



# South Coast Air Quality Management District

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## SCIENTIFIC, TECHNICAL & MODELING PEER REVIEW MEETING MINUTES

Wednesday, March 16, 2022  
2:00 pm

### 1. Welcome and Introduction

Ian MacMillan, Assistant Deputy Executive Officer/Planning, Rule Development and Implementation (PRDI), welcomed attendees and introduced the topics of the meeting. The meeting was conducted virtually via zoom.

### 2. Attainment Demonstration for the 2015 8-hour Ozone Standard

Dr. Sang-Mi Lee, Planning & Rules Manager, PRDI, presented modeling results of an attainment scenario for the 2015 8-hour ozone standard for the South Coast Air Basin and the Coachella Valley.

Mr. Ralph Morris suggested that when developing control strategies, it would be useful to look at intermediate years leading up to the attainment year 2037 and come up with some (Volatile Organic Compounds) control strategies early on to counteract the temporary disbenefit of oxides of nitrogen (NO<sub>x</sub>) as it appears in some stations by looking at the ozone isopleths. He also pointed that we're not meeting the 1979 1-hour standards and 1997 80-ppb 8-hour standards by their deadlines.

Mr. MacMillan acknowledged and confirmed Mr. Morris' point that we are not on track to meet the deadlines of attaining 1979 1-hour Ozone (2022) and 8-hour standards by 2023 and 2031 as well. He mentioned that while taking on earlier than later VOC controls could be interesting, the overall strategy to attain ozone standards still remains the same, which is controlling NO<sub>x</sub> levels based on the modelling results. Dr. Lee added that some locations monitored in the South Coast AQMD region might benefit from early-on VOC benefits. She mentioned that limited VOC control strategy is being included in the current 2022 AQMP, and the VOC controls are being reviewed for these reasons 1) easing up the NO<sub>x</sub> disbenefits in earlier years 2) toxicity-associated VOCs and 3) exempted compounds which are cancer inducing for which replacement is needed. Mr. MacMillan added that we are also expecting VOC controls from many mobile source control measures for conversion to zero emissions technologies even if they are not necessarily targeting VOC reductions.

Dr. Kelly Barsanti commented that she is thinking along the same line as Mr. Morris, that we are seeing air monitoring data at some locations becoming closer to VOC-limited and wondering what happens if some of the other stations become VOC-limited, thus, suggesting the need for VOC controls. She wondered whether the chemical transport models at AQMD, which are used for ozone predictions, are accounting for the fact that OH concentrations are increased with decreases in NO<sub>x</sub> levels thus changing the ozone chemistry.

Dr. Lee responded by acknowledging the existence of NO<sub>x</sub>-disbenefit and pointed to the real-world example with the pandemic NO<sub>x</sub> disbenefit. However, the level of NO<sub>x</sub> disbenefit is diminishing compared to earlier years and the basin is transitioning to a NO<sub>x</sub>-limited regime. Dr. Lee responded to Dr. Barsanti's 2<sup>nd</sup> question that we are aware that NO<sub>x</sub> chemistry is impacted by changes in ambient level of NO<sub>x</sub> and that OH plays an important role. Dr. Lee added that we do use off-the-shelf standard version of CMAQ model from U.S. EPA, so the attainment demonstration is certainly based on this default version of CMAQ. However, we are investigating this matter to better understand how to incorporate the changes in ambient level of NO<sub>x</sub> and its impact on OH production in our modelling framework and will definitely consult with experts.

Mr. Jim Lutz wondered whether staff have been looking at (or including) the impact of smoke from wildfires in the models knowing the increase in wildfires. Dr. Lee responded that wildfire does impact air quality in the basin, but the federal ozone standards focus on the fourth highest ozone day in a year which are typically unaffected by fires. Thus, really high ozone days go into this attainment demonstration determining how far we are from standards. Dr. Lee added that the home-grown portion of ozone which is formed via chemical reactions in the atmosphere outweighs the ozone production from events such as wildfires (which are less related to high ozone episodes), thus, we only consider wildfire impacts in our statistical analysis of air quality modeling performance evaluation.

Mr. Morris asked how staff are treating the boundary conditions in their modeling of 2037 emissions and if reductions from ozone transport from Asia will be accounted for, and if the 2018 boundary values is held constant. Dr. Lee responded that for lateral boundary conditions, South Coast AQMD staff explored multiple versions but the one included in the model is from CARB, and she asked Dr. Jeremy Avise, Chief of Modeling & Meteorology/CARB, to clarify. Dr. Avise responded that they use global model outputs (either WACCM or Chem-Cam; he pointed that he needs to verify which one of these two) from NCAR for 2018; he confirmed Mr. Morris' understanding regarding holding lateral boundaries values constant.

Mr. Alan DeSalvio from Mojave Desert AQMD asked Dr. Lee if what she described for Coachella Valley severe area is similar situation for two other severe areas namely Antelope and Mojave. Dr. Lee confirmed that the situation in these areas is similar.

### **Sensitivity Analysis for the VOC emissions and its Impact on Attainment Scenario**

Dr. Marc Carreras Sospedra, Air Quality Specialist, PRDI, presented CMAQ modeling results and RRF adjusted design values associated with ozone sensitivity on VOC emissions.

Mr. Morris acknowledged the good explanation by Dr. Carreras Sospedra's plots indicating that by doubling VOC levels ozone becomes more responsive to NO<sub>x</sub> reductions in the future, which raises a question, but he acknowledged that this is due to how RRF works. Mr. Morris noted that some volatile chemical products (VCP) are not included in the model and wondered whether there is any plan to incorporate VCP emissions into the model (within the context of VOC sensitivity); he noted that U.S. EPA in 2016 includes these in their current platform released last year which accounts for VCP emissions levels. Dr. Carreras Sospedra acknowledged that South Coast AQMD staff are aware of that study, have briefly reviewed the work by U.S. EPA and have plans to explore that and maybe incorporate them (VCP emissions) in the model in the future; he acknowledged

that this would not be feasible for current AQMP version. Dr. Lee added that another reason is that we always stay one version behind from U.S. EPA's current modelling platform as the most updated version usually has bugs that needs to be fixed. Thus, South Coast AQMD uses a stable version, but she acknowledged that Mr. Morris' comments is however well-noted. Mr. Morris commented that he understands that, but he intended to clarify if there is any plan to use VCP emissions in the model.

### **EMFAC Heavy-Duty Vehicle Emission Rates CARB**

Dr. Mo Chen, Air Pollution Specialist/CARB, presented an overview of Heavy-Duty vehicle NOx emission rates in EMFAC and the emission assessment of recent port congestion.

Mr. Naveen Berry commented that he noted that some of the changes reflected the 2013 or later model years. He wondered if CARB's staff had looked into some of the data for 2010 to 2012 model years which is what the truck and bus regulations focus on as far as the starting point for the 0.2 NOx per gram per brake horsepower of trucks. Mr. Berry also inquired whether CARB had looked into aggregated or cumulative impact of these low-speed operations and what those NOx reductions that were anticipated in the original Truck and Bus Regulation that may not be achieved due to some of these low-speed considerations that we are more aware of now than when the regulations were initially adopted. Dr. Sara Forestieri, Air Resources Engineer/CARB, responded that including 2010-2012 model years was a particular focus when developing EMFAC 2017 and CARB tested the vehicles with engine model year 2010-2012 on various cycles, and as Dr. Chen showed, such low-speed cycles are pretty good at capturing low-load/ low-temperature operations when the SCRs are not working as well. Dr. Forestieri added that because CARB had a good amount of data for 2010-2012 in EMFAC 2017, CARB turned the focus to OBD-equipped like 2013 model year vehicles in EMFAC 2021 and did the same set of cycles to quantify and wrap into the model low-temperature operations, so she concluded that low-load cycle emissions are well captured and accounted for in the model. Dr. Forestieri answered that with regards to Trucks and Bus Regulation and the benefits we would expect from that, some assumptions were made during rulemaking process (probably back in 2008) but later through the tests made on model engine 2010 and newer vehicles CARB staff were able to update those assumptions and reflect the true emissions reductions from truck and bus rule into the inventory, so that is pretty well captured into EMFAC 2017 and further improved in EMFAC 2021 as we get more data through the bus and truck surveillance program in EMFAC 2021.

### **3. Zero-Emission Infrastructure and Other Cost Considerations**

Dr. Paul Stroik, Air Quality Specialist/PRDI, presented on challenges in fully quantifying and apportioning zero-emission infrastructure related costs and other cost considerations for the 2022 AQMP control measures.

Dr. Anthony Oliver, Senior Economist/CARB, commented on Slide 7, specifically the cost component of electricity infrastructure. He added that, for recently adopted and proposed CARB regulations, the cost of necessary grid upgrade is not directly quantified, but it is incorporated in the forecasted electric utility rates. In the case of increasing rates due to cost of infrastructure, where there is more demand, it creates a broader base to spread out the fixed cost of infrastructure.

Mr. Lutz commented on the technologies in residential electrification that help optimize the usage within the residential sector to allow for expanded gas appliance electrification (and sometimes vehicle home charging) without incurring the cost of expanding infrastructure.

### **STMPR Participants, March 16th**

<b>AQMD Staff</b>	<b>26</b>
<b>Non-AQMD Participants</b>	<b>47</b>
<b>Phone Participants</b>	<b>1</b>
<b>Total</b>	<b>74</b>

#### **Members Present (8)**

Anthony Oliver, Senior Economist, California Air Resources Board (CARB)  
Greg Osterman, Jet Propulsion Laboratories  
Jeremy Avise, Chief of Modeling & Meteorology, CARB  
Kelly C. Barsanti, University of California Riverside  
Pablo Saide, Faculty, UC Los Angeles, Dept. of Atmospheric Sciences  
Peter Evangelakis, Vice President, REMI, Inc.  
Ralph Morris, Principal, Ramboll  
Rynda Kay, U. S. Environmental Protection Agency, Region IX

#### **Public Attendees and Interested Parties (39)**

Abas Goodarzi, US Hybrid  
Adrian Martinez, Earthjustice  
Ali Ghasemi, Ventura County Air Pollution Control District  
Alison Torres  
Ariel Fideldy, CARB  
Austin Hicks, CARB  
Ben Leers, EPA Region IX  
Bill LaMarr, California Small Business Alliance  
Bridget McCann, Chevron  
Chenxia Cai, CARB  
Christine Batikan, Port of Los Angeles  
Craig Sakamoto, PBF Energy  
Dan McGivney, SoCal Gas  
Duane Baker, San Bernardino County Transportation Authority  
Hilary Lewis  
Jacqueline Moore, Pacific Merchant Shipping Association  
Jamie Bartolome  
Janet Whittick, California Council for Environmental and Economic Balance  
Jie Zhou, CARB  
Jim Lutz, Lawrence Berkeley National Laboratory  
Joe Lyou, Coalition for Clean Air  
John Ungvarsky, EPA Region IX  
Julie Van Wagner, Los Angeles Dept. of Water & Power  
Justin Martin  
Lakshmi Jayaram, Ramboll  
Leonardo Ramirez, CARB  
Michael Benjamin, CARB

Michelle Zumwalt, Mojave Desert Air Quality Management District  
Mo Chen, CARB  
Naveen Berry  
Phil Gleason, MIG  
Ramine Cromartie, Western States Petroleum Association  
Sara Forestieri, Air Resources Engineer, CARB  
Scott King, CARB  
Scott Weaver, Ramboll  
Steve Levy, Center for Continuing Study of the California Economy (CCSCE)  
Teresa Pisano, Port of Los Angeles  
William Leung, CARB  
Wilson Wong  
Yasmine Stutz, Ramboll

**South Coast AQMD Staff Present (26)**

Anthony Tang, Information Technology Supervisor  
Barbara Radlein, Program Supervisor  
Brian Vlasich, Air Quality Specialist  
Cui Ge, Air Quality Specialist  
Daphne Hsu, Principal Deputy District Counsel  
Elaine Shen, Planning and Rules Manager  
Elham Baranizadeh, Air Quality Specialist  
Eric Praske, Air Quality Specialist  
Ian MacMillan, Assistant Deputy Executive Officer  
Jason Aspell, Deputy Executive Officer  
Jillian Wong, Asst. Deputy Executive Officer  
Jong Hoon Lee, Air Quality Specialist  
Kathryn Roberts, Deputy District Counsel  
Kevin Ni, Air Quality Specialist  
Marc Carreras Sospedra, Air Quality Specialist  
Paul Stroik, Air Quality Specialist  
Paul Wright, Information Technology Specialist  
Rosalee Mason, Secretary  
Rui Zhang, Air Quality Specialist  
Ryan Finseth, Air Quality Specialist  
Sang-Mi Lee, Planning and Rules Manager  
Sarah Rees, Deputy Executive Officer  
Scott Epstein, Program Supervisor  
Shah Dabirian, Program Supervisor  
Wei Li, Air Quality Specialist  
Xinqiu Zhang, Sr. Staff Specialist