BOARD MEETING DATE: December 7, 2018 AGENDA NO. 4

TITLE: Conduct Emissions Study on Use of Alternative Diesel Blends in Off-Road Heavy-Duty Engines and Amend SOON Provision Awards

SYNOPSIS: CARB has committed to adopting a low emission diesel measure in the State Implementation Plan to reduce NOx and particulate matter (PM) emissions from on-road and off-road vehicles. Renewable diesel and biodiesel with NOx-mitigating additives show a potential for reductions up to 13 percent in NOx and 30 percent in PM. CARB is currently contributing $932,499 in a $1,353,499 study by the University of California Riverside (UCR) CE-CERT testing on- and off-road diesel engines on a wide matrix of test fuels. Additional cost-share is proposed for this comprehensive study as follows: SCAQMD, $261,000; U.S. EPA, $150,000; and San Joaquin Valley Air Pollution Control District, $10,000. This action is to execute a contract with UCR CE-CERT in an amount not to exceed $261,000 from the Clean Fuels Program Fund (31). In addition, in November 2017 and September 2018, the Board approved SOON Provision awards. This action is to also amend awards under the SOON Provision.

COMMITTEE: Technology, November 16, 2018; Recommended for Approval

RECOMMENDED ACTIONS:

1. Authorize the Chairman to execute a contract with UCR CE-CERT to conduct an emissions and performance study to characterize tailpipe emissions using renewable diesel and biodiesel in off-road engines in an amount not to exceed $261,000 from the Clean Fuels Program Fund (31).
2. Amend SOON Provision awards approved by the Board in November 2017 and September 2018 with C5 Equipment Rental and Peed Equipment to change the project types from engine replacements to repowers.

Wayne Nastri
Executive Officer

MMM:FM:NB:JL

Background
CARB has committed to adopting a low emission diesel (LED) measure in the State Strategy for the 2016 State Implementation Plan to reduce NOx and particulate matter (PM) emissions from on-road and off-road vehicles. This measure, which is anticipated for implementation in the South Coast Air Basin first, would require diesel fuel providers to steadily decrease criteria pollutant emissions from diesel products. This includes achieving emissions reductions from currently available renewable diesel and NOx-mitigated biodiesel fuels that can reduce both NOx and PM. CARB, in conjunction with researchers from the University of California Riverside (UCR), University of California Davis and others, conducted a study to characterize the emissions impacts of biodiesel and renewable diesel relative to ultra-low sulfur diesel (ULSD) fuel in several on-road and off-road engines under a variety of test conditions. However, this study did not investigate the emissions impacts of these fuels on performance or in engines without emissions controls. Since off-road engines, including those for stationary uses, represent a large NOx and PM source in the South Coast Air Basin, it is essential to support the development and implementation of clean fuels that will help reduce mobile source emissions. It is also equally important to assess the new technologies to prevent or mitigate any negative impact on air quality and public health.

In November 2017, the Board approved FY 2016-17 "Year 19" Carl Moyer Program and SOON Provision awards, and subsequently amended these awards augmenting funds in September 2018. These Board letters included awards for engine replacements to C5 Equipment Rental and Peed Equipment. Staff realized these two project awards should have been listed in the Board letter as engine repowers (not replacements); they were evaluated as repower projects and the emissions reductions, cost-effectiveness and ranking remain unchanged.

Proposal
The purpose of this study is to better understand emissions and performance effects from renewable diesel and NOx-mitigated biodiesel relative to ULSD fuel. This study proposes to conduct detailed emissions testing on various renewable diesel blends and biodiesel blends on heavy-duty off-road engines, with and without selective catalytic reduction (SCR) exhaust treatments and diesel particulate filters (DPF) using an engine dynamometer. The study will focus on the physical and chemical characterization of particulate emissions and gaseous toxic pollutants from two off-road engines, one equipped with SCR and DPF aftertreatment systems and one Tier 2 engine without an aftertreatment system. This action is to execute a contract with UCR CE-CERT to conduct an emissions and performance study to characterize tailpipe emissions using renewable diesel and biodiesel in off-road engines.

This action is to also amend SOON Provision awards with C5 Equipment Rental and Peed Equipment to change the project types from engine replacements to repowers. The funding awards and project parameters remain the same.

Sole Source Justification
Section VIII.B.2 of the Procurement Policy and Procedure identifies provisions under which a sole source award may be justified. This request for a sole source award to UCR CE-CERT is made under provisions B.2.d.(1) and (8): Other circumstances exist which in the determination of the Executive Officer require such waiver in the best interest of the SCAQMD. Specifically, such circumstances may include but are not limited to projects involving cost-sharing by multiple sponsors and research and development efforts with educational institutions or nonprofit organizations. The project is being funded by CARB and may also be funded by the U.S. EPA and the San Joaquin Valley APCD. UCR is an educational institution and CE-CERT is their research center with multidisciplinary resources to engage in diverse environmental and transportation research programs.

Benefits to SCAQMD
To achieve national ambient air quality standards and protect public health, one of SCAQMD's primary priorities is to reduce NOx and PM emissions from mobile sources while realizing GHG co-benefits, where possible. The proposed alternative diesel fuel study will help to better understand the air quality and public health impact of older equipment that exists in large numbers in the off-road sector. It will also support the need and benefit for cleaner fuels in the Basin. Large-scale use of renewable diesel and NOx-mitigated biodiesel in California can lead to the expanded availability of these alternatives as a transportation fuel, as well as a clean alternative energy source. This will further accelerate the deployment of near-zero heavy-duty transportation technologies, helping to lower NOx and PM emissions in the Basin.

Resource Impacts
The total estimated cost for the proposed project is $1,353,499, of which SCAQMD's proposed cost-share will not exceed $261,000 from the Clean Fuels Program Fund (31), as summarized below:

Proposed Project Cost-Share

Project Partner	UCR Study
CARB	$932,499
U.S. EPA*	$150,000
SJVAPCD*	$10,000
SCAQMD *(requested)*	$261,000
Total Project Cost	**$1,353,499**

*anticipated

Sufficient funds are available in the Clean Fuels Program Fund (31) for this proposed project. The Clean Fuels Program Fund (31) is 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.

There is no fiscal impact for the two SOON Provision awards, which simply change the project type from engine replacements to repowers.