SOUTHEAST TEXAS PHOTOCHEMICAL MODELING TECHNICAL REVIEW
COMMITTEE

Meeting Summary
June 11, 2008

H-GAC Offices
3555 Timmons Avenue
Houston, Texas

Members and Guests Present:
Dan Baker, Susan Moore, Jay Olaguer, Liz Hendler, James Wilkinson, Daewon Byun, Bernhard
Rappenglueck, Graciela Lubertino, John Jolly, Mark Estes, and Dick Karp, and Lola Brown, Jim
Smith, and Tom Tesche via telephone.

Dick handed out a SETPMTC membership list. This list, which is currently on the web site,
needs to be updated. Dick asked the members present to review the list and e-mail any changes
of which they were aware.

SIP Planning and Implementation Update – Lola Brown (TCEQ)
Lola gave a brief update via the telephone. She indicated that the comments received from
participants at the initial HGB stakeholder meetings (held in Houston on March 25 and 26, 2008)
are posted on the HGB Eight-Hour Ozone Stakeholder Group Web page
(http://www.tceq.state.tx.us/implementation/air/sip/hgb_stakeholder.html). Lola indicated that
TCEQ met with H-GAC and representatives of local governments on May 15, 2008, to discuss
the need for extensive stakeholder involvement in the development of broad measures for
emission reductions that will be needed from all source categories. She also indicated that
TCEQ staff have attended and will continue to attend various work group meetings with
representatives of specific emission source categories (e.g., construction industry).

Lola indicated that staff is analyzing the most recent emissions data to develop effective
industrial, mobile, and local control strategies that address ozone formation in the HGB area.
She also stated that a proposed rulemaking (Rule Log No. 2008-019-115-EN) has been initiated
that will review the EPA's Control Technology Guidelines (CTGs) for consumer and
commercial products to determine if the suggested controls represent RACT for Texas. Liz
Hendler with the 8-hour Coalition asked about the consumer products CTGs and whether they
addressed reformulation. Lola indicated that Lindley Anderson (LAnderso@tceq.state.tx.us) is
the TCEQ contact for this proposal, which involves CTG groups II, III & IV product categories.
Liz also asked whether any of the CTGs that may be approved would constitute RACT, making
them SIP creditable, and therefore need to be included in the current SIP modeling. Lola
indicated she would have to discuss that with the appropriate TCEQ staff. Lola's e-mail address
is lbrown@tceq.state.tx.us. (Note: subsequent to the meeting, Lola discussed this issue with staff
eliciting the following response: TCEQ is required to update the SIP in response to any changes
made to the rules based on the CTGs ,and will receive SIP credit for any reductions from the
revisions made to the rules.)

H-GAC Update – Graciela Lubertino, Ph.D. (H-GAC)
(Note: Graciela's one-page presentation is available on the SETPMTC Web site:
http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html). Graciela
indicated that on March 31, 2008, H-GAC received the "notice to proceed" for development of
the mobile source control strategy catalogue. The control strategies catalogs for the Final Master
List and technical reports are due to TCEQ by June 27, 2008. The control strategies catalogs for
the Final Short List and technical reports are due to TCEQ by January 29, 2009.

Graciela reported that H-GAC is planning separate stakeholder meetings, with representatives
from the airports, construction industry, rail roads, and ports and marine. Also, Graciela reported
that H-GAC would like to develop an MOU with the various stakeholder groups for this SIP
process. One of the issues being addressed is the reluctance of the construction industry to
provide activity data (e.g., hours of operation) needed to quantify emissions and emission
reductions. (She reported that industry representatives believe that the high cost of diesel fuel is
already resulting in reduced idling emissions.)

Graciela was asked whether companies with large vehicle fleets (e.g., UPS) will be included as a
part of this process and she responded that H-GAC had already set up VMEP working groups
with companies with large vehicle fleets, and that the H-GAC Clean Vehicle Program is part of
that process.

EPA SIP-Related Update
There was no EPA update. Dick indicated Erik Snyder was unavailable, and Dick was not able
to find another EPA staff member.

SIP Modeling Update: First Interim June 2006 Base Case Modeling – Dick Karp, TCEQ
Dick presented an update of the first interim base case modeling for the June 2006 episode
(Note: Dick's presentation is available on the SETPMTC Web site
http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html). The update
included a presentation of the meteorological modeling, the emissions modeling and processing,
and the CAMx modeling. Dick indicated that the modeling files for this episode would be
posted to the TCEQ ftp site by early next week.

Questions and comments that arose during Dick's presentation included:
- A question about the temperature data used for the biogenic emissions modeling (with
  GloBEIS).   In particular, if MM5 simulated temperatures were used.
- A question about the temperatures used in the mobile source modeling.
- A question about what hours are represented by the endpoints on the meteorological
  plume plots.
- A question about the trend in NO_X CEM data.
- A question about the $NO_2^* + H_2O$ reaction in CB05.
- A request to post the ambient air quality data, including that converted to CB05 species,
  on the TCEQ FTP site.
- A comment that the HRVOC scatter plots are a comparison of point measurements with
  grid cell modeled values.

Dick was asked about the temperature data used for the biogenic emissions modeling (with GloBEIS), in particular, if MM5 simulated temperatures were used. Mark Estes, who worked on the biogenic emissions modeling, responded that rather than using the MM5 simulated temperatures, a gridded temperature field was developed by kriging surface site measurements. Dick indicated that generally the MM5 simulated temperatures tend to overpredict the afternoon measured temperatures, and in particular, temperatures adjusted for the 2 meter surface site probe height.

Jim Wilkinson, with Alpine Geophysics representing the 8-hour Coalition, asked about the temporal and spatial resolution of the temperature used in the mobile source modeling. Graciela, who has worked on this, particularly with MOBILE6.2, responded that county-wide averages of measured hourly temperature (as well as humidity) data are used. Dick further responded that MOBILE6.2 does not include temperature (or humidity) adjustments for all 28 vehicle types, but that TCEQ does apply a temperature and humidity correction.

Dick agreed that the plots, identified as "6 am and 9 am emissions," could be considered as snapshots taken at 6 pm and 9 pm that show the path of the 6 am and 9 am emissions.

Regarding the question about the trend in NO_X CEM data for the HGB area, Dick indicated he was not aware of anything recently presented. However, compliance with the Mass Emissions Cap and Trade (MECT) program has been ongoing over the past few years, so notable NO_X reductions have been occurring.

Jay Olaguer, HARC, asked about modeling the $NO_2^* + H_2O$ reaction. Dick responded that the current modeling does not include this reaction. Mark further indicated that TCEQ is working with Environ to include the reaction in the CB05 mechanism.

Tom Tesche requested TCEQ make the ambient air quality data, including that converted to CB05 species, available on the TCEQ FTP site. Tom indicated that may ensure everyone uses the same ambient data for model evaluations. Dick indicated he would look into this request.

Dan Baker, with Shell, pointed out that the HRVOC scatter plots are a comparison of point measurements with grid cell modeled values. Since these are highly reactive compounds, the area of representation of the auto-GCs may be notably less than a grid cell (i.e., a 2-km by 2-km area).

TexAQS II Findings from U of H: Preliminary CMAQ Modeling –Daewon Byun, Ph.D.
Daewon's presentation, entitled "The Second Texas Air Quality Study: Atmospheric Measurement and Modeling to Study Photochemical Processes and Emissions Uncertainties," is available on the SETPMTC Web site.
(http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html).
Daewon presented retrospective modeling for the TexAQS II period. This modeling was conducted with the CMAQ photochemical model using the SAPRC99 chemical mechanism. In addition, the MM5 meteorological modeling was conducted using the MUltiscale Nest-down Data Assimilation System (MUNDAS), which utilized extensive measurements and recursive application of the objective analysis/FDDA method across multiple domains with different

resolutions (36-, 12-, to 4-km resolution). From the modeling results for the period of the special 2006 emissions inventory (i.e., 8/15/06 to 9/15/06), Daewon concluded that a substantial amount of HRVOC emissions are still missing from the inventory.

TexAQS II Findings from U of H: Ambient Data Analyses – Bernhard Rappenglueck, Ph.D.
Bernhard's presentation, entitled "Why UH Moody Tower site is a special site ..," is available on the SETPMTC Web site
http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html). Bernhard presented some of the results from analyses of the ambient air quality data collected from the UH Moody Tower, as well as some of the auto-GCs.

Using a Positive Matrix Factorization (PMF) analysis of the ambient VOC data collected at Moody Tower, the composition was resolved into profiles for eight factors (i.e., source/species categories). A wind-rose analysis for each of the factors indicates the preponderance of profiles representing petrochemical, refining and evaporative sources emanating from the direction of the ship channel.

In addition, Bernhard presented some comparisons of benzene, peroxyacyl nitrate (PAN) and formaldehyde between Moody Tower and other monitoring sites (e.g., Wallisville, Lynchburg Ferry), as well as with CMAQ modeled estimates for periods during TexAQS II. These comparisons also seem to indicate that alkenes are underreported in the EI.

Eight-Hour Coalition Update – Jim Wilkinson, Ph.D. (Alpine Geophysics)
Jim's presentation, entitled "Near Term Modeling Support for the 2010 HGB 8-hr Ozone SIP," is available on the SETPMTC Web site
http://www.tceq.state.tx.us/implementation/air/airmod/committee/pmtc_set.html). The purpose of Jim's presentation was to outline ongoing modeling and analysis work funded by the Houston 8-hr Ozone Coalition to achieve three goals:
- Make direct contributions to the overall modeling science foundation available to the TCEQ for developing the 2010 8-hr Ozone SIP;
- Produce parallel data sets that may be helpful in other on-going science investigations in the region (e.g., H97); and
- Produce data sets that may be of interest to other modeling and analysis groups seeking greater participation in the 2010 HGB ozone SIP development process (e.g., EPA/OAQPS/ORD).

Questions and comments that arose during Jim's presentation included:
- A question about EPA's MATS software.
- A number of questions concerning the meteorological modeling at a 1.33-km gridded domain, including the assimilation of observational data, the land-use/land-cover (LU/LC) data and the reliability of MM5 simulated parameters (e.g., wind speed).
- A question about the photochemical models to be used, including the chemical mechanisms.
- A question about hourly VMT mix in the on-road mobile emissions.

Tom explained that MATS stands for "Modeled Attainment Test Software. MATS is a PC-based software tool that can perform the modeled attainment tests for ozone, as well as particulate matter, and generate the uniform rate of progress analysis needed for regional haze. Tom indicated they plan to use this software to generate the projected future year (2018) ozone design values, which should facilitate determining the residual eight-hour ozone nonattainment (85 ppb and 75 ppb) at each monitor in Texas.

Jim and Tom explained that they are modeling with MM5 down to the 1.33-km gridded domain because of technical concerns with flexi-nesting 4-km gridded domain winds due to the prominence of the gulf and bays, such as Galveston. They further explained that they are using two nudging schemes to assimilate observed data, the standard NWS/NCEP analysis nudging and FDDA nudging using files provided by TAMU. Tom indicated he would need to check with Dennis McNally about the resolution of LU/LC data being used in MM5. Tom indicated that although it has taken a considerable amount of time (a few months) to develop, the fine grid modeling seemed creditable.

Jim and Tom indicated they plan to use both the CAMx (version 4.5) and CMAQ (version 4.6) photochemical models with the CB05 chemical mechanism. In addition, they may use the SAPRC mechanism in a HARC project.

Regarding the hourly varying VMT mix, in the past this feature of the TTI/TCEQ modeled on-road mobile emissions was not conserved when converted to SMOKE. Jim Smith (via telephone) asked if the conversion to SMOKE would preserve this feature. Jim indicated he would have to check with Cindy Loomis, since she had converted the on-road mobile emissions files.

Adjourn
The meeting adjourned with a brief discussion of the scheduling of subsequent meetings. Dick indicated that he needed to check on available dates for the second half of the calendar year, and then notify members via the listserve.