

## **SOUTHEAST TEXAS PHOTOCHEMICAL MODELING TECHNICAL COMMITTEE**

*Houston-Galveston Area Council Offices  
3555 Timmons Avenue  
Houston, Texas*

*March 26, 2013 10:00 a.m. – 3:30 p.m.*

### **ATTENDEES**

Bruce Davis, Barry Lefer, Ken Gathright, Adrian Shelley, John Chapa, Yunsoo Choi, Jian Zhang, Ziyuan Wang, Steve Smith, Graciela Lubertino, Marise Textor, Dan Baker, Doug Boyer, John Jolly, Mark Estes, Judy Bigon, Angela Kissell, Jim Smith, Kathy Pendleton, Erik Snyder, and Lola Brown

### **MINUTES**

Doug Boyer with the Texas Commission on Environmental Quality (TCEQ) welcomed the group and started the meeting. All presentations are available on the SET PMTC Web site, [http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc\\_set.html](http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html).

#### SIP Planning and Implementation Update – Lola Brown (TCEQ)

Lola gave an update on the SIP adoptions that occurred since our last meeting. Lola also discussed upcoming TCEQ agendas that have SIP actions, including the adoption for the HGB SIP revision to update the MVEB using the MOVES model on April 23, 2013.

#### Section 185 Fees: Severe Ozone Nonattainment Area Failure to Attain Fee Proposal – Kathy Pendleton (TCEQ)

Kathy provided a verbal update on the Section 185 fee program and noted the program will go before the TCEQ Commission for adoption on May 22, 2013. Kathy explained that the 2002-adjusted fee would be \$9169/ton and that the collected fees would be deposited into the State's clean air fund. Depending on aggregation of pollutants and/or sites, the total collected amount would be \$30-70 million. The initial fee would be due in December 2014 based on 2012 emissions.

#### H-GAC Air Quality Issues – Graciela Lubertino, Ph.D. (H-GAC)

Graciela gave a verbal update of current H-GAC conformity planning, which needs to be finalized and submitted by July 20, 2013 to comply with the 1 year conformity grace period from the 2008 8-hr ozone standard designations. The analyses were completed with MOBILE6.2 because the HGB area does not have a MOVES-based on-road mobile vehicle emissions budget (MVEB) approved by EPA.

#### HGB MVEB SIP Revision Comments Review – Doug Boyer (TCEQ)

Doug verbally discussed the technical comments to the HGB MVEB SIP Revision. Comments about the modeled days used in the design value calculations, the responsiveness of the model, background ozone concentrations, and the control strategy were received. The comments and TCEQ responses will be included in the SIP Revision package at adoption on April 23, 2013.

Continuous Measurements of Ozone and Nitrogen Dioxide at Moody Tower - Barry Lefer, Ph.D (University of Houston)

Dr. Lefer presented James Flynn's analysis of the ozone and NO<sub>2</sub> measurements at the elevated Moody Tower site compared to nearby surface sites. The Moody Tower site was found to consistently measure ozone higher than nearby CAMS sites. By looking at Ox (ozone + NO<sub>x</sub>), they found that most sites agreed better with the Moody Tower. Some differences appeared to be the effects of the residual layer at the 70m Moody Tower sampling height, which didn't make it to the surface. Other differences may be due to calibration issues and sampling inlet line cleanliness. UH plans to investigate the dirty inlets and suggest QC protocols for future measurements.

The influence of meteorology and atmospheric composition on the year-to-year variability in the number of ozone exceedances in Houston – Barry Lefer, Ph.D. (University of Houston)

Dr. Lefer presented a history of ozone, NO<sub>x</sub>, and VOC trends in the HGB area and noted the declining trends in those pollutants. He compared notable decreases to points in time when emission rules went into effect, such as the Mass Emissions Cap and Trade (MECT) program. He presented the idea of Non-Typical Ozone Change (NTOC) events ( $\geq 40$  ppb/hr rise) from William Vizuete at the University of North Carolina, which many attendees questioned because of the differing nature of sharp ozone concentration rises. Barry also presented the meteorology-adjusted trends of ozone from Dr. Chu at EPA that exhibited 2007-2010 had HGB ozone concentrations lower than predicted by Dr. Chu's algorithm. Emission reductions or other atmospheric changes may account for the ozone decreases.

University of Houston Air Quality Forecasting System and its Application – Yunsoo Choi, Ph.D. (University of Houston)

Dr. Choi showed the attendees many of the modeling applications his group is working on including lightning emissions and their real-time CMAQ and WRF-Chem modeling. His group found large NO<sub>x</sub> biases over Texas and other areas of the country when using the 2005 NEI emission inventory. Using an adjustment factor, they were able to compensate for the NO<sub>x</sub> bias and produce modeling more in line with observations. For future work, they intend to use TCEQ-developed inventories for Texas. Dr. Choi's group has WRF-Chem running now and expects their WRF-CMAQ model to be operational for the DISCOVER-AQ study in August/September.

EPA SIP-Related Update – Erik Snyder (EPA Region VI)

Erik gave a verbal update on relevant meetings and SIP actions. The draft PM<sub>2.5</sub> permit modeling guidance comment period was extended until May 31, 2013 after many requests were received. This guidance help clarify procedures and modeling platforms/techniques for addressing fine particulate matter impacts from stationary sources. This topic was discussed at the recent AWMA/EPA permit modeling conference in Raleigh. One SET PMTC participant asked if TCEQ plans to submit official comments to the draft PM<sub>2.5</sub> permit modeling guidance. TCEQ does plan on submitting official comments by the deadline.

The Regional, State, and Local Modeler's meeting will happen April 22-25 at Region VI headquarters in Dallas. The first day is open to industry and their contracted modelers. The following days are only for government modelers.

EPA is under a consent decree order to act on the HGB MVEB SIP Revision this fall. It will be up for adoption at the April 23, 2013 TCEQ Commissioner's Agenda.

The federal budget sequestration has reduced EPA's 2013 budget by ~\$430 million. Each employee may be furloughed 13 work days between now and September. This may impact some actions.

#### Ethylene / Propylene Trends at Lake Jackson C1016 Auto-GC and Clute C11 Canister – John Jolly (TCEQ)

John Jolly presented an analysis of the monitored Auto-GC VOC data at the industry-sponsored Lake Jackson monitor in Brazoria county. He also included every sixth day 24-hour VOC canister data from the nearby Clute monitor. John showed the Lake Jackson ethylene and propylene concentrations by wind direction since 2003 and noted a decreasing trend through most years. The highest concentrations are observed from the southeast (Freeport-area industry) and north-northeast (ship channel industry). The geometric means of the Clute VOC canister data showed similar trends, though first through third high value trends showed anomalous years. The Clute monitor is in close proximity to the Dow facility in Freeport.

John indicated that while the trends have been decreasing, the Lake Jackson monitor is the only Brazoria county Auto-GCs that can monitor the Freeport area industry. With the low price of natural gas many facilities have proposed expansions, which would be important to monitor. There was some discussion on how companies might be able to gain VOC offsets, which are scarce to nonexistent right now, in order to increase emissions due to plant expansions. The Auto-GC data is also of great use in photochemical modeling evaluation and would be very useful for the DISCOVER-AQ study later in 2013.

#### DISCOVER-AQ – Mark Estes (TCEQ)

Mark presented the plans for the NASA-sponsored Deriving Information on Surface conditions from Column and Vertically resolved observations Relevant to Air Quality (DISCOVER-AQ) study. NASA and other collaborators will bring instrumented aircraft and surface stations to the Houston area to compare with satellite column measurements. By the end of 2014, NASA expects to study Baltimore, the California Central Valley, Houston, Los Angeles, and Denver. The data analysis is expected to inform NASA on the creation of the next generation Earth Observing Satellites.

For Houston, the aircraft are planned to fly a figure-eight pattern with spiral points over existing surface stations. The resultant vertical profiles from the aircraft will be compared to satellite estimates of ozone, NO, NO<sub>2</sub>, CO, PM, CO<sub>2</sub>, some VOCs, and other gases. Many other groups will install additional surface monitors to complement the aircraft measurements. Some of the groups have been funded by the Air Quality Research Program. The air quality study will occur in September 2013.

#### 2013 Air Quality Research Program (AQRP) Projects – Doug Boyer (TCEQ)

Doug discussed the approved 2013 AQRP projects. Six projects are dedicated to monitoring and support during the DISCOVER-AQ study. Those projects total approximately \$900,000. Similar to past air quality studies, these projects will monitor trace gas species using advanced techniques such as the Solar Occultation Flux (SOF) vehicle and mobile Differential Optical Absorption Spectroscopy (DOAS). Ozonesondes will be launched to better characterize the chemical environment of the troposphere.

Improvement to photochemical modeling is also a focus of AQRP for 2013. Eight projects are expected to develop new parameterizations for nitrous acid (HONO), highly reactive VOCs, SO<sub>2</sub>, and organic nitrate as well as improve nighttime wind speed performance in the meteorological model. Approximately \$790,000 is dedicated to model improvement projects.

### Next Meeting

The group did not have specific topics they would like to see/present at a future meeting. A month for the next meeting was not preferred either. Doug indicated the next meeting would occur when enough topics are ready to be presented by TCEQ and others.