Carbon Monoxide

Limited Maintenance Plan

for the

Charlotte,

Raleigh/Durham,

& Winston-Salem

Carbon Monoxide Maintenance Areas

August 2, 2012

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PREFACE:

This document contains North Carolina's update to the Charlotte, Raleigh/Durham, and Winston-Salem areas limited maintenance plans for the National Ambient Air Quality Standard for carbon monoxide.

EXECUTIVE SUMMARY:

INTRODUCTION

Carbon monoxide (CO), a poisonous gas and can cause harmful health effects by reducing oxygen delivery to the body's organs and tissues. It is the product of the incomplete combustion of carbon containing compounds such as wood, coal, and liquid and gaseous fuels. Its formation is enhanced when the oxygen supply is inadequate for complete oxidation of fuels to carbon dioxide. Most CO emissions are from the incomplete combustion of gasoline by motor vehicles. Optimal combustion of gasoline occurs with warmer ambient temperatures because fuel combustion and pollution control equipment operate more efficient at warmer temperatures. During winter months, vehicles emit larger amounts of CO due to cold starts and longer warmup periods. The incomplete combustion of fuels for space heating, industrial processes, and solid waste combustion are also sources of CO. Meteorological factors also contribute to high CO levels during cold weather months since temperature inversions occur more frequently, resulting in a lower atmospheric mixing height and thus poorer dispersion of the CO pollutants. For these reasons, CO emission inventories are developed for winter months.

The national ambient air quality standard (NAAQS) for CO is 9 parts per million (ppm) for an 8-hour running average and 35 ppm for a 1-hour average (76 FR 54294). The determination of attainment of the standard is based on an annual number of exceedance days over a two year period. A violation occurs when there is greater than one exceedance in any one year. In North Carolina, the maintenance areas are for the 8-hour CO standard.

DESIGNATIONS

The nonattainment designation was an action taken by the United States Environmental Protection Agency (USEPA) under Section 107(d) of the Clean Air Act (CAA). The CAA requires that some area be designated as nonattainment if a monitor is found to be in violation of a NAAQS. The USEPA took designation action in 1990 based on the ambient data from 1988 and 1989 for the Charlotte, Raleigh/Durham and Winston-Salem areas.

In November 1994, the Winston-Salem area was redesginated to attainment/maintenance for CO and in September 1995, the Charlotte and Raleigh/Durham areas were redesignated.

AIR QUALITY

Since the Charlotte, Raleigh/Durham and Winston-Salem areas have been redesignated to maintenance status for CO, the areas have continued to meet the CO NAAQS. The major emissions reductions contributing to the continued maintenance of the CO NAAQS are a result of lower vehicle tailpipe emissions associated with an increasing number of newer vehicles on North Carolina roads. In addition, all three areas have a vehicle inspection and maintenance program, as well as many of their neighboring counties.

The most recent two years of CO monitoring data (2010-2011) for all three maintenance areas are well below the 8-hour CO standard. The Charlotte area has a regional 8-hour CO design

value of 1.7 ppm or 19% of the NAAQS; the Raleigh/Durham area has a regional 8-hour CO design value of 1.4 ppm or 16% of the NAAQS; and the Winston-Salem area has a regional 8-hour CO design value of 2.1 ppm or 23% of the NAAQS.

REQUIREMENTS FOR LIMITED MAINTENANCE PLAN

When an area has monitoring data at 85% of the NAAQS or lower, a state may choose the less rigorous maintenance plan option of a limited maintenance plan. A limited maintenance plan requires an attainment year emissions inventory, a commitment to continue monitoring in the CO maintenance area and a contingency plan.

Under a limited maintenance plan, a maintenance demonstration is considered to be satisfied if the monitoring data shows that the area is meeting the air quality criteria for a limited maintenance plan (i.e., 85% of the NAAQS). The USEPA believes that the continued applicability of prevention of significant deterioration requirements, and control measures already contained in the State Implementation Plan and Federal measures, such as the Federal motor vehicle control program, should provide adequate assurance of maintenance for such areas. Additionally, with an approved CO limited maintenance plan, Federal actions requiring conformity determinations under the transportation conformity or general conformity rules could be considered to satisfy the budget test required in the respective rules.

North Carolina has chosen the limited maintenance plan approach for this revision to the second maintenance plan. The second maintenance period plan was submitted in March 2005 and approved by the USEPA in March 2006. This document serves as the maintenance plan through 2015 for all CO maintenance areas.

CONTINGENCY MEASURES

The North Carolina contingency plan involves a triggering mechanism to determine when contingency measures are needed and a process of implementing appropriate control measures. The trigger for the contingency plan will be a violation of the ambient air quality standard for CO. The trigger date will be the date that the State certifies to the USEPA that the air quality data is quality assured.

As a central feature of its contingency plan, North Carolina has pre-adopted an oxygenated fuels program with minimum oxygen content by weight of 2.7 for the Charlotte, Raleigh/Durham and Winston-Salem maintenance areas. This was the only measure required to be implemented by low moderate (design values below 12.7 ppm) areas that generated CO emission reductions. This pre-adoption procedure will allow the State to respond quickly to any future air quality violation and prevent further degradation of the State's air quality while a revised final plan for attainment is developed. Upon a trigger activation, the State will commence a study to evaluate what corrective measures need to be taken in order to comply with the CO standard. In situations where a regional CO problem is evident, the first measure considered will be the pre-adopted oxygenated fuel program.

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1.0 INTRODUCTION

1.1 What is Carbon Monoxide (CO)

Carbon monoxide (CO), a poisonous gas, is the product of the incomplete combustion of carbon containing compounds such as wood, coal, and liquid and gaseous fuels. Its formation is enhanced when the oxygen supply is inadequate for complete oxidation of fuels to carbon dioxide. Most CO emissions are from the incomplete combustion of gasoline by motor vehicles. Optimal combustion of gasoline occurs with warmer ambient temperatures because fuel combustion and pollution control equipment operate more efficient at warmer temperatures. During winter months, vehicles emit larger amounts of CO due to cold starts and longer warm up periods. The incomplete combustion of fuels for space heating, industrial processes, and solid waste combustion are also sources of CO. Meteorological factors also contribute to high CO levels during cold weather month since temperature inversions occur more frequently, resulting in a lower atmospheric mixing height and thus poorer dispersion of the CO pollutants. Therefore, the period inventoried for CO emissions is winter.

The national ambient air quality standard (NAAQS) for CO is 9 parts per million (ppm) for an 8-hour running average and 35 ppm for a 1-hour average. The determination of attainment of the standard is based on an annual number of exceedances days over a two year period. A violation occurs when there is greater than one exceedance in any one year. In North Carolina, the maintenance areas are for the 8-hour CO standard.

1.2 Clean Air Act of 1990

Since the 1977 Amendments to the Clean Air Act, areas of the country that had not attained the ambient standard for a particular pollutant were formally designated as nonattainment for that pollutant. This formal designation concept was retained in the 1990 Amendments; however, areas designated as nonattainment were to be classified as to the degree of nonattainment. Section 186 of the Clean Air Act Amendments (CAAA) of 1990 established two categories of nonattainment for CO: moderate (design values between 9.1 and 16.4) and serious (design values greater than 16.4). Areas that did not meet the classification scheme were designated as "not-classified". In addition, the United States Environmental Protection Agency (USEPA) defined two subclassifications within the moderate classification. These are low moderate areas (design values of 12.7 ppm or below) and high moderate areas (design values greater than 12.7 ppm).

The design value is based on 8-hour average ambient concentrations of CO, and is used to compare with the CO NAAQS. Specifically, the second highest maximum (non-overlapping) 8-hour values at a site for each of the most recent two years of CO data are used for determining the design value. The higher of two second highest maximums is considered the site's design value. Then the highest design value among all sites becomes the design value for the area (*Ozone and Carbon Monoxide Design Value Calculations*, William G. Laxton, Director, Technical Support Division, June 18, 1990).

1.3 Nature of Problem in North Carolina

The Charlotte area experienced violations of the NAAQS in the late 1970's and was designated as nonattainment for CO in 1978. The Charlotte, Raleigh/Durham, and Winston-Salem areas were recommended as nonattainment for CO by the Governor in a March 15, 1991 letter to the USEPA Region IV Administrator as required by section 107(d)(1)(A) of the 1990 CAAA.

Although the Charlotte area had an attaining design value of 8.4 ppm, based on 1988 and 1989 data, the 1978 nonattainment designation was reaffirmed by operation of law on the day of enactment of the 1990 CAAA. Therefore, the Charlotte area was designated as "not-classified" and was given, under the CAAA, 5 years from the date of official designation to attain the standard and therefore had an attainment deadline of November 15, 1995.

The Raleigh/Durham and Winston-Salem areas were designated as nonattainment and classified as "moderate" under the provisions outlined in Sections 186 and 187 of the CAAA. The design values were 10.9 ppm and 9.7 ppm (based on 1988 and 1989 data) for Raleigh/Durham and Winston-Salem, respectively. Since the design values were less than 12.7 ppm, both areas were designated as "low moderate". With a moderate designation, both areas had until December 31, 1995 to attain the standard.

Figure 1.3-1 is a map of the designated CO nonattainment areas in North Carolina.

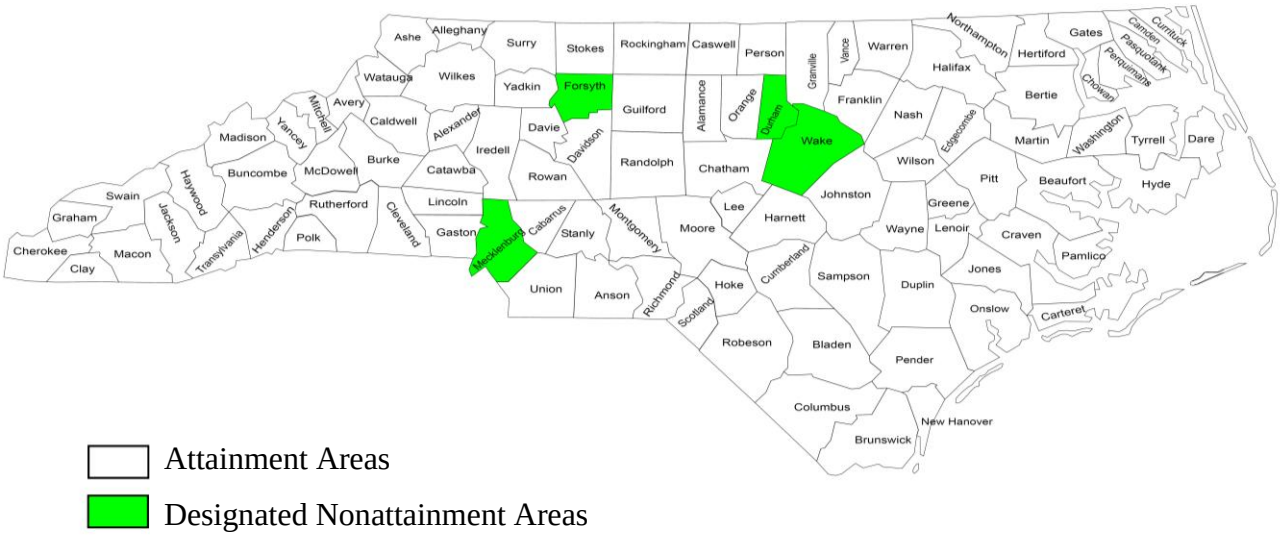

Figure 1.3-1. Map of Areas Designated as CO Nonattainment in North Carolina

The Mecklenburg County local program submitted a redesignation request for the Charlotte area to the USEPA in August 1991. The USEPA had many comments regarding this submittal and

the local program decided to let the State handle the follow up request. In October 1994, the State of North Carolina submitted a redesignation request to the USEPA and the area was designated attainment/maintenance for CO in September 1995.

In April 1994, the State of North Carolina submitted a request to the USEPA to redesignate the Winston-Salem area to maintenance status based upon three years of clean air quality data. In November 1994, this area was redesginated to attainment/maintenance for CO.

For the Raleigh/Durham area, the State submitted a request to the USEPA to redesignate this area to maintenance in October 1994 and was redesignated to attainment/maintenance for CO in September 1995. In October 1995, the State submitted a revision to the motor vehicle emission budgets in the maintenance plan.

In March 2005, the State submitted the second maintenance plan to the USEPA for all three areas. This plan was approved by the USEPA in March 2006, and a clarification regarding this approval was published in June 2007. The June 2007 clarification was with respect to moving the oxygenated fuels program to the contingency measures.

1.4 Limited Maintenance Plan Option

North Carolina is using the limited maintenance plan option for this revision to the second maintenance plan. The requirements of a limited maintenance plan for CO are explained in the October 6, 1995 guidance from Joseph W. Paisie (See Appendix A). The guidance allows for a less rigorous maintenance plan than what was formerly required in developing attainment/maintenance plans for CO nonattainment areas that have design values at or below 85% of the CO NAAQS (i.e., 7.65 ppm).

Currently, all three areas in North Carolina are well below the 8-hour CO NAAQS. The current design values for the period 2010 – 2011 are 1.7 ppm (19% of NAAQS), 1.4 ppm (16% of NAAQS), and 2.1 ppm (23% of NAAQS) for the Charlotte, Raleigh/Durham and Winston-Salem areas, respectively. The design value for each site was determined using the second highest maximum (non-overlapping) 8-hour values at a site for each of the most recent two years of CO. The higher of two second highest maximums is considered the site's design value. The highest design value for all the sites in an area is the regional design value.

The limited maintenance plan approach requires the development of an attainment emissions inventory for a typical winter day, but does not require projected future years emissions inventories as with a typical maintenance plan. The maintenance demonstration is considered to be satisfied if the monitoring data shows that the area is meeting the air quality criteria for a limited maintenance plan (i.e. 85% of the NAAQS). The USEPA believe that the continued applicability of prevention of significant deterioration requirements, and control measures already contained in the State Implementation Plan (SIP) and Federal measures, such as the Federal motor vehicle control program, should provide adequate assurance of maintenance for such areas.

The limited maintenance plan, like a traditional maintenance plan, requires a commitment to continue operation of an appropriate, USEPA-approved air quality monitoring network, in accordance with the Code of Federal Regulations (CFR), 40 CFR Part 58. This is to verify the attainment status of the area over the maintenance period especially since there is no cap on the emissions for a limited maintenance plan. A contingency plan is also required to promptly correct any violation of the CO 8-hour standard that occurs after approval of the limited maintenance plan. The contingency measures do not have to be fully adopted; however the contingency plan is considered to be an enforceable part of the SIP and should ensure that the contingency measures are adopted expeditiously once they are triggered.

The final requirement in a traditional maintenance plan is the establishment of motor vehicle emission budgets for transportation conformity purposes and emission budgets for general conformity purposes. In a limited maintenance plan, the emission budgets are treated as essentially non-constraining for the length of the maintenance period because it is unreasonable to expect that such an area will experience so much growth in that period that a violation of the CO NAAQS would result. Therefore, the USEPA is concluding in the guidance that for a limited maintenance area, the emissions need not be capped for the maintenance period and the "budget test" of the transportation and general conformity rules are met. This is discussed in more detail in Section 3.6.

2.0 DISCUSSION OF ATTAINMENT

2.1 Historic Air Quality

Since the Charlotte, Raleigh/Durham and Winston-Salem areas have been redesignated to maintenance status for CO, the areas have continued to meet the CO NAAQS. Table 2.1-1 through Table 2.1-3 show the historic air quality data for the maintenance areas since the submittal of the second maintenance plan in 2005 through 2009. It should be noted that in all three areas, the monitoring network includes monitors not only in the maintenance area but also in some of the surrounding counties. All monitors in each area have maintained the 8-hour CO NAAQS.

Table 2.1-1 Charlotte Area Historic Air Quality Data for CO

Site ID# and County	Year	Maximum of 8-hr Running Average (ppm)		Values ≥ 9.5 ppm (measured)
		1st	2nd	
371190041 Mecklenburg	2005	2.7	2.3	0
	2006	2.3	2.3	0
	2007	2.6	2.0	0
	2008	1.9	1.6	0
	2009	2.0	1.7	0
371590021 Rowan	2005	1.0	1.0	0
	2006	0.9	0.9	0
	2007	0.8	0.7	0
	2008	0.9	0.7	0
	2009	0.8	0.8	0

Table 2.1-2 Raleigh/Durham Area Historic Air Quality Data for CO

Site ID# and County	Year	Maximum of 8-hr Running Average (ppm)		Values ≥ 9.5 ppm (measured)
		1st	2nd	
370630013 Durham	2005	0.9	0.9	0
	2006	0.9	0.8	0
370630015 Durham	2007	0.7	0.7	0
	2008	1.5	1.2	0
	2009	0.7	0.6	0
371830014 Wake	2005	1.9	1.8	0
	2006	1.8	1.8	0
	2007	1.9	1.8	0
	2008	2.4	1.8	0
	2009	1.4	1.2	0
371830018 Wake	2005	2.5	2.4	0
	2006	2.6	2.5	0
	2007	2.2	2.1	0
	2008	2.2	2.2	0
	2009	1.6	1.6	0

Table 2.1-3 Winston-Salem Area Historic Air Quality Data for CO

Site ID# and County	Year	Maximum of 8-hr Running Average (ppm)		Values ≥ 9.5 ppm (measured)
		1st	2nd	
370330001 Caswell	2005	0.7	0.5	0
	2006	0.4	0.4	0
	2007	1.0	0.6	0
	2008	1.3	1.1	0
370670023 Forsyth	2005	2.9	2.5	0
	2006	2.7	2.4	0
	2007	2.0	1.8	0
	2008	2.3	1.9	0
	2009	1.8	1.7	0
370811011 Guilford	2005	2.2	2.1	0
	2006	2.6	2.5	0
	2007	2.0	2.0	0
	2008	1.6	1.5	0

2.2 Recent Air Quality Values

As stated in the previous section, the Charlotte, Raleigh/Durham and Winston-Salem maintenance areas have continued to meet the 8-hour CO standard. A number of the monitors have been shut down since the ambient air concentrations have been significantly below the CO

NAAQS. The Caswell and Guilford Counties monitors were shut down at the end of 2008, the Durham County monitor was shut down at the end of 2009 and one of the Wake County monitors (371830018) was shut down March 31, 2011. Table 2.2-1 lists the most recent air quality data (2010 – 2011) for the remaining monitors in the three CO maintenance areas.

Table 2.2-1 Current Air Quality Data (2010 – 2011) for the CO Maintenance Areas

Site ID# and County	Year	Maximum of 8-hr Running Average (ppm)		Design Value	Percent of Standard
		1st	2nd		
Charlotte Maintenance Area					
371190041 Mecklenburg	2010	2.0	1.7	1.7	19%
	2011	1.8	1.5		
371590021 Rowan	2010	0.8	0.7	0.7	8%
	2011	0.8	0.7		
Raleigh/Durham Maintenance Area					
371830014 Wake	2010	1.7	1.3	1.4	16%
	2011	1.4	1.4		
371830018 Wake	2010	1.8	1.6	N/A	N/A
	2011	---	---		
Winston-Salem Maintenance Area Raleigh					
370670023 Forsyth	2010	1.9	1.9	2.1	23%
	2011	2.3	2.1		

One major reduction in CO emissions results from improvements in vehicle tailpipe emissions associated with an increasing number of newer vehicles on the road. Another contributor to the reduction in CO emissions is the inspection and maintenance (I/M) program in North Carolina. Not only do the four CO maintenance counties have I/M programs, North Carolina has adopted an I/M program that includes 48 counties across the State, phased in beginning July 2002 through January 2006 (Figure 2.2-1).

The historical air quality data as well as the recent air quality data clearly demonstrates that the Charlotte, Raleigh/Durham and Winston-Salem areas are sufficiently below the CO NAAQS to qualify for the limited maintenance plan option.

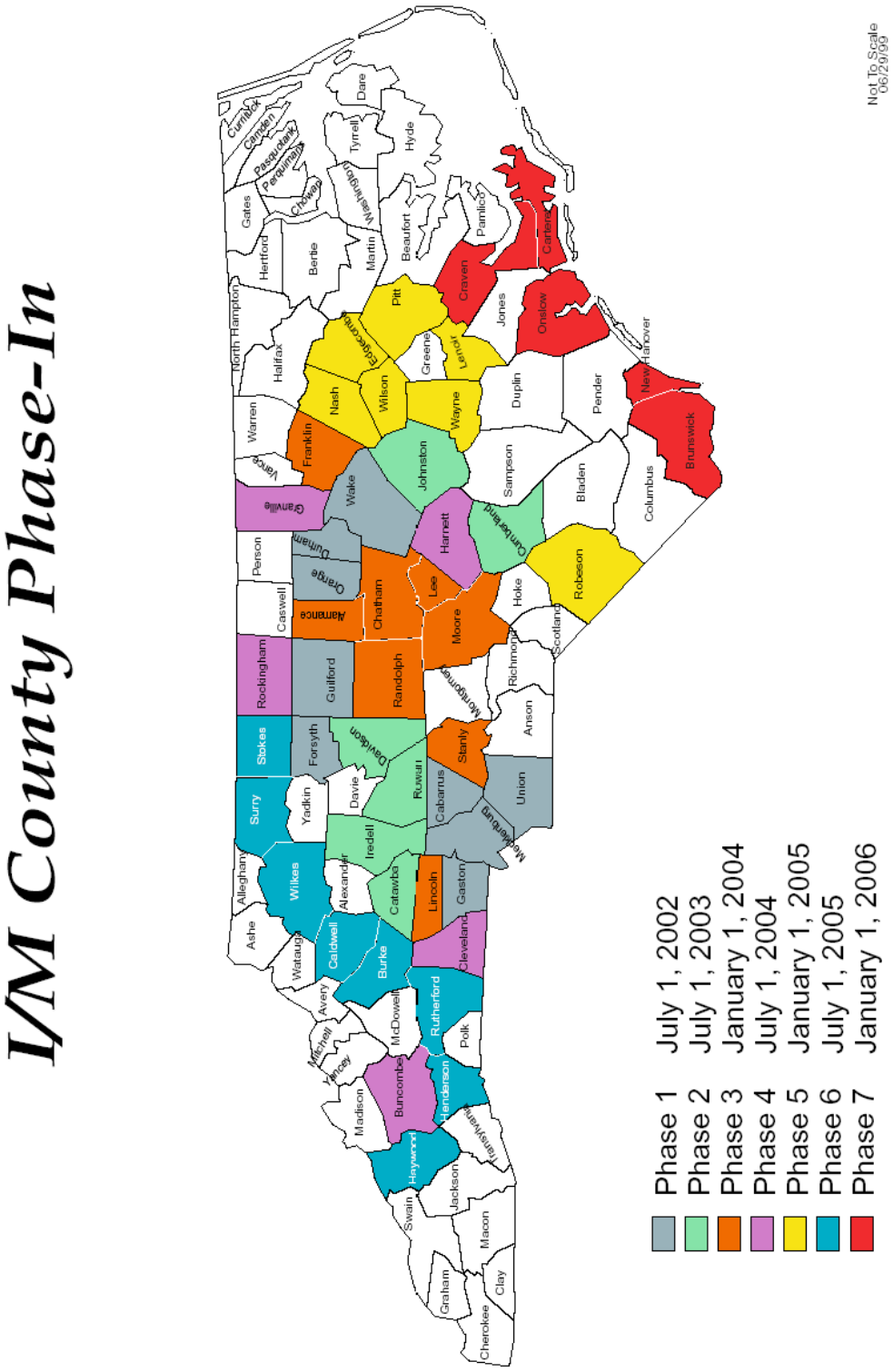

Figure 2.2-1 Map of I/M Counties and Phase-In Schedule

3.0 LIMITED MAINTENANCE PLAN

3.1 Attainment Emission Inventory

There are four different man-made emission inventory source classifications: stationary point and area sources, and nonroad and on-road mobile sources.

Point sources are stationary sources that have the potential to emit more than 5 tons per year CO from a single facility and are required to have an operating air permit. The source emissions are tabulated from data collected by direct on-site measurements of emissions, or mass balance calculations utilizing emission factors from USEPA's AP-42. There may be several emission sources for one facility. Emission data is collected for each point source at a facility and the data is reported to the State or local air agencies. For a detailed discussion regarding the point source emissions inventory development, see Appendix B.1.

Stationary area sources are those sources whose emissions are relatively small, but due to the large number of sources, the collective emissions could be significant (i.e., combustion of fuels for heating, structure fires). For area sources, emissions are estimated by multiplying an emission factor by some known indicator of collective activity: such as fuel usage, number of households, or population. These types of emissions are estimated on the county level. For a detailed discussion regarding the area source emissions inventory development, see Appendix B.2.

For on-road mobile sources, the USEPA's Motor Vehicle Emission Simulator (MOVES) mobile model is run to generate emissions. The MOVES model includes the road class vehicle miles traveled as an input file and can directly output the estimated emissions. For a detailed discussion regarding the on-road mobile source emissions inventory development, see Appendix B.3.

Nonroad mobile sources are pieces of equipment that can move but do not use the roadways (i.e., lawn mowers, construction equipment, railroad locomotives, aircraft). The emissions from this category are calculated using the USEPA's NONROAD2008a nonroad mobile model, with the exception of railroad locomotives and aircraft engines. The railroad locomotive and aircraft engine emissions are estimated by taking an activity and multiplying by an emission factor. These emissions are also estimated at the county level. For a detailed discussion regarding the nonroad mobile source emissions inventory development, see Appendix B.4.

Table 3.1-1 displays the 2010 attainment year emissions inventory as required for a limited maintenance plan.

Table 3.1-1 2010 CO Emissions (tons/day) for Maintenance Areas

County	Point Source	Area Source	On-Road Mobile Source	Nonroad Mobile Source	Total
Charlotte Maintenance Area					
Mecklenburg	2.39	4.21	724.39	114.71	845.70
Raleigh/Durham Maintenance Area					
Durham	0.97	1.54	186.00	19.04	207.55
Wake	1.17	4.26	642.97	70.62	719.02
Total	2.14	5.80	828.97	89.66	926.57
Winston-Salem Maintenance Area					
Forsyth	2.22	1.41	244.16	23.97	271.76

3.2 Foundation Control Program

The main element of the maintenance plan is the foundation control program. The foundation control program contains the emission controls necessary to maintain the ambient air quality standards. The purpose of the foundation control program is to prevent the ambient air quality standards from being violated and thereby eliminates the need for more costly controls being imposed on industry and the general public. Each component of the State's foundation control program is essential in demonstrating maintenance of the air quality standards.

The foundation control program consists of Federal and State measures. The Federal measure includes the Federal Motor Vehicle Control Program. State measures include an I/M program (including anti-tampering) in Charlotte, Raleigh/Durham, and Winston-Salem areas as well as the prevention of significant deterioration program. All of these programs have already been implemented.

Federal Motor Vehicle Control Program

The Federal Vehicle Control Program specifies emissions standards for motor vehicles. Newer motor vehicles are required to meet lower emissions standards for CO. As newer vehicles replace older vehicles, the emissions per vehicle mile traveled decreases. The light duty engine standards, or Tier 2, became effective with manufacturers year (MY) 2004 vehicles and most vehicles were phased in by 2007. Tier 2 standards includes passenger vehicles over 8,500 pounds gross vehicle weight rating (large pickup trucks and SUVs), which were not covered by Tier 1 regulations. For these vehicles, the standards were phased in beginning in 2008, with full compliance in 2009. The Tier 2 standards require vehicles to be 77% to 95% cleaner than those vehicles that met the Tier 1 regulations.

The USEPA standards designed to reduce nitrogen oxides (NOx) and volatile organic compounds (VOC) emissions from heavy-duty gasoline and diesel highway vehicles began to take effect in 2004. A second phase of standards and testing procedures, began in 2007 and will reduce particulate matter from heavy-duty highway engines, and reduce highway diesel fuel sulfur content to 15 ppm since the sulfur damages emission control devices. The total program is expected to achieve a 90% reduction in particulate matter (PM) emissions and a 95% reduction in NOx emissions for these new engines using low sulfur diesel, compared to engines using higher-content sulfur diesel and will have a co-benefit of reducing CO emissions as well. These emission reductions are federally enforceable.

Federal Nonroad Engine Control Programs

The large spark-ignition engines contribute to ozone formation and ambient CO and particulate matter levels in urban areas. Tier 1 of this standard was implemented in 2004 and Tier 2 started in 2007. Like the large spark-ignition, recreational vehicles contribute to ozone formation and ambient carbon monoxide and particulate matter levels. For the off-highway motorcycles and all-terrain-vehicles, the exhaust emissions standard was phased-in. Fifty percent of model year 2006 engines were required to meet the standard and for model years 2007 and later, all engines must meet the standard. Recreational marine diesel engines over 37 kilowatts are used in yachts, cruisers, and other types of pleasure craft. Recreational marine engines contribute to ozone formation and particulate matter levels, especially in marinas. Depending on the size of the engine, the standard began phasing-in in 2006.

When all of the nonroad spark-ignition and recreational engine standards are fully implemented, an overall 72% reduction in hydrocarbons, 80% reduction in NOx, and 56% reduction in CO emissions are expected by 2020. These controls will help reduce ambient concentrations of ozone, CO, and fine particulate matter. These emission reductions are federally enforceable.

Inspection/Maintenance Program

The State has adopted an I/M program in the Charlotte, Raleigh/Durham, and Winston-Salem areas. The I/M program became effective for CO in Mecklenburg County on December 1, 1982 and in Wake County on November 1, 1986. The I/M program was later expanded to other counties and included provisions to prevent the emissions control devices from being tampered with. The revised I/M program became effective in Mecklenburg and Wake Counties on April 1, 1991 and in Durham and Forsyth Counties on July 1, 1991. In 1999, the State adopted a new I/M program that was phased in by January 2006 in 48 counties (Figure 2.2-1). This program reduces CO emissions as well as other pollutants in the maintenance areas as well as from cars registered in neighboring counties that drive into the three maintenance areas.

Prevention of Significant Deterioration

All new major sources and major modifications of existing sources that emit CO will be evaluated under the prevention of significant deterioration program and will be required to use best available control technology.

3.3 Maintenance Demonstration

In a limited maintenance plan, the maintenance demonstration requirement is considered to be satisfied if the monitoring data shows the area is meeting the air quality criteria for limited maintenance areas (i.e., 85% or lower of the CO NAAQS). There is no requirement to project emissions over the maintenance period. The USEPA believes that the continued applicability of prevention of significant deterioration requirements, and control measures already in the SIP and Federal measures, such as the Federal motor vehicle control program, should provide adequate assurance of maintenance for such areas. When the USEPA approves a limited maintenance plan, the USEPA is concluding that an emissions budget may be treated as essentially non-constraining for the length of the maintenance period because it is unreasonable to expect that such an area will experience so much growth in that period that a violation of the CO NAAQS would result. The CO maintenance period is through December 31, 2015 for all three CO maintenance areas.

3.4 Monitoring Network

To verify the attainment status of the area over the maintenance period, the limited maintenance plan should contain provisions for continued operation of an appropriate, USEPA-approved air quality monitoring network, in accordance with the 40 CFR Part 58. This is particularly important for areas using limited maintenance plan because there will be no cap on emissions.

The NCDAQ commits to continue operating at least one CO monitor in the Charlotte, Raleigh/Durham and Winston-Salem CO maintenance areas. Any monitor shutdowns or relocations will only be made with the approval of the USEPA. In 2011, the NCDAQ discontinued the operation of one of the CO monitors located in Wake County with the approval of the USEPA. No other plans are under way to discontinue operation, relocation or otherwise affect the integrity of the ambient monitoring network for CO that is in place. The current monitors are operated consistent with 40 CFR Part 58 and any changes will only be made if they are consistent with 40 CFR Part 58.

3.5 Contingency Plan

The North Carolina contingency plan involves a triggering mechanism to determine when contingency measures are needed and a process of implementing appropriate control measures. The trigger of the contingency plan will be a violation of the ambient air quality standard for 8-hour CO. The trigger date will be the date that the State certifies to the USEPA that the air quality data is quality assured.

As a central feature of its contingency plan, North Carolina has pre-adopted an oxygenated fuels program with minimum oxygen content by weight of 2.7 for Charlotte, Raleigh/Durham, and Winston-Salem maintenance areas. This is the only measure required to be implemented by low moderate areas (design values below 12.7 ppm) that generate CO emissions reductions. This pre-adoption procedure will allow the State to respond quickly to any future air quality violation

and prevent further degradation of the State's air quality, while a revised final plan for attainment is developed. The oxygenated fuel program is required, under Section 175A(d) of the CAAA, to be in the Raleigh/Durham and Winston-Salem contingency plan, as the program was a required control measure prior to redesignation to attainment. The oxygenated fuel program was selected as the contingency measure for Charlotte, as it is most effective in reducing area wide CO emissions, and is relatively easy for the State to implement as opposed to transportation control measures, which are difficult to implement and enforce.

Upon a trigger activation, the State will commence a study to evaluate what corrective measures need to be taken in order to comply with the CO standard. In situations where a regional CO problem is evident, the first considered measure will be the pre-adopted oxygenated fuel program.

Action Resulting From Trigger Activation

Once the trigger has been activated in any of the CO maintenance areas, the State will commence an analysis and regulation development process within 60 days of the trigger. The following measures would be considered:

1. amending the oxygenated fuels program by adopting an oxygenate content of:
   a. 2.0 to 2.7 % by weight, or
   b. activation of the 2.7 % by weight pre-adopted contingency measure, or
   c. 2.7 to 3.1 % by weight

2. expanding coverage of oxygenated fuels to include counties where a strong commuting pattern into the core maintenance area exists

3. alternative fuel vehicle programs to include compressed natural gas and electric vehicles

4. employee commute options programs

Where these or other measures are needed to ensure that a future violation of the CO NAAQS does not occur or to bring an area back into attainment, the State will complete the adoption process as expeditiously as possible under the State rule making procedures. The State will prepare an analysis of the need for these measures to prevent a violation or to ensure continued maintenance of the CO standard. This analysis will be presented for public review and comment. Each adopted rule will include a compliance schedule. In situations where an areawide CO problem is evident, the first considered measure will be the pre-adopted oxygenated fuel program.

The NCDAQ commits to implement within 24 months of the trigger, or as expeditiously as practicable, at least one of the control measures listed above or other contingency measures that may be determined to be more appropriate based on the analyses performed.

3.6 Conformity Determination

The transportation and general conformity rules apply to nonattainment areas and maintenance areas operating under maintenance plans. Transportation conformity determinations are required in nonattainment and maintenance areas whenever the State Transportation Improvement Program is revised or a metropolitan planning organization revises their Long Range Transportation Plan. General conformity determinations are required whenever there is a Federal action, other than transportation related, within a nonattainment or maintenance area that will increase emissions above a de minimis level. In a traditional maintenance plan, emission budgets are established explicitly for transportation conformity by means of motor vehicle emission budgets and implicitly for general conformity where the estimated emissions in the SIP that reflect the Federal action being considered becomes the emission budget that must be met. Examples of implicit emission budgets used for general conformity are aircraft and ground support equipment emissions for an airport change requiring the Federal Aviation Administration approval or construction equipment emissions for a facility that requires the Nuclear Regulatory Commission approval in order to construct.

Emissions budgets in limited maintenance plan areas may be treated as non-constraining for the length of the maintenance period because it is unreasonable to expect that such an area will experience so much growth in that period that a violation of the CO NAAQS would result. For general conformity determinations, this means that emission estimates for Federal actions, other than transportation related, would no longer need to be compared to the SIP since the limited maintenance plan would be considered to satisfy the required budget test.

For transportation conformity determinations, it would be unreasonable to expect the area to experience so much growth in vehicle emissions during the limited maintenance plan period that a violation of the CO NAAQS would occur. As a result, Federal actions requiring transportation conformity determinations under the transportation conformity rule are considered to satisfy the budget test without the need for a regional emissions analysis. Therefore, motor vehicle emission budgets are not established in a limited maintenance plan.

Approval of the limited maintenance plan does not relieve transportation partners of the other transportation conformity requirements. Transportation plan revisions and transportation improvement program conformity determinations must satisfy all other applicable requirements of the transportation conformity rule and hot-spot requirements must be satisfied for transportation projects (40 CFR 93.109(e)).

The CO maintenance period is through 2015 for all three CO maintenance areas.

4.0 CONCLUSIONS

The NCDAQ believes that the Charlotte, Raleigh/Durham and Winston-Salem CO maintenance areas meet the requirements for a limited maintenance plan. The Charlotte area is 19% of the CO 8-hour standard with a regional design value of 1.7 ppm; the Raleigh/Durham area is 16% of the CO 8-hour standard with a regional design value of 1.4 ppm; and the Winston-Salem area is 23% of the CO 8-hour standard with a regional design value of 2.1 ppm. An attainment inventory for 2010 has been provided, as well as contingency measures in case any of the CO maintenance areas should have such an increase in CO emissions that the area would violate the standard in the future. Finally, the NCDAQ has committed to continue operating CO monitors in the three CO maintenance areas in accordance with 40 CFR Part 58.