column (b).

For applications pertaining to multiple programs where one or more programs require a breakdown by function or activity, prepare a separate sheet for each program requiring the breakdown. Additional sheets should be used when one form does not provide adequate space for all breakdown of data required. However, when more than one sheet is used, the first page should provide the summary totals by programs.

Lines 1-4, Columns (c) through (g)

For new applications, leave Column (c) and (d) blank. For each line entry in Columns (a) and (b), enter in Columns (e), (f), and (g) the appropriate amounts of funds needed to support the project for the first funding period (usually a year).

For continuing grant program applications, submit these forms before the end of each funding period as required by the grantor agency. Enter in Columns (c) and (d) the estimated amounts of funds which will remain unobligated at the end of the grant funding period only if the Federal grantor agency instructions provide for this. Otherwise, leave these columns blank. Enter in columns (e) and (f) the amounts of funds needed for the upcoming period. The amount(s) in Column (g) should be the sum of amounts in Columns (e) and (f).

For supplemental grants and changes to existing grants, do not use Columns (c) and (d). Enter in Column (e) the amount of the increase or decrease of Federal funds and enter in Column (f) the amount of the increase or decrease of non-Federal funds. In Column (g) enter the new total budgeted amount (Federal and non-Federal) which includes the total previous authorized budgeted amounts plus or minus, as appropriate, the amounts shown in Columns (e) and (f). The amount(s) in Column (g) should not equal the sum of amounts in Columns (e) and (f).

Line 5 - Show the totals for all columns used.

Section B Budget Categories

In the column headings (1) through (4), enter the titles of the same programs, functions, and activities shown on Lines 1-4, Column (a), Section A. When additional sheets are prepared for Section A, provide similar column headings on each sheet. For each program, function or activity, fill in the total requirements for funds (both Federal and non-Federal) by object class categories.

Line 6a-i - Show the totals of Lines 6a to 6h in each column.

Line 6j - Show the amount of indirect cost.

Line 6k - Enter the total of amounts on Lines 6i and 6j. For all applications for new grants and continuation grants the total amount in column (5), Line 6k, should be the same as the total amount shown in Section A, Column (g), Line 6. For supplemental grants and changes to grants, the total amount of the increase or decrease as shown in Columns (1)-(4), Line 6k should be the same as the sum of the amounts in Section A, Columns (e) and (f) on Line 5.

INSTRUCTIONS FOR THE SF-424A (continued)

Line 7 - Enter the estimated amount of income, if any, expected to be generated from this project. Do not add or subtract this amount from the total project amount. Show under the program narrative statement the nature and source of income. The estimated amount of program income may be considered by the Federal grantor agency in determining the total amount of the grant.

Section C. Non-Federal Resources

Lines 8-11 Enter amounts of non-Federal resources that will be used on the grant. If in-kind contributions are included, provide a brief explanation on a separate sheet.

Column (a) - Enter the program titles identical to Column (a), Section A. A breakdown by function or activity is not necessary.

Column (b) - Enter the contributions to be made by the applicant.

Column (c) - Enter the amount of the State's cash and in-kind contribution if the applicant is not a State or State agency. Applicants which are a State or State agencies should leave this column blank.

Column (d) - Enter the amount of cash and in-kind contributions to be made from all other sources.

Column (e) - Enter totals of Columns (b), (c), and (d).

Line 12 - Enter the total for each of Columns (b)-(e). The amount in Column (e) should be equal to the amount on Line 5, Column (f), Section A.

Section D. Forecasted Cash Needs

Line 13 - Enter the amount of cash needed by quarter from the grantor agency during the first year.

Line 14 - Enter the amount of cash from all other sources needed by quarter during the first year.

Line 15 - Enter the totals of amounts on Lines 13 and 14.

Section E. Budget Estimates of Federal Funds Needed for Balance of the Project

Lines 16-19 - Enter in Column (a) the same grant program titles shown in Column (a), Section A. A breakdown by function or activity is not necessary. For new applications and continuation grant applications, enter in the proper columns amounts of Federal funds which will be needed to complete the program or project over the succeeding funding periods (usually in years). This section need not be completed for revisions (amendments, changes, or supplements) to funds for the current year of existing grants.

If more than four lines are needed to list the program titles, submit additional schedules as necessary.

Line 20 - Enter the total for each of the Columns (b)-(e). When additional schedules are prepared for this Section, annotate accordingly and show the overall totals on this line.

Section F. Other Budget Information

Line 21 - Use this space to explain amounts for individual direct object class cost categories that may appear to be out of the ordinary or to explain the details as required by the Federal grantor agency.

Line 22 - Enter the type of indirect rate (provisional, predetermined, final or fixed) that will be in effect during the funding period, the estimated amount of the base to which the rate is applied, and the total indirect expense.

Line 23 - Provide any other explanations or comments deemed necessary.

ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

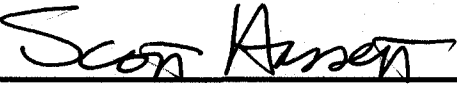
PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. 4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM=s Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. 1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. 794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. 6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) 523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. 290 dd-3 and 290 ee-3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VII of the Civil Rights Act of 1968 (42 U.S.C. 3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. 1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. 276a to 276a-7), the Copeland Act (40 U.S.C. 276c and 18 U.S.C. 874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. 327-333), regarding labor standards for federally-assisted construction subagreement.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in flood plains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. 1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. 7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. 1271 et seq.) Related to protecting components or potential components of the national wild and scenic rivers system.
13. Will assist the awarding agency in assuring compliance will Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. 470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. 469a-1 et seq.).
14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. 2131 et seq.) Pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4801 et seq.) Which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL 	TITLE
APPLICANT ORGANIZATION Wisconsin Department of Natural Resources	DATE SUBMITTED 9/18/05

Project Title:

Evaluation of Passive Sampling Techniques for Monitoring Roadway and Neighborhood Exposures to Benzene and Other Mobile Source VOCs.

Application Category: Method Evaluation and Comparison

Organization: Wisconsin Department of Natural Resources

Contact Information:

Contact Person: Mark K. Allen
Phone: 608-266-8049
Fax: 608-267-0560
E-mail: mark.allen@dnr.state.wi.us

Funding Request: \$79,211

Project period: October 1, 2005 to December 31, 2006

Project Description:

Passive sampling technologies can be useful for extending our knowledge of personal exposures to volatile air pollutants. Current technologies for sampling volatile organic compounds (VOCs) include actively sampled (pressurized) canisters and field deployed gas chromatographic systems. The current technologies have high costs associated with both sampling and analysis. The current technologies also often require a large foot print in the location that is being monitored. Passive monitoring techniques can be used at a smaller cost per sample and often require only a minimal footprint.

The Wisconsin DNR will develop in-house analytical methods to analyze air samples captured in passively sampled canisters and air pollutants trapped on passively sampled adsorbent tubes. The passively sampled canister can provide short-term (less than 24 hours) measurements of VOCs. Passively sampled canister require no external power. This results in a relatively simple deployment to the field. Passively sampled adsorbent tubes capture VOCs through the diffusion process. The adsorbent tubes are less expensive than canisters and are easier to prepare for sampling. A number of adsorbent tubes can be deployed to an area of interest to provide *saturation* sampling. The adsorbent sampling tube provides a longer averaging time. While the longer time is less useful for studying atmospheric chemistry and physics, it does provide a time scale more relevant to existing risk assessment modeling.

Goals for the monitoring project will be the following:

1. Develop easily deployed sampling units for both passive canisters and adsorbent tubes.
2. Develop in-house analytical methods for passively sampled canisters and adsorbent tubes using existing analytical systems.
3. Test the passive sampling systems to establish comparability to existing active sampling systems used by the Wisconsin DNR.
4. Deploy the passive systems in a field study and use this information to optimize designs to support risk assessment modeling.

Background Information on Roadway Exposure:

Benzene is ubiquitous aromatic hydrocarbon formed in many combustion processes. Benzene is a known human carcinogen and is considered one of the most significant risk drivers in the urban environment. Mobile source emissions make up the major source of benzene in the urban environment (Fruin et al., 2001). Models show that the exposure from roadways is related to the distance from the roadway (Funk and Lurmann, 2001). Monitoring studies suggest that for mobile source pollutants, like benzene, the outdoor and indoor air concentration are similar and indicate ambient air is the most important exposure driver (Paynes-Struges et al., 2004).

A review of Wisconsin's air emission inventory for the year 2000 shows a total of 37 facilities in Milwaukee reporting a total of more than 16850 pounds of benzene emissions. The majority of these emissions (over 14750 pounds) are accounted for by 14 primary metal industries (foundries and metal casting). Petroleum products terminals, motor manufacturing, pipelines, power generation and wastewater treatment account for the majority of the remaining reported emissions (over 2090 pounds).

Roadway emissions are important because Milwaukee is location of a major urban interstate roadway, Highway 94. Construction of Highway 94's Marquette interchange began in 2005 and will be continue until 2008. This construction may have significant impact on mobile source roadway emissions in the city.

Therefore questions remain about benzene in the urban environment that warrants further study. How accurate are current stationary source and mobile source inventories in predicting ambient benzene concentrations? Are major roadways significant sources of benzene? How quickly is benzene dispersed from the roadways to the adjoining environment? What are benzene exposures in neighborhood environment?

The Wisconsin DNR's development of passive sampling techniques will provide a tool to better understand the sources, transport, and diffusion of benzene from roadways. While benzene will be the primary focus of the project, related hydrocarbons will be monitored to assist in assessing the sources and impact of the benzene.

Soundness of Proposed Methodology

The development and testing of passive monitors for monitoring concentration of benzene and other aromatic hydrocarbons was been reported by Brown, et. al. (1981). In a later paper Brown et. al. (1999) discussed the use of these passive sampler for mobile source related pollutants, including benzene, toluene, and xylenes. The technique will use commercially available diffusion tubes designed for analysis by a Perkin-Elmer gas chromatographic system, like that used at Wisconsin's Milwaukee PAMS site. This gas chromatographic system is operated during the peak ozone months, June through August. We will enlarge the scope of work by conducting analyses of the passive samples before June and after August. The current analysis parameters will provide a solid base for the passive sample analysis, development time for the method should be minimal.

Wisconsin DNR's current methodologies and methods have been proven in the Photochemical Assessment Monitoring Station (PAMS) and Urban Air Toxic Monitoring (UATM) projects. These current methodologies will provide the benchmarks for comparisons of the passive technologies. Currently pressurized whole air samples in passivated canisters are analyzed at the Wisconsin State Laboratory of Hygiene. The Wisconsin State Laboratory of Hygiene has analyzed PAMS and UATM monitoring samples for the Wisconsin DNR since 1994. Hourly benzene values are collected at the Type 2 PAMS site using a Perkin-Elmer Ozone Precursor

analyzer (AutoGC). This unit has been in operation at the Wisconsin site in Wisconsin since 1999. Other monitoring parameters collected at fixed-long term sites include ozone, carbon monoxide, wind speed and wind direction. The Wisconsin DNR has established operating procedures for these parameters including Standard Operating Procedures (SOPs) and Quality Assurance Project Plans (QAPPs).

The Wisconsin DNR has an established record for carrying out environmental studies similar to that proposed. In 1995 WDNR staff conducted a short intensive study of reformulated gasoline components (Allen, Grande and Foley, 1996). This monitoring project included monitoring near roadways as well as exposure studies during vehicle refueling.

Benefits of the Project:

The project will provide an evaluation of two new techniques that can be used for roadway monitoring. The passive methods will be useful for evaluating emissions on the roadways and the diffusion of the benzene into adjoining areas. The monitoring technique should provide data for ground truthing emission models and risk models. The technique will also be useful in evaluating shifting emission patterns that may result from the extensive highway reconstruction planned for the Marquette interchange.

Statement of Work Tasks:

Task 1: Develop the guidance documents for staff to initiate and complete the monitoring project

Objectives: Develop analysis SOPs, field monitoring plans, and quality assurance projects plans for sampling and analysis.

Methods: The Quality Assurance Project Plan (QAPP) will be developed to ensure that monitoring is consistent with existing state, regional and national quality assurance goals. The Project Monitoring Plan plans will include detailed information on monitoring sites, sampling schedules, staff work assignments, and data management. Existing DNR databases will be assessed for the ability to store and manage project data. If necessary, a plan will be developed to handle data that does not conform to the existing database standards.

Completion time: by January 2006.

Task 2: Procure and assemble passive monitoring system for canister and adsorbent tubes.

Objectives: To purchase or procure through other means (loans, rental, ect.) additional equipment or supplies required for the project.

Methods: Capital equipment and supplies will be procured using standard State of Wisconsin procedures for obtaining resources. Wisconsin DNR staff will assemble and install all necessary monitoring equipment.

Completion time: March 31, 2006

Task 3: Develop analytical methods for the analysis of passive samples.

Objectives: To develop analytical methods and procedures for the analysis of benzene and other mobile source VOCs captured in passive samples. To demonstrate that high confidence in the analytical measurements made in this project.

Methods: The development and optimization of an analytical method on the Perkin Elmer gas chromatographic system will use standard gas chromatographic techniques. Standard quality control elements including blanks, replicate analyses and spiked recoveries will be used to demonstrate the quality of the measurement.

Task 4: Conduct a preliminary field roadway monitoring study

Objectives: Conduct a spring preliminary sampling study for benzene and MS-VOCs along a roadway in the Milwaukee Urban area.

Methods: Air samples will be collected using the passive techniques developed. This study will use a single linear transect of the roadway centering on the median and extending outward away from the roadway.

Completion time: The preliminary field monitoring study will be completed before May 7, 2006.

Task 5: Validate the passive sampling methods.

Method: Passive samplers will be collocated with currently used active sampling systems. Samples from both systems will be analyzed according to established protocols. Data from both systems will be evaluated to establish the comparability of the passive and active sampling systems.

Completion Time: August 31, 2006.

Task 6: Roadway Monitoring Study

Objectives: Use information from the preliminary roadway study and summertime validation. Deploy a field study to demonstrate roadway exposure to benzene and show how that exposure changes as you move from the roadway to residential neighborhoods adjoining the roadway. This study is expected to use a more complex array of samplers.

Method: The field study will use the passive sampling techniques. Sampling will take place along a major roadway. Saturation sampling in an adjoining neighborhood will be used to track changes in concentration as a function of distance from the roadway. Passive canister samples will be used for short term concentrations.

Roadway study will be completed by November 1, 2006.

Collaboration:

The Wisconsin DNR will work with the Wisconsin Department of Health and Family Services in planning and conducting the roadway field studies. The Wisconsin DHFS will be directly involved in determining exposure from field measurements. The Wisconsin DHFS may extend roadway studies into the indoor air of residences near targeted roadways.

A letter of support from the Wisconsin Department of Health and Family Services is attached as Attachment A to this proposal

Project Budget:

a. Personnel	\$35,765
b. Fringe Benefits	\$10,964
c. Contractual Costs	\$4,832
d. Travel	\$2,632
e. Equipment	0
f. Supplies	\$17,200
g. Other	\$0
h. Total Direct Costs	\$71,393
i. Total Indirect Costs: must include documentation of accepted indirect rate	\$7,818
j. Total Cost	\$79,211

Additional Resources: The above budget reflects the funds needed to complete this project. The project will make use of existing equipment and monitoring sites. Included are canister samples and a gas chromatographic analysis system. Existing monitoring sites in Milwaukee will be used for the field validation of the passive sampling systems.

Quality Assurance for the Project:

The primary goal for this project is to develop reliable passive sampling technique for the investigation of benzene exposure from mobile sources. Quality assurance goals for the project will be to construct reliable database of measurements made with the passive sampling methods. The database will provide information to show the passive methods provide good data, to establish comparability with the current sampling methods, and to show how the passive monitors can be used for roadway field studies. Important quality assurance tasks for this project include the following:

- Develop necessary quality assurance plans for the project. Quality assurance plans should identify the methods to be used and quality control procedures for evaluating data quality from the testing.
- Develop and document analytical methods for sampling using established protocols to optimize the analyses.
- Develop a data management plans to store and review project data.
- Use established statistical tests to compare results from existing VOC methodologies with the new passive methods.

References:

Allen, M.K., D. Grande, and T. Foley, (1996) "Monitoring Reformulated Gasoline in Milwaukee, Wisconsin", *Proceedings of the 1996 International Symposium on Measurements of Toxic and Related Air Pollutants*, VIP-64, AWMA:Pittsburgh, pp. 319-325,.

Brown, R.H., J. Charlton, and K.J. Saunders (1981) "The development of an improved diffusive sampler", *Am. Ind. Hyg. Assoc. J.*, 42, 865-869.

Brown, R.H., M.D.Wright, and N.T.Plant, (1999) "The use of diffusive sampling for monitoring of benzene, toluene and xylene in ambient air", *Pure Appl. Chem.*, 71, 1993-2008.

Fruin, S.A., M.J. St.Denis, A.M. Winer, S. D. Colome, and F.W. Lurmann, (2001) "Reductions in human benzene exposure in the California South Air Coast Basin", *Atmos. Env.*, 35, 1069-1077.

Funk T.H. and F. W.Lurmann (2001) "Using GIS to investigate children's exposure to air pollution". Presentation at the *Twenty-First ESRI International User Conference, San Diego, CA, June 9-13* (STI-2107).

Paynes-Struges, D.C., Burke, T.A., Breysse, P., Diener-West, M., and Buckley, T.J., (2004) "Personal Exposure Meets Risk Assessment: A Comparison of Measured and Modeled Exposures and Risks in an Urban Community", *Environmental Health Perspectives*, 112(5), 589-598.

Attachment A: Letter of Support from Wisconsin Department of Health and Family Services



DIVISION OF PUBLIC HEALTH

1 WEST WILSON STREET
P O BOX 2659
MADISON WI 53701-2659

Jim Doyle
Governor

Helene Nelson
Secretary

State of Wisconsin

Department of Health and Family Services

608-266-1251

FAX: 608-267-2832
dhfs.wisconsin.gov

August 17, 2005

Lloyd Eagan, Director
Bureau of Air Management - AM/4
Wisconsin Department of Natural Resources
101 S. Webster Street
Madison, WI 53707

Subject: Letter of Support for EPA Air Toxics Monitoring Grant Proposal

Dear Ms. Eagan:

I am sending this letter to express the Wisconsin Department of Health and Family Services (DHFS) strong support for your EPA grant proposal "Evaluation of Passive Sampling Techniques for Monitoring Roadway and Neighborhood Exposures to Benzene and Other Mobile Source VOCs." This project marks another important step in our efforts to utilize air quality monitoring data in our environmental and public health tracking activities.

DHFS believes this work will allow us to better characterize exposures to benzene and other transportation source pollutants in nearby residential areas. The findings of this project will allow transportation officials to more directly consider public health and residential air quality impacts within long-term transportation planning. We expect that the use of this monitoring methodology will also have broad application for other public health related air quality issues.

In addition to our expressed support for this project, DHFS intends to add a complementary component by concurrently monitoring residential indoor air within the monitoring areas of this proposal. DHFS has already allocated capacity for sample analysis at the Wisconsin State Laboratory of Hygiene for this purpose. The DHFS component will provide additional insight into proportional contributions from roadways and other sources (e.g. attached garages) to overall human exposure in these areas.

Please include this letter with your grant application materials submitted to the EPA. If you, EPA officials, or other grant reviewers have questions about this letter of support or our related monitoring plans, please contact either myself at (608) 266-1253, or Chuck Warzecha at (608) 267-3732. Thank you for your continued work to protect the health of Wisconsin citizens through improved air quality.

Sincerely,

A handwritten signature in black ink, appearing to read "Henry O. Anderson".

Dr. Henry Anderson, M.D.

Chief Medical Officer for Environmental and Occupational Health
Wisconsin Department of Health and Family Services

Attachment B: Biographical Information of Key Project Monitoring Personnel

MARK KENNETH ALLEN – Project Manager

EDUCATION:

Master of Science in Analytical Clinical Chemistry
University of Wisconsin, Madison, Wisconsin
awarded 1986

Bachelor of Science in Medical Technology
University of Wisconsin, Madison, Wisconsin
awarded 1978

WORK EXPERIENCE:

Wisconsin Department of Natural Resources
Bureau of Air Management, Monitoring Section
February 13, 1990 to present
November 24, 1985 to August 18, 1989

Served as leader worker for ozone precursor monitoring projects conducted in southeastern Wisconsin. These projects include: *Nonmethane Organic Compound Monitoring in Milwaukee (1987 to 1990)*; *Lake Michigan Ozone Study (1990 and 1991 field monitoring programs)*; and *Enhanced Ozone Monitoring in Southeastern Wisconsin (1992 to present)*.

Served as leader worker for air toxics monitoring projects conducted throughout Wisconsin. Some of these projects have included: *Urban Air Toxic Monitoring (1991 to present)*; *Statewide testing of landfill gas emissions (1986 and 1992)*; *Statewide monitoring of prescribed burning (1992)*; and *Statewide monitoring of mercury in deposition (1993 to present)*.

Wisconsin Occupational Health Laboratory
University of Wisconsin
Center for Health Sciences
August 21, 1989 to February 12, 1990

Operated and maintained the laboratory's Hewlett Packard 5995 gas chromatograph/mass spectrometer. Prepare quality control samples that are analyzed by the chemists as part of the laboratory's quality control program. Performed gas chromatographic analysis of air samples captured on charcoal adsorbent tubes.

Clinical Toxicology Laboratory
University of Wisconsin Clinical Science Center
August 14, 1978 to November 22, 1985

Performed chemical analyses of biological samples for therapeutic and emergency drug monitoring. Operated and maintained laboratory instruments, including gas and liquid chromatographs; a UV-VIS spectrophotometer; and a mass spectrometer. Investigated, developed and implemented new methods for drug analysis.

PUBLICATIONS:

Allen, M.K., Sponseller, B., and Rodger, B., "Monitoring Mercury Deposition Using Passive Samplers", *Presented at the 1998 International Symposium on Measurements of Toxic and Related Air Pollutants*, RTP, NC (September 1998).

Allen, M.K. and Sponseller, B., "Monitoring Mercury Deposition In Wisconsin 1996-1997", *Presented at the 1998 International Symposium on Measurements of Toxic and Related Air Pollutants*, RTP, NC (September 1998).

Allen, M.K., Miller, E., and Leair, J., "Development of an Intelligent Canister/Cartridge Sampler for the Collection of Ozone Precursors or Air Toxics", *Proceedings of the 1996 International Symposium on Measurements of Toxic and Related Air Pollutants*, VIP-64, AWMA:Pittsburgh, pp 227-233, (1996).

Allen, M.K., Grande, D., and Foley, T., "Monitoring Reformulated Gasoline in Milwaukee, Wisconsin", *Proceedings of the 1996 International Symposium on Measurements of Toxic and Related Air Pollutants*, VIP-64, AWMA:Pittsburgh, pp. 319-325, (1996).

Allen, M.K., Miller, E., and Leair, J., "Evaluation of an Intelligent Multi-canister/ Multi-cartridge Sampler for the Collection of Ozone Precursors", *Proceedings of the 1994 U.S. EPA/A&WMA International Symposium on Measurement of Toxic and Related Air Pollutants*, VIP-39, AWMA:Pittsburgh, 1994; pp 205-210, (1994).

Chazin, J., Allen, M., and Rodger, B., "Measurement of Mercury Deposition Using Passive Samplers Based on the Swedish (IVL) Design", *Atmospheric Environment*, 19(11) p1201-1209, (1995)

Allen, M.K., Chazin, J.D., Hecker, J., "Monitoring Volatile Organic Compounds (VOCs) in the Green Bay Area", *Proceedings of the 1993 International Symposium on Measurements of Toxic and Related Air Pollutants*, VIP-34, AWMA:Pittsburgh, pp 604-609, (1993).

Chazin, J.D., Allen, M.K., and Adamski, W.J., "Development of A Regional Strategy for Enhanced Ozone Monitoring for the Lower Lake Michigan Region", *Proceedings of the Air and Waste Management's 86th Annual Meeting*, AWMA:Pittsburgh, 93-WP-101.02 (1993).

Chazin, J.D., Allen, M.K., and Hillery, J., "The Establishment and Operation of an NMOC and Aldehyde Monitoring Program -- Experience of a State Agency", *Proceedings of the 1990 International Symposium on Measurements of Toxic and Related Air Pollutants*, VIP-17, AWMA:Pittsburgh, pp 753-760, (1990).

Chazin, J.D., Allen, M.K., and Pippin, D., "Measurement, Assessment and Control of Hazardous (Toxic) Air Contaminants in Landfill Gas Emissions in Wisconsin", *Proceedings of the 1987 International Symposium on Measurements of Toxic and Related Air Pollutants*, VIP-8, APCA:Pittsburgh, pp. 516-521, (1987).

DAVID E. GRANDE – Field Study Technical Leader

EDUCATION

University of Wisconsin-Madison

Graduate Studies in the Institute of Environmental Studies, 1998 - 2000

Graduate Studies in Biochemistry, 1983 - 1984

University of Nebraska at Lincoln

Bachelor of Science in Chemistry, 1983

WORK EXPERIENCE

Wisconsin Dept. of Natural Resources, Bureau of Air Management, Air Monitoring Section

Air Toxic Monitoring Chemist

November 1994 to Present

Wisconsin Urban Air Toxics Monitoring Program (ongoing) Establishing and operating a network for the determination of a variety of toxic air pollutants in Wisconsin's urban atmospheres, including PCBs and pesticides, VOCs and carbonyl compounds.

Photochemical Assessment Monitoring (PAMS) (ongoing) Participation in the PAMS monitoring program includes quality control testing of the air samplers and data analysis.

Ambient Mercury Monitoring (ongoing) Investigating ambient mercury concentrations using Tekran analyzers in a variety of locations around Wisconsin, both near major emitting facilities including a major mercury recycler and a chlor-alkali plant, and in urban environments.

Biogenic Hydrogen Sulfide Generation, 2002 and 2003 Investigating emissions generated at a bottom draw water impoundment. Emissions observed during lake stratification.

Air Impacts of Livestock Operations (ongoing) Investigations into ammonia and hydrogen sulfide emissions and ambient concentrations associated with different livestock operations.

Fox River Remediation Air Monitoring, 1999, Design and implementation of a multi-site study for the investigation of PCB concentrations associated with dredging and landfilling of contaminated sediments from the Fox River.

Ammonia from a Wastewater Solids Composting Facility, 1998, a year and a half long study observing ammonia concentrations downwind of a biosolid production facility, during which the facility incorporated several process and facility design changes to mitigate emissions.

Hazardous Air Pollutant Emissions from Wood-Fired Boilers, 1996, Investigation of HAP emissions from a wood and coal fired boiler; correlations between operating parameters, CO and specific HAP emissions determined.

Reformulated Gasoline Air Monitoring Study, 1995, ambient roadside study related to the impact of reformulated gasoline on the air environment conducted after the introduction of RFG in the Milwaukee area.

Resource Management Associated, Short term consultant

March 1996

Participated in air monitoring efforts in Mariupol, Ukraine, intended to provide technical support and training for the operations of and monitoring strategies incorporating gas chromatography for the evaluation of ambient hydrocarbon concentrations.

**Clean Air Engineering, Inc. Chemist and Manager of Analytical Services
June 1985 – November 1988**

Clean Air Engineering (now CAE) is an air pollution source testing firm with a wide range of expertise. Duties included:

Extensive Gas Chromatographic (GC) determinations of VOC in workplace air and emission streams; GC operations, maintenance and operator training. Innovative source VOC test design and implementation, from test plans, through sampling and analysis, to reporting of results. Developed method to determine capture efficiency of VOC sources. Method effectively removed assumptions based on coating VOC content, and was both accurate ($\pm 2\%$ relative known standards) and precise ($\pm 3\%$ between duplicate determinations) Laboratory operations, including expansion of services to include hazardous waste analysis.

Publications:

Green Bay Urban Air Toxics Monitoring, A Summary Report for the Period July 1991 – June 1995, Wisconsin DNR Publication Number PUBL-AM-218-97, 1997. Author

Green Bay Urban Air Toxics Monitoring, A Summary Report for the Period July 1995 – June 1996, Wisconsin DNR Publication Number PUBL-AM-230-97, 1997. Author

Wisconsin Urban Air Toxics Monitoring, A Summary Report for the Period July 1996 – June 1997, Wisconsin DNR Publication Number PUBL-AM-294-99, 1999. Author

Wisconsin Urban Air Toxics Monitoring, A Summary Report for the Period July 1997 – June 1998, Wisconsin DNR Publication Number PUBL-AM-296-99, 1999. Author

Wisconsin Urban Air Toxics Monitoring, An Interim Report for the Period July 1997 – June 2000, Wisconsin DNR Publication Number PUBL-AM-311-00, 2000. Author

Ammonia Monitoring Project at West Central Wisconsin Biosolids, Ellsworth, Wisconsin (October 1997 – June 1999), Wisconsin DNR Publication Number PUBL-AM-304-00. Author

Fox River Remediation Air Monitoring Report, Ambient PCBs During SMU 56/57 Demonstration Project, August – November, 1999, Wisconsin DNR Publication Number PUBL-AM-310-00, 2000. Author

Reformulated Gasoline Air Monitoring Study, Wisconsin DNR Publication Number AM-175-95, 1995. Co-author

Monitoring Reformulated Gasoline in Milwaukee, Wisconsin, Proceedings of the 1996 International Symposium on Measurements of Toxic and Related Air Pollutants, VIP-64, AWMA:Pittsburgh, pp. 319-325, (1996). Co-author

Correlating Benzene, Total Hydrocarbon and Carbon Monoxide Emissions from Wood-Fired Boilers, Proceedings of the 1997 AWMA Annual Meeting, 97-TA34.05, 1997 Co-author

Spatial Distribution of Airborne PCBs in Milwaukee, Wisconsin DNR Publication Number AM-342 2004. Author.

Benzene Exposure Toxics Grant FFY 2006 Allocation Amendment (10/01/05 - 12/31/06)			
A. Personnel			
FTE	Project Manager (100 hrs @ \$24.19/hr)		\$2,419
	Technical Manager (200 hrs @ \$20.48/hr)		\$4,096
	FTE subtotal		\$6,515
LTE	Auto GC/Site Operations LTE for 1,560 hrs @ \$18.75/hr		\$29,250
	LTE subtotal		\$29,250
	Salary Total		\$35,765
B. Fringe			
FTE	\$6,515 * 44.60%		\$2,905.69
LTE	\$29,250 * 27.55%		\$8,058.38
	Fringe Total		\$10,964
C. Travel			
	Oversite and service (Madison to Milwaukee)		\$498
	Milwaukee site operations		\$234
	National meeting to present report		\$1,900
	Travel Total		\$2,632
D. Equipment			
	Equipment Total		\$0
E. Supplies			
	Sampling Trap (1 @ \$500)		\$500
	Chromatograph Columns (2 @ \$1,000 ea)		\$2,000
	Passive Canister Sampler (5 @ \$1,800 ea)		\$9,000
	Site Upgrade/Acquisition Sampling Platform (2 @ \$50 ea)		\$100
	PAT Holders (20 @ \$10 ea)		\$200
	Passive Sampling Tubes (50 @ \$62 ea)		\$3,100
	Diffusion Caps (50 @ \$46 ea)		\$2,300
	Supplies Total		\$17,200
F. Contractual			
SLOH	Comparison sampling PAMS (8 @ \$291.50 ea)		\$2,332
SLOH	Canister Cleanings PAMS (50 @ \$50 ea)		\$2,500
	Contractual Total		\$4,832
G. Construction	Construction Total		\$0
H. Other	Other Total		\$0
I. Total Direct Charges (sum of A - H)			\$71,393
J. Indirect			
	Salaries + Fringe * Indirect Rate (.1673)		
	Indirect Total		\$7,818
K. Totals (sum of I and J)			\$79,211