State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 07-38

September 27, 2007

Agenda Item No.: 07-9-2

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 2634-257, entitled "Assessing Near-Field Exposures from Distributed Residential Wood Smoke Combustion Sources," has been submitted by the California Polytechnic State University, San Luis Obispo;

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 2634-257, entitled "Assessing Near-Field Exposures from Distributed Residential Wood Smoke Combustion Sources," submitted by the California Polytechnic State University, San Luis Obispo, for a total amount not to exceed $320,286.

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 2634-257, entitled "Assessing Near-Field Exposures from Distributed Residential Wood Smoke Combustion Sources," submitted by the California Polytechnic State University, San Luis Obispo, for a total amount not to exceed $320,286.

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 $320,286.

I hereby certify that the above is a true and correct copy of Resolution 07-38, as adopted by the Air Resources Board.

Lori Andreoni

Lori Andreoni, Clerk of the Board

ATTACHMENT A

"Assessing Near-Field Exposures from Distributed Residential Wood Smoke Combustion Sources"

Background

In some areas of the State, wood is burned for heat and is a significant contributor to winter-time particulate matter levels (both as PM2.5 and PM10). These levels often exceed State and federal air quality standards and expose people to significant health risks. At present, regulators employ rather crude methods to estimate such impacts because they do not have the spatially and chemically resolved data to do more refined estimates. Regulators use data from routine air monitoring stations, producing rather general city-wide estimates. It is likely that this underestimates the local near-source ambient concentrations and what people near these sources actually experience. Methods exist that can provide highly time resolved data for factors related to wood smoke. These methods can be used in community air and along with other measurements can provide data that may identify the impacts of local wood burning within communities. In order for this to be accomplished it is necessary to perform field and laboratory studies to establish clear markers of residential smoke, how these markers vary within the community, how local sources of smoke contribute to local concentrations, and how people are exposed to this smoke.

Objective

This project has four primary objectives to clarify the nature of near-source levels of smoke and associated exposures from residential wood burning. These objectives are to: 1) measure the variability of wood smoke within a residential neighborhood; 2) determine if calculations of exposure based on data from neighborhoods where wood is burned differs from those estimated from data collected at central monitoring stations; 3) estimate whether it is possible to determine neighborhood smoke concentrations from available meteorological and wood burning activity data; and 4) evaluate the relationship between indoor concentrations and outdoor concentrations of wood smoke.

Methods

The investigators will conduct studies to establish how chemical and optical methods for assessing wood smoke in ambient air relate to one another. They will then perform community monitoring in a compact residential area of Fresno where wood is burned for heating during winter months. Wood smoke will be measured at twelve locations within this one square kilometer community. This monitoring data, data from meteorological networks, and wood burning activity levels will be used to develop models to estimate the nature of wood smoke within this community. A novel model estimation will be performed to calculate the contribution of local residential sources on individual exposures.

Expected Results

This project will provide information regarding how local sources of wood smoke generated within a community impacts the local air quality of that community and how this contributes to individual exposures.

Significance to the Board
The results will inform the Air Resources Board and local air regulators regarding the importance of wood smoke exposures in communities from nearby sources relative to other PM sources and the possible need for new controls on wood burning.

Contractor:
California Polytechnic State University, San Luis Obispo

Contract Period:
36 months

Principal Investigator (PI):
Tracy Thatcher, PhD

Contract Amount:
$320,286

Basis for Indirect Cost Rate:
The indirect cost rate applied to this contract is 25 percent, applied to modified total direct costs. This rate has been negotiated between ARB and Cal Poly and is below their normal rate is 40 percent. The rate applied by the subcontractor is the rate the National Laboratory applied to all contracts and includes a general rate of 48.2 percent with additional fees of approximately 23 percent applied to portions of the project cost.

Past Experience with this Principal Investigator:
This is the Board's first contract with this investigator; however she has participated in a prior funded project with Lawrence Berkeley National Laboratory and UC Berkeley. She performed her tasks in these projects adequately.

Prior Research Division Funding to California Polytechnic State University, San Luis Obispo:

Year	2007	2006	2005
Funding	$0	$0	$0

BUDGET SUMMARY

California Polytechnic State University, San Luis Obispo

Assessing Near-Field Exposures from Distributed Residential Wood Smoke Combustion Sources

DIRECT COSTS AND BENEFITS			
1.	Labor and Employee Fringe Benefits	$ 46,064	
2.	Subcontractors	$ 133,300[1]	
3.	Equipment	$ 43,278[2]	
4.	Travel and Subsistence	$ 7,000	
5.	Electronic Data Processing	$ 0	
6.	Reproduction/Publication	$ 0	
7.	Mail and Phone	$ 1,825	
8.	Supplies	$ 40,000[3]	
9.	Analyses	$ 7,500	
10.	Miscellaneous	$ 9,221	
	Total Direct Costs		$288,188
INDIRECT COSTS			
1.	Overhead	$ 32,098	
2.	General and Administrative Expenses	$ 0	
3.	Other Indirect Costs	$ 0	
4.	Fee or Profit	$ 0	
	Total Indirect Costs		$32,098
TOTAL PROJECT COSTS			**$320,286**

[1] Lawrence Berkeley National Laboratory will assist the contractor with field sampling, laboratory analyses, interpretation of study results for a total cost of $133,300.
[2] Two Aethalometers at $16,204 each will be purchased to measure carbon. One infrared camera at $10,870 will be purchased to assess chimney heat and burning activity.
[3] Sampling supplies will be purchased for us in field sampling. 17 pumps, impactors, and housing assemblies will be the major portion of this purchase. The cost of these is $22,100 for pumps, $8,500 for impactor samplers, and $1,700 for pump housings. $7,700 is to be spent for various minor materials.

Attachment B

SUBCONTRACTORS BUDGET SUMMARY

Subcontractor: Lawrence Berkeley National Laboratory

Description of subcontractor's responsibility: The subcontractor will perform laboratory analyses of carbon, assist the contractor with field sampling and with data analysis.

DIRECT COSTS AND BENEFITS				
1.	Labor and Employee Fringe Benefits	$	64,616	
2.	Subcontractors	$	0	
3.	Equipment	$	0	
4.	Travel and Subsistence	$	2,123	
5.	Electronic Data Processing	$	0	
6.	Reproduction/Publication	$	0	
7.	Mail and Phone	$	0	
8.	Supplies	$	6,160	
9.	Analyses	$	0	
10.	Miscellaneous	$	4,089	
	Total Direct Costs			$76,988
INDIRECT COSTS				
1.	Overhead	$	56,312	
2.	General and Administrative Expenses	$	0	
3.	Other Indirect Costs	$	0	
4.	Fee or Profit	$	0	
	Total Indirect Costs			$56,312
TOTAL PROJECT COSTS				**$133,300**