



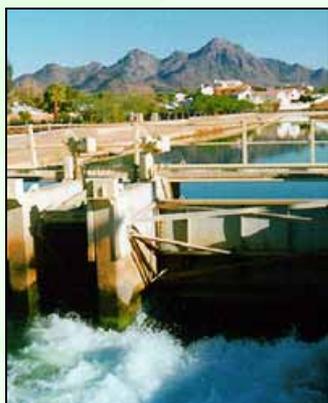
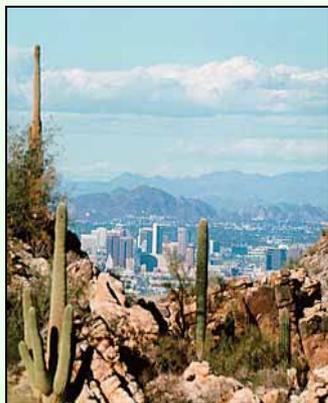
Status of Ongoing EPA Review of National Ambient Air Quality Standards for Particulate Matter

MAG Air Quality Technical Advisory Committee

October 28, 2010

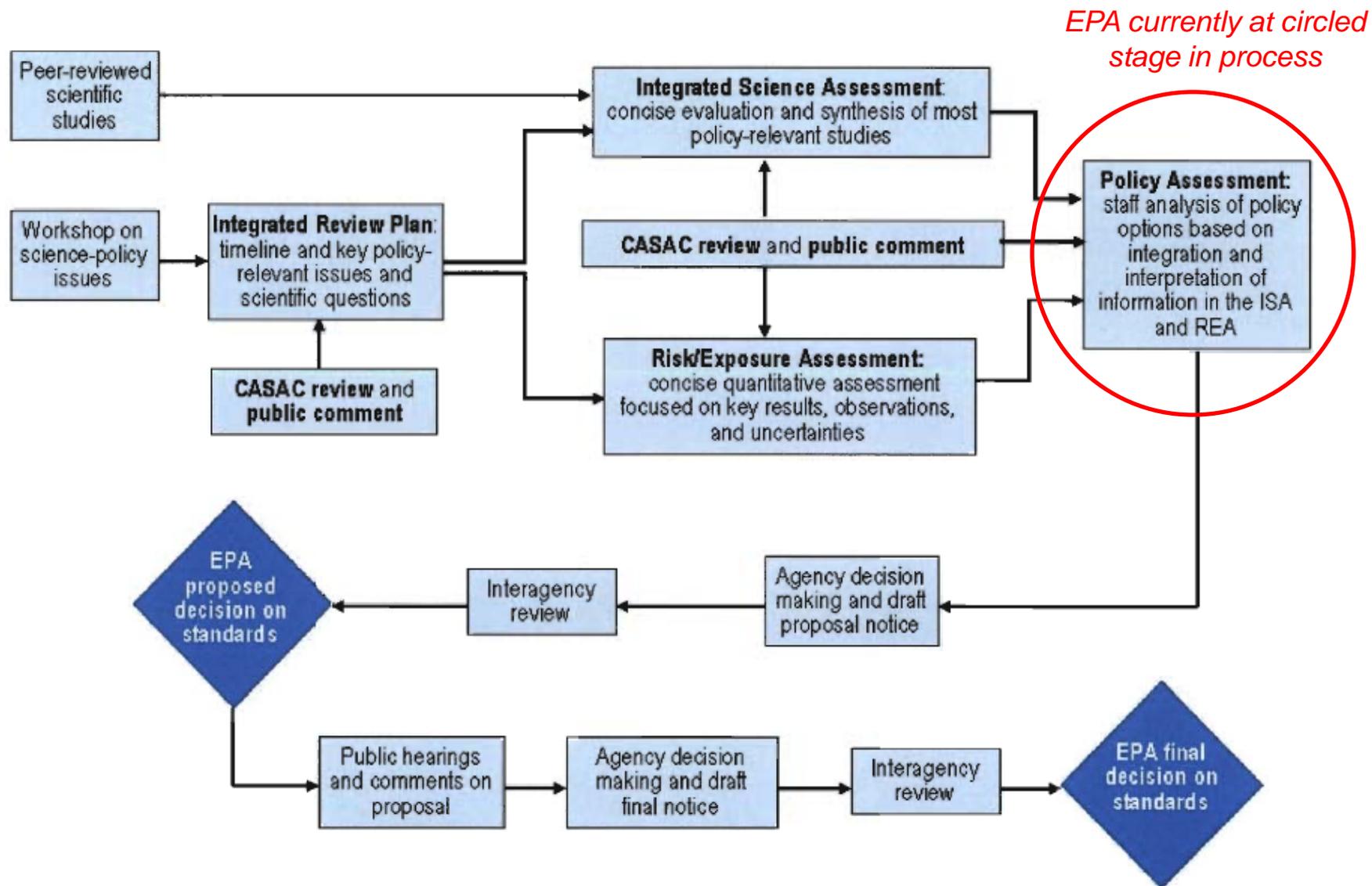
Background

- n **Current particulate matter standards adopted by EPA in October 2006**
 - l Retained primary 24-hour PM-10 standard at 150 $\mu\text{g}/\text{m}^3$, revoked primary annual PM-10 standard
 - l Revised primary 24-Hour PM-2.5 standard from 65 to 35 $\mu\text{g}/\text{m}^3$, retained primary annual PM-2.5 standard at 15 $\mu\text{g}/\text{m}^3$
 - l Secondary standards set identical to primary standards
- n **EPA required to review each standard every 5 years {Clean Air Act Section 109(d)(1)}**
- n **Current review of particulate matter standards scheduled for preliminary rulemaking in February 2011, final rulemaking in October 2011**
- n **Latest documents out for review with recommendations on new particulate matter standards:**
 - l EPA staff recommendations contained in: *Policy Assessment for the Review of the PM NAAQS – Second External Review Draft* (June 2010)
 - l Clean Air Scientific Advisory Committee (CASAC) review of EPA recommendations in: *CASAC Review of Policy Assessment for the Review of the PM NAAQS – Second External Draft* (September 2010)



New NAAQS review process

April 2009



Source: EPA Memorandum, *Process for Reviewing National Ambient Air Quality Standards*, May 21, 2009

ISA = Integrated Science Assessment, REA = Risk/Exposure Assessment

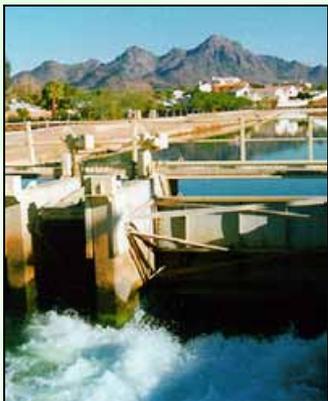
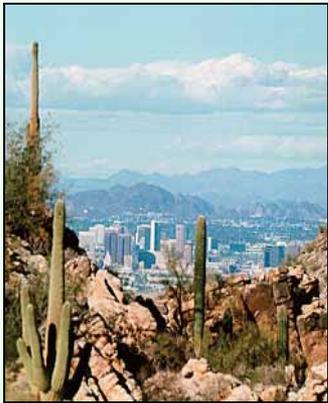
EPA Current Recommendations on Revising the Particulate Matter Standard

For Primary PM-10 Standard:

- I Retain or revise current standard; if revised recommend:
 - o Keep indicator (PM-10)
 - o Keep averaging time (24-hour)
 - o New form (3-year average of 98th percentile)
 - o New level (85 to 65 $\mu\text{g}/\text{m}^3$), with evidence supporting upper bound level of 85 $\mu\text{g}/\text{m}^3$

For Primary PM-2.5 Standards:

- I Revise current standard:
 - o Keep indicator (PM-2.5)
 - o Keep both averaging times (annual & 24-hour)
 - o Keep forms (3-year annual average & 3- year average of 24-hour 98th percentile)
 - o New annual level (13 to 11 $\mu\text{g}/\text{m}^3$), 24-hour level between (35 to 30 $\mu\text{g}/\text{m}^3$)



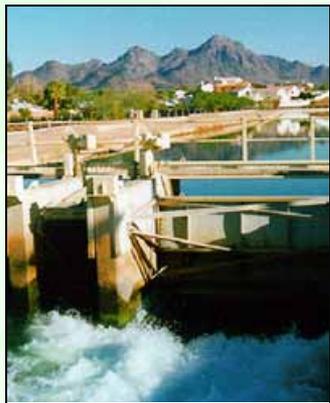
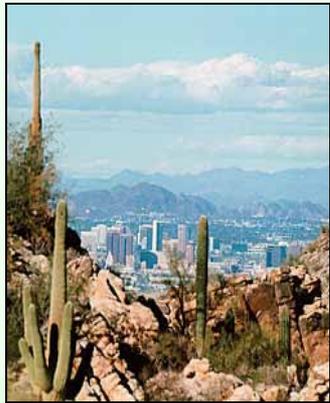
CASAC Current Recommendations on Revising the Particulate Matter Standard

For Primary PM-10 Standard:

- I. Revise current standard:
 - Keep indicator (PM-10), preferable in future to use PM coarse ($10\text{-}2.5\ \mu\text{g}/\text{m}^3$) if sufficient data existed. Recommends deployment of coarse networks
 - Keep averaging time (24-hour)
 - New form (3-year average of 98th percentile)
 - New level (75 to $65\ \mu\text{g}/\text{m}^3$), disagrees with EPA staff that science supports $85\ \mu\text{g}/\text{m}^3$

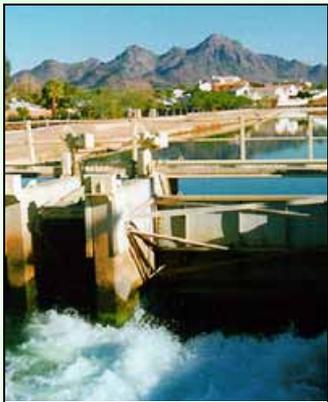
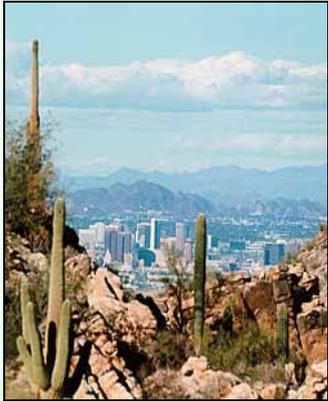
For Primary PM-2.5 Standards:

- I. Revise current standard:
 - Keep indicator (PM-2.5)
 - Keep both averaging times (annual & 24-hour)
 - Keep forms (3-year annual average & 3-year average of 24-hour 98th percentile)
 - New annual level (13 to $11\ \mu\text{g}/\text{m}^3$), 24-hour level between (35 to $30\ \mu\text{g}/\text{m}^3$) – committee unclear on appropriate combination of annual & 24-hour levels

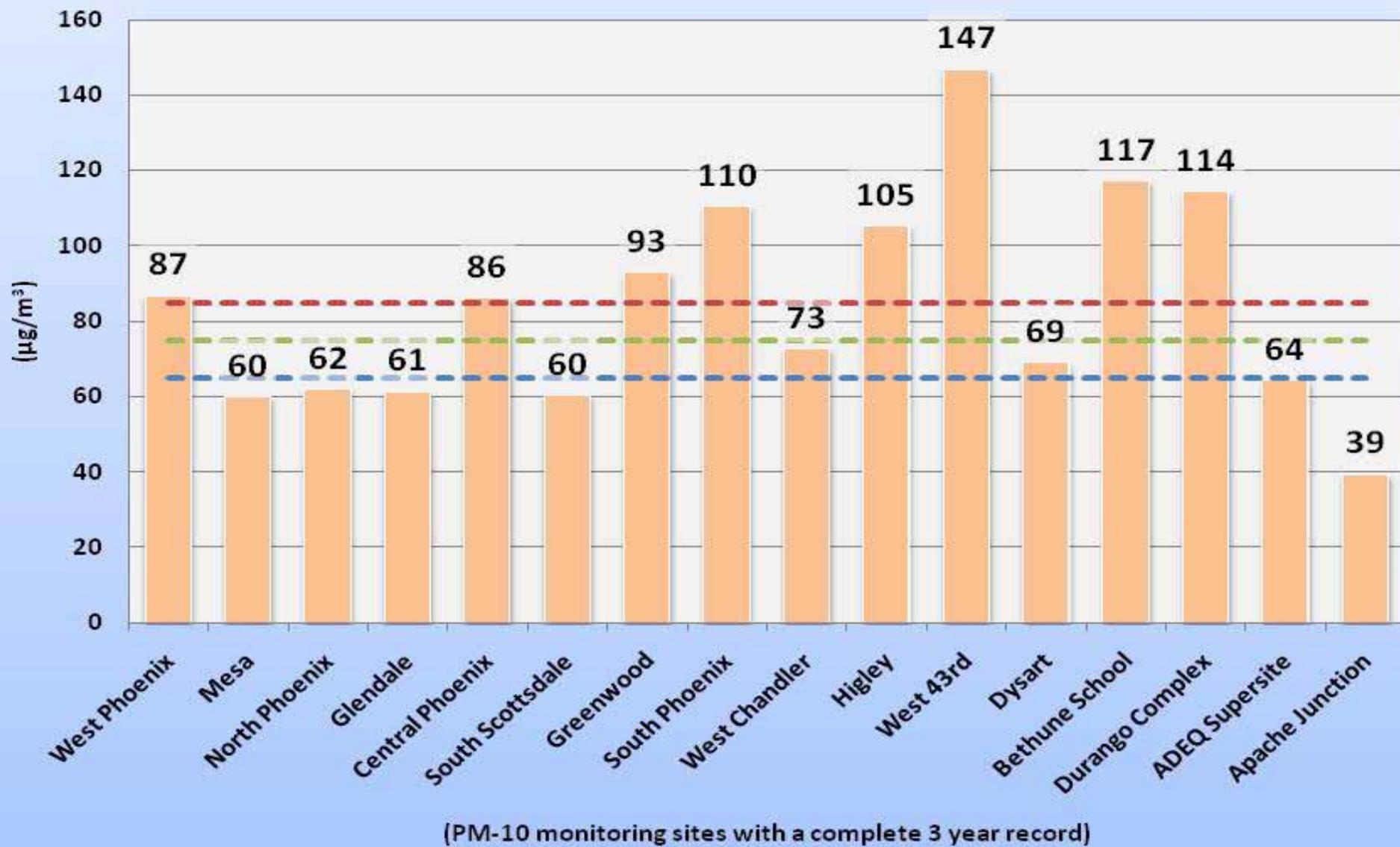


Impact of a Revised Primary PM-10 Standard

- n **Based on PM-10 nonattainment area monitors with complete 2007-2009 monitoring data:**
 - | 8 monitors exceed at the 85 or 75 $\mu\text{g}/\text{m}^3$ level
 - | 10 monitors exceed at the 65 $\mu\text{g}/\text{m}^3$ level
 - | The above statistics are the most conservative (worst case) because they do not account for the exclusion of exceptional events



2007-2009 3-Year Average 98th Percentile PM-10 Value (exceptional event days not excluded)

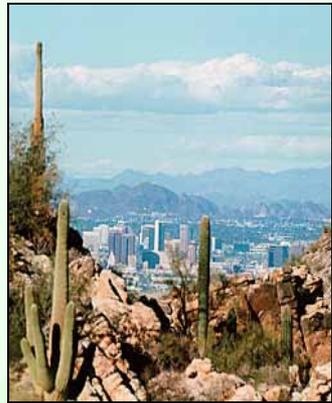


(PM-10 monitoring sites with a complete 3 year record)

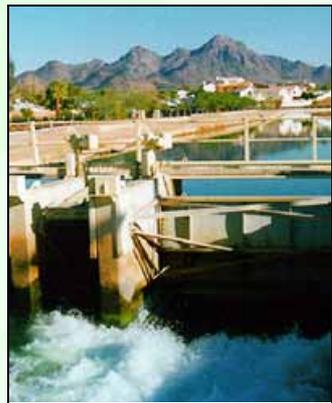




Continued Impacts of a Revised Primary PM-10 Standard



- n In most cases where a continuous PM-10 monitor is present, the new form (98th percentile) equates to the eighth highest reading in a year. In order to attain the standard (over a 3-year average) the monitor cannot exceed 7 24-hour readings over the set level in each year
- n The table below shows the number of days a year some of the current PM-10 monitors would exceed a revised standard (based on averaged 2007-2009 data)



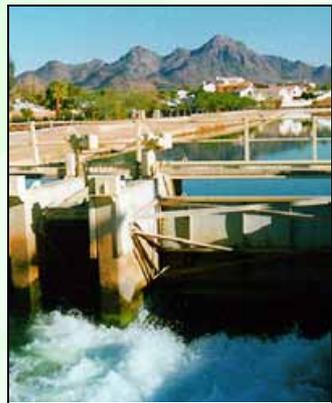
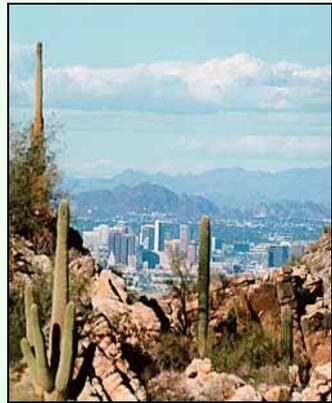
PM-10 Monitor	3-Year Annual Average Days over 85 µg/m ³	3-Year Annual Average Days over 75 µg/m ³	3-Year Annual Average Days over 65 µg/m ³
West 43 rd Avenue	60	86	122
Durango Complex	33	52	79
South Phoenix	19	33	48
Higley	19	30	48
Greenwood	11	22	41



Continued Impacts of a Revised Primary PM-10 Standard

n On a positive note, PM-10 control measures are working as PM-10 is trending downward under the new form. As an example, statistics from the West 43rd monitor show:

- | In 2007, 85 $\mu\text{g}/\text{m}^3$ was in the 70th percentile
- | In 2008, 85 $\mu\text{g}/\text{m}^3$ was in the 87th percentile
- | In 2009, 85 $\mu\text{g}/\text{m}^3$ was in the 92nd percentile
- | In 2010 (through Oct. 12), 85 $\mu\text{g}/\text{m}^3$ is just below the 98th percentile (89 $\mu\text{g}/\text{m}^3$)



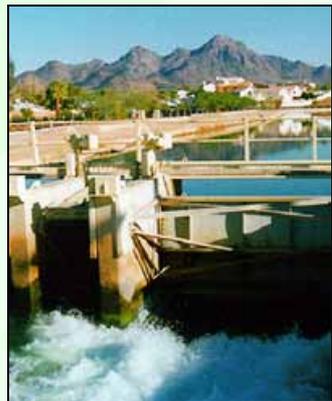
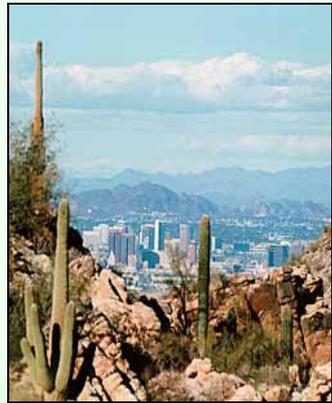
West 43 rd Avenue Monitoring Year	Days over 85 $\mu\text{g}/\text{m}^3$	Days over 75 $\mu\text{g}/\text{m}^3$	Days over 65 $\mu\text{g}/\text{m}^3$
2007	106	150	190
2008	46	67	111
2009	27	42	65
2010 (through Oct. 12)	(6), [15*]	(12), [28*]	(21), [46*]
2008-2010 Projected Avg	29	46	74

*Projected 2010 Year-end Value



Continued Impacts of a Revised Primary PM-10 Standard

- n **Exceptional events will increase in frequency and importance**
- n **Table below shows the 6 days in 2010 (through Oct. 12) the West 43rd Avenue monitor has exceeded the 85 µg/m³ level with associated maximum hourly wind speed**

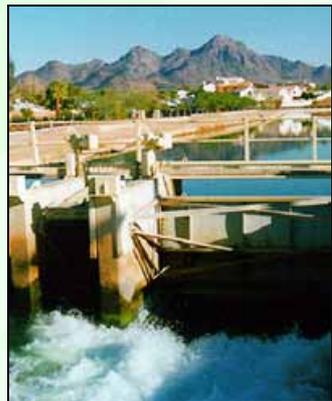
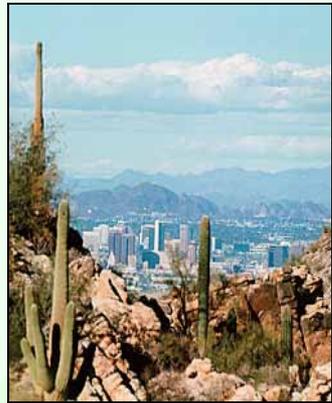


Date	24-hour PM-10 Concentration	Maximum Hourly Wind Speed
1/7/2010	97 µg/m ³	2.8 mph
1/11/2010	100 µg/m ³	5.1 mph
1/13/2010	99 µg/m ³	6.8 mph
4/29/2010	99 µg/m ³	17.7 mph
5/2/2010	108 µg/m ³	21.9 mph
10/2/2010	113 µg/m ³	17.7 mph



Impact of Revised Primary PM-2.5 Standards

- Maricopa County monitors currently demonstrate attainment with a revised 24-hour ($35-30 \mu\text{g}/\text{m}^3$) PM-2.5 standard. However, if annual standard is set at the strictest suggested level of $11 \mu\text{g}/\text{m}^3$, the South Phoenix site currently shows exceedance levels



PM-2.5 Monitor	2007 98 th Percentile Value	2008 98 th Percentile Value	2009 98 th Percentile Value	98 th Percentile 3-Year Average
Mesa	18.3	14.5	17.2	16.7
South Phoenix	29.2	10.9	34.5	24.9
West Phoenix	27.2	10.6	29.4	22.4
State Super Site	23.5	17.8	24.0	21.8

PM-2.5 Monitor	2007 Annual Mean	2008 Annual Mean	2009 Annual Mean	3-Year Average of the Annual Mean
Mesa	9.7	8.5	7.3	8.5
South Phoenix	12.3	10.9	11.0	11.4
West Phoenix	10.9	10.6	10.4	10.6
State Super Site	9.5	8.9	8.6	9.0

Secondary Standards

- n **Current secondary standards the same as primary standards**
- n **EPA staff recommend a new secondary standard for protection against PM-related visibility impairment. New standard would include a new indicator, light extinction. The standard proposes measurement of light extinction by using speciated PM-2.5 mass and relative humidity**
- n **“Candidate Protection Levels” (CPLs) for visibility protection could be set at the 20 to 30 deciview range (64 to 191 Mm^{-1}) in combination with a PM-2.5 mass level between 10 to $60 \mu\text{g}/\text{m}^3$**
- n **The research included in the EPA staff recommendations show that the Phoenix area currently has low light extinction levels compared to other urban areas included in the research**

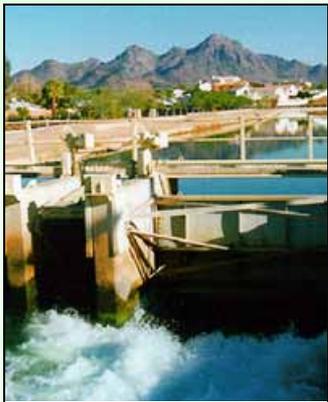


Table 4-5. 90th percentile maximum daily 1-hour PM light extinction design values (Mm^{-1}) after rollback to meet alternative standards of $60 \mu g/m^3$, $40 \mu g/m^3$, $30 \mu g/m^3$, $20 \mu g/m^3$ and $10 \mu g/m^3$ maximum daylight 1-hour PM mass concentration for the 90th percentile.*

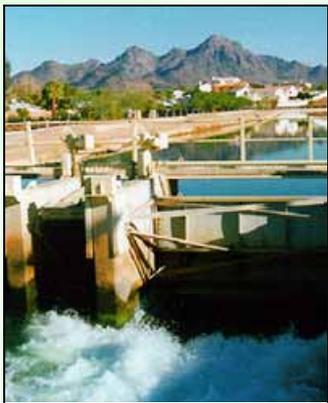
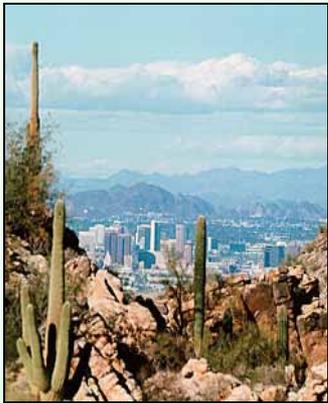
	$60 \mu g/m^3$	$40 \mu g/m^3$	$30 \mu g/m^3$	$20 \mu g/m^3$	$10 \mu g/m^3$
Tacoma, WA	$140 Mm^{-1}$	$140 Mm^{-1}$	$140 Mm^{-1}$	$128 Mm^{-1}$	$82 Mm^{-1}$
Fresno, CA	$338 Mm^{-1}$	$248 Mm^{-1}$	$190 Mm^{-1}$	$132 Mm^{-1}$	$74 Mm^{-1}$
Los Angeles, CA	$403 Mm^{-1}$	$284 Mm^{-1}$	$220 Mm^{-1}$	$156 Mm^{-1}$	$105 Mm^{-1}$
Phoenix, AZ	$105 Mm^{-1}$	$105 Mm^{-1}$	$105 Mm^{-1}$	$105 Mm^{-1}$	$86 Mm^{-1}$
Salt Lake City, UT	$164 Mm^{-1}$	$164 Mm^{-1}$	$153 Mm^{-1}$	$107 Mm^{-1}$	$59 Mm^{-1}$
Dallas, TX	$183 Mm^{-1}$	$183 Mm^{-1}$	$183 Mm^{-1}$	$146 Mm^{-1}$	$80 Mm^{-1}$
Houston, TX	$194 Mm^{-1}$	$194 Mm^{-1}$	$179 Mm^{-1}$	$125 Mm^{-1}$	$73 Mm^{-1}$
Birmingham, AL	$357 Mm^{-1}$	$266 Mm^{-1}$	$208 Mm^{-1}$	$152 Mm^{-1}$	$102 Mm^{-1}$
Atlanta, GA	$249 Mm^{-1}$	$249 Mm^{-1}$	$191 Mm^{-1}$	$134 Mm^{-1}$	$76 Mm^{-1}$
Detroit, MI	$291 Mm^{-1}$	$202 Mm^{-1}$	$157 Mm^{-1}$	$120 Mm^{-1}$	$88 Mm^{-1}$
Pittsburgh, PA	$278 Mm^{-1}$	$243 Mm^{-1}$	$185 Mm^{-1}$	$127 Mm^{-1}$	$69 Mm^{-1}$
Baltimore, MD	$246 Mm^{-1}$	$246 Mm^{-1}$	$201 Mm^{-1}$	$138 Mm^{-1}$	$76 Mm^{-1}$
Philadelphia, PA	$258 Mm^{-1}$	$175 Mm^{-1}$	$134 Mm^{-1}$	$98 Mm^{-1}$	$63 Mm^{-1}$
New York, NY	$306 Mm^{-1}$	$281 Mm^{-1}$	$212 Mm^{-1}$	$141 Mm^{-1}$	$74 Mm^{-1}$
Mean Values	$250.9 Mm^{-1}$	$212.9 Mm^{-1}$	$175.6 Mm^{-1}$	$129.2 Mm^{-1}$	$79.1 Mm^{-1}$

(Source: Table 4-5 of EPA's Policy Assessment for the Review of Particulate Matter National Ambient Air Quality Standards, Second External Review Draft, June 2010)

*Colored highlighting shows which of the CPL levels the values are near, using the following definitions: PM light extinction equal or above the high CPL $\geq 191 Mm^{-1}$; above the middle CPL, $112 Mm^{-1} - 190 Mm^{-1}$; above the low CPL, $64 Mm^{-1} - 111 Mm^{-1}$; below the low CPL, $< 64 Mm^{-1}$. Values without color highlighting indicate no rollback, so no information about the effectiveness of the hourly PM mass based alternative standards

Summary

- n A revised primary PM-10 standard at any level between 85 to 65 $\mu\text{g}/\text{m}^3$ is more stringent than the current standard in the Maricopa PM-10 nonattainment area
- n 8 monitors currently exceed a revised PM-10 standard at the 85 $\mu\text{g}/\text{m}^3$ level, with 10 monitors exceeding at the 65 $\mu\text{g}/\text{m}^3$ level
- n Exceptional events will be hugely important given the new form of the PM-10 standard (98th percentile) and given how frequently monitors record readings above proposed levels (85 to 65 $\mu\text{g}/\text{m}^3$)
- n PM coarse (10-2.5 $\mu\text{g}/\text{m}^3$) likely will become more important as a replacement indicator for PM-10 in the future
- n Maricopa County attains a revised 24-hour PM-2.5 standard (35 to 30 $\mu\text{g}/\text{m}^3$) at current control levels. The South Phoenix monitoring site may register an annual exceedance if standard is set at lowest level of the range (11 $\mu\text{g}/\text{m}^3$)
- n A new secondary standard designed to limit light extinction may be adopted. Preliminary data shows Phoenix area in good shape to meet possible standard as compared to other urban areas. However, Phoenix could exceed at the lowest alternate levels suggested by EPA





For More Information

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