REGIONAL AIR QUALITY COUNCIL

Colorado Department of Public Health and Environment

December 27, 2005

MEMORANDUM

TO: Signatories to the Early Action Compact for Ozone for the Front Range Metropolitan Area

Regional Air Quality Council
Jim Scherer, Chairman

Air Quality Control Commission
Robert E. Brady, Jr., Chairman

Colorado Department of Public Health and Environment
Douglas H. Benevento, Executive Director

Colorado Department of Transportation
Thomas Norton, Executive Director

Denver Regional Council of Governments
Will Toor, Chairman

U.S. Environmental Protection Agency, Region 8
Robert E. Roberts, Regional Administrator

Elbert County, Board of County Commissioners
Stephen F. Stutz, Chair

Larimer County, Board of County Commissioners
Kathay Rennels, Chair

Morgan County, Board of Commissioners
Michael Harms, Chair

Weld County, Board of County Commissioners
Rob Masden, Chair

RE: December 31, 2005 Progress Report

In accordance with terms of the Early Action Compact for Ozone for the Front Range Metropolitan Area, please find attached a report that documents progress in stakeholder

development, securing of local control measures, public outreach and modeling/technical planning activities, etc. This report meets the December 31, 2005 milestone specified in the Compact.

Ken Lloyd, Executive Director
Regional Air Quality Council

Margie Perkins, Director
Air Pollution Control Division

cc: Doug Lempke, Air Quality Control Commission
Lisa Silva, Air Pollution Control Division
Ann Skinner, Colorado Department of Transportation
Jeff May, Denver Regional Council of Governments
Dick Long, EPA Region 8
Tim Russ, EPA Region 8
Jerry Dilley, RAQC

Ozone Early Action Compact
Denver Metro Area
December 31, 2005 Progress Report
December 27, 2005

Introduction

In December 2002 state and local agencies in the Denver area entered into an Ozone Early Action Compact (EAC) with the Environmental Protection Agency (EPA). The Compact is a Memorandum of Agreement between the Regional Air Quality Council (RAQC), the Colorado Department of Public Health and Environment (CDPHE), the Air Quality Control Commission (AQCC), the Denver Regional Council of Governments (DRCOG), the Colorado Department of Transportation (CDOT), and EPA Region 8. The EAC was amended in 2004 with additional signatories for Elbert, Larimer, Morgan and Weld Counties, areas potentially affected by ozone nonattainment.

The Compact entails a commitment to develop and implement an Ozone Action Plan in return for deferring any potential non-attainment designation for the EPA's 8-hour ozone standard. The EAC outlines several planning milestones (including progress reports every 6 months) that must be met, culminating in attainment of the 8-hour standard by December 2007. The June 30, 2004 Progress Report was prepared demonstrating that an Ozone Action Plan, emission control regulations, and supporting documentation had been completed and adopted by the State authority, the Colorado AQCC. The adopted plan and regulations were subsequently reviewed and approved by the Colorado State Legislature and the bill approving the plan and regulations was signed into law by the Governor of Colorado in May 2004.

The December 31, 2004 Progress Report addressed the disposition of comments received from the EPA in August 2004 regarding recommendations for revisions to emission control regulation, Air Quality Regulation No.7, to provide clarity and ensure approvability of the Ozone Action Plan, and a necessary change to the Ambient Air Quality Standards regulation to define the 8-hour ozone control area.

The June 30, 2005 Progress Report addressed progress towards implementation of Ozone Action Plan control strategies, the Denver Metro area's voluntary response to the 8-hour ozone issue and planning activities in the North Front Range to ensure cooperation in terms of possible Conformity issues and coordination of voluntary control programs, if necessary.

This December 31, 2005 Progress Report addresses progress towards completion of milestones, the Denver Metro area's voluntary response in summer 2005 to the 8-hour ozone issue and planning activities for 2006 and the activities and report of the Multi-Jurisdictional I/M Transition Committee in the North Front Range.

Updates on Activities Related to the EAC

Stakeholder meetings and other actions and activities that have occurred since the June 30, 2005.

Although not mentioned in the June 30, 2005 report, the APCD permit staff sponsored a half day training on January 19, 2005 for the oil & gas industry on the development and use of the required spread sheet report of production and controls. Approximately 25 people were in attendance representing oil & gas well drillers, operators of condensate tanks, and consultants and lawyers representing various companies. Encana, Kerr-McGee & Duke Energy (among the largest operators) were represented.

The RAQC board received an update from APCD staff at the regular board meeting, August 4, 2005, on the Colorado Clean Screen Program.

At the August 18, 2005 regular Commission meeting, the AQCC received briefings on the following:

- An update by APCD staff on the Rocky Mountain National Park Initiative which is concerned with visibility degradation, increasing tropospheric ozone concentrations, and nitrogen/acidic deposition
- An update by APCD staff on ambient ozone concentrations along the Front Range which addresses the impact on surface ozone concentrations due to longer term build-up of ozone in the middle atmosphere.
- A presentation based on a study by NREL on the weekday/weekend differences in Colorado Front Range air quality

APCD staff provided the AQCC and the Colorado Board of Health with an update on Front Range ozone concentrations for the 2005 ozone season at the regular Commission meeting, October 20, 2005.

The Multi-Jurisdictional I/M Transition Committee, comprised of staff from the City of Fort Collins, the North Front Range MPO, Pikes Peak Area Council of Governments (PPACG), the Emissions Coalition of Colorado Springs, the CDPHE and the RAQC, continued to meet to foster cooperation and coordination along the north Front Range in terms of potential voluntary programs to replace the I/M programs that are being removed in the City of Fort Collins, Colorado Springs and Greeley. The committee has met four times since June 30, 2005 as follows: August 3rd, September 8th, October 5th, and November 2nd and presented an Air Quality Strategy Evaluation Report, to the AQCC at the regular Commission meeting on November 17, 2005

The RAQC board received an update at the regular board meeting, December 1, 2005, on the 2005 Ozone Outreach Campaign, the results of the 2005 public awareness research survey, and the plans for the Ozone 2006 Outreach Campaign.

The AQCC revised the OAP to include periodic assessment of assumptions of emissions and modeling assumptions at the regular Commission meeting, December 15, 2005.

Updates or revisions to modeling, technical analysis or planning activities.

Summary of Modeling and Technical Analysis to Date

The technical analysis that supports the approved Ozone Action Plan was completed in early March 2004 and was included in the submittal to the EPA in fulfillment of the required March 31, 2004 milestone. The Technical Support Document has been provided to EPA Region 8 on CD-ROM and is posted on the Air Pollution Control Division's website, http://apcd.state.co.us/documents/eac/

All supporting reports are included in the Technical Support Document referenced above, as well as on the RAQC website, www.raqc.org/ozone/EAC/ozone-eac.htm. No additional modeling or analyses has been completed beyond which is referenced in the original TSD.

A draft technical report by Environ that addressed model sensitivity was submitted February 11, 2005 to the RAQC and APCD. The modeling platform continues to demonstrate unresponsiveness to small refinements in the sensitivity analyses, although it meets most of the EPA evaluation protocols.

The Ethanol Management Company sponsored a draft report by Environ dated April 7, 2005 which sought to photochemically model the effects of the use of ethanol blends in gasoline on ozone concentration in the Denver region. The results of the analysis were negligible reductions/increases in ozone concentration across the Front Range. However there continues to be uncertainty about the results because of the importance of ethanol in increased evaporative emissions, and the inability of current tools to precisely quantify evaporative emissions and the lack of sensitivity to inventory changes in the modeling platform.

Planning

Periodic Assessment

Language addressing periodic assessment of growth assumptions was inadvertently omitted from the OAP approved by the AQCC in March 2003. In their final review in early 2005, the EPA noticed the omissions and brought it to the attention of the APCD. March 22, 2005, a letter of commitment to periodic assessment of assumptions of emissions and modeling assumptions in the OAP was sent to the EPA. AQCC action to revise the OAP to include a section addressing periodic assessment took place at the regular AQCC meeting on December 15, 2005.

Assessment of Growth in Flash Emissions
APCD Planning Program and Technical Services Program staff initiated a review in November 2005 of reported flash emissions from the condensate tanks at oil & gas exploration facilities. The flash emissions are estimated based on application of an established emissions factor applied to barrels of condensate developed while pumping natural gas from wells. The review was based on the Stationary Source Permit Program's Air Pollution Emissions Notice (APEN) program. Because of lag time in reporting and processing the reports, the most recent complete year of data is 2004. However, based on an analysis of the available data, the APCD staff has observed that the annual flash emissions growth trend appears greater than originally assumed in the OAP analysis in 2002. Also, at the same time the Colorado Oil and Gas Conservation Commission's data base indicates that the oil & gas industry has reduced the wells in production in Weld County during the summer months of 2005 from approximately 13,000 wells to 10,000 wells. Taking these two points into account indicates that a better understanding of the production of condensate in 2005 is needed. Additionally, information is needed concerning future operational characteristics of the oil and gas industry.

Although the first report of VOC reductions required by Reg. 7 is not due until April of '06, the APCD is requesting, in a letter, the daily summaries of operations for the 2005 ozone season for review by the end of the year. A meeting with oil and gas industry representatives will be scheduled in early 2006.

The APCD will assess the possible growth in flash emissions beyond original assumptions and its impact on the modeling analysis and determine if the required 2007 reduction needs to be increased to meet the inventory used in the OAP modeling for the 2007 control scenario.

Progress towards completion of the December 31, 2005 EAC milestones

Technology based controls

Reid Vapor Pressure
The OAP approved by the AQCC on March 12, 2004 established an RVP limit of 8.1 psi for gasoline and the photo chemical modeling assumed the estimated 10 tpd VOC reduction in the 2007 controlled inventory.

In spring of 2004 the EPA decided not to extend the waiver to allow 9.0 psi RVP in the region. As a result, the region was then required to provide gasoline meeting the national RVP limit of 7.8 psi (8.8 psi for ethanol blends) starting with the 2004 summer ozone season. The reduction using a 7.8 psi RVP in 2007 is estimated at 13 tpd VOC (12 tpd from mobile sources and 1 tpd from service stations).

Testing of fuel by the APCD in the summer ozone seasons of 2004 and 2005 indicates that the established limits are being achieved in the Denver metro area as follows:

2004 - clear gasoline 7.6 psi RVP, ethanol blend 8.5 psi RVP
2005 - clear gasoline 7.7 psi RVP, ethanol blend 8.6 psi RVP

Condensate Tank Emissions Controls
The condensate tank emissions are commonly referred to as flash emissions, and are VOCs emitted during the condensate collection, storage, processing and handling at oil and gas wells. In 2002 there were over 3000 condensate tanks operating in the nine-county region, primarily in Weld County.

Revisions were made to AQ Regulation No. 7, as part of the OAP to require a system wide 37.5% reduction in summer 2005 and a 47.5% reduction by the end of 2005 in preparation for the 2006 summer ozone season. Control technology is primarily flares, but some companies have installed vapor recovery systems. At a meeting in May 2004, industry representatives indicated that they were prepared to meet the interim and final requirements in Regulation No. 7.

The APCD permit engineers and field inspection engineers have provided training (as noted above under stakeholder meetings) for the required reporting of condensate production and controls. There have been some problems as might be expected in the undertaking of such a massive operation. However, considering the effectiveness of the installed controls and the rule effectiveness factor, it is currently expected that the reduction in VOC emissions will meet or exceed the 55 tpd reduction assumed in the 2007 controlled inventory.

As noted above in the section on modeling, technical analysis and planning, a letter to the effected companies has been sent requesting daily summaries of system wide condensate production and controls 12/31/05. APCD staff will assess the possible growth in condensate production beyond original assumptions and its impact on the modeling analysis and determine if the required 2007 reduction needs to be increased to meet the inventory used in the OAP modeling for the 2007 control scenario.

Controls for Stationary Engines
The OAP includes an amendment to AQ regulation No. 7 requiring installation of control technology by May 1, 2005 for reciprocating internal combustion engines (RICE) larger than 500 horsepower located in the 8-hour ozone control area. Rich burn RICE shall be controlled with non-selective catalyst reduction and an air fuel ratio controller. Lean burn RICE shall be controlled by oxidation catalyst reduction. Existing lean burn RICE may be exempted upon demonstration that cost of emissions controls exceed $5000/ton of VOC reduced.

At this time 192 engines have been identified in the 8-hour ozone control area, although a complete breakout of lean burn vs rich burn is currently unavailable. Of the 192 engines identified, 29 have received approved exemptions and 2 at Denver International Airport have been converted to electricity. There are 11 engines owned by Kerr-McGee that may be out of compliance with the control requirements of Regulation No. 7. These engines are the subject of an ongoing enforcement action against the company. Therefore, on May 1, 2005 there were 152 engines controlled (192 -29 -11 = 152).

Specific compliance with the requirements of Regulation No. 7 will be verified through the Division's ongoing inspection and compliance programs. It is assumed that the compliance issues with Kerr-McGee will be resolved, and based on lean burn RICE exemptions currently approved there will be a shortfall of VOC reductions of approximately 0.8 tpd in 2007 from the stationary engine control category. This shortfall is very slight and beyond the sensitivity of the photochemical modeling. However, the 7.8 psi RVP requirement discussed above provide an additional gain in reduction of 3 tpd of VOC.

Controls for Dehydrators

Regulation No. 7 was amended to require control of dehydrators with emissions in excess of 15 tpy. Specific compliance with the requirements of Regulation No. 7 will be verified through the Division's ongoing inspection and compliance programs. Controls added are reported through the APCD Permit Program APEN process. Complete APEN summaries of 2005 will be available in March –April of 2006.

Revisions to Regulation No. 11 – Automobile Inspection and Readjustment Program

The OAP includes an amendment to Regulation No. 11 to reduce the coverage of remote sensing clean screen area from 80% to 50% in order to reduce the disbenefit of the program and to reflect the practical reality of coverage. No more than 50% of the gasoline fleet will be evaluated with remote sensing during any twelve month period after December 31, 2005. Also, hydrocarbon limits have been established and gas cap pressure checks are included in Regulation No. 11.

The APCD reports that it is currently at about 10% coverage, well below the 50% coverage which would further reduce the disbenefit originally estimated. Therefore, the current estimated reduction of 9.1 tpd VOC and 0.3 tpd NOx in 2007 is expected to be achieved as a minimum.

Program-based measures

Ozone Outreach and Education Program

The Regional Air Quality Council (RAQC) launched the seventh year of its Voluntary Ozone Reduction Program. The 2005 program built upon previous

years with the implementation of a large-scale awareness, education, and outreach program entitled "Let's Take Care of Our Summer Air." This comprehensive program was made possible with the help of numerous stakeholders from the Front Range region, including local, state, and federal governments, businesses, transportation organizations, non-profits, and citizens. The goal was to increase awareness and understanding of ozone pollution and voluntary activities to help reduce it throughout the region.

Although the voluntary Ozone Outreach and Education Program is important to the region in helping to achieve compliance of the standard at the area air quality monitors, the program is not included as an enforceable measure in the SIP and no emissions reduction credit is taken for the program..

The program encompassed large-scale outreach, advertising, education, and evaluation components in order to raise public awareness and education about ozone issues and increase the number of people undertaking voluntary ozone reduction steps. In addition, it assisted with the promotion of the RAQC's high-emitting outreach project, the Repair Your Air Campaign.

Although the program is important to the region in helping to achieve compliance of the standard at the area air quality monitors, the region has decided to take no credit for the voluntary Ozone Outreach and Education Program in the OAP.

The four main components of the program – media advertising and outreach, citizen outreach, local government outreach, and analysis and reporting – were designed to complement the efforts of each component of the program to maximize effectiveness. The results of this all encompassing program are detailed below.

Media Outreach and Advertising

Program partners and contractors worked with staff to develop a simple, yet memorable campaign to encourage citizens to take action to reduce ozone-forming behaviors. The outcome was a colorful campaign that utilized television, radio, and outdoor mediums to yield 2,200 media advertising spots. At least 50 news stories were generated as a result. See Table 1 below for more information.

Table 1: Results of Media Advertising Campaign

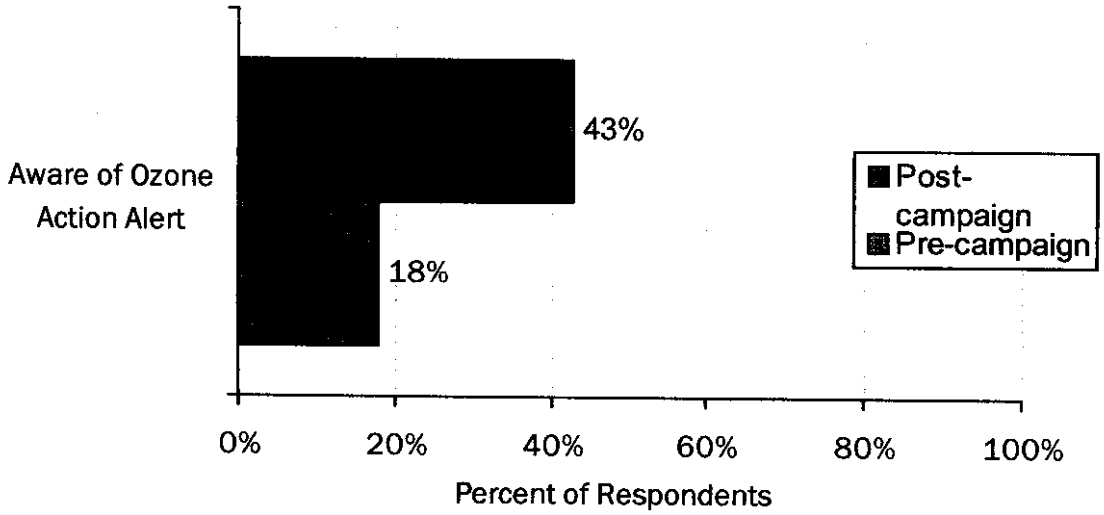
	Paid Media	**Bonus Media**	**Total**
Television	543	308	**851**
Radio	676	115	**791**
Billboards	5	---	**5**
Bus Boards	---	50	**50**
Pump Toppers	248	257	**505**
Print	3	---	**3**
Total	**1,475**	**730**	**2,205**

Citizen Outreach
The RAQC hosted and participated in a number of community events to further educate citizens about ozone pollution. These included over 20 spring Car Care Fairs to perform over 500 free vehicle inspections, Mow Down Pollution events to exchange over 50 pieces of gasoline-powered equipment for more earth friendly options at eight area Home Depot stores, and participation in a number of existing events, such as Denver Regional Council of Government's Bike to Work Day. In addition, RAQC launched an ozone-dedicated web site in both English and Spanish located at OzoneAware.org. The web site served as the main hub for information about ozone pollution and the specific activities of the campaign. A total of 6,500 new users visited the web site June 1 through August 31.

Local Government Outreach
Local governments continue to be an integral part of the RAQC's ozone reduction efforts. During the 2005 ozone season, RAQC developed two unique programs to encourage participation by area local governments. The first was a fleet gas cap testing program to identify and replace faulty and missing gas caps. A total of nine local governments participated, including Arvada, Broomfield, Denver, Englewood, Federal Heights, Golden, Louisville, Northglenn, and Westminster. The participating governments tested nearly 900 gas caps and found that 109 (over 12 percent) failed. The second was a sub-grant program to encourage and increase ozone outreach and education efforts by providing small grants to a few select governments that developed creative outreach proposals. Boulder County, City and County of Denver, and Federal Heights received funding to increase and enhance their outreach and education efforts relating to ozone pollution.

Analysis and Reporting
The RAQC worked with a professional public opinion research firm to conduct a pre- and post-survey to determine the effectiveness of the increased outreach and education efforts in affecting behavior change among the public. The RAQC conducted pre-campaign research, which consisted of a telephone survey and two focus groups, and post-campaign research, which included a telephone survey. The results were positive; there appeared to be a meaningful increase in awareness before and after the implementation of the large-scale education campaign. For example, 18 percent of respondents reported awareness of the Ozone Action Alert Program before implementation of the campaign; 43 percent of respondents reported awareness of the program after the campaign. See Table 2 below.

Table 2: Awareness of Ozone Action Alert



Government Agency/Department with Authority and Responsibility for Implementation of Control Measures

All technology-based controls are under the authority and responsibility of the Colorado Department of Public Health and Environment Air Pollution Control Division. Within the APCD the specific responsible programs and the respective control measures are as follows:

- Stationary Source Program
  - Condensate Tank Emissions Controls
  - Controls for Stationary Engines
  - Controls for Dehydrators

- Mobile Source Program
  - Reid Vapor Pressure
  - Revisions to Regulation No. 11 – Automobile Inspection and Readjustment Program

The program-based measure – the Ozone Outreach and Education Program - is under the authority and responsibility of the Regional Air Quality Council.

A. Control Measure	B. Summary Description of Measure	C. Program/Measure Status	D. Specific Implementation Date	E. VOC Reduction	F. NOx Reduction	G. Resources (FTE's, $$)	H. Additional Information
1 Denver, CO (Effective date of nonattainment designation deferred)							
Lower Reid Vapor Pressure	The EPA did not extend waiver to allow 9.0 psi RVP for the 2004 ozone season, and the region is now required to achieve the the national RVP limit of 7.8 psi for gasoline (8.8 psi for ethanol blends).	7.6-7.7 psi RVP clear gasoline and 8.5-8.6 psi RVP ethanol blends were sold in the DMA during the 2004-2005 ozone seasons (June 1 to September 15)	March 12, 2004	13 TPD			
Reduce VOC flash emissions from condensate tanks at various natural gas facilities	System wide reduction of 37.5% of flash emissions daily in 2004 ozone season by operators with uncontrolled system emissions greater than 30 tpy. Reduction of 47.5% required by 12-31-05	Operators report control technology (flares or vapor recovery units) installed to achieve the interim and final control requirements.	by Dec. 31, 2005	55 TPD	0 TPD		
Control IC engines>500 HP	Rich-burn engines required to have non-selective catalyst reduction and lean-burn engines required to have oxidation catalyst.	192 engines were identified. 29 received approved exemptions upon demonstration that controls exceeded $5000/ton of VOC reduced. 11 engines are currently subject to an enforcement action. 152 engines are known to have controls installed.	Dec. 2005	4.7 TPD	19 TPD		
Control dehydration units	Controls required on dehydrators with emissions in excess of 15 tpy.	Compliance will be verified through Division's ongoing inspection and compliance program.	Dec. 31, 2005	0.5 TPD	0 TPD		
Reduce % of clean screen program	RSD clean screen coverage to be reduced from 80% to 50%, thus decreasing the disbenefit to the I/M program.	Clean screen coverage for 2005 is at approximately 10%. It is not anticipated at this time that it will achieve 50% coverage.	Dec. 2005	9.1 TPD	0.3 TPD		
Comments: The EAC area includes the AQCC - Colorado Air Quality Control Commission 7-county area - Adams, Arapahoe, Broomfield, Boulder (includes part of Rocky Mountain National Park), Denver, Douglas and Jefferson plus part of Weld and Larimer counties. The reductions quoted are expected reductions in 2007							