November 23, 1998

Jeanne M. Fox
Regional Administrator
United States Environmental Protection Agency
Region II
290 Broadway - 26th Floor
New York, New York 10007-7866

Dear Regional Administrator Fox:

Enclosed please find for your review New Jersey's proposed revision to its Ozone State Implementation Plan, specifically the revised 15 percent Rate of Progress (ROP) Plan. As you are aware on December 12, 1997, the USEPA disapproved the State's previously approved plan. This action initiated the sanction and Federal Implementation Plan (FIP) processes, and a subsequent transportation conformity freeze. The State of New Jersey requests the USEPA parallel process its review of the New Jersey plan. This will allow for us to minimize any ramifications due to the disapproval of the original plan.

The revised plan includes all the measures of the original plan, except for the Enhanced Inspection and Maintenance (I/M) program and several new non-highway source measures to meet the emission target. These new measures include credit for: the USEPA spark ignition small engine regulation, the USEPA Architectural Coatings regulation, the USEPA Autobody refinishing regulation, the National Low Emission Vehicle program, the New Jersey Landfill Control Program and the New Jersey Architectural and Industrial Maintenance Coatings rule. The latter two programs were in place in 1996, but the State did not take credit for them in its original 15 percent plan. In addition to the revised 15 percent Rate of Progress plans, revised transportation conformity budgets are included which reflect the shift in the burden of emission reductions from highway vehicle control programs.

If you have any questions regarding this State Implementation Plan revision, please contact Mr. John C. Elston, Administrator of the Office of Air Quality Management at (609) 292-6710.

Sincerely,

Robert C. Shinn, Jr.
Commissioner

c: Governor Whitman
Commissioner Haley
Ron Borsellino, USEPA
John C. Elston, Administrator

The State of New Jersey
Department of Environmental Protection

Revision to the State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards

Proposed

Revision to the New Jersey 15 Percent Rate of Progress Plan

November 23, 1998

Preface

This document revises New Jersey's State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards (NAAQS). Specifically, the purpose of this SIP revision is to: 1) replace the State's 15 percent Rate of Progress (ROP) plans that was disapproved by the United States Environmental Protection Agency (USEPA) on December 12, 1997; and 2) provide for a 1999 Transportation Conformity Budget. The State's 15 percent ROP plans were disapproved by the USEPA based on the Federal Agency's finding that, due to delays in starting the enhanced inspection and maintenance (I/M) program, New Jersey cannot timely achieve the required 15 percent emission reductions.

Acknowledgments

The New Jersey Department of Environmental Protection (NJDEP) acknowledges the efforts and assistance of the many agencies and individuals whose contributions were instrumental in the preparation of this SIP revision. In particular, the NJDEP wishes to acknowledge the many individuals within the New Jersey Department of Transportation (NJDOT), the North Jersey Transportation Planning Authority (NJTPA), the South Jersey Transportation Planning Organization (SJTPO), the Delaware Valley Regional Planning Commission (DVRPC), the United States Environmental Protection Agency (USEPA) -- Region II, the Federal Highway Administration (FHWA) – New Jersey Division, and the staff within the NJDEP for their assistance and guidance.

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Acronyms and Abbreviations

AQCR	Air Quality Control Region
FHWA	Federal Highway Administration
FIP	Federal Implementation Plan
I/M	Inspection and Maintenance
MPO	Metropolitan Planning Organization
NAAQS	National Ambient Air Quality Standards
NHSDA	National Highway System Designation Act
NJDEP	New Jersey Department of Environmental Protection
NJDOT	New Jersey Department of Transportation
NO_x	Oxides of Nitrogen
ROP	Rate of Progress
SIP	State Implementation Plan
tpd	tons per day
USEPA	United States Environmental Protection Agency
VOCs	Volatile Organic Compounds

Executive Summary

This document contains New Jersey's proposed revisions to it's Phase I Ozone State Implementation Plan (SIP), specifically the 15 percent Rate of Progress (ROP) plan. The original plan was submitted on December 31, 1996. The United States Environmental Protection Agency (USEPA) granted conditional interim approval to New Jersey's Phase I Ozone SIP submittal on June 30, 1997.[†] However, on December 12, 1997, the USEPA subsequently converted its approval of the 15 Percent ROP Plans contained in New Jersey's Phase I Ozone SIP to a disapproval.[††] This action was taken after the USEPA determined that the emission reduction benefits claimed by the State for its enhanced inspection and maintenance (I/M) program would not be realized due to implementation delays. In the December 12, 1997 action, the USEPA did not take any negative action regarding the New Jersey's 24 percent ROP plan; it remains approved. Estimates indicated that the required 24% ROP Plan emissions will be achieved even without the enhanced I/M program by its incorporation of significant emission reductions in oxides of nitrogen (NO_x).[†††] These NO_x reductions were achieved by the NJDEP's Reasonably Available Control Technology (RACT) program in the 1995 timeframe. Additional NO_x reductions will be achieved in the summer of 1999 as required by the NOx budget program.[††††]

The purpose of this revision is to amend the State's 15 percent ROP plans. The revised plans includes all the measures of the original plan, except for the enhanced I/M program and several new non-highway source measures to meet the emission target. These new measures include credit for: 1) the USEPA spark ignition small engine regulation; 2) the USEPA Architectural Coatings regulation; 3) the USEPA Autobody Refinishing regulation; 4) the National Low Emission Vehicle program; 5) the New Jersey Landfill Control Program; and, 6) the New Jersey Architectural and Industrial Maintenance (AIM) program. The latter two programs were in place in 1996, but the State did not take credit for them in its original 15 percent plans. The USEPA has stated that to stop the sanction and FIP processes New Jersey must submit revised 15 Percent Rate of Progress Plans which include adopted State rules that provide for the necessary VOC emission reductions and which are approved by the USEPA. Therefore, as part of this revision, the State has revised its 15 Percent ROP Plans such that they no longer rely on the State's enhanced I/M program, but instead include both federal and State programs which provide for the necessary emission reduction benefits.

[†] 62 Fed. Reg. 35100, (June 30, 1997). In a letter dated May 29, 1997, New Jersey committed to perform the remodeling necessary to estimate the emissions reductions that would result from the enhanced I/M program, as implemented, within 12 months from the effective date of the USEPA's approval action (that is, by July 30, 1998).

[††] Letter dated December 12, 1997 to Commissioner Robert C. Shinn, Jr., NJDEP and Commissioner John J. Haley, Jr., New Jersey Department of Transportation, from Deputy Regional Administrator William J. Muszynski, P.E., USEPA, Region II. A similar, but less detailed letter, was sent on the same day to New Jersey Governor Christine Todd Whitman from Regional Administrator Muszynski.

[†††] The State of New Jersey Department of Environmental Protection, Phase I Ozone SIP Submittal, Remodeling of the 24 Percent Rate of Progress (ROP) Plans, July 30, 1998.

[††††] N.J.A.C. 7:27-31.

In addition to its revisions of the 15 percent ROP plans, the State has also included, as part of this revision, an updated Transportation Conformity budget for the year 1999 which reflects the shift in the burden of emission reductions away from highway vehicle control programs in the revised plans.

I. Introduction and Background

A. Prior Actions

On December 31, 1996, the New Jersey Department of Environmental Protection (NJDEP) submitted to the United States Environmental Protection Agency (USEPA) a revision to its State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards (NAAQS).[5] This submittal, hereafter referred to as the Phase I Ozone SIP, contained the State's 1996 15 percent and 1999 24 percent ROP plans demonstrating continued emission reduction progress as required by the Clean Air Act[6] and established transportation conformity budgets for New Jersey's three Metropolitan Planning Organizations for 1996 and 1999. The USEPA granted conditional interim approval to New Jersey's Phase I Ozone SIP submittal, including its 15 and 24 percent ROP plans, on June 30, 1997.[7]

On December 12, 1997, the USEPA took action against New Jersey by converting its approval of New Jersey's 15 percent ROP plans to a full disapproval pursuant to section 110(k) of the Clean Air Act.[8, 9] The USEPA subsequently formalized this disapproval in a notification of final rulemaking.[10] This disapproval was based on the determination that the benefits New Jersey claimed in these plans for its enhanced inspection and maintenance (I/M) program would not be realized. Specifically, the USEPA's conditional interim approval of New Jersey's 15 percent ROP plans was based, among other things, on the State commitment to begin enhanced I/M testing in sufficient time (that is, by November 15, 1997) to achieved the 15 percent reduction in volatile organic compound (VOC) emissions that the State relied upon to fulfill its 15 percent requirement. When the State failed to implement its enhanced I/M program by November 15, 1997, the USEPA determined that New Jersey could not timely achieve the required 15 percent emission reductions as

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[5] The State of New Jersey Department of Environmental Protection, State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards, Meeting the Requirements of the Alternative Ozone Attainment Demonstration Policy, Phase I Ozone SIP Submittal, December 31, 1996. This SIP revision was transmitted under a December 31, 1996 cover letter from Robert C. Shinn, Jr., Commissioner, NJDEP to Jeanne M. Fox, Regional Administrator, USEPA--Region II.

[6] 42 U.S.C. §7511a(b)(1)(A) and §7511a(c)(2)(B).

[7] 62 Fed. Reg. 35100, (June 30, 1997). In a letter dated May 29, 1997, New Jersey committed to perform the remodeling necessary to estimate the emissions reductions that would result from the enhanced I/M program, as implemented, within 12 months from the effective date of the USEPA's approval action (that is, by July 30, 1998).

[8] 42 U.S.C. 7410(k).

[9] Letter dated December 12, 1997 to Commissioner Robert C. Shinn, Jr., NJDEP and Commissioner John J. Haley, Jr., New Jersey Department of Transportation, from Deputy Regional Administrator William J. Muszynski, P.E., USEPA, Region II. A similar, but less detailed letter, was sent on the same day to New Jersey Governor Christine Todd Whitman from Regional Administrator Muszynski.

[10] 63 Fed. Reg. 45399 (August 26, 1998).

specified in its 15 percent ROP plans. On December 12, 1997, the USEPA also found that the State failed to implement its enhanced I/M program on schedule. The USEPA's disapproval action does not affect the conditional interim approval of the State's 24 percent ROP plans, as the State continues to meet its 24 percent ROP requirements. Estimates[11] indicated that the 24% Rate of Progress Plan will be achieved even without the enhanced I/M program by its incorporation of significant emission reductions in oxides of nitrogen (NO_x). These NO_x reductions were achieved by the NJDEP's Reasonably Available Control Technology (RACT) program in the 1995 timeframe. Additional NO_x reductions will be achieved in the summer of 1999 as required by the NOx budget program.[12]

The conversion of the conditional interim approval of the State's 15 percent ROP plans to a disapproval started a mandatory sanctions clock for New Jersey's 15 percent ROP plans. Unless this clock is stopped, New Jersey will face the imposition of federal sanctions.[13] The first sanction would occur in eighteen (18) months, or June 12, 1999, requiring new or modified major sources of VOCs and oxides of nitrogen (NO_x) to offset their potential emission at a rate of two tons of reduction for every one ton of emissions, pursuant to section 179(b)(2) of the Clean Air Act.[14] The second sanction would occur in twenty four months or six months later (December 12, 1999), imposing restrictions on New Jersey's receipt of Federal highway approvals and funds, pursuant to section 179(b)(1) of the Clean Air Act.[15]

In addition, two Federal Implementation Plan (FIP) clocks began as a result of the USEPA's December 12, 1997 disapproval action. First, a statutory 24-month 15 percent ROP plan FIP clock began for the New Jersey portion of the New York-Northern New Jersey-Long Island ozone nonattainment area, pursuant to section 110(c) of the Clean Air Act.[16] Unless this FIP clock is stopped, the USEPA must promulgate a Federal 15 percent ROP plan by December 12, 1999. Second, pursuant to a consent decree entered on March 26, 1997 in American Lung Association of Northern Virginia, et al. v. Carol M. Browner, Civ. No. 1:96CV01388, in the United States District Court for the District of Columbia, an expedited 15 percent ROP plan FIP clock began for the New Jersey portion of the Philadelphia-Wilmington-Trenton ozone nonattainment area. This clock requires the USEPA to propose a 15 percent ROP plan FIP for the New Jersey portion of the Philadelphia-Wilmington-Trenton ozone nonattainment area by January 15, 1999, and promulgate that FIP by August 15, 1999.

The USEPA's December 12, 1997 disapproval letter also found that New Jersey had failed to implement its enhanced I/M program on schedule (that is, by November 15, 1997). Although this finding does not effect the USEPA's approval of New Jersey enhanced I/M program, it did result in the start of a second sanctions clock, identical to the first clock (described above), that is, 2:1 offsets in 18 months followed

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[11] The State of New Jersey Department of Environmental Protection, Phase I Ozone SIP Submittal, Remodeling of the 24 Percent Rate of Progress (ROP) Plans, July 30, 1998.

[12] N.J.A.C. 7:27-31.

[13] 42 U.S.C. §7509(a)(2).

[14] 42 U.S.C. §7509(b)(2).

[15] 42 U.S.C. §§7509(b)(1).

[16] 42 U.S.C. §7410(c).

by transportation funding sanctions in 24 months, for New Jersey. This sanction clock will continue to run until the State commences implementation of its enhanced I/M program.

The USEPA conversion of the conditional interim approval on New Jersey's 15 percent ROP plans to a disapproval also triggered a transportation conformity "freeze," which went into effect 120 days (that is, April 12, 1998) after the disapproval action.[17] Under a conformity freeze, no new MPO Regional Transportation Plans and Transportation Improvement Programs (TIPs) may be found to conform. During the freeze, only projects in the first three years of the conforming Plan and TIP may be advanced, and exempt projects are the only projects that may be added to the TIP. In addition, after 24 months, that is, on December 12, 1999, a conformity lapse would take effect if New Jersey fails to develop an acceptable revised 15% plan by that date. Under a conformity lapse, only exempt and grandfathered projects may be advanced.

The submittal of the revised 15 percent ROP plans with the corresponding transportation conformity budgets, and subsequent finding of their adequacy by the USEPA, will lift the transportation conformity freeze and prevent the lapse in conformity.

In order to stop both the sanctions and FIP processes discussed above, New Jersey must: 1) submit revised 15 percent ROP plans which include adopted State rules that provide for the necessary emission reductions; and, 2) notify the USEPA that the State has begun implementation of its enhanced I/M program. In addition, the USEPA must approve the State's newly revised 15 percent ROP plans in a Federal Register notice. The proposed 15 percent ROP plans included in this SIP revision, once finalized and submitted to the USEPA, will fulfill the USEPA's first requirement for stopping the sanctions and FIP processes which are on-going for New Jersey. The State continues to work toward the full implementation of its enhanced I/M program. To that end, on August 7, 1998, the Treasurer signed a State contract with Parsons Infrastructure and Technology Group to design, build, operate and maintain the centralized portion of New Jersey's enhanced I/M program, and facilitate the integration of the decentralized portion of the program. Full program implementation is expected before December 12, 1999, thereby avoiding transportation funding sanctions based upon the untimely enhanced I/M program start-up.

B. New Guidance

The Clean Air Act requires states to develop and submit their 15 percent ROP plans by November of 1993.[18] These plans must demonstrate compliance with the 15 percent emission reduction goal net any increase in emissions during the 1996 ozone season. To address concerns with the interpretation of the Clean Air Act by the USEPA, Congress passed, and President Clinton subsequently signed into law, clarifying portions of the National Highway Systems Designation Act (NHSDA) of 1995.[19] These portions addressed the implementation of enhanced I/M programs. Specifically, the NHSDA required the USEPA not to assume an automatic 50 percent discount of decentralized (test-and-repair) inspection programs and allowed states to claim the appropriate credit for their decentralized programs, so long as they could prove this credit claim using full program implementation data. New Jersey took advantage of the provisions of the NHSDA and submitted a revision to its enhanced I/M SIP on March 27, 1996.

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[17] 40 C.F.R. Parts 51 and 93 (August 15, 1997).

[18] 42 U.S.C. 7511a(b)(1).

[19] P.L. 104-59 [s. 440], §348, (November 28, 1995).

Consistent with the provisions of the NHSDA, the USEPA policy calls for the implementation of the 15 percent ROP plan measures as soon as practicable.[20] For the purposes of this SIP revision, New Jersey takes advantage of this flexibility and has computed and presented the benefits of its control programs for 1999.

II. Update to the 1990 Base Year Emission Inventory and the 1996 and 1999 Projected Emission Inventories

The NJDEP submitted the last revision to its 1990 Base Year Emission Inventory and its 1996 and 1999 Projection Year Emission Inventories as part of its Phase I Ozone SIP submittal on December 31, 1996. The USEPA granted full approval the State's 1990 Base Year Emission Inventory and the 1996 and 1999 Projection Year Emission Inventories, on June 30, 1997.[21] The approval of the State's 1990 Emission Inventory and the 1996 and 1999 Projection Year Emission Inventories was unaffected by the USEPA's disapproval action regarding New Jersey's 15 percent ROP plans. However, as part of New Jersey's efforts to continually improve the accuracy of its emission estimates, the NJDEP identified an update/correction to the estimate of emissions from landfills. This update/correction is the result of three actions: 1) revised guidance from the USEPA for estimating emissions[22]; 2) correction of errors identified in the NJDEP's data; and, 3) updating the information in the data base with more accurate information. Each of these actions is summarized in the remainder of this section.

The USEPA developed new guidance for calculating landfill emission inventories. In its January 1997 update to AP-42 Section 2.4, the USEPA updated several of the landfill emission estimation model parameters. The AP-42 update also provided for the reapportionment of non-reactive VOCs from the total non-methane organic compounds (NMOC) landfill emission estimate. The application of new modeling parameters and reapportionment of the non-reactive VOCs fraction significantly adjusted New Jersey's landfill emission inventory.

The NJDEP corrected information included in its landfill emission database. These corrections mainly focused on the fact that some of the landfills previously considered to have accepted liquid solvent waste, i.e. co-disposal landfills, had most probably not accepted any such waste. Originally, the State classified many landfills as being co-disposal landfills because they had disposed of industrial waste. However, disposal of industrial waste does not necessarily result in higher landfill emissions, especially if that industrial waste was

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[20] Memorandum dated February 12, 1997 from John S. Seitz, Director, Office of Air Quality Planning and Standards (MD-10) and Richard B. Ossias, Deputy Associate General Counsel, Division of Air and Radiation, OGC (MC-2344) to the USEPA Regional Air Directors entitled "15 Percent VOC SIP Approvals and the "As soon As Practicable" Test."

[21] 62 Fed. Reg. 35100, (June 30, 1997). In a letter dated May 29, 1997, New Jersey committed to perform the remodeling necessary to estimate the emissions reductions that would result from the enhanced I/M program, as implemented, within 12 months from the effective date of the USEPA's approval action (that is, by July 30, 1998).

[22] AP-42, Compilation of Air Pollutant Emission Factors, Section 2.4, September 1997, the USEPA, Office of Air Quality Planning and Standards, Research Triangle Park, NC.

filtered sludge or construction debris instead of liquid solvents. In fact, disposal of these industrial wastes will generate less emissions than an ordinary municipal waste landfill.

Prior information on landfill acreage and waste density, and opening and closing dates, was updated from information obtained from a survey of sixteen (16) major solid waste landfills. Individual landfill gas modeling episodes were performed with this updated information for each of the 16 landfills. In most instances, the use of this updated information justifies the reporting of lowered emissions. This reduction at most of the 16 landfills is probably due to the fact that the new information included the date any flare or other control device was installed to control landfill emissions.

Table I summarizes the original[23] and adjusted landfill emission inventories for years 1990, 1996 and 1999 for the entire State, the New York and the Philadelphia AQCRs. The original projected landfill emission estimates for 1996 and 1999 did not account for the fact that landfill emissions decline over time as the amount of organic matter undergoing natural decay lessens and that many landfills had begun to install control devices after 1990. Table II shows the revised 1990 Base Year Inventory, as well as the revised 1996 and 1999 Projected Emission Inventories.

Table I: New Jersey's Adjusted Landfill Emission Inventory

Region	Original Documented 1990 to 1999 estimate [1, 2]	Updated 1990 estimate[2]	Updated 1996 estimate [2]	Updated 1999 estimate[2]
New Jersey Total	15.36	3.12	2.36	1.80
New York AQCR	9.38	2.09	1.70	1.34
Philadelphia AQCR	4.07	0.75	0.64	0.55

[1] Value remained the same for the years 1990, 1996 and 1999.
[2] All values are in tons per day (tpd).

[23] Appendices VI and VII, respectively, of the "State of New Jersey Department of Environmental Protection, State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards, Meeting the Requirements of the Alternative Ozone Attainment Demonstration Policy, Phase I Ozone SIP Submittal," December 31, 1996 describe the New Jersey's 1990 Base Year and 1996 and 1999 Projected Emission Inventories.

Table II: Updated 1990 Base Year Inventory and 1996 and 1999 Projected Inventories

	New York City AQCR (VOC Tons/Day)			Philadelphia AQCR (VOC Tons/Day)		
	1990	1996	1999	1990	1996	1999
Major Point Sources	238.02	211.93	216.28	111.68	85.87	87.93
Minor Point Sources	170.24	162.81	166.82	63.49	61.41	62.61
Area Sources	115.52	117.29	118.01	33.78	35.53	36.36
Highway Mobile Sources	296.66	246.71	242.41	103.45	89.22	88.17
Off-Highway Mobile Sources	136.58	139.82	141.44	45.76	48.13	49.34
Biogenic Sources[1]	209.66	---	---	203.20	---	---
Use of Pre-1990 Banked ERC	---	5.00	5.00	---	3.00	3.00
Total	1166.69	883.56	889.96	561.35	323.16	327.42

[1] The State did not account for biogenic sources in its 1996 and 1999 Projections.

III. Rate of Progress Plans

A. Original 15 Percent Rate of Progress Plans

Table III summarizes New Jersey's 15 percent ROP plans as they were approved by the USEPA.[24] As shown in this Table, the State determined that the plans must provide for an estimated 129.82 tons per day of VOC emission reductions in the New Jersey portion of the New York-Northern New Jersey-Long Island Air Quality Control Region (AQCR), subsequently referred to as the New York City AQCR, and 37.18 tons per

[24] Note that the benefits from the State's Employer Trip Reduction (ETR) Replacement Package are not included, since these benefits were not part of the 15 percent ROP plans as approved by the USEPA.

day of VOC emission reductions in the New Jersey portion of the Philadelphia-Wilmington-Trenton AQCR, subsequently referred to as the Philadelphia AQCR. In these original plans, the enhanced I/M program was expected to reduce VOC emissions by 33.08 tons per day (tpd) and oxides of nitrogen (NO_x) by 31.03 tpd emissions in the New York City AQCR and by 11.91 tpd of VOC and 9.88 tpd of NO_x in the Philadelphia AQCR. As discussed in Section I.A., this will not be timely achieved and the USEPA initiated the sanction process.

Table III: Summary of the Original 15% ROP Plans

	New York City AQCR[1] (Tons/Day)		Philadelphia AQCR[1] (Tons/Day)	
	VOC	**NO_x**	**VOC**	**NO_x**
1990 Base Year Emission Inventory	1,173.96	1,012.35	564.67	445.64
1990 Baseline Emission Inventory	958.19	1,012.35	359.90	445.64
Non-Creditable Emission Reductions	69.18	48.42	21.17	19.87
1990 Adjusted Baseline Emission Inventory	889.01	963.93	338.74	425.77
15% Reduction Requirement	133.35	N/A	50.81	N/A
1996 Target Emission Inventory	755.66	N/A	287.93	N/A
1996 Projected Emission Inventory	885.48	957.28	325.11	422.72
Shortfall	129.82	N/A	37.18	N/A
Mobile Source Benefits				
Tier I Vehicles	1.96	11.15	0.73	3.73
Reformulated Gasoline — On Highway	47.99	0.62	17.51	0.20
Reformulated Gasoline — Off Highway	4.32	N/A	1.33	N/A
Enhanced Inspection and Maintenance	33.08	31.03	11.91	9.88
Stationary Source Benefits				
Barge Loading	21.08	N/A	1.21	N/A
RACT				
Subchapter 16: Asphalt Plants	0.00	N/A	0.47	
Subchapter 16 & 19: Boilers	0.15	44.23	0.16	43.36
Subchapter 16: Flares	0.00	N/A	0.70	N/A
Subchapter 16: Gas Pipeline Blowdowns	0.22	N/A	0.00	N/A
Subchapter 16 & 19: Internal Combustion Engines	0.00	0.67	0.00	0.14
Subchapter 16: Leak Detection and Repair	5.41	N/A	0.71	N/A
Subchapter 16: Transfer of Vol. Org. Liquids	1.04	N/A	0.09	N/A
Subchapter 16 & 19: Combustion Turbines	0.11	22.47	0.04	11.77
CTG: SOCMI Distillation and Reactors	6.21	N/A	0.95	N/A
CTG: Offset Lithography	3.10	N/A	0.63	N/A
CTG: Plastic Parts Coating	.10	N/A	0.00	N/A
New Jersey Consumer Products rule	5.93	N/A	1.79	N/A
Federal HON Rule	0.12	N/A	0.06	N/A
Total Benefits	130.82	110.18	38.29	69.08
Remaining Shortfall[2]	-1.00	N/A	-1.10	N/A

[1] New Jersey portion only.

[2] Zero or negative values indicate achievement of the 15% reduction requirement.

NOTE: This table does not include the benefits from the ETR Replacement Package, which was not part of the 15% ROP plans as approved by the USEPA.

B. The Revised 15 Percent Rate of Progress Plans

1. Recalculation of the Target Emission Inventories and Subsequent Shortfall

Since New Jersey is proposing to revise its 1990 base year and subsequent projection year emission inventories (see Section II), the first step in developing the revised 15 percent ROP plans is to recompute the emission target and accompanying shortfall. The process to compute the targets is described in detail in the New Jersey Phase I Ozone SIP.[25] Table IV presents the revised target and accompanying shortfall the State's ROP plans must address.

Table IV: Revised 15% ROP Plan Shortfall

	New York City AQCR (VOC Tons/Day)	**Philadelphia AQCR (VOC Tons/Day)**
1990 Base Year Emission Inventory	1166.69	561.35
1990 Baseline Emission Inventory	950.91	356.59
Non-Creditable Emission Reductions	69.18	21.17
1990 Adjusted Baseline Emission Inventory	881.73	335.42
15% Reduction Requirement	132.26	50.31
1996 Target Emission Inventory	749.47	285.11
1996 Projected Emission Inventory	883.56	323.16
Shortfall	134.10	38.05

2. Revised Control Measure Plan

Table V provides a comparison of the control programs that were used in the original and those that are proposed to remain in the revised 15 percent ROP plans to meet the emission target. It also notes the additional control measures included in the revised plans which were not originally included in the 15 percent ROP plans.

The remainder of this section discusses the new control programs used in the revised 15 percent ROP plans, the 1999 emission reduction benefits associated with these programs, and how these benefits were calculated. For a detailed discussion of the control programs that were included in the original and subsequently remain in this proposed revised 15 percent ROP plans,

[25] Appendices VI of the "State of New Jersey Department of Environmental Protection, State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards, Meeting the Requirements of the Alternative Ozone Attainment Demonstration Policy, Phase I Ozone SIP Submittal," December 31, 1996.

refer to the original Phase I Ozone SIP.[26] The control measures are divided into two categories, those implemented by the Federal government and those implemented by the State of New Jersey.

[26] "State of New Jersey Department of Environmental Protection, State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards, Meeting the Requirements of the Alternative Ozone Attainment Demonstration Policy, Phase I Ozone SIP Submittal," December 31, 1996.

Table V: Comparison of Control Programs in Original and Revised 15% ROP Plans

Control Programs	Original Plan	Revised Plan
Mobile Source Programs		
Tier I Vehicles	X	X
Reformulated Gasoline — On Highway	X	X
Reformulated Gasoline — Off Highway	X	X
Enhanced Inspection and Maintenance	X	
Basic Inspection and Maintenance		X
National Low Emission Vehicle Program		X
Federal Spark Ignition Small Engine Program		X
Stationary Source Programs		
Barge Loading	X	X
RACT	X	X
Subchapter 16: Asphalt Plants	X	X
Subchapter 16 & 19: Boilers	X	X
Subchapter 16: Flares	X	X
Subchapter 16: Gas Pipeline Blowdowns	X	X
Subchapter 16 & 19: Internal Combustion Engines	X	X
Subchapter 16: Leak Detection and Repair	X	X
Subchapter 16: Transfer of Vol. Org. Liquids	X	X
Subchapter 16 & 19: Combustion Turbines	X	X
CTG: SOCMI Distillation and Reactors	X	X
CTG: Offset Lithography	X	X
CTG: Plastic Parts Coating	X	X
New Jersey Consumer Products rule	X	X
Federal HON Rule	X	X
New Jersey AIM Program		X
New Jersey Landfill Control Program		X
Federal Autobody Refinishing Program		X
Federal Architectural Coatings Program		X

a. State Measures

(1) New Jersey's Architectural and Industrial Maintenance (AIM) Program

In 1989, the NJDEP adopted a rule which limited the VOC content of architectural coatings and consumer products at N.J.A.C. 7:27-23 (Prevention of Air Pollution From Architectural Coatings and Consumer Products). This rule was subsequently amended in 1990, 1992, and 1994. This rule, hereafter referred to as the New Jersey AIM rule, took effect in January 1990 for Group 1 products, and in March 1990 for Group 2 products, and allowed coatings manufactured before 1990 to be sold until 1993. Although the rule for implementation of this program was adopted and SIP-approved[27] prior to the State's submittal of its original 15 percent ROP plans, the State did not include this program's benefits in the original 15 percent ROP plans.

In developing its 1990 Base Year Emission Inventory, the State did consider the reductions achieved from traffic paints and high performance maintenance coatings, which are both regulated under the New Jersey AIM program. Thus no additional benefits for these two categories are included in the benefit estimates. However, because of uncertainty at the time in determining when the actual emission reductions from the remaining categories regulated would occur, the State decided to consider the combination of these remaining categories as uncontrolled in the 1990 Base Year Emission Inventory. The uncertainty is related to provisions which allowed the sale of products already in the distribution chain until 1993.

The State has estimated that by 1999, the New Jersey AIM rule will achieve emission reductions of 4.91 tons per day in New York AQCR and 1.51 tons per day in the Philadelphia AQCR by 1999. In the calculation of the benefits for the New Jersey AIM rule, an 80% Rule Effectiveness (RE) factor was used. This was included, in part, to take into consideration the use of non-conforming products purchased in other states, but used in New Jersey. For more information on how these emission reduction benefits were calculated, refer to Appendix III, Section 5.

As discussed in further in Section II.B.2.ii.(1), the USEPA has also implemented a Federal Architectural Coatings rule.[28] The Federal Architectural Coatings program goes beyond the New Jersey AIM rule in that it is more stringent for several categories of architectural coatings than the New Jersey rule.

(2) Landfill Control Program

Over the past decade, New Jersey has implemented a landfill closure program. As part of this program, landfills are required to include a gas collection system prior to closure of the landfill. In accordance with N.J.A.C. 7:27-8, controls are required on the collection system vents.

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[27] 58 Fed. Reg. 29975, (August 9, 1990).

[28] 63 Fed. Reg. 48848, (September 11, 1998).

The State takes credit for the reductions obtained through these landfill gas recovery initiatives. Although the permitting requirements used in the implementation of this program were adopted and SIP-approved prior to the State's submittal of its original 15 percent ROP plans, the State did not include this program's benefits in the original 15 percent ROP plans.

As part of the NJDEP's effort to continually improve its emission inventories, the NJDEP identified creditable emission reductions resulting from the installation of landfill emission controls between the period of 1991 and 1999. Based on a survey of sixteen (16) major solid waste landfills, it was determined that several landfills applied such controls between 1991 and the present day. A control efficiency typical of flares and energy conversion devices was applied to estimate emission reductions. The creditable VOC emission reductions realized from landfills is 0.37 tpd in the New Jersey portion of the New York AQCR and 0.12 tpd in the New Jersey portion of the Philadelphia AQCR.

For more information on how these emission reduction benefits were calculated, refer to Appendix III, Section 3.

(3) National Low Emission Vehicle Program

On November 22, 1995, New Jersey adopted a Low Emission Vehicle (LEV) program with new car emission standards identical to the California LEV program.[29] Subsequently, and after negotiations on the part of USEPA, the OTC states and the automobile manufacturers, the USEPA promulgated a rule creating a National Low Emission Vehicle program (NLEV). The USEPA found the NLEV program to be equivalent to the California LEV program.[30] On January 28, 1998, New Jersey opted to participate in the NLEV program. On March 9, 1998, the USEPA found the NLEV program in effect.[31] The State is now in the process of amending its LEV rule to reflect its commitment to the NLEV program. These amendments will appear in the December 7, 1998 New Jersey Register. A hearing on these amendments is scheduled for January 6, 1998.

The NLEV program calls for manufacturers to produce cleaner motor vehicles beginning with model year 1999. As such, this program's benefits are beginning to accrue during calendar year 1998. Benefits from this program will be realized in 1999 and, as such, are included in New Jersey's 15 percent ROP plans. No credit for any LEV program was taken in the original 15 percent ROP plans, because the program was still under development, and the State was uncertain as to when program benefits would begin. The State has estimated the benefits from this program for calendar year 1999 at 0.48 tpd for the New York AQCR and 0.18 tpd for the Philadelphia AQCR. For more information on how these emission reduction benefits were calculated, refer to Appendix III, Section 1.

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[29] See 27 N.J.R. 5016(a) (December 18, 1995). The LEV rule is codified at N.J.A.C. 7:27-26.

[30] 62 Fed. Reg. 31192 (June 6, 1997).

[31] 63 Fed. Reg. 11374 (March 9, 1998).

(4) Revisions to Basic Inspection and Maintenance (I/M) Program

The State of New Jersey has implemented a statewide emission inspection program since 1974. This basic I/M program, which was the first of its kind in the nation, requires that all non-exempt gasoline-fueled motor vehicles be inspected using an idle exhaust emission test. As vehicle emission control technology improved, additional design elements were made to the State's basic program, such as inspections for the presence of a catalytic converter and the possible use of leaded gasoline (leaded gasoline reduces the effectiveness of the vehicle's catalytic converter).

Since 1990, several changes were made to the State's basic I/M program. The impact of these changes is reflected in this section. First, in 1990, the compliance rate, that is, the percentage of vehicles subject to the program which are meeting the requirements of the program, was 91 percent. However, in the earlier 1990s, the State significantly increased the penalty for operating an motor vehicle with expired inspection sticker. The State believes that this action was primarily responsible for increasing the compliance rate to 96 percent, where it has been for the last several years. Further, during the transition to the State's enhanced I/M program, the State will continue to require compliance with its basic I/M program, albeit on a biennial (every other year) schedule. As such, the State will continue to reap benefits from its basic I/M program until the implementation of the enhanced program, which is expected by the end of 1999. To offset any loss in VOC emission reductions from the transition to a biennial testing frequency, the State implemented, as part of its basic inspection program: 1) a test for the integrity of a vehicle's gas cap at all centralized inspection facilities; and, 2) a visual inspection of the gas cap and evaporative emission control system at all decentralized inspections for all vehicle originally equipped with a sealed gas cap (1971 and newer model year vehicles).

The State estimated that the positive impact of an increased compliance rate combined with the new gas cap inspection procedure will more than offset the negative impact from switching from an annual to a biennial inspection frequency, resulting in a benefit of 2.47 tpd in the New York AQCR and 1.10 tpd in the Philadelphia AQCR by the year 1999. For more information on how these emission reduction benefits were calculated, refer to Appendix III, Section 1.

b. Federal Measures

(1) Federal Architectural Coatings Program

On September 11, 1998, the USEPA promulgated its Architectural Coatings regulation.[32] This rule is applicable to all entities that manufacture or import for sale or distribution in the United States architectural coatings. Architectural coatings include, but are not limited to, such coatings as: primers and sealers, flat and nonflat paints, stains, enamels, and wood preservatives. A complete list of coatings subject to this rule is contained in 40 CFR Part 59, Subpart D, Table 1. The VOC content standards are dependent on the coating category and specify limitations expressed as grams of VOC per liter of coating. Architectural coatings manufactured on or after

[32] 63 Fed. Reg. 48848.

September 11, 1999 for sale or distribution in the United States must meet the VOC content limitations of the Federal regulation. The Federal rule also provides for a tonnage exemption for a limited quantities of coatings and an exceedance fee provision which allows manufacturers or importers the option of paying a fee, based on the amount that VOC content levels are exceeded, instead of actually achieving the VOC content limitations.

Given that New Jersey already regulates many of the AIM categories, only the incremental benefits of the Federal AIM rule above the New Jersey rule are included in the revised 15 percent ROP plans. The expected incremental benefit of the Federal Architectural Coatings rule beyond the New Jersey AIM rule is estimated at 3.22 tpd in the New York AQCR and 1.15 tpd in the Philadelphia AQCR. USEPA policy allows states to take credit for this Federal program through the year 1999 for their 15 percent ROP plans.[33] See Appendix III, Section 5 for a discussion of the calculations used to determine these benefits.

(2) Federal Spark Ignition Small Engine Regulation

On July 3, 1995, the USEPA promulgated the first phase of its final regulations to control emissions from new non-road spark-ignition engines.[34] This regulation, entitled "Control of Air Pollution; Emission Standards for New Non-road Spark-Ignition Engines at or Below 19 Kilowatts," sets forth VOC, carbon monoxide, and NO_x emission standards which apply to all 1997 and newer non-road spark-ignition vehicles/engines that have a gross power output at or below 19 kilowatts. These engines are used principally in lawn and garden equipment, including, but not limited to, lawn mowers, leaf blowers, trimmers, chainsaws, and generators.

The USEPA determined that the first phase of its federal non-road emission standards would reduce VOC emissions nationally by 13.1 percent in 1997, 19.5 percent in 1998, and 23.9 percent in 1999. Applying these national percentages to New Jersey's specific engine population, the resulting VOC emission reductions in 1999 for New Jersey would be 16.16 tpd in the New York AQCR and 5.70 tons per day in the Philadelphia AQCR. For a more detailed discussion of how the emission reductions from the Federal small, non-road vehicle/engine rule were calculated, see Appendix III, Section 2.

(3) Federal Autobody Refinishing Rule

On September 11, 1998, the USEPA promulgated its regulations to control emissions from autobody refinishing coatings at 40 C.F.R. Part 59, Subpart B - "National Volatile Organic

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[33] Memorandum dated November 29, 1994 from John S. Seitz, Director, Office of Air Quality Planning and Standards, USEPA, to the USEPA Regional Air Directors entitled "Credit for the 15 Percent Rate-of-Progress Plans for Reductions from the Architectural and Industrial Maintenance (AIM) Coating Rule and the Autobody Refinishing Rule". Also, memorandum dated February 12, 1997 from John S. Seitz, Director, Office of Air Quality Planning and Standards (MD-10) and Richard B. Ossias, Deputy Associate General Counsel, Division of Air and Radiation, OGC (MC-2344) to the USEPA Regional Air Directors entitled "15 Percent VOC SIP Approvals and the "As soon As Practicable" Test.".

[34] 60 Fed. Reg. 34581.

Compound Emission Standards for Automobile Refinish Coatings" (Subpart B).[35] This regulation applies to all individuals that manufacture and/or import automobile refinish coating components or complete refinishing coatings. Specifically, these individuals must insure compliance of all automobile refinish coatings and coating components manufactured on or after January 11, 1999. Regulated automobile refinish coatings include: pretreatment wash primers, primers/primer surfacers, primer sealers, single/two-stage topcoats, topcoats of more than two stages, multi-colored top coats, and specialty coatings. As with the Federal Architectural Coatings Program, USEPA policy allows states to take credit for this Federal program through the year 1999 for their 15 percent ROP plans.[36]

The State determined that the Federal autobody refinishing rule would result in 1999 VOC emission reductions of 13.23 tpd in the New York AQCR and 3.44 tpd in the Philadelphia AQCR. The estimated tpd emission reduction benefits were determined using New Jersey specific automobile refinishing industry data.

IV. Summary of New Jersey's Revised 15 Percent Rate of Progress Plans

Table VI shows the State's revised 15 percent ROP plans for both the New York City and Philadelphia AQCRs. As shown by this table, the State now meets the 15 percent ROP emission reduction target in both the New York City and Philadelphia AQCRs without the benefits of its enhanced I/M program. However, implementation of the State's enhanced I/M program is still needed to provide the emission reductions necessary for New Jersey to attain and maintain both the one-hour and eight-hour ozone National Ambient Air Quality Standards (NAAQS). Additionally, the implementation of the State's enhanced I/M program is necessary to stop the sanction process. Table VII outlines the implementation status for the control programs contained in the revised 15 percent ROP plans. As shown by this table, any program which has not already been implemented, will be implemented as expeditiously as practicable.

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[35] 63 Fed. Reg. 48806.

[36] Memorandum dated November 29, 1994 from John S. Seitz, Director, Office of Air Quality Planning and Standards, USEPA, to the USEPA Regional Air Directors entitled "Credit for the 15 Percent Rate-of-Progress Plans for Reductions from the Architectural and Industrial Maintenance (AIM) Coating Rule and the Autobody Refinishing Rule". Also, memorandum dated February 12, 1997 from John S. Seitz, Director, Office of Air Quality Planning and Standards (MD-10) and Richard B. Ossias, Deputy Associate General Counsel, Division of Air and Radiation, OGC (MC-2344) to the USEPA Regional Air Directors entitled "15 Percent VOC SIP Approvals and the "As soon As Practicable" Test.".

Table VI: Revised 15% ROP Control Measures

	New York City AQCR (VOC Tons/Day)	Philadelphia AQCR (VOC Tons/Day)
Shortfall	134.10	38.05
Mobile Source Benefits		
Tier I Vehicles	14.85	5.53
Reformulated Gasoline — On Highway	45.98	16.77
Reformulated Gasoline — Off Highway	4.37	1.36
Basic Inspection and Maintenance	2.47	1.10
National Low Emission Vehicle Program	0.48	0.18
Federal Spark Ignition Small Engine Program	16.16	5.70
Stationary Source Benefits		
Barge Loading	22.75	1.23
RACT		
Subchapter 16: Asphalt Plants	0.00	0.46
Subchapter 16 & 19: Boilers	0.16	0.17
Subchapter 16: Flares	0.00	0.69
Subchapter 16: Gas Pipeline Blowdowns	0.24	0.00
Subchapter 16 & 19: Internal Combustion Engines	0.00	0.00
Subchapter 16: Leak Detection and Repair	5.51	0.72
Subchapter 16: Transfer of Vol. Org. Liquids	1.07	0.09
Subchapter 16 & 19: Combustion Turbines	0.12	0.04
CTG: SOCMI Distillation and Reactors	6.40	0.98
CTG: Offset Lithography	3.14	0.64
CTG: Plastic Parts Coating	0.10	0.00
New Jersey Consumer Products rule	5.98	1.84
New Jersey Landfill Controls	0.37	0.12
New Jersey AIM Rule	4.91	1.51
Federal HON Rule	0.12	0.06
Federal Architectural Coatings Rule	3.22	1.15
Federal Autobody Refinishing Rule	13.23	3.44
Total Benefits	151.61	43.77
Remaining Shortfall	-17.51	-5.73

Table VII: Implementation Status of the Measures Contained in New Jersey's 15 Percent ROP Plans

Control Programs	Implementation Status
Mobile Source Programs	
Tier I Vehicles	Implemented and reduction being achieved
Reformulated Gasoline — On Highway	Implemented and reduction being achieved
Reformulated Gasoline — Off Highway	Implemented and reduction being achieved
Enhanced Inspection and Maintenance	
Basic Inspection and Maintenance	Implemented and reduction being achieved
National Low Emission Vehicle Program	Implemented and reduction being achieved
Federal Spark Ignition Small Engine Program	Implemented and reduction being achieved
Stationary Source Programs	
Barge Loading	Implemented and reduction being achieved
RACT	Implemented and reduction being achieved
Subchapter 16: Asphalt Plants	Implemented and reduction being achieved
Subchapter 16 & 19: Boilers	Implemented and reduction being achieved
Subchapter 16: Flares	Implemented and reduction being achieved
Subchapter 16: Gas Pipeline Blowdowns	Implemented and reduction being achieved
Subchapter 16 & 19: Internal Combustion Engines	Implemented and reduction being achieved
Subchapter 16: Leak Detection and Repair	Implemented and reduction being achieved
Subchapter 16: Transfer of Vol. Org. Liquids	Implemented and reduction being achieved
Subchapter 16 & 19: Combustion Turbines	Implemented and reduction being achieved
CTG: SOCMI Distillation and Reactors	Implemented and reduction being achieved
CTG: Offset Lithography	Implemented and reduction being achieved
CTG: Plastic Parts Coating	Implemented and reduction being achieved
New Jersey Consumer Products rule	Implemented and reduction being achieved
Federal HON Rule	Implemented and reduction being achieved
New Jersey AIM Program	Implemented and reduction being achieved
New Jersey Landfill Control Program	Implemented and reduction being achieved
Federal Autobody Refinishing Program	Regulation requires compliant coatings be sold on or after January 11, 1999
Federal Architectural Coatings Program	Regulation requires compliant coatings be sold on or after September 11, 1999

V. 1999 Transportation Conformity Budget

The Clean Air Act, 42 U.S.C. §7506, requires that the emissions resulting from transportation plans, programs and projects conform to the highway source emissions projections (referred to as "emissions budgets") contained in each state's SIP. The rule implementing 42 U.S.C. §7506 is referred to as the transportation conformity rule. In practice, the rule is implemented by the metropolitan planning organizations (MPOs), who must make a conformity determination before approving certain transportation plans, programs, or projects.

The State has included, as part of this SIP revision, an update to the 1999 transportation conformity budget for all three MPOs. This budget reflects the revised control strategies/measures plan. It is the State intention to update all of the out-year transportation conformity budgets (2002, 2005 and 2007) in a subsequent SIP submittal.

Table VIII represents the revised highway mobile source emission budget for 1999. Rather than aggregating the total emissions within the boundaries of the Air Quality Control Region (AQCR), the budgets are set by aggregating the total county-wide emissions within each MPO boundary.

Table VIII: Emission Budgets for Conformity

	VOC (Tons/Day)	**NO_x (Tons/Day)**
1999		
NJTPA	182.23	279.14
DVRPC (New Jersey Portion)	57.97	81.57
SJTPO	21.45	33.86

42 U.S.C. §7506 also requires that emissions from all Federal actions, except Federal Highway Administration (FHWA) and Federal Transit actions, which are covered by transportation conformity, conform with the State's Implementation Plan. The USEPA promulgated rules establishing the procedures implementing the requirements of 42 U.S.C. §7506.[37] According to the USEPA rules, any federally sponsored or approved project which exceeds specific emission thresholds must also conform with the emission budgets established in the SIP; this rule is referred to as the general conformity rule. The State is making no adjustments to its general conformity budget, which was set forth in the State original 15 percent ROP plans. For more information on the State's general conformity budget, refer to the New Jersey's "State Implementation Plan (SIP) Revision for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards, Meeting the Requirements of the Alternative Ozone Attainment Demonstration Policy, Phase I Ozone SIP Submittal," December 31, 1996.

[37] 40 C.F.R. Parts 6, 51 and 93.

VI. Conclusion

Once finalized, submitted and approved by the USEPA, this revision of the State's 15 percent ROP plans, and the associated 1999 transportation conformity budget, will stop the sanction clock which is running due to the conversion of the State's 15 percent ROP plans from approved to disapproved and the FIP clocks for both the New York and Philadelphia AQCRs. This submittal will not, however, stop the sanction clock which is running due to the State's failure to implement its enhanced I/M program on time. This sanction clock will stop only after the State has fully implemented its enhanced I/M program.

The State of New Jersey
Department of Environmental Protection

Revision to the State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards

Proposed
Revision to the New Jersey 15 Percent Rate of Progress Plan

Appendix I: Public Participation

November 23, 1998

The announcement on the proposed revision to New Jersey's Ozone State Implementation Plan (SIP), specifically the 15% Rate of Progress Plan will appear in approximately six (6) newspapers throughout the state on or before December 4, 1998. In addition, it will appear as a Miscellaneous Notice in the New Jersey Register on December 21, 1998. This proposed SIP will be transmitted to the USEPA Region II Administrator on November 23, 1998. It will be sent to the states within the Ozone Transport Region and other interested parties on or before December 1, 1998.

The Public Hearing on this proposed SIP Revision is scheduled to occur on January 5, 1999, in the DEP public hearing room at 401 E. State Street in Trenton beginning at 10 a.m.

The comment period is scheduled to close on January 11, 1999.

Upon closure at the comment period this Appendix will be updated to include the legal notice, the State's response to comment document and verification that the advertisement did occur in compliance with 40CFR 51.102.

The State of New Jersey
Department of Environmental Protection

Revision to the State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards

Proposed
Revision to the New Jersey 15 Percent Rate of Progress Plan

Appendix II: Landfill Emission Inventory Updates

November 23, 1998

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II Overview

The New Jersey Department of Environmental Protection (NJDEP) proposes to adjust its 1990 base and future year landfill emission inventories and estimated the emission reductions from the installation of landfill emission controls between 1991 and 1999. The landfill emission inventory adjustment resulted in estimates of statewide Volatile Organic Compounds (VOC) emissions in 1990 of 3.122 tons per day (tpd) and not 15.36 tpd as was previously documented in State Implementation Plan (SIP) documents.

The main reasons for the landfill emission inventory adjustment are as follows:

The USEPA developed new guidance for calculation of landfill emission inventories. USEPA in the recent January 1997 update to AP-42 Section 2.4 included less conservative landfill emission estimation model parameters that provided for more realistic estimations of landfill emissions. The AP-42 update also provided for the cancellation of non-reactive VOCs from the total non-methane organic compounds (NMOC) landfill emission estimate. The application of new modeling parameters and cancellation of non-reactive VOCs significantly adjusted the landfill emission inventories.

NJDEP corrected information included in the landfill emission database. These corrections mainly concerned the fact that some of the landfills previously considered to have accepted liquid solvent waste, i.e., co-disposal landfills, had most probably not accepted any such waste. Many landfills had been considered to be co-disposal just because they had disposed of industrial waste. However disposal of industrial waste may not result in higher landfill emissions if that industrial waste was filtered sludge or construction debris instead of liquid solvents. For example, the emission statement for the Ciba Geigy facility in Toms River reported landfill VOC emissions of only 0.01 tons per year (tpy). Previously estimated VOC emissions were 22.43 tpy for the Ciba Geigy landfill. Clearly the industrial waste from this landfill generated less emissions than an ordinary municipal waste landfill. Therefore industrial landfills should not be considered to be a co-disposal landfill unless information has been provided to indicate that the industrial landfill accepted liquid solvents.

Prior information on landfill acreage and waste density, and opening and closing date had been updated from information obtained from a survey of 16 major solid waste landfills. Individual landfill gas modeling episodes were performed with this updated information for each of these landfills. In most instances the introduction of more accurate information lowered emissions for these 16 major landfills since this information included the date any flare or other control device was installed to control landfill emissions.

Table 1 provided below includes both the original and adjusted landfill emission inventories for years 1990, 1996 and 1999 for the entire State, the New York/Northern New Jersey and the Philadelphia Air Quality Control Regions. These inventories did not consider the emission reductions achieved by landfill emission controls installed from 1991 to 1998. These emission reductions are considered in Appendix 3 of this SIP. Please also note that the original documented landfill emission values for 1996 and 1999 are the same as their 1990 value. Thus no consideration had been previously made for the fact that some landfill emissions decline over time from the natural decay of organic matter.

Table 1: Landfill Emission Inventory Without Controls installed between 1991 and 1999

Region	Original Documented 90 to 99 value* tons per day (TPD)	Up-dated 90 value TPD	Up-dated 96 value TPD	Up-dated 99 value TPD
Total State	15.36	3.1215	2.5738	2.0851
New York/Northern NJ AQCR	9.377	2.0875	1.7010	1.3371
Philadelphia AQCR	4.0718	0.7462	0.6481	0.5466

*Value never changed from 90 to 99 in the Phase I Ozone SIP. (December 31, 1996)

A detailed discussion on the methodology used to calculate landfill emissions is provided in Section B below. This is followed in Section C by a detailed discussion on how each of the major factors listed above adjusted the landfill emission inventory.

B. Landfill Emission Estimation Methodology

The USEPA Landfill Air Emissions estimation model estimates the emissions resulting from the biodegradation of refuse in landfills. The anaerobic decomposition of refuse in solid waste landfills causes emissions of landfill gas. As landfill gas passes through the refuse, it sweeps nonmethane organic compounds (NMOC) present in the refuse to the surface. The computer model uses a first order decomposition rate equation to estimate annual NMOC emissions over any time period. This equation is as follows:

$M_{NMOC}=2L_oR(e^{-kc} - e^{-kt})(C_{NMoc})(3.6x10^{-9})$

where,
M_{NMOC}=mass emission rate of NMOC, megagrams per year
L_o=methane generation potential, cubic meters per megagram solid waste
R=average annual acceptance rate, megagrams per year
k=methane generation rate constant, $year^{-1}$
t=age of landfill, years
C_{NMOC}=concentration of NMOC, parts per million by volume as hexane (ppmv)
c=Time since closure, years. For active landfill c = 0 and e^{-kc} = 1
3.6 x 10^{-9} =conversion factor

Landfill information for parameters R (average annual acceptance rate), c (time since closure), and t (age of the landfill) was not generally available for many landfills in New Jersey especially during the development of the original 1990 landfill emission inventory. NJDEP relied on landfill default factors developed by its Division of Solid Waste (DSW) to estimate these model parameters if specific information was not available. Later adjustments to the 1990 landfill emission inventory and the development of the 1996 landfill emission inventory did include the use of specific information for these parameters for some of the larger Municipal Solid Waste (MSW) landfills as discussed below in Section C.3. However most of the over 400 landfills included in the inventory database still relied on these default factors. A discussion of each parameter and the default factors needed to determine them is provided below:

R (average annual acceptance rate) Parameter

R can be determined by dividing the refuse in place by the age of landfill when the refuse acceptance rate is scant or unknown. R can also be determined by dividing the total landfill waste acreage or total cubic yards of waste with the age of the landfill and then multiplying by the default density factors of (20,000 tons/acre) or (1 ton/3.3 cubic yards) respectively, if the total refuse in place cannot be determined. Actual density factors for individual landfills can also be applied instead of these default factors if supplied by the landfill operator. However the only information NJDEP had when it calculated R for all the landfills included in the original 1990 emission inventory and most of them included in the adjusted 1990 and 1996 emission inventories was a listing provided by the DSW which included landfill acreage and closure date and waste type. The reader should refer to appendix I of this report to view this list and the discussion in Section C.3 below to ascertain when actual information had been applied to landfill inventory for the c and t parameters.

Finally if a facility has documentation that a certain segment (cell) of a landfill received only nondegradable refuse, then the waste from this segment of the landfill can be excluded from the calculation of R. Nondegradable refuse includes concrete, brick, stone glass, plaster, wallboard, piping, plastics, and metal objects.

c (time since closure) and t (age of landfill) parameters

The life parameter, c, includes the total number of years from landfill closure to the projection date. The time variable, t, includes the total number of years that the refuse has been in place (including the number of years that the landfill has accepted waste and, if applicable, has been closed). NJDEP applied a default factor to the c and t parameters for all of the landfills included in the original 1990 emission inventory and most of the landfills included in the adjusted 1990 and the 1996 emission inventories. The DSW indicated that the average operative life of a landfill was 20 years, and that a landfill would have closed by the year 1990 if the actual closure date had not been known, i.e. t = 28. The reader should again refer to the DSW list following this discussion and the discussion in Section C.3 below to ascertain when actual information had been applied to the landfill inventory for the c and t parameters.

Lo (methane generation potential) and k (methane rate constant)

The Landfill Air Emission Estimation model includes both regulatory default values and recommended AP-42 default values for L_o and k. The regulatory default values represent very conservative values developed for compliance purposes (NSPS/Emission Guideline). The other set of default values is based on emission factors from the January 1997 update to the USEPA Compilation of Air Pollutant Emission Factors, AP-42 Section 2.4 (AP-42). This set of default values produces more representative emission values and can be used to produce typical emission estimates in the absence of site-specific test data. The current recommended AP-42 defaults used in the development of the adjusted 1990 and 1996 emission inventory include a k value of 0.04/yr for areas receiving 25 inches or more of rain per year. An L_o value of 100 cubic meters per megagram ($m^3/\mu g$) refuse is appropriate for most landfills. NJDEP previously utilized the same k value of 0.04/yr but a different L_o value of 124.92 $m^3/\mu g$. This L_o value was originally recommended by an earlier edition of AP-42 when it developed the 1990 emission inventory. A discussion on the affect that this difference in parameter values has on the landfill emission inventory is provided below in Section C.

CO_2 and CH_4 and NMOCs When gas generation reaches steady state conditions, landfill gas consists of approximately 55 percent by volume CH_4, 45 percent CO_2 and other gases, and trace amounts of NMOCs. Most of the NMOC emissions result from the volatization of organic compounds contained in the landfilled waste. For emission inventory purposes, site-specific information should be taken into account when determining the total NMOC concentration. In the absence of site-specific information, a value of 2,420 parts per million volume as hexane was used for landfills known to have co-disposal of MSW and organic commercial/industrial wastes for the adjusted 1990 and 1996 emission inventories.

If the landfill is known to contain only MSW or have very little organic commercial /industrial wastes, i.e. *no co-disposal*, then a total NMOC value of 595 ppmv as hexane was used for the adjusted 1990 and 1996 emission inventories. NJDEP previously utilized different parameters which are the original percentage values of 50 percent by volume for both CH_4 and CO_2 and a value of 6555 ppmv as hexane for co-disposal and 880 ppmv as hexane for *no-codisposal* landfills to develop originally recommended by an earlier edition of AP-42 when it developed the 1990 emission inventory. Table 2 below summarizes the standard parameter values referenced above.

The above discussion referenced both the original set of AP-42 standard parameters used to calculate the original 1990 landfill emission inventory and the current set of up-dated AP-42 standard parameters used to calculate the adjusted 1990 and 1996 landfill emission inventory. The revision made to the parameters between the original EPA guidance included far more conservative parameters. A discussion on the affect that the parameter adjustments made to the landfill emission inventory from the application of the updated parameters is provided below in Section C.

C. Landfill Emission Inventory Adjustments

The primary factors responsible for the landfill emission inventory adjustments are as follows:

Updated USEPA Guidance

USEPA developed new guidance for the calculation of landfill emission inventories. USEPA in the recent January 1997 update to AP-42 Section 2.4 included less conservative landfill emission estimation model parameters that provided for more realistic estimations of landfill emissions. A comparison of the original and updated guidance parameters are provided in Table 2.

Table 2: Original and Up-dated Landfill Model Parameters

Units	Parameter	Original value	Up-dated value
Potential methane generation capacity of refuse	cubic meters/megagrams (m3/μg)	124.92	100.0
Methane generation constant	$year^{-1}$	0.040	0.040
Total Non-Methane Organic Compounds (NMOC) concentration for co-disposal of liq solvents	parts per million by volume (ppmv)	880	595
Total non-methane organic compounds (NMOC) concentration for *no co-disposal* of liq solvents	parts per million by volume (ppmv)	6555	2420
Total methane percent volume	Percent (%)	50	55

Application of the above referenced up-dated model parameters in the USEPA landfill gas model adjusted landfill emissions by lowering them by a factor of approximately fifty percent (50 %) from every landfill designated as *no co-disposal*, i.e. landfills that did not accept any significant quantities of liquid solvent waste.

NJDEP conducted three modeling runs with the up-dated model parameters for three (3) *no co-disposal* landfills considered representative of the over four hundred (400) *no co-disposal* landfills included in the NJDEP emission inventory. The results obtained from these three (3) updated modeling runs were divided by their previous modeling results to establish the ratio used to up-date the remaining *no co-disposal* landfill inventory, eqn., (updated emissions)/(original emissions)* original emissions = up-dated emissions. The ratios obtained for each of these three landfill modeling runs was approximately 50 percent (%). NJDEP averaged the ratios from the three landfill modeling runs to obtain a single value of 49.21 percent (%). This value was applied to all of the original landfill emission results to convert them to the results that would have been obtained had a modeling episode been performed with the new parameters for each of these landfills.

In concern for co-disposal landfills, NJDEP performed individual modeling runs with up-dated parameters for the eleven (11) co-disposal landfills that exist in New Jersey. Use of the up-dated parameters for co-disposal landfills also substantially lowered landfill emissions.

<u>Discounted non-reactive volatile organic compounds (VOC) emissions from total NMHC landfill emissions</u>

Previous Volatile Organic Compound (VOC) landfill emissions had not discounted non-reactive VOCs from the total non-methane hydrocarbon (NMHC) landfill gas estimate as specified by the updated AP-42 Section 2.4. This section indicated that active VOC emissions represent only 39 percent (%) of total NMHC emissions from municipal waste landfills and 80 percent (%) of all NMHC emissions from industrial or hazardous waste landfills which accepted liquid solvents. These factors were applied to all NMHC emissions to discount non-reactive VOC emissions from the landfill emission inventory.

Conversion of industrial landfills from co-disposal status to no co-disposal status

Some of the landfills previously considered to have accepted liquid solvent waste, i.e. co-disposal landfills, had most probably not accepted any such waste. Many landfills had previously been considered to be co-disposal just because they had disposed of industrial waste. However disposal of industrial waste may not result in higher landfill emissions if that industrial waste was filtered sludge or construction debris instead of liquid solvents. For example, the emission statement for the Ciba Geigy facility in Toms River reported landfill VOC emissions of only 0.01 tpy. Previously estimated VOC emissions were 22.43 tons per year for the Ciba Geigy landfill. Clearly the industrial waste from this landfill generated less emissions than an ordinary municipal waste landfill. Therefore industrial landfills should not be considered to be a co-disposal landfill unless information has been provided to indicate that the industrial landfill accepted liquid solvents.

NJDEP converted most of those industrial landfills previously considered co-disposal to no-codisposal status. This results in a substantial reduction in modeled landfill emissions from all such industrial landfills since a much lower NMHC concentration model parameter of only 595 parts per million by volume (ppmv) will be currently used to model up-dated no-codisposal landfill emissions rather then the 6555 ppmv originally applied to all these industrial waste landfills formally considered to be co-disposal landfills. Furthermore, the active volatile organic compound (VOC) portion of a no-codisposal landfill NMHC emissions represents only 39 % as compared to 85 % represented by a co-disposal landfill.

NJDEP conducted three modeling runs with the up-dated model parameters for three (3) *no co-disposal* landfills considered representative of the *co-disposal* landfills included in the NJDEP emission inventory. The results obtained from these 3 updated modeling runs were divided by their previous modeling results to establish the ratio used to convert the applicable co disposal landfills to *no co-disposal* status, eqn., (updated *no-codisposal* emissions)/(original codisposal emissions)* original codisposal emissions = up-dated *no-codisposal* emissions. The ratios obtained for each of these three landfill modeling runs was approximately 6 %. NJDEP averaged the ratios from the three landfill modeling runs to obtain a single value of 6.607 %. This value was applied to all of the applicable original co-disposal landfill emission results to convert them to the results that would have been obtained had a modeling episode been performed with the new parameters for *no-codisposal* status.

Running a landfill model with the NMHC parameter of 595 ppmv instead of 6555 ppmv adjusted landfill emissions to approximately six percent (6 %) of their former value from every landfill converted from co disposal to *no co-disposal*, i.e. landfills that did not accept any significant quantities of liquid solvent waste. NJDEP ran three models for three different industrial landfills formally designated as co disposal to establish a factor of 6.607 % to convert emissions from co-disposal to no co-disposal. A listing of the landfills that were converted from co-disposal to no co-disposal status is provided in Table 3.

Table 3: Former Co-disposal Landfills Changed to No Co-Disposal Status

Landfill	Municipality
Griffin Pipe	Florence Twp
Tenneco	Burlington Twp
US Pipe	Burlington Twp
Dennis Twp	Dennis Twp
Kerr glass	Millville City
Dupont	Greenwich
Essex Chemical	Paulsboro
Hercules	Greenwich
Malanka	Secaucus
Ball Incon	Carteret
Edison Disposal	Edison
NL Industries	Sayreville
Plainsboro	Plainsboro
Stanley Olbrys	Monroe Twp
Woodbridge Pottery	Woodbridge
Hercules	Roxbury Twp
Kapkowski Rd	Elizabeth
Peapack	Peapack
Hillsborough	Hillsborough Twp
Independence	Independence Twp
Ciba Geigy	Dover Township
Edison Disposal Armory	Edison
Mannington Mills	Mannington
Somerville Boro SL	Somerville Boro
J.T. Baker	Harmony
Warren CO Regional	White Township

Co-disposal landfills which accepted liquid solvent wastes are present in New Jersey. NJDEP used the information provided in the NJDEP document "Publicly Funded Cleanup Site Status Report" to determine which landfills in New Jersey should be considered to be co-disposal. A listing of these landfills is provided in the Table 4.

Table 4: Landfills Considered to be Co-Disposal Landfills

Landfill	Landfill Municipality
Price Landfill (½ of landfill only)	Atlantic City
BEMS/Big Hill LF	Southhampton
Florence LF	Florence Township
Gems LF	Gloucester City
Kramer LF	Mantua Twp
Lipari LF	Mantua Twp
Global LF	Old Bridge Twp
JIS Landfill	South Brunswick
Kin-Buc LF	Edison
Combe South	Chester Twp
Combe North	Mt Olive Twp

Duplicate landfill

The original landfill list contained a duplicate landfill. Two landfills were listed as Atlantic City LFD and Atlantic City SLF. These are the same landfill. The Atlantic City LFD was deleted. Also permits and the emission statement for Ciba Geigy only indicate two landfill areas, whereas the original list indicated four (4) areas. Two (2) areas were therefore deleted.

Updated information on landfill activities

Prior information on landfill acreage and waste density, and opening and closing date had been updated from information obtained from a phone survey of 16 major solid waste landfills. Individual landfill gas modeling episodes were performed with this updated information for each of these landfills. In most instances the introduction of more accurate information lowered emissions for these 16 major landfills since this information included the date any flare or other control device was installed to control landfill gas emissions. Use of any type of control device would significantly lower VOC emissions for any landfill. NJDEP relied on information provided to us by either the operator of the landfill control device, emission statement, permit limitation or AP-42 default values to determine control efficiency for any control device installed on a landfill and also the capture efficiency of any landfill gas collection system. A rule effectiveness factor of 80 % was applied to all controlled landfill emissions.

The State of New Jersey
Department of Environmental Protection

Revision to the State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards

Proposed
Revision to the New Jersey 15 Percent Rate of Progress Plan

Appendix III: Emission Benefit Calculations

November 23, 1998

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Introduction

The purpose of this Appendix is to the describe the methodologies used by the State to calculate the emission reduction benefits resulting from the control measures used in the proposed revision to the State's 15 percent Rate of Progress (ROP) plans. Specifically, the remainder of this Appendix discusses the methodologies used to determine the emission reduction benefits from: 1) highway mobile sources; 2) the Federal non-road engine standards; 3) the State's landfill control program; 4) the Federal Autobody Refinishing rule; 5) both the State Architectural and Industrial Maintenance (AIM) program and the Federal Architectural Coatings rule; and, 6) the control measures included in the State's original 15 percent ROP plans. For a more detailed discussion of how the emission reduction benefits were calculated for the control programs included in the State's original 15 percent ROP plans, refer to Appendix V of the New Jersey's Phase I Ozone SIP revision.

Section 1: Mobile Highway Benefits

The revision to New Jersey 15 percent Rate of Progress (ROP) plans include the benefits from several highway source control programs. These programs include: the Federal Tier I motor vehicle control program; the state/Federal National Low Emission Vehicle (NLEV) program, the Federal Reformulated Gasoline (RFG) program, and adjustments/enhancements to the New Jersey Basic Inspection and Maintenance (I/M) program. This Section documents the methods used and summarizes the estimates of the benefits from these programs.

For a detailed description of the calculation methodologies, please see the New Jersey Phase I Ozone State Implementation Plan (SIP); specifically, Appendix V and its accompanying attachments.

General Approach

The benefits from the implementation of all the highway source strategies were estimated using the USEPA's Mobile 5a-H emission factor model and the appropriate travel demand model post-processor for each Metropolitan Planning Organization (MPO) in the State. (Refer to Appendix VI of the Phase I Ozone SIP submittal for a complete discussion of the modeling process.) In summary, the benefits for a given program were obtained by determining the difference between a emission estimate with the desired program and one without the desired program.

Tier I

The first step in estimating the emission reductions from the implementation of the Tier 1 standards is to prepare a projected highway mobile source emission inventory which does not account for changes brought about by the Clean Air Act Amendments of 1990, and which uses the inspection and maintenance program that was in place in 1990. A second projected inventory is then prepared which includes only the effects of the Tier 1 standards. This second inventory

uses 1990 gasoline (does not include reformulated gasoline) and the 1990 I/M program. The difference between these two inventories is the benefit attributable to the Tier 1 standards. Table 1 presents the benefits from the Tier 1 program. The Mobile 5a-H input files used to generate the Tier 1 inventory is contained in Attachment A.

National Low Emission Vehicle Program

The benefits from the NLEV program were estimated using the credit table for OTC states opting into the NLEV program beginning in 1999 in the Mobile5a-H model in accordance with USEPA guidance.[38] The benefits were calculated by first generating a projected highway mobile source emission inventory which includes only the Tier 1 program as previously discussed. This emission inventory does not include the effects of the NLEV program, RFG, or any improvements to the basic I/M program. The next step is to generate the same projected inventory with the addition of the NLEV program. The difference between these two emission inventories represents the benefits from the NLEV program. Table 1 presents the benefits associated with the NLEV program. The Mobile 5a-H input files used to generate the NLEV program inventory are contained in Attachment B.

Reformulated Gasoline

The benefits from implementation of the Federal RFG program were calculated by taking the difference between two projected highway mobile source emission inventories. The two inventories are: 1) the projected highway inventory which includes both Tier 1 and the NLEV Program; and, 2) the projected highway inventory, which includes Tier 1, the NLEV program and RFG. Table 1 presents the benefits associated with the RFG program. The Mobile 5a-H input files used to generate the RFG inventories are included as Attachment C.

Basic I/M Program

Since 1990, three significant actions occurred with respect to the State's Basic I/M program. These are: 1) the compliance rate for the program, that is, the percentage of vehicles subject to the program which are meeting the requirements of the program, increased from 91% to 96% (the 96% compliance rate was determined through random inspection sticker surveys performed by both the NJDEP and the NJDMV and documented in quarterly reports submitted to the USEPA[39]); 2) On October 1, 1998, the inspection frequency changed from annual to biennial

[38] "MOBILE5 Information Sheet #6 -- Effect of the New National Low Emission Vehicle Standard for Light-Duty Gasoline Fueled Vehicles," EPA420-F-98-027, July 1998, the USEPA, Office of Air and Radiation, OMS, AMD.

[39] Quarterly Inspection and Maintenance Compliance Reports for April 1993 through September 1997, submitted quarterly to Ronald Borsellino, Chief of the Division of Environmental Planning and Protection, Air Program Section, the USEPA, Region II from John C. Elston, Administrator of the Office of Air Quality Management, NJDEP.

to accommodate the transition from the basic inspection program to the enhanced inspection program; and 3) on July 1, 1998, the State instituted a mandatory functional gas cap inspection in the centralized inspection system and a visual inspection of the gas cap and evaporative emission control system in the decentralized system. For further information on the transition to a biennial basic inspection frequency and the gas cap inspections, please see The State of New Jersey Department of Environmental Protection, Revision to the State Implementation Plan (SIP) for the Inspection and Maintenance (I/M) Program for the State of New Jersey, June 5, 1998.

The benefits from implementation of the changes in the basic I/M program were calculated by taking the difference between two projected highway mobile source emission inventories. The two inventories are: 1) the projected highway inventory which includes both Tier 1, the NLEV and RFG Programs; and, 2) the projected highway inventory which includes Tier 1, the NLEV, and RFG programs and the changes to the basic I/M program. Table 1 presents the benefits associated with the changes to the basic I/M program. The Mobile 5a-H input files used to generate the RFG inventories are included as Attachment C.

To calculate the benefits from the functional gas cap inspection in the centralized inspection facilities, the procedure incorporated in the New Jersey Enhanced I/M Performance Standard Modeling was utilized. In this procedure, the benefits from the gas cap test are assumed to be represented by 40% of the pressure test.[40] The benefits from implementation of the gas cap inspection in the basic I/M program were calculated by taking 40% of the difference between two projected highway mobile source emission inventories for the centralized system only. The two inventories are: 1) the projected highway inventory which includes the Tier 1, NLEV, RFG programs with the changes to the basic I/M program; and, 2) the projected highway inventory which includes the Tier 1, the NLEV, RFG programs with the changes to the basic I/M program including a pressure test. This difference was then subtracted from the results of the Tier 1, NLEV, RFG programs with the changes to the basic I/M program inventory to determine the resulting emission inventory.

The equation representing the resulting emission inventory is:

$$E = E_{nbrt} - 0.40 * (E_{nbrtc} - E_{nprtc})$$

Where:

E = Resulting emissions

E_{nbrtc} = Emission estimates including Tier 1, NLEV, RFG, basic I/M

E_{nprtc} = Emission estimates including Tier 1, NLEV, RFG, basic I/M, and a pressure test in the centralized program.

[40] 40 C.F.R. 52, 62 Fed. Reg. 26402 (May 14, 1997).

Table 1 presents the benefits associated with the changes to the basic I/M program. The Mobile 5a-H input files used to generate the basic I/M inventories are included as Attachment D.

Transportation Conformity Budgets

The transportation conformity budgets were set using the modeling simulations considering all the control programs, including: Tier I, NLEV, reformulated gasoline, and the Basic I/M program including the benefits for the gas cap test. While the benefits were determined by taking the difference between two simulations, the budget is set by taking the result of the "final" simulation. The last column in Table 1 presents the resulting emissions used in calculating the transportation conformity budgets.

Table 1: Benefits from the Highway Mobile Source Control Measures and the Resulting Transportation Conformity Budgets

					VOC Benefits (lbs)								
NAA	MPO	Area	County	CAA Base (lbs)	Tier I	NLEV	RFG	Basic	Gascap	Basic w/ Gascap	Resulting VOC Emissions (lbs)	NOx Emissions (lbs)
A	S	1	Atlantic	30,056	1,788	67	5,138	-119	350	231	22,831	33,998.41
N	N	3	Bergen	79,105	4,929	184	15,261	-276	1,113	837	57,895	78,862.33
P	D	5	Burlington	44,437	2,764	92	8,479	-133	716	583	32,518	47,522.05
P	D	7	Camden	54,086	3,588	110	10,512	-167	836	669	39,207	50,551.81
A	S	9	Cape May	9,025	506	29	1,576	-41	115	74	6,840	10,149.72
P	S	11	Cumberland	9,802	537	17	1,693	-32	121	89	7,466	11,097.25
N	N	13	Essex	48,833	3,044	96	9,279	-158	690	531	35,883	52,530.74
P	D	15	Gloucester	25,046	1,506	51	4,746	-73	413	340	18,402	28,979.94
N	N	17	Hudson	33,229	2,135	67	6,298	-120	436	316	24,412	30,977.18
N	N	19	Hunterdon	9,023	438	22	1,526	-37	108	72	6,965	17,564.38
P	D	21	Mercer	35,399	2,258	73	6,796	-106	560	453	25,819	36,092.59
N	N	23	Middlesex	77,482	4,664	124	14,721	-277	1,040	763	57,211	91,182.44
N	N	25	Monmouth	49,326	2,949	94	9,169	-206	672	466	36,647	55,950.26
N	N	27	Morris	44,932	2,755	95	8,527	-127	631	504	33,051	53,213.76
N	N	29	Ocean	39,043	2,307	75	7,328	-130	537	407	28,925	43,307.63
N	N	31	Passaic	30,765	1,951	31	5,906	-103	428	325	22,552	32,808.20
P	S	33	Salem	7,575	405	19	1,315	-23	91	67	5,769	12,465.90
N	N	35	Somerset	27,563	1,680	65	5,264	-113	371	258	20,295	34,220.11
N	N	37	Sussex	8,701	499	19	1,624	-27	119	92	6,468	9,903.07
N	N	39	Union	36,816	2,341	79	7,067	-140	512	372	26,957	39,499.99
W	N	41	Warren	9,206	435	21	1,496	-48	102	54	7,201	18,250.55
			Statewide Total	709,451	43,480	1,430	133,721	-2,456	9,959	7,504	523,316	789,128

	Nonattainment Area Summary (lbs)										
A		Atlantic City	39,080	2,294	96	6,714	-159	465	306	29,671	44,148
N		NY-NNJ-LI	484,819	29,693	951	91,970	-1,714	6,657	4,943	357,262	540,020
P		Phl-Wil-Ttn	176,345	11,059	362	33,541	-535	2,736	2,201	129,182	186,710
W		Warren County	9,206	435	21	1,496	-48	102	54	7,201	18,251
	Nonattainment Area Summary (tons)										
		Atlantic City	19.54	1.15	0.05	3.36	-0.08	0.23	0.15	14.84	22.07
		NY-NNJ-LI	242.41	14.85	0.48	45.98	-0.86	3.33	2.47	178.63	270.01
		Phl-Wil-Ttn	88.17	5.53	0.18	16.77	-0.27	1.37	1.10	64.59	93.35
		Warren County	4.60	0.22	0.01	0.75	-0.02	0.05	0.03	3.60	9.13
	MPO Area Summary (lbs)										
	N	NJTPA	494,025	30,128	972	93,466	-1,762	6,759	4,997	364,462	558,271
	D	DVRPC	158,968	10,117	326	30,533	-479	2,525	2,045	115,947	163,146
	S	SJTPO	56,458	3,236	132	9,722	-214	676	462	42,907	67,711
	MPO Area Summary (tons)										
		NJTPA	247.01	15.06	0.49	46.73	-0.88	3.38	2.50	182.23	279.14
		DVRPC	79.48	5.06	0.16	15.27	-0.24	1.26	1.02	57.97	81.57
		SJTPO	28.23	1.62	0.07	4.86	-0.11	0.34	0.23	21.45	33.86

Section 2: Non-Road Engines Standards

Background

Prior to 1990, the USEPA's regulatory programs for motor vehicles and engines dealt only with on-highway vehicles. In the 1990 Clean Air Act Amendment, Section 213(a)(1) directed the USEPA to study the contributions to air quality from non-road engines and vehicles. Section 213(a)(2) of the Clean Air Act directed the Administrator to determine whether the emissions from non-road sources are significant contributors to ozone or carbon monoxide in more than one nonattainment area and, if so determined, the Administrator was further required to promulgate regulations for non-road engines and vehicles within one year of completion of the study. In accordance with these Clean Air Act requirements, the USEPA performed the Non-road Engine and Vehicle Emission Study, which was completed in November 1991.

As a result of the study, it was determined that there are substantial summertime volatile organic compounds (VOC) emissions from non-road sources. Non-road engines were found to contribute 19.6 percent of the national summertime VOC inventory. In the 19 ozone nonattainment areas included in the study, non-road engines were found to contribute an average of 10 percent of the summertime VOCs. The largest contributing categories nationally are the lawn, garden and recreational marine categories. Using a lawnmower for one hour releases the same amount of VOC emissions as driving your car for 50 miles. The study established baseline and in-use emission estimates per equipment type.

Requirements/Applicability

On May 16, 1994, the USEPA published a notice of proposed rulemaking for small non-road engines.[41] The Federal Register notice, Control of Air Pollution; Emission Standards for New Nonroad Spark-Ignition Engines at or Below 19 Kilowatts, proposed emission standards which are expected to result in a 32 percent reduction in hydrocarbon (HC) emissions and a 14 percent reduction in carbon monoxide emissions nationally by the year 2020 (that is, when complete fleet turnover is projected). On July 3, 1995, the USEPA published a Federal Register notice finalizing the determination of significance of emissions from nonroad sources.[42]

The July 3, 1995 Federal Register notice contained the final rule on the emission standards for new non-road engines at or below 19 kilowatts. This rule became effective with the 1997 model year. The Regulatory Impact Analysis and Regulatory Support Document (RIA/RSD) for this final rule contains national emission impacts expected from this rule. Annual emission reductions increase greatly in the first few years of the program and level off as fleet turnover is achieved. According to the RIA/RSD and the final non-road rulemaking, the USEPA has

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[41] 59 Fed. Reg. 25399.

[42] 60 Fed. Reg. 34581.

determined that the new non-road standards will cause a reduction of VOC emissions by 13.1 percent in 1997, 19.5 percent in 1998 and 23.9 percent in 1999 nationally (See Table 2).

Table 2: Non-Road Engines, VOC Emissions Nationally

YEAR	EMISSIONS UNCONTROLLED (tons/yr)	EMISSIONS CONTROLLED (tons/yr)	% PERCENT REDUCTION
1996	767,794.09	767,809.20	****
1997	782,746.42	679,966.77	13.1
1998	796,289.25	640,627.27	19.5
1999	809,319.86	615,552.65	23.9

**** standards not yet in effect.

The USEPA's Office of Mobile Sources is currently finalizing a non-road engine emissions model to more precisely calculate the emissions attributable to non-road engines in each state. The model will use state-specific information, such as vehicle populations and turnover rates. However, this model is not yet available for use. It will be available for BETA testing in April or May 1998. In the interim, the RIA/RSD was utilized here to gauge an estimate of the emission reductions anticipated in New Jersey due to the new small non-road engines standards only. This does not account for other non-road equipment and new related standards and their associated emission reductions.

Projection of VOC Emission Reductions from Nonroad Engine Standards

In New Jersey's original 15 Percent ROP plans, the State did not claim any emission reductions from the new small non-road engine standards. Instead, based upon population growth, the State projected VOC emissions from the non-road sources to increase from the 1990 base year inventory. " Table 34: Projected Off-Highway Mobile Source VOC Emission Inventory by Category" in New Jersey's Phase I Ozone SIP revision lists the 1990 baseline VOC emissions and the 1996 and 1999 emission projections for non-road engines in the entire state. Appendix VII - Attachment F, "Projected Off-Highway Mobile Source Emission Inventory by Source Category, County and AQCR" of the State's Phase I Ozone SIP revision was used to extract the engine categories affected by the non-road final rule in the New York-Northern New Jersey and Philadelphia nonattainment areas. Non-road engine categories such as generator sets, pumps and welders contain a number of diesel powered engines. The 1990 base year emission inventory prepared by the USEPA as part of the non-road study was used to subtract the VOC emissions attributable to the diesel engines, leaving only the VOC emissions from the small gasoline non-road engines.

Based on the USEPA Guidance (included in Appendix IV of this SIP revision, the New Jersey Department of Environmental Protection (NJDEP) is taking credit for the benefits of this measure in 1999. That methodology for deriving these benefits is described below.

The 1999 VOC emissions attributable to small non-road gasoline engines uncontrolled were estimated as follows:

New York-Northern New Jersey nonattainment area = 135,214 lbs/day (see Table 3)
Philadelphia nonattainment area = 47,669 lbs/day (see Table 4)

The total 1999 nonroad VOC emissions uncontrolled is the sum of the two nonattainment areas:

Total VOC $_{(uncontrolled)}$ = 135,214 lbs/day + 47,669 lbs/day = 182,883 lbs/day

The RIA/RSD shows that the small non-road engines' VOC emissions will be reduced by 23.9 percent nationally by 1999. Applying this percent reduction to the Total VOC $_{(uncontrolled)}$ will result in the total 1999 controlled non-road VOC emissions. This total is calculated as follows:

Total VOC $_{(controlled)}$ = 182,883 lbs/day $*$ (1-23.9%) = 139,174 lbs/day

The VOC emission reduction is determined by:

VOC emission reduction = 182,882 - 139,174 = 43,709 lbs/day

or,

VOC emission reduction = 43,709 lbs/day ÷ 2000 lbs/ton = 21.86 tons/day

Table 3: Non-Road Engines - Uncontrolled Emissions
New York-Northern New Jersey Nonattainment Area

ENGINE CATEGORIES AFFECTED	1999 UNCONTROLLED EMISSIONS (lbs/day)
2-wheel tractors	5
agricultural mowers	`4
air compressors	1,033
cement and mortar mixers	263
chainsaws < 4 hp	20,607
chainsaws > 4 hp	773
commercial turf equipment	9,452
concrete industrial saws	699
dumpers/tenders	34
front mowers	478
gas compressors	65
generator sets	20,117
golf carts	1,970
hydro power units	22
lawn and garden tractors	6,580
lawn mowers	45,116
leaf blowers/vacuums	3,980
other general industrial equipment	833
other lawn and garden equipment	477
plate compactors	995
pressure washers	473
pumps	1,904
rear engine riding mowers	1,057
shredders	146
specialty vehicle carts	742
sprayers	19
surfacing equipment	168
tampers/rammers	599
tillers < 5 hp	2,303
tillers > 5 hp	260
trimmers/ edgers/brush cutters	11,669
welders	1,490
wood splitters	881
Total	135,214

Table 4: Non-Road Engines - Uncontrolled Emissions - Philadelphia Nonattainment Area

ENGINE CATEGORIES AFFECTED	1999 UNCONTROLLED EMISSIONS (lbs/day)
2-wheel tractors	6
agricultural mowers	6
air compressors	323
cement and mortar mixers	71
chainsaws < 4 hp	5,271
chainsaws > 4 hp	410
commercial turf equipment	3,568
concrete industrial saws	169
dumpers/tenders	10
front mowers	209
gas compressors	8
generator sets	4,566
golf carts	1,129
hydro power units	19
lawn and garden tractors	3,068
lawn mowers	18,975
leaf blowers/vacuums	1,226
other general industrial equipment	262
other lawn and garden equipment	119
plate compactors	291
pressure washers	175
pumps	596
rear engine riding mowers	517
shredders	37
specialty vehicle carts	327
sprayers	23
surfacing equipment	45
tampers/rammers	153
tillers < 5 hp	714
tillers > 5 hp	253
trimmers/ edgers/brush cutters	4,466
welders	472

wood splitters	185
Total	47,669

As stated above, the VOC emission reductions included here are just estimates based on applying national emission reductions to New Jersey's engine population. This number will be refined once the non-road model is made available.

Summary of VOC Emission Reductions from Nonroad Spark-ignition Engines

The total emission reductions anticipated from Non-road Spark-ignition Engines within the New Jersey counties in the New York-Northern New Jersey and Philadelphia nonattainment areas are 21.86 tons per day. The Northern New Jersey nonattainment area is expected to achieve 16.16 tons per day while the Philadelphia nonattainment area is expected to achieve 5.70 tons per day. Table 5 below provides a summary of the emission reductions for each nonattainment area.

Table 5: Summary of Nonroad Spark-ignition Engines VOC Emission Reductions By Nonattainment Area

Nonattainment Area	**New York-Northern New Jersey (Tons/Summer Day)**	**Philadelphia (Tons/Summer Day)**
Nonroad Spark-Ignition Engines Reductions	*16.16*	*5.70*

Section 3: Landfill Controls Benefits

The NJDEP can take creditable emission reductions for the installation of landfill emission controls between the period of 1991 and 1999. From a survey of sixteen (16) major solid waste landfills, it was determined that several landfills had applied controls between 1991 and the present. A control efficiency typical of flares and energy conversion devices was applied to those landfills to estimate the emission reductions. Table 6 below includes the creditable emission reductions realized from those several landfills in the entire State and the New York/North New Jersey and the Philadelphia Air Quality Control Regions (AQCRs). Please note that NJDEP did not take any prior credit in its original 15 percent ROP plans for the installation of landfill controls. Therefore all the creditable emissions reductions included below may be used in the revised 15 percent ROP plans.

Table 6: Creditable Emission Reductions - Landfills

Region	Creditable Emission Reductions TPD
Total State	0.5034
New York/Northern New Jersey AQCR	0.3695
Philadelphia AQCR	0.1231

Section 4: Autobody Refinishing Standards

Background

The National Volatile Organic Compound (VOC) Emission Standards for Automobile Refinish Coatings (Autobody Refinishing) was proposed by the USEPA on April 30, 1996 and supplemented on December 30, 1997.[43] This rule was developed as part of a larger requirement on the part of the USEPA to control VOC emissions from certain categories of consumer and commercial products. Based on a study conducted by the USEPA which concluded that VOC emissions from automobile refinishing contributed significantly to the violation of the National Ambient Air Quality Standard (NAAQS) for ozone, the USEPA proposed the autobody refinishing rule.[44]

The above Federal Register notices discuss the impact of the national rule on the environment, energy usage, cost and economic considerations, and cost-effectiveness across the country. These notices also provide the detailed rationale for adopting this regulation on a national level. Since the two New Jersey nonattainment areas are classified as severe, the justification and need for this regulation to control ozone levels goes beyond that on a national level.

Requirements/Applicability

This rule applies to manufacturers, processors, wholesale distributors, and importers of automobile refinish coatings and limits the VOC contents of such coatings which are manufactured or imported for use on automobiles in the United States. For the purposes of this rule, automobiles are defined as cars, vans, motorcycles, trucks, and all other mobile equipment that are capable of being driven or drawn upon a highway, such as farm machinery and construction equipment. In addition, " refinishing" refers to any coating applications (to the interior or exterior bodies of automobiles) that occur subsequent to those at original equipment manufacturer assembly plants, and includes dock repair of imported automobiles and dealer repair of transit damage before the sale of an automobile. Please refer to the above Federal Register notices for more details on the national regulatory requirements.

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[43] 61 Fed. Reg. 19005 and 62 Fed. Reg. 6774, respectively.

[44] "Report to Congress: Study of Volatile Organic Compound Emissions from Consumer and Commercial Products" date March 15, 1995 (EPA-453/R-94066A).

A November 29, 1994 memorandum from John S. Seitz, Director, Office of Air Quality Planning and Standards (OAQPS) to EPA Regional Office Air Directors interpreted the requirements of the proposed rule as allowing a 37 percent reduction in automobile refinishing VOC emissions from 1990 levels. This level of emission reduction was recorded in the April 30, 1996 Federal Register. More recent guidance, however, indicates that a 36 percent reduction is more appropriate for states without autobody finishing standards and takes into account the categories exempted from the rule[45]. For those states that already have automobile refinishing rules in place, only a 33 percent reduction is projected. Although New Jersey controls major automobile refinish coatings manufacturers (explained in further detail later in this section), most of the sources in this category are minor and therefore, exempt from the State regulation. Therefore, the USEPA considers New Jersey to essentially be a state without autobody controls and applies the 36 percent control.

A February 12, 1997 memorandum from John S. Seitz entitled "15% VOC SIP approvals and the "as soon as Practicable Test," as well as a March 2, 1995 memorandum from Mary Nichols, Assistant Administrator, Office of Air and Radiation titled Ozone Attainment Demonstrations allow states to take credit in their 15 Percent Plans for all emission reductions achieved from this measure up until 1999. Therefore, for the purposes of this SIP revision, the NJDEP is applying a control efficiency of 36 percent to the 1999 projected emissions. The automobile refinishing emissions provided have been supplemented by the base year and projection year emissions reported by the New Jersey Department of Environmental Protection (NJDEP) in the DOUBLE.DBF and A_PROJ.DBF databases submitted to the USEPA.

New Jersey 1990 Base Year Ozone Season VOC Emission Inventory Calculations

The 1990 VOC emissions from the automobile refinishing category were calculated based on employment activity in that industry. Please refer to New Jersey's 1990 Base Year Emission Inventory for more information on the source of the employment data. The 1990 Base Year Inventory was approved by the USEPA on October 2, 1995 and on June 30, 1997. The NJDEP then combined the employment data at the municipality level with the automobile refinishing emission factor obtained from Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone: Volume I, May 1991, page 4-24 (Procedures) to obtain the 1990 annual emissions at the municipal level. Because the USEPA requires emissions to be reported at the county level, the NJDEP then apportioned its emissions to the county level. The reader is also referred to the New Jersey 1990 Base Year Emission Inventory for more details on this apportionment. The annual emissions were adjusted to ozone season emissions by using seasonal adjustment factors and activity day factors obtained from the Procedures document. The annual activity day factor was calculated by multiplying the weekly activity (5 days/week) by the yearly activity (52 weeks/year). These factors are provided in Table 7. An example calculation for Union County is given below:

[45]63 Fed. Reg. 48806

Table 7: Activity Level and Adjustment Factors from Procedures Volume I Document

1990 Union County Automobile Refinishing Employment (Empl)	674.38
Automobile refinishing VOC emission factor (lbs/year employee)	3,519
Automobile refinishing VOC emission factor (tons/year employee) (E.F.)	1.7595
Automobile refinishing seasonal adjustment factor, SAF	1
Weekly activity (WA), days/week	5
Yearly activity (YA), weeks/year	52
Automobile refinishing annual activity day factor (AADF), days/year	260

Sample Calculation of 1990 Annual Automobile Refinishing VOC Emissions ($Emiss_{annual}$) for Union County

($Emiss_{annual}$) = (Empl) x (E.F.)
$Emiss_{annual}$ = (674.38 employees) x (1.7595 tons/year employee)
$Emiss_{annual}$ = 1186.57 tons/year

Sample Calculation for 1990 Ozone Season Automobile Refinishing VOC emissions ($Emiss_{ozone}$) for Union County

$Emiss_{ozone}$ =($Emiss_{annual}$ /AADF) x SAF
$Emiss_{ozone}$ = (1186.57/260) x 1
$Emiss_{ozone}$ = 4.56 tons/day

Because major point sources of VOC emissions from automobile refinishing are regulated by New Jersey Subchapter 16 (see Regulation of Auto Refinishing in New Jersey), their contribution (0.02 tons per day) has been subtracted from the total 1990 automobile refinishing base year emissions. For the purposes of this SIP revision, the resulting value (VOC emissions from minor point sources) is reflected in the tables at the end of this section. Further, the emissions projections and reductions are based solely on the minor point VOC emissions reported in the base year inventory.

New Jersey 1996 Projection Year Ozone Season VOC Emission Inventory Calculations

The 1996 projected VOC emissions were calculated using growth factors obtained from the New Jersey Phase I State Implementation Plan (SIP), December 1996. The values reported in the Phase I Plan were obtained by linear interpolation of New Jersey statewide Value Added data (1984-1991) gathered at the two-digit SIC level by the United States Department of Commerce, Bureau of Census, for industrial facilities. Because value added data for the automobile refinishing SIC[75] were unavailable, a statewide growth factor (constrained at -1.0%) was used for the 1996 projections.

The 1990 base year ozone season VOC emissions were combined with the (1990 - 1996) growth factor to yield the 1996 projected VOC emissions for this category. An example calculation is given below:

Sample Calculation for 1996 Projected Ozone Season Automobile Refinishing VOC Emissions ($1996Emiss_{proj}$) for Union County

Annual value added growth factor for autobody refinishing (G.F.) -0.01

$1996Emiss_{proj} = Emiss_{ozone} \times (1+G.F.)^6$
$1996Emis_{proj} = (4.56) \times (1+(-0.01))^6$
$1996Emis_{proj} = 4.29$ tons/day

New Jersey 1999 Projection Year Ozone Season VOC Emission Inventory Calculations

The 1999 projected VOC emissions from automobile refinishing were calculated using earnings data, available from the Bureau of Economic Analysis (BEA) at the two-digit SIC level (SIC 75). Because 1996 and 1999 earnings data were not available, the NJDEP used linear interpolation to determine the 1996 and 1999 values. Please refer to the New Jersey Phase I SIP revision, December 1996, for more details. In addition, the NJDEP used earnings as an indicator for 1999 projections because 1999 value added projections were not available.

The 1996 and 1999 earnings data were combined with the 1996 projected VOC emissions from this category to obtain the 1999 projection year VOC emissions. An example calculation for Union County is given below.

Sample Calculation for 1999 Projected Ozone Season Automobile Refinishing VOC Emissions ($1999Emiss_{proj}$) for Union County

(1996-1999) earnings growth factor for automobile refinishing (G.F.) 1.08

$1999Emiss_{proj} = (G.F.) \times 1996Emiss_{proj}$
$1999Emiss_{proj} = (1.08) \times 4.29$ t/d
$1999Emiss_{proj} = 4.63$ tons/day

1999 Projection Year Ozone Season Emission Inventory with Controls Calculations

The 1999 projected controlled VOC emission inventory was calculated using a control efficiency value of 36 percent. Rule effectiveness and rule penetration values of 100 percent were used based on the John Seitz memorandum, previously referenced in Section I.B. of this document**.** An example calculation for Union County is given below:

Sample Calculation for 1999 Projected Automobile Refinish Coatings VOC Emissions with Controls ($1999Emiss_{projcont}$) for Union County

$1999Emiss_{proj}$	4.63 tons/day
Rule effectiveness (R.E.)	1.00
Rule Penetration (R.P.)	1.00
Control Efficiency (C.E.)	0.36

$1999Emiss_{projcont} = 1999Emiss_{proj} \times [1 - (C.E. \times R.E. \times R.P.)]$
$1999Emiss_{projcont} = 4.63 \times [1-(0.36 \times 1.00 \times 1.00)]$
$1999Emiss_{projcont} = 2.96$ tons/day

Regulation of Auto refinishing in New Jersey

Permitting:

Automotive refinishing facilities have been required to have a permit pursuant to Subchapter 8 since 1967 if they made use of any type of control equipment. This would include filters, water curtails, etc. If the facility conducted open spraying or the spray booth did not contain any filters or controls, then the facility did not need a permit.

VOC controls:

New Jersey revised Subchapter 16 - "Control and Prohibition of Air Pollution by Volatile Organic (VOC) Compounds" several times to address major sources emitting VOCs which included categories for which the USEPA did not publish Control Techniques Guidelines (CTG). The revision to Subchapter 16, effective June 19, 1989, included requirements and exemptions for automobile and truck refinishing. The USEPA proposed approval of this revision on July 16,

1993 and approved the revision on April 15, 1994 and was intended to fulfill the requirement for RACT at major auto refinishing sources.[46]

Subchapter 16 (16.7, Table 7A) limited the VOC content of automobile refinishing coatings to:

Base coat	6.0 pounds of VOC per gallon,
Clear coat	4.4 pounds of VOC per gallon, and
All others	5.0 pounds of VOC per gallon.

Section 16.7 (l) also contained exemptions for automobile refinishing facilities:

1. If coating use is less than 50 gallon per week;

II Customized top coating of automobiles and trucks if coating use is less than 48 gallon per week.

Section 16.7 required compliance with the emission limitations by June 15, 1990. Based on this compliance date and the uncertainties associated with determining whether the sources were in compliance, New Jersey in preparing their 1990 Base year emission inventories did not credit any reductions in the 1990 Base Year emission inventory to this source category.

Industry:

The majority of New Jersey auto refinishing facilities are small and exempt from Subchapter 16 emission limitations. The NJDEP has 1,464 minor auto refinishing sources on file which are exempt. This represents over 95% of the auto refinishers. A search of the Aerometric Information Retrieval System (AIRS) database, which houses emissions from major sources of VOC, NO_x and CO, found only two sources which had VOC emissions from a spray operation or control device. Their emissions were less than 4 tons per year (0.02 tons per day). The NJDEP's projected emission reductions have, therefore, excluded major sources.

Summary of VOC Emission Reductions from Federal Autobody Refinishing

The total emission reductions anticipated from autobody refinishing from the New Jersey counties in the New York-Northern New Jersey and Philadelphia nonattainment areas (NAAs) are 16.67 tons per day. The New York-Northern New Jersey NAA is expected to achieve a 13.23

[46] 58 Fed. Reg. 38326 and 59 Fed. Reg. 17933, respectively.

tons per day reduction while the Philadelphia NAA is expected to achieve 3.44 tons per day reduction. Tables 8 and 9 below provide a summary of VOC emission reductions by county and nonattainment area.

Table 8: New York-Northern New Jersey Nonattainment Area Autobody Refinishing Base Year and Projection Year VOC Emissions

Nonattainment Area	County	1990 Base Year VOC Emissions (Tons/Day)	1996 Projected VOC Emissions (Tons/Day)	1999Projected VOC Emissions (Tons/Day)	1999 Projected VOC Emissions with Control (Tons/Day)	Full Emission Reduction Credit (Tons/Day)
Northern New Jersey	Bergen	5.96	5.61	6.04	3.86	2.17
Northern New Jersey	Essex	6.05	5.69	6.12	3.92	2.20
Northern New Jersey	Hudson	3.34	3.15	3.38	2.16	1.22
Northern New Jersey	Hunterdon	0.46	0.43	0.46	0.30	0.17
Northern New Jersey	Middlesex	3.06	2.88	3.10	1.99	1.12
Northern New Jersey	Monmouth	3.69	3.48	3.74	2.39	1.35
Northern New Jersey	Morris	2.16	2.04	2.19	1.40	0.79
Northern New Jersey	Ocean	1.87	1.76	1.89	1.21	0.68
Northern New Jersey	Passaic	3.24	3.05	3.28	2.10	1.18
Northern New Jersey	Somerset	1.38	1.30	1.39	0.89	0.50
Northern New Jersey	Sussex	0.53	0.50	0.54	0.35	0.19
Northern New Jersey	Union	4.55	4.29	4.61	2.95	1.66
TOTAL		**36.30**	**34.18**	**36.75**	**23.52**	**13.23**

Table 9: Philadelphia Nonattainment Area Autobody Refinishing Base Year and Projection Year VOC Emissions

Nonattainment Area	County	1990 Base Year VOC Emissions (Tons/Day)	1996 Projected VOC Emissions (Tons/Day)	1999 Projected VOC Emissions (Tons/Day)	1999 Projected VOC Emissions with Control (Tons/Day)	Full Emission Reduction Credit (Tons/Day)
Trenton	Burlington	2.01	1.90	2.04	1.31	0.73
Trenton	Camden	3.18	2.99	3.22	2.06	1.16
Trenton	Cumberland	0.94	0.88	0.95	0.61	0.34
Trenton	Gloucester	1.52	1.43	1.54	0.98	0.55
Trenton	Mercer	1.63	1.54	1.65	1.06	0.60
Trenton	Salem	0.17	0.16	0.18	0.11	0.06
TOTAL		**9.45**	**8.90**	**9.57**	**6.12**	**3.44**

Section 5: AIM Coating Standards

Background

The National Volatile Organic Compounds (VOC) Emission Standards for Architectural Coatings (USEPA AIM rule) was proposed by the USEPA on June 25, 1996 (61 FR 32729), September 2, 1996 (61 FR 46410) and the comment period was extended on October 8, 1996 (61 FR 52735). The rule was finalized on September 11, 1998 (61 FR 48848). The USEPA AIM rule was developed based on a study conducted by the USEPA to determine the potential of VOC emissions from consumer and commercial products to contribute to ozone levels which violate the National Ambient Air Quality Standards (NAAQS). The USEPA is currently undergoing a joint study with the AIMs coatings industry to assess the feasibility of more stringent VOC requirements in the future.

The current USEPA AIM rule will reduce annual VOC emissions in New Jersey from thirty three (33) specific coating subcategories at various reduction levels. Each of these specific coating subcategories fall under the broader classification of five (5) major coating categories included in the NJDEP 1990 base year emission inventory. These five major coating categories are architectural, high performance maintenance, other product, special purpose, and traffic paint coatings. An additional eleven (11) other major coating categories had also been included in the NJDEP 1990 base year emission inventory. None of these 11 additional major categories are affected by the USEPA AIMs rule. A complete listing of major AIM coating categories and their corresponding emission factors is provided on page 4-24 of the USEPA guidance document "Procedures for the Preparation of Emission Inventories for Carbon Monoxide and Precursors of Ozone" (Procedures Manual).

Requirements/Applicability

This rule applies to manufacturers and importers of architectural and industrial maintenance coatings. For manufacturers, this includes but is not limited to sources that produce, package, or repackage architectural coatings for sale or distribution in the United States. For importers, this includes but is not limited to sources that bring AIMs coatings from outside the United States into the United States for sale or distribution within the United States.

On March 7, 1996, John Seitz, Director, Office of Air Quality Planning and Standards (OAQPS), issued a memorandum to USEPA Regional Office Air Directors confirming that states were allowed to claim a 20 percent reduction in architectural coating VOC emissions from their 1990 levels from the USEPA AIM rule. The level of emission reduction was also projected in the June 25, 1996 Federal Register. Further, a February 12, 1997 memorandum from John S. Seitz, Director, Office of Air Planning and Standards, titled 15 Percent VOC Approvals and the As Soon As Practicable Test, allowed states to take credit in their 15 Percent Plans for all emission reductions achieved from this measure up until 1999. For the purposes of this SIP, the New Jersey Department of Environmental Protection (NJDEP) based on its calculations is applying an

overall control efficiency of only 10.23 % to architectural coatings from reductions achieved from this measure up until 1999 by the USEPA AIM rule.

The NJDEP used information provided within the originally proposed USEPA AIMs rule to determine that architectural coating emissions will not be reduced further then 10.23 % from the USEPA AIM rule. Furthermore, emission reductions are projected from the major coating categories of high performance coatings, other product coating, special product coatings and traffic paints. However, high performance maintenance and traffic paint coating emissions have already been adjusted in the 1990 inventory from application of VOC content limitations included in New Jersey surface coating rules.

The New Jersey surface coating rules, N.J.A.C. Subchapter 23:Prevention of Air Pollution from Architectural Coatings and Consumer Products (NJDEP AIM rule) adopted on February 21, 1989 closely corresponds with the USEPA rule. It provides similar VOC content limitations for thirty (30) AIM coating subcategories which had also been included in the USEPA AIM rule. N.J.A.C. 7.27-16.7 (Surface Coating and Graphic Arts Operations) also provided VOC content limitations for high performance maintenance coatings.

NJDEP applied its surface coating regulations to adjust the 1990 base year emission inventory for high performance maintenance and traffic paints. This emission inventory adjustment to high performance maintenance coatings prevents NJDEP from claiming any creditable emission reductions from the USEPA AIMS rule for this category. NJDEP can still however claim partial emission reduction credit for the traffic paints category because the USEPA AIMS rule regulates traffic paints with more stringent emission limitations then does the NJDEP AIM rule.

NJDEP did not adjust emissions for architectural, other product and other special purpose coatings. This is because each of these major categories included too many subcategories to evaluate whether the emissions from each subcategory had been reduced within the 1990 inventory base year. Although the NJDEP AIM rule took effect on January 1990, an exemption allowed existing stock of coatings manufactured before 1990 to be sold until 1993. NJDEP could not confirm whether the numerous subcategory coatings represented by the aforementioned three major categories would conform to the NJDEP Aim rule by 1990 or by 1993. Traffic paints on the other hand only encompassed a single subcategory which NJDEP could confirm would achieve the 250 grams/liter VOC limitation established by the NJDEP AIM rule by the 1990 inventory base year.

The NJDEP discussions with the New Jersey Department of Transportation (NJDOT) indicate that all traffic coatings confirmed to the NJ AIM rule by 1990. To confirm this NJDOT provided copies of several manufacturer traffic paint specifications and their own specification to establish that traffic paints met the 250 grams/liter content limitation by 1990. The NJDEP therefore concluded that most traffic paints conformed to this limitation. In regard to the small

amount of nonconforming traffic paints that may have been applied, NJDEP applied a rule effectiveness (RE) factor to account for any such nonconformance. The reader is referred to the Traffic Paint Section of this report for a complete explanation of how traffic paint inventory emissions and reductions from both the NJDEP and the USEPA AIM rules had been calculated.

The RE factor adjusts the emission estimate data to account for the underestimation of emissions due to any noncompliance with existing rules. All emission reduction credits achieved by either the NJDEP or the USEPA AIM rule have had a rule effectiveness factor applied to them to insure that NJDEP accounts for any noncompliance with these rules. The reader is referred to Section 5.0 of the Appendix II The 1990 Base Year Emission Inventory for the Ozone Season in New Jersey for more information on RE factor. Also, the sample calculations provided below include applications of the RE factor to AIM rule coatings.

The following sections present sample calculations utilized by NJDEP for estimation of emission reductions achieved by the USEPA and NJDEP AIM rule. The Emission Inventory Section below explains how the 1990 state level emission inventory had been developed for major coating categories. The Category Classification Section below explains the procedure employed to classify each subcategory under their corresponding major AIMs category. The Sections on Uncontrolled and Controlled Subcategory Emissions explain how 1990 state level subcategory emissions were determined and projected to 1999 with controls applied from the AIM rule implementation. A determination of emission reductions creditable towards the revised 15 % plan from the implementation of the USEPA and NJDEP AIM rules was performed in the Emission Reduction Section. Finally a discussion on how Traffic Paint Emissions had been first adjusted by the NJDEP AIM rule and later by the USEPA AIM rule is provided in the Traffic Paints Section. Finally a summary of creditable emission results is provided.

Emission Inventories: Major Categories

1990 Base Year Ozone Season Major Category Surface Coating Emission Inventory Calculations

The 1990 VOC emissions from the 16 major coating categories included in the Procedures manual were calculated by NJDEP on an annual basis at the municipality level based on population, employment or traffic paints activity data. The reader is referred to the New Jersey 1990 Base Year Emission Inventory for more information on the source of this activity data. The calculation presented below uses this exact same methodology except that for the purposes of this exercise the annual emissions were calculated at State, New York and Philadelphia Air Quality Control Region levels instead of municipal levels for only those five (5) major coating categories affected by the USEPA AIM rule. The reason for this is that this exercise only needs to determine the emission reductions at these levels to calculate the control efficiency to be applied to the applicable major coating emissions inventories. Therefore this exercise will only present activity data at the higher category levels.

Once obtained, the activity data was combined with the major coating emission factor obtained from page 4-24 of the aforementioned Procedures Manual to yield the 1990 annual

emissions at the municipality level. The NJDEP applied seasonal adjustment and annual activity day obtained from the aforementioned "Procedures" document to arrive at the ozone season VOC emissions. The annual activity day factor was calculated by multiplying the weekly activity (7 or 5 days/week) by the yearly activity (52 weeks/year).

The NJDEP also subtracted any major coating source emissions included in the point source inventory for that coating category to compensate for emission double counting. The reader is referred to page 36 of Appendix II of the 1990 Base Year Emission Inventory for the Ozone Season in New Jersey for more information on how NJDEP compensated for double counted emissions. An example calculation for determination of 1990 state level ozone day emissions for the Architectural Coating Major Category is given below:

1990 Annual Architectural Coating Major Category VOC Emissions ($Emiss_{annual}$)

1990 NJ Population (Pop)	7,730,188
Architectural coating VOC emission factor (lbs/year person)	4.6
Architectural coating VOC emission factor (tons/year person) (E.F.)	0.0023

$Emiss_{annual}$ = (Pop) x (E.F.)
$Emiss_{annual}$ = (7,730,188 people) x (0.0023 tons/year person)
$Emiss_{annual}$ = 17779.43 tons/year

1990 Ozone Season Architectural Coating Major Category VOC emissions ($Emiss_{ozone}$)

Architectural coating seasonal adjustment factor, SAF	1.3
- Weekly activity (WA), days/week 7	
- Yearly activity (YA), weeks/year	52
Architectural coating annual activity day factor (AADF), days/year	365

$Emiss_{ozone}$ = ($Emiss_{annual}$ /AADF) x SAF
$Emiss_{ozone}$ = (17,779.43/365) x 1.3
$Emiss_{ozone}$ = 63.498 tons/day

1990 Ozone Season Architectural Coating Major Category Area Source VOC emissions after double counting ($Emiss_{ozonearea}$)

Architectural coating point source emissions, lb, $Emiss_{ozonepoint}$	0
Architectural coating emissions, lb, $Emiss_{ozone}$	63.498

$Emiss_{ozonearea}$ = $Emiss_{ozone}$ - $Emiss_{ozonepoint}$
$Emiss_{ozonearea}$ = 63.498 tons/day - 0

$Emiss_{ozonearea}$ = 63.498 tons/day

Category Classification

Classification of Specific Subcategory Coatings included in NJDEP and USEPA AIMs Rule into one of the Five Generic AIM Categories included in the Procedures Manual

Classification of specific subcategory AIMs coatings into one of the generic major category headings included in the Procedures Manual is accomplished by Table 1-1 "Average VOC Content for AIM Coatings to be Covered by Proposed Regulation" included in the aforementioned June 25, 1996 AIM rule proposal (61 FR 32729). In this table the USEPA classified flat coating as a member of the architectural major coating category and an assortment of wood preservatives as an allied paint products which NJDEP considers to correspond to the other product coating major category referenced in the Procedure Manual. The USEPA classified swimming pool coatings and anti-graffiti coatings either as special purpose or industrial maintenance coatings. NJDEP considered swimming pool coatings to constitute a special purpose coating. Whereas further delineation of the anti-graffiti coating from an examination of the definitions provided in Section 59.401 of the aforementioned AIM rule proposal indicates that this coating constitutes a high performance coating. Other high performance coatings include high temperature coatings, impacted immersion coatings and industrial maintenance coatings.

Emission reductions from the application of USEPA or NJDEP AIM rule can now be determined after specific subcategory coatings have been classified under their major category headings.

Uncontrolled Subcategory Emissions

Estimation of National Level VOC in Tons Per Day Achieved from the Subcategory Coatings Included in AIMs Rule

The NJDEP next had to determine the amount of VOC emitted at the state level, and the Philadelphia and New York Air Quality Control Regions for every subcategory included within the aforementioned AIM rule proposal. The aforementioned AIMs rule proposal includes values for National VOC at Maximum Thinning (tons/yr) for numerous coating subcategories in Table 2-2 "1990 National Sales, Industry Average VOC Content at Maximum Thinning and Total VOC Emissions At Maximum Thinning for Architectural Coatings". The National VOC emissions in

tons/yr for each coating subcategory was proportioned down to the state and regional level VOC in tons per year using a population factor, the ratio of 1990 National level population to State level population, as shown in the sample calculation below for the flat coating subcategory:

Conversion of 1990 National Level VOC in tons/yr ($1990Emiss_{Nat}$) to 1990 State level VOC in tons/yr ($1990Emiss_{state}$) for the Flat Coating Subcategory

1990 National level flat coating VOC in tons/yr ($1990Emiss_{Nat}$)	56,250
1990 National population ($1990Nat_{pop}$)	248,718,000
1990 State population ($1990State_{pop}$)	7,730,188

$1990Emiss_{state} = (1990Emiss_{Nat})*(1990State_{pop})/(1990Nat_{pop})$
$1990Emiss_{state} = (56,250 \text{ tons/yr})*7,730,188/248,718,000$
$1990Emiss_{state} = 1,748.26 \text{ tons/year}$

Calculation for 1990 Base Year Ozone Season tons per day for the Subcategory Coatings Included in the AIMs Rule

NJDEP next applied seasonal adjustment and annual activity day factors to arrive at the ozone season tons per day VOC emissions. The seasonal adjustment factor was obtained from the aforementioned "Procedures" document. The annual activity day factor was calculated by multiplying the weekly activity (7 days/week) by the yearly activity (52 weeks/year). An example calculation for flat coatings is given below:

Conversion of 1990 State Level Emissions of Tons Per Year ($1990Emiss_{state}$) to Ozone Season State Level VOC Emissions of Tons Per Day ($1990Emiss_{ozone}$) for the Flat Coating Subcategory

Flat Coating seasonal adjustment factor, SAF	
1.3	
- Weekly activity (WA), days/week	
7	
- Yearly activity (YA), weeks/year	52
Flat Coating annual activity day factor (AADF)	364

$1990Emiss_{ozone} = (1990Emiss_{state}/AADF) \times SAF$
$1990Emiss_{ozone} = (1,748.26/364) \times 1.3$
$1990Emiss_{ozone} = 6.2438 \text{ tons/day}$

1996 Projection Year Ozone Season VOC Flat Coating Emission Inventory Calculations

The 1996 projected VOC emissions from flat coating paint coatings were calculated using as a (1990 - 1996) growth factor, the ratio of 1996 interpolated population to 1990 population. The reader is referred to the New Jersey Phase I SIP, December 1996 for details on how the interpolated 1996 population was determined. Additionally, the Emission Inventories: Major Categories Section refers the reader to the source of this population data. The 1990 base year VOC emissions from architectural surface coatings were multiplied by the (1990 - 1996) growth factor to yield the 1996 projected VOC emissions. An example calculation for flat coatings is given below:

1996 Projected Flat Coating Ozone Season VOC Emissions ($1996Emiss_{proj}$)

1990 Population for State ($1990State_{pop}$)	7730188
1996 Population for State ($1996State_{pop}$)	7931040
1990-1996 population growth factor (G.F.)	

G.F. = $1990State_{pop}/1996State_{pop}$ = 7730188/7931040 = 1.026

$1996Emiss_{proj}$ = $1990Emiss_{ozone}$ x (G.F.)
$1996Emiss_{proj}$ = (6.2438) x (1.026)
$1996Emiss_{proj}$ = 6.4060 tons/day

1999 Projection Year Ozone Season VOC Flat Coating Surface Coating Emission Inventory Calculations

The 1999 projected VOC emissions for flat coatings were calculated using as a (1996 - 1999) growth factor, the ratio of 1999 interpolated population to 1996 interpolated population. The reader is referred to the New Jersey Phase I State Implementation Plan (SIP), December 1996 for details on how the interpolated 1999 population was determined. Additionally, Emission Inventories: Major Categories Section refers the reader to the source of the population data. The 1996 projected VOC emissions from flat coatings were multiplied by the (1996 - 1999) growth factor to yield the 1999 projected VOC emissions. An example calculation for flat coating is given below:

1999 Projected Flat Coating Ozone Season VOC Emissions ($1999Emiss_{proj}$)

1996 Population for State ($1996State_{pop}$)	7931040
1999 Population for State ($1999State_{pop}$)	8033660
1996-1999 population growth factor (G.F.)	

G.F. = $1999State_{pop}/1996State_{pop}$ = 8033660/7931040 = 1.013

$1999Emiss_{proj} = 1996Emiss_{ozone}$ x (G.F.)
$1999Emis_{proj}$ = (6.4060) x (1.013)
$1999Emis_{proj}$ =6.4889 tons/day

Controlled Subcategory Emissions

Calculation for Exterior Flat Coatings Controlled Emissions (tons per day) after USEPA AIMs Rule Application

The USEPA AIMs rule provides percentage of emission reductions for 16 AIM subcategories in Table 5-1 "Volatile Organic Compound Content Levels and National Emission Reductions for Architectural Coatings at Maximum Thinning" from the aforementioned June 25, 1996 AIM rule proposal (61 FR 32729). The % emission reduction, i.e. control efficiency, was applied to the 1999 state level ozone season VOC emission levels to obtain controlled emissions after the USEPA AIMs rule application. An example calculation for flat coating is given below:

1999 State level VOC emissions for flat coating	= 6.4889 tons/day
exterior flat coating control efficiency	= 23 %
interior flat coating control efficiency	= 5 %

Assume that ½ of the flat coating emissions or 3.2444 tons per day represents exterior flat coating emissions and the other ½ represents interior flat coating emissions. This sample calculation will consider exterior flat coating.

1999 Projected Exterior Flat Coatings VOC Emissions (tons per day) with Controls and 100 % RE from application of USEPA AIM rule ($1999Emiss_{projcontEPA}$)

$1999Emiss_{proj}$	3.244 tons/day
Rule effectiveness (RE)	1.00
Rule Penetration (RP)	1.00
Control Efficiency (CE)	0.23

$1999Emiss_{projcontEPA} = 1999Emiss_{proj}$ x [1 - (C.E. x R.E. x R.P.)]
$1999Emiss_{projcontEPA}$ = 3.2444 x [1-(0.23 x 1.00 x 1.00)]

$1999Emiss_{projcontEPA}$ = 2.4982 tons/day

Calculation for Exterior Flat Coatings Controlled Emissions (tons per day) from NJDEP AIMs Rule Application

NJDEP utilized the same aforementioned percentages of emission reduction from the USEPA AIM rule to establish the creditable emission reductions obtained from the implementation of the NJDEP AIMs rule for AIM coating subcategories. The NJDEP and USEPA AIM rules will achieve same subcategory emission reductions where the subcategory VOC content limitations promulgated by each of these rules are the same. For example, flat exterior coatings shall achieve the same 23 % reduction from application of either rule because each rule establishes a 250 gram/liter VOC content limitation. Whereas opaque waterproofing sealer shall achieve a lower emission reduction from the NJDEP AIM rule as compared to the USEPA AIM rule because the VOC content limitation established by the USEPA AIM rule is only 400 gram/liter as compared to the higher amount of 600 gram/liter established by the NJDEP AIM rule.

The percentage of emission reductions, i.e. control efficiency, was applied to the 1999 state level ozone season VOC emission levels in the same manner as shown in the sample calculations in Section 7 above. However, an additional factor must be applied to the control efficiency to obtain controlled emissions from the NJDEP AIM rule as was accomplished for the USEPA AIM rule. The additional factor is the ratio of the NJDEP AIM rule VOC content limitations to the USEPA AIM rule VOC content limitations. Furthermore, NJDEP is applying a RE factor of 80 percent (%) for any nonconformance from its rule. An example calculation for the exterior flat coating subcategory is given below:

1999 Projected Exterior Flat Coatings VOC Emissions with Controls and 80 % RE from Application of NJDEP AIM rule ($1999Emiss_{projcontDEP}$)

USEPA AIM rule emission reduction percentage for exterior flat coating (C.E.): 23 %
USEPA AIM rule VOC content limitation for exterior flat coating ($VOC_{contentEPA}$): 250
NJDEP AIM rule VOC content limitation for exterior flat coating ($VOC_{contentDEP}$): 250

1999 State level VOC emissions for exterior flat coating ($1999Emiss_{proj}$): 3.2444 tons/day
Rule effectiveness (RE) 0.80
Rule Penetration (RP) 1.00
Control Efficiency (CE) 0.23

$$1999Emiss_{projcontDEP} = 1999Emiss_{proj} \times [1- \frac{CE}{VOC_{contentDEP}} \times VOC_{contentEPA} \times R.E. \times R.P.)]$$

$$1999Emiss_{projcontDEP} = 3.2444 \times [1- \frac{0.23}{250} \times \frac{250}{250} \times 1.0 \times 0.80]$$

$1999Emiss_{projcontDEP} = 2.6474$ tons/day

Emission Reductions

Calculation for Creditable Emissions Reductions (tons per day) after NJDEP AIMs Rule Implementation

Emission reductions applied for credit in the revised 15 % plan from the NJDEP AIMs rule constitute the difference between the uncontrolled 1999 Emissions and controlled 1999 Emissions. The NJDEP shall first claim credit from the emission reductions achieved by its own AIM rule with an 80 % RE factor as shown in the sample calculation for the exterior flat coating subcategory as given below. Thereafter NJDEP shall claim credit from any additional emission reductions obtained from the USEPA AIM rule with the application of the 100 % RE factor as also shown below.

Emission Reduction ($Emiss_{red}$) Results from NJDEP AIM rule for Exterior Flat Coating

$Emiss_{redDEP} = 1999Emiss_{proj} - 1999Emiss_{projcontDEP}$
$Emiss_{redDEP} = 3.2444 - 2.6474$
$Emiss_{redDEP} = 0.5970$ tons per day

Emission Reduction ($Emiss_{red}$) Results from USEPA AIM rule for Exterior Flat Coating

$Emiss_{redEPA} = 1999Emiss_{proj} - 1999Emiss_{projcontEPA}$
$Emiss_{redEPA} = 3.2444 - 2.4982$ tons/day
$Emiss_{redEPA} = 0.7462$ tons per day

Calculation for Incremental Creditable Emissions Reductions (tons per day) from the implementation of the USEPA AIM Rule after implementation of the NJDEP AIM rule

Emission reductions applied for additional credit from the application of the USEPA rule in the revised 15 % plan from the AIMs rule constitute the difference between the controlled USEPA and NJDEPAIM rule emission reductions. An example calculation for the exterior flat coating subcategory is given below:

Incremental Emission Reduction ($Emissin_{redINC}$) Results for Exterior Flat Coating

$Emiss_{redINC}$ = 1999$Emiss_{redEPA}$ - 1999$Emiss_{redDEP}$
$Emiss_{redINC}$ = 0.7462 tons per day - 0.5970 tons per day
$Emiss_{redINC}$ = 0.1492 tons per day

Correlation of 1999 AIM rule subcategory emission reductions with their corresponding major category classifications

The NJDEP summed the emission reductions achieved from the application of the USEPA and NJDEP AIM rules for each grouping of individual coating subcategories included in architectural, other product and other special purpose major categories. The incremental emission reductions achieved from the difference between the USEPA and NJDEP AIM rule emission reductions have also been summed. The total emission reduction achieved from the addition of the NJDEP AIM rule and the incremental emission reduction has also been performed. A sample summation of architectural, other product and special purpose major coating subcategory emission reductions at the state level is provided in the tables below:

Table 10: Tabulation of Emission Reductions Achieved from the Application of the USEPA AIM Rule for Architectural Aim Coating Subcategories in New Jersey

AIMs Rule Subcategory Included Under Architectural Aim Coating Major Category Classification	Emission Reduction from USEPA AIM rule & 100 % RE (Tons/Day)	Creditable Emission Reduction from NJDEP AIM rule & 80 % RE (Tons/Day)	Creditable Incremental Emission Reduction from USEPA AIM rule applied after NJDEP AIM rule & 80 % RE (Tons/Day)	Total Creditable Emission Reduction (Tons/Day)
Bitum coats & mastics	0.0000	0.0000	0.0000	0.0000
Flat coatings exterior	0.7462	0.5970	0.1492	0.7462
Flat coatings interior	0.1622	0.1298	0.0324	0.1622
Nonflat coatings exterior	0.9394	0.7516	0.1879	0.9394

Nonflat coatings interior	0.7633	0.6106	0.1527	0.7633
Primers and undersealers	0.6921	0.5537	0.1384	0.6921
Quick-dry enamels	0.0564	0.0451	0.0113	0.0564
Quick-dry primers, seal	0.0896	0.0645	0.0251	0.0896
Roof coatings	0.8139	0.5426	0.2713	0.8139
Sealers (inc int clr wood)	0.5905	0.4724	0.1181	0.5905
Waterprf sealers clear	0.4696	0.3757	0.0939	0.4696
Waterprf sealers opaque	0.0203	0.0162	0.0041	0.0203
Lacquers	0.1457	0.1166	0.0291	0.1457
Stain clear & semi-tran	1.8387	1.4710	0.3677	1.8387
Stains opaque	0.7489	0.5992	0.1498	0.7489
Varnishes	0.3635	0.2908	0.0727	0.3635
Total	8.4404	6.6366	1.8038	8.4404

Table 11:Tabulation of Emission Reductions Achieved from the Application of the USEPA AIM Rule for Other Product Coatings Subcategories in New Jersey

AIMs Rule Subcategory Included Under Other Product Coatings Major Category Classification	Emission Reduction from USEPA AIM rule & 100 % RE (Tons/Day)	Creditable Emission Reduction from NJDEP AIM rule & 80 % RE (Tons/Day)	Creditable Incremental Emission Reduction from USEPA AIM rule applied after NJDEP AIM rule & 80 % RE (Tons/Day)	Total Creditable Emission Reduction (Tons/Day)
Below ground wood preservative coating	0.0129	0.0103	0.0027	0.0129
Clear & semitransparent wood preservative coating	0.0000	0.0000	0.0000	0.0000
Opaque coating	0.0000	0.0000	0.0000	0.0000
Total	0.0129	0.0103	0.0027	0.0129

Table 12:Tabulation of Emission Reductions Achieved from the Application of the USEPA AIM Rule for Other Special Purpose Subcategory Coatings in New Jersey

AIMs Rule Subcategory Included Under Other Special Purpose Coatings Major Category Classification	Emission Reduction from USEPA AIM rule & 100 % RE (Tons/Day)	Creditable Emission Reduction from NJDEP AIM rule & 80 % RE (Tons/Day)	Creditable Incremental Emission Reduction from USEPA AIM rule applied after NJDEP AIM rule & 80 % RE (Tons/Day)	Total Creditable Emission Reduction (Tons/Day)
Concrete curing compds	0.0793	0.0634	0.0159	0.0793
Dry fog coatings	0.0623	0.0498	0.0125	0.0623
Fire retardent clear	0.0000	0.0000	0.0000	0.0000
Fire retardent opaque	0.0000	0.0000	0.0000	0.0000
Form release compounds	0.0000	0.0000	0.0000	0.0000
Graphic art	0.0000	0.0000	0.0000	0.0000
Magnesite cement	0.0000	0.0000	0.0000	0.0000
Mastic texture	0.0060	0.0000	0.0060	0.0060
Metallic pigments	0.0365	0.0072	0.0283	0.0365
Mutli-colored	0.0000	0.0000	0.0000	0.0000
Pretreat wash primers	0.0000	0.0000	0.0000	0.0000
Sanding sealer (not lacq)	0.0054	0.0043	0.0011	0.0054

Swimming pool	0.0000	0.0000	0.0000	0.0000
Shellac Clear	0.0000	0.0000	0.0000	0.0000
Shellac Opaque	0.0000	0.0000	0.0000	0.0000
Total	0.1895	0.0355	1.741	1.895

Traffic Paint Calculations

1990 Base Year Ozone Season Traffic Paints Emission Inventory Calculations from Application of the NJDEP AIM rule

This section describes how 1990 VOC emissions from the traffic paints category were calculated by the NJDEP on an annual basis at the county level based on lane mileage data. The reader is referred to the New Jersey 1990 Base Year Emission Inventory for more information on the source of this lane mileage data.

Once obtained, the mileage data was multiplied with a traffic paints emission factor obtained from page 4-24 of the aforementioned Procedures document. Next, a control efficiency was applied based on the application of the NJDEP AIM rule VOC content limitations to yield the 1990 traffic paint annual emissions.

The control efficiency determining the benefit of the USEPA AIM rule is dependent upon the USEPA VOC content limitation inherent in the emissions calculation compared to the NJDEP VOC content limitation set forth in the NJDEP regulation. The USEPA VOC content limitation was derived from the USEPA supplied emission factor and an associated coating usage factor. For traffic paints the USEPA emission factor was 69 lbs VOC per roadway lane mileage painted and the coating usage factor was 22 gallons of paint used per roadway lane mileage painted. Therefore for this example,

$$\text{USEPA VOC Content Limit} = \frac{\text{Emission Factor}}{\text{Coating Usage Factor}}$$

$$\text{USEPA VOC} = \frac{\frac{69 \text{ lbs VOC}}{\text{Roadway Lane Mile}}}{\frac{22 \text{ Gallons of Paint}}{\text{Roadway Lane Mile}}} = 3.1 \text{ lbs VOC/gallon}$$

As shown in the calculation above the USEPA supplied emission factor of 69 lbs VOC per roadway lane mile assumes a VOC content limitation of 3.1 lbs VOC pre gallon of paint. While the NJDEP AIM rule limits VOC content at 2.1 lbs VOC per gallon of paint. Therefore for this example,

Control efficiency = 1 - NJDEP limit/USEPA limit

Control efficiency = 1 - 2.1/3.1 = 0.32

In regard to the small amount of nonconforming traffic paints that may have been applied, NJDEP applied a rule effectiveness (RE) factor of 80 % to account for any such nonconformance.

The NJDEP applied seasonal adjustment and annual activity day factors to arrive at the ozone season VOC emissions from this category obtained from the aforementioned "Procedures" document. The annual activity day factor was calculated by multiplying the weekly activity (5 days/week) by the yearly activity (52 weeks/year). No adjustment had to be made to compensate for point source double counting since all traffic paint activity is classified as an area source.

An example calculation for determination of 1990 state level ozone day emission inventory for the traffic paints major category after adjustment by the NJDEP AIM rule is given below:

1990 Annual Traffic Paints VOC Emissions ($Emiss_{annual}$) for State

1990 New Jersey Lane Mileage (1990L_MILE):	76,018.72
Traffic Paints VOC emission factor (lbs/lane-mile-year):	69
Traffic Paints VOC emission factor (tons/lane-mile-year) (E.F.):	0.0345
Control Efficiency	0.32
Rule Effectiveness	0.80

$(Emiss_{annual}) = (1990L\_MILE) \times (E.F.) \times (1-CE*RE)$
$Emiss_{annual} = (76,018.72 \text{ lane miles}) \times (0.0345 \text{ tons/lane mile-year}) \times (1-.32*.8)$
$Emiss_{annual} = 1,951.249 \text{ tons/year}$

1990 Ozone Season Traffic Paints VOC emissions ($Emiss_{ozone}$) for State

Traffic Paints seasonal adjustment factor, SAF	1
- Weekly activity (WA), days/week	5
- Yearly activity (YA), weeks/year	52
Traffic Paints annual activity day factor (AADF), days/year	260

$Emiss_{ozone} = (Emiss_{annual} / AADF) \times SAF$
$Emiss_{ozone} = (1,951.249/260) \times 1.0$
$Emiss_{ozone} = 7.5048 \text{ tons/day}$

Calculation of 1996 and 1999 Projection Year Ozone Season VOC Traffic Paints Emission Inventory after application of the NJDEP AIM rule

The 1996 and 1999 traffic paint inventory used the same procedure used to calculate the 1990 traffic paint inventory except for 2 adjustments which are 1) 1996 traffic lane miles obtained from the NJDOT were used for estimation of both 1996 and 1999 traffic paint inventories and 2) a minor adjustment to the 1996 traffic lane miles had to be made to account for the fact that approximately 4375 miles of New Jersey traffic lanes were painted in the 1996 and 1999 projection year with a 100 % solid based epoxy that contains no VOCs[47]. This value is subtracted from the 1996 traffic lane miles as shown in the first step of the example

[47]NJDEP May 7, 1998 phone conversation with Fred Lovett of the Bureau of Materials. Of the New Jersey Department of Transportation.

calculation for determination of 1996 and 1999 state level ozone day for the traffic paints major category as given below:

1996/1999 Adjusted New Jersey Lane Mileage ($1999L\_MILE_{adjusted}$)

1996/1999 Lane miles (1999L_MILE)	77,847
1996/1999 Lane miles painted with solid based epoxy ($1999L\_MILE_{zero\ emissions}$)	4,375

($1999L\_MILE_{adjusted}$) = 1999L_MILE - $1999L\_MILE_{zero\ emissions}$
($1999L\_MILE_{adjusted}$) = 77,847 lane miles - 4,375 lane miles
($1999L\_MILE_{adjusted}$) = 73,462 lane miles

1996/1999 Annual Traffic Paints VOC Emissions ($Emiss_{annual}$) for State

$1999L\_MILE_{adjusted}$ (lane miles)	73,462
Traffic Paints VOC emission factor (lbs/lane-mile year)	69
Traffic Paints VOC emission factor (tons/lane-mile) (E.F.)	0.0345
Control Efficiency	0.32
Rule Effectiveness	0.80

($Emiss_{annual}$) = ($1999L\_MILE_{adjusted}$) x (E.F.) x (1-CE*RE)
$Emiss_{annual}$ = (73,462 lane miles) x (0.0345 tons/lane mile-year) x (1-.32*.8)
$Emiss_{annual}$ = 1885.6226 tons/year

1999/1996 Ozone Season Traffic Paints VOC emissions ($Emiss_{ozone}$) for State

Traffic Paints seasonal adjustment factor, SAF		1.0
- Weekly activity (WA), days/week		5
- Yearly activity (YA), weeks/year	52	
Traffic Paints annual activity day factor (AADF), days/year		260

$Emiss_{ozone}$ =($Emiss_{annual}$ /AADF) x SAF
$Emiss_{ozone}$ = (1885.6226/260) x 1.0
$Emiss_{ozone}$ = 7.2524 tons/day

Calculation for 1996 and 1999 Projection Year Ozone Season VOC Traffic Paints Controlled Emission (tons per day) after USEPA AIM Rule Application

Application of the USEPA AIM rule will achieve additional emission reduction benefits from traffic paints because its VOC content limitation of 150 pounds/gallon is more stringent then the NJDEP AIM limitation of 250 pounds/gallon. The control efficiency that corresponds to this VOC content change is conducted below:

Control efficiency = 1 - USEPA limit/NJDEP limit
Control efficiency = 1 - 150/250 = 0.40

An example calculation for determination of 1996/1999 controlled state level ozone day emission inventory for the traffic paints major category after application of the USEPA AIM rule is given below:

1996/1999 Controlled Annual Traffic Paints VOC Emissions ($Emiss_{annual}$) for State

$1999L\_MILE_{adjusted}$ (lane miles)	73,462
Traffic Paints VOC emission factor (lbs/lane-mile year)	69
Traffic Paints VOC emission factor (tons/lane-mile) (E.F.)	0.0345
Control Efficiency	0.40
Rule Effectiveness	1.00

$(Emiss_{controlannual}) = (1999L\_MILE_{adjusted}) \times (E.F.) \times (1\text{-}CE*RE)$
$Emiss_{controlannual}$ = (73,462 lane miles) x (0.0345 tons/lane mile-year) x (1-.40*1.0)
$Emiss_{controlannual}$ = 1520.663 tons/year

1996/1999 Controlled Ozone Season Traffic Paints VOC emissions ($Emiss_{ozone}$) for State

Traffic Paints seasonal adjustment factor, SAF	1.0
- Weekly activity (WA), days/week	5
- Yearly activity (YA), weeks/year	52
Traffic Paints annual activity day factor (AADF), days/year	260

$Emiss_{control} = (Emiss_{annual} / AADF) \times SAF$
$Emiss_{control}$ = (1520.6630/260) x 1.0
$Emiss_{control}$ = 5.8487 tons/day

Calculation for Creditable Emissions Reductions (tons per day) after USEPA AIMs Rule Implementation

Traffic paint emission reductions applied for credit in the revised 15 % plan from the NJDEP AIMs rule constitute the difference between the uncontrolled 1999 Emissions and controlled 1999 Emissions. The NJDEP shall only claim credit from the USEPA AIM rule for this category since the NJDEP AIM rule had already been applied to adjust the 1990 base year and 1996 and 1999 projection year traffic paint emission inventory. For the purposes of this exercise these traffic paint emission inventories adjusted by the NJDEP rule represent the uncontrolled emissions. While the controlled emissions amount represents the traffic paint projected emissions controlled by the USEPA AIM rule. A sample calculation has been performed below to calculate traffic paint emission reductions on a state level from application of the USEPA AIM rule:

Emission Reduction ($Emiss_{redEPA}$) Results from USEPA AIM rule for Traffic Paint

$Emiss_{redEPA} = Emiss_{ozone} - 1999Emiss_{cont}$
$Emiss_{redEPA}$ = 7.2524 tons/day - 5.8487 tons/day
$Emiss_{redEPA}$ = 1.4037 tons per day

Summary of Emission Reduction Results for Major Coating Categories from NJDEP and USEPA AIM Rule

The total creditable emission reductions achieved from the application of the USEPA and NJDEP AIM rules on a State and New York and Philadelphia AQCR level for architectural, other product, other special purpose coating major categories are presented in Table 13.

Table 13:Total Creditable Emission Reductions for Major Category Coatings obtained from Application of the NJDEP and USEPA AIM Rules

Major Category Classification	State Creditable Emission Reductions (Tons/Day)	New York AQCR Creditable Emission Reduction (Tons/Day)	Philadelphia AQCR Creditable Emission Reduction (Tons/Day)
Architectural Coatings	8.4404	6.0968	1.8744
Other Product Coatings	0.0129	0.0093	0.0029
Special Purpose Coatings	0.1895	0.1369	0.0342
Actual traffic paints	2.9014	1.8891	0.7689
Total	11.5442	8.1321	2.6594

The summations performed above indicate that the NJDEP and USEPA AIM rules mainly effect the architectural coating major category with creditable emission reductions of 8.4404 tons per day for the entire state. The USEPA Aim rule also had a significant effect on traffic paint emissions with a statewide creditable emission reduction of 2.9014 tons per day. Whereas the other product coatings achieved creditable emission reductions of 0.0129 tons per day and the other special purpose category achieved creditable emission reductions of 0.1895 tons per day. Thus the total statewide VOC emission reductions achieved from application of the USEPA AIMs rule is 11.5442 tons per day. Creditable emission reductions of 8.1321 tons/day were achieved for New York AQCR and 2.6594 tons/day for the Philadelphia AQCR.

<u>Section 6</u>: Emission Benefits From Measures Included in the Original 15% Rate of Progress Plan

The emission benefit calculations for those measures that were not added to or revised in this document are discussed in the NJDEP Phase I Ozone SIP, Appendix V. Those measures are listed below.

- Federal reformulated gasoline-on and off highway
- Barge loading
- RACT
  - Subchapter 16: Asphalt Plants
  - Subchapter 16 & 19: Boilers
  - Subchapter 16: Flares
  - Subchapter 16: Gas Pipeline Blowdowns
  - Subchapter 16: Internal Combustion Engines
  - Subchapter 16: Leak Detection and Repair
  - Subchapter 16: Transfer of Volatile Organic Liquids
  - Subchapter 16 & 19: Combustion Turbines
  - CTG: SOCMI Distillation and Reactors
  - CTG: Offset Lithography
  - CTG: Plastic Parts Coating
- NJ Consumer Products Rule
- Federal HON Rule

The State of New Jersey
Department of Environmental Protection

Revision to the State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards

Proposed
Revision to the New Jersey 15 Percent Rate of Progress Plan

Appendix III: Emission Benefits Calculation

Attachment A: Tier I Benefit Estimation

November 23, 1998

This Attachment provides a ‘template’ MOBILE5ah input file. For the the input and output files for the NJTPA, SJTPO, and DVRPC modeling areas, please see the computer file documentation, as these files are too large to provide in a written Attachment.

Baseline Simulation - Template

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1       SPDFLG
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3       MYMRFG
5       NEWFLG
2       IMFLAG
1       ALHFLG
2       ATPFLG
2       RLFLAG
2       LOCFLG
1       TEMFLG
3       OUTFMT
4       PRTFLG
2       IDLFLG
3       NMHFLG
3       HCFLAG
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85 75 20 2222 11 091. 12211112                      ATP Record
89 1 85 70                                          Stage II VRS
[            ]  C  71.  95.  9.0  9.0 89 1 1 1      LAP Record
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Baseline Simulation - Tier I Template

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1       NEWFLG
2       IMFLAG
1       ALHFLG
2       ATPFLG
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0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0570.1070.1030.0750.0800.0970.0890.0520.0460.035
0.0420.0470.0340.0280.0120.0140.0170.0190.0120.009
0.0060.0050.0050.0020.007
0.1140.1680.1350.1090.0880.0700.0560.0450.0360.029
0.0230.0970.0000.0000.0000.0000.0000.0000.0000.000
0.0000.0000.0000.0000.000
74 20 68 20 00 00 091 1 1 2222 1111 220. 1.20 999.  I/M Record
85 75 20 2222 11 091. 12211112                      ATP Record
89 1 85 70                                          Stage II VRS
[            ]  C  71.  95.  9.0  9.0 89 1 1 1      LAP Record
```

The State of New Jersey
Department of Environmental Protection

Revision to the State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards

Proposed
Revision to the New Jersey 15 Percent Rate of Progress Plan

Appendix III: Emission Benefits Calculation

Attachment B: NLEV Benefit Estimation

November 23, 1998

This Attachment provides a ‘template’ MOBILE5ah input file. For the the input and output files for the NJTPA, SJTPO, and DVRPC modeling areas, please see the computer file documentation, as these files are too large to provide in a written Attachment.

Baseline Simulation - Tier I Template

```
1       PROMPT
99c____t
1       TAMFLG
1       SPDFLG
3       VMFLAG
3       MYMRFG
1       NEWFLG
2       IMFLAG
1       ALHFLG
2       ATPFLG
2       RLFLAG
2       LOCFLG
1       TEMFLG
3       OUTFMT
4       PRTFLG
2       IDLFLG
3       NMHFLG
3       HCFLAG
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0380.0720.0710.0590.0640.0700.0670.0560.0460.039
0.0290.0690.0600.0510.0390.0250.0230.0250.0180.014
0.0100.0110.0100.0070.025
0.0360.0620.0630.0560.0580.0630.0620.0490.0420.035
0.0310.0650.0560.0500.0390.0320.0290.0330.0240.018
0.0160.0160.0110.0110.042
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0570.1070.1030.0750.0800.0970.0890.0520.0460.035
0.0420.0470.0340.0280.0120.0140.0170.0190.0120.009
0.0060.0050.0050.0020.007
0.1140.1680.1350.1090.0880.0700.0560.0450.0360.029
0.0230.0970.0000.0000.0000.0000.0000.0000.0000.000
0.0000.0000.0000.0000.000
74 20 68 20 00 00 091 1 1 2222 1111 220. 1.20 999.  I/M Record
85 75 20 2222 11 091. 12211112                      ATP Record
89 1 85 70                                          Stage II VRS
[            ]  C  71.  95.  9.0  9.0 89 1 1 1      LAP Record
```

NLEV Secenario - Template

```
5       PROMPT
99c_n__t
1       TAMFLG
1       SPDFLG
3       VMFLAG
3       MYMRFG
1       NEWFLG
2       IMFLAG
1       ALHFLG
2       ATPFLG
2       RLFLAG
2       LOCFLG
1       TEMFLG
3       OUTFMT
4       PRTFLG
2       IDLFLG
3       NMHFLG
3       HCFLAG
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0380.0720.0710.0590.0640.0700.0670.0560.0460.039
0.0290.0690.0600.0510.0390.0250.0230.0250.0180.014
0.0100.0110.0100.0070.025
0.0360.0620.0630.0560.0580.0630.0620.0490.0420.035
0.0310.0650.0560.0500.0390.0320.0290.0330.0240.018
0.0160.0160.0110.0110.042
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0570.1070.1030.0750.0800.0970.0890.0520.0460.035
0.0420.0470.0340.0280.0120.0140.0170.0190.0120.009
0.0060.0050.0050.0020.007
0.1140.1680.1350.1090.0880.0700.0560.0450.0360.029
0.0230.0970.0000.0000.0000.0000.0000.0000.0000.000
0.0000.0000.0000.0000.000
74 20 68 20 00 00 091 1 1 2222 1111 220. 1.20 999.  I/M Record
85 75 20 2222 11 091. 12211112                      ATP Record
89 1 85 70                                          Stage II VRS
[            ]  C  71.  95.  9.0  9.0 89 1 1 1      LAP Record
```

The State of New Jersey
Department of Environmental Protection

Revision to the State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards

Proposed
Revision to the New Jersey 15 Percent Rate of Progress Plan

Appendix III: Emission Benefits Calculation

Attachment C: RFG Benefit Estimation

November 23, 1998

This Attachment provides a ‘template’ MOBILE5ah input file. For the the input and output files for the NJTPA, SJTPO, and DVRPC modeling areas, please see the computer file documentation, as these files are too large to provide in a written Attachment.

NLEV Secenario - Template

```
5       PROMPT
99c_n__t
1       TAMFLG
1       SPDFLG
3       VMFLAG
3       MYMRFG
1       NEWFLG
2       IMFLAG
1       ALHFLG
2       ATPFLG
2       RLFLAG
2       LOCFLG
1       TEMFLG
3       OUTFMT
4       PRTFLG
2       IDLFLG
3       NMHFLG
3       HCFLAG
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0380.0720.0710.0590.0640.0700.0670.0560.0460.039
0.0290.0690.0600.0510.0390.0250.0230.0250.0180.014
0.0100.0110.0100.0070.025
0.0360.0620.0630.0560.0580.0630.0620.0490.0420.035
0.0310.0650.0560.0500.0390.0320.0290.0330.0240.018
0.0160.0160.0110.0110.042
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0570.1070.1030.0750.0800.0970.0890.0520.0460.035
0.0420.0470.0340.0280.0120.0140.0170.0190.0120.009
0.0060.0050.0050.0020.007
0.1140.1680.1350.1090.0880.0700.0560.0450.0360.029
0.0230.0970.0000.0000.0000.0000.0000.0000.0000.000
0.0000.0000.0000.0000.000
74 20 68 20 00 00 091 1 1 2222 1111 220. 1.20 999.  I/M Record
85 75 20 2222 11 091. 12211112                      ATP Record
89 1 85 70                                          Stage II VRS
[            ]  C  71.  95.  9.0  9.0 89 1 1 1      LAP Record
```

RFG Simulation Template

```
5       PROMPT
99c_n_rt
1       TAMFLG
1       SPDFLG
3       VMFLAG
3       MYMRFG
1       NEWFLG
2       IMFLAG
1       ALHFLG
2       ATPFLG
2       RLFLAG
2       LOCFLG
1       TEMFLG
3       OUTFMT
4       PRTFLG
2       IDLFLG
3       NMHFLG
3       HCFLAG
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0380.0720.0710.0590.0640.0700.0670.0560.0460.039
0.0290.0690.0600.0510.0390.0250.0230.0250.0180.014
0.0100.0110.0100.0070.025
0.0360.0620.0630.0560.0580.0630.0620.0490.0420.035
0.0310.0650.0560.0500.0390.0320.0290.0330.0240.018
0.0160.0160.0110.0110.042
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0570.1070.1030.0750.0800.0970.0890.0520.0460.035
0.0420.0470.0340.0280.0120.0140.0170.0190.0120.009
0.0060.0050.0050.0020.007
0.1140.1680.1350.1090.0880.0700.0560.0450.0360.029
0.0230.0970.0000.0000.0000.0000.0000.0000.0000.000
0.0000.0000.0000.0000.000
74 20 68 20 00 00 091 1 1 2222 1111 220. 1.20 999.  I/M Record
85 75 20 2222 11 091. 12211112                      ATP Record
89 1 85 70                                          Stage II VRS
[            ]  C  71.  95.  9.0  9.0 89 1 1 2      LAP Record
```

The State of New Jersey
Department of Environmental Protection

Revision to the State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards

Proposed
Revision to the New Jersey 15 Percent Rate of Progress Plan

Appendix III: Emission Benefits Calculation

Attachment D: Basic I/M Benefit Estimation

November 23, 1998

This Attachment provides a ‘template’ MOBILE5ah input file. For the the input and output files for the NJTPA, SJTPO, and DVRPC modeling areas, please see the computer file documentation, as these files are too large to provide in a written Attachment.

RFG Simulation Template

```
5       PROMPT
99c_n_rt
1       TAMFLG
1       SPDFLG
3       VMFLAG
3       MYMRFG
1       NEWFLG
2       IMFLAG
1       ALHFLG
2       ATPFLG
2       RLFLAG
2       LOCFLG
1       TEMFLG
3       OUTFMT
4       PRTFLG
2       IDLFLG
3       NMHFLG
3       HCFLAG
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0380.0720.0710.0590.0640.0700.0670.0560.0460.039
0.0290.0690.0600.0510.0390.0250.0230.0250.0180.014
0.0100.0110.0100.0070.025
0.0360.0620.0630.0560.0580.0630.0620.0490.0420.035
0.0310.0650.0560.0500.0390.0320.0290.0330.0240.018
0.0160.0160.0110.0110.042
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0570.1070.1030.0750.0800.0970.0890.0520.0460.035
0.0420.0470.0340.0280.0120.0140.0170.0190.0120.009
0.0060.0050.0050.0020.007
0.1140.1680.1350.1090.0880.0700.0560.0450.0360.029
0.0230.0970.0000.0000.0000.0000.0000.0000.0000.000
0.0000.0000.0000.0000.000
74 20 68 20 00 00 091 1 1 2222 1111 220. 1.20 999.  I/M Record
85 75 20 2222 11 091. 12211112                      ATP Record
89 1 85 70                                          Stage II VRS
[            ]  C  71.  95.  9.0  9.0 89 1 1 2      LAP Record
```

Basic I/M Template

```
5       PROMPT
99c_n_rt
1       TAMFLG
1       SPDFLG
3       VMFLAG
3       MYMRFG
1       NEWFLG
2       IMFLAG
1       ALHFLG
2       ATPFLG
2       RLFLAG
2       LOCFLG
1       TEMFLG
3       OUTFMT
4       PRTFLG
2       IDLFLG
3       NMHFLG
3       HCFLAG
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0380.0720.0710.0590.0640.0700.0670.0560.0460.039
0.0290.0690.0600.0510.0390.0250.0230.0250.0180.014
0.0100.0110.0100.0070.025
0.0360.0620.0630.0560.0580.0630.0620.0490.0420.035
0.0310.0650.0560.0500.0390.0320.0290.0330.0240.018
0.0160.0160.0110.0110.042
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0570.1070.1030.0750.0800.0970.0890.0520.0460.035
0.0420.0470.0340.0280.0120.0140.0170.0190.0120.009
0.0060.0050.0050.0020.007
0.1140.1680.1350.1090.0880.0700.0560.0450.0360.029
0.0230.0970.0000.0000.0000.0000.0000.0000.0000.000
0.0000.0000.0000.0000.000
74 20 68 20 00 00 096 1 2 2222 1111 220. 1.20 999.  I/M Record
85 75 20 2222 12 096. 12211112                      ATP Record
89 1 85 70                                          Stage II VRS
[            ]  C  71.  95.  9.0  9.0 89 1 1 2      LAP Record
```

Basic I/M with Pressure Test Simulation

```
5       PROMPT
99c_n_rt
1       TAMFLG
1       SPDFLG
3       VMFLAG
3       MYMRFG
1       NEWFLG
2       IMFLAG
1       ALHFLG
5       ATPFLG
2       RLFLAG
2       LOCFLG
1       TEMFLG
3       OUTFMT
4       PRTFLG
2       IDLFLG
3       NMHFLG
3       HCFLAG
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0380.0720.0710.0590.0640.0700.0670.0560.0460.039
0.0290.0690.0600.0510.0390.0250.0230.0250.0180.014
0.0100.0110.0100.0070.025
0.0360.0620.0630.0560.0580.0630.0620.0490.0420.035
0.0310.0650.0560.0500.0390.0320.0290.0330.0240.018
0.0160.0160.0110.0110.042
0.0600.0980.0940.0910.0900.0830.0780.0740.0670.058
0.0490.0420.0330.0240.0180.0130.0080.0060.0040.003
0.0020.0020.0030.0010.003
0.0550.0990.0980.0920.0970.0730.0620.0330.0270.029
0.0310.0470.0440.0370.0280.0170.0230.0230.0190.013
0.0100.0090.0080.0060.018
0.0570.1070.1030.0750.0800.0970.0890.0520.0460.035
0.0420.0470.0340.0280.0120.0140.0170.0190.0120.009
0.0060.0050.0050.0020.007
0.1140.1680.1350.1090.0880.0700.0560.0450.0360.029
0.0230.0970.0000.0000.0000.0000.0000.0000.0000.000
0.0000.0000.0000.0000.000
74 20 68 20 00 00 096 1 2 2222 1111 220. 1.20 999.  I/M Record
85 75 20 2222 12 096. 12211112                      ATP Record
98 71 20 2222 12 096.                               Pressure
89 1 85 70                                          Stage II VRS
[            ]  C  71.  95.  9.0  9.0 89 1 1 2      LAP Record
```

The State of New Jersey
Department of Environmental Protection

Revision to the State Implementation Plan (SIP) for the Attainment and Maintenance of the Ozone National Ambient Air Quality Standards

Proposed
Revision to the New Jersey 15 Percent Rate of Progress Plan

Appendix IV: USEPA Guidance Memorandum Regarding Emission Benefit Calculation

November 23, 1998

Only available in hard copy.