

**Region 3 Plan Summary  
Shenandoah National Park 8-Hour Ozone Maintenance Plan**

**Title:** Maintenance Plan for the Shenandoah National Park (SNP) 8-Hour Ozone Area

**Federal Register Dates:** November 4, 2005, 70 FR 67109 (Proposed Rule); January 3, 2006, 71 FR 24 (Final Rule).

**EPA Effective date:** February 2, 2006.

**State Submittal Date:** September 23, 2005.

**Affected Area:** Shenandoah National Park (portions of Page and Madison Counties).

**Summary of the Plan:** On September 23, 2005, Virginia submitted a maintenance plan for the SNP area as a SIP revision, to ensure continued attainment over the next 10 years. The SNP area is composed of those portions of Page and Madison Counties located within the boundaries of Shenandoah National Park. Quality-assured ozone monitoring data from the Big Meadows monitor taken during the 3-year period of 2002-2004 indicates that the SNP area has a design value of 0.082 parts per million (ppm). Therefore, the ambient ozone data for the SNP area indicates no violations of the 8-hour ozone standard (0.084 ppm). Available preliminary monitoring data for 2005 indicates continued attainment of the 8-hour ozone standard. The fourth high 8-hour daily maximum concentrations, along with the three-year average, are summarized in Table 1.

<b>Year</b>	<b>Annual 4<sup>th</sup> High Reading (ppm)</b>
<b>2002</b>	0.086
<b>2003</b>	0.086
<b>2004</b>	0.075
<b>The average for the 3-year period 2002 through 2004 is 0.082 ppm</b>	

Virginia has the legal authority to implement and enforce specified measures necessary to attain and maintain the NAAQS. Additionally, federal programs such as the national low emissions vehicle (NLEV) program, Tier2/Low Sulfur Gasoline Rule, 2007 On-Road Diesel Engine Rule, and Federal Non-road Engine/Equipment Rules will continue to be implemented on a national level. These programs help provide the reductions necessary for the SNP area to maintain attainment.

Virginia will track the progress of the maintenance demonstration by periodically updating the emissions inventory. This tracking will consist of annual and periodic evaluations. The annual evaluation will consist of checks on key emissions trend indicators such as the annual emissions update of stationary sources, the Highway Performance Monitoring System (HPMS) VMT data reported to the Federal Highway Administration, and other growth indicators. These indicators will be compared to the growth assumptions used in the plan to determine if the predicted versus the observed growth remains relatively constant. Virginia will also develop and submit comprehensive tracking inventories to EPA every three years during the maintenance plan period.

**Emissions Inventory:** Virginia prepared comprehensive volatile organic compounds (VOC) and nitrogen oxides (NOx) emissions inventories for the SNP area, based on actual emissions for a “typical summer day.” Tables 2 and 3 specify the VOC and NOx emissions for the SNP area for 2004, 2009, and 2015. Virginia chose 2009 as an interim year in the 10-year maintenance demonstration period to demonstrate that the VOC and NOx emissions are not projected to increase above the 2004 attainment level during the time of the 10-year maintenance period.

<b>Table 2: Total VOC Emissions for 2004-2015 (tpd)</b>			
<b>Source Category</b>	<b>2004 VOC Emissions</b>	<b>2009 VOC Emissions</b>	<b>2015 VOC Emissions</b>
<b>Mobile<sup>1</sup></b>	0.042	0.028	0.019
<b>Nonroad</b>	0.162	0.109	0.081
<b>Area<sup>2</sup></b>	0.375	0.378	0.383
<b>Point</b>	0	0	0
<b>Total</b>	<b>0.579</b>	<b>0.514</b>	<b>0.483</b>
<sup>1</sup> Includes transportation conformity provisions <sup>2</sup> Includes vehicle refueling emissions			
<b>Table 3: Total NOx Emissions 2004-2015 (tpd)</b>			
<b>Source Category</b>	<b>2004 NOx Emissions</b>	<b>2009 NOx Emissions</b>	<b>2015 NOx Emissions</b>
<b>Mobile<sup>1</sup></b>	0.075	0.047	0.025
<b>Nonroad</b>	0.136	0.110	0.077

<b>Area</b>	0.204	0.204	0.204
<b>Point</b>	0	0	0
<b>Total</b>	<b>0.415</b>	<b>0.361</b>	<b>0.306</b>
<sup>1</sup> Includes transportation conformity provisions			

**Control Measures/Regulations Included As Part of the Plan:** Between 2002 and 2004, VOC emissions were reduced by 0.044 tpd, and NOx emissions were reduced by 0.031 tpd, due to the following permanent and enforceable measures implemented or in the process of being implemented in the SNP area. Table 4 summarizes these emissions reductions:

<b>Table 4: Total VOC and NOx Emissions for 2002 and 2004 (tpd)</b>					
<b>Volatile Organic Compounds (VOC)</b>					
<b>Year</b>	<b>Point</b>	<b>Area *</b>	<b>Nonroad</b>	<b>Mobile</b>	<b>Total</b>
<b>Year 2002</b>	0	0.390	0.182	0.052	0.624
<b>Year 2004</b>	0	0.375	0.162	0.042	0.579
<b>Diff. (02-04)</b>	0	-0.014	-0.020	-0.010	-0.044
<b>Nitrogen Oxides (NOx)</b>					
<b>Year</b>	<b>Point</b>	<b>Area *</b>	<b>Nonroad</b>	<b>Mobile</b>	<b>Total</b>
<b>Year 2002</b>	0	0.212	0.145	0.089	0.446
<b>Year 2004</b>	0	0.204	0.136	0.075	0.415
<b>Diff. (02-04)</b>	0	-0.008	-0.009	-0.014	-0.031
* Area source category includes emissions from motor vehicle refueling					

Virginia has demonstrated that the implementation of permanent enforceable emissions controls have reduced local VOC and NOx emissions. Programs currently in effect are:

- (a) National Low Emission Vehicle (NLEV);
- (b) Motor vehicle fleet turnover with new vehicles meeting the Tier 2 standards; and,
- (c) Low-sulfur gasoline.

Additionally, Virginia has attributed permanent emissions reductions to the NOx SIP Call, which took effect in 2004. While there are no subject sources currently located in the SNP area, Virginia's explains that the SNP area indirectly benefits in terms of

improved air quality due to this program. Virginia estimates that between 2003 and 2004, emissions of NOx were reduced from facilities located within Virginia and subject to the NOx SIP Call by approximately 7,400 tons during the ozone season (May 1<sup>st</sup> through September 30<sup>th</sup>). Virginia believes that these emission reductions, which are taking place outside the SNP area, are significant in improving the SNP area's air quality.

Virginia has also attributed permanent emissions reductions from the following Federal programs:

- (a) Non-road diesel, 69 FR 39858 (June 29, 2004),
- (b) The heavy duty engine and vehicle standards, 66 FR 5002 (January 18, 2001)
- (c) The new Tier 2 tailpipe standards for automobiles, 65 FR 6698 (January 10, 2000),

The Tier 2 standards came into effect in 2004, and by 2030, EPA expects that the new Tier 2 standards will reduce NOx emissions by about 74 percent.

**Conformity Process/Motor Vehicle Emissions Budget (MVEB):** The maintenance plan identifies the MVEBs for NOx and VOC for transportation conformity purposes for the years 2004, 2009 and 2015, as summarized in Table 5 below:

<b>Table 5: Motor Vehicle Emissions Budgets in Tons per Day (tpd)</b>		
<b>Year</b>	<b>NOx</b>	<b>VOC</b>
<b>2004</b>	0.075	0.042
<b>2009</b>	0.057	0.038
<b>2015</b>	0.035	0.029

A "safety margin" is the difference between the attainment level of emissions (from all sources) and the projected level of emissions (from all sources) in the maintenance plan. The attainment level of emissions is the level of emissions during one of the years in which the area met the national ambient air quality standards (NAAQS). The emissions up to the level of the attainment year including the safety margins are projected to maintain the area's air quality consistent with the 8-hour ozone NAAQS. Table 6 shows the safety margins for the 2009 and 2015 years.

<b>Table 6: 2009 and 2015 Safety Margins for the Shenandoah National Park Area</b>		
<b>Inventory Year</b>	<b>VOC Emissions (tpd)</b>	<b>NOx Emissions (tpd)</b>
<b>2004 Attainment</b>	0.0579	0.415

<b>2009 Interim</b>	0.0525	0.371
<b>2009 Safety Margin</b>	0.054	0.044
<b>2004 Attainment</b>	0.579	0.415
<b>2015 Final</b>	0.493	0.316
<b>2015 Safety Margin</b>	0.086	0.099

Once allocated to the mobile source budgets, these portions of the safety margins are no longer available, and may no longer be allocated to any other source category. Table 7 shows the final 2009 and 2015 MVEBS for the SNP area.

<b>Table 7: 2009 and 2015 Final MVEBs for the Shenandoah National Park Area</b>		
<b>Inventory Year</b>	<b>VOC Emissions (tpd)</b>	<b>NOx Emissions (tpd)</b>
<b>2009 projected on-road mobile source projected emissions</b>	0.028	0.047
<b>2009 Safety Margin Allocated to MVEBs</b>	0.010	0.010
<b>2009 MVEBs</b>	0.038	0.057
<b>2015 projected on-road mobile source projected emissions</b>	0.019	0.025
<b>2015 Safety Margin Allocated to MVEBs</b>	0.010	0.010
<b>2015 MVEBs</b>	0.029	0.035

**Contingency Measures:** The contingency plan provisions are designed to promptly correct a violation of the NAAQS that occurs after redesignation. Virginia's maintenance plan lays out two situations where the need to adopt and implement a contingency measure to further reduce emissions would be triggered. Those situations are as follows:

- (i) An actual increase of the VOC or NOx emissions above the 2004 attainment levels is identified or predicted through the development of the comprehensive periodic tracking inventories - If the 2004 attainment level emissions for VOC or NOx is exceeded or is predicted to be exceeded, Virginia will prepare a complete and thorough VOC and NOx emission inventory for the current year.

(ii) A violation of the 8-hour ozone standard occurs at the Madison County/Big Meadows monitor - In the event that a violation of the ozone standard occurs at the Big Meadows monitor, Virginia, in consultation with EPA and the SNP, will implement one of the following measures:

- (1) Stage I vapor recovery on the gasoline stations located in the SNP area;
- (2) Expansion of a series of voluntary, episodic control measures through an Air Quality Action Day Program (AQADP). The program will be based upon ozone forecasts created for the Shenandoah National Park by the Virginia Department of Air Quality (VADEQ) meteorological staff. The AQADP would be operated by the Shenandoah National Park in partnership with Virginia.
- (3) The following actions, or similar actions deemed appropriate by the SNP Superintendent, on days when 8-hour ozone levels are forecast to exceed 0.08 ppm (code orange or code red days):
  - (1) Encourage employees to decrease vehicle use by car pooling and reducing the number of non-essential trips;
  - (2) Postpone or decrease the use of mowers, weed eaters, chainsaws, electroshockers, and other similar gasoline engine equipment until the ozone level drops;
  - (3) Postpone painting projects that use oil based paints or solvents; and
  - (4) Encourage refueling of vehicles in the early morning or late evening hours.
- (4) One or more of the following Virginia VOC regulations throughout the entire SNP area: Emission Standards for Portable Fuel Container Spillage; Emission Standards for Mobile Equipment Repair and Refinishing Operations; Emission Standards for Architectural and Industrial Maintenance Coatings; Solvent Cleaning; and Emission Standards for Consumer Products.

The following schedule for adoption, implementation and compliance applies to the contingency measures concerning the option of implementing either Stage I vapor recovery requirements or one or more area source VOC regulations.

- (5) Notification received from EPA that a contingency measure must be implemented, or three months after a recorded violation;
- (6) Applicable regulation to be adopted 6 months after this date;
- (7) Applicable regulation to be implemented 6 months after adoption. In the event that implementation of Stage I vapor recovery is selected as a contingency measure, Virginia would notify all sources located in the SNP area within 6 months after notification received from EPA that the contingency measure must

be implemented, or within three months after a recorded violation. The newly subject Stage I vapor recovery sources would be required to comply with Stage I vapor recovery requirements no later than 12 months from the date VADEQ adopts the regulation.

- (8) Compliance with regulation to be achieved within 12 months of adoption.

The following schedule for adoption, implementation and compliance applies to the contingency measures concerning the option of implementing an AQADP.

- (1) Implementation of meteorological forecasts for the SNP area commencing 60 days after a recorded violation.
- (2) Implementation of the AQADP, based on meteorological forecasts created by VADEQ, no later than 60 days after VADEQ notifies the SNP Superintendent that the meteorological forecasts are available.

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