INTRODUCTION

Contained herein for Board review is one resolution and its accompanying summary from the Extramural Research Program recommended to the Board by the Research Screening Committee.

Item 1 is a research proposal from the Research Triangle Institute, entitled "CEC Augmentation to Environmental Health Conditions in Portable Classrooms." The principal investigator will be Dr. Roy Whitmore.
Resolution No. 03-10.

State of California
AIR RESOURCES BOARD

Resolution 03-10

May 22-23, 2003

Agenda Item No.: 03-4-2

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;

WHEREAS, a research proposal, number 2528-229, entitled "CEC Augmentation to Environmental Health Conditions in Portable Classrooms," 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 2528-229 entitled "CEC Augmentation to Environmental Health Conditions in Portable Classrooms," submitted by Research Triangle Institute, for a total amount not to exceed $100,000.

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 2528-229 entitled "CEC Augmentation to Environmental Health Conditions in Portable Classrooms," submitted by Research Triangle Institute, for a total amount not to exceed $100,000.

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, and as described in Attachment A, in an amount not to exceed $100,000.

I hereby certify that the above is a true and correct copy of Resolution 03-10, as adopted by the Air Resources Board.

Stacey Dorais, Clerk of the Board

ATTACHMENT A

"CEC Augmentation to Environmental Health Conditions in Portable Classrooms"

Background

The Air Resources Board (ARB) is currently funding the Research Triangle Institute (RTI) to conduct the field work of the California Portable Classrooms Study in order to examine environmental health conditions in K-12 portable classrooms in California. The Governor and the Legislature directed ARB and the Department of Health Services (DHS) to jointly conduct this study and prepare a report that includes recommendations for preventing indoor environmental quality problems identified in the study. As warranted, the report shall include recommendations to improve the design and construction of buildings, including ventilation specifications; emissions limits for building materials and furnishings; and other relevant factors (Health and Safety Code 39619.6).

The Portable Classrooms Study has yielded a large, comprehensive database on indoor environmental quality and related building characteristics in portable and traditional classrooms in California's K-12 schools. The initial results from the study indicate that a substantial percentage of the classrooms have problems with ventilation systems, noise, thermal comfort, lighting, and other factors related to energy use. A great deal of useful data on these factors, such as the specifics of ventilation systems, window and door usage, and lighting systems, were collected. However, detailed analyses of some of these data were not funded in the initial study. Additional analyses of these data on energy-related building factors are needed to understand their relationships to potential improvements in classroom indoor environmental quality.

The California Energy Commission (CEC) plans to fund these additional analyses. The CEC will need the study results next year as it begins to revise the state building energy efficiency standards, including those for mechanical and natural ventilation in schools. ARB is also working with the Division of the State Architect (DSA), the Office of Public School Construction (OPSC), and other state agencies to improve classroom indoor environmental quality through better design, operation, and maintenance specifications for school buildings. The results of the additional analyses proposed by RTI will be very valuable to these efforts as well.

Objectives

The objectives of this study are to conduct additional analyses of the Portable Classrooms Study data that will:

1) Provide key statistical information on energy- and comfort-related characteristics of portable and traditional classrooms in a statewide, representative sample of public K-12 classrooms.
2) Explore the relationships among major energy-related building factors and indoor environmental quality.

Methods
The investigators will statistically analyze the pertinent data from the Portable Classrooms Study, such as that on heating, ventilating and air-conditioning systems, natural ventilation, and lighting systems. Correlation and regression analyses will be conducted using data weighted to represent the statewide population of schools and classrooms. The investigators will provide basic statistical results for up to 100 building factors that were not analyzed fully in the main study, such as the amount of outdoor air supplied by ventilation systems, contamination of air filters and air conditioner drain pans, and moisture levels in walls, floors, and ceilings. For a subset of these factors, the investigator will explore and quantify the statistical relationships with indoor environmental quality indicators such as measured levels of air pollutants, humidity, temperature, and noise.

Expected Results
The contractor will provide summary statistics for energy-related building factors that were not fully analyzed previously, and quantify and highlight the association of some of those factors with indoor environmental quality problems in classrooms. The contractor will consult with the ARB and CEC staff in selecting the factors for analysis. ARB will use the results to better understand the nature of classroom indoor environmental quality problems, and to refine ARB recommendations to various stakeholders, especially the DSA and OPSC, who are planning to revise the specifications for portable classroom construction. The CEC will use the results to help revise ventilation design standards for school buildings.

Significance to the Board
Poor indoor environmental quality in schools has been linked to reduced student performance and to increased health risks such as asthma and exposure to toxic substances. Because energy conservation efforts and maintenance budget cuts sometimes result in reduced building ventilation and poor indoor air quality, ARB needs detailed information on the factors affecting building ventilation and its relationship to indoor environmental quality in schools. The additional analyses proposed here will help refine ARB's recommendations for classroom design, operation, and maintenance to CEC, DSA, OPSC, school districts, manufacturers, and other decision makers, and may identify actions needed by the Board on indoor and outdoor pollutants.

Contractor:
Research Triangle Institute

Contract Period:
13 months

Principal Investigator (PI):
Roy Whitmore, Ph.D.

Contract Amount:
$100,000

Cofunding:
The California Energy Commission has agreed to fund this project through an interagency agreement; ARB would oversee the study.

Basis for Indirect Cost Rate:
The contractor is using rates approved in a recent federal audit.

Past Experience with this Principal Investigator:
Dr. Whitmore is currently a co-principal investigator for the ARB-funded study of indoor environmental quality in portable classrooms, for which he has submitted a draft final report to ARB. He has previously participated in other major field studies of indoor air quality funded or co-funded by ARB, including field studies of indoor and personal exposure to volatile organic compounds, particulate matter, and polycyclic aromatic hydrocarbons.

Prior Research Division Funding to the Research Triangle Institute:

Year	2002	2001	2000
Funding	$0	$0	$673,879

BUDGET SUMMARY

Research Triangle Institute

CEC Augmentation to Environmental Health Conditions in Portable Classrooms

DIRECT COSTS AND BENEFITS			
1.	Labor and Employee Fringe Benefits	$47,319	
2.	Subcontractors	$ 0	
3.	Equipment	$ 0	
4.	Travel and Subsistence	$ 0	
5.	Electronic Data Processing	$ 0	
6.	Reproduction/Publication	$ 0	
7.	Mail and Phone	$ 200	
8.	Supplies	$ 360	
9.	Analyses	$ 0	
10.	Miscellaneous	$ 0	
	Total Direct Costs		$ 47,879
INDIRECT COSTS			
1.	Overhead	$24,911	
2.	General and Administrative Expenses	$18,108	
3.	Other Indirect Costs	$ 11	
4.	Fee or Profit	$ 9,091	
	Total Indirect Costs		$ 52,121
TOTAL PROJECT COSTS			**$100,000**