Appendix IX
2008 Inventory and 2007/2008/2025 Inventory Comparison

A comparison of MARAMA's v3.3 2007 and 2025 emission inventories and the USEPA's 2008 National Emissions Inventory (NEI) v2 was evaluated to show that the 2007 inventory is an appropriate and representative inventory to use as a surrogate attainment inventory for the 2008 inventory for the Southern New Jersey-Philadelphia nonattainment area for the daily 35 $\mu g/m^3$ $PM_{2.5}$ standard. This comparison is included as Attachment 1. The 2008 NEI v2 emissions for New Jersey, Delaware, and Pennsylvania for the counties in the Southern New Jersey-Philadelphia Nonattainment Area were downloaded from the USEPA Emissions Inventory System (EIS) are also included in Attachment 1. The MARAMA technical support documents can be found in Appendices V and VI of this SIP.

The New Jersey 2007 and 2025 MARAMA inventory portion was updated to include New Jersey's latest inventory contained in this SIP, except for the PM2.5 emissions for point and area sources. The MARAMA v3.3 unadjusted fugitive dust emissions were used in this comparison in order to be consistent with the USEPA 2008 NEI which has unadjusted fugitive dust.

USEPA has updated their emissions methodology for paved roads, which is reflected in the 2007 and 2025 inventories, but not in the USEPA 2008 NEI. The new methodology results in much larger $PM_{2.5}$ emissions for this category. New Jersey has updated the 2008 inventory emissions in the attached summary for New Jersey and Delaware based on the new methodology.

The inventory comparison in Attachment 1 excludes wildfires from the comparison. It would not be an accurate comparison of the 2007 and 2008 emissions inventories with the inclusion of wildfires. Wildfires are exceptional events, are not spread out over the entire year, and are unpredictable from year to year. For this reason, the USEPA has changed the way wildfires are reported in their US National Emissions Inventory (NEI). They are now required to be reported as events. Therefore, the exclusion of wildfires from this analysis provides a more reliable and accurate data comparison. Wildfires have been included in the SIP inventories, as discussed in Appendices V and VI and VIII.

The data shows that the 2007 inventory is comparable to the 2008 inventory for both the New Jersey portion of the Southern New Jersey-Philadelphia (SNJ-Phila.) nonattainment area, and the SNJ-Phila. nonattainment area as a whole. A comparison of the MARAMA 2007 inventory to the MARAMA 2025 inventory shows a decrease in $PM_{2.5}$, NO_x and SO_2 emissions from 2007 to 2025. A comparison of the USEPA 2008 NEI to MARAMA's 2025 inventory also shows a decrease in $PM_{2.5}$, NO_x and SO_2 emissions from 2008 and 2025.

Discrepancies in the two inventories (2007 and 2008) are noted due to methodology discrepancies. For some categories the USEPA uses their own data and calculations, not New Jersey's state specific data and calculations, either because New Jersey did not submit emissions, because methodologies have recently changed or for certain categories they prefer to use their own data. Specifically, some discrepancies include:

- USEPA does their own on-road MOVES model runs for the NEI. While some decreases are anticipated due to fleet turnover of new vehicles, discrepancies are also due to differences in model runs and inputs. Increases in SO2 from 2007 to 2008 are a reflection of methodology differences, not actual emissions. New Jersey's inputs for 2007 were based on actual New Jersey fuel survey data of gasoline and diesel fuel sulfur levels; while the 2008 fuel inputs used to generate the 2008 EPA NEI emissions did not use actual local fuel sulfur levels.

- 2008 USEPA NEI emissions for air and railroad emissions were calculated by USEPA, and may vary from New Jersey's state specific calculations.

- As discussed above, USEPA has updated their emissions methodology for paved roads, which is reflected in the 2007 and 2025 inventories, but not in the USEPA 2008 NEI. The new methodology results in much larger PM2.5 emissions for this category. New Jersey has updated the 2008 inventory emissions in the attached summary for New Jersey and Delaware.

Despite the inventory methodology discrepancies, the inventory analysis shows that a decreasing trend in emissions is anticipated out to 2025 from a 2007 inventory base year and from a 2008 inventory base year. Both the 2007 and 2008 inventories satisfy the requirement that a state may demonstrate maintenance of a NAAQS by showing that future projected missions are less than or equal to the attainment year inventory.[1]

[1] USEPA memorandum dated September 4, 1992, entitled *Procedures for Processing Requests to Redesignate Areas to Attainment*, from John Calcagni, Director, Air Quality Management Division, to Regional Air Directors, page 9.

Comparison of USEPA 2008 NEI with MARAMA 2007 and 2025 Emission Inventories
New Jersey-Delaware-Pennsylvania PM2.5 Nonattainment Area
June 14, 2012

	Nonattainment Area Total Emissions tpy			New Jersey Emissions tpy			Delaware Emissions tpy			Pennsylvania Emissions tpy		
	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007
MARAMA 2007 Inv. v3.3 1/17/12 (1)	**NOx**	**PM2.5**	**SO2**	**NOx**	**PM2.5**	**SO2**	**NOx**	**PM2.5**	**SO2**	**NOx**	**PM2.5**	**SO2**
Point	31,832	4,573	35,047	4,453	794	2,034	6,635	1,335	13,380	20,744	2,444	19,633
Area	17,639	15,153	16,763	3,422	3,061	1,129	1,293	1,207	630	12,924	10,885	15,004
Onroad	107,532	3,794	773	26,992	1,055	161	10,577	324	100	69,963	2,415	512
Nonroad and MAR	30,890	2,344	6,078	6,790	560	1,642	4,580	327	1,118	19,521	1,457	3,318
2007 Wildfire Emissions (2810001000)	62	415	0	61	413	0	0	0	0	0	1	0
2007 TOTAL including Wildfires	187,955	26,279	58,661	41,718	5,884	4,965	23,084	3,193	15,228	123,153	17,202	38,467
2007 TOTAL excluding Wildfires	**187,893**	**25,864**	**58,661**	**41,657**	**5,470**	**4,965**	**23,084**	**3,193**	**15,228**	**123,153**	**17,201**	**38,467**
	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008	2008
EPA NEI 2008 v2	**NOx**	**PM2.5**	**SO2**	**NOx**	**PM2.5**	**SO2**	**NOx**	**PM2.5**	**SO2**	**NOx**	**PM2.5**	**SO2**
Point	31,233	4,790	29,340	4,131	733	2,321	5,596	1,145	10,577	21,506	2,911	16,443
Area	22,148	12,830	17,011	6,877	2,706	1,036	1,276	1,159	399	13,995	8,964	15,576
Onroad	71,510	2,724	1,140	19,471	782	332	8,889	299	129	43,151	1,643	678
Nonroad and MAR	27,246	2,250	5,330	5,787	507	1,467	4,464	319	1,159	16,995	1,425	2,704
2008 Wildfires (281001000)	50	338	0	50	338	0						
2008 TOTAL including Wildfires	**152,187**	**22,931**	**52,821**	**36,316**	**5,066**	**5,156**	**20,224**	**2,922**	**12,264**	**95,646**	**14,943**	**35,401**
2008 TOTAL excluding Wildfires	**152,137**	**22,594**	**52,821**	**36,266**	**4,729**	**5,156**	**20,224**	**2,922**	**12,264**	**95,646**	**14,943**	**35,401**
	2025	2025	2025	2025	2025	2025	2025	2025	2025	2025	2025	2025
MARAMA 2025 Inv. v3.3 1/17/12 (1)	**NOx**	**PM2.5**	**SO2**	**NOx**	**PM2.5**	**SO2**	**NOx**	**PM2.5**	**SO2**	**NOx**	**PM2.5**	**SO2**
Point	19,862	3,870	13,565	4,433	853	1,355	4,113	1,208	6,352	11,316	1,808	5,858
Area	17,336	14,836	9,756	3,366	2,932	101	1,295	1,308	469	12,674	10,595	9,186
Onroad	27,316	1,460	423	6,095	278	124	2,591	113	89	18,630	1,069	210
Nonroad and MAR	17,296	1,315	712	3,915	315	141	2,116	148	40	11,265	852	531
2025 Wildfire Emissions (2810001000)	62	415	0	61	413	0	0	0	0	0	1	0
2025 TOTAL including Wildfires	81,871	21,895	24,456	17,870	4,792	1,721	10,115	2,777	6,949	53,886	14,326	15,785
2025 TOTAL excluding Wildfires	**81,810**	**21,480**	**24,455**	**17,809**	**4,378**	**1,721**	**10115**	**2777**	**6949**	**53,886**	**14,325**	**15,785**
Difference Between 2007 and 2008	**-35,757**	**-3,270**	**-5,840**	**-5,390**	**-742**	**191**	**-2,860**	**-270**	**-2,964**	**-27,507**	**-2,258**	**-3,067**
% Difference Between 2007 and 2008	**-19%**	**-13%**	**-10%**	**-13%**	**-14%**	**4%**	**-12%**	**-8%**	**-19%**	**-22%**	**-13%**	**-8%**
Difference Between 2007 and 2025	**-106,084**	**-4,383**	**-34,205**	**-23,847**	**-1,092**	**-3,244**	**-12,969**	**-416**	**-8,279**	**-69,267**	**-2,876**	**-22,682**
% Difference Between 2007 and 2025	**-56%**	**-17%**	**-58%**	**-57%**	**-20%**	**-65%**	**-56%**	**-13%**	**-54%**	**-56%**	**-17%**	**-59%**
Difference Between 2008 and 2025	**-70,327**	**-1,114**	**-28,366**	**-18,457**	**-350**	**-3,435**	**-10,109**	**-146**	**-5,315**	**-41,760**	**-618**	**-19,616**
% Difference Between 2008 and 2025	**-46%**	**-5%**	**-54%**	**-51%**	**-7%**	**-67%**	**-50%**	**-5%**	**-43%**	**-44%**	**-4%**	**-55%**

Notes:

1. MARAMA 2007 and 2025 Inventories v3.3 dated 1/17/2012 for DE and PA.
   NJ's inventory has been updated in accordance with final updates in this SIP, exept for Area and Point PM2.5.
   Area and Point PM2.5 emissions are from MARAMA v3.3 unadjusted for fugitive dust.
   Currently adopted Sulfur in Fuels Rule was used for SO2 Projections for Area Sources and NonEGU Point Sources
2. NJ and DE Area Source Paved Roads in 2008 Inventory have been updated with the new EPA methodology to be consistent with the 2007 inventory.
   PA 2008 paved roads have not been updated.