

**DORCHESTER COUNTY**  
**Final Early Action Plan**  
**for the 8-Hour Ozone Standard**

## **Background**

In 1997, the Environmental Protection Agency (EPA) revised the National Ambient Air Quality Standard (NAAQS) for Ozone from a one-hour standard to an 8-hour standard. This was done to reflect the latest understanding of the effects of ozone exposure and provide public health protection with adequate margin of safety. EPA will be designating areas as attainment (meeting the standard) or non-attainment (not meeting the standard) in April of 2004. This designation will be based on the most recent three years of monitoring data (i.e., 2001, 2002, and 2003). The Department of Health and Environmental Control (DHEC) has an intensive monitoring network covering the state and routinely monitors for ozone during the months of April through October. This time period is often referred to as the “Ozone Season.” If an area is designated non-attainment, the Clean Air Act (CAA) requires states to revise their State Implementation Plan (SIP) outlining how the area will return to attainment within a certain time period. If EPA designates areas in South Carolina as non-attainment in April of 2004, a revision to the South Carolina SIP will be due no later than 2007. Additionally, once an area is designated as non-attainment, the CAA has specific requirements that must be implemented. These requirements affect industry, economic development, and transportation. One requirement, Non-attainment New Source Review sets out the level of emissions reductions required for new and modified industrial facilities. Another requirement of non-attainment areas is to coordinate local transportation and air quality planning to ensure that transportation plans, programs and projects are consistent with air quality goals. According to the CAA, transportation plans, programs, and projects cannot create new violations of the Federal air quality standards; increase the frequency or severity of existing violations of the standard; or, delay attainment of standards.

The above approach is commonly referred to as the “traditional” approach. While safeguards for areas to return to attainment are included, certain prescriptive requirements may not be appropriate for all areas designated non-attainment for the 8-hour ozone standard. As a result, EPA provided an option for areas that were meeting the one-hour standard to attain the 8-hour ozone standard by December 31, 2007, and obtain cleaner air sooner than currently federally mandated. This option offers a more expeditious time frame for achieving emissions reductions, while providing “fail-safe” provisions for the area to revert to the traditional SIP process if specific milestones are not met. EPA will move forward with the designation process (attainment or non-attainment) but will defer the effective date, thus the prescriptive requirements of non-attainment designations, provided all terms and conditions of an Early Action Compact (EAC) are being met.

Forty-five counties in South Carolina elected to participate in the development of an Early Action State Implementation Plan (EAP). On December 20, 2002, Mr. Colin Martin, County Administrator signed an Early Action Compact (EAC) for Dorchester County.

Participants in the EAC include Dorchester County, DHEC and the EPA. All of these parties agree to work together to implement federal, state and local emissions control measures that will allow the non-attainment areas to attain the 8-hour ozone standard earlier and therefore avoid implementing costly prescriptive measures. The EAC requires that all counties submit a local Early Action Plan to DHEC by March 31, 2004.

Although **Dorchester County** is not a potential area to be designated non-attainment for the 8-hour ozone standard, other areas in South Carolina may be designated non-attainment. As air knows no boundaries, implementation of emission reduction strategies and support of federal and state rules and regulations by **Dorchester County** will help to provide cleaner air sooner to citizens of South Carolina.

## **What is Ozone?**

Ozone is a gas that occurs both in the Earth's upper atmosphere and at ground level. Ozone is one of six criteria pollutants used by the EPA as an indicator of air quality. Depending on where ozone is found, it can be good or bad. Occurring naturally in the upper atmosphere, ozone acts as a shield from the sun's harmful ultraviolet rays. However, ground-level ozone is a concern during the summer months when the weather conditions are favorable for producing ozone. Ozone is formed by chemical reactions between volatile organic compounds (VOCs) and oxides of nitrogen (NOx) in the presence of sunlight. Ozone is a major ingredient of smog.

## **Ozone Health Effects**

Ozone can cause permanent damage to the respiratory system. Active children are at highest risk from ozone exposure because they often spend a large amount of time outdoors. Active adults of all ages who exercise or work outdoors have an increased risk of exposure to elevated levels of ozone. People with asthma or other respiratory diseases are particularly sensitive to ozone exposure. The following 2001 statistics are for **Dorchester County** and were collected by the Bureau of Epidemiology at DHEC:

- (6.4) percent of the adults suffer annually from asthma;
- 178 hospitalizations were due to asthma;
- 165 children under the age of 18 visited the Emergency Room due to asthma; and,
- Asthma is the leading cause of hospitalization for children under the age of 18.

## **Sources of NOx and VOCs**

NOx and VOCs come from emissions from the following sources: stationary, area, mobile and biogenic (natural) sources. Stationary sources include larger permitted industry and power plants. Area sources are small, stationary and non-transportation sources that collectively contribute to air pollution. Area sources include gas stations (emit NOx) and dry-cleaners (emit VOCs). Mobile sources are divided into two categories, on-road and off-road. The off-road mobile sources include trains, ships, boats, airplanes, lawn equipment, and construction equipment. On-road mobile sources include cars, trucks, and buses. Biogenic or natural sources for VOCs are released from vegetation, mostly pine trees in South Carolina. Biogenic or natural sources for NOx are very rare and include emissions from soil, lightning, and oceans. The following figures for **Dorchester County** show the percentage of sources by category for NOx (Figure 1) and VOCs (Figure 2).

Figure 1-NOx

# Sources of Nox

(Oxides of Nitrogen)

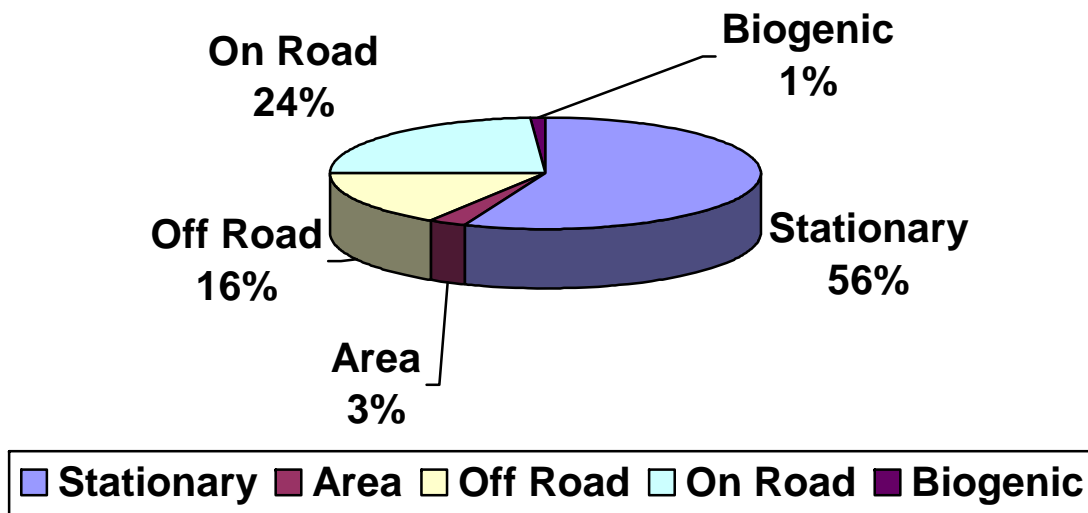
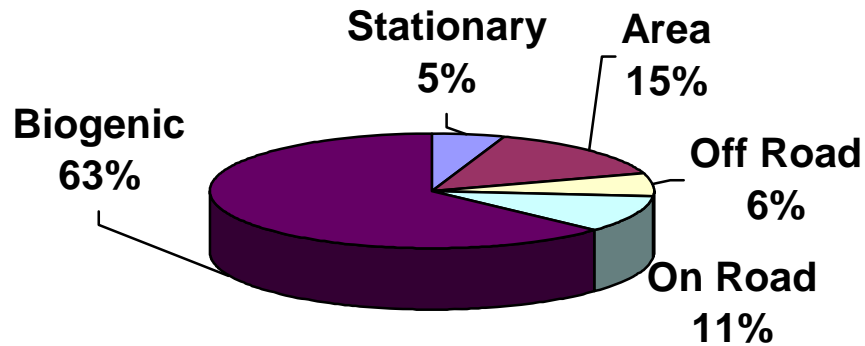


Figure 2 - VOC

## Sources of VOC

(Volatile Organic Compounds)



Emissions of NO<sub>x</sub> and VOC are precursors to the formation of ozone. South Carolina is sometimes referred to as “NO<sub>x</sub> limited.” This means that small amounts of NO<sub>x</sub> enable ozone to form rapidly when VOC levels are relatively high, but ozone production is quickly limited by the removal of NO<sub>x</sub>. Under these conditions, NO<sub>x</sub> reductions are highly effective in reducing ozone while VOC reductions have little effect. Figure 1 shows that 56% of NO<sub>x</sub> emissions is from Stationary Sources (Electrical Generating Plants) an element that cannot be easily changed without a drastic effect on Quality of life issues. The second greatest source of NO<sub>x</sub> emissions is (24%) from on-road sources (vehicle exhaust). With such a high percentage of NO<sub>x</sub> coming from on-road sources, it would appear that reductions from mobile sources would be beneficial.

### Demographics

Dorchester County is 575 square miles I area with a population of 96,413 (as of August 2000) according to the 2001-2002 South Carolina Statistical Abstract. The population density is 168 persons per square mile of land area. There are a total of 695 miles of interstate, state primary and state secondary roads in the county. In addition, the County maintains over 300 miles of public roads. Dorchester County had 74,663 vehicles registered in the county, ranking Dorchester County 15th of 46 counties owning the greatest number of registered vehicles.

Dorchester County and its municipalities all have Comprehensive Plans wherein we promote preservation of our natural resources. Most incorporated areas have Tree Ordinance's to promote natural shade in its development plans as well as commercial parking lots. Promoting natural shade reduces the need for air conditioning in homes and for vehicles. The County Zoning and Subdivision Ordinances encourages development be directed to areas that already have sewer and water (toward in-filling) vacant areas in urban areas). This restricts the development of utility services to areas of minimal growth and clusters people within a smaller geographical area making mass transportation more cost efficient and convenient. Dorchester County has over 60% of its workforce commuting outside the County to their places of employment. Dorchester County has always been an advocate for the "park and ride" proposals to promote car-pooling.

Dorchester County has a workforce of 44,282 people over the age of 16. Of those employed, 43,131 people commute to work. The distribution of commute choices are identified on Table 1.

Table 1 Distribution of Commute Choices of Employed over the age of 16		
Commute Choice	Number Employed	Percentage
Drove alone	36,311	82%
Carpooled	5,624	12.7%
Worked at home	709	1.6%
Other	664	1.5%
Walked	753	1.7%
Public Transportation	221	.5%

Other includes motorcycles, bicycles and other means of transportation not identified.

Dorchester County is a typical "bedroom community", where the majority of its citizens commute to adjacent counties to go to work. There may be fewer industries within the County, however, Property Tax becomes the major source of tax revenue. Dorchester County will continue to pursue an aggressive Economic Development program to generate more jobs for its residents, and yet remain selective in the kind of jobs and preserve our rural small town character and way of life. Dorchester County will continue to support

the CHATS program to reduce traffic congestion, providing more Park and Ride programs and to encourage our citizens to share their rides with others.

## **Industry**

Enclosure (2) contains a list of the industry within Dorchester County and the most recent annual emission figures. Dorchester County Economic has several programs to promote economic development within the county (expansion) and to show the County's appreciation for their presence. The County stakeholders have not yet asked for their participation to reduce emissions.

## **Public Involvement**

Dorchester County has invited various groups and representatives from various organizations and towns to participate in the preparation of a plan by a stakeholders group. Presently we have a County representative, a representative from SC DOT and a representative from Harleyville, Ridgeville and St. George. We have found a more receptive group at the Council of Governments (Regional BCD COG) with representatives from Berkeley and Charleston Counties. We intend to involve local governmental fleet vehicle managers and local school systems in developing an education program starting with the school aged children. The local newspapers will be asked to participate with the publication of various articles about Ozone over a long period of time to educate the public. We find we get better cooperation if we do the research and write proposed articles.

## **Steering Committee**

Steering Committees and Stakeholders groups are one in the same.

Meetings held to date regarding the EAP:

- The initial Dorchester County Stakeholders meeting met April 14, 2003, at the Public Works office. A representative from DHEC (Ms. Melinda Mathias), a representative from the Dorchester County, SC DOT and a Town representative from Ridgeville, St. George, Harleyville and Reevesville were present. A representative from the Town of Summerville nor was the representative from Biedler Forest present. The Media did not attend.
- On July 24, 2003, August 14, 2003, September 18, 2003 and February 26, 2004, the Berkeley, Charleston, Dorchester Council of Governments (BCD COG) hosted meetings in which all counties (Berkeley, Charleston and Dorchester) were present. Various guests were invited and were active in representing DHEC Central Office (Ms. Melinda Mathias) EQC District Office,

the Charleston Area Transportation Authority (CARTA), the Rural Transportation Mass transit Authority (RTMA), Coastal Carolina Conservation League, the Sierra Club, the Medical University of SC (MUSC), Clemson Extension Services and the Fleet Transportation Supervisors from each County were invited to discuss their strategies to reduce Ozone emissions.

- Two Early Action Plan meetings were conducted at DHEC, Columbia on February 26, 2003, and June 25, 2003. The DHEC representatives were very active on the internet and the telephone to keep all parties abreast of activities.

## **Emission Reduction Strategies**

Through the development and implementation of this plan, Dorchester County will implement local emission reduction strategies that are economically feasible and that make sense for the county. In doing so, the efforts of Dorchester County should assist the state in achieving the 8-hour ozone standard by December 31, 2007, and maintaining the standard beyond 2012.

A number of federal control measures are in place and/or will be phased in over the next several years. These programs include the Tier II and Low Sulfur Gasoline and also the NOx SIP call. All of these programs have been developed to help areas attain air quality standards.

The state is also proposing new and/or modifications to regulations that will assist non-attainment areas. The State programs could include a Best Available Control Technology (BACT) regulation; modifications to the "open burning" regulations and a process to assure transportation plans, programs, and projects consider air quality goals.

Local measures must be implemented no later than April 2005. However, Dorchester County will continue to address strategies that will assist in long-term maintenance of the 8-hour ozone standard. It is not possible to determine emissions reductions for each of the following strategies. However, directionally sound strategies have been selected and the county anticipates the cumulative impact of adopting each of these strategies will assist in maintaining the standard.

## **Challenges**

Dorchester County will be faced with challenges regarding the implementation of emissions reduction strategies. Education and behavior modification will be one of the major challenges facing the Tri County area. Dorchester County through the development of the Dorchester County Ozone Steering Committee and the efforts of the Ozone Action Coordinator, hopes to educate local citizens on the air quality standards and the implications of not meeting the standards. Once education efforts begin, the county anticipates



behavior modifications will be made by local citizens. It will be through the joint efforts of local government, private citizens, business, and industry that Dorchester County will be able to assist the state in meeting and maintaining the 8-hour ozone standard.

## **Maintenance**

Local measures must be implemented no later than April 2005. However, as previously mentioned, Dorchester County will continue to address strategies that will assist in long-term maintenance of the 8-hour ozone standard. DHEC will continue to provide the air quality monitoring necessary to determine attainment of the 8-hour ozone standard. Yearly, at the end of each ozone season, Dorchester County will review and evaluate the effectiveness of the strategies adopted. If necessary, additional emission reduction strategies may be adopted. Once the standard is reached in December 2007, and non-attainment designations are replaced with attainment designations, Dorchester County will continue to evaluate the effectiveness of the strategies adopted and adjust emission reduction strategies where needed. Maintenance of the standard will depend upon the success of emission reduction strategies implemented by Dorchester County and surrounding counties as well as federal and state initiatives.