BOARD MEETING DATE: April 7, 2017 AGENDA NO. 3

PROPOSAL: Recognize Revenue and Execute Contract to Develop and Evaluate Aftertreatment Systems for Large Displacement Diesel Engines

SYNOPSIS: CARB previously awarded a contract to Southwest Research Institute (SwRI) to investigate and demonstrate emission control strategies for 13-liter diesel engines to achieve 90% emission reductions using available aftertreatment systems. While the demonstration was successful, in order to better estimate real-world emissions under low load and low temperature conditions, an aged aftertreatment system is required for further optimization. These actions are to recognize revenue up to $500,000 from U.S. EPA into the Clean Fuels Fund (31) and execute a contract with SwRI in an amount not to exceed $400,000 from the Clean Fuels Fund (31), comprising up to $290,000 from the EPA revenue and $110,000 for SCAQMD's cost-share, to develop and evaluate an aged aftertreatment system for emissions testing. The remaining EPA funds will be allocated to a future project, subject to Board approval.

COMMITTEE: Technology, March 17, 2017; Recommended for Approval

RECOMMENDED ACTIONS:

1. Recognize, upon receipt, up to $500,000 from the EPA into the Clean Fuels Fund (31) for diesel reduction projects.
2. Authorize the Chairman to execute a contract with SwRI for the development of an ultra-low NOx aftertreatment system for large displacement engines in an amount not to exceed $400,000 from the Clean Fuels Fund (31), comprising up to $290,000 from the EPA revenue and $110,000 for SCAQMD's cost-share.

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Background
SCAQMD and CARB have identified the need for lower NOx heavy-duty engine standards as a key component of a multi-part strategy for reaching air quality goals. In fact, CARB has initiated a rule development effort to establish a 0.02 grams per brake horsepower per hour (g/bhp-hr) standard for on-highway heavy-duty engines for California, and recently U.S. EPA has acknowledged a need to further lower the NOx standard on a national level.

Previously, using funds from CARB, Southwest Research Institute (SwRI) successfully demonstrated the feasibility of 0.02 g/bhp-hr NOx emissions level on a heavy-duty 13L diesel engine (Stage 1). The prototype developed in Stage 1, however, failed prior to the final catalyst aging process. Subsequently, CARB has initiated a follow-up project with SwRI involving further efforts aimed at examining the ability to control emissions over light-load duty cycles that are representative of urban environments and vocational applications (Stage 1b).

Proposal
SwRI will develop, age and test a second set of catalysts to represent real-world low load and low temperature test cycles. The parts will be aged for 1,000 hours and emissions testing will be performed at set intervals along the Federal Test Procedure transient cycle. Once complete, the new hardware will be tested with the engine under the developed cycles from Stage 1. The objective of this effort is to overcome the aging issues encountered in Stage 1, as well as to provide a robust aftertreatment system for the next phase of work, which will include development of a larger displacement diesel engine suitable for long-haul operations, including an aftertreatment system optimized to achieve the 0.02 g/bhp-hr NOx emissions level.

These actions are to recognize, upon receipt, up to $500,000 from the EPA into the Clean Fuels Fund (31) for diesel reduction projects and execute a contract with SwRI for development of an ultra-low NOx aftertreatment system to be supplied as a hardware set to the ongoing heavy-duty diesel project at CARB.

The EPA funding is from the FY17 Section 105 Clean Air Technology Initiative (CATI). CATI was established by the EPA, CARB, San Joaquin Valley Air Pollution Control District and SCAQMD to identify and implement emission reduction projects in San Bernardino and Boyle Heights where residents are disproportionately affected by emissions of diesel exhaust from the goods movement corridors and from diesel activities at the Ports, warehouses and rail yards.

Sole Source Justification
Section VIII.B.3 of the Procurement Policy and Procedure identifies four major provisions under which a sole source award may be justified for projects funded in whole or in part with federal funds. This request for sole source award is made under

provisions B.3.a. – The item is available only from a single source; and B.3.c. – The awarding federal agency authorizes noncompetitive proposals. The proposed project will also be cost-shared by EPA and the Manufacturers of Emission Controls Association (MECA). Details of the cost-share to be provided by EPA and MECA are shown under Resource Impacts.

Benefits to SCAQMD

Projects to support implementation of various clean fuel vehicle programs are included in the *Technology Advancement Office Clean Fuels Program 2017 Plan Update* within the category "Engine Systems" under "Develop and Demonstrate Advanced Alternative Fuel Medium- and Heavy-Duty Engines and Vehicles". This project is to optimize aftertreatment systems, leading to a more robust near-zero emission diesel engine for on-road heavy-duty vehicles. This engine also can be fueled with renewable diesel fuels. Successful development will help to support the larger engines necessary for long-haul trucking operations and contribute towards technology to support the petition for a national standard for near-zero heavy-duty engines. Longer term, it will help to accelerate wide-scale deployment of heavy-duty engines in the South Coast Air Basin with contributions toward the attainment of clean air standards for the region by significantly reducing criteria pollutant emissions from diesel-fueled trucks. Statewide, the project addresses the reduction of GHG emissions and the mandated goal of near-zero NOx levels by 2021.

Resource Impacts

The proposed total project budget is $480,000, which includes in-kind contributions from MECA. SCAQMD's contract will not exceed $400,000 from the Clean Fuels Fund (31), comprising SCAQMD's cost-share of $110,000 as well as up to $290,000 out of the $500,000 to be recognized from EPA into the Clean Fuels Fund (31) for diesel reduction projects. (The remaining EPA funds will be allocated to a future project, subject to Board approval.) Proposed project costs and partners are summarized below:

Proposed Project Costs

Funding Source	Funding Amount	Percent
EPA	$290,000	60
MECA (in-kind)	$80,000	17
SCAQMD (*requested*)	$110,000	23
Total	**$480,000**	**100**

Sufficient funds are available from the Clean Fuels Fund, established as a special revenue fund resulting from the state-mandated Cleans Fuels Program. The Clean Fuels Program, under Health and Safety Code Sections 40448.5 and 40512 and Vehicle Code Section 9250.11, establishes mechanisms to collect revenues from mobile sources to support projects to increase the utilization of clean fuels, including the development of the necessary advanced enabling technologies. Funds collected from motor vehicles are restricted, by statute, to be used for projects and program activities related to mobile sources that support the objectives of the Clean Fuels Program.