

BOARD MEETING DATE: September 2, 2022

AGENDA NO. 4

**PROPOSAL:** Recognize Revenue and Appropriate Funds for U.S. EPA Pass Through Grants to Develop Low-Cost Sensor Device for Measuring VOCs and Reference Method for Validating Open-Path Remote Sensing Systems

**SYNOPSIS:** Recently, U.S. EPA awarded multiple nationwide competitive Science to Achieve Results research grants. South Coast AQMD staff will be a co-investigator for two of these grants, one with Virginia Polytechnic Institute and State University (Virginia Tech) to develop a low-cost sensor device for time-resolved measurements of VOCs, and one with the University of California, Los Angeles (UCLA) to develop a reference method for validating the performance of open-path remote sensing systems for air toxic measurements. These actions are to recognize revenue up to \$199,949 from Virginia Tech and up to \$208,187 from UCLA into the General Fund, and appropriate up to \$46,120 and \$41,320, respectively from the two universities, in the Monitoring and Analysis FY 2022-23 and/or, FY 2023-24 and/or, FY 2024-25 Budgets to support efforts on these projects.

**COMMITTEE:** Administrative, August 12, 2022; Recommended for Approval

**RECOMMENDED ACTIONS:**

1. Recognize revenue up to \$199,949 from Virginia Polytechnic Institute and State University (Virginia Tech) to the General Fund, upon receipt, and appropriate up to \$46,120 from the General Fund Unassigned (Undesignated) Fund Balance in the Monitoring and Analysis FY 2022-23 and/or, FY 2023-24 and/or, FY 2024-25 Budgets (Org 43), Services and Supplies Major Object, as shown in Table 1 (Salaries & Employee Benefits of \$153,829 are already included in the budget); and
2. Recognize revenue up to \$208,187 from University of California, Los Angeles (UCLA) to the General Fund, upon receipt, and appropriate up to \$41,320 from the General Fund Unassigned (Undesignated) Fund Balance in the Monitoring and Analysis FY 2022-23 and/or, FY 2023-24 and/or, FY 2024-25 Budgets (Org 43),

Services and Supplies Major Object, as shown in Table 2 (Salaries and Employee Benefits of \$166,867 are already included in the Budget).

Wayne Natri  
Executive Officer

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### **Background**

On March 25, 2021, U.S. EPA as part of its Science to Achieve Results (STAR) program, solicited applications from research institutions, governmental agencies and other organizations throughout the nation proposing research to advance “Measurement and Monitoring Methods for Air Toxics and Contaminants of Emerging Concern in the Atmosphere.” South Coast AQMD partnered with Virginia Tech and UCLA to submit two separate grant proposals, one to develop a low-cost sensing device for time-resolved measurements of VOCs and another to develop a reference method for validating measurements of hazardous air pollutants (HAPs) from open-path remote sensing systems. Both proposals were selected for funding and, as co-principal investigator, South Coast AQMD staff will have a major role in the implementation of these two projects which will contribute to developing new tools that can be used for improving VOCs and HAPs measurements from point and stationary sources such as oil and gas wells and refineries. These projects have the potential to enhance the way air quality agencies, industry and communities monitor VOCs and HAPs at the local, regional and national scale by providing guidance for appropriate operation and validation of these technologies.

### **Proposal**

The first proposal is: Enabling Real-time, Low-cost Measurement of Hazardous Air Pollutants. The objective of this three-year project is to develop, characterize and validate a new low-cost sensor-based prototype for quantitative measurements of VOCs. South Coast AQMD staff will work with Dr. Gabriel Isaacman-VanWertz at Virginia Tech to develop a new sensor device that is sufficiently small and lightweight to be deployed as part of a dispersed network, and/or on mobile platforms for time-resolved measurements of total and individual VOCs including benzene. South Coast AQMD will evaluate the performance of this device by conducting rigorous laboratory testing as well as stationary and mobile co-location measurements. The resulting testing data will be used to explore the use of advanced analysis techniques to improve data quality and the prototype's ability to speciate between different VOCs. The testing of this device, the assessment of different approaches to data processing and the resulting analysis of the collected data will result in recommendations for citizen scientists, researchers and other individuals interested in using this new device for measuring VOCs in ambient air.

The second proposal is: Development of a Reference Method for Open-path Remote Sensing of Air Toxics. The goal of this three-year project is to develop a reference instrument and methodology for the operation, validation and quality assurance/quality control (QA/QC) of Open-Path Optical Remote Sensing (OP-ORS) instruments for monitoring VOCs and other HAPs such as the fenceline systems employed by refineries as part of South Coast AQMD's Rule 1180 program. South Coast AQMD staff will collaborate with Dr. Jochen Stutz at UCLA on the testing and validation of a reference OP-ORS instrument to be developed by UCLA for this project. South Coast AQMD staff will design and build a trace gas release system and in collaboration with UCLA, perform a validation of the reference OP-ORS instrument. South Coast AQMD staff will also contribute to the development of an OP-ORS validation protocol and a guidance document for best practices for the operation, QA/QC and validation of OP-ORS systems.

The documents and instrumentation developed during this project will provide regulatory agencies and industry with the necessary guidance to appropriately operate OP-ORS systems, and to assess the quality of the data they produce. Results from this study will promote improvements and standardized use of OP-ORS within the South Coast Air Basin and across the United States. Findings from this study will also provide OP-ORS manufacturers and users with valuable guidance for improving current systems and designing the next generation open-path technology.

### **Benefits to South Coast AQMD**

The successful implementation of these two projects will provide South Coast AQMD with additional tools that will ultimately enhance our ability to detect VOCs and HAPs from multiple point and stationary sources, and for community-level, fenceline and other important applications.

### **Resource Impacts**

Upon Board approval, sufficient funding will be available for these projects. U.S. EPA has authorized funding of \$800,000 for the Virginia Tech project and \$797,988 for the UCLA project, and South Coast AQMD will receive sub-awards of up to \$199,949 and \$208,187, respectively. There is no cost-share by South Coast AQMD or the project partners for either project.

### **Attachments**

Table 1: Proposed Expenditures for EPA STAR Grant (Virginia Tech subcontract) for FY 2022-23 and/or, FY 2023-24 and/or, FY 2024-25

Table 2: Proposed Expenditures for EPA STAR Grant (UCLA subcontract) for FY 2022-23 and/or, FY 2023-24 and/or, FY 2024-25

**Table 1**  
**Proposed Expenditures for EPA STAR Grant (Virginia Tech subcontract)**  
**for FY 2022-23 and/or, FY 2023-24 and/or, FY 2024-25**

Description	Account Number	Program Code	Estimated total cost
Mileage and Travel	67700/67800		\$7,420
Laboratory Supplies*	68050/77000		\$30,000
Rents & Leases Equipment	67300		\$8,700
<b>Total Appropriations Services &amp; Supplies and/or Capital Outlays Major Object</b>			<b>\$46,120</b>
Salaries and Benefits			\$153,829
<b>Total Grant Award for South Coast AQMD</b>			<b>\$199,949</b>

\*During the procurement process, these items may be categorized as Capital Outlays or Services and Supplies, depending on whether the item is purchased or contracted as a service.

**Table 2**  
**Proposed Expenditures for EPA STAR Grant (UCLA subcontract)**  
**for FY 2022-23 and/or, FY 2023-24 and/or, FY 2024-25**

Description	Account Number	Program Code	Estimated total cost
Mileage and Travel	67700/67800		\$5,200
Communications	67900		\$3,120
Laboratory Supplies*	68050/77000		\$12,000
Office Expenses*	68100/77000		\$6,000
Small Tools, Instruments, Equipment*	68300/77000		\$7,000
Miscellaneous Expense (meeting supplies and publications)	69700		\$8,000
<b>Total Appropriations Services &amp; Supplies and/or Capital Outlays Major Object</b>			<b>\$41,320</b>
Salaries and Benefits			\$166,867
<b>Total Grant Award for South Coast AQMD</b>			<b>\$208,187</b>

\*During the procurement process, these items may be categorized as Capital Outlays or Services and Supplies, depending on whether the item is purchased or contracted as a service.