

State of California  
AIR RESOURCES BOARD

Resolution 87-18  
March 26, 1987

WHEREAS, the Air Resources Board 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 solicited research proposal, Number 1491-131, entitled "Methods Development for Assessment of Vapor-Phase Mutagens and Carcinogens in Ambient Air," has been submitted by the Department of Environmental Toxicology, University of California, Davis;

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

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


Proposal Number 1491-131, entitled "Methods Development for Assessment of Vapor-Phase Mutagens and Carcinogens in Ambient Air," submitted by the Department of Environmental Toxicology, University of California, Davis for a total amount not to exceed \$146,927.

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 1491-131, entitled "Methods Development for Assessment of Vapor-Phase Mutagens and Carcinogens in Ambient Air," submitted by the Department of Environmental Toxicology, University of California, Davis for a total amount not to exceed \$146,927.

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 in an amount not to exceed \$146,927.

I hereby certify that the above is a true and correct copy of Resolution 87-18, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 1  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1491-131 entitled "Methods Development for Assessment of Vapor-Phase Mutagens and Carcinogens in Ambient Air."

RECOMMENDATION: Adopt Resolution 87-18 approving Proposal No. 1491-131 for funding in an amount not to exceed \$146,927.

SUMMARY: The purpose of this project is to develop and demonstrate methods to sample vapor-phase contaminants in ambient air and to identify and quantify the most active mutagenic/carcinogenic fractions using short-term, bioassay-directed chemical analyses. This study will address two objectives for toxic air contaminant research contained in the ARB's Long-Range Research Plan; specifically, to investigate and characterize priority toxic air contaminants from selected sources and to conduct health effects assessments for selected toxic air contaminants.

The methods which will be developed by the investigators in this study will be used by the Air Resources Board and others to determine the relative importance of vapor-phase and particle-phase mutagens and carcinogens in ambient air and to determine the identity and source of vapor-phase constituents that may contribute to adverse health effects.

The test methods selected for sampling and the biological/chemical analyses of vapor-phase mutagens will be validated using model compounds, first in the laboratory, and finally at several field testing sites. Test protocols will include a quality control program to ensure reliable data.

The contractor for this project is the University of California, Davis, Department of Environmental Toxicology. The principal investigator will be Dr. Dennis P. H. Hsieh. A member of the ARB staff, Dr. Norman Kado, is one of the originators of the microsuspension bioassay technique to be used in the study, and he will participate as a co-principal investigator for the study.

B U D G E T   S U M M A R Y

University of California, Davis  
Department of Environmental Toxicology

"Methods Development for Assessment of Vapor-Phase  
Mutagens and Carcinogens in Ambient Air"

BUDGET ITEMS:

|  |                           |                  |
|--|---------------------------|------------------|
| Salaries   | \$82,344                  |                  |
| Benefits   | 19,838                    |                  |
| Supplies   | 20,970                    |                  |
| Equipment  | 7,000                     |                  |
| (GC Thermal Conductivity<br>Detector, GC/MS charge, etc. |                           |                  |
| Travel   | 2,245                     |                  |
| Other  | <u>1,400</u>              |                  |
| TOTAL, DIRECT COSTS                                      |                           | \$133,797        |
| TOTAL, INDIRECT COSTS                                    |                           | <u>13,130</u>    |
|  | <u>TOTAL PROJECT COST</u> | <u>\$146,927</u> |

State of California  
AIR RESOURCES BOARD

Resolution 87-19  
March 26, 1987

WHEREAS, the Air Resources Board 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 solicited research proposal, Number 1497-131, entitled "Determination of Particle Size Distributions and Chemical Composition of Particulate Matter from Selected Sources in California," has been submitted by OMNI Environmental Services, Inc.;

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

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

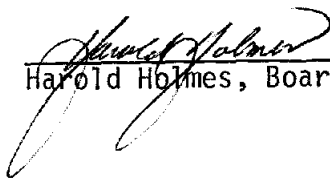
Proposal Number 1497-131, entitled "Determination of Particle Size Distributions and Chemical Composition of Particulate Matter from Selected Sources in California," submitted by OMNI Environmental Services, Inc. for a total amount not to exceed \$245,967.

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 1497-131, entitled "Determination of Particle Size Distributions and Chemical Composition of Particulate Matter from Selected Sources in California," submitted by OMNI Environmental Services, Inc. for a total amount not to exceed \$245,967.

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 in an amount not to exceed \$245,967.

I hereby certify that the above is a true and correct copy of Resolution 87-19, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 2

DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1497-131 entitled "Determination of Particle Size Distributions and Chemical Composition of Particulate Matter from Selected Sources in California."

RECOMMENDATION: Adopt Resolution 87-19 approving Proposal No. 1497-131 for funding in an amount not to exceed \$245,967.

SUMMARY: The purpose of this study is to determine the size distribution and chemical composition of directly-emitted particles from selected sources. This study addresses one of the objectives for the stationary source research element, as contained in the ARB's Long-Range Research Plan; specifically, to better define emissions of hydrocarbons, oxides of nitrogen, oxides of sulfur, and PM<sub>10</sub> from selected source categories that contribute to violations of ambient air quality standards.

The results of this study will be used to relate source contributions to measured particulate concentrations in the atmosphere. This information will be used to help develop a least-cost strategy to attain the (anticipated) federal and state ambient air quality standards for PM<sub>10</sub>.

The study will be conducted by OMNI Environmental Services, Inc. The principal investigator will be Dr. James E. Houck.

B U D G E T   S U M M A R Y

OMNI Environmental Services, Inc.

"Determination of Particle Size Distributions  
and Chemical Composition of Particulate  
Matter from Selected Sources in California"

BUDGET ITEMS:

|                   |               |
|-------------------|---------------|
| Salaries          | \$ 48,912     |
| Benefits          | 11,855        |
| Supplies          | 2,430         |
| Equipment Rental  | 17,700        |
| Chemical Analyses | 39,250        |
| Other Costs       | 6,089         |
| Travel            | <u>16,823</u> |

|                       |                |
|-----------------------|----------------|
| TOTAL, Direct Costs   | \$143,059      |
| TOTAL, Indirect Costs | <u>102,908</u> |

|                           |                  |
|---------------------------|------------------|
| <u>TOTAL PROJECT COST</u> | <u>\$245,967</u> |
|---------------------------|------------------|

State of California  
AIR RESOURCES BOARD

Resolution 87-20  
March 26, 1987

WHEREAS, the Air Resources Board 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, an unsolicited research proposal, Number 1512-132, entitled "Evaluation of a Method for Determining Vapor Pressures of Petroleum Mixtures by Headspace Gas Chromatography," has been submitted by the University of California, Davis;

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

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

Proposal Number 1512-132, entitled "Evaluation of a Method for Determining Vapor Pressures of Petroleum Mixtures by Headspace Gas Chromatography," submitted by the University of California, Davis for a total amount not to exceed \$29,539.

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 1512-132, entitled "Evaluation of a Method for Determining Vapor Pressures of Petroleum Mixtures by Headspace Gas Chromatography," submitted by the University of California, Davis for a total amount not to exceed \$29,539.

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 in an amount not to exceed \$29,539.

I hereby certify that the above is a true and correct copy of Resolution 87-20, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 3  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1512-132 entitled "Evaluation of a Method for Determining Vapor Pressures of Petroleum Mixtures by Headspace Gas Chromatography."

RECOMMENDATION: Adopt Resolution 87-20 approving Proposal No. 1512-132 for funding in an amount not to exceed \$29,539.

SUMMARY: The purpose of this project is to complete development and demonstration of a method for measuring the vapor pressure of complex petroleum mixtures such as crude oil. This study addresses one of the objectives of the stationary source research element, as stated in the ARB's Long-Range Research Plan, specifically, to better define emissions of hydrocarbons, oxides of nitrogen, oxides of sulfur, and PM<sub>10</sub> from selected source categories that contribute to violations of ambient air quality standards.

The method will be used by ARB staff and others, along with other data, to assess hydrocarbon emissions from crude oil storage and processing facilities. These emissions account for a major portion of the uncertainty in the statewide emissions of volatile organic compounds.

The study will be conducted at the University of California, Davis. The principal investigator will be Dr. James N. Seiber.



State of California  
AIR RESOURCES BOARD

Resolution 87-21  
March 26, 1987

WHEREAS, the Air Resources Board 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 solicited research proposal, Number 1516-132, entitled "Proposal to Conduct Data Management for the Southern California Air Quality Study," has been submitted by Environmental Research & Technology, Inc.;

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

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

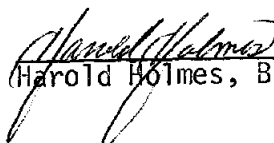
Proposal Number 1516-132, entitled "Proposal to Conduct Data Management for the Southern California Air Quality Study," submitted by Environmental Research & Technology, Inc. for a total amount not to exceed \$49,953.

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 1516-132, entitled "Proposal to Conduct Data Management for the Southern California Air Quality Study," submitted by Environmental Research & Technology, Inc. for a total amount not to exceed \$49,954.

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 in an amount not to exceed \$49,954.

I hereby certify that the above is a true and correct copy of Resolution 87-21, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 4  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1516-132 entitled "Proposal to Conduct Data Management for the Southern California Air Quality Study,"

RECOMMENDATION: Adopt Resolution 87-21 approving Proposal No. 1516-132 for funding in an amount not to exceed \$49,954.

SUMMARY: The purpose of this project is to provide the data manager for the Southern California Air Quality Study. SCAQS is a multi-year, integrated air quality study whose overall goal, as stated in the ARB's Long-Range Research Plan, is to develop a comprehensive and properly archived air quality and meteorological data base for the South Coast Air Basin. This data base will be used to test, evaluate and improve elements of air quality simulation models for oxidants, PM<sub>10</sub>, fine particles, toxic air contaminants and acidic species.

The contractor will compile, review, archive and distribute all of the data from the Southern California Air Quality Study, including all data collected by ARB-sponsored and non ARB-sponsored participants and other governmental agencies.

The principal investigator will be Mr. John Collins of Environmental Research & Technology, Inc.

State of California  
AIR RESOURCES BOARD

Resolution 87-22,  
March 26, 1987

WHEREAS, the Air Resources Board 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 request for budget augmentation for Contract Number A5-157-32, entitled "Southern California Air Quality Study - Program Management," has been submitted by Sonoma Technology, Inc.;

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

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

Augmentation to Contract Number A5-157-32, entitled "Southern California Air Quality Study - Program Management," submitted by Sonoma Technology, Inc. by \$52,046 for a total amount not to exceed \$289,666.

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:

Augmentation to Contract Number A5-157-32, entitled "Southern California Air Quality Study - Program Mangement," submitted by Sonoma Technology, Inc. by \$52,046 for a total amount not to exceed \$289,666.

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 by \$52,046 for a total amount not to exceed \$289,666.

I hereby certify that the above is a true and correct copy of Resolution 87-22, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 5  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

ITEM: Augmentation for Contract A5-157-32 entitled "Southern California Air Quality Study - Program Management."

RECOMMENDATION: Adopt Resolution 87-22 approving a budget augmentation of Contract No. A5-157-32 by \$52,046 for a total contract amount not to exceed \$289,666.

SUMMARY: This augmentation will provide funds for type A (intensive measurement) site preparation expenses at Upland and Long Beach during the SCAQS program, as defined in the ARB's Long-Range Research Plan. Included in the site preparation and field expenses during the study are costs for sampling platforms, security guards, and telecommunications between the two sites. Several million dollars' worth of equipment will be located at each site.

The principal investigator for this proposed effort is Dr. Donald Blumenthal of Sonoma Technology Inc.

B U D G E T   S U M M A R Y

Sonoma Technology, Inc.

"Southern California Air Quality Study - Program Management"

BUDGET ITEMS:

|                              |              |
|------------------------------|--------------|
| Sampling Platform            | \$11,545     |
| Gas Cylinder and<br>Supplies | 2,100        |
| Telecommunications           | 5,990        |
| Trailer Rentals              | <u>4,200</u> |

|                       |              |
|-----------------------|--------------|
| TOTAL, Direct Costs   | \$23,835     |
| TOTAL, Indirect Costs | <u>2,383</u> |

OTHER:

|   |                 |
|---|-----------------|
| Expenses required for security guard duty, portable toilet facilities, distilled water and miscellaneous expenses to be purchased by Research Division staff. | <u>\$25,828</u> |
|---|-----------------|

|                           |                 |
|---------------------------|-----------------|
| <u>TOTAL PROJECT COST</u> | <u>\$52,046</u> |
|---------------------------|-----------------|

State of California  
AIR RESOURCES BOARD

Resolution 87-23  
March 26, 1987

WHEREAS, the Air Resources Board 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 solicited research proposal, Number 1507-132, entitled "Activity Pattern Study of California Residents," has been submitted by the University of California, Berkeley; and

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

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

Proposal Number 1507-132, entitled "Activity Pattern Study of California Residents," submitted by the University of California, Berkeley for a total amount not to exceed \$199,386.

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 1507-132, entitled "Activity Pattern Study of California Residents," submitted by the University of California, Berkeley for a total amount not to exceed \$199,386.

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 in an amount not to exceed \$199,386.

I hereby certify that the above is a true and correct copy of Resolution 87-23, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 6  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1507-132 entitled "Activity Pattern Study of California Residents."

RECOMMENDATION: Adopt Resolution 87-23 approving Proposal No. 1507-132 for funding in an amount not to exceed \$199,386.

SUMMARY: This solicited proposal represents the first research project of a new ARB program in indoor air quality and total exposure, which was initiated by a Budget Change Proposal for FY 1986-87.

The purpose of this study is to obtain statistically representative information regarding the time Californians spend in various locations and activities, particularly those indoor and outdoor locations and activities likely to result in exposure to harmful air pollutants. This information is needed to improve estimates of actual exposure to toxic air contaminants and criteria pollutants in order to make more realistic assessments of risks to health.

The contractor for this study is the University of California, Berkeley, and the principal investigator is Dr. James Wiley, Assistant Director of UCB's Survey Research Center. The project director is Dr. John Robinson, one of the leading researchers in activity pattern research in the U.S.

B U D G E T   S U M M A R Y

University of California, Berkeley

"Activity Pattern Study of  
California Residents"

BUDGET ITEMS:

|                       |                           |                  |
|-----------------------|---------------------------|------------------|
| Salaries/Benefits*    | \$151,960                 |                  |
| Supplies              | 500                       |                  |
| Other Costs           | 28,300                    |                  |
| Travel                | <u>500</u>                |                  |
| TOTAL, Direct Costs   |                           | \$181,260        |
| TOTAL, Indirect Costs |                           | <u>18,126</u>    |
|                       | <u>TOTAL PROJECT COST</u> | <u>\$199,386</u> |

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\* The original budget did not separate benefits from salaries. A revised budget itemizing benefits separately has been requested from UCB.



State of California  
AIR RESOURCES BOARD

Resolution 87-24  
March 26, 1987

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California, pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a unsolicited research proposal, Number 145-22, entitled "Control of the Dry Deposition Flux of Nitrogen-Containing Air Pollutants," has been submitted by the California Institute of Technology;

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

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

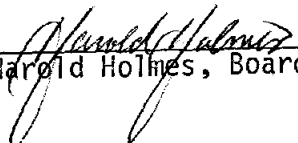
Proposal Number 145-22, entitled "Control of the Dry Deposition Flux of Nitrogen-Contained Air Pollutants," submitted by the California Institute of Technology for a total amount not to exceed \$199,727.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

Proposal Number 145-22, entitled "Control of the Dry Deposition Flux of Nitrogen-Containing Pollutants," submitted by the California Institute of Technology for a total amount not to exceed \$199,727.

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 in an amount not to exceed \$199,727.

I hereby certify that the above is a true and correct copy of Resolution 87-24, as adopted by the Air Resources Board.

  
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Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 7  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 145-22 entitled "Control of the Dry Deposition Flux of Nitrogen-Containing Air Pollutants."

RECOMMENDATION: Adopt Resolution 87-24 approving Proposal No. 145-22 for funding in an amount not to exceed \$199,727.

SUMMARY: The purpose of this study is to determine the effect of a number of candidate emissions control strategies on the dry deposition fluxes of nitrogen-containing gases (NO, NO<sub>2</sub>, PAN, nitric acid, and ammonia) and aerosols (ammonium nitrate) to the surface of the South Coast Air Basin (SoCAB). The proposed control strategies include both mobile and stationary source controls for hydrocarbon and NO<sub>x</sub> emissions. Dry deposition fluxes of nitric acid and aerosol nitrate are believed to be significantly more than the wet deposition fluxes (rain) and have the potential to damage economically valuable forest areas, crops and materials.

A three-dimensional grid (Eulerian) model would be modified to include state-of-the-art techniques to calculate dry deposition to the surface. The model would be run and validated for the "base case" of August 30-31, 1982 for which extensive field data were collected by the Caltech group. In the next step, the effect of emissions controls will be evaluated by comparing against the base case. The emission control measures for hydrocarbon and NO<sub>x</sub> will be grouped into a 3 x 3 matrix of mobile and stationary source controls that will be tested for their effect on dry deposition patterns in the SoCAB. The matrix of control combinations includes increasingly stringent stationary source NO<sub>x</sub> controls added to a minimal motor vehicle control program, as well as increasingly stringent mobile source emission reductions added to a minimal stationary source control program. Each of the nine combinations of emissions controls will be tested for their effect on dry deposition patterns. The project would provide useful information in designing acid deposition management strategies for the South Coast Air Basin. The study of such management strategies is mandated by the Kapiloff Acid Deposition Act.

The research contractor is the California Institute of Technology and the principal investigator will be Dr. Glen Cass.

B U D G E T   S U M M A R Y

California Institute of Technology

"Control of the Dry Deposition Flux of  
Nitrogen-Containing Air Pollutants"

BUDGET ITEMS:

|                          |                           |                  |
|--------------------------|---------------------------|------------------|
| Salaries                 | \$55,600                  |                  |
| Benefits                 | 15,121                    |                  |
| Supplies                 | 5,040                     |                  |
| Travel                   | 8,000                     |                  |
| Other Costs <sup>1</sup> | <u>43,472</u>             |                  |
| TOTAL, Direct Costs      |                           | \$127,233        |
| TOTAL, Indirect Costs    |                           | <u>72,494</u>    |
|                          | <u>TOTAL PROJECT COST</u> | <u>\$199,727</u> |

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1- Includes \$36,872 for computer (VAX) time and \$6,600 for publication costs.

State of California  
AIR RESOURCES BOARD

Resolution 87-25  
March 26, 1987

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California, pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an augmentation research proposal, Number 133-19A, entitled "Acidic Aerosol Size Distribution During SCAQS - Winter Period," has been submitted by California Public Health Foundation;

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

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

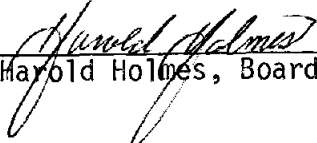
Proposal Number 133-19A, entitled "Acidic Aerosol Size Distribution During SCAQS - Winter Period," submitted by California Public Health Foundation for a total amount not to exceed \$68,905.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

Proposal Number 133-19A, entitled "Acidic Aerosol Size Distribution During SCAQS - Winter Period," submitted by California Public Health Foundation for a total amount not to exceed \$68,905.

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 in an amount not to exceed \$68,905.

I hereby certify that the above is a true and correct copy of Resolution 87-25, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 8  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

- ITEM: Research Proposal No. 133-19A entitled "Acidic Aerosol Size Distribution During SCAQS - Winter Period."
- RECOMMENDATION: Adopt Resolution 87-25 approving Proposal No. 133-19A for funding in an amount not to exceed \$68,905.
- SUMMARY: The purpose of this study is to provide data on size-resolved chemical composition of aerosols during the winter portion of the Southern California Air Quality Study (SCAQS). (The summer portion of this project was funded by the Board in November 1986.) The overall goal of the SCAQS is to develop a comprehensive and properly archived air quality and meteorological data base for the South Coast Air Basin that can be used to test, evaluate, and improve elements of air quality simulation models for oxidants, PM<sub>10</sub>, fine particles, toxic air contaminants and acidic species.
- Gas and Aerosol phase computer models require, for their validation, spatially and temporally resolved ambient measurements of aerosols, including information on organic ions (nitrate, sulfate, chloride, ammonium, potassium, and sodium). To provide these data, the proponent would use the nine stage Berner cascade impactor, which was demonstrated successfully during the ARB-sponsored Nitrogen Species Measurement Methods Comparison Study held in Claremont in September 1985.
- The Contractor will measure the particle size distribution of major inorganic ions during the summer intensive study period of SCAQS, approximately 4 weeks (6 sampling days) beginning in November 1987. The Berner impactors will be operated at three stations including the two type "A" (intensive) stations, and a mobile station which would be situated in an upwind area. In addition to the above measurements, the contractor would analyze ten percent of the samples collected for calcium and magnesium ions, and formic and acetic acids.
- The research contractor is the California Public Health Foundation and the principal investigator will be Dr. Walter John.

B U D G E T   S U M M A R Y

California Public Health Foundation

"Acidic Aerosol Size Distribution During SCAQS: Winter Period"

BUDGET ITEMS:

|                       |                           |                 |
|-----------------------|---------------------------|-----------------|
| Salaries              | \$32,324                  |                 |
| Benefits              | 9,236                     |                 |
| Supplies <sup>1</sup> | 7,000                     |                 |
| Travel                | 6,034                     |                 |
| Equipment             | <u>842</u>                |                 |
| TOTAL, Direct Costs   |                           | \$55,436        |
| TOTAL, Indirect Costs |                           | <u>13,469</u>   |
|                       | <u>TOTAL PROJECT COST</u> | <u>\$68,905</u> |

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1 - Includes mechanical supplies (\$3,000), chemical supplies (\$3,000), and electronic supplies (\$1,000)

State of California  
AIR RESOURCES BOARD

Resolution 87-26  
March 26, 1987

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California, pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, a solicited research proposal, Number 132-19, entitled "Assessment of Dry Deposition During the Southern California Air Quality Study," has been submitted by Carnegie-Mellon University;

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

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

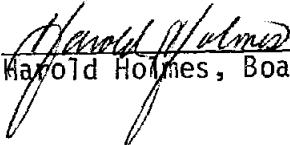
Proposal Number 132-19, entitled "Assessment of Dry Deposition During the Southern California Air Quality Study," submitted by Carnegie-Mellon University for a total amount not to exceed \$58,708.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

Proposal Number 132-19, entitled "Assessment of Dry Deposition During the Southern California Air Quality Study," submitted by Carnegie-Mellon University for a total amount not to exceed \$58,708.

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 in an amount not to exceed \$58,708.

I hereby certify that the above is a true and correct copy of Resolution 87-26, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 9  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

- ITEM: Research Proposal No. 132-19 entitled "Assessment of Dry Deposition During the Southern California Air Quality Study."
- RECOMMENDATION: Adopt Resolution 87-26 approving Proposal No. 132-19 for funding in an amount not to exceed \$58,708.
- SUMMARY: Carnegie-Mellon University will measure the dry deposition of particulate sulfate, particulate nitrate, nitric acid vapor, and the trace elements Ca, K, and Pb to natural and surrogate surfaces during SCAQS. The deposition fluxes of these species will be directly measured, and the information obtained will be used by modelers for boundary conditions in PM<sub>10</sub>, ozone, and acid deposition models. Ultimately, these models will provide direction for the Board in establishing PM<sub>10</sub>, ozone, and acid deposition management strategies. The principal investigator on this project will be Dr. Cliff Davidson.



State of California  
AIR RESOURCES BOARD

Resolution 87-27  
March 26, 1987

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California, pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 150-23, entitled "Measurement of the Dry Deposition of Atmospheric Coarse Particle Nitrate and Sulfate in Los Angeles," has been submitted by Illinois Institute of Technology;

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

WHEREAS, the Scientific Advisory Committee has reviewed and recommends for funding:

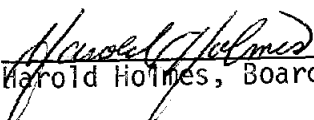
Proposal Number 150-23, entitled "Measurement of the Dry Deposition of Atmospheric Coarse Particle Nitrate and Sulfate in Los Angeles," submitted by Illinois Institute of Technology for a total amount not to exceed \$5,000.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

Proposal Number 150-23, entitled "Measurement of the Dry Deposition of Atmospheric Coarse Particle Nitrate and Sulfate in Los Angeles," submitted by Illinois Institute of Technology for a total amount not to exceed \$5,000.

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 in an amount not to exceed \$5,000.

I hereby certify that the above is a true and correct copy of Resolution 87-27, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 10  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 150-23 entitled "Measurement of the Dry Deposition of Atmospheric Coarse Particle Nitrate and Sulfate in Los Angeles."

RECOMMENDATION: Adopt Resolution 87-27 approving Proposal No. 150-23 for funding in an amount not to exceed \$5,000.

SUMMARY: The Illinois Institute of Technology is planning to participate in the upcoming Southern California Air Quality Study beginning in June 1987. IIT will measure the airborne concentrations of large particle nitrate and sulfate and simultaneously measure the deposition flux to a greased plate. These measurements will be used to improve our understanding of large particle deposition processes; processes which are important because they are the only way to remove large particles from the atmosphere. IIT will provide funding for the Principal Investigator and analysis, but has requested funding from ARB for travel. This resolution is to provide travel expenses to participate in SCAQS. The principal investigator on this project will be Dr. Kenneth Noll.

B U D G E T   S U M M A R Y

Illinois Institute of Technology

"Measurement of the Dry Deposition of Atmospheric Coarse Particle  
Nitrate and Sulfate in Los Angeles"

BUDGET ITEMS:

|                       |                           |                |
|-----------------------|---------------------------|----------------|
| Salaries              | \$-----                   |                |
| Benefits              | -----                     |                |
| Supplies              | -----                     |                |
| Other Costs           | -----                     |                |
| Travel                | <u>5,000*</u>             |                |
| TOTAL, Direct Costs   |                           | \$5,000        |
| TOTAL, Indirect Costs |                           | <u>  --</u>    |
|                       | <u>TOTAL PROJECT COST</u> | <u>\$5,000</u> |

\* Car rental \$2,000, Gasoline \$800, Motel \$1,500, per diem \$700

State of California  
AIR RESOURCES BOARD

Resolution 87-31  
March 26, 1987

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 142-22, entitled "An Integrated Watershed Study: Biological and Chemical Characteristics of Emerald Lake and Streams and Their Responses to Acidic Deposition," has been submitted by the University of California, Santa Barbara;

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

WHEREAS, the Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

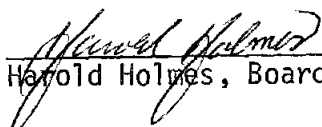
Proposal Number 142-22, entitled "An Integrated Watershed Study: Biological and Chemical Characteristics of Emerald Lake and Streams and Their Responses to Acidic Deposition," has been submitted by the University of California, Santa Barbara for a total amount not to exceed \$370,000.

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 Scientific Advisory Committee on Acid Deposition and approves the following:

Proposal Number 142-22, entitled "An Integrated Watershed Study: Biological and Chemical Characteristics of Emerald Lake and Streams and Their Responses to Acidic Deposition," submitted by the University of California, Santa Barbara for a total amount not to exceed \$370,000.

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 in an amount not to exceed \$370,000.

I hereby certify that the above is a true and correct copy of Resolution 87-31, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 11  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 142-22 entitled "An Integrated Watershed Study: Biological and Chemical Characteristics of Emerald Lake and Streams and Their Responses to Acidic Deposition."

RECOMMENDATION: Adopt Resolution 87-31 approving Proposal No. 142-22 for funding in an amount not to exceed \$370,000.

SUMMARY: The purpose of this study is to characterize the chemistry and biology of Emerald Lake and its associated streams in the Sierra Nevada. This project will also investigate the response of these aquatic systems to acidic inputs. Sources of buffering material will be identified and quantified during the 1987 field season.

The Kapiloff Acid Deposition Act calls for an evaluation of natural ecosystem sensitivity to acid deposition. In response to this mandate, the Air Resources Board initiated the Integrated Watershed Study at Emerald Lake in Sequoia National Park. In 1984 field work began at this site to assess the susceptibility of a high-elevation lake (9200 ft.) to acid deposition. This aquatic research program also was designed to evaluate the response of biota to acid inputs.

This proposal outlines a 14-month effort to collect baseline information on the chemistry and biology of Emerald Lake and its associated streams and to develop dose-response relationships for the effects of acid inputs on biota. This research program will estimate the flux of neutralizing material from the sediments, the cycling of nitrogen within the water column and the physical structure of the lake. All of these data will be useful in constructing mass balances for the lake and in formulating a model to predict the effects of acid deposition on lake processes. Biological work will be focused on two sensitive groups: fish populations and zooplankton populations (microscopic aquatic animals).

This study will be conducted by Drs. Melack, Cooper and Jenkins at the University of California, Santa Barbara.

## B U D G E T   S U M M A R Y

University of California, Santa Barbara

**"An Integrated Watershed Study: Biological and Chemical  
Characteristics of Emerald Lake and Streams and Their  
Responses to Acidic Deposition"**

**BUDGET ITEMS:**

|                             |                           |                  |
|-----------------------------|---------------------------|------------------|
| Salaries/Benefits           | \$260,723                 |                  |
| Equipment <sup>1</sup>      | 8,800                     |                  |
| Supplies <sup>2</sup>       | 13,555                    |                  |
| Other Costs <sup>3</sup>    | 18,600                    |                  |
| Travel <sup>4</sup>         | <u>35,486</u>             |                  |
| TOTAL, Direct Costs         |                           | \$337,164        |
| TOTAL, Indirect Costs (10%) |                           | <u>32,836</u>    |
|                             | <u>TOTAL PROJECT COST</u> | <u>\$370,000</u> |

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1. Equipment includes bag enclosures (\$2,500), benthic chambers (\$1,200), scuba gear (\$1,200) and a current meter (\$1,500).
  2. Supplies include laboratory items (filters, reagents bottles, pipettes, isotopes) and field equipment (nets, pH electrodes, sample bottles and probes).
  3. Other costs include samples analyses (\$5,600) equipment repair (\$700), helicopter fees (\$2,500), computer time (\$1,800) and publication costs (\$4,000).
  4. Travel includes mileage to study site and per diem expenses (\$27,354), travel to Sacramento and conference travel (\$8,132).

State of California  
AIR RESOURCES BOARD

Resolution 87-32  
March 26, 1987

WHEREAS, the Air Resources Board has been directed to design and implement a comprehensive program of research and monitoring of acid deposition in California, pursuant to Health and Safety Code Sections 39900 through 39915; and

WHEREAS, an unsolicited research proposal, Number 143-22, entitled "Characterization of Cloud Chemistry and Frequency of Canopy Exposure to Clouds in the Sierra Nevada," has been submitted by California Institute of Technology;

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

WHEREAS, the Scientific Advisory Committee has reviewed and recommends for funding:

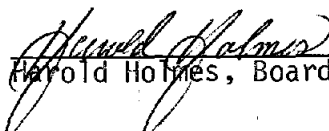
Proposal Number 143-22, entitled "Characterization of Cloud Chemistry and Frequency of Canopy Exposure to Clouds in the Sierra Nevada," submitted by California Institute of Technology for a total amount not to exceed \$267,901.

NOW, THEREFORE, BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39906, hereby accepts the recommendation of the Scientific Advisory Committee on Acid Deposition and approves the following:

Proposal Number 143-22, entitled "Characterization of Cloud Chemistry and Frequency of Canopy Exposure to Clouds in the Sierra Nevada," submitted by California Institute of Technology for a total amount not to exceed \$267,901.

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 in an amount not to exceed \$267,901.

I hereby certify that the above is a true and correct copy of Resolution 87-32, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 87-5-4(b) 12  
DATE: March 26, 1987

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 143-22 entitled "Characterization of Cloud Chemistry and Frequency of Canopy Exposure to Clouds in the Sierra Nevada."

RECOMMENDATION: Adopt Resolution 87-32 approving Proposal No. 143-22 for funding in an amount not to exceed \$267,901.

SUMMARY: The objectives of this study are twofold. The first is to determine the temporal and elevational variations in the frequency of cloud impaction and cloudwater chemistry within Sequoia National Park and Yosemite National Park. Sampling will be conducted continuously from July 1987 to June 1988. Several special studies will also be conducted during the year at Sequoia National Park. Measurement of gas-phase and aerosol concentrations would be made prior to, during, and following two to three major events per year to look for evidence of a coupling between frontal approach and increased pollutant levels in Sequoia National Park. At the same time, the drip from several species of trees located near the main site will be collected and analyzed to determine whether significant acid leaching of cations from the needles is occurring. Samples of cloudwater, fractionated by droplet size, will also be collected and analyzed to determine whether any significant difference exists between the chemical composition of small vs. large cloudwater droplets.

The second objective is to construct five automated fogwater collectors suitable for routine monitoring and to assist the ARB in establishing a network of fogwater collection sites in other areas of the state. The equipment will be turned over to the ARB along with a recommendation for site locations, sampling protocol and equipment maintenance support for one year.

The contractor for this project is the California Institute of Technology; Professor Michael Hoffman would be the principal investigator.



B U D G E T   S U M M A R Y

California Institute of Technology

"Characterization of Cloud Chemistry and Frequency of Canopy  
Exposure to Clouds in the Sierra Nevada"

BUDGET ITEMS:

|                                 |                           |                  |
|---------------------------------|---------------------------|------------------|
| Salaries                        | \$ 45,800                 |                  |
| Benefits                        | 12,036                    |                  |
| Supplies <sup>1</sup>           | 16,000                    |                  |
| Travel Expenses <sup>2</sup>    | 12,500                    |                  |
| Equipment <sup>3</sup>          | 118,850                   |                  |
| Other direct costs <sup>4</sup> | <u>8,000</u>              |                  |
| <br>                            |                           |                  |
| TOTAL, Direct Costs             |                           | \$213,186        |
| TOTAL, Indirect Costs           |                           | <u>54,715</u>    |
|                                 |                           |                  |
|                                 | <u>TOTAL PROJECT COST</u> | <u>\$267,901</u> |

- 
1. Includes \$7,000 for laboratory supplies, \$4,000 for machine shop supplies, \$2,500 for computer maintenance, and \$2,500 for printing of final report.
  2. Includes \$10,000 for travel and per diem during field program.
  3. Includes \$55,625 for five new automated fogwater samplers for routine monitoring, \$3,400 for modification of two existing fogwater samplers, \$16,500 for Scintrex LMA-3 low threshold nitrogen dioxide monitor and external calibrator, \$13,875 for fifteen passive cloudwater collectors, \$11,500 for data loggers, and \$11,450 for meteorological equipment.
  4. Subcontracts with the Park Service to service field equipment.