Final Draft

DELAWARE PLAN
FOR MEETING THE NITROGEN OXIDE (NOx) BUDGET REQUIREMENTS CONTAINED IN THE EPA NOx SIP CALL

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Delaware Department of Natural Resources & Environmental Control
Division of Air and Waste Management

Air Quality Management Section

Executive Summary

This document constitutes a revision to the Delaware State Implementation Plan (SIP) for attainment of the National Ambient Air Quality Standard (NAAQS) for ground-level ozone. It sets forth Delaware's plan for meeting its obligations under Section 110(a)(2)(D) of the Clean Air Act Amendments of 1990 (CAAA) to reduce emissions transported to downwind ozone non-attainment areas. Under the authority of Section 110, the United States Environmental Protection Agency (EPA) promulgated a rule entitled *"Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone"* (63 FR 57397). This rule, along with its technical amendments, is commonly referred to as the "NOx SIP Call". Delaware is one of the states that must comply with the NOx SIP Call. The NOx SIP Call sets a statewide NOx emissions budget for Delaware of 22,861 tons over the five-month summer control period from May 1 through September 30. That budget must be met for the year 2007 and beyond. Delaware will meet this budget through the promulgation and implementation of *"Regulation No. 39 – Nitrogen Oxides (NOx) Budget Trading Program"* of the Delaware Regulations Governing the Control of Air Pollution.

Regulation No. 39 assigns NOx budget allocations to electric generating units (EGU's) with nameplate capacities of 15 megawatts electrical (Mwe) or greater, non-electric generating units (non-EGU's) with maximum design heat input capacities of 250 million British Thermal Units per hour (MMBTU/hr) or greater, and any units that voluntarily opt in to the program. Any unit subject to Regulation No. 39 must comply by the later of May 1, 2003 or the date the unit commences operation. All units in the program can participate in an inter-state trading program that allows for the selling, purchasing, or banking of excess emission reductions in order to facilitate compliance with the overall NOx budget.

Responsible Personnel

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1.0 INTRODUCTION

1.1 Background

Ground-level ozone is a pollutant formed when nitrogen oxides (NOx) and volatile organic compounds (VOC) react in heat and sunlight. Ozone is a toxic chemical that causes respiratory illness, eye irritation and plant damage.

States, including Delaware, that are part of the Philadelphia-Wilmington-Trenton non-attainment area for the 1-hour ground-level ozone National Ambient Air Quality Standard (NAAQS) have been unable to make their required attainment demonstrations without relying on a reduction in pollution transported into the area from areas upwind of the non-attainment area. Likewise, ozone non-attainment areas downwind of the Philadelphia-Wilmington-Trenton non-attainment area have been unable to demonstrate attainment without reductions in transported NOx emissions from states such as Delaware in the Philadelphia-Wilmington-Trenton non-attainment area.

Because of this pollution transport problem, a group called the Ozone Transport Assessment Group (OTAG) was formed as a partnership between the United States Environmental Protection Agency (EPA), the Environmental Council of States (ECOS) and various industry and environmental groups. ECOS is a national organization of environmental commissioners with members from fifty states and territories. OTAG membership included representatives of 37 eastern states plus the District of Columbia. The goal of this partnership was to perform a detailed scientific study of the ozone transport problem and propose efficient and cost-effective solutions. OTAG's study focused on the eastern United States, where the ozone transport phenomenon is especially significant. OTAG was formed in 1995 and concluded its work in early 1997.

The OTAG study found that the main driver of the ozone transport problem is the transport of NOx emissions. As a result of the OTAG findings, on September 24, 1998, EPA finalized a rule entitled, "*Finding of Significant Contribution and Rulemaking for Certain States in the Ozone Transport Assessment Group Region for Purposes of Reducing Regional Transport of Ozone*" (63 FR 57396). This rule, along with its later technical amendments, has come to be known as the "NOx SIP Call". Originally the NOx SIP Call required 23 jurisdictions (i.e., 22 OTAG states plus the District of Columbia) to submit State Implementation Plan (SIP) revisions that address the regional transport of ground-level ozone. The original 23 jurisdictions were Alabama, Connecticut, Delaware, District of Columbia, Georgia, Illinois, Indiana, Kentucky, Massachusetts, Maryland, Michigan, Missouri, North Carolina, New Jersey, New York, Ohio, Pennsylvania, Rhode Island, South Carolina, Tennessee, Virginia, Wisconsin, and West Virginia. However, a March 3, 2000 ruling by the D.C. Circuit Court of Appeals had the effect of eliminating Wisconsin, Georgia and Missouri from the original group, leaving the final SIP Call limited to the remaining 20 jurisdictions. The purpose of the NOx SIP Call is to require the 20 jurisdictions to reduce NOx emissions, thereby reducing NOx transport into downwind non-attainment areas.

1.2 The Problem

Nitrogen oxides are a class of compounds made of nitrogen and oxygen in varying percentages. Nitrogen dioxide (NO_2) is the most common and prevalent component of nitrogen oxide emissions. NOx is emitted from high temperature combustion processes. Sources include motor vehicles, fossil fuel electric generators, and other industrial, commercial and residential sources that burn fuels. In 1997, over 23 million tons of nitrogen oxides were emitted into the air in the United States. An important characteristic of NOx emissions is that they can be transported long distances and cause problems far from the original emissions sources. Some of the possible problems of NOx transport include acid rain, greenhouse effect, regional haze, formation of toxic chemicals, and eutrophication of waterways due to nitrogen deposition. In particular, transported NOx emissions interfere with the ability of downwind states to attain or maintain the ozone NAAQS. The Plan herein addresses this immediate non-attainment problem.

1.3 The Solution

The NOx SIP Call does not mandate NOx reductions from specific sources in specific jurisdictions. Rather, it sets an overall NOx emission limit, known as a NOx budget, for each jurisdiction, and allows each jurisdiction to determine its preferred way of reducing emissions to the level of its budget. The jurisdiction can choose to reduce emissions from one or any combination of the four NOx emission source sectors, i.e., point sources, stationary area sources, on-road mobile sources, and off-road mobile sources. The budget is a five-month budget that must be met for the period from May 1 through September 30 of each year, beginning with 2007.

As part of developing a cost-effective strategy, EPA developed a model, market-based emissions trading program (40 CFR 96) that states may use to provide more flexibility in controlling NOx emissions. The program allows controlled sources that exceed their emissions reduction requirements, or that achieve the required reductions ahead of schedule, to bank 'credits', or sell them to other sources that cannot meet their limits. Conversely, sources that have difficulty meeting their emission reduction requirements can purchase NOx credits to ensure compliance. EPA allows this trading program to be used as part of a jurisdiction's plan to comply with the NOx SIP Call budget.

EPA anticipates that the full implementation of the NOx SIP Call will reduce total NOx emissions by an average of 28 percent over the control region, will remove approximately 1.2 million tons of NOx from the air, and will enable impacted non-attainment areas to attain the 1 hour ozone NAAQS.

2.0 THE NOx BUDGET PLAN

2.1 Synopsis

EPA, through the its final *"Technical Amendment to the Finding of Significant Contribution and Rulemaking for Certain States for Purposes of Reducing Regional Transport of Ozone"* (effective April 3, 2000), assigned Delaware a statewide NOx emissions budget of 22,861 tons/season. Delaware plans to meet this budget by: 1.) holding to EPA's 2007 base NOx emission inventory projections for the source sectors of stationary area sources, on-road mobile sources and off-road mobile sources, and 2.) reducing point source electric generating unit (EGU) and non-electric generating unit (non-EGU) emissions from EPA's 2007 base NOx emissions projections through the promulgation and implementation of the proposed *"Regulation No. 39 – Nitrogen Oxides (NOx) Budget Trading Program"* of the Delaware Regulations Governing the Control of Air Pollution.

2.2 Derivation of Budget

In order to derive a statewide total 2007 NOx budget, EPA first applied growth factors to the baseline emission inventories for each source sector (i.e., EGU, non-EGU, stationary area, on-road mobile and off-road mobile), thereby forecasting the emissions to 2007. These projected inventories are called 2007 base inventories. The 2007 base inventories reflect existing controls, and controls required to be implemented by 2007. For the stationary area, on-road mobile and off-road mobile source sectors, the 2007 base inventories become the 2007 sector budgets. This is because EPA applied no additional controls to those sectors in deriving the total 2007 budget.

The situation for point sources is different. Point sources are divided into two sectors, i.e., EGUs and non-EGUs. For the EGU and non-EGU sectors, the 2007 budgets are derived from the 2007 base inventories by applying additional controls to those sectors. This was done by assuming an EGU control level of 0.15 pounds of NOx per million BTU (lb/mmBTU) on units rated at 25 megawatts (Mw) or more, and a non-EGU control level of 60% for boilers and turbines with maximum rated heat inputs of 250 mmBTU/hr or more.

After the budgets for all of the source sectors were derived, they were summed to derive the total statewide 2007 NOx emissions budget. This total budget is the budget to which the state must adhere.

The procedures for deriving the base and budget numbers are described in the EPA document, Development of Emission Budget Inventories For Regional Transport NOx SIP Call Technical Amendment Version (A-96-56:X-B-11), December, 1999. EPA revised the baseline and budget numbers several times, and released the final numbers in the April 3, 2000 rule entitled, *"Technical Amendment to the Finding of Significant Contribution and Rulemaking for certain States for Purposes of Reducing Regional Transport of Ozone*." Delaware reviewed the procedures and baseline inventory numbers for each source sector, and agrees with EPA's final baseline and budget numbers. The final baseline and budget numbers are given in Table 1.

Table 1

Final Base Inventory and Budget Numbers

SOURCE SECTORS	2007 BASE (tons/season)	2007 BUDGET (tons/season)	REDUCTION (tons/season)	REDUCTION (%)
EGUs	5,838	5,250	588	10
Non-EGUs	2,821	2,473	348	12
Stationary Area	1,129	1,129	0	0
On-Road Mobile	8,358	8,358	0	0
Off-Road Mobile	5,651	5,651	0	0
Total	23,797	22,861	936	4

2.3 Delaware's Strategy

The NOx SIP Call requires that the 20 jurisdictions each hold to their respective total budgets, but it allows jurisdictions the flexibility to meet that budget through any choice of NOx controls affecting any source sectors. In other words, the state does not have to adhere to the budgets for the individual source sectors, as long as the total budget is met. Delaware's strategy for meeting the total statewide 2007 budget of 22,861 is twofold.

First, the State anticipates full implementation of the control measures that were included by EPA in developing the 2007 base inventories for each source sector. As previously discussed, the base inventories are equal to the budgets for the stationary area, on-road mobile and off-road mobile source sectors. Delaware will therefore comply with the budgets for these three sectors by holding to their base inventories.

Second, the State will promulgate and implement "*Regulation No.39 – Nitrogen Oxides (NOx) Budget Trading Program"* in order to achieve the reductions in the EGU and non-EGU sectors as reflected in the EPA-derived budgets for those sectors. Regulation No. 39 will result in a reduction in the EGU and non-EGU sector base inventories that is equal to or greater than that used by EPA to calculate the budgets for those sectors. Therefore, Regulation No. 39 guarantees that the EGU and non-EGU sectors will stay at or below their sector budgets of 5,250 tons and 2,473 tons of NOx per 5-month season, respectively. Regulation No. 39 holds each EGU with a nameplate capacity of 25 Mwe or greater to an allocation that is determined by multiplying each unit's heat base heat capacity by a NOx emissions rate factor of 0.15 lb/MMBTU. Each non-EGU with a maximum design heat input capacity of 250 MMBTU/hr or greater is held to an allocation that is determined by multiplying each unit's base heat input by a NOx emissions rate factor of 0.17 lb/MMBTU, as recommended in EPA's model rule (40 CFR, Part 96). In addition, Regulation No. 39 goes beyond the NOx SIP Call by requiring that every EGU and process heater with a design capacity between 15 and 25 Mwe be held to an allocation. That allocation is determined by multiplying each unit's base heat input by the unit's actual average 1996 ozone season NOx emission rate. Therefore, as a group, sources between 15 and 25 Mwe are not allowed to grow beyond their 1996 levels. All allocations can be found in Table 1 of

Appendix A of Regulation No. 39. All units subject to Regulation No. 39 must comply by May 1, 2003 or the date the unit commences operation, whichever is later.

The controls considered by EPA in development of the base inventories are listed in Table 2 for each source sector.

Table 2

2007 Base Inventory Controls

SOURCE SECTOR	**CONTROL MEASURE**	**IMPLEMENTATION MECHANISM**
EGUs	Title IV Controls	State Reg. No. 36 (adopts 40 CFR, Parts72 through 78 by reference)
	Prevention of Significant Deterioration	State Reg. No. 25
	New Source Performance Standards	State Reg. No. 20
	OTC MOU Phase II	State Reg. No. 37
	NOx RACT	State Reg. No. 12
	New Source Review (LAER)	State Reg. No. 25
Non-EGUs	Prevention of Significant Deterioration	State Reg. No. 25
	OTC MOU Phase II	State Reg. No. 37
	New Source Performance Standards	State Reg. No. 20
	New Source Review (LAER)	State Reg. No. 25
	NOx RACT	State Reg. No. 12
Stationary Area	N/A	N/A
On-Road Mobile	National Low Emission Vehicle Stds.	State Reg. No. 40/Federal rule
	Reformulated Gasoline (RFG II)	Federal Rule
	Low Enhanced Inspection & Maint.	State Reg. No. 31
	Clean Fuel Fleets	State Reg. No. 40 (substitute rule)
	Heavy Duty Vehicle Standards	Federal Rule
Off-Road Mobile	Phase II Small Engine Standards	Federal Rule
	Marine Engine Standards	Federal Rule
	Non-road Heavy Duty (50 hp or more) Engine Standards – Phase I	Federal Rule
	Non-road Diesel Engine Standards – Phases 2 and 3	Federal Rule
	Reformulated Gasoline (RFG II)	Federal Rule
	On-board Vapor Recovery	Federal Rule
	Locomotive Standards	Federal Rule

All of the base inventories and budgets are listed in Table 1. For purposes of the NOx SIP Call, Delaware accepts EPA's 2007 base inventories and budgets for all source sectors, and will implement the NOx SIP call as described above. By meeting the budgets for each source sector, Delaware will meet the statewide total statewide 2007 N0x budget of 22,861 tons/season.

2.4 Reporting Requirements

In order to track compliance with the NOx SIP call, each jurisdiction must perform the following three types of emission inventory reporting:

(1) Annual Reporting. The state must report to EPA emissions data from the NOx sources within the state for which the state has adopted control measures specifically for the purpose of meeting the 2007 NOx budget. This includes any measures that differ from the measures included by EPA in the derivation of the 2007 base inventories. For Delaware, these sources will be all EGU and non-EGU sources covered by Regulation No. 39. The annual reporting requirements for these sources can be satisfied by meeting the monitoring and reporting requirements of subpart H of 40 CFR part 75. Regulation No. 39 requires that these monitoring and reporting requirements be met. Annual reporting is to begin with the data for emissions occurring in the year 2003, and must cover emissions for the 5-month compliance season.

(2) Triennial Reporting. For the year 2002 and every third year thereafter, the state must develop and submit an emission inventory covering NOx emissions from all sources within the state. Emissions must cover the 5-month compliance season.

(3) Year 2007 Reporting. In order to determine compliance with the 2007 budget, a separate 2007 NOx emission inventory must be developed and submitted. This inventory must cover emissions from the 5-month compliance season for all NOx sources. The 2007 inventory is a separate requirement because the year 2007 does not fall on the triennial reporting schedule.

States must submit data for a required year no later than 12 months after the end of the calendar year for which the data are collected. States are required to report emissions data in an electronic format.

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