

State of California  
AIR RESOURCES BOARD

**RESEARCH PROPOSAL**

Resolution 07-7

January 25, 2007

Agenda Item No. : 07-1-4

WHEREAS, the Air Resources Board (ARB) has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code sections 39700 through 39705; and

WHEREAS, a research proposal, number 2617-253, entitled "Toxicity of Source-Oriented Ambient Aerosol," has been submitted by the University of California, Davis; and

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Electric Power Research Institute (EPRI) has agreed to co-sponsor this proposal for a total amount of \$377,419; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

Proposal Number 2617-253 entitled "Toxicity of Source-Oriented Ambient Aerosol," submitted by the University of California, Davis, for a total amount not to exceed \$838,934.

NOW, THEREFORE BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

Proposal Number 2617-253 entitled "Toxicity of Source-Oriented Ambient Aerosol," submitted by the University of California, Davis, for a total amount not to exceed \$838,934.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein, and as described in Attachment A, in an amount not to exceed \$838,934.

I hereby certify that the above is a true and correct copy of Resolution 07-7, as adopted by the Air Resources Board.

/s/

---

Lori Andreoni, Clerk of the Board

## **ATTACHMENT A**

### **“Toxicity of Source-Oriented Ambient Aerosol”**

#### **Background**

Ambient particulate matter (PM) has been linked with increased morbidity and mortality, yet the reasons are unclear. Ambient PM derives from a wide range of sources and experiences a range of atmospheric processes that may alter its toxicity. Direct exposure of animals to emissions neglects atmospheric photochemistry that may enhance toxicity, while exposure to PM combined from many sources results in a masking effect that does not elucidate which source contributes to the toxicity.

Ambient particles will be collected in Fresno using slot impactors followed by filters. The toxicity of the particles will be assessed by instilling the filtered material into rats and by conducting toxicity studies on them. Collecting one sample mixes the particles from various sources together, obscuring the relative toxicity of each. This study will attempt to direct particles from a particular source (or a few sources) into each of several impactor/filter combinations.

#### **Objective**

The objective of this project is to obtain toxicity profiles of atmospherically processed source-oriented fine and ultrafine particulate emissions.

#### **Methods**

This study will use a single-particle mass spectrometer to selectively collect ambient particles with a series of impactors followed by filters. The filter contents will then be instilled into rats that will be studied for several possible toxic endpoints.

#### **Expected Results**

The expected results are relative toxicity indices for particles derived from each of several source categories of fine PM.

#### **Significance to the Board**

The results would help the ARB to develop a fine PM control strategy that focuses on sources based on the relative toxicities of their PM emissions.

#### **Contractor:**

University of California, Davis

#### **Contract Period:**

36 months

#### **Principal Investigators (PIs):**

Anthony S. Wexler and Kent Pinkerton

#### **Contract Amount:**

\$838,934

**Cofunding:**

The Electric Power Research Institute (EPRI) is contributing \$377,419 to the cost of this study.

**Basis for Indirect Cost Rate:**

The State and the UC system have agreed to a ten percent indirect cost rate.

**Past Experience with this Principal Investigator:**

Anthony Wexler is successfully completing a research project funded by the ARB that is improving methods to concentrate particulate matter for health studies. Kent Pinkerton has successfully completed two research projects funded by the ARB that have helped elucidate the ways in which particulate matter may cause adverse health effects.

**Prior Research Division Funding to UCD:**

Year	2006	2005	2004
Funding	\$1,288,666*	\$1,539,052	\$473,660

\*The California Energy Commission provided \$1,059,996 of this amount.

# BUDGET SUMMARY

Contractor: University of California, Davis

## Toxicity of Source-Oriented Ambient Aerosol

### DIRECT COSTS AND BENEFITS

1.	Labor and Employee Fringe Benefits	\$ 498,694
2.	Subcontractors	\$ 0
3.	Equipment	\$ 0
4.	Travel and Subsistence	\$ 35,273
5.	Electronic Data Processing	\$ 0
6.	Reproduction/Publication	\$ 0
7.	Mail and Phone	\$ 10,000
8.	Supplies	\$ 169,427 <sup>1</sup>
9.	Analyses	\$ 40,000
10.	Miscellaneous	<u>\$ 9,273</u>
	Total Direct Costs	\$ 762,667

### INDIRECT COSTS

1.	Overhead	\$ 76,267
2.	General and Administrative Expenses	\$ 0
3.	Other Indirect Costs	\$ 0
4.	Fee or Profit	<u>\$ 0</u>
	Total Indirect Costs	<u>\$ 76,267</u>

### TOTAL PROJECT COSTS

\$ 838,934

<sup>1</sup> Supplies are needed for the following: 1) to build the 10 channel fine/ultrafine dichotomous sampler; 2) to prepare the site and rent a portable building to house the samplers; 3) replace expendables related to the samplers; and 4) to assess the toxicity of the samples.

Sampler kits (slot impactors and filters)	\$ 8,000
Valco 10-position valve	\$ 2,000
Miscellaneous supplies	\$ 10,000
Site preparation	\$ 10,000
Gases for excimer laser (helium and nitrogen)	\$ 4,000
Uchan plates, vacuum gear and misc. parts	\$ 10,000
Data and Sample Chemical Analysis	\$ 10,000
Aqiris or Gage 12 bit A/D converter	\$ 15,000
Animals and toxicological supplies	<u>\$100,427</u>
	<u>\$169,427</u>