

EPA Assistance Agreement Annual Report Summary

Period Covered by the Report: May 1, 2016 to April 30, 2017

Date of Report: August 1, 2017

EPA Agreement Number: RD83618401

Title: Engage, Educate, and Empower California Communities on the Use and Applications of “Low-Cost” Air Monitoring Sensors

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Project Period: May 1, 2016 to April 30, 2019

Objectives: The overall objective of the proposed research is to provide California communities with the knowledge necessary to appropriately select, use, and maintain “low-cost” sensors and to correctly interpret sensor data. This will be accomplished by pursuing the following four specific aims: (1) develop new methodologies to educate and engage communities on the use and applications of “low-cost” sensors ; (2) conduct testing to characterize the performance of commercially available “low-cost” sensors and to identify candidates for field deployment; (3) deploy the selected sensors in California communities, and interpret the collected data; and (4) communicate the lessons learned to the public through a series of outreach activities.

Progress Summary/Accomplishments (Outputs/Outcomes): **Aim 1.** During this reporting period, the UCLA Institutional Review Board (IRB) determined that the study meets the criteria for an exemption from IRB review until 1/31/2021. SCAQMD worked with STI to develop the draft guidebook of the educational toolkit with a focus on content that encompasses the three major stages of community air monitoring: planning, deployment, and community action. SCAQMD also worked with STI to develop two different surveys, the first to assess community knowledge of air pollution, monitoring, and exposure; the second to assess community perception of sensor operation and data usefulness. The content and format (e.g., hard-copy, electronic) of each survey will be evaluated in collaboration with the community organizations. SCAQMD worked with UCLA, the Center for Community Action and Environmental Justice (CCA EJ) and other air pollution control districts that are members of the California Air Pollution Control Officers Association (CAPCOA) to specifically target and recruit communities in Environmental Justice areas and near specific sources of air pollution. Two communities in Southern California have been identified for this project. The first is located in San Bernardino County and is mainly impacted by particulate and ozone pollution from rail yard, diesel trucks and transmodal operations. The second is located in Riverside County and is mainly impacted by high levels of particulate pollution from diesel trucks traveling on a major transportation corridor. **Aim 2.** SCAQMD has conducted a thorough performance characterization of currently available “low-cost” sensors using both field and laboratory testing, and identified PM and Ozone “low-cost” air monitoring sensor candidates for field deployment. A summary of the sensor evaluation process addressing sensor capabilities, currently existing technologies, and potential candidates for the STAR study has been shared with STI and UCLA, CCA EJ, Bay Area Air Quality Management District (BAAQMD) and Santa Barbara County Air Pollution Control District (SBCAPCD). Most of the activities related to this aim have already been completed. **Aim 3.** Contract negotiations delayed the start of the sensor deployment activities, but are not expected to further impact the project timeline. Partnerships with the community organizations are in the process of being finalized and, thus, SCAQMD agreed with STI to delay the outreach and workshop activities that

were originally planned to occur during this reporting period. BAAQMD offered to provide funding to purchase additional sensor devices and coordinate the recruitment of members in two Bay Area communities. SBCAPCD expressed interest in participating in the study, purchased 40 particulate matter (PM) sensors measuring PM₁, PM_{2.5} and PM₁₀ and offered to provide funding to recruit additional communities/schools in their jurisdiction. To complement and further expand the goal and objectives of Aim 3, the SCAQMD partnered with the University of Auckland (New Zealand) to deploy around 100 additional sensor devices in Southern California communities. These devices include sensors for measuring multiple pollutants (i.e., Ozone, Nitrogen Dioxide, PM_{2.5} and PM₁₀) and their performance will be evaluated by the SCAQMD.

Upcoming Activities: Aim 1. SCAQMD will work with STI, UCLA, CCAEJ and CAPCOA to determine how to incorporate sensor-specific information, in the guidebook, the training videos and other educational material. STI will receive and incorporate feedback on the guidebook from SCAQMD, UCLA, Community Groups and CAPCOA. The updated guidebook will then be used and evaluated during the first community workshops and the content, structure, and design will be adapted and refined. SCAQMD will continue to work with STI to determine the appropriate timeframe during which to complete these tasks. UCLA plans to pilot test the project documentation for clarity and impact within the next reporting cycle. CCAEJ Community members will be the first to be trained on how to operate low-cost sensors and will provide feedback on the use of these devices. They will also conduct outreach activities to engage other members of their communities. **Aim 3.** Sensor deployment is expected to begin in Southern California communities later this year.

Supplemental Keywords: community education, community empowerment, sensor testing, sensor measurements, data interpretation, public outreach

Relevant website: www.aqmd.gov/aq-spec