

Appendix D - Updated Early PM_{2.5} Transportation Conformity Emission Budgets

PM_{2.5} and Annual NO_x Inventories for 2002 and 2009

To establish early PM_{2.5} budgets, the USEPA requires¹ that a voluntary early PM_{2.5} SIP revision be submitted that demonstrates that progress towards attainment is being made. In reference to the voluntary SIP that includes early budgets, the preamble states:

"To be approvable, such a SIP would have to include inventories for all source sectors and meet other SIP requirements. While these early SIPs would have to show some progress toward attainment, it is not a requirement that all of the reductions would come from onroad mobile vehicles."

The term "some progress toward attainment" has been interpreted by the USEPA to mean that the total 2009 inventories for direct PM_{2.5} and annual NO_x to be less than the 2002 values by at least five to ten percent.² Annual NO_x is the only PM_{2.5} precursor for which a budget is being established at this time. The five percent to ten percent criteria is met for the New Jersey portion of the New York/New Jersey/Long Island /Connecticut PM_{2.5} nonattainment area but is not met for the New Jersey portion of the Philadelphia/Wilmington PM_{2.5} nonattainment area. Preliminary results show a small increase in overall direct PM_{2.5} emissions between 2002 and 2009 for the New Jersey portion of the Philadelphia/Wilmington PM_{2.5} nonattainment area. Therefore, early PM_{2.5} budgets are established for the New Jersey portion of the New York/New Jersey/Long Island /Connecticut PM_{2.5} nonattainment area only.

In a 2006 SIP revision³ (the "2006 SIP Revision") New Jersey established early transportation conformity emission budgets for directly emitted fine particulate matter (direct PM_{2.5}) and annual NO_x (a PM_{2.5} precursor) for the New Jersey portion of the New York/New Jersey/Long Island/Connecticut PM_{2.5} nonattainment area. The initial early budgets for New Jersey were approved by the USEPA on July 10, 2006.⁴

Subsequent to the approval of the initial early budgets, an analysis of the model assumptions regarding the distribution of vehicle miles traveled (VMT) between vehicle types was conducted. One of the results of this analysis was that a greater fraction of the total VMT should be attributed to the heaviest class of diesel trucks (trucks greater than 60,000 lbs. Gross Vehicle Weight Rating). When the updated VMT by vehicle type fractions are used as a model input, the predicted emissions of direct PM_{2.5} and annual NO_x increase. The increased predictions result in values that are significantly higher than those adopted as initial early budgets. The following inventory analyses include the updated emission predictions for Mercer County for 2009. All other inventory values are the same as those documented in the 2006 SIP Revision. The bases for these inventory

¹ 69 Fed. Reg., 40030.

² USEPA Region 2 and NJDEP, conference call, October 4, 2005.

³ NJDEP, State Implementation Plan (SIP) Revisions for the Attainment and Maintenance of the 8-Hour Carbon Monoxide National Ambient Air Quality Standard, 1-Hour Ozone National Ambient Air Quality Standard, and Fine Particulate Matter National Ambient Air Quality Standard; and the 2002 Periodic Emission Inventory, May 2006.

⁴ Final Rule, Approval and Promulgation of Implementation Plans; Carbon Monoxide Maintenance Plan, Conformity Budgets, Emissions Inventories; State of New Jersey, Federal Register / Vol. 71, No. 131 / Monday, July 10, 2006.

values were documented in the 2006 SIP Revision.⁵ The purpose of the following analysis is to evaluate the impact of the updated Mercer County 2009 budget values on continuing to meet the “progress towards attainment” criteria that allows for the establishment of early transportation conformity budgets.

Table B1 shows the results of the 2002 and 2009 direct PM_{2.5} inventory (with anticipated controls in place) by source type for the New Jersey counties in the New York /New Jersey/Long Island/Connecticut PM_{2.5} nonattainment area. Emissions from controlled stationary and area sources are projected to increase by nine and three percent respectively, for a total increase of 438 tons per year. The increase is projected to be more than offset by projected decreases in PM_{2.5} emissions from onroad and nonroad mobile sources, by a total of 1,324 tons per year, for an overall decrease of 884 tons per year by 2009. This represents an overall 6.3% reduction in direct PM_{2.5} emissions (see Table B2). Thus the area continues to meet the USEPA’s criteria for “progress toward attainment” for direct PM_{2.5} emissions.

⁵ NJDEP, op. cit., Section II C.

**Table D1: Direct PM_{2.5} Emission Inventories for 2002 and 2009 for the New Jersey
Portion of the New York /New Jersey/Long Island/Connecticut PM_{2.5}
Nonattainment Area**

| COUNTY | DIRECT ANNUAL PM _{2.5} CONTROLLED EMISSIONS (TONS PER YEAR) ⁽¹⁾ | | | | | | | | | | | |
|--|---|--------------|-------------------|--------------|--------------|--------------------|--------------|--------------|-------------------|--------------|--------------|--------------------|
| | AREA | | | NONROAD | | | STATIONARY | | | ONROAD | | |
| | 2002 | 2009 | (2009-2002) | 2002 | 2009 | (2009-2002) | 2002 | 2009 | (2009-2002) | 2002 | 2009 | (2009-2002) |
| BERGEN | 537 | 569 | +32 | 478 | 419 | -59 | 149 | 183 | +34 | 376 | 214 | -162 |
| ESSEX | 411 | 436 | +25 | 393 | 341 | -51 | 185 | 222 | +37 | 291 | 163 | -128 |
| HUDSON | 269 | 286 | +16 | 345 | 299 | -45 | 1,077 | 1,085 | +7 | 134 | 76 | -58 |
| MERCER | 530 | 548 | +18 | 203 | 177 | -26 | 188 | 212 | +24 | 141 | 108 | -33 |
| MIDDLESEX | 467 | 497 | +30 | 346 | 299 | -47 | 483 | 553 | +70 | 347 | 207 | -140 |
| MONMOUTH | 981 | 1,002 | +21 | 501 | 426 | -75 | 55 | 66 | +10 | 244 | 145 | -100 |
| MORRIS | 1,284 | 1,297 | +13 | 280 | 251 | -29 | 39 | 45 | +6 | 209 | 126 | -83 |
| PASSAIC | 543 | 554 | +11 | 178 | 151 | -27 | 19 | 22 | +3 | 141 | 81 | -60 |
| SOMERSET | 441 | 452 | +11 | 149 | 131 | -19 | 55 | 60 | +4 | 152 | 88 | -64 |
| UNION | 272 | 289 | +17 | 333 | 291 | -42 | 540 | 589 | +49 | 185 | 108 | -78 |
| TOTAL for New Jersey portion of the NY/NJ/ LI/CT Area | 5,736 | 5,930 | +193 (+3%) | 3,206 | 2,788 | -419 (-13%) | 2,790 | 3,035 | +245 (+9%) | 2,220 | 1,315 | -905 (-41%) |

NOTES:

- (1) In order for the calculated inventory values to more closely match the actual measured levels in New Jersey air quality monitors, the fugitive dust emissions were multiplied by a dust adjustment factor of 20%. Fugitive dusts are directly released air contaminants that do not pass through an exhaust pipe, stack, flue, vent or chimney. The main sources of fugitive dusts are dust from paved and unpaved roadways, stock/storage piles, landfill activity, quarry/mining activity, raw material handling, construction and agricultural tilling.

Table D2: Direct PM_{2.5}: Calculation of the Percent Reduction in Projected 2009 Emissions from the 2002 Emissions by County

| | % EMISSION REDUCTION | CONTROLLED EMISSIONS ANNUAL (TONS PER YEAR) ⁽¹⁾ | | |
|--|-------------------------|---|---------------|-------------|
| | | TOTAL OF ALL SECTORS | | |
| COUNTY | (2009-2002)/2002 | 2002 | 2009 | 2009-2002 |
| BERGEN | -10.0% | 1,540 | 1,385 | -155 |
| ESSEX | -9.2% | 1,280 | 1,162 | -117 |
| HUDSON | -4.4% | 1,825 | 1,746 | -80 |
| MERCER | -1.6% | 1,062 | 1,045 | -17 |
| MIDDLESEX | -5.3% | 1,643 | 1,556 | -87 |
| MONMOUTH | -8.1% | 1,781 | 1,639 | -144 |
| MORRIS | -5.1% | 1,812 | 1,719 | -93 |
| PASSAIC | -8.3% | 881 | 808 | -73 |
| SOMERSET | -8.6% | 797 | 731 | -68 |
| UNION | -4.0% | 1,330 | 1,277 | -54 |
| TOTAL for New Jersey portion of the NY/NJ/ LI/CT Area | -6.3% | 13,952 | 13,068 | -884 |

NOTES:

- (1) In order for the calculated inventory values to more closely match the actual measured levels in New Jersey air quality monitors, the fugitive dust emissions were multiplied by a dust adjustment factor of 20%. Fugitive dusts are directly released air contaminants that do not pass through an exhaust pipe, stack, flue, vent or chimney. The main sources of fugitive dusts are dust from paved and unpaved roadways, stock/storage piles, landfill activity, quarry/mining activity, raw material handling, construction and agricultural tilling.

Table B3 shows the results of the 2002 and projected 2009 NO_x inventories by source type for the New Jersey counties in the New York /New Jersey/Long Island/Connecticut PM_{2.5} nonattainment area. Emissions from stationary and area sources are projected to increase by seven percent in both categories, for a total increase of 3,698 tons per year. The increase is projected to be more than offset by projected decreases in NO_x emissions from onroad and nonroad mobile sources, by a total of 79,231 tons per year, for an overall decrease of 75,533 tons per year, or about thirty-two percent (32%), by 2009. Thus the area continues to meet the USEPA's criteria for "progress toward attainment" for direct NO_x emissions.

**Table D3: Annual NO_x Emission Inventories for 2002 and 2009 for the New Jersey
Portion of the New York /New Jersey/Long Island/Connecticut PM_{2.5}
Nonattainment Area**

| | CONTROLLED EMISSIONS ANNUAL (TONS PER YEAR) | | | | | | | | | | | |
|--|---|---------------|---------------------|---------------|---------------|----------------------|---------------|---------------|---------------------|----------------|---------------|-----------------------|
| SOURCE CATEGORY | AREA | | | NONROAD | | | STATIONARY | | | ONROAD | | |
| COUNTY | 2002 | 2009 | (2009-2002) | 2002 | 2009 | (2009-2002) | 2002 | 2009 | (2009-2002) | 2002 | 2009 | (2009-2002) |
| BERGEN | 2,815 | 3,019 | +204 | 6,707 | 5,178 | -1,530 | 988 | 1,189 | +201 | 23,917 | 11,198 | -12,719 |
| ESSEX | 2,436 | 2,621 | +185 | 8,137 | 7,048 | -1,090 | 2,441 | 3,081 | +640 | 16,537 | 7,979 | -8,558 |
| HUDSON | 1,735 | 1,864 | +129 | 5,976 | 5,291 | -685 | 9,674 | 9,970 | +296 | 7,853 | 3,873 | -3,980 |
| MERCER | 1,257 | 1,354 | +97 | 2,427 | 1,898 | -529 | 13,034 | 13,201 | +167 | 8,505 | 5,056 | -3,449 |
| MIDDLESEX | 2,343 | 2,512 | +169 | 4,849 | 3,745 | -1,104 | 3,567 | 4,164 | +597 | 22,147 | 10,871 | -11,276 |
| MONMOUTH | 1,806 | 1,934 | +128 | 4,316 | 3,846 | -470 | 240 | 272 | +31 | 14,860 | 6,973 | -7,887 |
| MORRIS | 1,752 | 1,879 | +127 | 3,151 | 2,417 | -735 | 284 | 337 | +53 | 13,748 | 6,398 | -7,350 |
| PASSAIC | 1,361 | 1,452 | +91 | 2,413 | 1,800 | -613 | 122 | 144 | +22 | 8,748 | 4,164 | -4,584 |
| SOMERSET | 1,048 | 1,121 | +74 | 2,097 | 1,570 | -527 | 313 | 370 | +57 | 9,090 | 4,376 | -4,715 |
| UNION | 1,621 | 1,732 | +111 | 5,883 | 4,903 | -980 | 3,757 | 4,077 | +320 | 12,294 | 5,844 | -6,451 |
| TOTAL for New Jersey portion of the NY/NJ/ LI/CT Area | 18,173 | 19,488 | +1,314 (+7%) | 45,957 | 37,694 | -8,262 (-18%) | 34,420 | 36,804 | +2,384 (+7%) | 137,701 | 66,732 | -70,969 (-52%) |

Table B4 is a comparison of total NO_x emissions for 2002 and 2009 by source sector for the New Jersey counties in the New York /New Jersey/Long Island/Connecticut PM_{2.5} nonattainment area. Annual NO_x emissions are projected to be lower in each county and across the entire New Jersey portion of the New York /New Jersey/Long Island/Connecticut PM_{2.5} nonattainment area by 14.7 percent to 41.7 percent with an average of over 30 percent. Based on these annual NO_x inventories, the New Jersey portion of the New York /New Jersey/Long Island/Connecticut area continues to meet the USEPA criteria of a reduction of at least five to ten percent to allow the area to be considered for the establishment of early PM_{2.5} budgets in a voluntary SIP.

Table D4: Annual NO_x: Calculation of the Percent Reduction in Projected 2009 Emissions from the 2002 Emissions by County

| SOURCE CATEGORY | % EMISSION REDUCTION | CONTROLLED EMISSIONS ANNUAL (TONS PER YEAR) | | |
|--|-------------------------|--|----------------|----------------|
| | | TOTAL OF ALL SECTORS | | |
| COUNTY | (2009-2002)/2002 | 2002 | 2009 | 2009-2002 |
| BERGEN | -40.2% | 34,427 | 20,584 | -13,843 |
| ESSEX | -29.9% | 29,551 | 20,729 | -8,822 |
| HUDSON | -16.8% | 25,238 | 20,998 | -4,240 |
| MERCER | -14.7% | 25,223 | 21,509 | -3,714 |
| MIDDLESEX | -35.3% | 32,906 | 21,292 | -11,614 |
| MONMOUTH | -38.6% | 21,222 | 13,025 | -8,197 |
| MORRIS | -41.7% | 18,935 | 11,031 | -7,904 |
| PASSAIC | -40.2% | 12,644 | 7,560 | -5,084 |
| SOMERSET | -40.7% | 12,548 | 7,437 | -5,112 |
| UNION | -29.7% | 23,555 | 16,556 | -7,000 |
| TOTAL for the New Jersey portion of the NY/NJ/ LI/CT Area | -32.0% | 236,251 | 160,718 | -75,533 |

The New Jersey portion of the New York /New Jersey/Long Island/Connecticut PM_{2.5} nonattainment area continues to meet the USEPA criterion for progress towards attainment and is eligible for establishing an early PM_{2.5} transportation budget.