State of California
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 08-15

February 28, 2008

Agenda Item No.: 08-2-2

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 2656-259, entitled "Developing a California Inventory for Ozone Depleting Substances and Hydrofluorocarbon Banks and Emissions from Foams," has been submitted by Caleb Management Services, Limited, in response to RFP No. 07-312;

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 2656-259 entitled "Developing a California Inventory for Ozone Depleting Substances and Hydrofluorocarbon Banks and Emissions from Foams," submitted by Caleb Management Services, Limited, for a total amount not to exceed $349,758.

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 2656-259 entitled "Developing a California Inventory for Ozone Depleting Substances and Hydrofluorocarbon Banks and Emissions from Foams," submitted by Caleb Management Services, Limited, for a total amount not to exceed $349,758.

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 $349,758.

I hereby certify that the above is a true and correct copy of Resolution 08-15, as adopted by the Air Resources Board.

Lori Andreoni

Lori Andreoni, Clerk of the Board

ATTACHMENT A

"Developing a California Inventory for Ozone Depleting Substances and Hydrofluorocarbon Banks and Emissions from Foams"

Background
With the passage of the California Global Warming Solutions Act of 2006 (AB 32), the California Air Resources Board (ARB) is charged with developing and implementing mitigation strategies to enable the State of California to reach its goal of carbon dioxide equivalent (CO_2E) greenhouse gas (GHG) emission reductions to 1990 levels by 2020. As a starting point, the Climate Action Team (CAT) report, which was developed by several agencies through a stakeholder process, identified a suite of strategies for reducing the six Kyoto pollutants (i.e., CO_2, methane, nitrous oxide, perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride). Other efforts, including the development of early actions under AB 32, have revealed additional opportunities to reduce emissions of GHGs, and it has become apparent to ARB staff that significant high-global warming potential (GWP) GHG emissions reductions are possible, particularly if ozone depleting substances are considered.

Objective
The project will support the development of regulatory and non-regulatory programs to move forward with the Climate Change Early Action Measure titled "Foam Recovery/Destruction Program."

The main objective of the project is to quantify banks and emissions of rigid poly foam in California, used primarily in appliance and building insulation, with minor usage in transport refrigerated units and other miscellaneous sources. Poly insulating foam contains high-GWP GHGs, and the existing amount (banks) are a significant source of current and future greenhouse gas emissions.

Methods
Inventory development methods include literature review and the design of survey instruments that focus on estimating high-GWP GHG production, installation, use, banks, and emissions in California, from rigid poly foams used primarily in appliances and building insulation. Additionally, the contractor will be required to propose a methodology for generating the inventory that could include data gathering from trade associations as well as surveying the sectors that employ high-GWP GHG foams in various applications.

Expected Results
A detailed, bottom-up inventory for high-GWP GHG foams, including banks and emissions, specific to California, will result from this project. The results of this study will ultimately help ARB refine CO_2E GHG emissions control strategies currently being developed, in terms of costs/benefits. The study will also help to identify as well as prioritize new mitigation opportunities, so that those presenting the greatest benefits receive the most attention. Such strategies would not only reduce GHG emissions but in some cases would provide co-benefits by mitigating emissions of substances that cause stratospheric ozone depletion.

The results of the study will provide the basis for the materials flow portion of the end-of-life (EOL) lifecycle analysis (LCA) model for high-GWP GHG sources, to be developed in early 2008. The quantities as well as the spatial and age distribution of foams in California will be a critical input to determine the most cost-effective way to deal with these materials at EOL.

Significance to the Board
AB 32, the Global Warming Solutions Act of 2006, codifies in law targets set by the California CAT to reduce CO_2E GHG emissions to 1990 levels by 2020. Controlling high-GWP GHG emissions (such as those found in rigid poly foam) can lead to significant, cost-effective GHG reductions.

The development of a foam banks and emission inventory is a critical part of creating strategies to reduce GHG emissions from this source; regulations cannot be enacted to reduce foam emissions in a cost-effective manner without inventory development. The research proposed in this project will produce a heretofore non-existent rigid poly foam emission inventory for California, which will form the basis of CARB's future emissions reductions policies and allow California to meet its 2020 GHG emissions target.

Contractor:
Caleb Management Services, Limited.

Contract Period:
23 months

Principal Investigator:
Arnie A.J. Vetter, Project Director, and Paul Ashford, Technical Director

Contract Amount:
$349,758

Basis for Indirect Cost Rate:
Indirect costs account for $79,276 of the total $349,758 budget proposal, or 22.7 percent of the total budget. Caleb is a private consulting firm, and as such, incorporates overhead into all of its contracts. Indirect costs in this contract will cover profit, overhead on travel expenses, and overhead on business operating costs.

Past Experience with this Principal Investigator:
ARB has not previously worked with Caleb Management Services, Limited. Its reputation as an excellent and dependable contractor is based upon its standing as one of the world-leading organizations in its expertise on foam banks and emissions, as evidenced by its international work with the International Panel of Climate Change and the United Nation Environmental Programme Technical Options Committee on Rigid and Flexible Foam (Montreal Protocol on Substances that Deplete the Ozone Layer).

Prior Research Division Funding to Caleb Management Services, Limited:

Year	2007	2006	2005
Funding	$0	$0	$0

BUDGET SUMMARY

Contractor: Caleb Management Services, Limited

Developing a California Inventory for Ozone Depleting Substances and Hydrofluorocarbon Banks and Emissions from Foams

DIRECT COSTS AND BENEFITS				
1.	Labor and Employee Fringe Benefits	$	94,560	
2.	Subcontractors	$	195,003	
3.	Equipment	$	0	
4.	Travel and Subsistence	$	20,970	
5.	Electronic Data Processing	$	0	
6.	Reproduction/Publication	$	0	
7.	Mail and Phone	$	4,400	
8.	Supplies	$	2,000	
9.	Analyses	$	0	
10.	Miscellaneous	$	1,515	
	Total Direct Costs			$318,448
INDIRECT COSTS				
1.	Overhead	$	24,086	
2.	General and Administrative Expenses	$	0	
3.	Other Indirect Costs	$	0	
4.	Fee or Profit	$	7,224	
	Total Indirect Costs			$31,310
TOTAL PROJECT COSTS				**$349,758**

Attachment 1

SUBCONTRACTORS' BUDGET SUMMARY

Subcontractor: Armines

Description of subcontractor's responsibility: Armines will be responsible for the identification and characterization of foams and greenhouse gas volumes arising from domestic refrigerators and freezers; stand alone units; commercial refrigeration units; and refrigerated transport. This will include identification of model types and relevant equipment populations, foam volumes per unit of equipment, blowing agent selection, current stocks by equipment life, and other necessary measurements to assist Caleb Services with the development of an emissions model for foam inventories and emissions specific to California.

DIRECT COSTS AND BENEFITS			
1.	Labor and Employee Fringe Benefits	$ 24,416	
2.	Subcontractors	$ 0	
3.	Equipment	$ 0	
4.	Travel and Subsistence	$ 18,360[1]	
5.	Electronic Data Processing	$ 0	
6.	Reproduction/Publication	$ 0	
7.	Mail and Phone	$ 0	
8.	Supplies	$ 0	
9.	Analyses	$ 0	
10.	Miscellaneous	$ 0	
	Total Direct Costs		$42,776
INDIRECT COSTS			
1.	Overhead	$ 17,091	
2.	General and Administrative Expenses	$ 0	
3.	Other Indirect Costs	$ 0	
4.	Fee or Profit	$ 0	
	Total Indirect Costs		$17,091
TOTAL PROJECT COSTS			**$59,867**

[1] ARMINES travels are necessary to perform tasks in the United States for the realization of the program, to present intermediate and final results.

Attachment 2

SUBCONTRACTORS' BUDGET SUMMARY

Subcontractor: University of California, Berkeley Survey Research Center

Description of subcontractor's responsibility: The University of California, Berkeley Survey Research Center (UCBSRC) will advise on the selection of the research design, sample design, questionnaire design, and other relevant supporting materials needed to conduct phone and field interviews to gather data to support foam inventory and emission estimates. UCBSRC will complete sampling interviews, assist with the management of data files, and assist with the data analysis.

DIRECT COSTS AND BENEFITS				
1.	Labor and Employee Fringe Benefits	$	22,393	
2.	Subcontractors	$	0	
3.	Equipment	$	0	
4.	Travel and Subsistence	$	350	
5.	Electronic Data Processing	$	0	
6.	Reproduction/Publication	$	0	
7.	Mail and Phone	$	0	
8.	Supplies	$	0	
9.	Analyses	$	0	
10.	Miscellaneous	$	0	
	Total Direct Costs			$22,743
INDIRECT COSTS				
1.	Overhead	$	4,255	
2.	General and Administrative Expenses	$	0	
3.	Other Indirect Costs	$	0	
4.	Fee or Profit	$	0	
	Total Indirect Costs			$4,255
TOTAL PROJECT COSTS				**$26,998**

Attachment 3

SUBCONTRACTORS' BUDGET SUMMARY

Subcontractor: RJR Consulting, Inc.

Description of subcontractor's responsibility: RJR Consulting, Inc., along with Rappa, Inc., will design and implement surveys to measure foam inventories and emissions. They will complete technical interviews from industry and other stakeholders, and analyze findings fro relevant data from which sector reports and emissions models can be generated.

DIRECT COSTS AND BENEFITS				
1.	Labor and Employee Fringe Benefits	$	30,600	
2.	Subcontractors	$	0	
3.	Equipment	$	0	
4.	Travel and Subsistence	$	5,300	
5.	Electronic Data Processing	$	0	
6.	Reproduction/Publication	$	0	
7.	Mail and Phone	$	0	
8.	Supplies	$	0	
9.	Analyses	$	0	
10.	Miscellaneous	$	0	
	Total Direct Costs			$35,900
INDIRECT COSTS				
1.	Overhead	$	7,650	
2.	General and Administrative Expenses	$	0	
3.	Other Indirect Costs	$	0	
4.	Fee or Profit	$	4,375	
	Total Indirect Costs			$12,025
TOTAL PROJECT COSTS				**$47,925**

Attachment 4

SUBCONTRACTORS' BUDGET SUMMARY

Subcontractor: Rappa Inc.

Description of subcontractor's responsibility: Rappa Inc., along with RJR Consulting, Inc., will design and implement surveys to measure foam inventories and emissions. They will complete technical interviews from industry and other stakeholders, and analyze findings fro relevant data from which sector reports and emissions models can be generated.

DIRECT COSTS AND BENEFITS				
11.	Labor and Employee Fringe Benefits	$	30,600	
12.	Subcontractors	$	0	
13.	Equipment	$	0	
14.	Travel and Subsistence	$	5,300	
15.	Electronic Data Processing	$	0	
16.	Reproduction/Publication	$	0	
17.	Mail and Phone	$	0	
18.	Supplies	$	0	
19.	Analyses	$	0	
20.	Miscellaneous	$	0	
	Total Direct Costs			$35,900
INDIRECT COSTS				
5.	Overhead	$	7,650	
6.	General and Administrative Expenses	$	0	
7.	Other Indirect Costs	$	0	
8.	Fee or Profit	$	4,375	
	Total Indirect Costs			$12,025
TOTAL PROJECT COSTS				**$47,925**

Attachment 5

SUBCONTRACTORS' BUDGET SUMMARY

Subcontractor: Robert Penny Enterprises

Description of subcontractor's responsibility: Robert Penny Enterprises (RPE) is the Disabled Veteran Business Enterprise provider on the contract. RPE will provide local surveying and administrative capabilities, and will research foam inventories primarily from building insulation sources, using building statistical sources (age, type, geographical area, building codes, etc.) to build a database that will inform modeling assumptions used in the contract.

DIRECT COSTS AND BENEFITS				
1.	Labor and Employee Fringe Benefits	$	9,619	
2.	Subcontractors	$	0	
3.	Equipment	$	0	
4.	Travel and Subsistence	$	100	
5.	Electronic Data Processing	$	0	
6.	Reproduction/Publication	$	0	
7.	Mail and Phone	$	0	
8.	Supplies	$	0	
9.	Analyses	$	0	
10.	Miscellaneous	$	0	
	Total Direct Costs			$9,719
INDIRECT COSTS				
1.	Overhead	$	1,828	
2.	General and Administrative Expenses	$	0	
3.	Other Indirect Costs	$	0	
4.	Fee or Profit	$	741	
	Total Indirect Costs			$2,569
TOTAL PROJECT COSTS				**$12,288**