State of California
AIR RESOURCES BOARD

Effectiveness of Sound Wall-Vegetation Combination Barriers as Near-Roadway Pollutant Mitigation Strategies

RESEARCH PROPOSAL

Resolution 13-28

June 27, 2013

Agenda Item No.: 13-6-1

WHEREAS, the Air Resources Board (ARB or 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 2766-276, entitled "Effectiveness of Sound Wall-Vegetation Combination Barriers as Near-Roadway Pollutant Mitigation Strategies," has been submitted by the University of California, Los Angeles; and

WHEREAS, in accordance with Health and Safety Code section 39705, the Research Screening Committee has reviewed and recommends for funding:

> Proposal Number 2766-276 entitled "Effectiveness of Sound Wall-Vegetation Combination Barriers as Near-Roadway Pollutant Mitigation Strategies" submitted by the University of California, Los Angeles, for a total amount not to exceed $516,139.

WHEREAS, the Research Division staff has reviewed Proposal Number 2766-276 and finds that in accordance with Health and Safety Code section 39701, the focus of the study is to collect data on traffic–related pollutants adjacent and downwind of sound walls for four sites in two air basins in California. In addition to providing the most comprehensive database in California to date, the results will provide insights into the value and best practices for siting and design of sound walls, and vegetation in combination with sound walls, to reduce downwind pollution from roadways.

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 recommendations of the Research Screening Committee and Research Division staff and approves the following:

> Proposal Number 2766-276 entitled "Effectiveness of Sound Wall-Vegetation Combination Barriers as Near-Roadway Pollutant Mitigation Strategies" submitted by the University of California, Los Angeles not to exceed $516,139.

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 $516,139.

I hereby certify that the above is a true and correct copy of Resolution 13-28, as adopted by the Air Resources Board.

Tracy Jensen

Tracy Jensen, Clerk of the Board

ATTACHMENT A

"Effectiveness of Sound Wall-Vegetation Combination Barriers as Near-Roadway Pollutant Mitigation Strategies"

Background

Recognizing the health impacts associated with nearby sources of pollution, including high traffic roadways, Air Resources Board published the Air Quality and Land Use Handbook in 2005, which recommends not siting sensitive receptors, including residences, within 500 feet of a high traffic roadway as a preventative measure. However, there are currently many people already living within this zone. With the passage of Senate Bill 375, which encourages the pursuit of infill development near transit, there is the potential to increase the number of people living near high traffic roadways. Although emissions near high traffic roadways are expected to decrease due to ARB regulation, it is anticipated that these areas will still have higher pollutant levels. While separating sensitive receptors from highly trafficked roadways is the most preventative and health-protective solution, other mitigation options (including sound barriers and vegetation) may also play a role in reducing the air pollution exposure of nearby residents. However, to date, studies of the effect of sound/vegetation barriers have not yet produced definitive results and few studies have been performed for California's roadway geometries and Mediterranean climate. Further research is needed to understand the effectiveness of these mitigation options.

Objective

The overall objective of this study is to provide state and local planners with information on potential mitigation options for near-roadway air pollution. More specifically, the investigators will evaluate the impacts of sound wall/vegetation combinations on downwind levels of traffic-related pollution including PM2.5, ultrafine particles, black carbon, and oxides of nitrogen. A comprehensive database, as well as look up tables and other decision support, will be developed using the collected data and summarized using a semi-empirical dispersion model.

Methods

The focus of this study is to collect data on traffic–related pollutants adjacent and downwind of sound walls for four sites in two air basins in California. A pilot study will be conducted in each location, and the main field campaign (also one site in each location) will occur over 10 weeks encompassing all four seasons. Sampling is scheduled such that a large range of meteorological variability will be captured. Sampling will include stationary monitoring (two fully instrumented sites, with three additional ultrafine particle monitoring sites), a network of passive monitoring, meteorological monitoring, and mobile monitoring.

Expected Results

In addition to providing the most comprehensive database in California to date, the results will provide insights into the value and best practices for siting and design of sound walls, and vegetation in combination with sound walls, to reduce downwind pollution from roadways.

Significance to the Board
Strategies to reduce the air pollution exposure of current and future residents living near high traffic roadways are needed. A better understanding of the effectiveness of potential mitigation options, in particular sound wall (barrier) and vegetation combinations is required.

Contractor:
University of California, Los Angeles

Contract Period:
36 months

Principal Investigator:
Suzanne E. Paulson, Ph.D.

Contract Amount:
$516,139

Basis for Indirect Cost Rate:
The State and The University of California, Los Angeles have agreed to a ten percent indirect cost rate.

Past Experience with the Principal Investigator:
Professor Suzanne Paulson has more than a decade of research experience in atmospheric science and has recently published a manuscript on characterization of air pollution concentrations in a neighborhood highly impacted by vehicle pollution under ARB contract, 09-357, "Characterizing Spatially Inhomogenous Non-Criteria Pollutants in the Los Angeles Air Basin." Several other manuscripts related to this contract are in progress. Professor Paulson has also led previous ARB-funded studies with success.

Prior Research Division Funding to the University of California, Los Angeles:

Year	2012	2011	2011
Funding	$400,000	$630,264	$290,000

BUDGET SUMMARY

The University of California, Los Angeles

"Effectiveness of Sound Wall-Vegetation Combination Barriers as Near-Roadway Pollutant Mitigation Strategies"

DIRECT COSTS AND BENEFITS			
1.	Labor and Employee Fringe Benefits	$ 273,958	
2.	Subcontractors	$ 177,374	
3.	Equipment	$ 0	
4.	Travel and Subsistence	$ 8,000	
5.	Electronic Data Processing	$ 0	
6.	Reproduction/Publication	$ 0	
7.	Mail and Phone	$ 1,910	
8.	Supplies	$ 1,200	
9.	Analyses	$ 15,600	
10.	Miscellaneous	$ 7,300	
	Total Direct Costs		$485,342
INDIRECT COSTS			
1.	Overhead	$ 30,797	
2.	General and Administrative Expenses	$ 0	
3.	Other Indirect Costs	$ 0	
4.	Fee or Profit	$ 0	
	Total Indirect Costs		$ 30,797
TOTAL PROJECT COSTS			**$516,139**

Attachment 1

SUBCONTRACTORS' BUDGET SUMMARY

Subcontractor: University of California, Riverside

Description of subcontractor's responsibility: Perform 3-D meteorological measurements and semi-empirical modeling of results

DIRECT COSTS AND BENEFITS			
1.	Labor and Employee Fringe Benefits	$ 154,281	
2.	Subcontractors	$ 0	
3.	Equipment	$ 0	
4.	Travel and Subsistence	$ 6,811	
5.	Electronic Data Processing	$ 0	
6.	Reproduction/Publication	$ 0	
7.	Mail and Phone	$ 0	
8.	Supplies	$ 4,043	
9.	Analyses	$ 0	
10.	Miscellaneous	$ 0	
	Total Direct Costs		$165,135
INDIRECT COSTS			
1.	Overhead	$ 12,239	
2.	General and Administrative Expenses	$ 0	
3.	Other Indirect Costs	$ 0	
4.	Fee or Profit	$ 0	
	Total Indirect Costs		$12,239
TOTAL PROJECT COSTS			**$177,374**