

April 17, 2008

TO: Members of the MAG Air Quality Technical Advisory Committee

FROM: John Kross, Queen Creek, Chair

SUBJECT: MEETING NOTIFICATION AND TRANSMITTAL OF TENTATIVE AGENDA

Thursday, April 24, 2008 - 1:30 p.m.
MAG Office, Suite 200 - Saguaro Room
302 North 1st Avenue, Phoenix

Please park in the garage underneath the building. Bring your ticket to the meeting; parking will be validated. For those using transit, the Regional Public Transportation Authority will provide transit tickets for your trip. For those using bicycles, please lock your bicycle in the bike rack in the garage.

Pursuant to Title II of the Americans with Disabilities Act (ADA), MAG does not discriminate on the basis of disability in admissions to or participation in its public meetings. Persons with a disability may request a reasonable accommodation, such as a sign language interpreter, by contacting Jason Stephens at the MAG office. Requests should be made as early as possible to allow time to arrange the accommodation.

Members of the MAG Air Quality Technical Advisory Committee may attend in person, via video conference or by telephone conference call. Those attending by video conference must notify the MAG site three business days prior to the meeting.

Please be advised that under procedures approved by the MAG Regional Council, all MAG committees need to have a quorum to conduct the meeting. A quorum is a simple majority of the membership. If you are unable to attend the meeting, please make arrangements for a proxy from your entity to represent you.

TENTATIVE AGENDA

COMMITTEE ACTION REQUESTED

1. Call to Order

2. Call to the Audience

An opportunity will be provided to members of the public to address the Air Quality Technical Advisory Committee on items not scheduled on the agenda that fall under the jurisdiction of MAG, or on items on the agenda for discussion but not for action. Members of the public will be requested not to exceed a three minute time period for their comments. A total of 15 minutes will be provided for the Call to the Audience agenda item, unless the Air Quality Technical Advisory Committee requests an exception to this limit. Please note that those wishing to comment on action agenda items will be given an opportunity at the time the item is heard.

3. Approval of the February 28, 2008 Meeting Minutes

4. Maricopa County Clean Air Initiative

On February 13, 2008, Maricopa County kicked off its new clean air initiative called Running Out of Air. Cleaning the air is this region's main focus. Maricopa County is committing to thirty-eight dust pollution prevention measures in the MAG 2007 Five Percent Plan for PM-10 which was submitted to the Environmental Protection Agency. In addition to ramping up staff and increasing enforcement, Maricopa County is informing the public about dust pollution and asking all residents to do their part by making a clean air commitment.

2. For information.

3. Review and approve the February 28, 2008 meeting minutes.

4. For information and discussion.

5. Update on the Maricopa County Dust Control Rules

On March 26, 2008, the Maricopa County Board of Supervisors approved revisions to its dust control regulations. Some of the revised regulations include those restricting the use of wood-burning fireplaces and fire pits, off-road vehicles, leaf blowers, unpaved parking lots and restraints on mining operations and construction entities. An update will be provided by the Maricopa County Air Quality Department.

6. Draft Modeling Protocol in Support of an Eight-Hour Ozone Redesignation Request and Maintenance Plan for the Maricopa Nonattainment Area

The Maricopa Association of Governments is in the process of preparing an Eight-Hour Ozone Redesignation Request and Maintenance Plan designed to demonstrate maintenance of the standard (0.08 parts per million) through 2025. A draft modeling protocol has been prepared to describe the modeling approach for the maintenance plan. A presentation on the modeling protocol will be given.

7. New Strengthened Eight-Hour Ozone Standard

On March 12, 2008, the Environmental Protection Agency revised the eight-hour ozone standard to 0.075 parts per million. The previous standard, set in 1997, was 0.08 parts per million. According to EPA, states are required to make recommendations to EPA no later than March 2009 for areas to be designated attainment, nonattainment, and unclassifiable. By March 2010, EPA will issue final designations unless there is insufficient information to make these designation decisions. In that case, EPA will issue designations no later than March 2011. In the future, it is anticipated that EPA will issue the

5. For information and discussion.

6. For information and discussion.

7. For information and discussion.

implementation guidance for the new standard addressing attainment dates, planning requirements, and plan deadlines. Please refer to the enclosed information.

8. PM-10 Source Attribution and Deposition Study

The MAG PM-10 Source Attribution and Deposition Study is designed to identify the sources of emissions contributing to violations of the PM-10 standard at monitors in the nonattainment area during stagnant conditions and characterize the deposition of PM-10 particles emitted by these sources. At the last meeting, the draft final report was presented by Sierra Research, MAG consultant. The report has now been finalized and is available on the MAG web site.

9. Call for Future Agenda Items

The next meeting of the Committee has been tentatively scheduled for Tuesday, May 27, 2008 at 1:30 p.m. The Chairman will invite the Committee members to suggest future agenda items.

8. For information and discussion.

9. For information and discussion.

MINUTES OF THE
MARICOPA ASSOCIATION OF GOVERNMENTS
AIR QUALITY TECHNICAL ADVISORY COMMITTEE MEETING

Thursday, February 28, 2008
MAG Office
Phoenix, Arizona

MEMBERS PRESENT

John Kross, Town of Queen Creek, Chairman
David Fitzhugh, Avondale
Lori Brown for Lucky Roberts, Buckeye
*Jim Weiss, Chandler
#Jamie McCullough, El Mirage
Lisa Taraborelli for Tami Ryall, Gilbert
Doug Kukino, Glendale
James Nichols, Goodyear
#Greg Edwards for Scott Bouchie, Mesa
Joe Gibbs for Gaye Knight, Phoenix
Larry Person, Scottsdale
Antonio DeLaCruz, Surprise
Oddvar Tveit, Tempe
*Mark Hannah, Youngtown
*Walter Bouchard, Citizen Representative
*Corey Woods, American Lung Association of Arizona
Barbara Sprungl, Salt River Project
*Brian O'Donnell, Southwest Gas Corporation
Mark Hajduk, Arizona Public Service Company
#Gina Grey, Western States Petroleum Association
*Randi Alcott, Valley Metro
*Dave Berry, Arizona Motor Transport Association
Jeannette Fish, Maricopa County Farm Bureau
*Russell Bowers, Arizona Rock Products Association
*Michelle Rill, Greater Phoenix Chamber of Commerce

Amanda McGennis, Associated General
Contractors
*Spencer Kamps, Homebuilders Association of
Central Arizona
#Mannie Carpenter, Valley Forward
Kai Umeda, University of Arizona Cooperative
Extension
Beverly Chenausky, Arizona Department of
Transportation
Diane Arnst, Arizona Department of
Environmental Quality
#Scott Bohning for Wienke Tax, Environmental
Protection Agency
Dena Konopka for Jo Crumbaker, Maricopa
County Air Quality Department
Duane Yantorno, Arizona Department of
Weights and Measures
*Ed Stillings, Federal Highway Administration
*Judi Nelson, Arizona State University
Stan Belone for B. Bobby Ramirez, Salt River
Pima-Maricopa Indian Community
*David Rueckert, Citizen Representative

*Members neither present nor represented by proxy.
#Participated via telephone conference call.
+Participated via video conference call.

OTHERS PRESENT

Lindy Bauer, Maricopa Association of Governments
Julie Hoffman, Maricopa Association of Governments
Patrisia Magallon, Maricopa Association of
Governments
Cathy Arthur, Maricopa Association of Governments
Taejoo Shin, Maricopa Association of Governments
Ranjith Dandanayakula, Maricopa Association of
Governments
Dean Giles, Maricopa Association of Governments
Randy Sedlacek, Maricopa Association of Governments
Heather Hodgman, City of Apache Junction

Bob Dulla, Sierra Research
Joonwon Joo, Arizona Department of
Transportation
Jane McVay, Arizona Department of
Transportation
Scott DiBiase, Pinal County
Russell VanLeuven, Arizona Department of
Agriculture
Johannes Zech, Arizona State University
Leonard Montenegro, Arizona Department of
Environmental Quality
Scott Norby Cedillo, Arizona Department of
Environmental Quality

1. Call to Order

A meeting of the MAG Air Quality Technical Advisory Committee was conducted on February 28, 2008. John Kross, Town of Queen Creek, Chair, called the meeting to order at approximately 1:30 p.m. Jamie McCullough, City of El Mirage; Greg Edwards, City of Mesa; Mannie Carpenter, Valley Forward; Gina Grey, Western States Petroleum Association; and Scott Bohning, Environmental Protection Agency, attended the meeting via telephone conference call.

2. Call to the Audience

Mr. Kross stated that, according to the MAG public comment process, members of the audience who wish to speak are requested to fill out comment cards, which are available on the tables adjacent to the doorways inside the meeting room. Citizens are asked not to exceed a three minute time period for their comments. Public comment is provided at the beginning of the meeting for nonagenda items and nonaction agenda items. He noted that no public comment cards had been received.

3. Approval of the December 17, 2007 Meeting Minutes

The Committee reviewed the minutes from the December 17, 2007 meeting. Doug Kukino, City of Glendale, moved and Joe Gibbs, City of Phoenix, seconded and the motion to approve the December 17, 2007 meeting minutes carried unanimously.

4. Gila River Indian Community Air Quality Management Plan

Mr. Kross stated that at the request of the Gila River Indian Community, this agenda item will be postponed. The Gila River Indian Community notified MAG staff that they are in the process of revising the plan and would prefer to wait on a presentation until the revisions are completed.

5. PM-10 Source Attribution and Deposition Study

Cathy Arthur, Maricopa Association of Governments, introduced the PM-10 Source Attribution and Deposition Study. She stated that the field study was conducted in November through December of 2006. Ms. Arthur added that the study was utilized to prepare the Five Percent Plan for PM-10 that was submitted to the Environmental Protection Agency (EPA) in December 2007. She mentioned that some of the material has been discussed previously as part of the Five Percent Plan development. Ms. Arthur indicated that Bob Dulla, Sierra Research, will provide an overview of the study and a draft report has been prepared. She added that the study was not submitted as part of the Five Percent Plan documentation; however, EPA has indicated that they may reference the study when providing comments on the Five Percent Plan. She commented that MAG contracted with Sierra Research and T&B Systems for the study. Ms. Arthur stated that T&B Systems conducted the field data collection. She added that Bob Baxter, T&B Systems, provided the preliminary results of the field study to the Committee approximately one year ago. She indicated that it has taken one year to pull the data together to be used for the Five Percent Plan and create the final report. Ms. Arthur introduced Bob Dulla, a senior partner of Sierra Research, to provide a presentation on the PM-10 Source Attribution and Deposition Study.

Mr. Dulla stated that the presentation will include: background, study team, study goals, approach in terms of collecting field data, analyses for ambient measurement and source characteristics, model performance, conclusions and recommendations. He indicated that the region had numerous exceedances recorded in late 2005 and early 2006. Mr. Dulla stated that failure to attain the PM-10

standard by December 2006 invoked Section 189(d) of the Clean Air Act, which indicates that the region must prepare a Five Percent Plan that requires annual five percent reductions until attainment. He added that the plan was due by the end of December 2007. Mr. Dulla stated that improvements were discussed in the process of plan development so they will not be repeated. He indicated that the focus of the presentation will be on key insights gained from the field study/analysis.

Mr. Dulla mentioned that the two separate contracts issued for the study were with T&B Systems and Sierra Research. He indicated that T&B Systems focused on ambient monitoring and was responsible for installing instrumentation, collecting data, and targeting periods and times for collecting data. Mr. Dulla commented that Sierra Research performed the data analysis and modeling. He noted that Sierra Research coordinated with T&B Systems, MAG, and a variety of other subcontractors that were involved in the effort. Mr. Dulla stated that MAG also had a contract with UC Riverside to collect SCAMPER measurements. He added that SCAMPER is a device that collects measurements from silt loadings on the road as a vehicle travels on the road. Mr. Dulla mentioned that there was a 100 mile SCAMPER route that went around the region and data was collected four times during 2006. The focus of this study was to collect SCAMPER data in the Salt River Area during the design day periods, which were in late November and early December, when there were stagnant conditions, the worst inversions, and the highest concentrations.

Mr. Dulla stated that Sierra Research subcontracted with UC Riverside to focus on the Salt River Area. He added that the 100 mile SCAMPER route went through the area; however, there were not many roads where data was collected. Mr. Dulla mentioned that a local subcontractor, Applied Environmental Consultants, collected information on a number of locations and facilities that were adjacent or near the monitors in the Salt River Area. He commented that Applied Environmental Consultants observed activity levels in order to estimate what unpaved road and vacant lot emissions would look like in areas around the Salt River. Applied Environmental Consultants also collected silt measurements. MAG contracted with Field Data Services to collect traffic count data in tandem with the SCAMPER measurements.

Mr. Dulla commented that there were high concentrations recorded in December 2006, which was when the field data was being collected. He noted that there were measurements of the activity, including traffic counts by vehicle type, on the days that were being modeled, which is a big advantage. Mr. Dulla mentioned that this study was useful in providing the information needed to have confidence in the emissions estimate being produced, as well as understanding the impacts at the monitors. He indicated that SOTA Environmental collected permit files for the larger sources in the area. Mr. Dulla stated that Rincon Ranch Consulting prepared a statistical analysis of the meteorological data and concentrations to understand which sources might be impacting the monitor sites. Mr. Dulla mentioned that Particle Measurement Technology specializes in particle counts. He indicated that their focus was to collect data on particle deposition. Mr. Dulla commented that all of the named firms were involved in the study and provided information that was integrated into the Five Percent Plan.

Mr. Dulla stated that the basic study goals were to understand and quantify the sources that were impacting the Durango Complex and West 43rd Avenue monitors under both low wind and high wind conditions. He added that another element of this study was to improve source characterization. Mr. Dulla commented that the first step was to review the historical work completed in the area. He noted that the Arizona Department of Environmental Quality (ADEQ) generated an air quality modeling study for the region. Mr. Dulla mentioned that Sierra Research looked at their inventory calculations

to understand where improvements might be needed. He stated that Sierra Research focused on definitions of boundaries for individual sources and roads in order to locate the sources within the modeling domain, and to quantify the emissions from those sources. Mr. Dulla added that Sierra Research wanted to understand what the diurnal profile of activity looked like for the facilities. He mentioned that interviews were conducted with a number of large operators in the area to understand their activity levels. He indicated that they learned from those interviews that the activity levels are highly variable and very demand driven. Mr. Dulla stated that it became apparent in the study that using assumptions about annual activity that is distributed to individual days is a poor substitute for understanding what is causing high concentrations on a specific day. He added that it is much more valuable to have accurate information on the day being modeled; however, it can be difficult to obtain.

Mr. Dulla stated that the ADEQ Salt River Area Technical Support Document (TSD) indicated that transport was a very significant issue. He added that the TSD concluded that many of the sources impacting the monitors in the Salt River Area were located outside of the modeling domain. Mr. Dulla mentioned that this conclusion has a big impact in terms of evaluating control strategies and the effectiveness. He indicated that Sierra Research also looked at the TSD modeling methodology with regard to how sources were defined and the profiles that were used. Mr. Dulla stated that another objective of the study was to look at particle deposition. He added that one important issue to understand is where the sources are located, and getting direct measurement of particle deposition would provide insight to the issue.

Mr. Dulla discussed the approach for the study. He stated that Maricopa County agreed to change the monitoring time for both meteorological and monitoring data from one hour to five minute increments. He added that this change was especially important when low wind speeds were present. Mr. Dulla indicated that when wind is frequently changing direction and at a very low speed, the five minute data gives insight in terms of understanding where the emissions are coming from that are impacting monitors.

Mr. Dulla stated that a series of instruments were added at the West 43rd Avenue monitoring site for this study. He added that a Mini SODAR was installed which is an acoustic measurement device that measures the mixing height. This device was useful in providing the actual measurements of mixing heights on the days in which the standard was exceeded. Mr. Dulla stated that it provided a metric that could be used to compare with what an air quality model would estimate using regional data. He stated that a digital camera that took thousands of pictures was also installed. This provided a great deal of insight into emission sources that are not normally characterized. He mentioned that a Particle LIDAR unit was installed that is a radar scanning device for particle distributions. Mr. Dulla stated that a temporary monitor was also installed at 35th Avenue. He added that two vehicles were equipped for mobile monitoring with DustTraks to obtain measurements for both PM-2.5 and PM-10. Mr. Dulla mentioned that one of the issues was trying to understand the particle size distribution. He indicated that one vehicle was equipped with DustTraks and an aerodynamic particle sizer, which is a unit that looks at the size distribution of particles.

Mr. Dulla stated that another focus of the study was activity measurements. He indicated that the activity measurements included traffic counts, off road travel, source interviews, accident reports for specific dates, and Notices of Violation (NOVs) issued on specific dates. Mr. Dulla mentioned that when assembling the data and looking at concentrations that were recorded, the profiles would be plotted throughout the day. He commented on the morning and evening peaks of activity. Mr. Dulla

mentioned that some high concentrations were not explained by any of the data that was characterized. Mr. Dulla added that the team looked to see if there were any accident statistics or NOVs that were issued during those hours. He mentioned that for particle deposition, four dust jars were located in areas surrounding the Durango Complex and West 43rd Avenue monitors in order to collect actual measurements of particle deposition. Mr. Dulla commented that information on silt measurements was also collected. He stated that one approach was to use the SCAMPER vehicle, which created a profile on all the roads throughout the region and was useful in characterizing the differences on the different roads. Mr. Dulla added that another method was using the vacuum sampling approach, EPA AP-42 methodology. He indicated that with this method, a sample is collected, bagged, weighed, and a sieve analysis is run to determine the silt measurements.

Mr. Dulla stated that the data analysis was broken into ambient measurements and source characterization. He added that with inventory development, Sierra Research started with the ADEQ TSD framework. Mr. Dulla indicated that the modeling domain was from 51st Avenue to 7th Street and Van Buren Street to Baseline Road. He mentioned that the domain which was selected for the study was slightly smaller than the domain in the TSD. He stated that for air quality modeling, the choice was made to configure and apply AERMOD. Mr. Dulla added that Sierra Research focused on evaluating model performance.

Mr. Dulla stated that the key categories of analysis for the ambient measurements were particle size distribution, back trajectories, particle deposition rate modeling, particle deposition monitoring, transport monitoring, nonparametric regression, and field observations. He indicated that back trajectories are key to understanding where the concentrations are coming from that are impacting the monitors during the previous time steps. He added that the back trajectory and five minute data were very helpful in understanding wind currents, wind directions, whether there was a prevailing wind direction, or if wind was present during stagnant conditions. Mr. Dulla discussed particle deposition rate modeling, which is looking at the estimated amount of time the particles remain in the atmosphere. He indicated that Sierra Research was able to compute the time that the particles could be suspended in the air. Mr. Dulla stated that particle deposition monitoring provided the size distribution of the particles that were deposited in the dust jars.

Mr. Dulla discussed transport monitoring. He commented that the ADEQ TSD concluded that transport was significant. Mr. Dulla stated that when concentrations were high at the monitors, they were able to drive the vehicle equipped with DustTraks through the area in order to collect measurements adjacent to the monitors, surrounding the monitors, and at the boundaries of the modeling domain. He mentioned that the data indicated if the concentrations were uniform or how they were distributed. Mr. Dulla indicated that by going out to the boundaries, they were able to show that those concentrations were lower than near the monitoring sites or other locations within the modeling domain. He stated that nonparametric regression provided information on wind speed, wind directions and concentrations so a profile could be created to see where the high concentrations are coming from that are impacting specific locations. He mentioned that nonparametric regression provides insight on sources that may be regularly impacting the monitors. Mr. Dulla discussed field observations. He mentioned that a lot of pictures were taken and Sierra Research was able to learn from these pictures. Mr. Dulla commented on a truck school that was located across from the Durango Complex monitor. He added that the school has now been shut down.

Mr. Dulla stated that in terms of ambient measurements, there were major findings in the study with regard to transport and mixing height. He indicated that the study looked at the different components of transport. He discussed settling velocity by particle size, based on diameter, and particle size distribution. Mr. Dulla mentioned that based on particle size distribution, the time that the particles were going to be suspended in the air was short depending on the ceiling height. He stated that based on the five minute measurements of wind speed and direction, Sierra Research was able to back calculate the locations of the air pockets. He discussed the mobile measurements at the domain boundaries. Mr. Dulla indicated that the data provided insight that led to the conclusion that localized sources are significant in terms of impacting the monitors.

Mr. Dulla commented on the mixing height in ambient measurements. He indicated that the ADEQ TSD showed that the mixing heights were about several hundred meters during severe inversions on the days that were modeled by ADEQ. Mr. Dulla stated that SODAR measurements showed that the mixing heights were below 100 meters and as low as 30 meters during high concentration periods. Mr. Dulla mentioned that Sierra Research was able to use AERMET, which is the preprocessor model for AERMOD, to calculate the ceiling height. Mr. Dulla stated that AERMET consistently replicated measured values in 2006. He commented on the AERMET estimates for design days and stated that a lower mixing height reinforces focus on localized sources. He added that the data was helpful since it allowed Sierra Research to understand the impact of the mixing height in terms of modeling.

Mr. Dulla commented on source characterization. He indicated that the traffic counts were useful since the counts were by hour on the days when violations occurred. Mr. Dulla mentioned that Sierra Research was able to also get counts by vehicle size class. He commented on the silt measurements and that the SCAMPER vehicle provided the silt levels throughout the area. Mr. Dulla stated that Sierra Research was also able to obtain silt measurements using the vacuuming method on the ground in 2007. He added that the vacuuming method was able to provide insight on the benefits of control measures that had been introduced to impact silt levels.

Mr. Dulla mentioned that Sierra Research had conversations with a number of industrial facilities throughout the area. He indicated that the industrial facilities had computerized records on the activity levels of each day including the hours of production. Mr. Dulla noted that the activity level was driven by the demand for the product, which may be different than what is assumed as a typical operating pattern throughout the year. He stated that information on construction activity was also collected. Mr. Dulla mentioned that the detail on hours of operation for construction was not available as it was for industrial sites; however, Sierra Research was able to obtain information on the permits for earthmoving used to identify individual locations where construction was occurring. He added that Sierra Research used aerial imagery to see the acreage that was going to be disturbed and identify the boundaries of the construction area. Mr. Dulla commented on agricultural activity. He stated that the normal approach for estimating emissions for agricultural activity is to determine the crop and passes required for tilling, fertilizing, and any other activities and then distribute those activities throughout the season in which the crop is growing. Mr. Dulla added that during the time period in which Sierra Research was interested, agricultural areas were transitioning from cotton to wheat and operating continuously. He mentioned that this type of insight shifts the understanding from where the sources are coming that are impacting the monitors. He commented on agricultural sources adjacent to monitors.

Mr. Dulla discussed the importance of source resolution and individual boundaries for individual sources. He stated that ADEQ had taken emissions for a number of facilities, roads in particular, and distributed them throughout grid cells that were 400x400 meters in size. Mr. Dulla stated that Sierra Research identified the borders for the individual roads, which changed the source strength. He added that as a result, the source impacted the monitor differently than it would have if distributed within a grid cell. This improvement was made for construction sites, agricultural sites and industrial facilities. Mr. Dulla indicated that the information provided the ability to more accurately identify the source impact at the monitors and gave confidence on the days that were being modeled in 2006. Mr. Dulla noted that there were measurements for 2006, but not 2005. He indicated that some of the insights were extrapolated back to 2005 for use in the SIP. He discussed the confidence in the 2006 inventory.

Mr. Dulla discussed the activity profile, which included vehicle counts and hours of operation. He added that the activity profile provided insight on source strength. Mr. Dulla stated that a category that did not work out as well was high wind events. He explained that high wind events occur when the winds are about 15 miles per hour and able to pick up material off the surface and re-entrain it into the air. Mr. Dulla mentioned that the five minute data was used to develop a profile of the wind distribution for the days that were modeled and allocate hourly average values into individual mile per hour bins. He indicated that emissions were computed for each bin and weighted by number of seconds within each hour. Mr. Dulla commented on the difference in emission estimates using this approach versus hourly average value. Mr. Dulla stated that the analysis resulted in a 10 percent increase in emissions and did not provide the insight in capturing the impacts of high wind events.

Mr. Dulla commented on model performance. He stated that the predicted concentrations generally track the diurnal profile. Mr. Dulla stated that the predicted concentrations versus the measured concentrations tracked reasonably well, particularly in the morning and midday. He mentioned that there was trouble trying to understand the nighttime hours when activity levels fall dramatically, but high concentrations are still in the area. Mr. Dulla indicated that they were not able to replicate what occurred at night and would like to understand it better. He added that there may be events occurring at night in the area that are not reported.

Mr. Dulla presented the comparison of the diurnal distribution of measured concentrations and AERMOD predicted source concentrations for the Durango Complex monitor on December 6, 2006. He mentioned the mix of sources during the morning hours. Mr. Dulla mentioned that there is a rise in activity when the ceiling height is low. He indicated that as the emissions increase, a higher concentration will be generated until the ceiling height starts to rise. Mr. Dulla commented that the ceiling height starts to rise around 8:00 a.m. to 9:00 a.m. in the morning. He stated that when there is room for dispersion, the concentrations begin to fall. Mr. Dulla commented on being able to replicate the profile well. He added that the levels during the midday stay low and in the evening, the ceiling height drops rapidly and concentrations come back up, which is coincident with the rise in activity in the evening. Mr. Dulla mentioned that elevated concentrations remain throughout the night and into the morning that are not explained by the activity levels found. He commented that the model is not doing a good job of predicting these elevated concentrations at night. Mr. Dulla mentioned model performance and looking at this issue in a future study.

Mr. Dulla presented the comparison of the diurnal distribution of measured concentrations for AERMOD predicted source concentrations for the West 43rd Avenue monitor on December 6, 2006. He commented on the West 43rd Avenue monitor comparison not doing as well as the Durango

Complex monitor. Mr. Dulla stated that during the morning hours there was a rise in the activity pattern, which the model showed. He added that for an unknown reason the concentrations remained elevated later in the morning after the ceiling height started to rise. Mr. Dulla mentioned that the model was not able to replicate what was causing the concentrations to remain elevated. He commented on a similar pattern in the evening when there were elevated concentrations relative to what was predicted. Mr. Dulla noted that the figures do not include background estimates. He stated that the study was for 2006 and background estimates were developed for the SIP, which were generally uniform throughout the day. Therefore, all of the predictions would be raised slightly. Mr. Dulla noted that the sources that were modeled for the study were only the sources that were thought to be impacting the monitor sites.

Mr. Dulla presented the model performance of a prediction on a high wind day. He stated that this was a time period where there was a front that came through and the wind was coming from the south-southwest. Mr. Dulla added that there was trouble identifying sources of disturbed land coming from the south-southwest that impacted the West 43rd Avenue monitor. He indicated that when the wind was from the west, the model was able to pick up more areas of alluvial soil and disturbed soil. Mr. Dulla mentioned that there was a peak as wind came up quickly and the model was not able to replicate the event.

Mr. Dulla discussed the conclusions of the study. He mentioned that source strength is an important issue. He stated that attention to detail cannot be understated in terms of its importance. Mr. Dulla added that the boundaries of the sources and the day specific activities are crucial to understanding source characterization. He discussed understanding what happened on a particular day as opposed to an entire season. He indicated that paved road emissions are the largest contributor to ambient PM-10 in the Salt River Area. Mr. Dulla pointed out that paved road emissions are caused by multiple sources including trackout, dragout and windblown dust from vacant lots. He commented on low wind and stagnant conditions. He stated that the highest impacts are occurring during the morning hours after anthropogenic activity starts and before the rise in the mixing height. Mr. Dulla added that localized sources are dominating the monitor impacts. He indicated that the modeled estimates are consistently under predicting the nighttime and early morning concentrations. Mr. Dulla mentioned that in the data for December 2006, wind speed never reached 15 miles per hour. He indicated that wind speed was approximately 9-10 miles per hour, which was not sufficient to cause fugitive dust. Mr. Dulla commented that elevated winds would disperse the material that was in the air and lead to a reduction in concentrations that are occurring during stagnant conditions.

Mr. Dulla stated that recommendations for future studies would include conducting saturation monitoring under low wind stagnant conditions in order to have more measurements at multiple locations within the area. He added that the mobile monitoring was great in terms of providing insight at a lot of locations. Mr. Dulla mentioned that the deficiency of the mobile monitoring was that it did not provide information throughout the day in order to have a continuous pattern and a reference point to use to compare relative to the monitors. He indicated that it would be helpful to know how dispersion is occurring and the impacts of particular sources. He stated that the other recommendation would be evaluating the ability of CALPUFF to represent dispersion within the Salt River Area. He indicated that AERMOD is a model that predicts concentrations based on the emissions that occurred in that hour; therefore, there is no carryover effect from one hour to the next. Mr. Dulla added that a comparison was conducted between CALPUFF and AERMOD late in the study. Mr. Dulla mentioned that CALPUFF is not configured to represent a lot of different sources like AERMOD. He stated that

CALPUFF had a limit of 300 sources and AERMOD had four to five thousand sources. Due to the time constraint of completing the Five Percent Plan for PM-10, Sierra Research was unable to take the time to modify the CALPUFF model and investigate other opportunities. He indicated that it would be useful to understand the impact of carryover and shifting wind direction.

Mr. Gibbs mentioned the difference between 2005 and 2006 and commented on the major findings being universal from year to year. He inquired about the timing issue. Mr. Dulla replied that some of the insight received from the study could be used. He stated that they were able to do the comparison of the mixing height between the SODAR unit and AERMET, the preprocessor for AERMOD. Mr. Dulla added that this comparison provided the confidence that the model was working well in predicting ceiling heights. He mentioned that the model could be used for 2005 and there would be the comfort that it would work well. Mr. Dulla indicated that the 2006 study also provided some insight into diurnal profiles. He stated that the study report has a table for each source category that shows the critical assumptions in the ADEQ analysis, the assumptions used in the 2006 inventory, as well as what was done for 2005 in the SIP.

Mannie Carpenter, Valley Forward, inquired if the report would be available online. Lindy Bauer, MAG, replied that once the final report is received, the report will be listed under Environmental Programs Resources on the MAG website.

6. CMAQ Annual Report

Dean Giles, MAG, gave a presentation on the 2007 Congestion Mitigation and Air Quality Improvement (CMAQ) Funds Annual Report. He stated that the federal CMAQ program guidance requires that states and Metropolitan Planning Organizations (MPOs) complete an annual report that specifies how CMAQ funds have been spent and the expected air quality benefits. He added that MAG, working cooperatively with Arizona Department of Transportation, has completed the annual report for fiscal year 2007 that ended on September 30, 2007. Mr. Giles mentioned that a copy of the report had been included in the agenda packet. He indicated that the 28 projects that are listed include the project amount, project type, project title and description, and the estimated air quality benefit in terms of volatile organic compounds, carbon monoxide, nitrogen oxide, and PM-10. Mr. Giles noted that the Federal Highway Administration has indicated that MAG does not need to report the PM-2.5 air quality benefit since the region is not a PM-2.5 nonattainment area.

7. Update on the Air Quality Monitoring Data

Julie Hoffman, MAG, presented an update on air quality monitoring data for the region. She stated that the 2007 air quality monitoring data for ozone and PM-10 has been compiled and provided at each place. Ms. Hoffman mentioned that for 2007, the region had no exceedances of the eight-hour ozone standard. She indicated that in terms of exceedances this is an improvement from 2006 when the region experienced 24 exceedances at 13 sites. However, since the standard is calculated by averaging three years of the fourth highest ozone concentration at each monitor, the region has had three years of no violations. She stated that the table provided to the Committee shows the fourth highest monitor values for 2005, 2006, and 2007 and the three year average of the fourth high.

Ms. Hoffman stated that for PM-10 in 2007, the region experienced 20 exceedances of the 24-hour PM-10 standard. She added that these exceedances occurred on 11 days at 8 different monitors in the region and ADEQ has been gathering data to determine if these days qualify for natural events. Ms.

Hoffman mentioned that based on information received from Leonard Montenegro of ADEQ, as of November 2007, ADEQ had flagged three of the exceedances at the West 43rd Avenue monitor as natural events. She stated that ADEQ has also indicated that five exceedance days in 2007 will likely be flagged as natural events. Ms. Hoffman added that there are a few exceedances where ADEQ does not know if they will be flagged as natural events. She noted that there have been no exceedances of the PM-10 standard in 2008.

8. Proposed New Air Quality Project for the MAG FY 2009 Work Program

Ms. Bauer discussed the proposed new air quality project for the MAG FY 2009 Work Program. She stated that the project would be for consultant on-call technical assistance in the preparation of an Eight-Hour Ozone Maintenance Plan and preparation of supplemental analyses and information on the MAG Five Percent Plan for PM-10 to EPA as necessary. Ms. Bauer indicated that MAG may also need technical assistance for air quality modeling; traffic surveys and emission inventories; dirt road inventories and tracking the progress made to pave dirt roads; analysis of control measures; tracking implementation of committed control measures; CMAQ evaluation methodologies; and transportation conformity.

Mr. Kross inquired if the consultant on-call assistance will be available to the cities. Ms. Bauer replied that the consultant will be for technical air quality on-call assistance to MAG. She stated that an example of how cities may be impacted would be if a city proposed a CMAQ project where MAG does not have a methodology. The consultant could help MAG devise a methodology to evaluate and produce the cost effectiveness analysis that is brought to the Committee.

Barbara Sprungl, Salt River Project, stated that there has been an indication that EPA is looking at a .075 parts per million standard for ozone. She inquired how that change will impact proceeding with an Eight-Hour Ozone Maintenance Plan. Ms. Bauer replied that the region will need to see what is decided by EPA. She stated that a similar situation occurred with the one-hour ozone standard. She indicated that EPA proposed the eight-hour ozone standard in 1997, and MAG prepared the One-Hour Ozone Maintenance Plan to show that the region would maintain the standard through 2015. She added that EPA approved the plan and then revoked the one-hour standard the next day. Ms. Bauer commented that MAG will have to see what is decided by EPA and the timing of the new standard.

9. Tentative MAG Air Quality Project Schedule

Ms. Bauer stated that MAG has provided the two year schedule to track the MAG air quality activities. She added that the schedule is for calendar years 2008 and 2009. Ms. Bauer noted that page two includes the Eight-Hour Ozone Maintenance Plan schedule. She mentioned that MAG has indicated the major tasks so that the Committee can track when MAG has anticipated that the plan will be due. Ms. Bauer commented that EPA is encouraging MAG to prepare an Eight-Hour Ozone Maintenance Plan. She added that the region has had three consecutive three year periods with no violations. Ms. Bauer noted that EPA has indicated that the region has been placed in the attainment bin with the Washington EPA and therefore should start working on the Eight-Hour Ozone Maintenance Plan. Ms. Bauer stated that page three, under the Five Percent Plan for PM-10, is the new supplemental analyses as well as tracking the plan implementation, which was included in the Suggested List of Measures approved by the MAG Regional Council on May 23, 2007. She added that the unpaved road inventory is also listed under the Five Percent Plan for PM-10.

Mr. Gibbs inquired about what would trigger the supplemental analyses. Ms. Bauer replied that EPA is currently reviewing the Five Percent Plan for PM-10 and may request additional analyses.

10. Call for Future Agenda Items

Mr. Kross announced that the next meeting of the Committee has been tentatively scheduled for March 27, 2008 at 1:30 p.m. With no further comments, the meeting was adjourned.

FACT SHEET
FINAL REVISIONS TO THE NATIONAL AMBIENT AIR QUALITY STANDARDS
FOR OZONE

SUMMARY OF ACTION

Ozone standards

- On March 12, 2008, EPA significantly strengthened its national ambient air quality standards (NAAQS) for ground-level ozone, the primary component of smog. These changes will improve both public health protection and the protection of sensitive trees and plants.
- EPA is revising the 8-hour “primary” ozone standard, designed to protect public health, to a level of 0.075 parts per million (ppm). The previous standard, set in 1997, was 0.08 ppm. Because ozone is measured out to three decimal places, the standard effectively became 0.084 ppm as a result of rounding.
- EPA is also strengthening the secondary 8-hour ozone standard to the level of 0.075 ppm making it identical to the revised primary standard. EPA decided to strengthen the secondary ozone standard after concluding that the 1997 secondary standard is not adequate to protect public welfare. Current ozone air quality concentrations in many areas of the country -- including some areas that meet the 1997 ozone standards -- are high enough to harm sensitive vegetation and ecosystems.
- EPA estimates that the revised standards will yield health benefits valued between \$2 billion and \$17 billion. Those benefits include preventing cases of bronchitis, aggravated asthma, hospital and emergency room visits, nonfatal heart attacks and premature death, among others.
- In addition, EPA is changing the Air Quality Index (AQI) to reflect the new primary standard. The AQI is EPA’s color-coded tool designed for use by state and local authorities to inform the public about daily air pollution levels in their communities.

Scientific Review

- Breathing air containing ozone can reduce lung function and increase respiratory symptoms, thereby aggravating asthma or other respiratory conditions. Ozone exposure also has been associated with increased susceptibility to respiratory infections, medication use by asthmatics, doctors visits, and emergency department visits and hospital admissions for individuals with respiratory disease. Ozone exposure may also contribute to premature death, especially in people with heart and lung disease.
- After evaluating the results of more than 1,700 new scientific studies available for this review, EPA concluded that ozone causes adverse health effects at the level of the 1997 standard and below. This newly available evidence strengthens EPA’s confidence in the findings of the 1997 review and identifies important new health endpoints associated with ozone exposure, including mortality, increased asthma medication use, school absenteeism, and cardiac-related effects. Furthermore, studies of asthmatics indicate that they experience larger and more serious responses to ozone that last longer than responses for healthy individuals.

- In addition, new scientific evidence since the last review of the ozone NAAQS continues to show that repeated exposure to ozone damages sensitive vegetation and trees, including those in forests and parks, leading to reduced growth and productivity, increased susceptibility to disease and pests, and damaged foliage.
- EPA selected levels for the final standards after completing an extensive review of thousands of scientific studies on the impact of ground level ozone on public health and the environment. The Agency also carefully reviewed and considered public comment as well as comment from its Clean Air Scientific Advisory Committee (CASAC) on the proposed standards. EPA held five public hearings and received thousands of written comments.

Clean Air Rules

- EPA has issued a number of rules that will help states make progress toward meeting the revised ozone standards. These rules will significantly reduce ground-level ozone pollution, both regionally and nationally, by reducing emissions of NOx. These rules include the Clean Air Interstate Rule to reduce ozone forming emissions from power plants in the eastern United States, and the Clean Diesel Program to reduce emissions from highway, nonroad and stationary diesel engines nationwide.

DETERMINING COMPLIANCE WITH THE STANDARDS

- In addition to changing the level of the standards from 0.08 ppm to 0.075 ppm, EPA is now specifying the level of the standard to the third decimal. An area will meet the revised standards if the three-year average of the annual fourth-highest daily maximum 8-hour average at every ozone monitor is less than or equal to the level of the standard (i.e., 0.075 ppm).

BENEFITS AND COSTS

- The Clean Air Act prohibits EPA from considering costs in setting or revising National Ambient Air Quality Standards. To inform the public, the Agency analyzes the benefits and costs of meeting the standards as required by Executive Order 12866 and guidance from the White House Office of Management and Budget.
- To estimate the benefits of meeting a standard, EPA uses a sophisticated peer-reviewed approach to model the relationship between air quality and health and welfare effects, the air quality impacts of implementing future pollution control technologies, and the dollar values of resulting public health improvements.
- EPA's Regulatory Impact Analysis presents a range of benefits for meeting the revised ozone standards:
 - o Based on the largest multi-city study used in EPA's risk analysis, an estimated 260 to 2,000 premature deaths would be avoided annually in 2020. When added to the other projected benefits from reduced ozone, these avoided deaths lead to an estimated total ozone-related benefit of \$3 to \$17 billion per year.

- Using three studies that synthesize data across a large number of individual studies, an estimated 420 to 2,300 premature deaths would be avoided annually in 2020, leading to total monetized ozone-related benefits of between \$4 and \$17 billion per year.
- Alternatively, if there is no causal relationship between ozone and mortality, avoided premature deaths associated with reduced ozone exposure would be zero, and the total monetized ozone-related benefits would range between \$2 billion and \$17 billion per year (including 190 to 2,000 deaths per year avoided due to reduced particle pollution).
- The benefits estimates also include the value of an estimated reduction in the following adverse health effects in 2020:
 - 380 cases of chronic bronchitis,
 - 890 nonfatal heart attacks,
 - 1,900 hospital and emergency room visits,
 - 1,000 cases of acute bronchitis,
 - 11,600 cases of upper and lower respiratory symptoms,
 - 6,100 cases of aggravated asthma,
 - 243,000 days when people miss work or school, and
 - 750,000 days when people must restrict their activities because of ozone-related illnesses

Note: These benefits estimates reflect both the ozone and particle pollution reductions that would result from a revised ozone standard.

- To estimate the costs of meeting a standard, EPA uses several peer-reviewed approaches for modeling the cost of using both existing controls and controls that may be developed in the future for reducing NO_x and VOCs .

EPA estimates that costs of implementing a standard of 0.075 ppm would range from a low of \$7.6 billion to a high of \$8.8 billion annually in 2020.

IMPLEMENTING THE STANDARDS

- These revised standards will lead to substantially improved air quality in urban and rural areas throughout the United States.
- The Clean Air Act requires EPA to designate areas as attainment (meeting the standards), nonattainment (not meeting the standards), or unclassifiable (insufficient data to classify) after the Agency sets a new standard, or revises an existing standard. The following schedule will apply to the revised ozone standards:
 - States must make recommendations to EPA no later than March 2009 for areas to be designated attainment, nonattainment and unclassifiable.

- o EPA will issue final designations of attainment, nonattainment and unclassifiable areas no later than March 2010 unless there is insufficient information to make these designation decisions. In that case, EPA will issue designations no later than March 2011.
- o States must submit State Implementation Plans outlining how they will reduce pollution to meet the standards by a date that EPA will establish in a separate rule. That date will be no later than three years after EPA's final designations. If EPA issues designations in 2010, then these plans would be due no later than 2013.
- o States are required to meet the standards by deadlines that may vary based on the severity of the problem in the area.
- EPA will issue a separate rule to address monitoring requirements necessary to implement the new standards. EPA intends to propose a monitoring rule in June 2008 and issue a final rule by March 2009.

BACKGROUND:

WHAT IS OZONE?

- Ozone is found in two regions of the Earth's atmosphere – at ground level and in the upper regions of the atmosphere. Both types of ozone have the same chemical composition (O₃). While upper atmospheric ozone forms a protective layer from the sun's harmful rays, ground level ozone is the primary component of smog.
- Ground-level ozone is not emitted directly into the air, but forms through a reaction of nitrogen oxides (NO_x) and volatile organic compounds (VOCs) in the presence of sunlight.
- Emissions from industrial facilities and electric utilities, motor vehicle exhaust, gasoline vapors, and chemical solvents are the major man-made sources of NO_x and VOCs.
- Because sunlight and hot weather accelerate its formation, ozone is mainly a summertime air pollutant. Both urban and rural areas can have high ozone levels, often due to transport of ozone or its precursors (NO_x and VOCs) from hundreds of miles away.

OZONE AND PUBLIC HEALTH

- Health effects associated with exposure to ground-level ozone include:
 - o Reduced lung function, making it more difficult for people to breathe as deeply and vigorously as normal;
 - o Irritated airways, causing coughing, sore or scratchy throat, pain when taking a deep breath and shortness of breath;
 - o Increased frequency of asthma attacks;
 - o Inflammation of and damage to the lining of the lung;
 - o Increased susceptibility to respiratory infection; and
 - o Aggravation of chronic lung diseases such as asthma, emphysema and bronchitis.

- In some people, these effects can lead to:
 - Increased medication use among asthmatics;
 - More frequent doctors visits;
 - School absences; and
 - Increased emergency room visits and hospital admissions.
- Ozone may continue to cause lung damage even when the symptoms have disappeared.
- Breathing ozone may contribute to premature death, especially in people with heart and lung disease.

OZONE AND THE ENVIRONMENT

- Ground-level ozone can have harmful effects on various plants and ecosystems. When sufficient ozone enters the leaves of a plant, it can:
 - Interfere with the ability of sensitive plants to produce and store food, making them more susceptible to certain diseases, insects, other pollutants, competition and harsh weather
 - Visibly damage the leaves of trees and other plants, harming the appearance of urban vegetation, national parks, and recreation areas; and
 - Reduce forest growth and crop yields.

REVIEW OF THE OZONE STANDARDS

- The Clean Air Act directs EPA to set National Ambient Air Quality Standards for pollutants considered harmful to public health and the environment. National standards exist for six pollutants: ozone, particulate matter, carbon monoxide, lead, nitrogen dioxide, and sulfur dioxide.
- For each of these pollutants, the Clean Air Act requires EPA to set the health-based or “primary” standards at a level judged to be “requisite to protect the public health with an adequate margin of safety” and establish secondary standards that are “requisite” to protect public welfare from “any known or anticipated effects associated with the pollutant in the ambient air” including effects on crops, vegetation, wildlife, buildings and national monuments, and visibility.
- The law requires EPA to review the standards once every five years to determine whether revisions to the standards are appropriate.
- EPA last updated the ozone standards in 1997. The decision to revise the standards was challenged in court by a number of parties and ultimately reached the U.S. Supreme Court. In 2001, the Court unanimously upheld the constitutionality of the 1970 Clean Air Act provision that authorizes EPA to set NAAQS to protect public health and welfare. The Court also affirmed that the Clean Air Act requires EPA to set ambient air quality standards, at levels sufficient but not more than necessary, to protect the public health with an adequate margin of safety, and to protect the public welfare, without considering the economic costs of implementing the standards.

- Under terms of a consent decree, EPA agreed to issue a proposal on the ozone standards by June 20, 2007 and a final rule by March 12, 2008.
- The ozone review process began with an assessment of scientific studies on ozone by EPA's National Center for Environmental Assessment. This assessment was published as an Air Quality Criteria Document for Ozone, which explored the scientific data pertaining to the health and environmental effects associated with ozone. EPA's Office of Air Quality Planning & Standards then prepared a "Staff Paper" document which presented key policy-relevant scientific information, the results of quantitative exposure and risk assessments with associated uncertainties, and a policy assessment that identified policy options, including ranges of standards, for consideration by the Administrator.
- The Criteria Document and Staff Paper underwent extensive scientific and public review, including review by the Clean Air Scientific Advisory Committee (CASAC), EPA's independent scientific advisory body established by the Clean Air Act. As part of its mandate, CASAC makes recommendations to EPA on the adequacy of the existing standards and revisions it believes would be appropriate. Based on the scientific assessments, and taking into account the recommendations of CASAC and public comments, the EPA Administrator must judge whether it is appropriate to revise the standards.
- Before making a final decision on whether to revise the ozone NAAQS, EPA undertook an extensive public review and comment process on its proposed decision of June 20, 2007. The Agency carefully considered and analyzed issues raised in public comments during the public comment period on the proposed rule, which ended October 9, 2007.

FOR MORE INFORMATION

- Interested parties can download the notice from EPA's Web site at:
<http://www.epa.gov/groundlevelozone>