

State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 06-3

January 26, 2006

Agenda Item No.: 06-1-1

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 2598-250, entitled "On-Road Measurement of Light-Duty Gasoline and Heavy-Duty Diesel Vehicle Emissions", has been submitted by the University of California, Berkeley;

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 2598-250 entitled "On-Road Measurement of Light-Duty Gasoline and Heavy-Duty Diesel Vehicle Emissions", submitted by the University of the California, Berkeley, for a total amount not to exceed \$288,463.

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 2598-250, entitled "On-Road Measurement of Light-Duty Gasoline and Heavy-Duty Diesel Vehicle Emissions", submitted by the University of California, Berkeley, for a total amount not to exceed \$288,463.

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 \$288,463.

I hereby certify that the above is a true and correct copy of Resolution 06-3, as adopted by the Air Resources Board.

Lori Andreoni, Clerk of the Board

ATTACHMENT A

“On-Road Measurement of Light-Duty Gasoline and Heavy-Duty Diesel Vehicle Emissions”

Background

Emissions of particulate matter (PM) and ozone precursors are regulated to protect public health. Emissions of nitrogen species are also of concern because they can cause (over) nitrification of watersheds and landscapes. In support of sound planning and regulatory decisions, trends in emission rates must be characterized. Changes in rates of emissions from motor vehicles stem from the combination of changes in fuel specifications, vehicle technology, emission controls, and fleet characteristics (e.g., distributions of vehicle age, model type, or fuel type).

Objective

The objective is to characterize fleet-averaged rates of pollutant emissions from light- and heavy-duty vehicle (LDV, HDV) fleets as operated in the Caldecott tunnel during the summer 2006.

Methods

Emission rates will be calculated in units of mass emitted per mass of fuel consumed. The ratio of these masses is based entirely on the concentrations measured in the air at the tunnel entrance and exit. The emission rates are estimated based on a carbon balance approach that is independent of the rate of ventilation of the tunnel, removing a source of uncertainty present in some other studies.

Expected Results

Fleet average emissions from both the heavy-duty and light-duty fleets will be compared with similar observations made in previous years. This will establish the combined effects on real world emission rates resulting from changes in fuel specifications, vehicle technology, emission controls, and fleet characteristics (e.g., distributions of vehicle age, model type, or fuel type).

Significance to the Board

The Board requires accurate characterization of the trends in emissions because that information is fundamental to good planning and regulatory decision making. The work proposed complements but does not replace testing of individual vehicles on a dynamometer. The proposed methodology allows efficient capture of the combined emissions from a local fleet. For the light-duty fleet emissions, each afternoon two-hour sampling period will represent the emissions from about 8,000 vehicles, including the full range of commuter vehicle ages and conditions operated at this location.

Contractor:

University of California, Berkeley

Contract Period:

21 Months

Principal Investigator (PI):

Professor Robert Harley

Contract Amount:

\$288,463

Basis for Indirect Cost Rate:

The State and the UC system have agreed to a ten percent indirect cost rate.

Past Experience with this Principal Investigator:

The ARB has had very positive experience with Professor Robert Harley as Principal Investigator leading similar research projects at Caldecott Tunnel and additional related projects.

Prior Research Division Funding to UCB:

Year	2005	2004	2003
Funding	\$918,997	\$1,021,876*	\$715,194

* Approximately \$780,000 was funded by the California Energy Commission.

BUDGET SUMMARY

University of California, Berkeley

“On-Road Measurement of Light-Duty Gasoline
and Heavy-Duty Diesel Vehicle Emissions”

DIRECT COSTS AND BENEFITS

1.	Labor and Employee Fringe Benefits	\$	163,683
2.	Subcontractors	\$	44,540
3.	Equipment	\$	24,200
4.	Travel and Subsistence	\$	2,900
5.	Electronic Data Processing	\$	0
6.	Reproduction/Publication	\$	600
7.	Mail and Phone	\$	300
8.	Supplies	\$	16,000
9.	Analyses	\$	600
10.	Miscellaneous	\$	<u>14,582</u>
	Total Direct Costs		\$267,405

INDIRECT COSTS

1.	Overhead	\$	21,058
2.	General and Administrative Expenses	\$	0
3.	Other Indirect Costs	\$	0
4.	Fee or Profit	\$	<u>0</u>
	Total Indirect Costs		<u>\$ 21,058</u>

TOTAL PROJECT COSTS

\$288,463

Attachment 1

SUBCONTRACTORS' BUDGET SUMMARY

Subcontractor: California Polytechnic State University, SLO

Description of subcontractor's responsibility: California Polytechnic State University will focus on the measurement and analysis of ammonia emissions. The Cal Poly Project Investigator, Andrew Kean, will supervise a UC graduate student on the calibration and operation of gas phase analyzers.

DIRECT COSTS AND BENEFITS

1.	Labor and Employee Fringe Benefits	\$ 30,854
2.	Subcontractors	\$ 0
3.	Equipment	\$ 0
4.	Travel and Subsistence	\$ 3,000
5.	Electronic Data Processing	\$ 0
6.	Reproduction/Publication	\$ 0
7.	Mail and Phone	\$ 0
8.	Supplies	\$ 1,778
9.	Analyses	\$ 0
10.	Miscellaneous	<u>\$ 0</u>
	Total Direct Costs	\$ 35,632

INDIRECT COSTS

1.	Overhead	\$ 8,908
2.	General and Administrative Expenses	\$ 0
3.	Other Indirect Costs	\$ 0
4.	Fee or Profit	<u>\$ 0</u>
	Total Indirect Costs	<u>\$ 8,908</u>

TOTAL PROJECT COSTS

\$ 44,540