

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

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

*October 23, 2012 10:00 a.m. – 2:00 p.m.*

### **ATTENDEES**

Dan Price, Bradley Flowers, Walt Crow, Marise Textor, Matthew Tejada, Adrian Shelley, Bruce Davis, Graciela Lubertino, Ryan Perna, Tom Tesche<sup>1</sup>, Erik Snyder<sup>1</sup>, Greg Stella<sup>1</sup>, Paul Petit<sup>1</sup>, Dan Baker, Jian Zhang, Judy Bigon, Ken Gathright, Ziyuan Wang, Dick Karp, Marvin Jones, Jim Smith, Doug Boyer, and Lola Brown<sup>1</sup>

### **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 upcoming TCEQ agendas that have SIP actions, including the proposal for the HGB SIP revision to update the MVEB using the MOVES model and the proposal for the FCAA §185 fee rulemaking. Lola also let the group know other items of interest, including the October 25, 2012 Regional Air Quality Planning Committee Meeting and the development of training for flare operators by TCEQ and the University of Texas.

Lola was asked when the FCAA §185 fee website will be updated and when the first fees will be due. A discussion of the fee program and a notification of a stakeholder meeting would be brought to a future meeting. (Lola indicated a public hearing on the proposed fee plan would be held January 9, 2013, in Houston)

For questions or more information, please contact Lola at [lola.brown@tceq.texas.gov](mailto:lola.brown@tceq.texas.gov).

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

Graciela gave a verbal update of H-GAC air quality activities including continued work on conformity analyses associated with revisions to the 2011-2014 and 2013-2016 Transportation Improvement Projects (TIPs). Graciela also continued to work on a paper with Bernhard Rappenglueck (University of Houston) comparing MOVES estimated on-road mobile source emissions with the ambient air quality measurements collected along roadways in Houston as part of the SHARP study in 2009. We look forward to a presentation at an upcoming SET PMTC meeting.

For questions or more information, please contact Graciela at [graciela.lubertino@h-gac.com](mailto:graciela.lubertino@h-gac.com).

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<sup>1</sup> Via conference call

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

Erik gave a verbal update on several SIP-related issues. In particular, EPA has requested an *en banc* review by the full court of the three judge panel's decision to vacate CSAPR. At this time the court has not decided whether to rehear the case.

EPA is reviewing the Texas Regional Haze SIP under a consent decree. EPA intends to propose their approval/disapproval in May 2013 and finalize in December 2013. The Texas Regional Haze SIP is one of the last in the country to be reviewed.

Erik indicated the EPA has received petitions to use the 2009 through 2011 ozone data instead of the 2008 through 2010 data, which resulted in notably fewer designations and lower classifications. EPA plans to get back with the court in a couple of months.

EPA Region 6 is also actively reviewing the petitions to reconsider Wise County's nonattainment status under the 2008 eight-hour ozone standard. Erik expects EPA to respond to the petitioners in the next couple of months.

For questions or more information, please contact Erik at [snyder.erik@epamail.epa.gov](mailto:snyder.erik@epamail.epa.gov).

#### Houston Clean Air Network's Real-time Ozone Mapping – Dan Price, Ph.D. & Matthew Tejada, Ph.D. (Air Alliance Houston)

Dr. Price and Dr. Tejada went through a demonstration of the ozone mapping tool, which plots 5-minute ozone data from 44 monitors in the Houston metropolitan area using Google Maps. The plotted contour data is interpolated across the 18 closest monitors and the past 30 minutes. They described it as a real-time visualization that an individual could use to estimate their personal exposure to ozone concentrations. The color coding is based on the eight-hour ozone Air Quality Index (AQI).

A research part of the web site is expected next spring as well as apps for the iPhone and Android devices. A modeled forecast is also in the works.

One comment was received that this tool should not be termed a personal monitor. Other comments and suggestions focused on changes to the display, such as adding real-time traffic, and whether using the threshold for eight-hour ozone exposure (eight-hour ozone AQI) was an appropriate level to flag thirty-minute ozone concentrations as hazardous.

#### Modeling Flare Destruction and Removal Efficiency – Jim Smith (TCEQ)

Dr. Smith reviewed the results of the 2010 TCEQ Flare study, which found that flare destruction and removal efficiency (DRE) and combustion efficiency (CE) were very sensitive to the steam and/or air assist rates. Therefore many flares operating under current regulations, may not be achieving the presumed 98 or 99% DRE. Dr. Smith presented his analysis of the results of the 2010 TCEQ Flare study that showed the combustion zone heating value (CZHV) and excess air are good predictors for the DRE of HRVOC flares with steam assist and air assist, respectively. Using the reported values from the 2010 TCEQ Flare study, Dr. Smith developed models to estimate DRE values from HRVOC flares using the CZHV and excess air values. These DRE values will be applied to the flare vent gas composition values from the 2011-2012 HRVOC flare survey provided by the companies to estimate their hourly emissions.

One commenter asked if industry was controlling their flares appropriately. Jim thought that more operators were aware but pointed to the development of flare operator training in Lola's update indicating that more work may be needed.

#### HRVOC Flare Survey Results – Marvin Jones (TCEQ)

Dr. Jones reviewed the responses to the 2011-2012 flare survey. Many responses were incomplete, missing operating data or stack parameters that would improve emission estimates. To overcome these omissions, operating parameters including assist rates had to be estimated based on other survey results or the annual Emission Inventory Questionnaire entries. From the data provided and estimates used for missing data, an emission modeling data set was developed for the 162 flares were in the 2011-2012 flare survey. In the modeling data set, each flare point source has a vent gas composition, flow rate, and calculated DRE for every hour of every day in the 2006 episodes. This provides a higher temporal resolution of emissions than those created from annual or typical ozone season day inventories.

Dr. Jones also presented plots showing the daily emissions from the top 12 emitting HRVOC flares, which accounts for approximately 75% of the HRVOC emissions from the surveyed flares. The hourly flare emissions vary greatly over the modeling episodes. A pie chart of the HRVOC emission distribution and the DREs showed that some flares emitted a similar magnitude of emissions with very different DREs. Thus, the flare operator training may be an important tool for reducing emissions.

The next step is to let the flare survey respondents review their supplied data, any assumptions or corrections, and the calculated emissions. The hourly flare emissions will be used in upcoming photochemical model runs.

One person asked if the hourly flare emissions were compared to auto-GC measurements. That comparison had yet to be made but is something that the TCEQ will consider analyzing. Another commenter was concerned about the assist rates chosen for companies that did not report to the flare survey. Marvin noted that assumptions had to be made to estimate emissions when the requested data was not provided. Yet another participant asked about how "process steam" could be accounted for. The TCEQ staff suggested this may be an issue to address during operator training.

#### Nitryl Chloride Formation Chemistry – Dick Karp (TCEQ)

Dick presented the results of the Air Quality Research Program (AQRP) project regarding nitryl chloride formation chemistry while the attendees ate cake, graciously provided by H-GAC to Dick for his years of service as the SET PMTC facilitator. Nitryl chloride forms overnight, which can then photolyze in the early morning. A chlorine radical is formed that can react with VOCs to produce peroxy radicals that convert NO to NO<sub>2</sub>. NO<sub>2</sub> can then produce additional ozone. These reactions had not been parameterized in the CAMx photochemical model prior to this project.

The project results showed the parameterization was able to form ClNO<sub>2</sub> in CAMx but the concentrations were under predicted. A few modeling inventories with additional levels of chlorine emissions, including swimming pools, were used to investigate the model's response. Those results indicated other chlorine sources were missing or the parameterization needed additional work. An investigation of sea salt acidification and hydrochloric acid dry deposition

may be two avenues of future work. At present, the ClNO<sub>2</sub> work will not be added to a public release of CAMx.

One person asked if the chlorine inventory from Dr. Allen's group at the University of Texas was used or investigated. That inventory has not as yet been used for this work.

#### Next Meeting

Because of holiday schedules, the next meeting is tentatively scheduled for the third week in January. Possible items for discussion include the Section 185 fees, a review of the 2012 ozone season, a discussion of comments on the HGB MVEB SIP, and a modeling update from the 8-hr Coalition.