



Department of the Environment

NAAQS Monitoring In Maryland: Implications of Recent Revisions to the NAAQS and Monitoring Rules

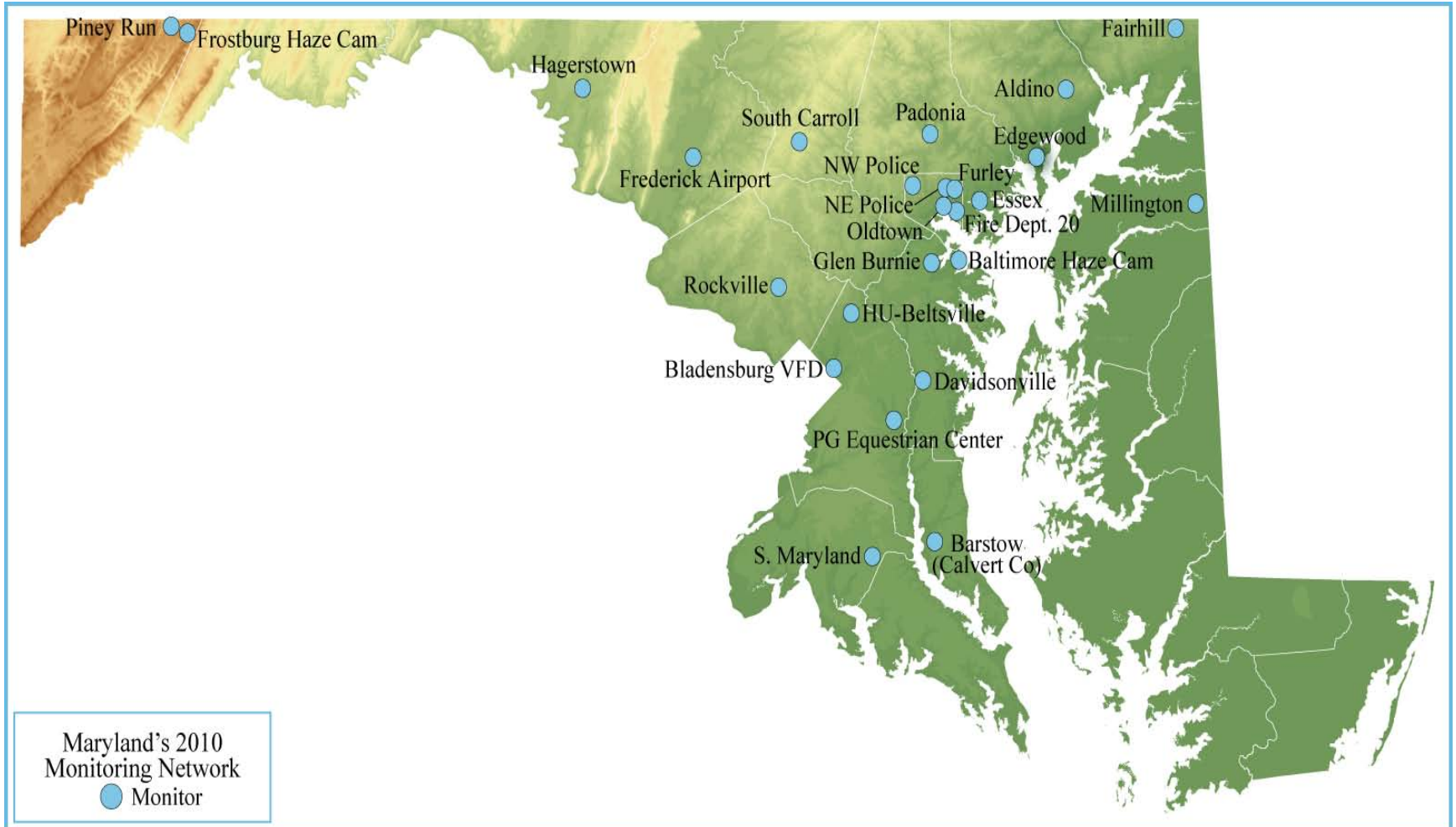
MWAQC Air Quality Public Advisory Committee

November 15, 2010





MDE's Air Monitoring Network





Data Collected At Each Air Mon Site

Sites	AQSCode	Parameters
Aldino	240259001	NO, NO ₂ , NO _y , O ₃ , Meteorology ^{10m}
Baltimore Haze Cam	n/a	Visibility
Bladensburg VFD	240330025	PM _{2.5} ^{FRM}
Calvert Co / Barstow	240090011	O ₃
Davidsonville	240030014	O ₃ , Meteorology ^{10m}
Edgewood	240251001	O ₃ , Meteorology ^{10m} , PM _{2.5} ^{FRM}
Essex	240053001	CO, NO, NO ₂ , NO _x , O ₃ , SO ₂ , Meteorology ^{10m} , PM _{2.5} ^{FRM} , PM _{2.5} ^{SpeciesCSN} , PM ₁₀ ^{BAMM} , PAMS, Air Toxics
Fairhill	240150003	O ₃ , Meteorology ^{10m} , PM _{2.5} ^{FRM} , PM _{2.5} ^{BAMM}
Fire Department 20	245100008	PM _{2.5} ^{FRM} , PM ₁₀ ^{FRM}
Frederick Airport	240210037	O ₃
Frostburg Haze Cam	n/a	Visibility
Furley	245100054	O ₃
Glen Burnie	240031003	PM _{2.5} ^{FRM} , PM ₁₀ ^{BAMM}
Hagerstown	240430009	O ₃ , PM _{2.5} ^{FRM} , PM _{2.5} ^{BAMM}
HU-Beltsville	240330030	CO ^(T) , NO, NO _y , NO ₂ , NO _x , O ₃ , SO ₂ ^(T) , Meteorology ^{10m} , Meteorology ^{PBL} , PM _{2.5} ^{FRM} , PM _{2.5} ^{BAMM} , PM _{2.5} ^{TEOM/FDMS} , PM _{2.5} ^{SpeciesCSN} , PM _{2.5} ^{OCEC} , PM _{2.5} ^{SO₄} , PAMS, Air Toxics
Millington	240290002	O ₃ , PM _{2.5} ^{BAMM} , Meteorology ^{10m}
NE Police	245100006	PM _{2.5} ^{FRM} , Air Toxics
NW Police	245100007	PM _{2.5} ^{FRM} , Radiation
Oldtown	245100040	CO, NO, NO ₂ , NO _x , PM _{2.5} ^{FRM} , PM _{2.5} ^{BAMM} , PM _{2.5} ^{TEOM} , Light Scatter, Air Toxics
Padonia	240051007	O ₃ , Meteorology ^{10m} , PM _{2.5} ^{FRM}
PG Equestrian Center	240338003	O ₃ , Meteorology ^{10m} , PM _{2.5} ^{FRM} (colocated)
Piney Run	240230002	CO ^(T) , NO, NO ₂ , NO _y , O ₃ , SO ₂ ^(T) , Meteorology ^{10m} , Meteorology ^{PBL} , PM _{2.5} ^{BAMM} , PM _{2.5} ^{SpeciesIMPROVE} , PM _{2.5} ^{OCEC} , PM _{2.5} ^{SO₄} , Scattering
Rockville	240313001	O ₃ , Meteorology ^{10m} , PM _{2.5} ^{FRM}
South Carroll	240130001	O ₃
Southern Maryland	240170010	O ₃



Detailed Network Information

- ❑ Annual Network Plan-
<http://www.mde.state.md.us/programs/Air/AirQualityMonitoring/Documents/MDNetworkPlanCY2011.pdf>

- ❑ 5-Year Network Assessment-
<http://www.mde.state.md.us/programs/Air/AirQualityMonitoring/Documents/MD5YearNetworkAssessment.pdf>



NAAQS Background

- ❑ CAA Sections 108 and 109 requires NAAQS reviews every 5 years
- ❑ Consider the latest health science and establish primary NAAQS that are “requisite to protect the public health”
- ❑ Establish secondary NAAQS to protect welfare (e.g. crops, environment)
- ❑ CASAC makes recommendations to EPA
- ❑ Revised NAAQS may necessitate revised monitoring rules (MRs)



Revised NO₂ NAAQS-1/22/2010

- ❑ New primary 1-hour NAAQS set at 100 ppb
- ❑ Form: 3-year average of 98th percentile
- ❑ Retain old annual primary NAAQS at 53 ppb
- ❑ Secondary NAAQS under separate review with SO₂, to be completed March 2012





Revised NO₂ Monitoring Rule

- ❑ New NO₂ monitors in urban areas within 50 meters of major roadways (up to 2 per urban area depending on population and AADT)
- ❑ Near road site selection must consider: rank by AADT, fleet mix, roadway design, congestion patterns, terrain and meteorology
- ❑ Minimum of 1 monitor in any urban area with population greater than or equal to 1 million to assess community-wide concentrations
- ❑ Additional monitors required at discretion of EPA RAs, up to 40 nationwide in areas w/ sensitive and vulnerable populations
- ❑ Monitors operational by Jan. 1, 2013





NO₂ MR Requirements for MD

- ❑ 3 near road monitors required, 2 in Baltimore CBSA, 1 in DC/MD/VA CBSA
- ❑ Existing monitors probably meet community-wide assessment requirements for Baltimore and DC/MD/VA CBSAs
- ❑ MDE participating in EPA pilot study in Baltimore in CY 2011, will help develop guidance for subsequent sites





Revised SO₂ NAAQS-6/2/2010

- ❑ New primary 1-hour NAAQS set at 75 ppb
- ❑ Form: 3-year average of 99th percentile
- ❑ Revoke both current 24 hour and annual SO₂ primary NAAQS
- ❑ Secondary NAAQS under separate review with NO₂, to be completed March 2010





Revised SO₂ Monitoring Rule

- ❑ Monitors required in CBSAs based on population weighted emissions index
 - 3 monitors in CBSAs with index more than 1,000,000
 - 2 monitors in CBSAs with index b/w 1,000,000 and 100,000
 - 1 monitor in CBSAs with index b/w 100,000 and 5,000
- ❑ Monitors not required to be source oriented as in original proposal
- ❑ EPA RAs can require additional monitors in certain circumstances
- ❑ Monitors operational by Jan. 1, 2013





SO2 MR Requirements for MD

- ❑ 2 monitors for Baltimore CBSA, 1 new monitor
- ❑ 3 monitors for Washington Metro CBSA, ? new monitor(s) in MD
- ❑ 2 monitors for Philadelphia CBSA, ? new monitor(s) in MD
- ❑ Plan for meeting new MR requirements due in July 1, 2011 Annual Network Plan





Revised Ozone NAAQS

- ❑ Revised 3/12/08 to 75 ppb 8-hour avg. (higher than CASAC recommendations)
- ❑ 9/16/09-EPA says it will reconsider the 2008 NAAQS
- ❑ Jan. 2010- reconsidered primary NAAQS proposed b/w 60-70 ppb, new secondary NAAQS proposed at 7-15 ppm-hrs
- ❑ Final reconsidered NAAQS due by Dec. 31, 2010





Proposed O₃ Monitoring Rule

- ❑ Proposed 7/8/09 – separate from NAAQS proposal
- ❑ New non-urban area requirements – each state operate a minimum of 3 monitors
 - Assessment of O₃ concentrations in federal, state or Tribal lands with O₃ sensitive natural vegetation and/or ecosystems
 - Assessment of one smaller population center between 10,000 and 50,000 (O₃ = 85% NAAQS)
 - Monitoring of location of expected max O₃ concentration outside of an urban area, including far-downwind transport zones of well monitored urban areas





Proposed O3 MR (cont.)

- New urban area requirements - at least one monitor for urban areas with pop. between 50,000 and 350,000 (w/no monitor for previous 5 years)
- Lengthen required ozone monitoring season (effective 2011 for existing monitors)
- New monitors operational by Jan. 1, 2012 (expected to be delayed to Jan, 1, 2013)
- Final rule anticipated by Dec. 31, 2010





O3 MR Requirements for MD

- ❑ 2 new urban area monitors-Cumberland MSA and Salisbury/Ocean Pines MSA
- ❑ Possibly 3 new non-urban area monitors, need to evaluate options for using some existing MDE monitors or monitors from other networks (e.g. CASTNET, NPS) to meet this requirement





Revised Pb NAAQS

- Revised 10/15/08 from 1.5 ug/m³ to 0.15ug/m³, primary and secondary
- Indicator remains as TSP
- Rolling 3-month average





Pb Monitoring Rule

- ❑ Source oriented monitors required to measure max concentrations near sources with emissions greater than or equal to 1 ton per year
- ❑ Urban areas with pop. greater than 500,00 will require 1 monitor to gather information on pop. exposure
- ❑ Source oriented monitors operational by Jan.1, 2010. Population monitors by Jan. 1, 2011
- ❑ 7/22/09-EPA announces it will reconsider monitoring requirements for both source and population oriented monitoring
- ❑ 12/30/09- reconsidered Pb MR proposed





Proposed Reconsidered Pb MR

- Source oriented monitors required to measure max concentrations near sources with emissions greater than or equal to 0.5 tpy (possible modeling waiver)
- Replace urban area monitoring with requirement for monitoring only at urban NCore sites-delays deployment until Jan. 1, 2012
- Monitoring at airports with emission greater than 0.5 tpy-may be replaced by pilot airport monitoring studies
- December 30, 2010 anticipated date for final rule.





CO NAAQS/Monitoring Rule

- Proposal delayed, anticipated to be released by the end of January 2011
- Final EPA policy assessment released 11/2/10, range of 11-15 ppm for primary 1-hour NAAQS “most strongly supported”, primary 8-hour either 8 or 9 ppm
- Expect some near road monitoring requirements similar to NO₂





PM NAAQS/Monitoring Rule

- ❑ CASAC reviewed EPA's 2nd Draft Policy Assessment in summer 2010
- ❑ Proposal due Feb. 2011, final Oct 2011
- ❑ Daily primary NAAQS range 13-10 ug/m³, annual 35-25 ug/m³
- ❑ May require expansion of monitoring network to previously under monitored areas





Network Design Criteria

Network Design Objectives

1. Provide data to public in timely manner
2. Support compliance with NAAQS and emissions strategy development
3. Support air pollution research studies

Network Design Site Types

Sites are located to measure...

1. Highest expected concentrations in the network area
2. In high population areas
3. Impact of significant sources or source categories
4. General background concentration levels
5. Extent of regional pollutant transport among populated areas
6. Impacts on visibility, vegetation damage, or other welfare-based impacts

Network Design Spatial Scales

1. Microscale: 1 – 100 meters
2. Middle: 100 – 500 meters
3. Neighborhood: 0.5 – 4.0 km
4. Urban: city-like dimensions, 4 – 50 km
5. Regional: rural homogeneous area 10's – 100's km
6. National & Global: characterize nations or the globe

Logistical Constraints

1. Minimal interference and perturbation of wind flow by buildings, the tree canopy, or other obstacles
2. Proximity to MDE office and drive time
3. Availability of electrical power and telephone line
4. Cost of site lease, relocation or new deployment, site improvements such as road and fence
5. Safety, security, and accessibility (access to locked facilities)
6. Flat, level footprint for shelters, concrete pads
7. Gravel or paved road access and snow plow access

Other Considerations

1. Finite resources – funding, staff
2. Longevity of site
3. Proximity to other monitors
4. Homogeneity in space & with respect to Speciation
5. Clear of immediate influence of sources (point, area, mobile) or within influence depending on site type

MDE performs an Annual review of all sites which is reviewed and approved by EPA. The next review is July 2011.





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