REDESIGNATION REQUEST AND MAINTENANCE PLAN FOR THE CLEVELAND-AKRON-LORAIN OZONE NONATTAINMENT AREA

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REDESIGNATION REQUEST AND
MAINTENANCE PLAN FOR THE CLEVELAND-AKRON-LORAIN, OHIO
OZONE NONATTAINMENT AREA

CHAPTER ONE

Introduction

The Clean Air Act (CAA) requires areas failing to meet the National Ambient Air Quality Standard (NAAQS) for ozone to develop State Implementation Plans (SIP's) to expeditiously attain and maintain the standard. In 1997, the United States Environmental Protection Agency (U.S. EPA) revised the air quality standard for ozone replacing the 1979 one-hour standard with an eight-hour ozone standard set at 0.08 parts per million (ppm). The standard was challenged legally and upheld by the U.S. Supreme Court in February of 2001.

On April 30, 2004, U.S. EPA designated 134 nonattainment areas for the eight-hour ozone standard. Since that time, U.S. EPA has reclassified nine of the 134 original nonattainment areas to the next lower classification. Section 107(d)(3)(E) of the CAA allows states to request nonattainment areas to be redesignated to attainment provided certain criteria are met. The following are the criteria that must be met in order for an area to be redesignated from nonattainment to attainment:

i) A determination that the area has attained the eight-hour ozone standard.
ii) An approved State Implementation Plan (SIP) for the area under Section 110(k).
iii) A determination that the improvement in air quality is due to permanent and enforceable reductions in emissions resulting from implementation of the SIP and other federal requirements.
iv) A fully approved maintenance plan under Section 175(A).
v) A determination that all Section 110 and Part D requirements have been met.

Background

The Cleveland - Akron - Lorain nonattainment area includes the following Counties: Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, and Summit. As part of the 1990 CAA Amendments re-evaluation, the Counties within the Cleveland - Akron - Lorain area were designated as moderate nonattainment for the one-hour ozone standard and, therefore, were subject to nonattainment area rulemakings. The Cleveland - Akron - Lorain area was redesignated to attainment with respect to the one-hour ozone standard on May 7, 1996 (61FR20458). As a result of the 2004 ozone designations, U.S. EPA designated the Cleveland - Akron - Lorain area moderate nonattainment for the eight-hour standard and Ohio EPA was required to develop a plan to reduce volatile organic compounds (VOCs) and nitrogen oxides (NO_x) emissions and to demonstrate that the area

will meet the federal eight-hour air quality standard for ozone by June 15, 2010. As part of the requirement, a 15 percent Rate of Progress (ROP) Plan was also required showing emissions would be reduced by 15 percent by June 15, 2009.

This document is intended to support Ohio's request that the Cleveland - Akron - Lorain area be redesignated from nonattainment to attainment for the eight-hour ozone standard. The Cleveland - Akron – Lorain area has recorded three (3) years of complete quality assured ambient air quality monitoring data for the years 2006 -- 2008 demonstrating attainment of the eight-hour ozone standard.

Geographical Description

The Cleveland - Akron - Lorain eight-hour ozone nonattainment area is located in northeastern Ohio and includes the Counties of Ashtabula, Cuyahoga, Geauga, Lake, Lorain, Medina, Portage, and Summit . This area is shown in Figure 1 under Chapter Three.

Status of Air Quality

Ozone monitoring data for the most recent three (3) years, 2006 through 2008, demonstrate that the air quality has met the NAAQS for ozone in this moderate nonattainment area. The NAAQS attainment, accompanied by decreases in emission levels discussed in Chapter Four, supports a redesignation to attainment for the Cleveland - Akron - Lorain area based on the requirements in Section 107(d)(3)(E) of the CAA.

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CHAPTER TWO

Requirements for Redesignation

U.S. EPA has published detailed guidance in a document entitled *Procedures for Processing Requests to Redesignate Areas to Attainment* (redesignation guidance), issued September 4, 1992, to Regional Air Directors. The redesignation request and maintenance plan are based on the redesignation guidance, supplemented with additional guidance received from staff of U.S. EPA Region V.

Below is a summary of each redesignation criterion as it applies to the Cleveland - Akron - Lorain area.

i.) Attainment of the standard:

There are two components involved in making this demonstration. The first component relies on ambient air quality data. The data that are used to demonstrate attainment should be the product of ambient monitoring that is representative of the area of highest concentration. The data should be collected and quality-assured in accordance with 40 CFR 58 and recorded in the Air Quality System (AQS) in order for it to be available to the public for review.

The second component relies upon supplemental U.S. EPA-approved air quality modeling. The supplemental modeling is not required for ozone nonattainment areas seeking redesignation; however, in Appendix C and Appendix D the most recent modeling results showing future attainment and maintenance are provided. Chapter Three discusses this requirement in more detail and provides the attainment demonstration.

ii.) SIP approval:

The SIP for the area must be fully approved under Section 110(k) and must satisfy all the requirements that apply to the area. Ohio's SIP was approved on May 9, 1994 (59FR23799), March 23, 1995 (60FR15235), and May 7, 1996 (61FR20458) and includes the Cleveland - Akron - Lorain area. Chapter Five discusses this requirement in more detail.

iii.) Permanent and enforceable improvement in air quality;

The state must be able to reasonably attribute the improvement in air quality to emission reductions which are permanent and enforceable. The state should estimate the percent reduction achieved from federal measures as well as control measures that have been adopted and implemented by the state.

The Cleveland - Akron - Lorain area was designated moderate nonattainment for ozone as part of the 1990 CAA Amendments re-evaluation. As a result, Ohio has adopted and implemented control measures for these Counties in

that area beyond the federal measures and the initial 1979/1981 Statewide rules. Chapters Four and Five discuss this requirement in more detail.

iv.) Section 110 and Part D requirements:
For purposes of redesignation, a state must meet all requirements of Section 110 and Part D that were applicable prior to submittal of the complete redesignation request.

Part D consists of general requirements applicable to all areas which are designated nonattainment based on a violation of the NAAQS.

i.) Section 110(a) requirements
Section 110(a) of Title I of the CAA contains the general requirements for a SIP. Section 110(a)(2) provides that the implementation plan submitted by a state must have been adopted by the state after reasonable public notice and hearing, and that, among other things, it must include enforceable emission limitations and other control measures, means or techniques necessary to meet the requirements of the CAA; provide for establishment and operation of appropriate devices, methods, systems and procedures necessary to monitor ambient air quality; provide for implementation of a source permit program to regulate the modification and construction of any stationary source within the areas covered by the plan; include provisions for the implementation of Part C, prevention of significant deterioration (PSD) and Part D, NSR permit programs; include criteria for stationary source emission control measures, monitoring, and reporting; include provisions for air quality modeling; and provides for public and local agency participation in planning and emission control rule development. In Ohio's December 5, 2007 infrastructure SIP submission, Ohio verified that the State fulfills the requirements of Section 110(a)(2) of the Act.

ii.) Section 172(c) requirements
This Section contains general requirements for nonattainment plans. The requirements for reasonable further progress, identification of certain emissions increases, and other measures needed for attainment will not apply for redesignations because they only have meaning for areas not attaining the standard. The requirements for an emission inventory will be satisfied by the inventory requirements of the maintenance plan. Chapters Four and Five discuss this requirement in more detail.

iii.) Conformity

The state must work with U.S. EPA to show that its SIP provisions are consistent with Section 176(c)(4) conformity requirements. The redesignation request should include conformity procedures, if the state already has these procedures in place. If a state does not have conformity procedures in place at the time that it submits a redesignation request, the state must commit to follow U.S. EPA's conformity regulation upon issuance, as applicable.

v.) Maintenance plans:

Section 107(d)(3)(E) stipulates that for an area to be redesignated, U.S. EPA must fully approve a maintenance plan that meets the requirements of Section 175(A). The maintenance plan must constitute a SIP revision and must provide for maintenance of the relevant NAAQS in the area for at least 10 years after redesignation. Section 175 (A) further states that the plan shall contain such additional measures, if any, as may be necessary to ensure such maintenance.

In addition, the maintenance plan shall contain such contingency measures as the Administrator deems necessary to ensure prompt correction of any violation of the NAAQS. At a minimum, the contingency measures must include a requirement that the state will implement all measures contained in the nonattainment SIP prior to redesignation.

States seeking redesignation of a nonattainment area should consider the following provisions:

a.) attainment inventory;
b.) maintenance demonstration;
c.) monitoring network;
d.) verification of continued attainment; and
e.) contingency plan.

Chapter Six discusses this requirement in more detail.

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CHAPTER THREE

OZONE MONITORING

CAA Section107 (d)(3)(E)(i)

Requirement 1 of 4

A demonstration that the NAAQS for ozone, as published in 40 CFR 50.4, has been attained.

Background

There are eleven monitors measuring ozone concentrations in this nonattainment area. These monitors are operated by Ohio EPA Division of Air Pollution Control, Northeast District Office, Cleveland Division of Air Quality, Lake County General Health District, and Akron Regional Air Quality Management District. A listing of the design values based on the three-year averages of the annual fourth highest daily maximum eight-hour average ozone concentrations from 2006 through 2008 are shown in Table 1. The locations of the monitoring sites for this nonattainment area are shown on Figure 1.

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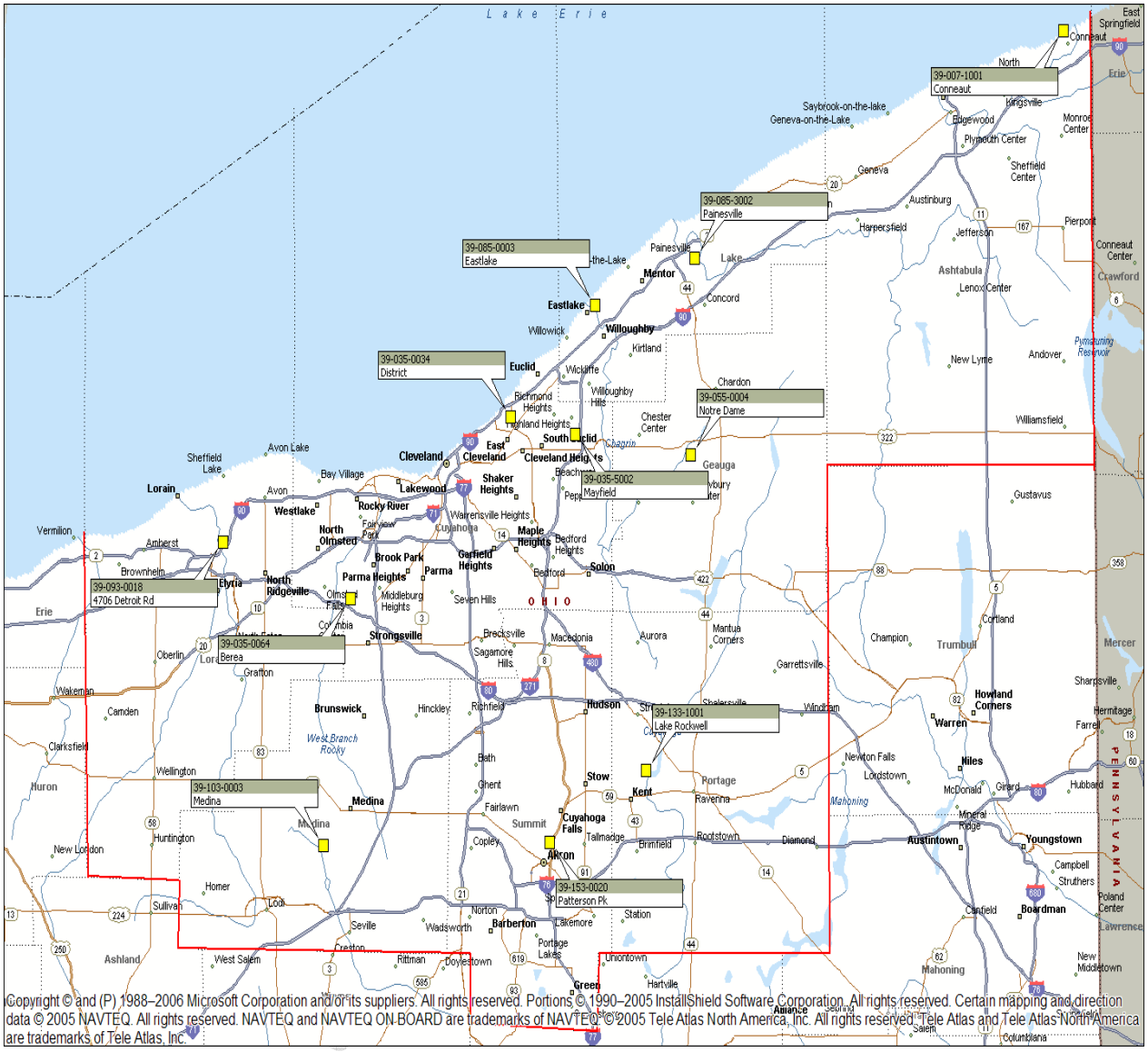
Demonstration

Figure 1 Map of the Cleveland - Akron - Lorain, OH nonattainment area and monitor locations.



Requirement 2 of 4

Ambient monitoring data quality assured in accordance with 40 CFR 58.10, recorded in the U.S. EPA air quality system (AQS) database, and available for public view.

Demonstration

The Ohio Environmental Protection Agency (Ohio EPA) has quality assured all data shown in Appendix A in accordance with 40 CFR 58.10 and the Ohio Quality Assurance Manual. Ohio EPA has recorded the data in the AQS database and therefore data are available to the public.

Requirement 3 of 4

A showing that the three-year average of the fourth highest values, based on data from all monitoring sites in the area or its affected downwind environs, are below 85 parts per billion (ppb). (This showing must rely on three (3) complete, consecutive calendar years of quality assured data.)

Background

The following information is taken from U.S. EPA's "Guideline on Data Handling Conventions for the eight-hour ozone National Ambient Air Quality Standard (NAAQS)," U.S. EPA-454/R-98-017, December 1998.

Three (3) complete years of ozone monitoring data are required to demonstrate attainment at a monitoring site. The eight-hour primary and secondary ozone ambient air quality standards are met at an ambient air quality monitoring site when the three-year average of the annual fourth-highest daily maximum eight-hour average ozone concentrations is less than or equal to 0.08 ppm. When this occurs, the site is said to be in attainment. Three (3) significant digits must be carried in the computations. Because the third decimal digit, in ppm, is rounded, 0.084 ppm is the largest concentration that is less than or equal to 0.08 ppm. Therefore, for the purposes of this request, the eight-hour standard is considered to be 0.085 ppm. Values below 0.085 ppm meet the standard, values equal to or greater than 0.085 ppm exceed the standard. These data handling procedures are applied on an individual basis at each monitor in the area. An area is in compliance with the eight-hour ozone NAAQS if, and only if, every monitoring site in the area meets the NAAQS. An individual site's three (3)-year average of the annual fourth highest daily maximum eight-hour average ozone concentrations is also called the site's design value.

Table 1 shows the monitoring data for 2006 – 2008 that were retrieved from the U.S. EPA AQS. The air quality design value for the area is the highest design value among all sites in the area. *Please note that the standard is measured in ppm while the commonly used unit is ppb. For the remainder of this document, ppb will be used.*

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Demonstration

Table 1 Monitoring Data for the Cleveland - Akron - Lorain, OH area For 2006 – 2008

Data source: **U.S. EPA Air Quality System (AQS)**
http://www.epa.gov/ttn/airs/airsaqs/index.htm

					1st	2nd	3rd	4th	2006-2008
SITE ID	**COUNTY**	**ADDRESS**	**YEAR**	**%OBS**	**8-HR**	**8-HR**	**8-HR**	**8-HR**	**AVERAGE**
39-007-1001	Ashtabula	Conneaut	2006	99	99	99	90	86	
39-007-1001	Ashtabula	Conneaut	2007	99	98	95	92	92	
39-007-1001	Ashtabula	Conneaut	2008	97	81	81	78	75	84
39-035-0034	Cuyahoga	Cleveland	2006	97	79	77	77	74	
39-035-0034	Cuyahoga	Cleveland	2007	98	84	84	83	80	
39-035-0034	Cuyahoga	Cleveland	2008	98	88	85	84	81	78
39-035-0064	Cuyahoga	Berea	2006	100	72	71	71	68	
39-035-0064	Cuyahoga	Berea	2007	97	103	95	87	83	
39-035-0064	Cuyahoga	Berea	2008	98	87	81	77	72	74
39-035-5002	Cuyahoga	Mayfield	2006	98	90	85	83	81	
39-035-5002	Cuyahoga	Mayfield	2007	98	86	84	82	80	
39-035-5002	Cuyahoga	Mayfield	2008	98	90	87	86	83	81
39-055-0004	Geagua	Cleveland	2006	100	76	72	71	70	
39-055-0004	Geagua	Cleveland	2007	100	71	69	68	68	
39-055-0004	Geagua	Cleveland	2008	100	88	83	82	82	73
39-085-0003	Lake	Eastlake	2006	98	88	84	83	83	
39-085-0003	Lake	Eastlake	2007	98	79	76	75	74	
39-085-0003	Lake	Eastlake	2008	99	84	84	84	78	78
39-085-3002	Lake	Painsville	2006	100	80	76	75	75	76

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SITE ID	COUNTY	ADDRESS	YEAR	%OBS	1st 8-HR	2nd 8-HR	3rd 8-HR	4th 8-HR	2006-2008 AVERAGE
39-085-3002	Lake	Painsville	2007	100	93	84	82	79	
39-085-3002	Lake	Painsville	2008	100	81	77	77	76	
39-093-0018	Lorain	Sheffield	2006	99	77	72	69	69	
39-093-0018	Lorain	Sheffield	2007	99	84	82	79	78	
39-093-0018	Lorain	Sheffield	2008	99	88	76	76	75	74
39-103-0003	Medina	Cleveland	2006	98	76	75	74	73	
39-103-0003	Medina	Cleveland	2007	100	73	71	70	69	
39-103-0003	Medina	Cleveland	2008	99	80	79	77	75	72
39-133-1001	Portage	Akron	2006	99	80	79	74	70	
39-133-1001	Portage	Akron	2007	96	90	85	85	84	
39-133-1001	Portage	Akron	2008	99	75	71	69	69	74
39-153-0020	Summit	Akron	2006	100	82	80	77	77	
39-153-0021	Summit	Akron	2007	100	97	92	90	90	
39-153-0022	Summit	Akron	2008	100	91	81	80	80	82
								Highest Average	**84 ppb**

The area's design values have trended downward as emissions have declined due to such factors as cleaner automobiles and fuels, and controls for EGUs, both regionally and locally.

Requirement 4 of 4

A commitment that once redesignated, the state will continue to operate an appropriate monitoring network to verify the maintenance of the attainment status.

Demonstration

Ohio EPA commits to continue monitoring ozone levels at the sites indicated in Figure 1. Ohio EPA will consult with U.S. EPA Region V prior to making changes to the existing monitoring network, should changes become necessary in the future. Ohio EPA will continue to quality assure the monitoring data to meet the requirements of 40 CFR 58 and all other federal requirements. Connection to a central station and updates to the

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Ohio EPA web site[1] will provide real time availability of the data and knowledge of any exceedances. Ohio EPA will enter all data into AQS on a timely basis in accordance with federal guidelines.

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[1] www.epa.state.oh.us/dapc/

CHAPTER FOUR

EMISSION INVENTORY

CAA Section107 (d)(3)(E)(iii)

U.S. EPA's redesignation guidance requires the submittal of a comprehensive inventory of ozone precursor emissions (VOC and NO_x) representative of the year when the area achieves attainment of the ozone air quality standard. Ohio also must demonstrate that the improvement in air quality between the year that violations occurred and the year that attainment was achieved is based on permanent and enforceable emission reductions. Other emission inventory related requirements include a projection of the emission inventory to a year at least 10 years following redesignation; a demonstration that the projected level of emissions is sufficient to maintain the ozone standard; and a commitment to provide future updates of the inventory to enable tracking of emission levels during the 10-year maintenance period.

Requirement 1 of 5

A comprehensive emission inventory of the precursors of ozone completed for the base year.

Background

The point source data are taken from Ohio's annual emissions reporting program. The 2002 periodic inventory has been identified as one of the preferred data bases for SIP development and coincides with nonattainment air quality in the Cleveland - Akron - Lorain area.

Periodic inventories, which include emissions from all sectors - mobile, area, non-road, and point sources - are prepared every three (3) years.

Demonstration

The 2002 inventory is used as the base year for the purpose of this submittal and was submitted to U.S. EPA on June 15, 2007 along with the attainment demonstration for this area. The detailed emission inventory information for the Columbus area is provided in Appendix B. Emissions of VOC and NOx for 2002 are identified under Requirement Three of this Chapter.

Requirement 2 of 5

A projection of the emission inventory to a year at least 10 years following redesignation.

Background

Ohio EPA prepared a comprehensive inventory for the Cleveland - Akron - Lorain area including area, mobile, and point sources for precursors of ozone (VOCs and NO_x) for base years 2002 and 2005. The 2002 inventory was submitted to U.S. EPA on June 15, 2007 and then supplemented on February 22, 2008 with the

2005 inventory, as part of the attainment demonstration for this area. The information below describes the procedures Ohio EPA used to generate the 2002 base year inventory and to develop SIP-ready modeling inventories and future year projections (Pechan Report[2]) based on a 2005 base year inventory. The report by Pechan generated future year estimates of annual emissions for each source sector using accepted growth surrogates. The on-road mobile source sector was addressed by specific modeling as addressed below. These inventories were provided to the Lake Michigan Air Directors Consortium (LADCO) and have been processed to develop summer day emissions for use in the air quality analyses. These processed modeling inventories have been identified as the correct iteration of the inventory for use in the redesignation. In this document, references to LADCO include the Midwest Regional Planning Organization.

- Area sources were taken from the Ohio 2005 periodic inventory submitted to U.S. EPA. These projections were made from the U.S. Department of Commerce Bureau of Economic Analysis (BEA) growth factors, with some updated local information.
- Mobile source emissions were calculated from MOVES2010 produced emission factors.
- Point source information was compiled from Ohio EPA's 2005 annual emissions inventory database and the 2005 U.S. EPA Air Markets acid rain database[3].
- Biogenic emissions are not included in these summaries.
- Non-road emissions were generated using U.S. EPA's National Mobile Inventory Model (NMIM) 2002 application. To address concerns about the accuracy of some of the categories in U.S. EPA's non-road emissions model, LADCO contracted with two (2) companies to review the base data and make recommendations. One of the contractors also estimated emissions for three (3) non-road categories not included in U.S. EPA's non-road model. Emissions were estimated for aircraft, commercial marine vessels, and railroads. Recreational motorboat population and spatial surrogates (used to assign emissions to each county) were significantly updated. The populations for the construction equipment category were reviewed and updated based upon surveys completed in the midwest, and the temporal allocation for agricultural sources also was updated.

[2] http://www.ladco.org/tech/emis/r5/reports/LADCO%202005%20Base%20Yr%20Growth%20and%20Controls%20Report_Final.pdf

[3] http://www.epa.gov/airmarkets/acidrain

Demonstration

On-Road Emission Estimations

In coordination with the Ohio Department of Transportation (ODOT) and the Akron Metropolitan Area Transportation Study (AMATS), the Northeast Ohio Areawide Coordinating Agency (NOACA) utilizes a regional travel demand forecast model to simulate traffic in the area and to forecast traffic flows for given growth expectations. The model is primarily used as a long range planning tool to evaluate the transportation system including determination of locations where additional travel capacity may be needed and to determine the infrastructure requirements necessary to meet that need. It is also used as a tool for air quality purposes to estimate the total emissions of pollution caused by vehicles in the area. The travel demand forecasting model is used to predict the total daily vehicle miles traveled (VMT), and a U.S. EPA computer program called MOVES2010 is used to calculate emissions rates. The product of these is the total amount of pollution emitted by the on-road vehicles for the area. In areas outside the regional travel demand model, traffic counts and Cleveland-Akron-Lorain Ohio traffic growth rates are used for the HPMS-based VMT estimates.

Overview

Broadly described, MOVES2010 is used to generate "emission factors", which are the average emissions per vehicle-mile (grams/vehicle-mile) and the average emissions per vehicle-hour (grams/vehicle-hour) for the ozone precursors, NO_x and VOC. The MOVES2010 model includes a number of variables that affect the emission factors. These variables have national default values, some of which require modification to reasonably reflect local conditions. Some of these variables are discussed here. The vehicle fleet (vehicles on the road) age and the source type have a major effect on the emission factors. The source types are traveling on road types (MOVES2010 road types are Rural Restricted Access, Rural Unrestricted Access, Urban Restricted Access, and Urban Unrestricted Access). The vehicle speeds also affect the emission factor values. Meteorological conditions such as air temperature and humidity have a significant effect on emission factors. Emission factors produced by MOVES2010 can also include the effect of emission reduction strategies such as vehicle inspection and maintenance programs, regulation of fuels, etc. These MOVES2010 inputs are estimated using the best available data.

These inputs are reviewed and agreed to by U.S. EPA and transportation agencies in a formal interagency consultation process. Emission factors are multiplied by VMT from the travel demand model to estimate the total vehicle emissions.

The emission factors from MOVES2010 can be used with the travel demand model information by combining the disaggregate emission rates with VMT, and source type population for each road type, source type and hour of day, and then sum them up to get the total emissions for the area.

The method, used by ODOT, is to aggregate the emission rates by two source types (cars & trucks), then applying VMT and source type population, thereby reducing the intensive processes. In the first step emission factors are broadly classified into total vehicles, cars and trucks by pollutant, by average speed, road type and hour of day. Then the hourly link volumes generated from travel demand model are combined with emission factors for each network link for each hour. The on-road vehicle emissions for the area is the sum of all individual link-hour emissions. Vehicle-based emissions are obtained by the combination of corresponding emission factors and source type population. Intrazonal emissions are computed using a separate method to account for those trips that use local roads to travel within a zone. Intrazonal VMT is combined with corresponding emission factors to get intrazonal emissions. Total emissions are sum of on-road vehicle emissions, vehicle-based emissions and intrazonal emissions.

Automated programs, using FORTRAN and CUBE scripting, were developed by ODOT to generate total emissions. The process uses data on daily and directional traffic distributions as well as more up to date volume/delay functions from the 2000 Highway Capacity Manual (HCM). This process also handles the newer model network formats and MOVES2010 generated emission factors. The Cleveland - Akron - Lorain area analysis uses an approach similar to ODOT's.

MOVES2010 input and output files are provided in Appendix C.

Best Available Data

Most current vehicle age distribution data, temperature data, fuel properties data, source type distribution data, and I/M data provided by ODOT's ATRs and WIMs, NOAA, ODPS, and Ohio EPA were used by the ODOT for generating emission factors. Likewise, the most current transportation planning data available from NOACA and AMATS and most current ODOT count data were used by ODOT for the emissions estimates.

Analysis Years

Analysis years for this redesignation request include 2002, 2006 (attainment year), 2012 (interim budget year), and 2020 to meet the requirements specified by the CAA and U.S. EPA. The travel demand model presents the transportation system conditions for each of these years. Model runs for each future analysis year contain the road network

NOACA, AMATS, and ODOT of that year with corresponding socioeconomic forecasts for that year.

Local Road VMT

Most local roads such as subdivision streets are not explicitly modeled in a travel demand model. These local roads are represented as fictitious roadways called centroid connectors. Local road traffic is captured as intra-zonal trips which travel demand models usually do not assign to roadway segments. The ODOT post process includes these trips as local road VMT.

Emission Estimations

Tables 2 through 9 contain the results of the emissions analysis for the appropriate years.

Table 2 - Ashtabula County Emission Estimations for On-Road Mobile Sources

	2002	2006	2012	2020
VMT (miles/day)	3,178,599	3,075,258	3,177,975	3,399,487
VOC (tons/day)	5.00	4.17	2.59	1.38
NOx (tons/day)	11.29	9.04	5.20	2.28

Table 3 - Cuyahoga County Emission Estimations for On-Road Mobile Sources

	2002	2006	2012	2020
VMT (miles/day)	29,297,006	29,378,875	29,404,954	29,696,610
VOC (tons/day)	62.92	48.61	26.65	13.60
NOx (tons/day)	128.84	104.67	61.07	33.73

Table 4 - Geauga County Emission Estimations for On-Road Mobile Sources

	2002	2006	2012	2020
VMT (miles/day)	2,567,692	2,698,563	2,775,615	2,996,643
VOC (tons/day)	6.06	5.10	2.88	1.74
NOx (tons/day)	13.47	11.85	7.63	5.37

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Table 5 - Lake County Emission Estimations for On-Road Mobile Sources

	2002	2006	2012	2020
VMT (miles/day)	5,738,319	5,889,045	5,965,888	6,212,829
VOC (tons/day)	13.28	10.87	6.33	3.42
NOx (tons/day)	29.59	25.93	16.62	10.62

Table 6 - Lorain County Emission Estimations for On-Road Mobile Sources

	2002	2006	2012	2020
VMT (miles/day)	6,972,908	7,088,351	7,121,863	7,338,790
VOC (tons/day)	16.56	13.59	8.02	4.28
NOx (tons/day)	34.23	29.89	19.15	12.01

Table 7 - Medina County Emission Estimations for On-Road Mobile Sources

	2002	2006	2012	2020
VMT (miles/day)	5,888,243	6,165,358	6,391,366	6,990,097
VOC (tons/day)	12.34	10.52	6.51	3.73
NOx (tons/day)	36.39	32.52	21.53	14.98

Table 8 - Portage County Emission Estimations for On-Road Mobile Sources

	2002	2006	2012	2020
VMT (miles/day)	4,782,788	5,186,076	5,494,912	5,872,599
VOC (tons/day)	8.26	6.95	4.39	2.37
NOx (tons/day)	17.17	14.83	8.81	3.89

Table 9 - Summit County Emission Estimations for On-Road Mobile Sources

	2002	2006	2012	2020
VMT (miles/day)	15,788,738	16,213,278	16,501,142	18,086,124
VOC (tons/day)	30.58	21.78	13.53	7.02
NOx (tons/day)	60.43	45.49	24.57	11.35

Table 10 - Emission Estimation Totals for On-Road Mobile Sources for the Cleveland - Akron - Lorain Area

	2002	2006	2012	2020
VOC (tons/day)	155.00	121.59	70.90	37.54
NOx (tons/day)	331.41	274.22	164.58	94.23

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Motor Vehicle Emission Budget

Table 11 contains the motor vehicle emissions budget for the Cleveland - Akron - Lorain area.

Table 11 - Mobile Vehicle Emissions Budget for the Cleveland - Akron – Lorain Area

	2012	2020
VOC (tons/day)	81.54	43.17
NO_x (tons/day)	189.27	108.36

The above budget includes the emission estimates calculated for 2012 and 2020 with an additional 15 percent margin of safety. The emission estimates are derived from the Tranplan travel demand model and MOVES2010 as described above under the expected NOACA and AMATS 2030 Long Range Plans and known projects in the areas not included within either MPO's jurisdiction. The additional 15 percent translates into an additional 5.63 tons/day for VOC and 14.13 tons/day for NOx for 2020.

All methodologies, the latest planning assumptions, and the safety margins were determined through the interagency consultation process described in the Transportation Conformity Memorandum of Understanding (MOU) among NOACA, AMATS, ODOT, and Ohio EPA.

The current one-hour budgets will no longer be applicable either after the effective date of the approved redesignation or after the effective date of any U.S. EPA action approving a finding that the eight-hour conformity budget included in this submittal is adequate for transportation conformity purposes whichever date comes first.

Requirement 3 of 5

A demonstration that the projected level of emissions is sufficient to maintain the ozone standard.

Background

In consultation with U.S. EPA, Ohio EPA selected the year 2020 as the maintenance year for this redesignation request. This document contains projected emissions inventories for 2012 and 2020.

Emission projections for the Cleveland - Akron - Lorain area were performed using the following approaches:

- As performed by NOACA, mobile source emission projections are based on the U.S. EPA MOVES2010 model. The analysis is

described in more detail in Appendix C. All projections were made in accordance with "Procedures for Preparing Emissions Projections" U.S. EPA-45/4-91-019.

- Emissions inventories are required to be projected to future dates to assess the influence growth and future controls will have. LADCO has developed growth and control files for point, area, and non-road categories. These files were used to develop the future-year emissions estimates used in this document. This was done so the inventories used for redesignation are consistent with modeling performed in the future. Appendix D contains LADCO's technical support document detailing the analysis used to project emissions. The 2006 attainment year was grown from the 2005 LADCO modeling inventory using LADCO's growth factors. The 2020 maintenance year was grown from the 2018 LADCO modeling inventory using LADCO's growth factors.

The detailed inventory information for the Cleveland - Akron - Lorain area for 2002 is in Appendix B. Emission trends are an important gauge for continued compliance with the ozone standard. Therefore, Ohio EPA performed an initial comparison of the inventories for the base year and maintenance years. Mobile source emission inventories are described in Section 5 of Appendix B.

Sectors included in the following tables are: Electrical Generating Unit (EGU-Point); Non-Electrical Generating Unit (Non-EGU); Non-road Mobile (Non-road); Other Area (Other); Marine; Aircraft; Rail (MAR); and On-road Mobile (On-road).

Maintenance is demonstrated when the future-year (2020) projected emission totals are below the 2006 attainment year totals.

The emissions data in the tables below are based on the following data sources:

All On-Road Data source: NOACA Transportation and Modeling Department

All Other Data source: Midwest Regional Planning Organization (MRPO) and Lake Michigan Air Directors Consortium (LADCO) Web site (2002 from Base K and all other years from Base M): http://www.ladco.org/tech/emis/

Demonstration

VOC

Table 12 Ashtabula County VOC Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	0.08	0.00	0.00	0.00	
Non-EGU	5.50	0.94	0.96	1.15	
Non-road	9.53	8.94	6.40	6.40	
Other	3.31	5.89	5.09	4.66	
MAR	0.24	0.25	0.19	0.11	
On-road	5.00	4.17	2.59	1.38	
TOTAL	**23.66**	**20.19**	**15.23**	**13.70**	**6.49**

Table 13 Cuyahoga County VOC Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	0.06	0.00	0.00	0.00	
Non-EGU	2.13	3.68	4.28	5.26	
Non-road	39.01	39.70	30.24	30.24	
Other	46.90	44.14	37.04	35.21	
MAR	0.94	0.92	0.84	0.72	
On-road	62.92	48.61	26.65	13.60	
TOTAL	**151.96**	**137.05**	**99.05**	**85.03**	**52.02**

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Table 14 Geauga County VOC Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	n/a	n/a	n/a	n/a	
Non-EGU	0.00	0.00	0.00	0.01	
Non-road	3.98	4.87	3.48	3.48	
Other	8.26	9.96	10.03	11.15	
MAR	0.00	0.00	0.00	0.00	
On-road	6.06	5.10	2.88	1.74	
TOTAL	**18.30**	**19.93**	**16.39**	**16.38**	**3.55**

Table 15 Lake County VOC Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	0.31	0.02	0.02	0.01	
Non-EGU	0.18	0.80	0.86	0.95	
Non-road	13.22	10.97	8.30	8.30	
Other	9.01	9.06	7.43	6.83	
MAR	0.13	0.16	0.12	0.05	
On-road	13.28	10.87	6.33	3.42	
TOTAL	**36.13**	**31.88**	**23.06**	**19.56**	**12.32**

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Table 16 Lorain County VOC Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	0.33	0.22	0.21	0.18	
Non-EGU	2.11	2.96	3.20	3.53	
Non-road	13.21	12.79	9.51	9.51	
Other	11.96	11.45	9.91	9.51	
MAR	0.25	0.24	0.18	0.10	
On-road	16.56	13.59	8.02	4.28	
TOTAL	**44.42**	**41.25**	**31.03**	**27.11**	**14.14**

Table 17 Medina County VOC Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	n/a	n/a	n/a	n/a	
Non-EGU	0.20	0.79	0.88	1.00	
Non-road	3.90	5.24	3.58	3.85	
Other	6.18	7.40	6.49	6.32	
MAR	0.06	0.05	0.04	0.03	
On-road	12.34	10.52	6.51	3.73	
TOTAL	**22.68**	**24.00**	**17.50**	**14.93**	**9.07**

Table 18 Portage County VOC Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	n/a	n/a	n/a	n/a	
Non-EGU	0.61	0.95	1.12	1.39	
Non-road	4.98	7.36	5.10	5.10	
Other	6.45	6.19	5.19	4.78	
MAR	0.12	0.13	0.10	0.10	
On-road	8.26	6.95	4.39	2.37	
TOTAL	**20.42**	**21.58**	**15.90**	**13.74**	**7.84**

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Table 19 Summit County VOC Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	n/a	n/a	n/a	n/a	
Non-EGU	1.13	1.27	1.38	1.58	
Non-road	9.01	12.21	8.91	8.91	
Other	18.61	18.17	15.00	14.17	
MAR	0.14	0.15	0.13	0.09	
On-road	30.58	21.78	13.53	7.02	
TOTAL	**59.47**	**53.58**	**38.95**	**31.77**	**21.81**

Table 20 Cleveland - Akron – Lorain Area VOC Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

VOC	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
Ashtabula	5.00	4.17	2.59	1.38	
Cuyahoga	62.92	48.61	26.65	13.60	
Geauga	6.06	5.10	2.88	1.74	
Lake	13.28	10.87	6.33	3.42	
Lorain	16.56	13.59	8.02	4.28	
Medina	12.34	10.52	6.51	3.73	
Portage	8.26	6.95	4.39	2.37	
Summit	30.58	21.78	13.53	7.02	
COMBINED VOC TOTAL	**155.00**	**121.59**	**70.90**	**37.54**	**84.05**

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NOx

Table 21 Ashtabula County NO_x Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	10.69	3.87	3.91	3.91	
Non-EGU	0.77	0.65	0.83	1.16	
Non-road	1.96	3.47	2.71	1.79	
Other	0.51	0.85	0.86	0.86	
MAR	7.03	5.24	4.12	3.01	
On-road	11.29	9.04	5.20	2.28	
TOTAL	**32.25**	**23.12**	**17.63**	**13.01**	**10.11**

Table 22 Cuyahoga County NO_x Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	5.13	5.88	6.50	6.50	
Non-EGU	5.63	7.68	7.08	7.79	
Non-road	26.39	26.15	19.00	11.12	
Other	5.90	13.83	14.01	14.09	
MAR	13.89	10.46	8.79	7.04	
On-road	128.84	104.67	61.07	33.73	
TOTAL	**185.78**	**168.67**	**116.45**	**80.27**	**88.40**

Table 23 Geauga County NO_x Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	n/a	n/a	n/a	n/a	
Non-EGU	n/a	n/a	n/a	n/a	
Non-road	2.07	2.58	1.81	0.97	
Other	0.44	1.01	1.01	1.00	
MAR	0.00	0.00	0.00	0.00	
On-road	13.47	11.85	7.63	5.37	
TOTAL	**15.98**	**15.44**	**10.45**	**7.34**	**8.10**

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Table 24 Lake County NO_x Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	71.16	36.33	33.99	27.74	
Non-EGU	1.20	1.15	0.82	0.83	
Non-road	4.55	6.01	4.59	3.06	
Other	0.97	2.30	2.32	2.33	
MAR	3.72	2.98	2.40	1.72	
On-road	29.59	25.93	16.62	10.62	
TOTAL	**111.19**	**74.70**	**60.74**	**46.30**	**28.40**

Table 25 Lorain County NO_x Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	56.94	25.00	23.92	21.04	
Non-EGU	1.74	2.31	2.01	2.40	
Non-road	6.93	8.05	5.86	3.63	
Other	0.77	2.66	2.69	2.70	
MAR	6.67	4.79	3.88	2.81	
On-road	34.23	29.89	19.15	12.01	
TOTAL	**107.28**	**72.70**	**57.51**	**44.59**	**28.11**

Table 26 Medina County NO_x Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	n/a	n/a	n/a	n/a	
Non-EGU	0.08	0.26	0.15	0.16	
Non-road	2.69	4.13	2.92	1.40	
Other	0.76	1.57	1.58	1.59	
MAR	1.33	0.89	0.76	0.56	
On-road	36.39	32.52	21.53	14.98	
TOTAL	**41.25**	**39.37**	**26.94**	**18.69**	**20.68**

Table 27 Portage County NO_x Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

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Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	n/a	n/a	n/a	n/a	
Non-EGU	0.00	0.22	0.19	0.23	
Non-road	3.07	3.84	2.70	1.33	
Other	0.77	1.52	1.53	1.53	
MAR	2.61	2.41	2.06	1.49	
On-road	17.17	14.83	8.81	3.89	
TOTAL	**23.62**	**22.82**	**15.29**	**8.47**	**14.35**

Table 28 Summit County NO_x Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

Sector	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
EGU Point	n/a	n/a	n/a	n/a	
Non-EGU	3.64	3.23	1.68	1.64	
Non-road	9.31	9.30	6.30	2.85	
Other	2.37	5.51	5.58	5.61	
MAR	2.22	2.03	1.75	1.28	
On-road	60.43	45.49	24.57	11.35	
TOTAL	**77.97**	**65.56**	**39.88**	**22.73**	**42.83**

Table 29 Cleveland - Akron – Lorain Area NO_x Emission Inventory Totals for Base Year 2002, Estimated 2006, and Projected 2012 and 2020 (tons per day)

NO_x	2002 Base	2006 Attainment	2012 Interim	2020 Maintenance	Safety Margin
Ashtabula	11.29	9.04	5.20	2.28	
Cuyahoga	128.84	104.67	61.07	33.73	
Geauga	13.47	11.85	7.63	5.37	
Lake	29.59	25.93	16.62	10.62	
Lorain	34.23	29.89	19.15	12.01	
Medina	36.39	32.52	21.53	14.98	
Portage	17.17	14.83	8.81	3.89	
Summit	60.43	45.49	24.57	11.35	
COMBINED NOx TOTAL	**331.41**	**274.22**	**164.58**	**94.23**	**179.99**

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Table 30 Cleveland - Akron – Lorain Area Comparison of 2006 attainment year and 2020 projected emission estimates (tons per day, summer)

	2006	2020	Projected Decrease
VOC	121.59	37.54	84.05
NO_x	274.22	94.23	179.99

As shown in the table above, VOC emissions in the nonattainment area are projected to decrease by 84.05 tons/day. Point sources show a slight increase due to expectations that the population will grow in this area; however, cleaner vehicles and fuels are expected to be in place in 2009 and 2018 and they cause an overall drop in VOC emissions.

NO_x emissions in the nonattainment area are projected to decrease by 179.99 tons/day. Again, area source emissions and point sources, show a slight increase due to expectations that the population will grow in this area. Decreases from U.S. EPA rules covering Tier 2 Motor Vehicle Emissions Standards and Gasoline Sulfur Control Requirements[4], Highway Heavy-Duty Engine Rule[5] , Non-Road Diesel Engine Rule[6], and the Clean Air Interstate Rule[7] are factored into the changes.

As identified in Table 11 above, an additional 15 percent margin of safety is being requested for mobile emissions. The additional 15 percent translates into an additional 5.63 tons/day for VOC and 14.13 tons/day for NOx for 2020. U.S. EPA's conformity regulations allow for allocation, through a revision to the SIP, all or some portion of the overall area's safety margin (emission reductions from 2006 to 2020) to the mobile emissions budgets for future conformity. Ohio chose to allocate 5.63 tons/day of the 84.05 tons/day safety margin for VOC and 14.13 tons/day of the 179.99 tons/day safety margin for NOx as a mobile emissions budget 15% safety margin.

Requirement 4 of 5

A demonstration that improvement in air quality between the year violations occurred and the year attainment was achieved is based on permanent and enforceable emission reductions and not on temporary adverse economic conditions or unusually favorable meteorology.

[4] http://www.epa.gov/fedrgstr/EPA-AIR/2000/February/Day-10/a19a.htm
[5] http://www.epa.gov/fedrgstr/EPA-AIR/1997/October/Day-21/a27494.htm
[6] http://www.epa.gov/fedrgstr/EPA-AIR/1998/October/Day-23/a24836.htm
[7] http://www.epa.gov/fedrgstr/EPA-AIR/2005/May/Day-12/a5723a.pdf

Background

Ambient air quality data from all monitoring sites indicate that air quality met the NAAQS for ozone in 2006-2008. U.S. EPA's redesignation guidance (p 9) states: "A state may generally demonstrate maintenance of the NAAQS by either showing that future emissions of a pollutant or its precursors will not exceed the level of the attainment inventory, or by modeling to show that the future mix of sources and emissions rates will not cause a violation of the NAAQS."

Demonstration

Permanent and enforceable reductions of VOC and NOx emissions have contributed to the attainment of the eight-hour ozone standard. Some of these reductions were due to the application of tighter federal standards on new vehicles. Also, Title IV of the CAA and the NO_x SIP Call required the reduction of NOx emissions from utility sources. Reductions achieved are discussed in greater detail under Chapter Five.

Table 31 Cleveland - Akron – Lorain Area Combined Comparison of 2002 base year and 2006 attainment year on-road and EGU reductions

All On-Road Data source: NOACA Transportation and Modeling Department

All Other Data source: Lake Michigan Air Midwest Regional Planning Organization (MRPO) and Directors Consortium (LADCO) Web site (Base M): http://www.ladco.org/tech/emis/

	2002	2006
On-road VOC	155.00	121.59
On-road NO_x	331.41	274.22
EGU NO_x	143.92	71.08

Requirement 5 of 5

Provisions for future annual updates of the inventory to enable tracking of the emission levels, including an annual emission statement from major sources.

Demonstration

In Ohio, major point sources in all counties are required to submit air emissions information annually, in accordance with U.S. EPA's Consolidated Emissions Reporting Rule (CERR). Ohio EPA prepares a new periodic inventory for all ozone precursor emission sectors every three (3) years. These ozone precursor inventories will be prepared for future years as necessary to comply with the inventory reporting requirements established in the CFR. Emissions information will be compared to the 2002 base year and

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the 2020 projected maintenance year inventories to assess emission trends, as necessary, and to assure continued compliance with the ozone standard.

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CHAPTER FIVE

CONTROL MEASURES AND REGULATIONS

CAA Section107 d)(3)(E)(ii), 107(d)(3)(iv) & 107(d)(3)(E)(v)

Requirement 1 of 6

Section 182(b) of the 1990 Clean Air Act Amendments requires states with moderate nonattainment areas to implement RACT under Section 172(c)(1).

Background

Section 182(b) of the 1990 Clean Air Act Amendments requires states with moderate nonattainment areas to implement RACT under Section 172(c)(1) with respect to the following:

i.) Each category of VOC sources in the area covered by a Control Technology Guideline (CTG) document issued between November 15, 1990, and the date of attainment;

ii.) All VOC sources in the area covered by any CTG issued before November 15, 1990; and

iii.) All other major stationary sources of VOCs that are located in the area.

Demonstration

As required under the 1-hour ozone standard, Ohio EPA submitted VOC RACT rules covering the second and third categories. The U.S. EPA approved Ohio's VOC RACT rules on April 25, 1996 (61 FR 18255), September 7, 1994 (59 FR 46182), and October 23, 1995 (60 FR 54308). With respect to the first category, EPA issued CTGs for five source categories in September 2006 and three additional source categories in September 2007. Areas classified as moderate and above were required to submit VOC RACT for the source categories covered by these CTGs, by September 2007 and September 2008, respectively. Ohio EPA is in the process of adopting all VOC RACT requirements under OAC Chapter 3745-21 as required under the first category as part of a rulemaking that will be finalized and submitted as a SIP revision in conjunction with this redesignation request.

RACT requirements are incorporated into permits along with monitoring, recordkeeping, and reporting necessary to ensure ongoing compliance. Ohio EPA also has an active enforcement program to address violations

discovered by field office staff. The Ohio RACT rules are found in OAC Chapter 3745-21[8].

Requirement 2 of 6

CAA Section 182(b) requires plan provisions for reasonable further progress for moderate nonattainment areas that include a 15 percent reduction in VOC and NOx emissions.

Background

Section 182(b)(1) requires reductions as part of a 15 percent rate of progress (ROP) demonstration. The requirement for NOx emission reductions can be waived if it is determined to not contribute to attainment. However, it was determined that NOx emission reductions would be necessary for Ohio.

As explained in a memorandum from John S. Seitz, Director, Office of Air Quality Planning and Standards, entitled "Reasonable Further Progress, Attainment Demonstration, and Related Requirements for Ozone Nonattainment Areas Meeting the Ozone National Ambient Air Quality Standards," dated May 10, 1995, U.S. EPA interprets the provisions regarding attainment demonstrations to not require SIP submittals if an ozone nonattainment area subject to those requirements is monitoring attainment of the ozone standard. The Cleveland-Akron-Lorain area is monitoring attainment; however, Ohio EPA submitted an attainment demonstration on June 15, 2007 (supplemented February 22, 2008) which is summarized below.

Demonstration

The Cleveland-Akron-Lorain area implemented state rules identified in their 1994 15 percent ROP demonstration as part of the one-time CAAA requirements. These measures include the region's Motor Vehicle Inspection and Maintenance (I/M) Program (E-Check), Stage II vapor recovery from gasoline nozzles, enforcement cases, the original architectural coatings rule, and removal of the 100 ton per year cut-off for VOC RACT requirements in the rural portion of the nonattainment area (including Stage I Vapor Recovery). While the March 14, 1994, 15 percent ROP plan submittal was not explicitly approved, these rules were assumed to be in place as part of the maintenance plan approved as part of the one-hour redesignation on May 7, 1996.

In addition to the 1994 15 percent ROP, Ohio implemented NOx RACT rules[9] effective December 22, 2007. Ohio's rule has compliance dates of December 22, 2009 and December 22, 2010. These rules were submitted to U.S. EPA for consideration as a revision to the SIP on January 10, 2008.

[8] http://www.epa.state.oh.us/dapc/regs/3745-21/3745_21.html
[9] http://www.epa.state.oh.us/dapc/regs/3745-110/3745_110.html

In addition to the above, Ohio also implemented the following control strategies as part of the attainment demonstration:

- Portable fuel containers[10]: Ohio's rule has a compliance date of July 1, 2007. This rule was approved into the SIP on March 30, 2007.

- Architectural and industrial maintenance (AIM) coatings[11]: Ohio's rule has a compliance date of January 1, 2009. This rule was not submitted for SIP approval due to impending changes to the corresponding federal rules, per agreement with U.S. EPA.

- Consumer and commercial products[12]: Ohio's rule has compliance dates of March 15, 2008 and January 1, 2009. These rules were submitted to U.S. EPA for consideration as a revision to the SIP on October 4, 2007.

Requirement 3 of 6

Section 182(a)(3)(B) requires states to submit emissions statements.

Background

Section 182(a)(3)(B) requires states to submit emissions statements within two years of the enactment of the Clean Air Act Amendments and then every three years thereafter.

Demonstration

Ohio EPA submitted its emissions statement SIP on March 18, 1994 which was approved by U.S. EPA on October 13, 1995 (59 FR 51863). As discussed in Chapter Four (Requirement Four), Ohio EPA submits, and commits to submit, emission inventories (statements) every three years.

Requirement 4 of 6

Evidence that control measures required in past ozone SIP revisions have been fully implemented.

Background

In addition to the historic RACT requirements and those mentioned above, the U.S. EPA NO_x SIP Call required 22 states to pass rules that would result in significant emission reductions from large EGUs, industrial boilers, and cement kilns in the eastern United States. Ohio passed this rule in 2001. NOx

[10] http://www.epa.state.oh.us/dapc/regs/3745-21/21_17.pdf
[11] http://www.epa.state.oh.us/dapc/regs/3745-113/3745_113.html
[12] http://www.epa.state.oh.us/dapc/regs/3745-112/3745_112.html

SIP Call requirements are incorporated into permits along with monitoring, recordkeeping, and reporting necessary to ensure ongoing compliance. Ohio EPA also has an active enforcement program to address violations discovered by field office staff. Compliance is tracked through the Clean Air Markets data monitoring program. Beginning in 2004, this rule accounts for a reduction of approximately 31 percent of all NO_x emissions statewide compared to previous uncontrolled years. The other 21 states also have adopted these rules.

On March 10, 2004, the U.S. EPA promulgated the CAIR. Beginning in 2009, U.S. EPA's CAIR rule requires EGUs in 28 eastern states and the District of Columbia to significantly reduce emissions of NOx. CAIR will replace the NOx SIP Call for EGUs. National NO_x emissions will be cut from 4.5 million tons in 2004, to a cap of 1.5 million tons by 2009, and 1.3 million tons in 2018 in 28 states. States were required to submit a CAIR SIP as part of this effort. Ohio submitted a CAIR SIP which was approved by U.S. EPA on February 1, 2007. U.S. EPA projects that in 2009 emissions of NOx will decrease from a baseline of 264,000 tons per year to 91,000 tons per year within Ohio[13].

Section 182(b) contains additional provisions applicable to moderate nonattainment areas. Section 182(b)(3) requires gasoline vapor recovery systems for gasoline dispensing stations in the area and section 182(b)(4) requires motor vehicle inspection and maintenance programs.

Demonstration

U.S. EPA and Ohio EPA performed modeling that indicated this area would attain the eight-hour ozone standard with the implementation of the NO_x SIP Call. Controls for EGUs formally commenced May 31, 2004. Emissions covered by this program have been generally trending downward since 1998 with larger reductions occurring in 2002 and 2003. Data taken from the U.S. EPA Clean Air Markets web site, quantify the gradual NO_x reductions that have occurred in Ohio as a result of Title IV of the 1990 CAA Amendments and the beginning of the NO_x SIP Call Rule. Ohio developed the NO_x Budget Trading Program rules in OAC Chapter 3745-14[14] in response to the SIP Call. OAC Chapter 3745-14 regulates EGUs and certain non-EGUs under a cap and trade program based on an 85 percent reduction of NOx emissions from EGUs and a 60 percent reduction of NO_x emissions from non-EGUs, compared to historical levels. This cap will stay in place through 2008, at which time the CAIR program will supersede it as discussed above.

[13] http://www.epa.gov/cair/pdfs/0053-2228.pdf
[14] http://www.epa.state.oh.us/dapc/regs/3745-14/3745_14.html

On April 21, 2004, U.S. EPA published Phase II of the NO_x SIP Call that establishes a budget for large (greater than 1 ton per day emissions) stationary internal combustion engines. Ohio EPA's OAC rule 3745-14-12 addresses stationary internal combustion engines, all used in natural gas pipeline transmissions. U.S. EPA approved this revision to the SIP on April 4, 2008. An 82 percent NO_x reduction from 1995 levels is anticipated. Completion of the compliance plan occurred by May 1, 2006 and the compliance demonstration began May 1, 2007. The 2007 controlled NO_x emissions is 599 tons statewide for the ozone season.

Section 182(b)(3) requires states to submit Stage II vapor recovery rules no later than November 15, 1992. The U.S. EPA partially approved and partially disapproved Ohio's SIP revision for implementation of Stage II on October, 20, 1994 (59 FR 52911). As stated in that rulemaking action, with the exception of paragraph 3745-21-09 (DDD)(5), U.S. EPA considers Ohio's Stage II program to fully satisfy the criteria set forth in the September 17, 1993, U.S. EPA guidance document for such programs entitled "Enforcement Guidance for Stage II Vehicle Refueling Control Programs." Furthermore, the September 17, 1993, guidance memorandum states that once onboard vapor recovery regulations are promulgated, the Stage II regulations are no longer applicable for moderate ozone nonattainment areas. The U.S. EPA promulgated onboard vapor recovery rules in February 1994. Therefore, pursuant to Section 202(a)(6) of the CAA, Stage II would no longer be required.

The U.S. EPA's final I/M regulations in 40 CFR Part 85 require the states to submit a fully adopted I/M program by November 15, 1993. U.S. EPA approved Ohio's enhanced I/M program (E-Check), on April 4, 1995 (60 FR 16989) and January 6, 1997 (62 FR 646).

The E-check program and Stage I and Stage II requirements are still being implemented.

<u>Tier II Emission Standards for Vehicles and Gasoline Sulfur Standards</u>
In February 2000, U.S. EPA finalized a federal rule to significantly reduce emissions from cars and light trucks, including sport utility vehicles (SUVs). Under this proposal, automakers will be required to sell cleaner cars, and refineries will be required to make cleaner, lower sulfur gasoline. This rule will apply nationwide. The federal rules will phase in between 2004 and 2009. U.S. EPA has estimated that NO_x emission reductions will be approximately 77 percent for passenger cars, 86 percent for smaller SUVs, light trucks, and minivans, and 65 to 95 percent reductions for larger SUVs, vans, and heavier trucks. VOC emission reductions will be approximately 12 percent for passenger cars, 18 percent for smaller SUVs, light trucks, and minivans, and 15 percent for larger SUVs, vans, and heavier trucks.

Heavy-Duty Diesel Engines

In July 2000, U.S. EPA issued a final rule for Highway Heavy Duty Engines, a program which includes low-sulfur diesel fuel standards, which will be phased in from 2004 through 2007. This rule applies to heavy-duty gasoline and diesel trucks and buses. This rule will result in a 40 percent reduction in NO_x from diesel trucks and buses, a large sector of the mobile sources NO_x inventory.

Clean Air Non-road Diesel Rule

In May 2004, U.S. EPA issued the Clean Air Non-road Diesel Rule. This rule applies to diesel engines used in industries such as construction, agriculture, and mining. It also contains a cleaner fuel standard similar to the highway diesel program. The new standards will cut emissions from non-road diesel engines by more than 90 percent. Non-road diesel equipment, as described in this rule, currently accounts for 47 percent of diesel particulate matter (PM) and 25 percent of NO_x from mobile sources nationwide. Sulfur levels will be reduced in non-road diesel fuel by 99 percent from current levels, from approximately 3,000 parts per million (ppm) now to 15 ppm in 2009. New engine standards take effect, based on engine horsepower, starting in 2008. Together, these rules will substantially reduce local and regional sources of ozone precursors.

Requirement 5 of 6

Acceptable provisions to provide for new source review.

Background

Ohio has a long standing and fully implemented New Source Review (NSR) program. This is addressed in OAC Chapter 3745-31[15]. The Chapter includes provisions for the Prevention of Significant Deterioration (PSD) permitting program in OAC rules 3745-31-01 to 3745-31-20. Ohio's PSD program was conditionally approved on October 10, 2001 (66 FR 51570) and received final approval on January 22, 2003 (68FR 2909) by U.S. EPA as part of the SIP.

Demonstration

Any facility that is not listed in the 2002 emission inventory, or for the closing of which credit was taken in demonstrating attainment, will not be allowed to construct, reopen, modify, or reconstruct without meeting all applicable NSR requirements. Once the area is redesignated, Ohio EPA will implement NSR through the PSD program.

[15] http://www.epa.state.oh.us/dapc/regs/3745-31/3745_31.html

Requirement 6 of 6

Assure that all existing control measures will remain in effect after redesignation unless the State demonstrates through photochemical modeling that the standard can be maintained without one (1) or more control measures.

Demonstration

Ohio commits to maintaining the aforementioned control measures after redesignation. Ohio hereby commits that any changes to its rules or emission limits applicable to VOC and/or NO_x sources, as required for maintenance of the ozone standard in the Cleveland - Akron - Lorain area, will be submitted to U.S. EPA for approval as a SIP revision.

Ohio, through Ohio EPA's Legal section, has the legal authority and necessary resources to actively enforce any violations of its rules or permit provisions. After redesignation, it intends to continue enforcing all rules that relate to the emission of ozone precursors in the Cleveland - Akron - Lorain area.

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CHAPTER SIX

CONTINGENCY MEASURES

CAA Section 107(d)(3)(E)(v)

Requirement 1 of 4

A commitment to submit a revised plan eight (8) years after redesignation.

Demonstration

Ohio hereby commits to review its maintenance plan eight (8) years after redesignation, as required by Section 175(A) of the CAA.

Requirement 2 of 4

A commitment to expeditiously enact and implement additional contingency control measures in response to exceeding specified predetermined levels (triggers) or in the event that future violations of the ambient standard occurs.

Demonstration

Ohio hereby commits to adopt and expeditiously implement necessary corrective actions in the following circumstances:

Warning Level Response:

A warning level response shall be prompted whenever an annual (1-year) fourth high monitored value of 88 ppb occurs in a single ozone season within the maintenance area. A warning level response will consist of a study to determine whether the ozone value indicates a trend toward higher ozone values or whether emissions appear to be increasing. The study will evaluate whether the trend, if any, is likely to continue and, if so, the control measures necessary to reverse the trend taking into consideration ease and timing for implementation as well as economic and social considerations. Implementation of necessary controls in response to a warning level response trigger will take place as expeditiously as possible, but in no event later than 12 months from the conclusion of the most recent ozone season (September 30).

Should it be determined through the warning level study that action is necessary to reverse the noted trend, the procedures for control selection and implementation outlined under action level response shall be followed.

Action Level Response:

An action level response shall be prompted whenever a two-year average fourth high monitored value of 85 parts per billion (ppb) or greater occurs within the maintenance area. A violation of the standard (three-year average fourth high value of 85 ppb or greater) shall also prompt an action level

response. In the event that the action level is triggered and is not found to be due to an exceptional event, malfunction, or noncompliance with a permit condition or rule requirement, Ohio EPA in conjunction with the metropolitan planning organization or regional council of governments, will determine additional control measures needed to assure future attainment of the NAAQS for ozone. In this case, measures that can be implemented in a short time will be selected in order to be in place within 18 months from the close of the ozone season that prompted the action level. Ohio EPA will also consider the timing of an action level trigger and determine if additional, significant new regulations not currently included as part of the maintenance provisions will be implemented in a timely manner and will constitute our response.

Control Measure Selection and Implementation

Adoption of any additional control measures is subject to the necessary administrative and legal process. This process will include publication of notices, an opportunity for public hearing, and other measures required by Ohio law for rulemaking.

If a new measure/control is already promulgated and scheduled to be implemented at the federal or State level, and that measure/control is determined to be sufficient to address the upward trend in air quality, additional local measures may be unnecessary. Furthermore, Ohio will submit to U.S. EPA an analysis to demonstrate the proposed measures are adequate to return the area to attainment.

Requirement 3 of 4

A list of potential contingency measures that would be implemented in such an event.

Demonstration

Contingency measures to be considered will be selected from a comprehensive list of measures deemed appropriate and effective at the time the selection is made. The selection of measures will be based on cost-effectiveness, emission reduction potential, economic and social considerations or other factors that Ohio EPA deems appropriate. Ohio EPA will solicit input from all interested and affected persons in the maintenance area prior to selecting appropriate contingency measures. Because it is not possible at this time to determine what control measure will be appropriate at an unspecified time in the future, the list of contingency measures outlined below is not exhaustive.

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1) Lower Reid vapor pressure gasoline program.

2) Tighten RACT on existing sources covered by U.S. EPA Control Technique Guidelines issued in response to the 1990 CAA.

3) Apply VOC RACT to smaller existing sources.

4) One or more transportation control measures sufficient to achieve at least half a percent reduction in actual areawide VOC emissions. Transportation measures will be selected from the following, based upon the factors listed above after consultation with affected local governments:

   a) trip reduction programs, including, but not limited to, employer-based transportation management plans, areawide rideshare programs, work schedule changes, and telecommuting;

   b) traffic flow and transit improvements; and

   c) other new or innovative transportation measures not yet in widespread use that affects local governments deemed appropriate.

5) Alternative fuel and diesel retrofit programs for fleet vehicle operations.

6) Require VOC or NO_x emission offsets for new and modified major sources.

7) Require VOC or NO_x emission offsets for new and modified minor sources.

8) Increase the ratio of emission offsets required for new sources.

9) Require VOC or NO_x controls on new minor sources (less than 100 tons).

10) Adopt NOx RACT for existing combustion sources.

No contingency measure shall be implemented without providing the opportunity for full public participation during which the relative costs and benefits of individual measures, at the time they are under consideration, can be fully evaluated.

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Requirement 4 of 4
A list of VOC and NO_x sources potentially subject to future additional control requirements.

Demonstration
The following is a list of VOC and NO_x sources potentially subject to future controls.

NO_x RACT
- EGUs
- asphalt batching plants
- industrial/commercial and institutional boilers
- process heaters
- internal combustion engines
- combustion turbines
- other sources greater than 100 tons per year

VOC RACT
- architectural and industrial maintenance coatings
- automobile refinishing shops
- cold cleaner degreasers
- synthetic organic compound manufacturing
- organic compound batch processes
- wood manufacturing
- industrial wastewater
- aerospace industry
- bakeries
- plastic parts coating
- volatile organic liquid storage
- industrial solvent cleaning
- offset lithography
- industrial surface coating
- other sources greater than 50 tons per year

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CHAPTER SEVEN

PUBLIC PARTICIPATION

Ohio published notification for a public hearing and solicitation for public comment concerning the draft redesignation petition and maintenance plan in the widely distributed county.

The public hearing to receive comments on the redesignation request will be held on October 23, 2012, at 3:30pm located at 2110 East Aurora Road Twinsburg, Ohio. The public comment period will close on October 23, 2012. Comments received during the public comment period have been included in the final package. Appendix E includes a copy of the public notice and response to comments from the public hearing and comment period.

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CHAPTER EIGHT

CONCLUSIONS

The Cleveland - Akron – Lorain ozone nonattainment area has attained the 1997 NAAQS for ozone and complied with the applicable provisions of the 1990 Amendments to the CAA regarding redesignations of ozone nonattainment areas. Documentation to that effect is contained herein. Ohio EPA has prepared a redesignation request and maintenance plan that meet the requirements of Section 110 (a)(1) of the 1990 CAA.

Based on this presentation, the Cleveland - Akron – Lorain ozone nonattainment area meets the requirements for redesignation under the CAA and U.S. EPA guidance. Ohio has performed an analysis that shows the air quality improvements are due to permanent and enforceable measures. Furthermore, because this area is subject to significant transport of pollutants, significant regional NO_x reductions will ensure continued compliance (maintenance) with the standard with an increasing margin of safety.

The State of Ohio hereby requests that the Cleveland - Akron – Lorain ozone nonattainment area be redesignated to attainment simultaneously with U.S. EPA approval of maintenance plan provisions contained herein. In addition, the State of Ohio requests that this maintenance plan satisfy the requirements of CAA Section 175A (b), for subsequent plan revisions required for areas redesignated for the one-hour ozone standard, as was the case with the Cleveland - Akron – Lorain ozone nonattainment area.

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