

State of California  
AIR RESOURCES BOARD

Resolution 86-87  
October 23, 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 1453-129, entitled "The Fate of Hexavalent Chromium in the Atmosphere," has been submitted by Research Triangle Institute;

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 1453-129, entitled "The Fate of Hexavalent Chromium in the Atmosphere," submitted by Research Triangle Institute, for a total amount not to exceed \$168,511.

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 1453-129, entitled "The Fate of Hexavalent Chromium in the Atmosphere," submitted by Research Triangle Institute, for a total amount not to exceed \$168,511.

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 \$168,511.

I hereby certify that the above is a true and correct copy of Resolution 86-87, as adopted by the Air Resources Board.

  
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Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (1)  
DATE: October 23, 1986

State of California  
AIR RESOURCES BOARD

- ITEM: Research Proposal No. 1453-129 entitled "The Fate of Hexavalent Chromium in the Atmosphere"
- RECOMMENDATION: Adopt Resolution 86-87 approving Proposal No. 1453-129 for funding in an amount not to exceed \$168,511.
- SUMMARY: Hexavalent chromium has been identified by the Air Resources Board as a toxic air contaminant. Airborne hexavalent chromium, Cr(VI), may be transformed to the less toxic trivalent chromium, Cr(III), and it may settle out of the air as particulate matter or be washed out with precipitation. However, the rates at which these removal processes occur are not well established.
- The primary objective of this study is to establish the rates of reduction of Cr(VI) to Cr(III) in ambient air. Additionally, the investigator will determine the likelihood of Cr(III) oxidation to Cr(VI) in the atmosphere. The Air Resources Board staff anticipates using the results of this study to model the airborne concentrations of chromium downwind of emission sources.
- The proposed study incorporates laboratory work to develop or refine necessary analytical methods for chromium; a simulation of atmospheric chemistry processes to obtain order of magnitude conversion rates necessary for field study design; and field work at three chromium emission sources to establish reaction rates for Cr(VI) and Cr(III) interconversion and/or removal processes.
- The study will be conducted by Research Triangle Institute. The principal investigator is William F. Gutknecht. Entropy Environmentalists will be subcontracted to conduct the field work, under the direction of William DeWees.

State of California  
AIR RESOURCES BOARD

Resolution 86-88  
October 23, 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 1445-129, entitled "Southern California Air Quality Study (SCAQS) - Aircraft Measurements," 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 1445-129, entitled "Southern California Air Quality Study (SCAQS) - Aircraft Measurements," submitted by Sonoma Technology, Inc., for a total amount not to exceed \$275,000.

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 Research Screening Committee and approves the following:

Proposal Number 1445-129, entitled "Southern California Air Quality Study (SCAQS) - Aircraft Measurements," submitted by Sonoma Technology, Inc., for a total amount not to exceed \$275,000.

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 \$275,000.

I hereby certify that the above is a true and correct copy of Resolution 86-88, as adopted by the Air Resources Board.

  
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Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (2)  
DATE: October 23 1986

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1445-129 entitled "Southern California Air Quality Study (SCAQS) - Aircraft Measurements."

RECOMMENDATION: Adopt Resolution 86-88 approving Proposal No. 1445-129 for funding in an amount not to exceed \$275,000.

SUMMARY: The Southern California Air Quality Study (SCAQS) is a multi-year, integrated air quality study whose overall goal is to develop a comprehensive and properly archived air quality and meteorological data base for the South Coast Air Basin (SoCAB) 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. The study will take place in the SoCAB during the summer of 1987 for 12 intensive sampling days and seven intensive sampling days during the winter of 1987-1988. Existing air quality monitoring locations in the SoCAB will be used for surface based measurements. Aircraft will be used to complete the three-dimensional data base that is required.

The purpose of this project is to make the required aircraft measurements during the SCAQS program. Approximately 160 hours of flying time will be used for spiral flight patterns by one aircraft, to make gaseous criteria pollutant measurements on the intensive study days. The additional air sampling aloft that is needed for SCAQS will be conducted under a separate ARB contract with the University of Washington. University of Washington will fly "orbits" with a larger, heavily instrumental aircraft to collect filter samples of cloud water and acidic species. Together, these two projects will provide the spatial and temporal resolution required for adequate characterization of air quality aloft during SCAQS.

The principal investigator for this project will be Jerry Anderson and the contractor will be Sonoma Technology, Inc.

B U D G E T   S U M M A R Y

Sonoma Technology, Inc.

"Southern California Air Quality Study (SCAQS) -  
Aircraft Measurements"

BUDGET ITEMS:

Salaries	\$78,028
Supplies and Equipment*	81,041
Aircraft Mechanic	1,370
Other Costs (Publications and Phone)	1,841
Travel	<u>18,412</u>

TOTAL, Direct Costs	\$180,692
TOTAL, Indirect Costs	<u>94,308</u>

<u>TOTAL PROJECT COST</u>	<u>\$275,000</u>
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* Purchased Parts	
Calibration Supplies, Filter Media, Shipping	\$ 5,879
Subcontracted Items	
Filter Analyses	6,337
PAN, carbonyl, H <sub>2</sub> O <sub>2</sub> analysis	9,617
Standard Commercial Items	
Aztec Aircraft (160 hrs. at \$180/hr)	28,980
Computer	2,700
Aircraft Data System	2,400
Air Quality Measurements (NO <sub>x</sub> , SO <sub>2</sub> , meteorology meas., etc.)	23,630
Inverters	1,400
Air Conditioners	98

State of California  
AIR RESOURCES BOARD

Resolution 86-89  
October 23, 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 1444-129, entitled "Southern California Air Quality Study: Meteorology Support Program," has been submitted by Technical and Business Systems;

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:

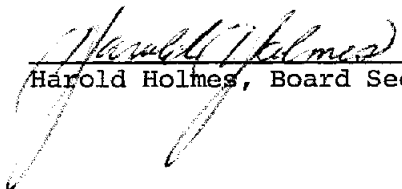
Proposal Number 1444-129, entitled "Southern California Air Quality Study: Meteorology Support Program," submitted by Technical and Business Systems, for a total amount not to exceed \$329,148.

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 1444-129, entitled "Southern California Air Quality Study: Meteorology Support Program," submitted by Technical and Business Systems, for a total amount not to exceed \$329,148.

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 \$329,148.

I hereby certify that the above is a true and correct copy of Resolution 86-89, as adopted by the Air Resources Board.

  
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Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (3)  
DATE: October 23, 1986

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1444-129 entitled "Southern California Air Quality Study: Meteorology Support Program."

RECOMMENDATION: Adopt Resolution 86-89 approving Proposal No. 1444-129 for funding in an amount not to exceed \$329,148.

SUMMARY: The purpose of this research proposal is to provide for the collection and analysis of a comprehensive set of core meteorological data in support of SCAQS.

The contractor proposes to operate a RAWINSONDE upper air monitoring network at four locations in the SoCAB which will measure pressure, wind, temperature, and humidity aloft. The contractor will also measure winds aloft at three additional locations using the pilot-balloon (PIBAL) method. Surface meteorological data, including winds and temperature, will be collected at three locations for a period of three months. Surface and upper-air data will be logged and checked for complete documentation and presented in tables, plotted on graphs, and stored on magnetic tape. Quality control steps will be taken to assure data reliability. In addition, analysis of the meteorological conditions during each intensive study day will be provided for a comprehensive overview of the atmospheric conditions that affect air pollution concentrations. Final revisions, if any, to this proposed study plan will be made by the ARB with the advice and consultation of other sponsors of SCAQS.

The principal investigator for this study will be Donald Lehrman of Technical and Business Systems.

State of California  
AIR RESOURCES BOARD

Resolution 86-90  
October 23, 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 1426-127A, entitled "Southern California Air Quality Study: Refurbishment and Calibration of Borrowed Instrumentation and Equipment for B Sites," 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:

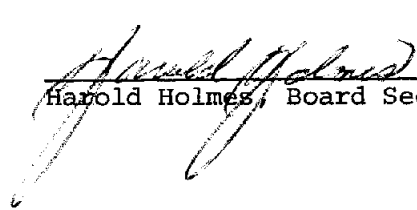
Proposal Number 1426-127A, entitled "Southern California Air Quality Study: Refurbishment and Calibration of Borrowed Instrumentation and Equipment for B Sites," submitted by AeroVironment, Inc., for a total amount not to exceed \$48,409.

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 1426-127A, entitled "Southern California Air Quality Study: Refurbishment and Calibration of Borrowed Instrumentation and Equipment for B Sites," submitted by AeroVironment, Inc., for a total amount not to exceed \$48,409.

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 \$48,409.

I hereby certify that the above  
is a true and correct copy of  
Resolution 86-90, as adopted by  
the Air Resources Board.

  
Harold Holmes, Board Secretary



ITEM NO.: 86-12-3 (b) (4)  
DATE: October 23, 1986

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1426-127A entitled Southern California Air Quality Study: Refurbishment and Calibration of Borrowed Instrumentation and Equipment for B Sites."

RECOMMENDATION: Adopt Resolution 86-90 approving Proposal No. 1426-127A for funding in an amount not to exceed \$48,409.

SUMMARY: This proposal provides for the refurbishment, calibration and construction of aerosol sizing instrumentation which will be used at several of the nine sampling locations. Electrical aerosol analyzers will be used to classify particles into approximately ten size cuts less than 1 um diameter. Optical particle counters will provide size distribution data for particles with diameters greater than 1 um diameter. Nephelometers will be used to measure light scattering properties of airborne particles, which is consistent with the Board's resolution of September 1986 regarding visibility and the need to provide instrumental measurements of light extinction as a part of the SCAQS. This collection of equipment will form the heart of the aerosol sizing instrumentation at each of the Type B stations in the SCAQS network.

The purpose of this proposal is to purchase and/or refurbish loaned aerosol sampling equipment, to be made available during the SCAQS field effort, at minimal cost to the ARB. Where new equipment is needed, Sonoma Technology will, under a separate research proposal, purchase that equipment with no overhead cost to ARB.

The principal investigator for this contract is David Wilbur and the contractor is AeroVironment.

B U D G E T   S U M M A R Y

AeroVironment, Inc.

"Southern California Air Quality Study: Refurbishment  
and Calibration of Borrowed Instrumentation and Equipment for B Sites"

BUDGET ITEMS:

Salaries	\$ 3,868
Equipment:	
Optical Particle Counters (2)	7,500
Electrical Aerosol Analyzers (2)	4,000
Nephelometers (9)	9,000
Printers (8)	2,000
Misc. Parts	4,000
Shipping Costs	<u>2,000</u>
 TOTAL, Direct Costs	 \$ 32,368
TOTAL, Indirect Costs	<u>16,041</u>
 <u>TOTAL PROJECT COST</u>	 <u>\$ 48,409</u>

State of California  
AIR RESOURCES BOARD

Resolution 86-91  
October 23, 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 1464-130, entitled "Southern California Air Quality Study: Purchase of Additional Instrumentation and Equipment that is needed for B Sites," 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:

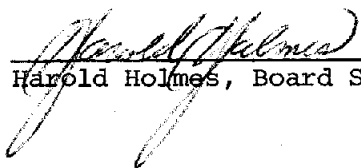
Proposal Number 1464-130, entitled "Southern California Air Quality Study: Purchase of Additional Instrumentation and Equipment that is needed for B Sites," submitted by Sonoma Technology, Inc., for a total amount not to exceed \$44,800.

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 1464-130, entitled "Southern California Air Quality Study: Purchase of Additional Instrumentation and Equipment that is needed for B Sites," submitted by Sonoma Technology, Inc., for a total amount not to exceed \$44,800.

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 \$44,800.

I hereby certify that the above  
is a true and correct copy of  
Resolution 86-91, as adopted by  
the Air Resources Board.

  
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Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (5)  
DATE: October 23, 1986

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1464-130 entitled "Southern California Air Quality Study: Purchase of Additional Instrumentation and Equipment that is needed for B Sites."

RECOMMENDATION: Adopt Resolution 86-91 approving Proposal No. 1464-130 for funding in an amount not to exceed \$44,800.

SUMMARY: This proposal provides for the procurement of aerosol sizing instrumentation which will be used at several of the nine type B sampling locations in the SCAQS network.

The purpose of this proposal is to purchase optical particle counters and associated data acquisition systems for aerosol sampling equipment, to be made available during the SCAQS field effort, at minimal cost to the ARB. As provided under a separate proposal from AeroVironment, borrowed equipment, where available, will be refurbished and calibrated by AV. Under this proposal, remaining equipment needs will be met by the purchase of equipment, without overhead cost to the ARB, by Sonoma Technology, Inc.

The principal investigator will be 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: Purchase of Additional  
Instrumentation and Equipment that is needed for B Sites"

BUDGET ITEMS:

Equipment Purchase:

Optical Particle Counters (2)	\$26,000
Data Acquisition Systems (8)	8,000
A-D Converter Cards (8)	3,600
Multichannel Analyzers (4)	<u>7,200</u>

TOTAL, Direct Costs	\$44,800
TOTAL, Indirect Costs	<u>    0    </u>

TOTAL PROJECT COST      \$44,800  
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This project, together with the proposal from AV to refurbish equipment, will provide the following equipment for use during SCAQS: 4 optical particle counters, 2 electrical aerosol analyzers, 9 nephelometers, 8 printers, 8 A-D converter cards, 4 multichannel analyzers, and related peripherals.

State of California  
AIR RESOURCES BOARD

Resolution 86-92  
October 23, 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 1440-129, entitled "Southern California Air Quality Study: Peroxyacetyl Nitrate (PAN) Measurements at Class B Stations," has been submitted by Daniel Grosjean and 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 1440-129, entitled "Southern California Air Quality Study: Peroxyacetyl Nitrate (PAN) Measurements at Class B Stations," submitted by Daniel Grosjean and Associates, Inc., for a total amount not to exceed \$34,302.

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 1440-129, entitled "Southern California Air Quality Study: Peroxyacetyl Nitrate (PAN) Measurements at Class B Stations," submitted by Daniel Grosjean and Associates, Inc., for a total amount not to exceed \$34,302.

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 \$34,302.

I hereby certify that the above  
is a true and correct copy of  
Resolution 86-92, as adopted by  
the Air Resources Board.

  
Harold Holmes, Board Secretary

ITEM NO.: 86-12-3 (b) (6)  
DATE: October 23, 1986

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1440-129 entitled "Southern California Air Quality Study: Peroxyacetyl Nitrate (PAN) Measurements at Class B Stations."

RECOMMENDATION: Adopt Resolution 86-92 approving Proposal No. 1440-129 for funding in an amount not to exceed \$34,302.

SUMMARY: The objective of this proposal is to provide peroxyacetyl nitrate (PAN) measurements at the nine SCAQS Class B stations during nineteen comprehensive study days in 1987. PAN is an eye irritant, an atmospheric mutagen, and a phytotoxicant, and it is a significant fraction of the atmospheric nitrogen budget in polluted urban air. PAN is not currently monitored at the South Coast Air Quality Management District monitoring locations, and this effort will be the first ever to measure PAN spatially throughout the South Coast Air Basin over a number of days.

The data obtained from this study will be used in the development and validation of the next generation of air quality simulation models for oxidant and PM<sub>10</sub> in the South Coast Air Basin.

The principal investigator for this study is Dr. Daniel Grosjean of Daniel Grosjean and Associates, Inc.

State of California  
AIR RESOURCES BOARD

Resolution 86-93  
October 23, 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 1458-129, entitled "Study of Ambient Concentrations of Chlorinated Dibenzodioxins and Dibenzofurans in Urban Areas in the South Coast Air Basin," has been submitted by the Environmental Research and 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:

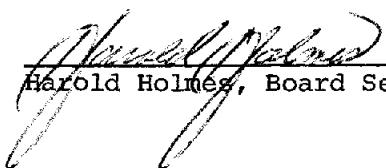
Proposal Number 1458-129, entitled "Study of Ambient Concentrations of Chlorinated Dibenzodioxins and Dibenzofurans in Urban Areas in the South Coast Air Basin," submitted by the Environmental Research and Technology, Inc., for a total amount not to exceed \$167,577.

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 1458-129, entitled "Study of Ambient Concentrations of Chlorinated Dibenzodioxins and Dibenzofurans in Urban Areas in the South Coast Air Basin," submitted by the Environmental Research and Technology, Inc., for a total amount not to exceed \$167,577.

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 \$167,577.

I hereby certify that the above is a true and correct copy of Resolution 86-93, as adopted by the Air Resources Board.

  
Harold Holmes, Board Secretary



ITEM NO.: 86-12-3 (b) (7)  
DATE: October 23, 1986

State of California  
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1458-129 entitled "Study of Ambient Concentrations of Chlorinated Dibenzodioxins and Dibenzofurans in Urban Areas in the South Coast Air Basin."

RECOMMENDATION: Adopt Resolution 86-93 approving Proposal No. 1458-129 for funding in an amount not to exceed \$167,577.

SUMMARY: The purpose of this project is to determine baseline qualitative and quantitative data on the concentrations of certain chlorinated dioxins and furans in ambient air. These data will be used by the ARB and others for both health assessment purposes and to compare current concentrations with future concentrations.

Certain chlorinated dibenzodioxins and dibenzofurans have been determined by the Air Resources Board to be toxic air contaminants subject to review and possible regulation in accordance with Section 39650, et seq. of the California Health and Safety Code. The dioxin and furan compounds of concern are the tetra-, penta-, hexa- and heptachloro derivatives.

The ARB has identified the need for background monitoring data to determine current population exposures and to provide a base of concentrations for assessing effects of future emissions from new sources. The most probable sources for the formation and/or synthesis of these toxic air pollutants are incinerators and boilers burning chlorinated industrial wastes and municipal refuse incinerators. Currently, no monitoring data for dioxins or furans have been reported for California.

The principal investigator for this project will be Dr. Alan Lloyd. The contractor will be Environmental Research and Technology, Inc.

B U D G E T   S U M M A R Y

Environmental Research and Technology, Inc.

"Study of Ambient Concentrations of Chlorinated Dibenzodioxins  
and Dibenzofurans in Urban Areas in the South Coast Air Basin"

BUDGET ITEMS:

Salaries <sup>1</sup>	\$14,350	
Supplies <sup>1</sup>	10,600	
Travel	3,175	
Other Costs <sup>2</sup>	7,100	
Subcontractor <sup>3</sup>	<u>89,300</u>	
TOTAL, Direct Costs		\$124,525
TOTAL, Indirect Costs		<u>43,052</u>
	<u>TOTAL PROJECT COST</u>	<u>\$167,577</u>

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- 1 Laboratory and Sampling Supplies
  - 2 Computer, Shipping, Postage, Reports
  - 3 Subcontract with ENSECO-CAL  
for Analysis of 80 Samples