

SOUTHEAST TEXAS PHOTOCHEMICAL MODELING TECHNICAL COMMITTEE

Meeting Summary

January 26, 2010

H-GAC Offices

3555 Timmons Avenue

Houston, Texas

Members and Guests Present:

Marise Textor, Susan Moore, Dan Baker, Steve Hansen, Rohit Sharma, Judy Bigon, Graciela Lubertino, Shixin Gao, Ryan Perna, Jim Smith, Kasey Savanich, Dave Westenbarger and Dick Karp, and Lola Brown, Xiaoxiao Gao, Liz Hendler, Lilly Wells, Jim Wilkinson, Tom Tesche, Erik Snyder, Steve Smith via telephone.

SIP Planning and Implementation Update – Lola Brown (TCEQ)

Lola reported that the HGB Attainment Demonstration and Reasonable Further Progress SIP revisions for the 1997 eight-hour ozone standard and the associated rule revisions are being finalized for adoption at the Commissioners' March 10, 2010, meeting. These revisions are scheduled to be filed with the Chief Clerk's Office and posted on the TCEQ's Web site (http://www.tceq.state.tx.us/comm_exec/agendas/comm/comm_agendas.html) on February 19, 2010. Notice will be sent out through the SIP Hot Topics Gov Delivery list serve.

Lola gave a brief summary of the comments received regarding the HGB Attainment Demonstration SIP revision. Twenty-five written comments were received, in addition to the five oral comments received at the public hearing held at 2:00 p.m. on October 28, 2009, in Houston. While several comments expressed support for this attainment demonstration SIP revision and its photochemical modeling analysis and weight of evidence (WoE) determination, a number of commenters contended that this SIP revision does not demonstrate attainment of the 1997 eight-hour ozone standard by the June 15, 2019, deadline. Some of the commenters who opposed this SIP revision also expressed opposition to the use of WoE to augment photochemical modeling.

Several commenters proposed that the TCEQ undertake a mid-course review (MCR) and offered suggestions for content and timing of an MCR for the HGB area. There were also numerous comments concerning the general effectiveness of control measures included in this attainment demonstration SIP revision, and statements were submitted about specific control measures, including comments concerning the rules associated with this attainment demonstration SIP revision.

More specifically, the Environmental Defense Fund and the Galveston-Houston Association for Smog Prevention commented that the TCEQ has failed to initiate additional reductions that will be necessary in order to attain the more stringent eight-hour ozone standard, which the EPA recently proposed. In addition, the City of Houston recommended that since the HGB area is attaining the 1997 eight-hour standard, the TCEQ develop a redesignation request and

maintenance plan for submission to the EPA and to concentrate future efforts on the revised ozone standard.

All the comments are posted on the TCEQ's Web site at:

http://www.tceq.state.tx.us/assets/public/implementation//air/sip/hgb/Houston_Comments.pdf.

Lola reported that the TCEQ staff is currently reviewing the EPA's proposal for the revised primary and secondary ozone standards and coordinating potential agency comment. In response to a question about whether the TCEQ would be making oral comments at the public hearing scheduled for February 2, 2010, in Houston, Lola indicated she was not sure whether the TCEQ staff attending the meeting would be presenting testimony.

In addition, Lola reported that a letter (dated January 5, 2010) has been submitted to the governor recommending Harris County remain in attainment for the PM_{2.5} standard. The recommendation is due to the EPA by February 5, 2010. The letter to the governor and other related documents are posted on the SIP Hot Topics Web page at:

<http://www.tceq.state.tx.us/implementation/air/sip/Hottop.html>.

Lola also listed the air quality related items for the February 10 and 24, 2010, Commissioners' meetings. The February 10 items include:

- Revisions to the Texas SIP for the Clean Air Interstate Rule (CAIR) (contact: Melissa Kuskie at mkuskie@tceq.state.tx.us, 512/239-6098);
- Repeal of the Clean Air Mercury Rule (CAMR) and withdrawal from consideration of the Texas State Plan for Mercury. (Contact: Brandon Greulich at bgreulich@tceq.state.tx.us, 512/239-4904); and
- Repeal of the Portable Fuel Container Rule and SIP Revision (Contact: Lisa Shuvalov at lshuvalo@tceq.state.tx.us, 512/239-4484).

The February 24 items include:

- Texas Clean Fleet Program (SB 1759) rulemaking; and
- Emission Reduction Incentive Grants (the HB 1796) rulemaking (Contact for both items: Steve Dayton at sdayton@tceq.state.tx.us, 512/239-6824)

For other questions or more information, please contact Lola at lbrown@tceq.state.tx.us.

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

(Note: Graciela's presentation is available on the SETPMTC Web site:

(http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html.)

Graciela presented changes to the year 2035 Regional Transportation Plan (RTP) for on-road mobile source emissions. The RTP needed to be updated due to the following:

- Increasing (widening) US-290 from 10 to 12 traffic lanes;
- Changing the Travel Demand Model (TDM) from EMME2 to Cube Voyager; and
- Changing the base year from 2002 to 2005.

Graciela presented a table of the mobile source emissions conformity determinations for the revised RTP. In each of the future prediction years, the conformity determinations for both VOC and NO_x emissions are less than the Motor Vehicle Emissions Budget (MVEB). The revised RTP is expected to be approved in February 2010.

In response to a question about the change in the TDM, Graciela indicated that the increase in Vehicle Miles Traveled (VMT) was only 0.3 percent, so emission increases were similarly quite small.

Graciela was also asked about the availability of protocols and/or user's manuals for the TDMs, and whether, similar to the use of other emissions models (e.g., SMOKE, GloBEIS), there is an approval process involving EPA and/or Federal Highway Administration. There was some follow-on discussion about QA/QC of the TDM inputs (e.g., traffic counts) and outputs (VMT). Graciela indicated she did not know of any approval process involving EPA, and she indicated that documentation of the conformity analysis using the TDM is available on the H-GAC web site (http://www.h-gac.com/taq/airquality_model/conformity/2009/default.aspx). Graciela asked David (Shixin) Gao, one of the H-GAC TDM modelers, to sit in on the meeting to answer questions concerning the TDM. David re-iterated that documentation was available on the H-GAC web site. He also alluded to the use of data grouped by traffic zones. It was suggested that follow-on discussion be conducted off-line. Tom Tesche and Jim Wilkinson indicated they would review the documentation on the H-GAC web site and if they had questions or concerns, they would work through Liz Hendler and Graciela to set up a conference call with H-GAC TDM modelers.

EPA SIP Related Update – Erik Snyder (EPA)

(Note: Erik's presentation is available on the SETPMTC Web site:

(http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html.)

Erik participated by telephone went through his presentation, which he had sent via e-mail. Erik's presentation covered the NAAQS schedule, the proposed revision to the ozone NAAQS and the section 185 fees.

Erik showed the current schedule for review of the standards for the various criteria pollutants. Many of the dates reflect court-ordered or settlement agreement deadlines (e.g., NO₂ and SO₂ primary and secondary standards). The revision to the ozone NAAQS, both the primary and secondary, proposed January 7, 2010, is scheduled to go final August 31, 2010. State nonattainment area recommendations are due January 7, 2011. Final nonattainment area

designations for the revised primary ozone standard are scheduled for August 31, 2011, with attainment demonstration SIPs due December 31, 2013. Erik was asked about EPA's 120-day letters, to which Erik responded that 120-day letters are sent to states commenting on the boundaries recommended for the various nonattainment areas, and including justification for modifying the recommended boundaries in cases where EPA disagrees with the state recommendation.

Erik showed a map of Texas indicating the counties with regulatory monitors that have 2009 ozone design values greater than the proposed levels of the revised NAAQS. For example, currently there are two counties (Tarrant and Denton) with regulatory monitors with 2009 design values greater than 84 ppb, 20 counties with regulatory monitors with 2009 design values greater than 70 ppb, 25 counties with regulatory monitors with 2009 design values greater than 65 ppb, and 29 counties with regulatory monitors with 2009 design values greater than 60 ppb.

Erik indicated that the proposed ozone implementation guidance for the revised standard is scheduled to be published in a couple of months. In response to a question regarding the classification scheme for the revised standard, Erik indicated the proposed guidance would be requesting comments on at least three classification schemes; one representing no change from the scheme used in the past and one that mimics the distribution of nonattainment areas throughout the classifications (i.e., marginal through extreme), as was the case for the one-hour ozone NAAQS.

Erik was asked about the schedule and implementation of the secondary standard, presumably, for areas which are in attainment of the primary but are in nonattainment for the secondary standard. Erik responded that similar to the primary, the secondary standard would become final on August 31, 2010. However, Erik indicated that he was unaware of an implementation schedule for areas only nonattainment for the secondary standard. Erik further indicated that EPA is working on a schedule for installing monitors in rural areas. EPA's currently proposed modification to the air quality monitoring network design would require at least one ozone monitor in populated areas of 50,000 to 350,000 and at least three monitors in rural areas of each state.

Erik showed a graphic explaining how the secondary ozone metric is calculated using the sigmoid weighting. In response to questions concerning the use of only ozone concentrations during the daytime (i.e., 8 AM to 8 PM) and why higher ozone concentrations are weighted higher, Erik indicated that EPA has compiled a lot of documentation on the effects of ozone on vegetation (e.g., trees, crops). It was also mentioned that the Bureau of Land Management (BLM) has conducted studies of the impact of air pollutants on vegetation.

It was pointed out that three years of monitoring data is needed in order to make designations for the secondary standard. Erik agreed and noted that similar to the primary, the secondary standard is also based on the average of three years of data. In response to a question about how each year's value is calculated, Erik seemed to indicate that the highest 90-day running average could be used, rather than the sum of the values for the three consecutive months in the ozone season with the highest monthly values. TCEQ staff indicated they have not used a 90-day running average in calculating secondary design values for those monitors with sufficient data.

Erik indicated that EPA recently (January 6, 2010) issued guidance addressing implementation of 185 fees. It was pointed out that the guidance appears to indicate that for an area, such as HGB, that has attained the current eight-hour ozone NAAQS even though the area would not be in attainment of the revoked one-hour NAAQS, the 185 fees are not required. Erik's presentation also indicated that EPA must do rule making to suspend the 185 fee requirement.

SIP Modeling Update: Revised 2006 and 2018 Modeling Emissions – Dick Karp (TCEQ)

Dick presented an update of the 2006 baseline, 2018 future base and 2018 control strategy modeling emissions. (Note: Dick's presentation is available on the SETPMTC Web site http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html.)

Dick indicated that in responding to comments, a review was conducted of the anthropogenic modeling emissions for the HGB eight-county area. This resulted in changes to the point source and non-road mobile source emissions.

Erik Snyder asked about the change in the reconciled HRVOC emissions, and Dick explained that no reduction in the reconciled HRVOC emissions was now being taken in the 2018 modeling. So the same reconciled HRVOC emissions modeled for 2006 are included in the 2018 modeling, which has increased the 2018 modeling emission by 6.4 tpd of HRVOC.

Dick was also asked about the growth in VOC emissions from point sources (241 tpd in 2006 to 292 tpd in 2018), and responded that this growth accounts for emission increases at minor sources and modifications at major sources that are not significant, neither of which would require off-sets.

A discussion arose concerning the growth in area source VOC (529 tpd in 2006 to 650 tpd in 2018). It was suggested that the IR camera could be used to identify area sources with excessive VOC emissions. Dick commented that a notable portion of the area source VOC is from flash emissions, and although these emissions are now subject to controls, no reduction was taken in 2018, because we are unable to quantify the estimated reduction. However, Dick also mentioned that the flash emissions are not grown from 2006 to 2018, so the approximately 120 tpd of VOC growth is from other area source categories, such as solvent use and surface coating.

Dick presented a table showing three monitors (Deer Park, DRPK, CAMS35; Bayland Park, BAYP, CAMS53; and Wallisville, WALV, CAMS617) with projected 2018 ozone design values greater than 84 ppb. It was noted that the maximum 2018 design value (86.5 ppb at DRPK) is less than the value reported in the SIP proposal (88.2 ppb at DRPK). Erik Snyder asked which of the emission changes accounted for the reduction in the 2018 design value, and Dick responded that the 8.4 tpd reduction in NO_x from MECT sources was probably the most influential change.

SIP Modeling Update: Base Case Model Performance Evaluations with Ron Brown Research Vessel – Jim Smith, Ph.D. (TCEQ)

Jim presented an evaluation of the model's ability to replicate the observed air quality measurements made from the Ron Brown Research Vessel during its 2006 tour (August 15 through September 11, 2006) in the Gulf of Mexico, Galveston Bay and the Houston Ship

Channel (HSC). In particular, Jim presented comparisons of modeled and measured concentrations (mixing ratios) of ozone and ozone precursor constituents (e.g., ethene, NO) for ship transects up and down the Houston Ship Channel, at Barbour's Cut, transects through Galveston Bay between Barbour's Cut and Galveston Harbor, at the entrance/anchorage area in the Gulf just southeast of Galveston Island, and in near-shore and farther offshore areas of the Gulf. (Note: Jim's presentation is available on the SETPMTC Web site http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html.)

Jim was asked whether sea-surface temperatures (SST) were measured by the Ron Brown, which could be compared to the values used in the model. Jim indicated that he had not examined all the data sets available from the Ron Brown, but suspected that sea-surface temperature may well have been measured and it would be useful to conduct a comparison. In fact, there is some SST data available in the data sets obtained from NOAA, and this data may be used to quality-assure the SST inputs to MM5 in the future.

Dan Cohan commented that in regards to the formaldehyde (HCHO) measurement, none of the data suggested the presence of noteworthy primary emissions. Jim responded that some recent measurements of flares indicate the presence of HCHO, but that he agreed that the measurements from the Ron Brown do not indicate persistent primary HCHO.

Jim pointed out that the measurements made in the HSC between the Turning Basin and the Jacinto Port around 6 AM on September 6, 2006, suggest notable anthropogenic isoprene emissions. Jim also pointed out the relatively large ozone concentrations measured in the vicinity of Galveston Harbor on September 8, 2006, starting around 11 AM and how winds during the morning hours may well have transported ozone created from emissions in the Beaumont Port Arthur area.

2009 Ozone Data Assessment: Meteorology's Impact on Ozone Trends – Kasey Savanich (TCEQ)

Kasey presented the TCEQ staffs' proposed response to comments that stated that the lower ozone concentrations measured during 2007 through 2009 were due more to favorable meteorological conditions than to reductions in emission of ozone precursors. (Note: Kasey's presentation is available on the SETPMTC Web site http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html.)

As Kasey presented, the TCEQ staff employed four analyses, two of which involved meteorological adjusted trends (UT, EPA), one involving a classification and regression tree (CART) analysis of ozone-conducive days, and one comparing forecasted ozone exceedance days and actual exceedance days. All four analyses show that favorable meteorology during the 2007 through 2009 period is not sufficient to account for the lower ozone concentrations and, that therefore, the reduced ozone precursor emissions have contributed to the lower ozone concentrations.

It was pointed out that the results of the CART analysis, in particular, strongly indicate that lower ozone in the 2007 to 2009 period is not due to favorable meteorology. The CART analysis shows that over the past 20 years (1990 – 2009), although variable, the trend in the annual

number of days with ozone-conducive meteorology has remained stable at approximately 60 days per year. However, the actual number of ozone exceedance days has been decreasing, most notably during 2007 to 2009.

Kasey was asked about the analysis comparing forecasted ozone exceedance days and actual exceedance days, in particular, how the forecast were made. Kasey responded that the forecasts are made by TCEQ staff in the Monitoring Operations Division (<http://www.tceq.state.tx.us/compliance/monitoring/air/monops/ozoneaction.html>). Jim Smith added that the TCEQ Monitoring Operations staff use results from national weather forecast models in forecasting exceedance days.

Marise Textor with Texas Petroleum Refining indicated the presentation was very helpful.

2009 Ozone Data Assessment: Economic Impact on Ozone Trends – Dave Westenbarger, TCEQ

Dave presented the TCEQ staff's proposed response to comments that stated that the lower ozone concentrations measured during 2007 through 2009 were due to an economic downturn. (Note: Dave's presentation is available on the SETPMTC Web site http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html.)

As Dave's presentation showed, the TCEQ staff examined and analyzed economic data for the state of Texas, the HGB area (Houston-Sugarland-Baytown, MSA) and the petrochemical industry along the gulf coast (PADD3). This investigation found no evidence of an economic downturn prior to 2009, so to the extent ozone precursor emissions are related to economic activity, the lower ozone concentrations measured during 2007 through 2009 do not appear to be due to an economic downturn.

Dave presented several graphics showing the trend in gross domestic product and was asked about the time-value of the dollar amounts. Dave indicated the amounts were current nominal values, not adjusted for inflation.

It was pointed out that the PADD3 district includes refining facilities in New Mexico and Arkansas, which are not gulf coast states. In addition, the PADD3 district does not include Florida. It was also mentioned that Energy Information Administration projections of petroleum refinery production of liquid fuels shows very little growth, presumably due to the increased number of vehicles with higher gas mileage (e.g., greater than 35 miles per gallon).

Future Modeling Activities: Houston 8-Hour Coalition Modeling Research Plan – Tom Tesche, Ph.D., and Jim Wilkinson, Ph.D

The Coalition's presentation by Tom and Jim focused on the dichotomy between the current eight-hour ozone design value (84 ppb) for the HGB area, showing attainment for the 1997 NAAQS, and the current SIP modeling, predicting that in 2018 the design value (86 ppb) will exceed the 1997 NAAQS and require additional emission control measures. (Note: The Coalition's presentation is available on the SETPMTC Web site http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html.)

It was pointed out that this dichotomy brings into question the reliability of the model to gauge the amount of emission reductions needed to achieve attainment. Further, as expressed by Rohit Sharma, the revised standard may likely require an additional 15 ppb reduction in ozone.

The presentation recommends grouping future activities into those specific to the model and those specific to the application (i.e., model versus application). Recommended modeling activities included incorporating emergent research, evaluating international transport and re-examining model inputs (e.g., emissions, meteorology). Recommended application activities included ensemble modeling, developing new episodes (2010 – 2011) and consideration of optimal control-cost analyses.

During the presentation, the schedule for modeling for the MCR and the revised standard was discussed. The recommendation from the committee was to combine the two into one modeling project. Since the SIP for the revised standard will be due December 31, 2013, the modeling will have to be completed as much as nine months before the submission date, i.e., March 31, 2013.

Jim Smith noted that currently the highest priority modeling project for TCEQ modeling staff is DFW, since it did not attain the ozone standard in 2009. In addition, as shown in EPA's presentation, there will be several additional nonattainment areas with SIPs due December 31, 2013, as well.

Concluding Discussion

Dick agreed to compile a list of the modeling projects, including contracts, TCEQ is conducting to improve the modeling in the HGB area for the next meeting.

The SETPMTC members present recommended that we continue to meet bi-monthly throughout the year. The next meeting would then be around the end of March. Dick indicated he would work with Graciela to get a meeting room.