State of California
AIR RESOURCES BOARD

Resolution 86-46
May 22, 1986

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 110-17, entitled "Particulate Monitoring for Acid Deposition Research in the Sierra Nevada, California," 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 Scientific Advisory Committee on Acid Deposition has reviewed and recommends for funding:

> Proposal Number 110-17, entitled "Particulate Monitoring for Acid Deposition Research in the Sierra Nevada, California," submitted by the University of California, Davis for a total amount not to exceed $58,127.

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 and approves the following:

> Proposal Number 110-17, entitled "Particulate Monitoring for Acid Deposition Research in the Sierra Nevada, California," submitted by the University of California, Davis for a total amount not to exceed $58,127.

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 $58,127.

I hereby certify that the above is a true and correct copy of Resolution 86-64 as adopted by the Air Resources Board.

Otaka Kimura for

Harold Holmes, Board Secretary

ITEM NO: 86-6-4 (b) (1)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 110-17 entitled "Particulate Monitoring for Acid Deposition Research in the Sierra Nevada, California"

RECOMMENDATION: Adopt Resolution 86-46 approving Proposal No. 110-17 for funding in an amount not to exceed $58,127.

SUMMARY: The purpose of this project is to obtain an estimate of the dry deposition of particles and ozone to high elevations in the Sierra Nevada at Sequoia National Park, and to provide a comparison between the chemical composition of ambient air samples and rainfall which is collected concurrently.

The project consists of the following elements. First, using two samplers at each site, particles would be monitored at 6000 feet and 10,000 feet elevations during the summer months. One sampler at each site would be analyzed with a 4-hour time resolution for comparison to rain events. The other sampler would collect particles in two size ranges for deposition estimates. Second, ozone would be monitored at the 10,000-foot site during the summer for comparison to existing monitoring at the lower site. These measurements would be the first extended measurements at the high elevation site. Third, upper level winds would be measured twice each day during the summer to aid interpretation of rain events and transport patterns. Fourth, the 6000-foot site would continue operation during the fall, winter, and spring on the same schedule as an existing sampler operated by the contractor at Yosemite National Park for the National Park Service. This concurrent operation for the remainder of the year would provide an estimate of the annual north-south gradient of particle concentrations in the Southern Sierra Nevada.

The principal investigator would be Dr. Thomas A. Cahill from the University of California, Davis.

BUDGET SUMMARY

University of California, Davis

"Particulate Monitoring for Acid Deposition

Research in the Sierra Nevada, California"

BUDGET ITEMS:

Salaries	$17,300	
Benefits*	-0-	
Supplies	4,470	
Other Costs**	28,984	
Travel	3,200	
TOTAL, Direct Costs		$53,954
TOTAL, Indirect Costs		4,173
TOTAL PROJECT COST		$58,127

* Benefits included in salaries

** Includes $13,684 for sample analysis, and $10,700 for ozone and humidity monitors

State of California
AIR RESOURCES BOARD

Resolution 86-48
May 22, 1986

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 1418-126, entitled "Development of Procedures for Establishing the Uncertainties of Emission Estimates," has been submitted by the Valley Research Corporation;

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 1418-126, entitled "Development of Procedures for Establishing the Uncertainties of Emission Estimates," submitted by the Valley Research Corporation for a total amount not to exceed $74,955.

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 1418-126, entitled "Development of Procedures for Establishing the Uncertainties of Emission Estimates," submitted by the Valley Research Corporation for a total amount not to exceed $74,955.

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 $74,955.

I hereby certify that the above is a true and correct copy of Resolution 86-48 as adopted by the Air Resources Board.

Utako Kimura for

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (3)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1418-126 entitled "Development of Procedures for Establishing the Uncertainties of Emission Estimates."

RECOMMENDATION: Adopt Resolution 86-48 approving Proposal No. 1418-126 for funding in an amount not to exceed $74,955.

SUMMARY: The purpose of this project is to develop standard procedures for establishing the uncertainties of the individual and aggregated factors which comprise the inventory of air polluting emissions from point, area and mobile sources.

The Air Resources Board and air pollution control districts use emission estimates to develop and implement air quality management strategies and for a variety of other purposes. Currently, the ARB and local districts do not have uniform procedures for estimating the uncertainties of single emission estimates or for aggregating these estimates to obtain emissions of totals that have a known accuracy. Previous ARB-sponsored research projects on emission inventories have not included statistical analyses of uncertainties. Both the South Coast and Bay Area Air Quality Management Districts have attempted to estimate uncertainties in their emission inventories, but the procedures developed were shown to have some deficiencies and were therefore not adopted by the ARB.

The proposed study has three objectives: to select the most appropriate statistical form for estimates of uncertainties in emission inventories; to develop procedures for computing uncertainties in the selected form for emissions from point, mobile, and area sources; and to assemble a handbook describing the foregoing statistical forms and procedures and demonstrating the use of these in actual applications.

The study will be conducted by the Valley Research Corporation. The principal investigator will be Dr. Yuji Horie.

BUDGET SUMMARY

Valley Research Corporation

"Development of Procedures for Establishing

the Uncertainties of Emission Estimates"

BUDGET ITEMS:

Salaries	$25,200	
Benefits	17,640	
Travel	1,350	
Contractors*	12,900	
Other Costs**	3,750	
TOTAL, Direct Costs		$60,840
TOTAL, Indirect Costs		14,115
TOTAL PROJECT COST		$74,955

* The principal consultants are: Dr. Charles Stone and Mr. Richard Rapoport

** Reproduction, Word Processing

State of California
AIR RESOURCES BOARD

Resolution 86-49
May 22, 1986

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 1414-126, entitled "A Survey of Ambient Concentrations of Selected Polycyclic Aromatic Hydrocarbons (PAHs) at Various Locations in California," has been submitted by the University of California, Riverside;

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 1414-126, entitled "A Survey of Ambient Concentrations of Selected Polycyclic Aromatic Hydrocarbons (PAHs) at Various Locations in California," submitted by the University of California, Riverside for a total amount not to exceed $193,552.

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 1414-126, entitled "A Survey of Ambient Concentrations of Selected Polycyclic Aromatic Hydrocarbons (PAHs) at Various Locations in California," submitted by the University of California, Riverside for a total amount not to exceed $193,552.

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 $193,552.

I hereby certify that the above is a true and correct copy of Resolution 86-49 as adopted by the Air Resources Board.

Utako Kimura

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (4)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1414-126 entitled "A Survey of Ambient Concentrations of Selected Polycyclic Aromatic Hydrocarbons (PAHs) at Various Locations in California."

RECOMMENDATION: Adopt Resolution 86-49 approving Proposal No. 1414-126 for funding in an amount not to exceed $193,552.

SUMMARY: Section 39650 et seq. of the California Health and Safety Code (Assembly Bill 1807, Tanner, 1983) directs the Air Resources Board to identify and adopt control measures for toxic air contaminants. The ARB staff has assembled a list of candidate toxic air contaminants to be evaluated. These compounds are grouped according to evidence for: risk of harm to public health; amount or potential amount of emissions; manner of usage; persistence in the atmosphere; and ambient concentrations. Included on this list are polycyclic aromatic hydrocarbons (PAHs).

High localized concentrations of PAHs have been measured in the vicinity of various types of emission sources, including: woodstoves and fireplaces; diesel and gasoline engines; asphalt roofing; agricultural and other waste burning; creosote wood preserving; and food preparation operations. PAH compounds including the nitrated PAHs have been shown to be both toxic and carcinogenic to animals and are associated with cancer in humans.

The objective of this study is to determine ambient concentrations of PAHs and nitro-PAHs at seven locations in California with high probability of occurrence of these pollutants. The study will be directed towards unsubstituted, hetero- and nitro-PAHs with priority given to compounds or precursors of compounds identified as having "sufficient" evidence of carcinogenicity in animals, according to recognized authorities. Ames testing for evidence of mutagenicity in the ambient samples will also be conducted.

The study will be performed by the Statewide Air Pollution Research Center, University of California, Riverside. Dr. Roger Atkinson will be the principal investigator.

BUDGET SUMMARY

University of California, Riverside

"A Survey of Ambient Concentrations of
Selected Polycyclic Aromatic Hydrocarbons (PAHs) at
Various Locations in California"

BUDGET ITEMS:

Salaries	$100,485	
Benefits	24,347	
Computer search	3,120	
Equipment**	9,700	
Supplies***	18,871	
Travel	15,715	
Other Costs*	4,600	
TOTAL, Direct Costs		$176,838
TOTAL, Indirect Costs		16,714
TOTAL PROJECT COST		$193,552

* Includes Hi-Vol, GC/MS maintenance
** Chavt Recorders ($3000); NO/NOx Analyzer ($6700)
*** Capillary columns, solvents, high-purity gases, Teflon-coated filters, Petri dishes, Ames testing supplies

State of California
AIR RESOURCES BOARD

Resolution 86-50
May 22, 1986

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 1426-126a, entitled "Southern California Air Quality Study: Sample Analyses and Reporting," has been submitted by Combustion Engineering, 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 1426-126a, entitled "Southern California Air Quality Study: Sample Analyses and Reporting," submitted by Combustion Engineering, Inc. for an amount not to exceed $385,364.

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 1426-126a, entitled "Southern California Air Quality Study: Sample Analyses and Reporting," submitted by Combustion Engineering, Inc. for an amount not to exceed $385,364.

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 $385,364.

I hereby certify that the above is a true and correct copy of Resolution 86-50 as adopted by the Air Resources Board.

Utako Fujiura
for Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (5)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1426-126a entitled "Southern California Air Quality Study: Sample Analyses and Reporting"

RECOMMENDATION: Adopt Resolution 86-50 approving proposal 1426-126a for funding in an amount not to exceed $385,364.

SUMMARY: The Air Resources Board is sponsoring a multi-year integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July of 1987. The overall objective of that program is to develop a comprehensive meteorologic and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. The backbone of the study is a network of approximately nine specially equipped air quality monitoring stations located throughout the basin in such a way as to permit detailed study of an air parcel from offshore at a site such as San Nicolas Island, through areas of heavy mobile source and industrial emissions, along a trajectory ending at a far downwind receptor area such as Riverside.

To accomplish this task in a cost-effective manner, existing air quality monitoring stations operated by the South Coast Air Quality Management District will be equipped with additional instrumentation and equipment to make detailed measurements of both primary and secondary gaseous pollutants and reaction intermediates and of the the detailed composition of size-resolved aerosol particles.

The purpose of this contract is to work with the ARB the Project Manager (Sonoma Technology) and AeroVironment to select and prepare sites for up to nine monitoring stations. The contractors will also be required to analyze samples collected during the two intensive sampling periods, one during the summer of 1987 and the other during the late fall/early winter of 1987-88.The contractor will be responsible for quality control and will write a final report and prepare a computer-readable data base of meteorologic and aerometric data collected under the terms of this contract.

The principal investigator for Combustion Engineering is Dr. William Keifer.

B U D G E T S U M M A R Y

Combustion Engineering

"Southern California Air Quality
Study: Sample Analyses and Reporting"

BUDGET ITEMS

1.	Direct Labor	$147,996
2.	Overhead (97.46% of 1)	144,237
3.	Materials*	59,324
4.	Transportation	1,770
5.	Per Diem	220
6.	G & A	-0-
7.	Fee (9% of 1 through 6)	31,817
	TOTAL	$385,364

*Expendable laboratory supplies to analyze samples collected on all Type B stations:

Description	Number	Total Cost
Nylasorb 47mm Filters	1000	$ 3,080
Zefluor 47mm Filters	1000	1,700
Teflon 37mm Filters	2000	5,500
Filter Holders	430	1,720
Plastic Beakers	6000	1,942
Filter Pak Sampler	10	16,000
Teflon Filter Holders	216	27,000
Miscellaneous Other Supplies		2,382
TOTAL		$59,324

State of California
AIR RESOURCES BOARD

Resolution 86-51
May 22, 1986

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 1426-126c, entitled "Southern California Air Quality Study: Prototype Instrumentation," has been submitted by Sonoma 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 1426-126c, entitled "Southern California Air Quality Study: Prototype Instrumentation," submitted by Sonoma Technology, Inc. for a total amount not to exceed $52,218.

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 1426-126c, entitled "Southern California Air Quality Study: Prototype Instrumentation," submitted by Sonoma Technology, Inc. for a total amount not to exceed $52,218.

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 $52,218.

I hereby certify that the above is a true and correct copy of Resolution 86-51 as adopted by the Air Resources Board.

Utako Kimura

for Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b)(6)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1426-126c entitled "Southern California Air Quality Study: Prototype Instrumentation"

RECOMMENDATION: Adopt Resolution 86-51 approving Proposal No. 1426-126c for funding in an amount not to exceed $52,218.

SUMMARY: The Air Resources Board is sponsoring a multi-year integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July of 1987. The overall objective of that program is to develop a comprehensive meteorologic and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. The backbone of the study is a network of approximately nine specially equipped air quality monitoring stations located throughout the Basin in such a way as to permit detailed study of an air parcel from offshore at a site such as San Nicolas Island, through areas of heavy mobile source and industrial emissions, along a trajectory ending at a far downwind receptor area such as Riverside.

To accomplish this task in a cost-effective manner, existing air quality monitoring stations operated by the South Coast Air Quality Management District will be equipped with additional instrumentation and equipment to make detailed measurements of both primary and secondary gaseous pollutants and reaction intermediates and of the detailed composition of size-resolved aerosol particles.

The major objectives of this project are to build one prototype sampler for aerosol sizing and to provide the data acquisition system for the routine monitoring Class B stations in the SCAQS program. The project consists of 3 tasks: 1) prototype preparation and testing; 2) construction of electronic controls for samplers: and 3) support for assembly and laboratory tests for up to nine field-worthy samplers. This project is intended to complement the proposal from Combustion Engineering/Aerovironment.

Sonoma Technology Inc. would serve as the contractor for this effort. The principal investigator would be Dr. Donald Blumenthal.

State of California
AIR RESOURCES BOARD

Resolution 86-52
May 22, 1986

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 1416-126, entitled "A Study of Excess Motor Vehicle Emissions - Causes and Control," has been submitted by Sierra Research, Inc./Radian Corporation;

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 1416-126, entitled "A Study of Excess Motor Vehicle Emissions - Causes and Control," submitted by Sierra Research, Inc./Radian Corporation for a total amount not to exceed $199,937.

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 1416-126, entitled "A Study of Excess Motor Vehicle Emission - Causes and Control," submitted by Sierra Research, Inc./Radian Corporation for a total amount not to exceed $199,937.

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 $199,937.

I hereby certify that the above is a true and correct copy of Resolution 86-52 as adopted by the Air Resources Board.

Italo Fumira for

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b)(7)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1416-126 entitled "A Study of Excess Motor Vehicle Emissions - Causes and Control"

RECOMMENDATION: Adopt Resolution 86-52 approving Proposal No. 1416-126 for funding in an amount not to exceed $199,937.

SUMMARY: This study is intended to investigate the causes of excess emissions* from light-duty vehicles, to evaluate potential measures which could reduce these emissions, and to gather information that would assess the adequacy of State and Federal standards in the area of heavy-duty diesel engines. Additional tasks to be carried out in this project are:

1. the development of an "expert" computer system to enhance the effectiveness of inspectors and repair mechanics in isolating and repairing emission control malfunctions;

2. assessing the effects of gasoline composition upon exhaust systems and assessing the potential for emission reductions through limitations on fuel additives and impurities; and

3. determining the causes of catalyst deterioration.

The principal investigators will be Robert Dulla of Sierra Research and Rob Klausmeier of Radian Corp.

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* "Excess emissions" are defined as those emissions which exceed the standards to which vehicles are originally certified.

BUDGET SUMMARY

Sierra Research, Inc./Radian Corporation

"A Study of Excess Motor Vehicle

Emissions-Causes & Control"

BUDGET ITEMS:	SIERRA	RADIAN	TOTAL
Salaries	$43,760	$33,492	$77,252
Benefits	11,853	*	11,853
Travel	5,698	2,720	8,418
Other Costs	1,500	200	1,700
TOTAL, Direct Costs	$62,811	$36,412	$99,223
TOTAL, Indirect Costs	38,109	62,605	100,714
TOTAL PROJECT COST			$199,937

* Not specified

State of California
AIR RESOURCES BOARD

Resolution 86-53
May 22, 1986

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 1420-126, entitled "Participation in the Carbonaceous Species Methods Comparison Study: Tunable Diode Laser Absorption Spectrometer Measurements of HCHO and H_2O_2," has been submitted by Unisearch Associates, 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 1420-126, entitled "Participation in the Carbonaceous Species Methods Comparison Study: Tunable Diode Laser Absorption Spectrometer Measurements of HCHO and H_2O_2," submitted by Unisearch Associates, Inc. for a total amount not to exceed $23,322.

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 1420-126, entitled "Participation in the Carbonaceous Species Methods Comparison Study: Tunable Diode Laser Absorption Spectrometer Measurements of HCHO and H_2O_2," submitted by Unisearch Associates, Inc. for a total amount not to exceed $23,322.

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 $23,322.

I hereby certify that the above is a true and correct copy of Resolution 86-53 as adopted by the Air Resources Board.

Utako Kimura
for Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (8)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1420-126 entitled "Participation in the Carbonaceous Species Methods Comparison Study: Tunable Diode Laser Absorption Spectrometer Measurements of HCHO and H_2O_2"

RECOMMENDATION: Adopt Resolution 86-53 approving Proposal No. 1420-126 for funding in an amount not to exceed $23,322.

SUMMARY: The Air Resources Board is sponsoring a multi-year, integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July 1987. The overall objective of that program is to develop a comprehensive meteorological and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. An important component of the field study will be the accurate measurement of hydrogen peroxide (H_2O_2) in a multi-station mode. Therefore, it is necessary to perform a H_2O_2 methods comparison study in Los Angeles. The major objective of this study will be to determine measurement methods for gas phase H_2O_2, which can be used in a multi-station monitoring mode in Los Angeles, whose validity, accuracy and precision are known.

Hydrogen peroxide present in polluted urban atmospheres may play an important role in both the formation of photochemical smog and atmospheric acidity. However, few reliable data are available on ambient concentrations of H_2O_2.

This project is to make measurements of formaldehyde (HCHO) and hydrogen peroxide (H_2O_2) by tunable diode laser absorption spectroscopy for a ten-day period during the Carbonaceous Species Methods Comparison Study, which is scheduled to take place in August 1986. The total cost of this study is $44,322, of which $21,000 would be paid by the Electric Power Research Institute (EPRI) under a separate contract between EPRI and Unisearch. As proposed herein, the ARB would have a separate contract with Unisearch for a total amount not to exceed $23,322 and with a budget summary as shown in the attachment.

The principal investigator would be Dr. Harold Schiff of Unisearch Associates, Inc.

BUDGET SUMMARY

Unisearch Associates, Inc.

"Participation in the Carbonaceous Species Methods Comparison Study: Tunable Diode Laser Absorption Spectrometer Measurements of HCHO and H_2O_2"

BUDGET ITEMS*:

Salaries	$12,285	
Equipment Rental	5,000	
Other Costs	500	
TOTAL, Direct Costs		$17,785
TOTAL, Indirect Costs		5,537
TOTAL PROJECT COST		$23,322

* In addition to $23,322 from the ARB allocated as shown above, $21,000 of funding from the Electric Power Research Institute (EPRI), provided under a separate contract between EPRI and Unisearch, will be used for transportation ($12,680) and overhead ($8,320).

State of California
AIR RESOURCES BOARD

Resolution 86-54
May 22, 1986

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 1421-126, entitled "Coordinated Multidisciplinary Research Program on Carbon Monoxide Health Effects," has been submitted by the University of California, Irvine;

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 1421-126, entitled "Coordinated Multidisciplinary Research Program on Carbon Monoxide Health Effects," submitted by the University of California, Irvine for a total amount not to exceed $157,493.

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 1421-126, entitled "Coordinated Multidisciplinary Research Program on Carbon Monoxide Health Effects," submitted by the University of California, Irvine for a total amount not to exceed $157,493.

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 $157,493.

I hereby certify that the above is a true and correct copy of Resolution 86-54 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (9)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1421-126 entitled "Coordinated Multidisciplinary Research Program on Carbon Monoxide Health Effects."

RECOMMENDATION: Adopt Resolution 86-54 approving Proposal No. 1421-126 for funding in an amount not to exceed $199,166.

SUMMARY: The scientific basis for the State and Federal ambient air quality standards for carbon monoxide (CO) has recently come under close scrutiny. The main impetus in recent research has been to replicate earlier findings in patients prone to developing angina pectoris, but the results of that research have raised some concerns about current knowledge of CO effects. This project is to fund a diverse group of investigators at UC Irvine, headed by Dr. Michael Kleinman, to begin a coordinated and thorough study of the effects of CO. This work is planned as the first year of a two-year study.

The first objective of the project is to resolve problems with techniques for measuring carboxyhemoglobin (COHb) by improving protocols for operating an instrument widely used for this purpose and by evaluating a new and promising instrumental approach for COHb measurement. The second objective is to evaluate factors that contribute to differences in COHblevels in different individuals by performing a thorough literature survey regarding the distribution of key physiological parameters in various parts of the population.

The third objective is to characterize populations with problems of heart rhythm. The investigators will review the scientific literature and the results of a previous clinical study in order to design studies to investigate the effect of CO on the development of cardiac rhythm problems in susceptible individuals. The fourth objective is to evaluate the influence of dose and dose rate on observed changes in the time of onset and duration of angina pain. This work is important in investigating criticisms of present protocols of presenting high exposures of CO to test subjects.

The fifth objective is to conduct detailed cardiac tests of angina patients during CO exposure in order to investigate the physiological mechanisms that produce the pain. The final objective is to obtain in vitro measurement of CO effects on the function and metabolism of heart muscle.

The results of this study would be useful in assessing effects of CO on ischemic heart disease, the basis of the current ambient CO standards. In addition, it would more fully elucidate the mechanism through which relatively small amounts of CO produce such profound effects on heart muscle tissue. Current theories cannot fully account for this observation. A more complete understanding of the mechanism would place our ambient air quality standards on a much firmer scientific basis.

BUDGET SUMMARY

University of California, Irvine

"Coordinated Multidisciplinary Research Program on Carbon Monoxide Health Effects"

BUDGET ITEMS:

Salaries	$ 103,796	
Benefits	28,769	
Supplies	9,177	
Other Costs	19,700	
Travel	-0-	
Equipment*	21,580	
TOTAL, Direct Costs		$ 183,022
TOTAL, Indirect Costs		16,144
TOTAL PROJECT COST		$ 199,166

*Beckman rectilinear recorder	$ 4,500
Beckman UV/VIS accessories	3,000
Van Slyke apparatus	2,200
Reduction gas analyzer	11,880

State of California
AIR RESOURCES BOARD

Resolution 86-55
May 22, 1986

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 1394-125, entitled "Testing of Low-Solvent Air-Dried Coatings for Miscellaneous Metal Parts and Coatings," has been submitted by Calcoast Analytical Labs;

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 1394-125, entitled "Testing of Low-Solvent Air-Dried Coatings for Miscellaneous Metal Parts and Coatings," submitted by Calcoast Analytical Labs for a total amount not to exceed $74,850.

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 1394-125, entitled "Testing of Low-Solvent Air-Dried Coatings for Miscellaneous Metal Parts and Coatings," submitted by Calcoast Analytical Labs for a total amount not to exceed $74,850.

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 $74,850.

I hereby certify that the above is a true and correct copy of Resolution 86-55 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-5-4 (b) (10)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1394-125 entitled "Testing of Low-Solvent Air-Dried Coatings for Miscellaneous Metal Parts and Coatings"

RECOMMENDATION: Adopt Resolution 86-55 approving Proposal No. 1394-125 for funding in an amount not to exceed $74,850.

SUMMARY: Many local air pollution control districts have adopted regulations limiting the amount of photochemically reactive organic compounds contained in coatings for metal parts. However, it is uncertain whether low-solvent coatings that meet district regulations can provide acceptable performance.

The objectives of this study are to obtain from paint manufacturers and suppliers a range of metal coating products which meet the solvent limits of district rules, and to compare the performance of those coatings against traditional high-solvent products to see if substitution of coatings is possible without significant compromise of performance.

Calcoast would test coatings using a protocol that conforms to applicable ASTM procedures, military specifications, where appropriate, and Federal Test Method Standards (141B) for coatings and solvents. Following these protocols, Calcoast will determine specified physical properties, composition and coating performance by various measures.

This study would be conducted by Calcoast Analytical Labs and the principal investigator would be D. Patrick Fairley, and Calcoast would be assisted by its consultant, Mr. Ron Joseph.

State of California
AIR RESOURCES BOARD

Resolution 86-57
May 22, 1986

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 1426-126b, entitled "Southern California Air Quality Study: Installation and Operation of Type B Stations," has been submitted by AeroVironment, 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 1426-126b, entitled "Southern California Air Quality Study: Installation and Operation of Type B Stations," submitted by AeroVironment, Inc. for an amount not to exceed $540,500.

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 1426-126b, entitled "Southern California Air Quality Study: Installation and Operation of Type B Stations," submitted by AeroVironment, Inc. for an amount not to exceed $540,500.

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 $540,500.

I hereby certify that the above is a true and correct copy of Resolution 86-57 as adopted by the Air Resources Board.

Utako Fujimura
for Harold Holmes, Board Secretary

ITEM NO.: 86-6-4 (b)(11)
DATE: May 22, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1426-126b entitled "Southern California Air Quality Study: Installation and Operation of Type B Stations"

RECOMMENDATION: Adopt Resolution 86-57 approving proposal 1426-126b for funding in an amount not to exceed $540,500.

SUMMARY: The Air Resources Board is sponsoring a multi-year integrated air quality study in the South Coast Air Basin, which is scheduled to begin in July of 1987. The overall objective of that program is to develop a comprehensive meteorologic and aerometric data base for improved air quality simulation models for PM_{10} and oxidants in the South Coast Air Basin. The backbone of the study is a network of approximately nine specially equipped air quality monitoring stations located throughout the basin in such a way as to permit detailed study of an air parcel from offshore at a site such as San Nicolas Island, through areas of heavy mobile source and industrial emissions, along a trajectory ending at a far downwind receptor area such as Riverside.

To accomplish this task in a cost-effective manner, existing air quality monitoring stations operated by the South Coast Air Quality Management District will be equipped with additional instrumentation and equipment to make detailed measurements of both primary and secondary gaseous pollutants and reaction intermediates and of the the detailed composition of size-resolved aerosol particles.

The purpose of this contract is to provide for the design of a prototype air quality monitoring station, and upon satisfactory building and demonstration of the prototype by STI under a separate, complementary project, and in cooperation with Combustion Engineering (to be funded under a separate contract), to install the equipment in up to nine existing SCAQMD stations; to acquire and train personnel to operate the stations; and to collect samples during the two intensive sampling periods, one during the summer of 1987 and the other during the late fall/early winter of 1987-88. The contractors will write a final report and prepare a computer-readable data base of meteorologic and aerometric data collected under the terms of this contract.

The principal investigator for AeroVironment is Mr. Michael Chan.

BUDGET SUMMARY

AeroVironment

"South Coast Air Quality Study: Installation and Operation of Type B Stations"

	TASK 1	TASK 2	TASK 3	TASK 4	TASK 5	TASK 7	TOTAL
1. Direct Labor	2,642	11,793	28,514	19,014	60,306	16,833	139,105
2. D.L.O. (120% of #1)	3,170	14,152	34,217	22,820	73,367	20,200	166,926
3. Materials*	0	7,500	10,200	0	3,300	0	21,000
4. Transportation**	0	100	6,600	1,400	6,100	1,000	15,200
5. Per Diem**	0	0	750	0	6,750	0	7,500
6. Temporary Labor***	0	0	0	9,000	47,920	0	56,920
7. G & A (20% of 1 thru 6)	1,162	6,709	16,056	10,447	39,349	7,607	81,330
8. Fee (9% of 1 thru 7)	628	3,623	8,670	5,642	21,248	4,108	43,918
9. Equipment Use ****					8,600		8,600
TOTAL	7,603	43,876	105,007	68,327	265,940	49,747	540,500

*MATERIALS	TASK 2	Use of aerosol calibration system $3,000
		Misc. materials and parts $200/station x 9 stations = $1800
	TASK 3	Misc. site preparation costs $500/site x 9 sites = $4,500
		Packing and shipping to return borrowed equipment $2,000
		Calibration gases $900
		Misc. supplies $200/site x 9 sites = $1,800
		Spare/repair parts $1,000
	TASK 5	Misc. operating supplies $200/site x 9 sites = $1,800
**TRANSPORTATION	TASK 2	Truck rental $100
	TASK 3	Air fare to offshore island monitoring site
		6 rt at $100 = $600
		Mileage 10,000 miles @ .50/mile = $5,000
		Truck rental $1,000
		Per Diem 10 days @ $75/day = $750
	TASK 4	Air fare to offshore island monitoring site
		4 rt at $100 = $400
		Mileage 2,000 miles @ .50/mile = $1,000
	TASK 5	Air fare to offshore island monitoring site
		8 rt at $100 = $800
		Mileage 10,000 miles @ .50/mile = $5,000
		Vehicle rental 6 days @ $50/day = $300
		Per Diem 90 days @ $75/day = $6,750
	TASK 7	Air fare 5 rt to Sacramento @ $150 = $750
		Car rental 5 days @ $50 = $250
***TEMPORARY LABOR	TASK 4	Training of site technicians 600 hrs. @ $15/hr=$9,000
	TASK 5	Site Technicians 2,528 hrs. @ $15/hr = $37,920
		Overtime premium 800 hrs @ $5/hr+
		800 hrs @ $7.50/hr = $10,000
*** EQUIPMENT USE	TASK 5	VAX Computer 38 CPU hrs @ $150/hr + 380 connect hrs. @ $5/hr = $7,600
		Mass flow calibrators for QA = $1,000

SUMMARY OF TASKS

AeroVironment, Inc.

"Southern California Air Quality Study: Installation and Operation of Type B Stations"

Task 1 - Program Plan

Review and help finalize Type B site program plan.

Task 2 - Aerosol Sizing and Data Acquisition Systems

Help design prototype system.

Install and test for one week prototype system at Type B site after STI/EMSI have finalized and lab tested design.

Construct and test eight duplicates of prototype system with equipment provided by EMSI.

Task 3 - Site Preparation

Survey and prepare nine sites assuming SCAQMD provides adequate space and power.

Install and test eight additional sites for summer study.

Tear down all sites (4 after summer study, 5 after winter study).

Task 4 - Training

Prepare station operation manuals and SOPs.

Train site operators for summer and winter study.

Task 5 - Operation

Operate 9 Type B sites in summer study for up to 12 measurement days in a six-week period and 5 Type B sites in winter study for up to 7 measurement days in a four-week period.

Process continuous and analytical data, eliminating invalid data based on site operations, and produce data set in format specified by ARB.

Task 7 - Project Meetings

Attend 6 project meetings at AV and 5 meetings at ARB, Sacramento.