

2010 Update: A Comparison of Iowa Ozone Levels to the Proposed Ozone NAAQS

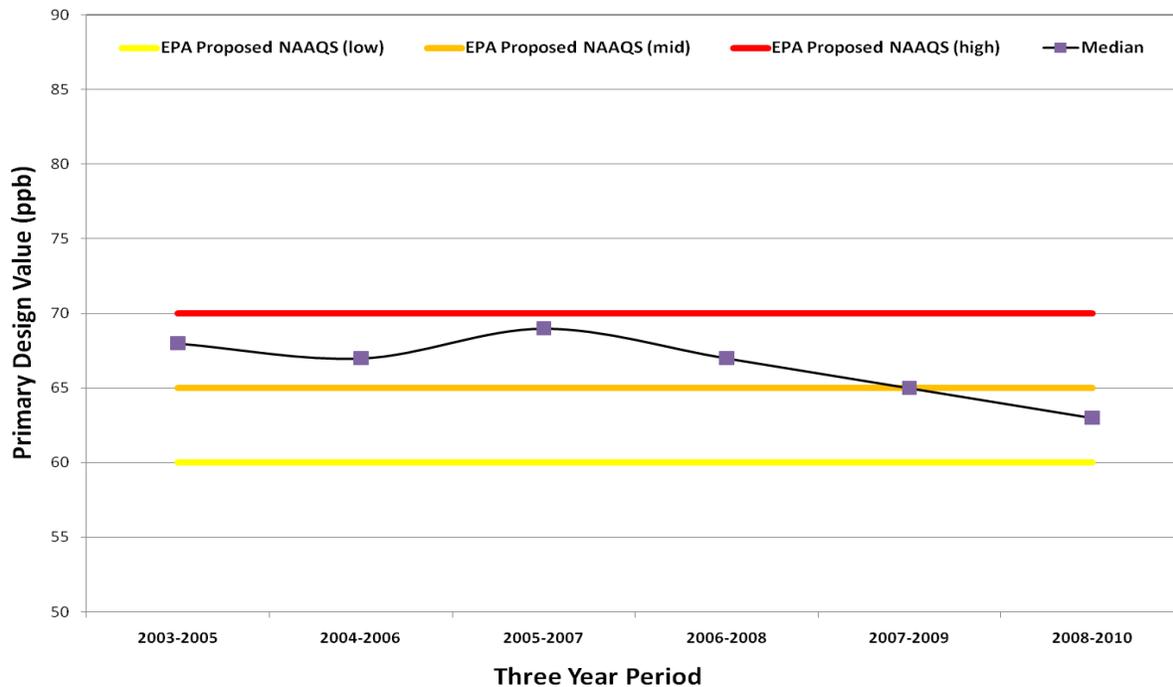


Iowa Department of Natural Resources
Air Quality Bureau
Ambient Air Monitoring Group

A Comparison of Historical Ozone Levels to the Proposed Primary Ozone NAAQS

A design value is a number computed from air monitoring data according to procedures specified by the U.S. Environmental Protection Agency (EPA). This number is compared to the level of the associated National Ambient Air Quality Standard (NAAQS) to determine if the air quality at a monitoring site meets the federal health standard. A violation of the primary NAAQS occurs when the primary ozone design value is greater than the level of the standard. EPA has proposed a range for the level of the ozone NAAQS¹ between 60 and 70 ppb. The primary design value in the proposed ozone rule is the three-year average of the annual 4th highest daily maximum 8-hour ozone values. This is the same form for the design value in the current rule; however, the proposed rule eliminates data handling conventions in the old rule that truncated intermediate results in the computation of the design value, so that the new design values are often 1 ppb higher than the old design values computed with the same data. Statewide median design values for each three year period from 1999-2010² are calculated below (using the proposed calculation method) and compared to low, mid, and high values in the range proposed for the new standard. If a value at the midpoint of the proposed range for the primary standard (65 ppb) is selected for the level of the primary NAAQS, based on the most recent 2008-2010 data, all monitors in the state of Iowa will be below the new primary NAAQS. If a value at the low end of the proposed range for the primary standard (60 ppb) is chosen, only two of the twelve ozone monitors in the state would meet the new standard.

**Comparison of Historical Ozone Primary Design Values
(Proposed Calculation) to Proposed NAAQS Levels**



¹ Available online at: <http://www.epa.gov/air/ozonepollution/fr/20100119.pdf>.

² 2010 ozone data should be considered preliminary until the data is certified in May 2011.

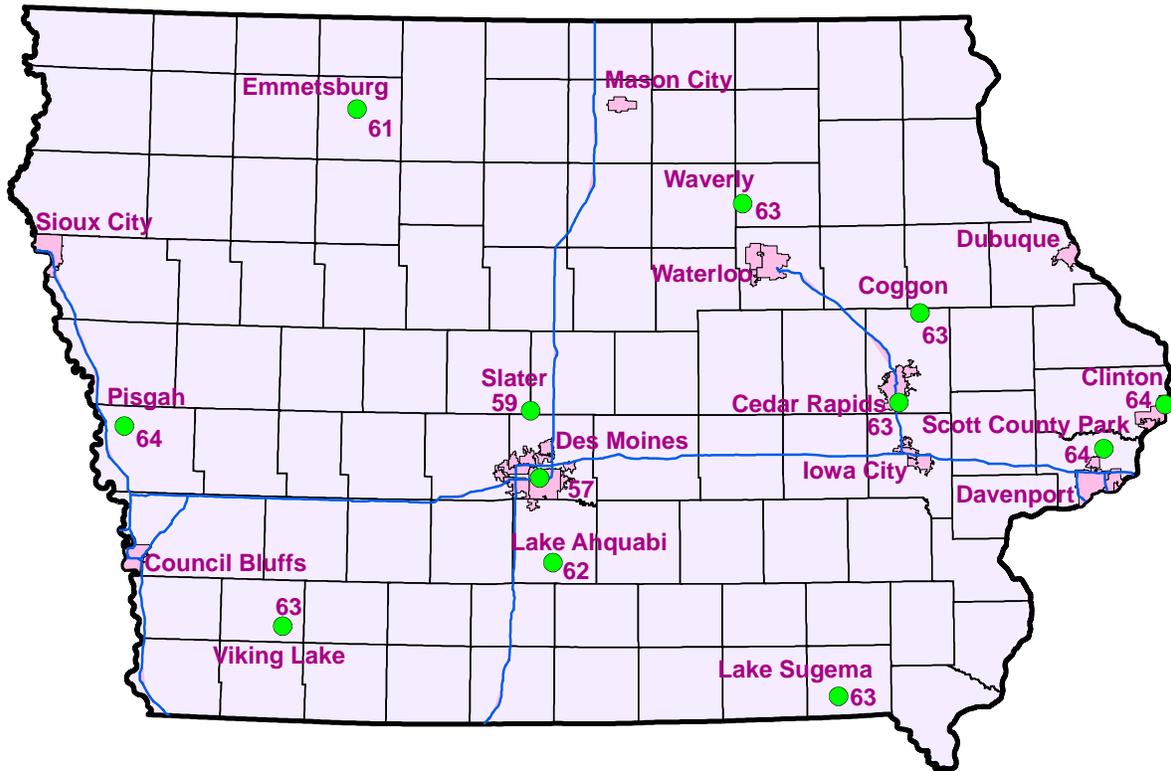
Ozone Primary Design Values for 2005-2010 (ppb), Calculated According to the Proposed Rule

Three Year Period	Omaha-Council Bluffs Downwind (Pisgah, Highway Maintenance Shed)	Southwest Background (Viking Lake State Park)	Northwest Background (Emmetsburg, Iowa Lakes Community College)	Des Moines Upwind (Indianola, Lake Ahquabi State Park)	Des Moines Metro (Des Moines, Health Department)	Des Moines Metro (Des Moines, Phillips School)	Des Moines Downwind (Slater, Elementary/City Hall)	Cedar Rapids Upwind (Cedar Rapids, Kirkwood College)	Cedar Rapids Downwind (Coggon Elementary School)	Waterloo Downwind (Waverly, Airport)	Southeast Background (Lake Sugema)	Davenport Downwind (Scott County Park)	Davenport Downwind (Argo, Highway Maintenance Shed)	Clinton Metro (Clinton, Rainbow Park)
2003-2005	75	65	62	62		61	59	67	69	68		74	72	73
2004-2006	75	65	61			67	60	67	67	66		69		70
2005-2007	75	69	63	69			67	72	71	68	69	70		73
2006-2008	68	67	58	64			65	69	68	66	67	66		68
2007-2009	65	64	59	63	61		63	66	67	65	64	67		67
2008-2010	64	63	61	62	57		59	63	63	63	63	64		64

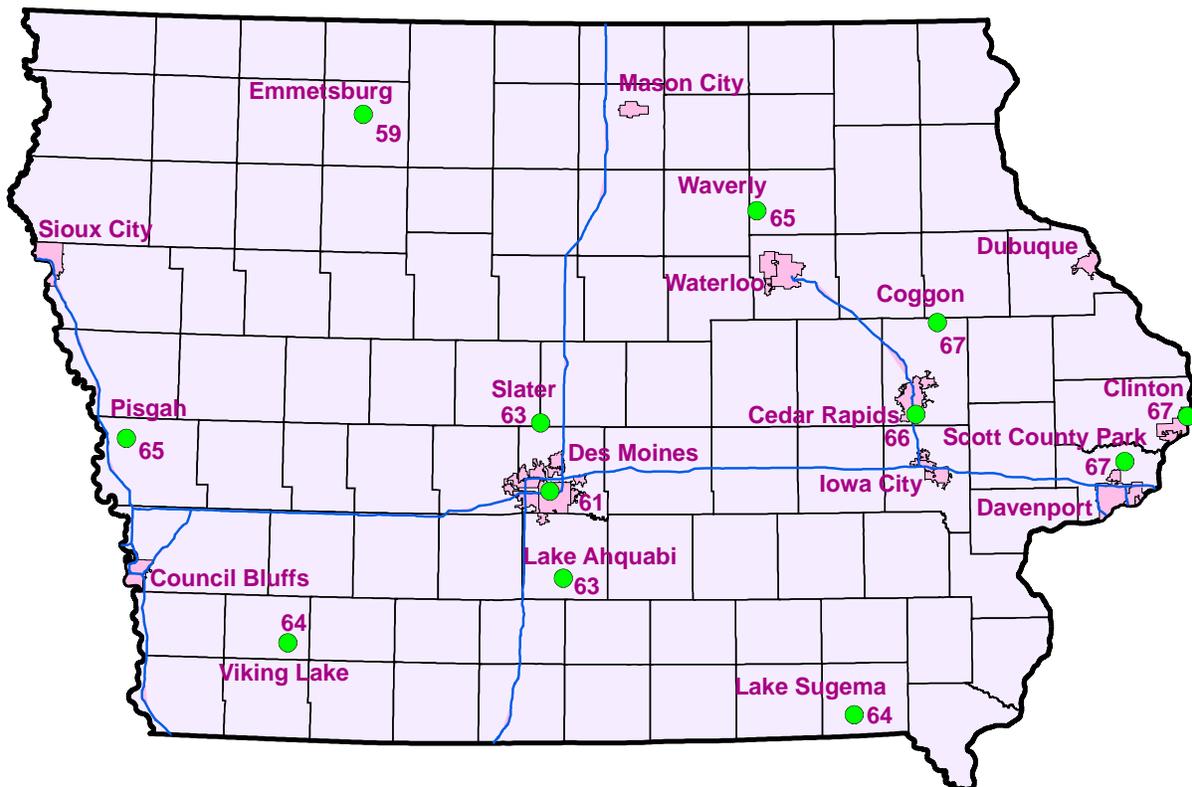
Legend	
Color	Design Value (dv) Range
	dv > 70 ppb
	65 ppb < dv ≤ 70 ppb
	60 ppb < dv ≤ 65 ppb
	dv ≤ 60 ppb

Maps of Ozone Primary Design Values

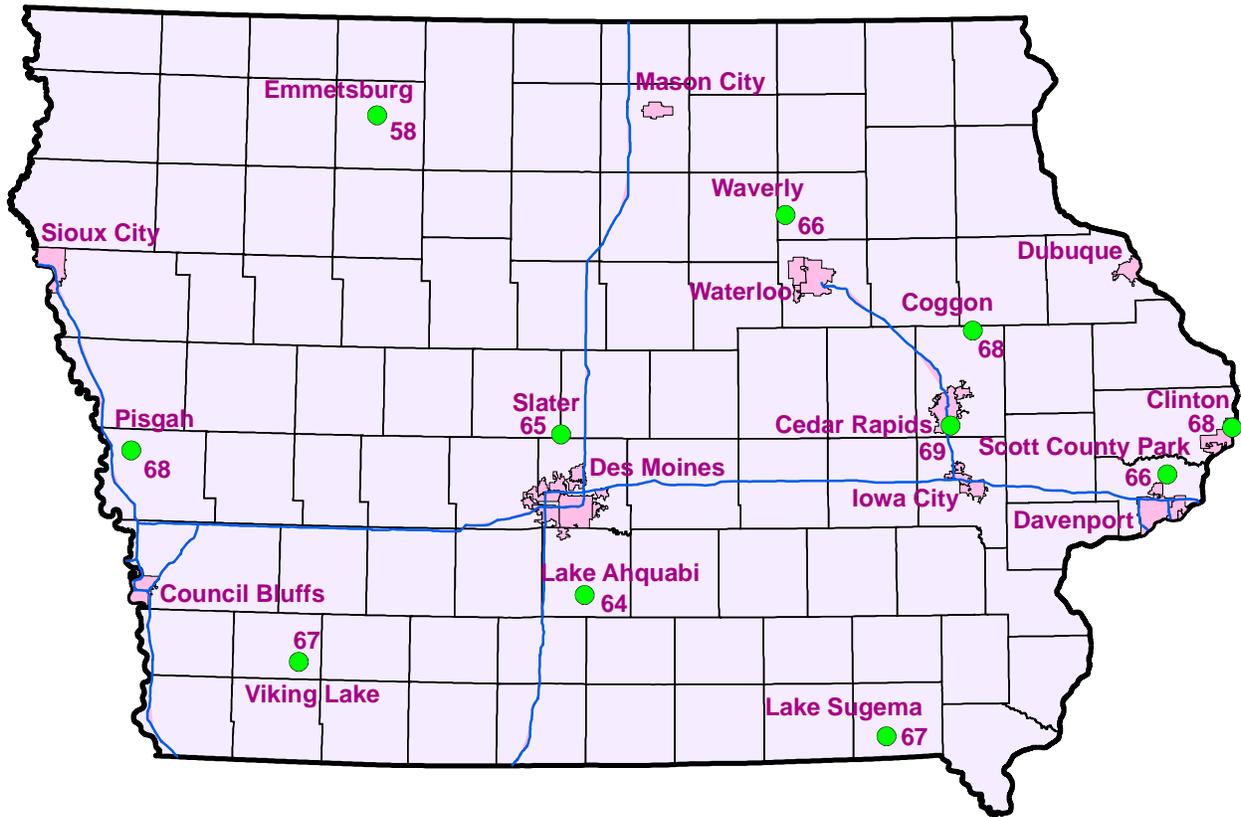
Maps of ozone primary design values, calculated according to the proposed ozone rule, are indicated below. Three years of complete data are required to compute this design value; only sites with complete data are indicated.



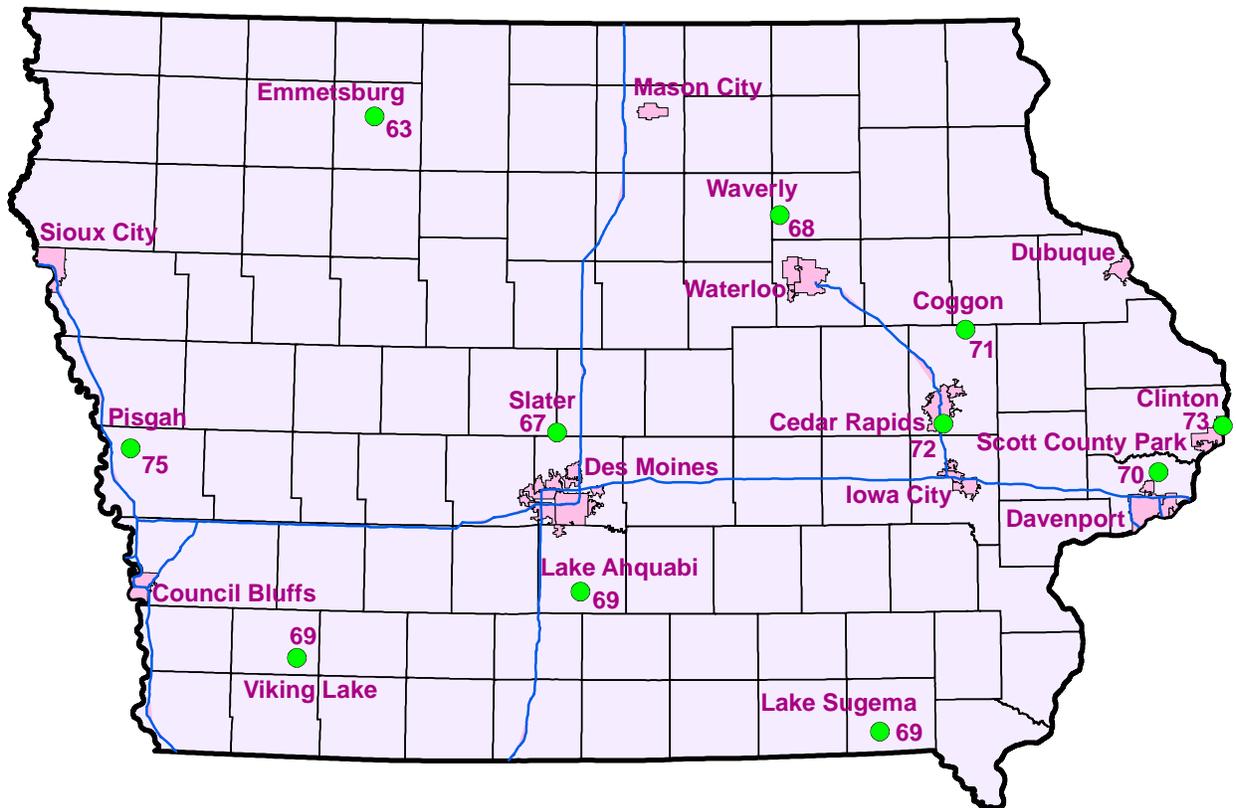
2008-2010 Ozone Primary Design Values (ppb)



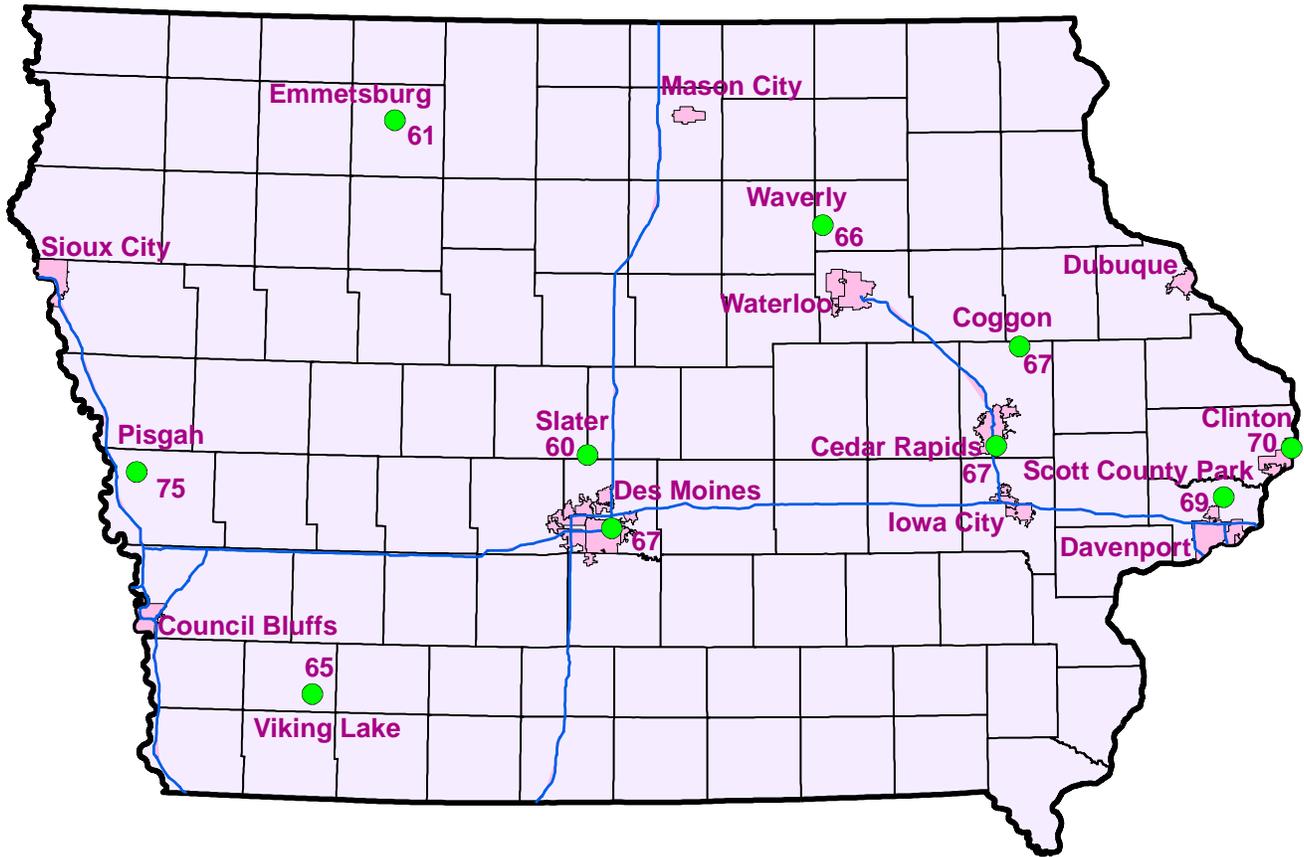
2007-2009 Ozone Primary Design Values (ppb)



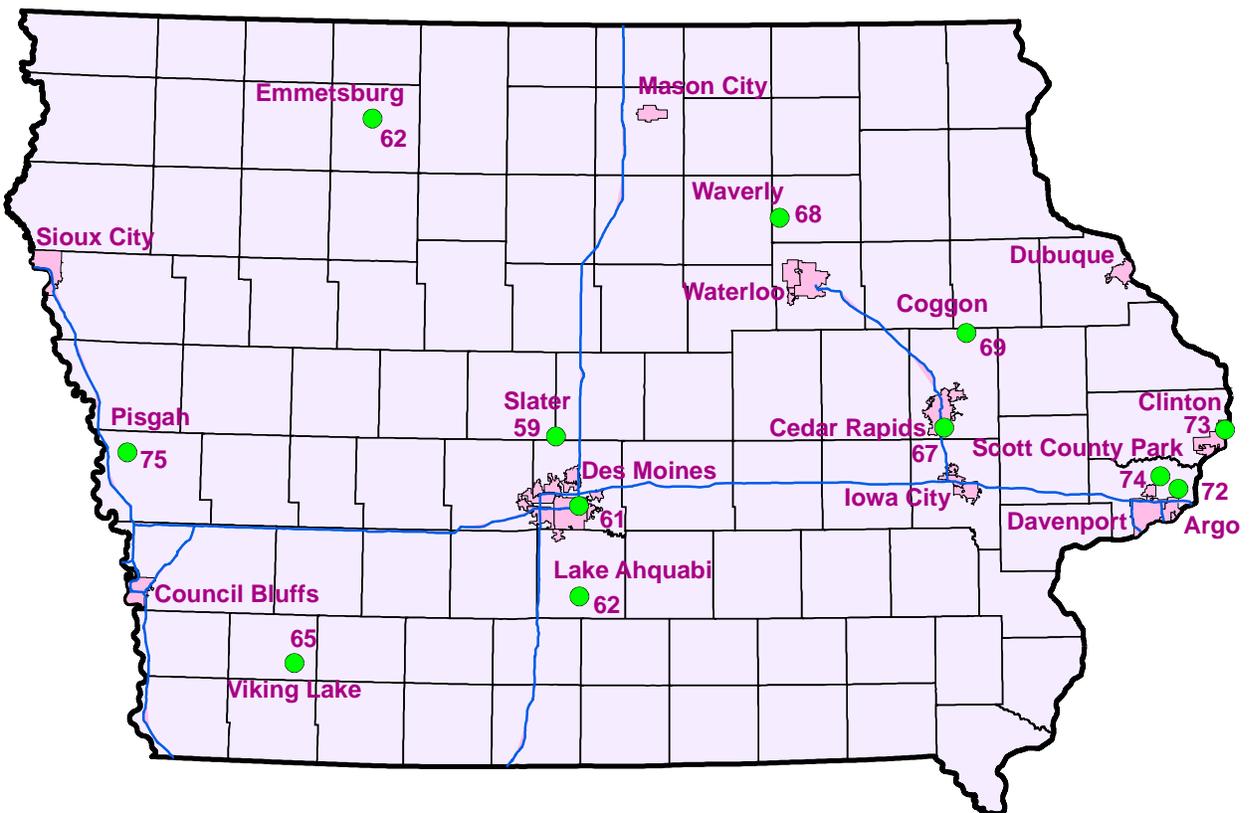
2006-2008 Ozone Primary Design Values (ppb)



2005-2007 Ozone Primary Design Values (ppb)



2004-2006 Ozone Primary Design Values (ppb)

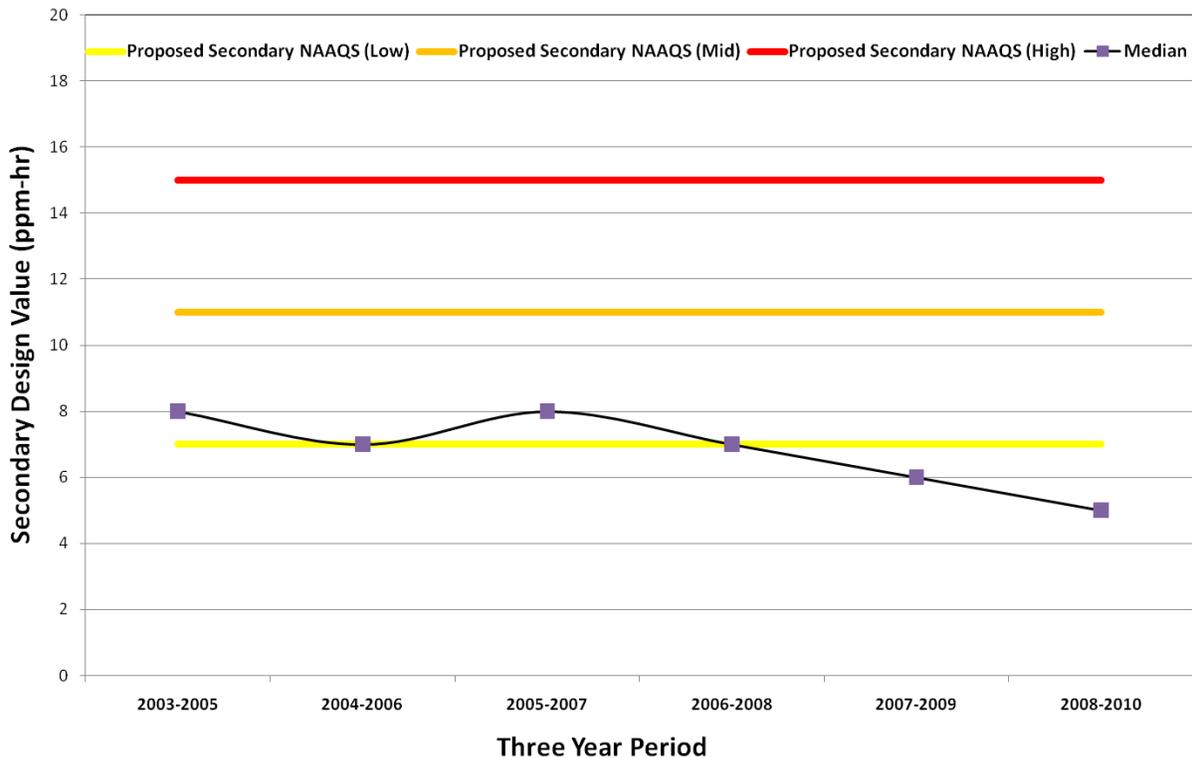


2003-2005 Ozone Primary Design Values (ppb)

A Comparison of Historical Ozone Levels to the Proposed Secondary Ozone NAAQS

The proposed ozone rule contains a new secondary standard to protect ozone-sensitive vegetation. During daylight hours, plants are sensitive to the cumulative effect of hourly ozone concentrations that exceed a level of about 67 ppb. The level of the secondary standard has units of ppm-hr, reflecting the fact that the standard represents a cumulative dosage; details of the design value computation for the secondary standard³ may be found in the proposed rule. The rule proposes a level for the secondary NAAQS between 7 ppm-hr and 15 ppm-hr. Ozone secondary design values are computed below and compared to low, mid, and high values in this range. If a value at the low end of the proposed range of the secondary standard (7 ppm-hr) is selected, based on the most recent 2008-2010 data, no monitors in Iowa will violate the new secondary NAAQS.

**Comparison of Historical Ozone Secondary Design Values
(Proposed Calculation) to Proposed NAAQS Levels**



³ A description of the secondary ozone design value computation is contained in the presentation: *Demystifying the W126 Statistic*, by David Mintz (EPA), presented at the 2010 National Air Quality Conference, March 16, 2010, available online at: http://www.epa.gov/airnow/2010conference/nagc/communications/demystifying_the_w126_calculation.ppt.

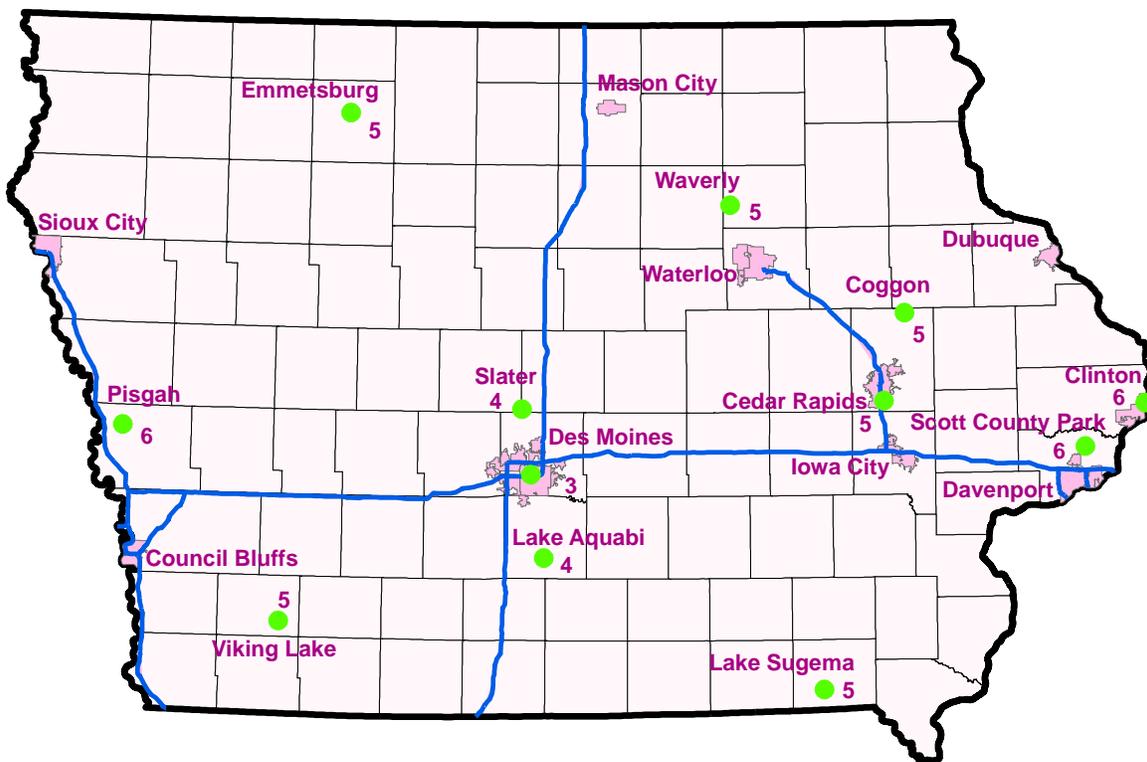
Ozone Secondary Design Values for 2005-2010 (ppm-hr), Calculated According to the Proposed Rule

Three Year Period	Omaha-Council Bluffs Downwind (Pisgah, Highway Maintenance Shed)	Southwest Background (Viking Lake State Park)	Northwest Background (Emmetsburg, Iowa Lakes Community College)	Des Moines Upwind (Indianola, Lake Ahquabi State Park)	Des Moines Metro (Des Moines, Health Department)	Des Moines Metro (Des Moines, Phillips School)	Des Moines Downwind (Slater, Elementary/City Hall)	Cedar Rapids Upwind (Cedar Rapids, Kirkwood College)	Cedar Rapids Downwind (Coggon Elementary School)	Waterloo Downwind (Waverly, Airport)	Southeast Background (Lake Sugema)	Davenport Downwind (Scott County Park)	Davenport Downwind (Argo, Highway Maintenance Shed)	Clinton Metro (Clinton, Rainbow Park)
2003-2005	12	5	4	5		5	3	7	8	8		12	11	11
2004-2006	12	5	4			7	4	6	7	7		9		9
2005-2007	12	7	4	8			6	8	9	8	8	10		11
2006-2008	9	7	3	6			6	7	7	7	6	7		7
2007-2009	7	6	4	5	4		5	6	7	6	6	8		7
2008-2010	6	5	5	4	3		4	5	5	5	5	6		6

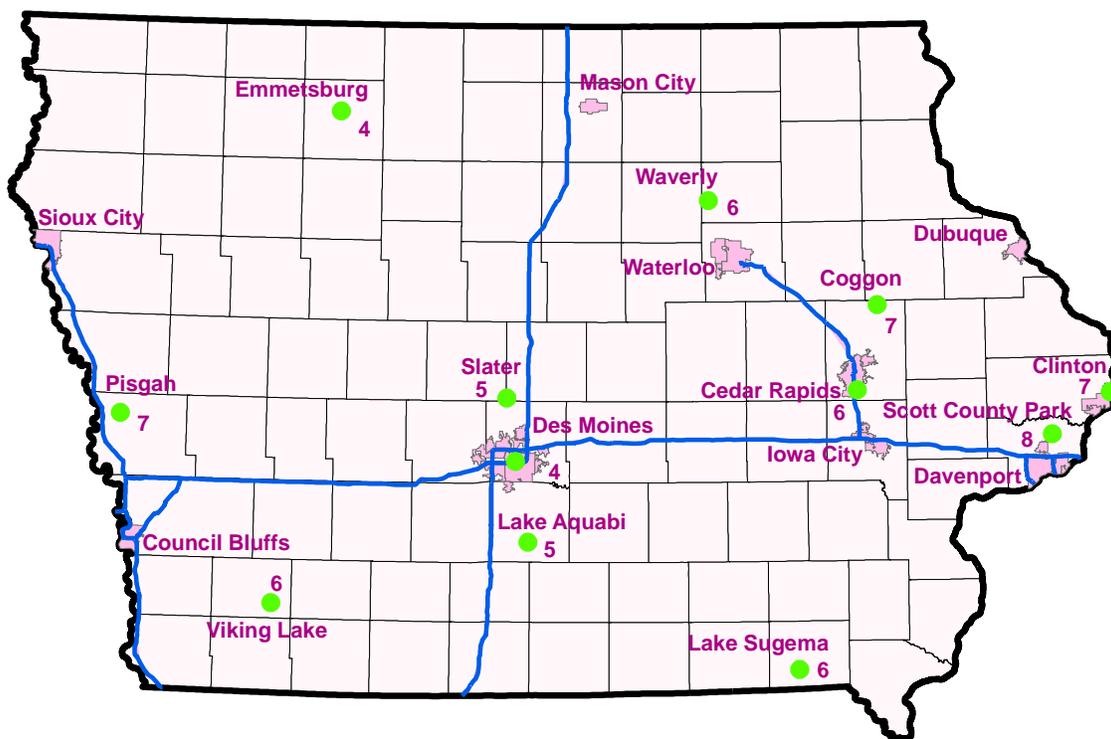
Legend	
Color	Design Value (dv) Range
	dv > 15 ppm-hr
	11 ppm-hr < dv ≤ 15 ppm-hr
	7 ppm-hr < dv ≤ 11 ppm-hr
	dv ≤ 7 ppm-hr

Maps of Ozone Secondary Design Values

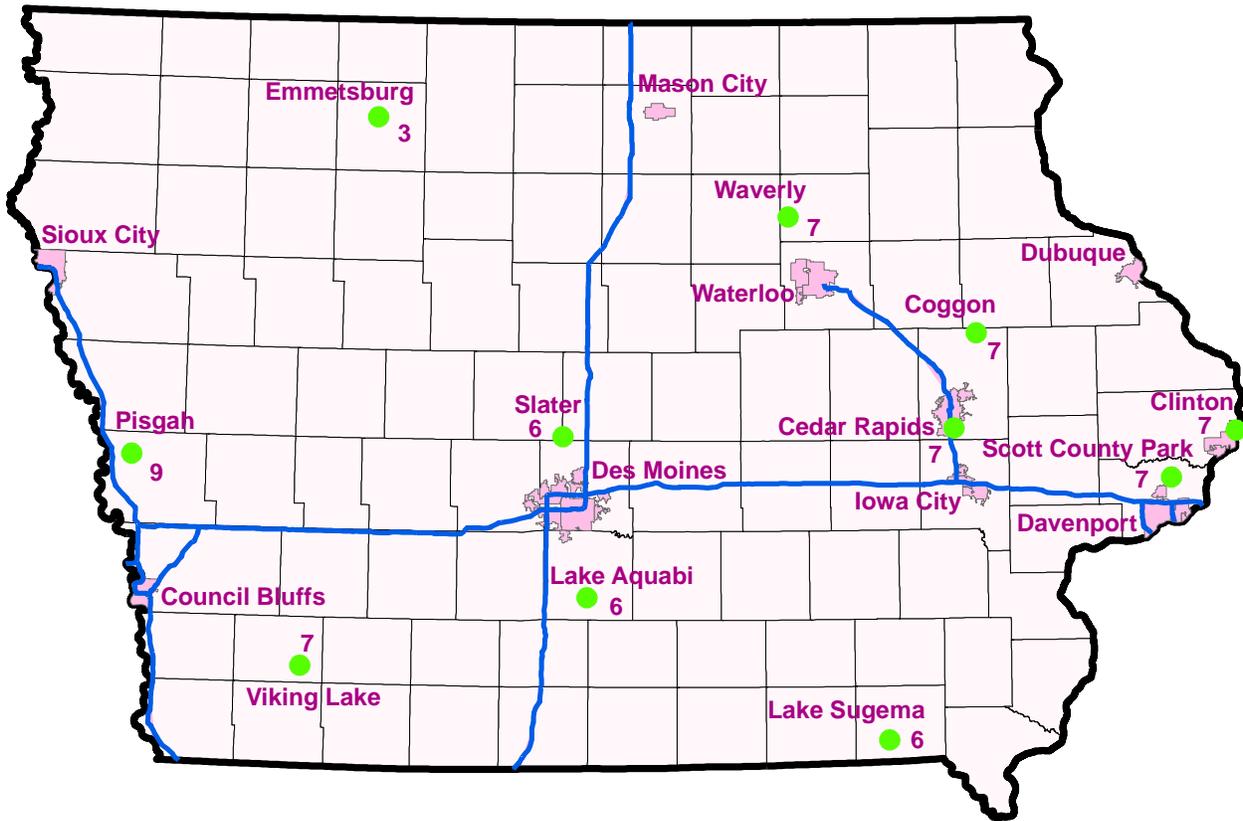
Maps of ozone secondary design values, calculated according to the proposed ozone rule, are indicated below. Three years of complete data are required to compute this design value; only sites with complete data are indicated. Monitors downwind of eastern Iowa cities and downwind of the Omaha-Council Bluffs area usually record the highest design values.



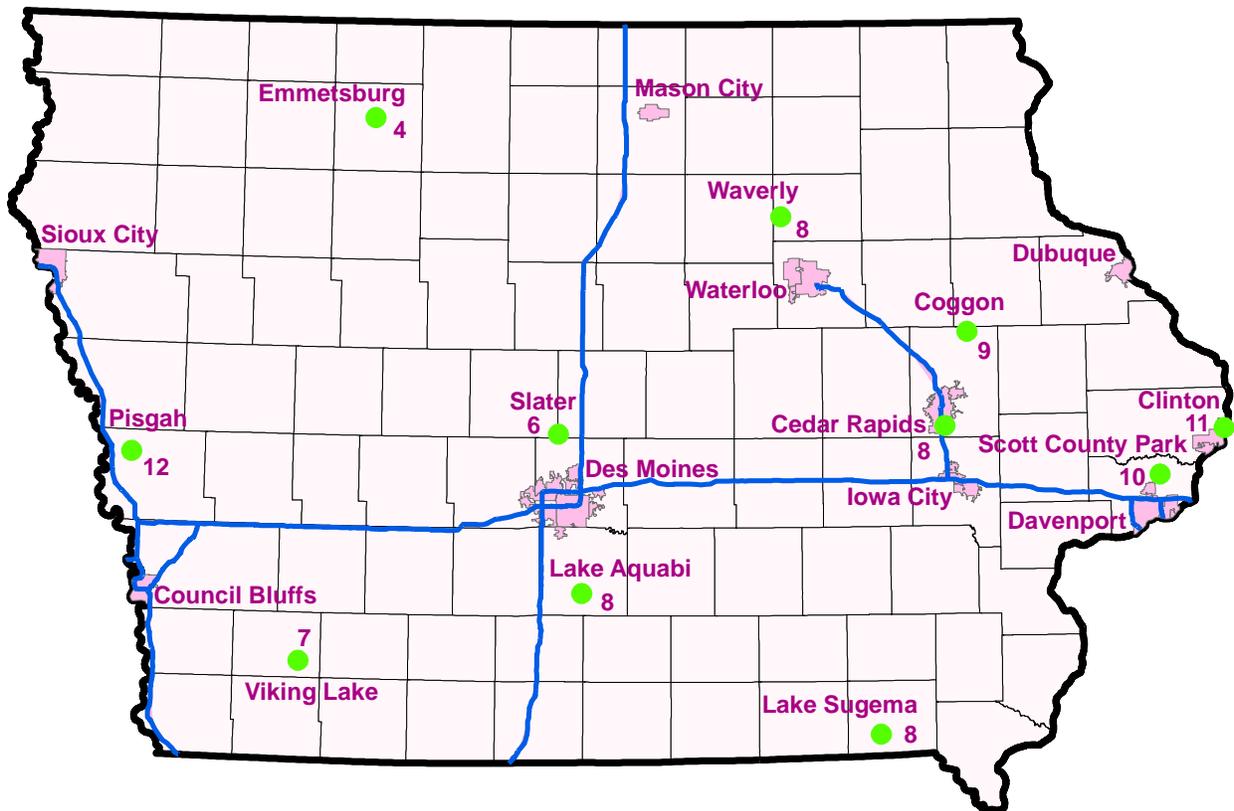
2008-2010 Ozone Secondary Design Values (ppm-hr)



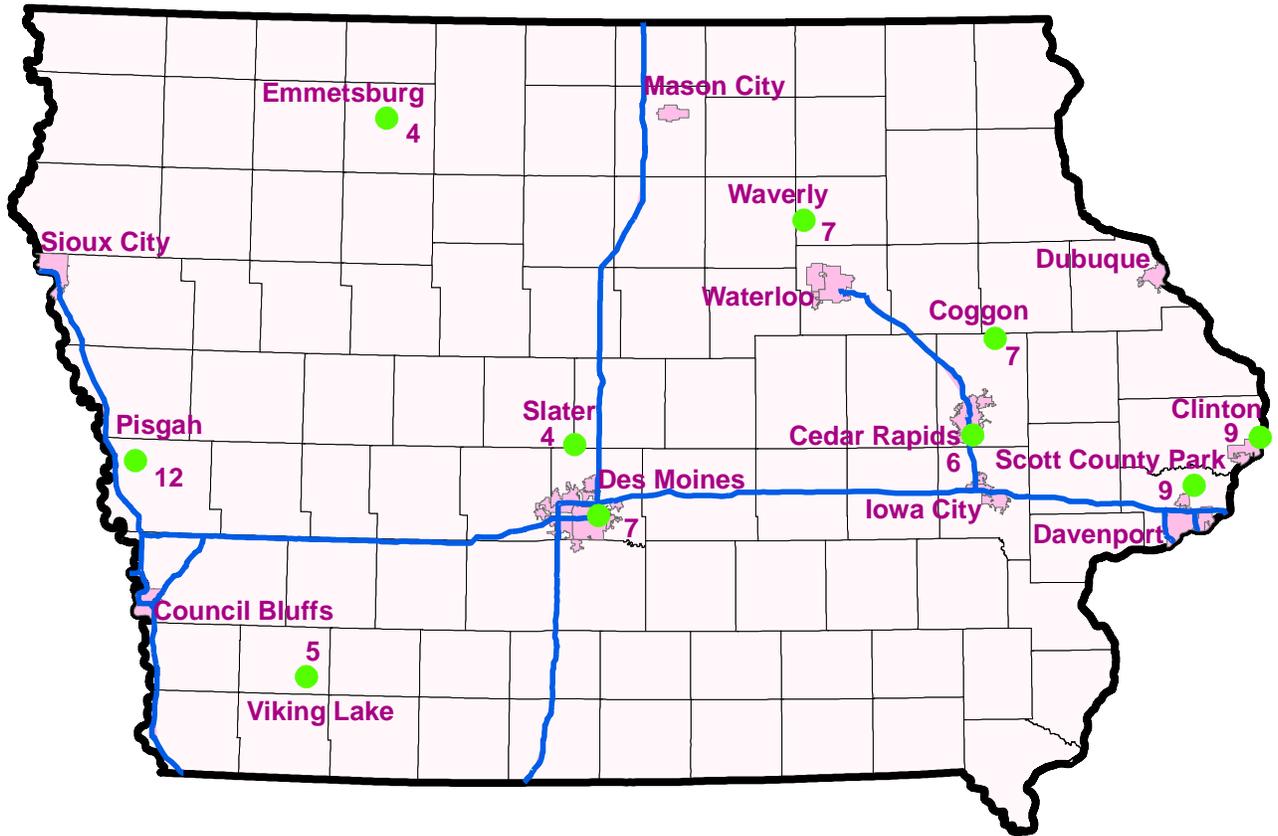
2007-2009 Ozone Secondary Design Values (ppm-hr)



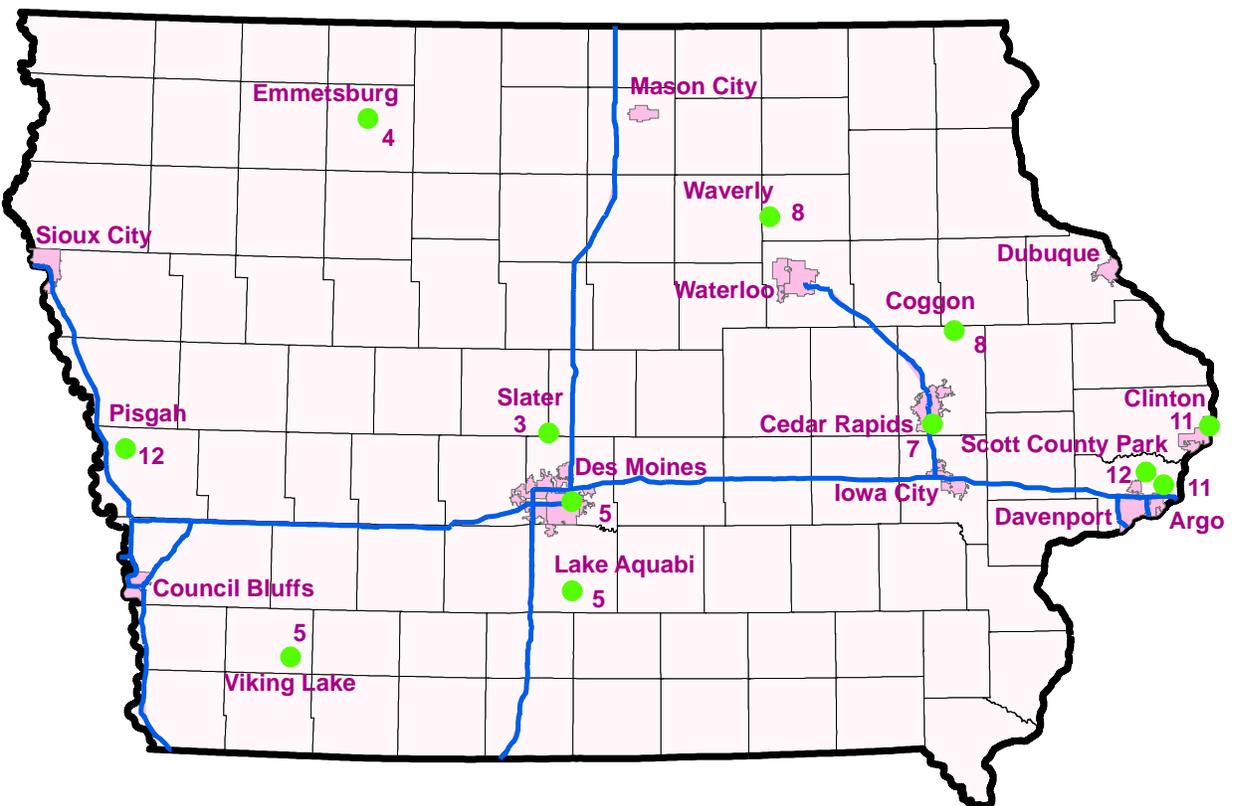
2006-2008 Ozone Secondary Design Values (ppm-hr)



2005-2007 Ozone Secondary Design Values (ppm-hr)



2004-2006 Ozone Secondary Design Values (ppm-hr)



2003-2005 Ozone Secondary Design Values (ppm-hr)

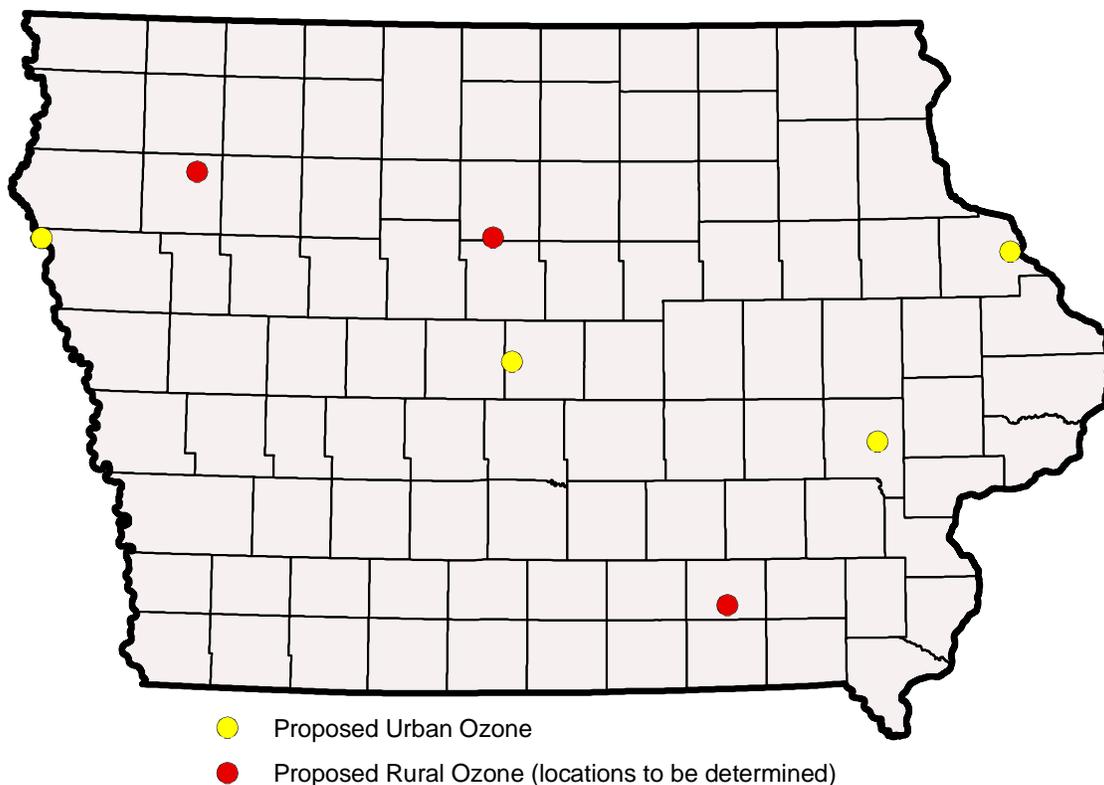
Monitoring Requirements under the Proposed Ozone NAAQS

In addition to the ozone NAAQS changes, EPA has also proposed changes to federal rules regarding ozone network design.⁴ If the proposed rule is finalized, new ozone sites would need to be established in or downwind of Iowa's smaller MSA's: Sioux City, Dubuque, Iowa City, and Ames.

The proposed rule also requires states to operate ozone monitors in non-urban areas to allow for:

- Assessment of ozone concentrations in areas such as federal, state, or Tribal lands, including wilderness areas that have ozone-sensitive natural vegetation and/or ecosystems, and to determine compliance with the revised secondary NAAQS.
- Assessment of at least one smaller population center of between 10,000 and 50,000 people that is expected to have ozone concentrations of at least 85 percent of the NAAQS.
- Monitoring in the location of expected maximum ozone concentration outside of any urban area, potentially including the far-downwind transport zones of currently well-monitored urban areas.

EPA has indicated that its current intention is to finalize the new ozone NAAQS by July 29, 2011.⁵



Monitoring Required Under the Proposed Ozone Network Rule

⁴ Available online at: <http://www.epa.gov/groundlevelozone/fr/20090716.pdf>

⁵ See: <http://www.epa.gov/glo/pdfs/20101208declaration.pdf>