

**State of California
AIR RESOURCES BOARD**

**Research Screening Committee Meeting
Cal/EPA Headquarters Building
1001 I Street
Conference Room 510
Sacramento, California 95814
(916) 445-0753**

**September 9, 2010
9:00 a.m.**

ADVANCE AGENDA

Contract Augmentations

1. "Nocturnal Chemistry in the Urban Boundary Layer of Los Angeles," University of California, Los Angeles, \$120,000, Augmentation to Contract No. 08-318, Proposal No. 2702-268

A contract augmentation is requested to cover unanticipated expenses associated with changing the field site of the project, which also served as a supersite for the field study CalNex 2010, from the originally intended Los Angeles Department of Water and Power (LADWP) building at North Main Street to a site on the campus of the California Institute of Technology (Caltech). The original contract was awarded in January 2009 and work commenced immediately on planning and organizing other groups as part of CalNex 2010. In January of 2010, however, the LADWP finalized a decision to install solar panels during the time planned for field work in CalNex 2010. Caltech offered assistance with a site large enough for the entire field experiment, which consisted of over 30 research groups with 30 gas-phase and 30 aerosol instruments. Because of the change in location, the project incurred additional costs associated with installation of power and rental of trailers and towers, and with the need for a more sensitive detector component for the increased light path of the principal investigator's (PI) Differential Optical Absorption Spectroscopy (DOAS) instrument. To cover these expenses, the original contract was amended to shift funds out of salary to appropriate categories. The final deliverables were correspondingly affected: the planned analysis of data can not be carried out with current funding (the PI and graduate student researcher provided in-kind labor to run the instruments and collect data during the field campaign). The requested augmentation would restore the original funding for salary and provide support for data analysis listed in the proposal and for the PI to continue the coordination of the data analyses efforts of the CalNex-LA researchers after the field experiment and to publish results from the field experiment.

2. "Characterization of the Atmospheric Chemistry in the Southern San Joaquin Valley," University of California, Berkeley, \$45,000, Augmentation to Contract No. 08-316, Proposal No. 2703-268

On January 23, 2009, the Research Screening Committee (RSC or Committee) approved the research proposal "Characterization of the Atmospheric Chemistry in the Southern San Joaquin Valley," which was submitted by the University of California, Berkeley (UCB), for the amount of \$1,050,000. This atmospheric chemistry project was the cornerstone of the research efforts at the CalNex 2010 supersite in Bakersfield. CalNex is an approximately \$20 million air quality field study being conducted by the National Oceanic and Atmospheric Administration and ARB. The air quality measurements at the Bakersfield supersite occurred from mid-May through June of 2010. The goal of this contract, in conjunction with additional researchers at the supersite, was to measure critical air quality species pertinent to understanding why air quality has not improved in the San Joaquin Valley as rapidly as one might expect, given the success in improving air quality in the South Coast Air Basin (SoCAB). Additional investigators under other contracts also made measurements at the Bakersfield supersite to investigate aerosol composition and aerosol sources. All of the data collected at the Bakersfield supersite are now being validated and will be analyzed during the next year to understand the emission sources and atmospheric processes controlling air quality in the southern San Joaquin Valley Air Basin (SJVAB).

Draft Final Reports

3. "A Pilot Study: Improvements in Health Outcomes from Incremental Improvements in Air Quality," University of California, Berkeley, \$471,261, Contract No. 01-346

This study was conducted in Southern California by the University of California, Berkeley (UCB) with Dr. Ira Tager as the PI and titled, "A Pilot Study: Improvements in Health Outcomes from Incremental Improvements in Air Quality." The original objective of the study was to quantify the extent to which changes in the health of the population of SoCAB are associated with the significant decreases in measured air pollution during the period from 1980-2000. The following pollutants and health indicators were to be evaluated using newly developed techniques:

1. Two pollutants (ozone and particulate matter (PM))
2. Three hospital discharges outcomes (pneumonia/bronchitis, asthma, chronic obstructive pulmonary disease (COPD))
3. At least five mortality outcomes (pneumonia/influenza, three different cardiovascular endpoints and COPD)

For all possible sixteen air pollutant/health endpoint combinations, the PI was to perform conventional statistical analyses in parallel with the new techniques, marginal structural models (MSMs), and compare inferences between the two approaches.

4. "Impact of Climate Change on the Frequency and Intensity of Low-Level Temperature Inversions in California," University of California, San Diego, \$249,995, Contract No. 06-319

Low-Level atmospheric temperature inversions (where temperature increases with height) inhibit vertical movement of air and can thereby increase the concentrations of air pollutants emitted near the ground. As the climate and regional circulation patterns change, the frequency and intensity of low-level temperature inversions will likely be affected. This research examined temperature inversions in California on various temporal scales (diurnal, synoptic, seasonal, and inter-annual) with a focus on two major air basins in California: SJVAB and SoCAB. Historical radiosonde and surface-based observations from 1960 through 2007 were analyzed while projections of inversion strength were produced for the time period 2010-2099 in the SJVAB and SoCAB. Climate model projections indicate increasing trends in elevated inversion strength into the next century at both air basins, ranging from 0.2°C to 1.6°C for the SJVAB and 0.5°C to 1.3°C for the SoCAB. The increases in inversion strength are projected to become substantial (relative to historical levels and variability) by 2060, and to worsen air quality within both the SJVAB and the SoCAB. The results of this research project would help to answer questions on the impacts of climate change on air quality. A better understanding of future changes in the temperature structure and other meteorological parameters is needed to help ARB staff prepare for future regional air quality plans in California.

5. "Characterizing MAC Refrigerant Emissions from Heavy-Duty On and Off-Road Vehicles in California," Eastern Research Group, \$148,513, Contract No. 06-342

The refrigerant HFC-134a is a potent greenhouse gas (GHG) that is slowly emitted from mobile air conditioning (MAC) systems. Leak rates from the light-duty fleet have been characterized and regulations are in place to reduce those emissions. Much less is known about the magnitude of refrigerant emissions from the heavy-duty fleet. The objective of this project was to accurately characterize in-use emissions from heavy-duty on- and off-road vehicles. Investigators obtained operating fleet vehicles, charged the evacuated MAC system with a known amount of refrigerant, and then measured the charge (by weight) after several months of normal vehicle operation to determine the leak rate. This study obtained mass based data for 62 heavy-duty vehicles. The average annual leak rate for vehicles of 2005 model year and older was 306 grams per year (g/yr). For 2006 model year and newer, the leak rate is estimated to be 103 g/yr. The leak rate for the entire fleet was 257 g/yr. Transit buses have a much larger air conditioning (AC) charge than other heavy-duty vehicles, up to four times larger. Analysis of transit bus maintenance data suggests a fleet average leak rate of 1,340 g/yr of HFC-134a per bus. This value includes all leak sources including servicing losses. When combined with California vehicle population data, results of this study suggest 1.36 million metric tons of carbon dioxide (CO₂) equivalent may be emitted annually from the heavy-duty fleet due to leaking air conditioning systems. These results provide basic emission inventory data for any possible future regulation to reduce GHG emissions from the heavy-duty fleet.

Other Business

6. Draft Planned Air Pollution Research for Fiscal Year 2010-2011

The objective of the Research Plan is to delineate the overall goals and direction of the Board's Research Program for the current fiscal year. ARB is asking the Committee to consider formal approval of the plan based on technical evaluation of the portfolio. Pending RSC approval of the draft Plan, it will be released for public comment and brought to the Board at the October 21, 2010 Board meeting.