State of California
AIR RESOURCES BOARD

Resolution 86-72
August 21, 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 1435-128, entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California," has been submitted by Sierra Research, 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 1435-128, entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California," submitted by Sierra Research, Inc. for a total amount not to exceed $29,638.

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 1435-128, entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California," submitted by Sierra Research, Inc. for a total amount not to exceed $29,638.

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 $29,638.

I hereby certify that the above is a true and correct copy of Resolution 86-72 as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-10-4 (b) (1)
DATE: August 21, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1435-128 entitled "Analysis of the 1982 Truck Inventory and Use Survey Data for California."

RECOMMENDATION: Adopt Resolution 86-72 approving Proposal No. 1435-128 for funding in an amount not to exceed $29,638.

SUMMARY: Approximately ten percent of the heavy-duty vehicles (HDVs) registered in the U.S. are based in California. HDVs encompass a broad range of weight categories and major use applications in both urban and rural areas of the state. Of primary interest to the ARB are: 1) the contribution of these HDV classes to emissions and air quality in urban areas, and 2) the contribution of trucks based outside the state to emission in California. The 1982 Truck Inventory and Use Survey (TIUS) data collected by the U. S. Bureau of the Census, together with other information and some data processing, can be used to address these concerns.

Data provided by this study would be used by the ARB staff to upgrade the State's emission inventory for HDVs and to assist in developing future emission standards and an inspection and maintenance program for HDV's.

The recommended contractor is Sierra Research, Inc. and the principal investigator would be Mr. Robert Dulla.

State of California
AIR RESOURCES BOARD

Resolution 86-73
August 21, 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 1436-128, entitled "Development of Inspection and Maintenance Procedures for Diesel-Powered Heavy-Duty Vehicles", has been submitted by the 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 1436-128, entitled "Development of Inspection and Maintenance Procedures for Diesel-Powered Heavy-Duty Vehicles", submitted by the Radian Corporation for a total amount not to exceed $19,600.

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 1436-128, entitled "Development of Inspection and Maintenance Procedures for Diesel-Powered Heavy-Duty Vehicles", submitted by the Radian Corporation for a total amount not to exceed $19,600.

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 $19,600.

I hereby certify that the above is a true and correct copy of Resolution 86-73 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-10-4 (b) (2)
DATE: August 21, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1436-128 entitled "Development of Inspection and Maintenance Procedures for Diesel-Powered Heavy-Duty Vehicles."

RECOMMENDATION: Adopt Resolution 86-73 approving Proposal No. 1436-128 augmenting funding for Contract A4-151-32 in an amount not to exceed $19,600 (original funding $99,798).

SUMMARY: The current program to develop inspection and maintenance procedures for diesel-powered heavy-duty vehicles is well underway. The contractor, Radian Corporation, has completed a preliminary estimate of the magnitude of the emissions from smoke emitting diesel vehicles and is currently involved in validating test procedures to relate emissions from these vehicles to poor maintenance practices and/or tampered emission controls. In order to establish a sound statistical basis for this relationship, the contractor has recommended a more extensive testing procedure than contemplated in the original contract. This procedure involves selecting ten vehicles with excessive smoke emissions and then measuring emissions of criteria pollutants from these vehicles (at random using the contractor developed smoke opacity test procedure) using a 14-mode dynamometer test procedure. The actual testing would be conducted by ARB staff at the Haagen-Smit Laboratory. The contractor would observe the testing and utilize the resulting data to relate excessive emissions to poor maintenance and/or tampered emission controls.

In addition, the contractor would obtain and analyze an unpublished data set collected by the New York City Department of Environmental Protection using transient chassis and smoke tests on more than 50 diesel buses. These data would provide the ARB with a more sound statistical basis for relating smoke emissions to vehicle defects.

Radian's participation in the dynamometer testing and analysis of NYCDEP's data, although closely related to the original contract and current effort, is beyond the scope of the original contract. Therefore, Radian has submitted a proposal for $19,600 to perform this added effort. The Research Screening Committee has reviewed the proposal and recommends funding the contract augmentation. Mr. Christopher Weaver would continue as the principal investigator for the study.

# BUDGET SUMMARY

Radian Corporation

"Development of Inspection and Maintenance Procedures
for Diesel-Powered Heavy-Duty Vehicles"
Contract Number A4-151-32

BUDGET ITEMS:

| | | |
|---|---|---|
| Salaries | $5668 | |
| Travel | 2520 | |
| Smokemeter Rental | 300 | |
| Supplies | 259 | |
| TOTAL, Direct Costs | | $ 8,747 |
| TOTAL, Indirect Costs | | 10,853 |
| | AMENDED COST | $ 19,600 |

| | |
|---|---|
| Original Project Cost | $ 99,798 |
| Cost of this Amendment | 19,600 |
| Total Project Cost | $119,398 |

State of California
AIR RESOURCES BOARD

Resolution 86-74
August 21, 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 1433-128, entitled "Chronic Physiological, Growth, and Productivity Effects of Photochemical Oxidants or $SO_2$ on Trees: Valencia Oranges (Citrus sinensis)," 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 1433-128, entitled "Chronic Physiological, Growth, and Productivity Effects of Photochemical Oxidants or $SO_2$ on Trees: Valencia Oranges (Citrus sinensis)," submitted by the University of California, Riverside, for a total amount not to exceed $86,978.

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 1433-128, entitled "Chronic Physiological, Growth, and Productivity Effects of Photochemical Oxidants or $SO_2$ on Trees: Valencia Oranges (Citrus sinensis)," submitted by the University of California, Riverside, for a total amount not to exceed $86,978.

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 $86,978.

I hereby certify that the above is a true and correct copy of Resolution 86-74 as adopted by the Air Resources Board.

Harold Holmes, Board Secretary

ITEM NO.: 86-10-4 (b) (3)
DATE: August 21, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1433-128 entitled "Chronic Physiological, Growth, and Productivity Effects of Photochemical Oxidants or $SO_2$ on Trees: Valencia Oranges (Citrus sinensis)."

RECOMMENDATION: Adopt Resolution 86-74 approving Proposal No. 1433-128 for funding in an amount not to exceed $86,978.

SUMMARY: An ARB funded study to determine the effects of photochemical oxidants and sulfur dioxide on oranges was initiated in early 1983. A grove of forty-two two-year-old Valencia orange trees was planted at the Statewide Air Pollution Research Center, large clear plastic chambers were erected over the trees, and air pollutant exposures begun in May of 1984. The investigator harvested the first representative crop in June, 1986. The current proposal would continue the study for the period from October 1, 1986 to September 30, 1987, with the following experimental treatments: a) filtered air; b) filtered air plus sulfur dioxide at 0.09 ppm; c) fifty percent each ambient air and filtered air; d) ambient air; and 3) outside trees as a check against chamber effects. The investigator will measure tree growth, fruit yield and quality, and a numer of physiological variables to determine possible physiological bases for any growth and yield effects, and to identify physiological variables which would be most useful in assessing plant response to air pollutants under field conditions. The investigator will continue to monitor environmental conditions to determine if there are differences between chamber and outside environments which may affect plant response, and to provide a basis for comparisons of plant response to pollutants in different years and for extrapolating to other sites. The investigator will also perform several biochemical analyses to determine if changes in biochemistry are indicative of long-term plant response to air pollution exposure.

The lack of pollutant dose-yield response information for tree crops is a significant information gap with respect to ARB's efforts in assessment of crop losses caused by air pollution. This study will provide valuable information on the response of orange trees to oxidants and to sulfur dioxide, and it will help to determine if the year to year carryover of pollutant effects observed in grapes occurs in other perennial crop species. Understanding long term biochemical changes may provide a way to apply results to other tree crop species by determining how air pollution affects the same biochemical variables in those other species.

The contractor would be the University of California, Riverside and the principal investigator would be Dr. David Olszyk.

# BUDGET SUMMARY

University of California, Riverside

"Chronic Physiological Growth,and Productivity Effects of Photochemical Oxidants or $SO_2$ on Trees: Valencia Oranges (Citrus sinensis)"

BUDGET ITEMS:

| | | |
|---|---|---|
| Salaries | $42,004 | |
| Benefits | 11,987 | |
| Equipment | 820 | |
| Supplies | 1,000 | |
| Other Costs | 21,771* | |
| Travel | 1,563 | |
| TOTAL, Direct Costs | | $79,145 |
| TOTAL, Indirect Costs | | 7,833 |
| TOTAL PROJECT COST | | $86,978 |

* Computer, Machine and Electronic Sharp Charges

| | |
|---|---|
| Computer, Machine and Electronic Sharp Charges | $ 1,700 |
| Computer Time - 10 hrs. @ $50/hr | 500 |
| Li-Cor Calibrations - 2 @ $125 | 250 |
| Leaf Elemental Analysis - 132 Samples @ $6/ea | 792 |
| Electricity - 13,427 KW @ $.115/KW | 18,529 |
| | $21,771 |

State of California
AIR RESOURCES BOARD

Resolution 86-75
August 21, 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 1432-128, entitled "Maintain and Operate California Air Resources Board Field Fumigation Facility for Experimental Use," 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 1432-128, entitled "Maintain and Operate California Air Resources Board Field Fumigation Facility for Experimental Use," submitted by the University of California, Riverside for a total amount not to exceed $30,797.

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 1432-128, entitled "Maintain and Operate California Air Resources Board Field Fumigation Facility for Experimental Use," submitted by the University of California, Riverside for a total amount not to exceed $30,797.

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 $30,797.

I hereby certify that the above is a true and correct copy of Resolution 86-75 as adopted by the Air Resources Board.

Harold Holmes

Harold Holmes, Board Secretary

ITEM NO.: 86-10-4 (b) (4)
DATE: August 21, 1986

State of California
AIR RESOURCES BOARD

ITEM: Research Proposal No. 1432-128 entitled "Maintain and Operate California Air Resources Board Field Fumigation Facility for Experimental Use."

RECOMMENDATION: Adopt Resolution 86-75 approving Proposal No. 1432-128 for funding in an amount not to exceed $30,797.

SUMMARY: For several years, the Air Resources Board has been concerned about air pollution damage to California's crops and its native plants. To foster research on the effects of air pollution on California vegetation ARB contracted with the University of California, Riverside, to build, operate, and maintain twenty open-top exposure chambers for plant study. Competent technical people are required to maintain and operate the chambers for the plant investigators who may not be familiar with the complex nature of experimental field exposure systems and air pollution meaurements.

Under the current proposal, routine maintenance procedures would cover both the twenty original open-top chambers, and twenty-eight tree exposure chambers now being used in an ARB funded study of the effects of air pollution on oranges. Combining the maintenance procedures for the two facilities under a single agreement is reasonable since maintenance of both facilities involves the same type of work. Procedures include: maintaining and repairing chambers built with ARB funds; ensuring proper operation and periodic calibration of pollutant dispensing, monitoring, and data collection equipment; performing necessary weed control and soil preparation; and providing instruction, supervision and day-to-day assistance to facility users.

The contractor would be the University of California, Riverside and the principal investigator would be Dr. David Olszyk.