Iowa Fine Particulate Monitoring Network Design Values 2004-2006

Iowa DNR
Ambient Air Monitoring Group

What is Fine Particulate Matter (PM2.5)?

The term “particulate matter” (PM) includes both solid particles and liquid droplets (excluding water droplets) that are found in outdoor air. Particulate matter may be emitted directly into the air or can form from pollutants that react in the atmosphere. Small particles tend to pose the greatest health concern because they can be inhaled into and accumulate in the respiratory system.

Particles of less than 2.5 microns in diameter are are referred to as fine particulate or PM2.5.

Sources of PM2.5 emissions include all types of combustion (motor vehicles, power plants, wood burning, etc.) and some industrial processes. Secondary PM2.5 is produced in the atmosphere away from sources through atmospheric chemistry.

What are the Design Values for PM2.5?

Design values for PM2.5 are numbers that are calculated from three years of data gathered at a particular monitoring site. If a design value is greater than the associated standard, the monitor is said to "fail the attainment test". The annual standard for PM2.5 is 15 ug/m^3 and the twenty-four hour standard is 35 ug/m^3. The 24 hr standard was lowered from 65 ug/m^3 to 35 ug/m^3 in December of 2006.

The design value for the 24 hr PM2.5 standard is the three year average of the annual 98th percentile values measured at a monitoring site. The design value for the annual PM2.5 standard is the three year average of the annual averages measured at a monitoring site. Additional details about design value calculations are contained in 40 CFR Part 50 Appendix N.

What Types of PM2.5 Monitoring Data May be Used to Calculate Design Values?

Iowa currently operates two different types of PM2.5 samplers. One type collects fine particles by drawing ambient air through a filter over a 24-hour period. The filters are then returned to an analytical laboratory where they are weighed. Provided EPA protocols for handling and weighing the filters are followed, these manual samplers produce data that may be used for design value calculations. Although manual samplers provide accurate concentrations, the data produced is not available in real time, and so EPA has encouraged States to use automated continuous samplers to inform the public of current air quality levels. To date, EPA has not approved the use of data from these continuous samplers for computing design values, but a new generation of more accurate continuous samplers is currently being tested by EPA. Data from continuous monitors that pass these tests may be available computing design values in the near future.

What is EPA's Schedule for Meeting the New PM2.5 Standard?

2006 to 2010

-areas in Iowa that do not meet the new (35 ug/m^3) standard are identified.

2013

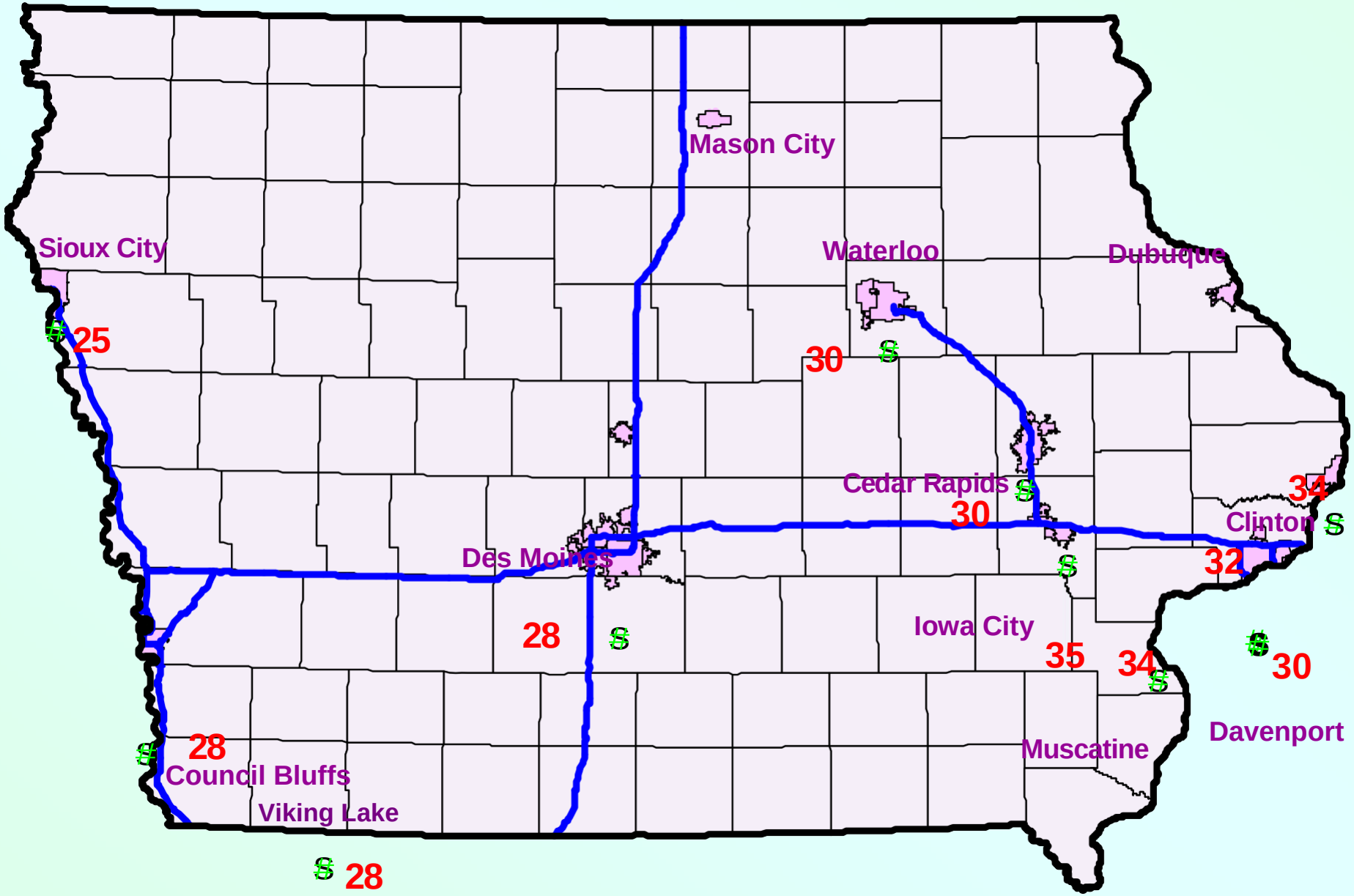
-Iowa's air pollution control rules (known as the State Implementation Plan) are revised so that all areas in Iowa meet and maintain the new standard.

2015 to 2020

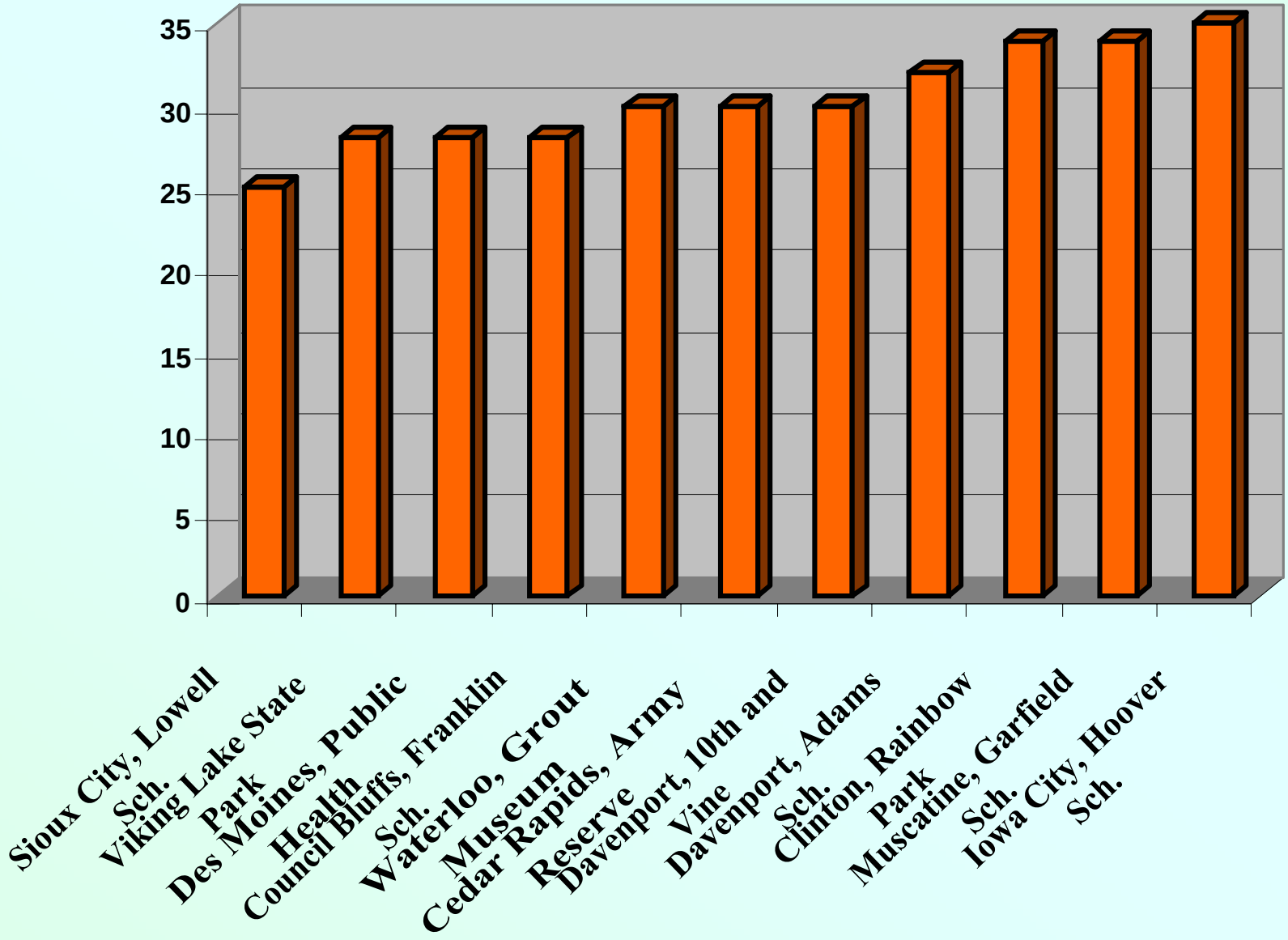
-air quality throughout Iowa must meet the new standard.

Iowa PM2.5 24-hour Design Values 2004-2006

(NAAQS Standard is 35 µg/m^3)

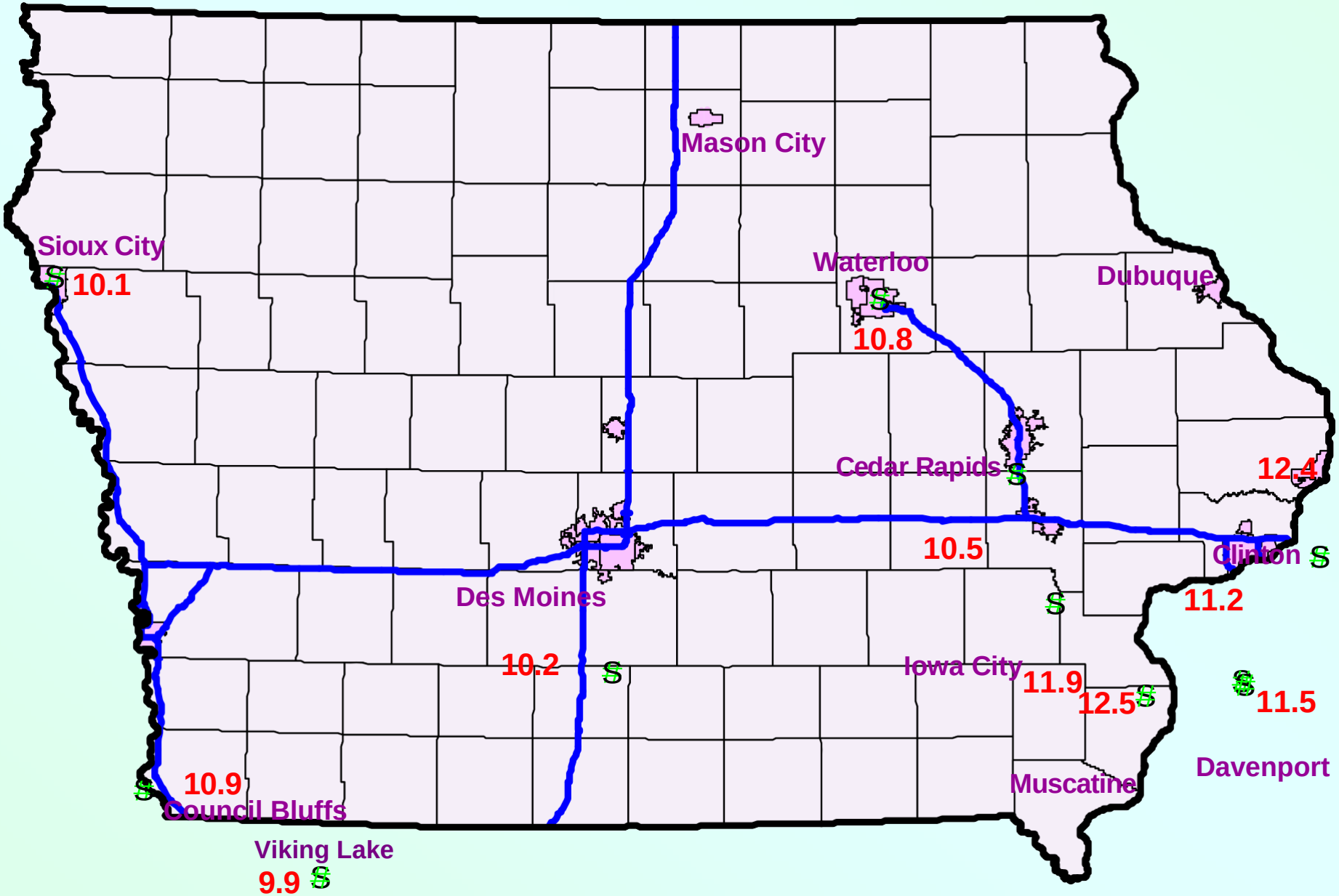


24-hr. PM2.5 Design Values 2004-2006

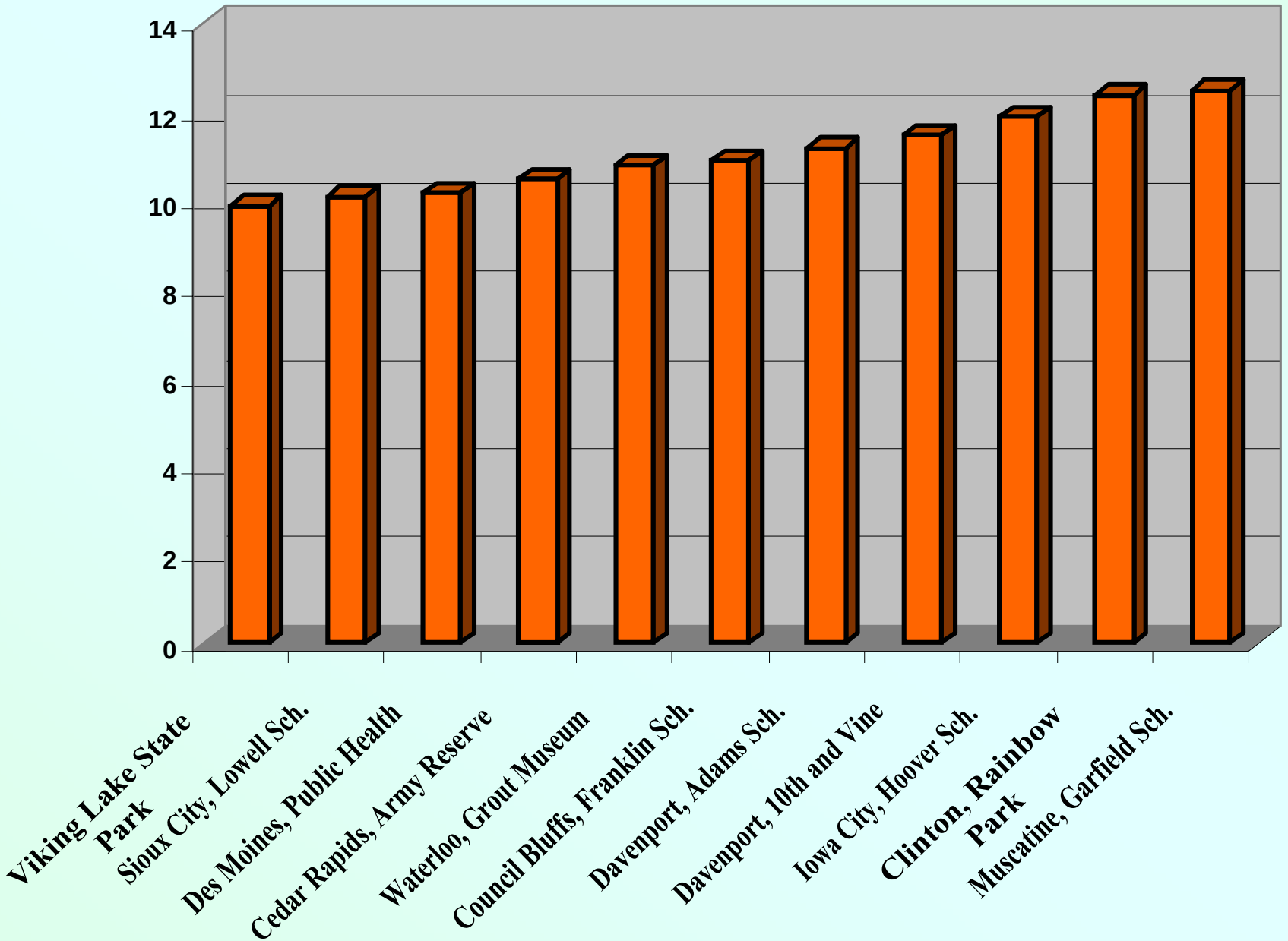


Iowa PM2.5 Annual Design Values 2004-2006

(NAAQS Standard is 15 µg/m^3)



Annual PM2.5 Design Values 2004-2006



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Countv	City	EPA Monitm· Id	Year	Annual 98th percentile (ug/mJ)	3-year ave1·age 98th peinntile (ug/m3}	Annual avenges (ug/m3)	3-yeai·avHage annual aven ge (ug/m3)
Bl ack. Hawk	\Vaterloo	1901.3000 .S	2004	31.8		10. l	
			2005	35.l		12.2	
			2006	23.8	30	*9..9*	**10 .8**
Clinton	Cl.inion	190450021	2004	34 .5		U .3	
			2005	39.7		B .9	
			2006	27.2	34	U .9	12..4
Johnson	Iowa. C i ty	1910320 01	2004	37.4!		U .O	
			2005	4!1.0		B .6	
			2006	27.l	35	U .O	**11.9**
Lifill	Ce dar Rap ids	1911.30037	2004	29.9		10. l	
			2005	35.4!		U .8	
			2006	24.4!	30	9..7	10...5
M onigom.ff}'	Red Oak	191370 002	2004	24 .5		.S..7	
			2005	33.0		11.l	
			2006	25 .5	**28**	*9. 9*	*9 .9*
Muscatine	Mnscaline	191390015	2004	38.41		U .8	
			2005	36.8		13.9	
			2006	27.6	34	U .7	12...5
Polk	Des Moines	191530030	2004	24 .7		*9..9*	
			2005	34.41		U .3	
			2006	23 .6	**28**	*9..3*	10..2
Po tt awaltamie	Cou ncil Bluffs	191550009	2004	31 .5		9.4	
			2005	30.0		12.5	
			2006	23.1	**28**	10.9	10..9
Scott	Davenport	1916.30015	2004	27.2		10.9	
			2005	36.7		B .O	
			2006	25.9	30	10.7	**11.5**
Scott	Davenp ort	191630018	2004	32.2		10.5	
			2005	36.8		*12.9*	
			2006	26..3	32	10.3	**11.2**
Woodbmy	Sioux City	1919 30017	2004	21.9		9.4	
			2005	*15 .l*		10. 6	
			2006	29.0	25	10. 3	IO. I

il'"ote: 24-hour NA.AQS level is 35 ug/ml, Annual :„/A.AQS level is 15 ug/m^3·
Sites ftitbout enou1?;h data to calcu lat e summuy statistics han been e:nluded from this report.

Web Resources

Calculation of the PM2.5 Design Values is treated in Appendix N of 40 CFR Pt. 50:

http://a257.g.akamaitech.net/7/257/2422/01jan20061800/edocket.access.gpo.gov/2006/pdf/06-8477.pdf

EPA's Design Value calculations for PM2.5 and other pollutants:

http://www.epa.gov/airtrends/values.html

EPA's timeline for meeting the PM2.5 standards (page 21).

http://epa.gov/pm/pdfs/20061013_presentation.pdf

Historical Air Pollution Data for Iowa and Other States:

http://www.epa.gov/air/data/

Web links listed are as accessed on 4/20/2007.