

**State of California  
AIR RESOURCES BOARD**

Resolution 01-3  
January 25, 2001

Agenda Item No.: 01-01-2

**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 00-01-04, entitled "Demonstration of a New Emission Control System for Stationary Diesel and Natural Gas Engines," has been submitted by Sorbent Technologies Corporation in response to the 2000 Innovative Clean Air Technologies (ICAT) Program solicitation;

**WHEREAS**, the proposal has been independently reviewed for technical and business merit by highly qualified individuals; and

**WHEREAS**, the Research Division staff, and the Executive Officer and Deputy Executive Officers have reviewed and recommended for funding:

Proposal Number 00-01-04 entitled "Demonstration of a New Emission Control System for Stationary Diesel and Natural Gas Engines", submitted by Sorbent Technologies Corporation, for a total amount not to exceed \$250,000.

**NOW, THEREFORE BE IT RESOLVED**, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby approves the following:

Proposal Number 00-01-04 entitled "Demonstration of a New Emission Control System for Stationary Diesel and Natural Gas Engines" submitted by Sorbent Technologies Corporation for a total amount not to exceed \$250,000.

**BE IT FURTHER RESOLVED**, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and agreements for the efforts proposed herein, and as described in Attachment A, in an amount not to exceed \$250,000.

I hereby certify that the above is a true and correct copy of Resolution 01-3, as adopted by the Air Resources Board.

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Marie Kavan, Clerk of the Board

## ATTACHMENT A

### INNOVATIVE CLEAN AIR TECHNOLOGIES (ICAT) PROGRAM PROPOSAL

#### “Demonstration of a New Emission Control System for Stationary Diesel and Natural Gas Engines”

##### **Background**

Despite recent improvements in engine designs to reduce pollution, diesel engines continue to emit large amounts of oxides of nitrogen (NO<sub>x</sub>), particulates, and hydrocarbons. These pollutants continue to be a problem with both stationary and mobile diesel engines. No completely satisfactory commercial control technology exists today to treat diesel-engine exhaust gases.

NO<sub>x</sub> is also a problem with natural gas-fired internal combustion engines. Although NO<sub>x</sub> levels have been improved in recent years, they continue to be a problem with no readily apparent solution.

Sorbent Technologies Corporation (Sorbtech) recently developed a simple regenerable NO<sub>x</sub> filter system for use with jet engines that it believes can be successfully adapted to control stationary diesel engine emissions and natural gas engine emissions. The system has already been proven successful in treating aircraft-engine emissions at jet engine test facilities. The system controls NO<sub>x</sub>, small particulates, hydrocarbons and carbon monoxide.

##### **Objective**

The objectives of this project are to design, construct, install, and test a full-scale prototype of Sorbtech's NO<sub>x</sub> control technology and to demonstrate the system in a commercial engine application.

##### **Expected Results**

The demonstration of the technology is expected to offer data to support emission reductions of 95 to 100 percent NO<sub>x</sub>, 90 to 99 percent diesel particulate, and lesser reductions in hydrocarbons and carbon monoxide.

##### **Significance to the Board**

With the successful demonstration of Sorbtech's technology, ARB will be able to encourage the commercialization of a feasible emissions after-treatment device suitable for retrofit applications. In addition, the project will support the State Implementation Plan for reduction of NO<sub>x</sub> emissions.

**Proponent:**  
Sorbent Technologies Corporation

**Project Period:**  
22 months

**Principal Investigator (PI):**  
Mr. Sidney G. Nelson

**ICAT Funding:**  
\$250,000

**Cofunding:**

Sorbent Technologies Corporation	\$ 50,000
U.S. Environmental Protection Agency	<u>\$ 200,000</u>
Total	\$ 250,000

**Basis for Indirect Cost Rate:** Rates are within ICAT limits.

**Past Experience with this Principal Investigator:**

Although staff may not have any prior experience with the PI, the extent of review that each ICAT proposal is subjected to provides a sufficient level of confidence for staff to recommend the proposal for an ICAT award. The ICAT evaluation process includes reviews by five external technical and four external business advisors, as well as internal reviewers from Mobile Source Control and Operations Divisions, Stationary Source Division, Research Division, and the Executive Office.

**Prior ICAT Funding to Sorbent Technologies Corporation:**

Year	1999	1998	1997
Funding	\$0	\$0	\$0

# BUDGET SUMMARY

Sorbent Technologies Corporation

Demonstration of a New Emission Control System for Stationary Diesel and Natural Gas Engines

<b><u>DIRECT COSTS AND BENEFITS</u></b>	<b><u>ICAT</u></b>	<b><u>TOTAL</u></b>
1. Labor and Employee Fringe Benefits	\$ 104,995	\$ 209,990
2. Subcontractors	\$ 9,500	\$ 19,000
3. Equipment	\$ 0	\$ 0
4. Travel and Subsistence	\$ 7,910	\$ 15,820
5. Electronic Data Processing	\$ 250	\$ 500
6. Reproduction/Publication	\$ 250	\$ 500
7. Mail and Phone	\$ 750	\$ 1,500
8. Supplies	\$ 29,630	\$ 59,260
9. Analyses	\$ 21,325	\$ 42,650
10. Miscellaneous	\$ 3,855	\$ 7,710
Total Direct Costs	\$ 178,465	\$ 356,930
<b><u>INDIRECT COSTS</u></b>		
1. Overhead	\$ 59,885	\$ 119,770
2. General and Administrative Expenses	\$ 11,650	\$ 23,300
3. Other Indirect Costs	\$ 0	\$ 0
4. Fee or Profit	\$ 0	\$ 0
Total Indirect Costs	\$ 71,535	\$ 143,070
<b><u>TOTAL PROJECT COSTS</u></b>	<b><u>\$ 250,000</u></b>	<b><u>\$ 500,000</u></b>

Attachment (##)

**SUBCONTRACTORS' BUDGET SUMMARY**

Subcontractors: Dr. A. L. Boehman/Pennsylvania State University  
Dr. B. W. Nelson/N. Dakota State University

<b><u>DIRECT COSTS AND BENEFITS</u></b>		<b><u>ICAT</u></b>	<b><u>TOTAL</u></b>
1.	Labor and Employee Fringe Benefits	\$9,500	\$19,000
2.	Subcontractors	\$ 0	\$ 0
3.	Equipment	\$ 0	\$ 0
4.	Travel and Subsistence	\$ 0	\$ 0
5.	Electronic Data Processing	\$ 0	\$ 0
6.	Reproduction/Publication	\$ 0	\$ 0
7.	Mail and Phone	\$ 0	\$ 0
8.	Supplies	\$ 0	\$ 0
9.	Analyses	\$ 0	\$ 0
10.	Miscellaneous	\$ 0	\$ 0
	Total Direct Costs	\$9,500	\$19,000
<b><u>INDIRECT COSTS</u></b>			
1.	Overhead	\$ 0	\$ 0
2.	General and Administrative Expenses	\$ 0	\$ 0
3.	Other Indirect Costs	\$ 0	\$ 0
4.	Fee or Profit	\$ 0	\$ 0
	Total Indirect Costs	\$ 0	\$ 0
<b><u>TOTAL PROJECT COSTS</u></b>		<b><u>\$9,500</u></b>	<b><u>\$19,000</u></b>