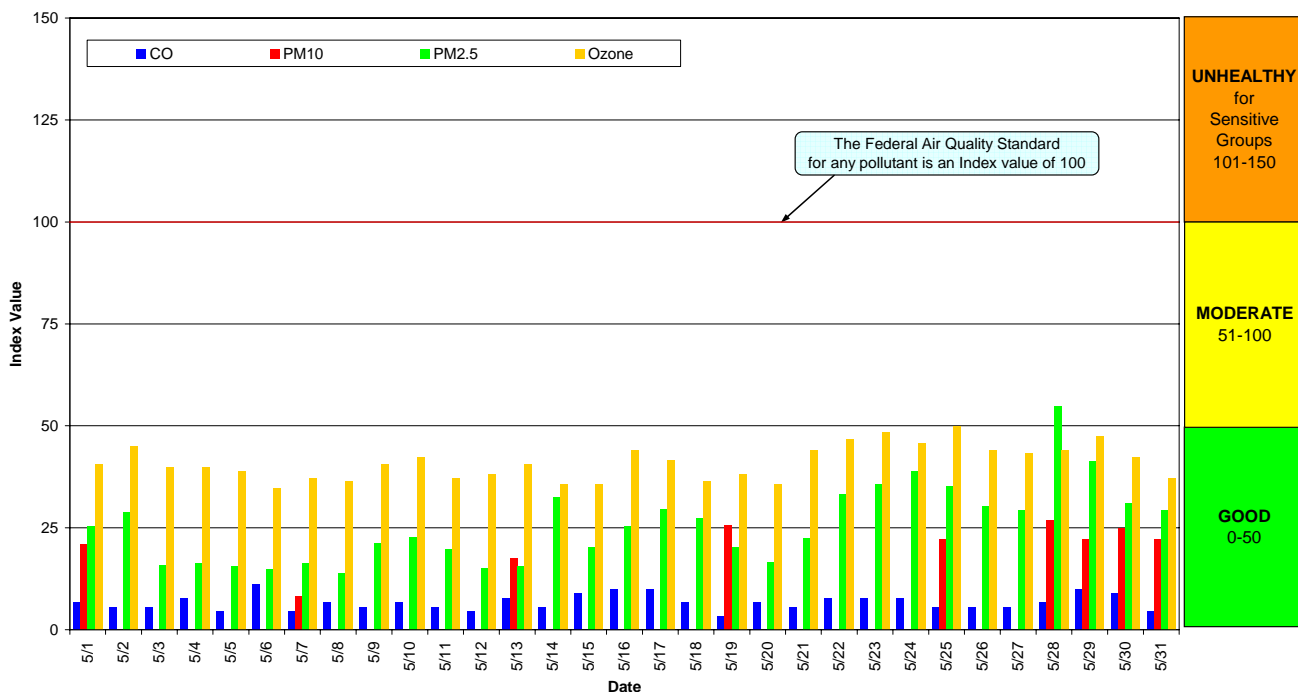


## Spokane Regional Clean Air Agency Air Quality Report - May 2009

The Clean Air Act requires EPA to set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, carbon monoxide (CO), lead (Pb), nitrogen dioxide (NO<sub>2</sub>), particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), ground-level ozone (O<sub>3</sub>) and sulfur dioxide (SO<sub>2</sub>). These are known as “criteria” pollutants because EPA established regulatory limits to concentrations in ambient air using human health or environmentally based criteria. See Appendix Table A-1 for a summary of the NAAQS. Carbon monoxide, particulate matter and ozone are monitored in Spokane County by the Spokane Regional Clean Air Agency (SRCAA) and the Washington State Department of Ecology (Ecology). Ozone monitoring at Ecology-operated stations at Greenbluff and Turnbull National Wildlife Refuge near Cheney resumed May 1, 2009.

Figure 1 shows the daily maximum Air Quality Index (AQI) for each pollutant in May. The AQI is EPA’s color-coded tool for communicating daily air quality to the public and can be calculated for any of the criteria pollutants except lead, provided monitoring data are available. An index value above 100 indicates that the concentration of a criteria pollutant exceeded the limit established in the NAAQS. Categories of the AQI are “good” (green, 0-50), “moderate” (yellow, 51-100), “unhealthy for sensitive groups” (orange, 101-150), “unhealthy” (red, 151-200), “very unhealthy” (purple, 201-300) and “hazardous” (maroon, 301-500). See Appendix Table A-2 for more information about the AQI. The Spokane region’s air quality is usually in the good range of the AQI and sometimes in the moderate range. About once every three years, on average, the AQI reaches the unhealthy for sensitive groups category as a result of a summertime dust storm. For more information about the AQI, see EPA’s AirNow AQI web page (<http://airnow.gov/index.cfm?action=static.aqi>).

**Figure 1: Air Quality Index (AQI) values for May 2009**



The data used for calculating the AQIs are obtained using automated air pollution monitoring methods that provide “real time” data, which the SRCAA uses in its day-to-day programs, e.g., air quality forecasting and burning curtailment. For measurement of particulate matter concentrations, the SRCAA operates a network of continuous particulate matter monitors consisting of Tapered Element Oscillating Microbalances (TEOM) and nephelometers. The PM<sub>10</sub> data shown in Figure 1 were obtained using a manual method, however, which was operated once every six days. Manual method data are not used for daily reporting of the AQI because samples must be analyzed in a laboratory. Mass concentration data are not available until a few weeks after the run date. The Department of Ecology operates the CO monitor near the intersection of 3<sup>rd</sup> & Washington in downtown Spokane. See Table 4 for the CO data for May.

Tables 1 and 2 contain the maximum AQI values for each pollutant for the month and for the year to date. Table 3 summarizes the year to date daily AQIs by category and compares them to last year's AQIs.

**Table 1: Maximum AQI values and pollutant concentrations for this reporting period**

Pollutant	AQI/Concentration	Location	Date
CO	11/1 ppm	3 <sup>rd</sup> & Washington	5/6/09
PM <sub>10</sub>	27/29 µg/m <sup>3</sup>	Turnbull Wildlife Refuge	5/28/09
PM <sub>2.5</sub>	42/12.9 µg/m <sup>3</sup>	Airway Heights	5/28/09
O3	50/0.059 ppm	Greenbluff	5/25/09

**Table 2: Maximum AQI values and pollutant concentrations this year to date**

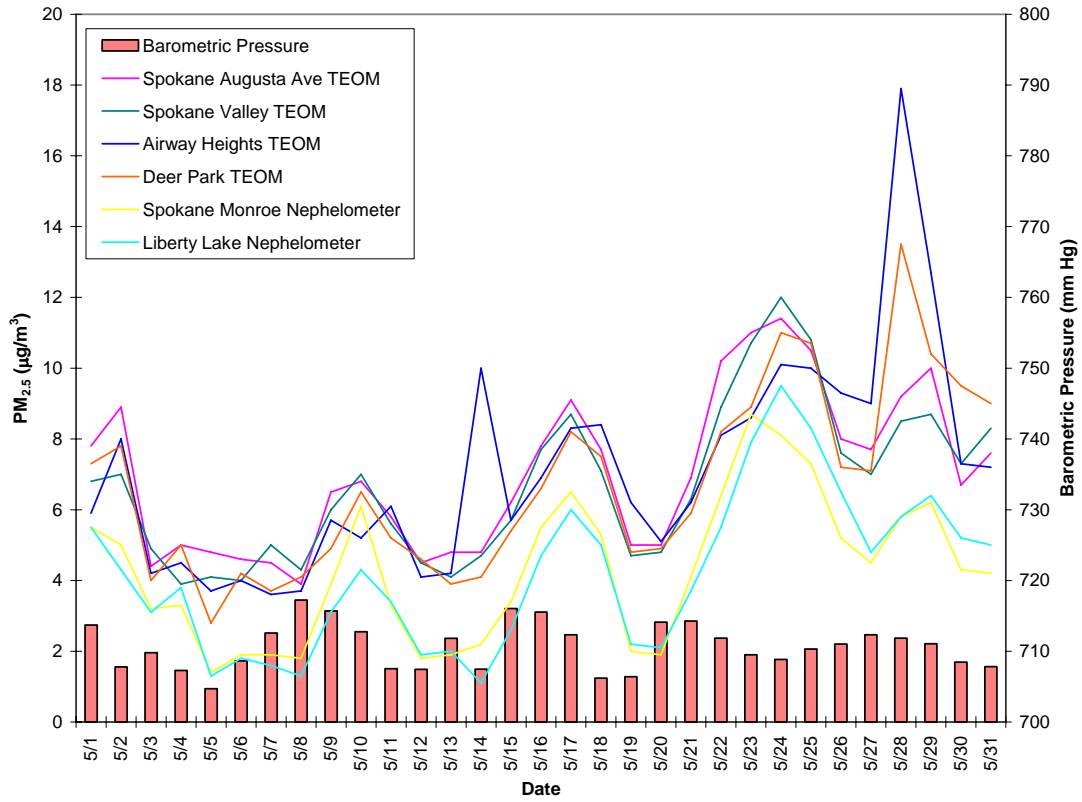
Pollutant	AQI/Concentration	Location	Date
CO	33/3 ppm	3 <sup>rd</sup> & Washington	4/1/09
PM <sub>10</sub>	44/47 µg/m <sup>3</sup>	Freya & Ferry	3/15/09
PM <sub>2.5</sub>	67/23.9 µg/m <sup>3</sup>	Freya & Ferry	1/28/09
O3	50/0.059 ppm	Greenbluff	5/25/09

**Table 3: AQI summary as of May 30, 2009**

Category	Number of Days This Year	Last Year to Date
Good (0-50)	146	134
Moderate (51-100)	5	18
Unhealthy for Sensitive Groups (101-150)	0	0
Unhealthy (151-200)	0	0
Very Unhealthy (201-300)	0	0
Hazardous (>300)	0	0

Figure 2 shows the 24 hour average PM<sub>2.5</sub> concentrations across the monitoring network as they change through the month. The cause of the higher PM<sub>2.5</sub> levels on May 28, including the high spike at Airway Heights, is unknown.

**Figure 2: PM<sub>2.5</sub> multi-station time series for May 2009**



The Augusta monitoring station is located in a mixed commercial/light industrial and residential area on the eastern side of the City of Spokane and contains both automated and manual methods for monitoring PM<sub>2.5</sub>. The manually-operated Federal Reference Method (FRM) is the “gold-standard” for measurement of the 24-hour average particulate matter concentration and meets the requirements for demonstrating attainment of federal air quality standards. The accuracy of the TEOM sample data can be verified by comparison with co-located FRM data. The correlation coefficient (R<sup>2</sup>) for the PM<sub>2.5</sub> TEOM and FRM data was 0.93 for the month of May. The trend for the month was for the TEOM to over-report slightly compared to the FRM (Figure 3).

**Figure 3: Comparison between Augusta Ave PM<sub>2.5</sub> TEOM and FRM data for May 2009.** The combined April and May data are shown in orange. Blue circles and trend line represent the data for May only.

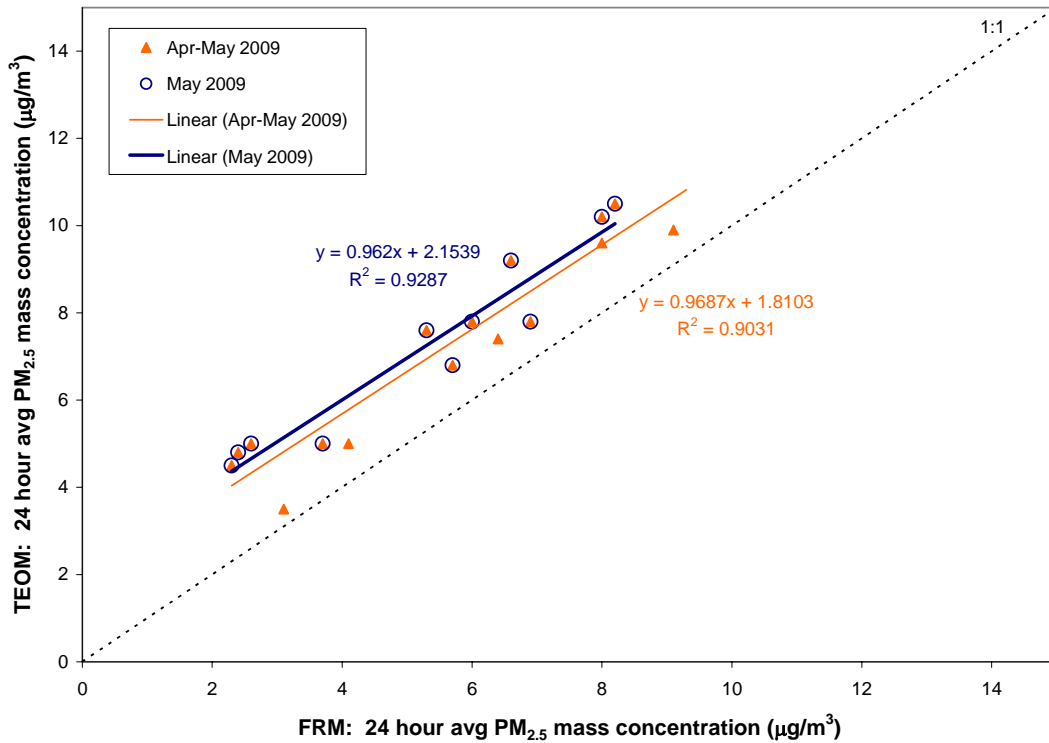


Figure 4 shows the eight hour running average daily maximum ozone concentrations measured within Spokane County in May. Daily maximum temperature can be used as a surrogate for solar radiation (ozone is formed through a photochemical reaction) for determining potential ozone maximum concentrations. The threshold for the moderate category for the AQI for ozone is 0.06 ppm. No measurements exceeded this threshold, but the concentration at Greenbluff on May 25 was very close at 0.059 ppm. Ozone concentrations at the new urban monitoring station at Augusta & Fiske followed a pattern similar to Greenbluff and Turnbull, but with slightly lower levels.

**Figure 4: Eight hour maximum ozone concentrations for the Spokane region in May.** Daily average wind speed and daily maximum temperature are also shown.

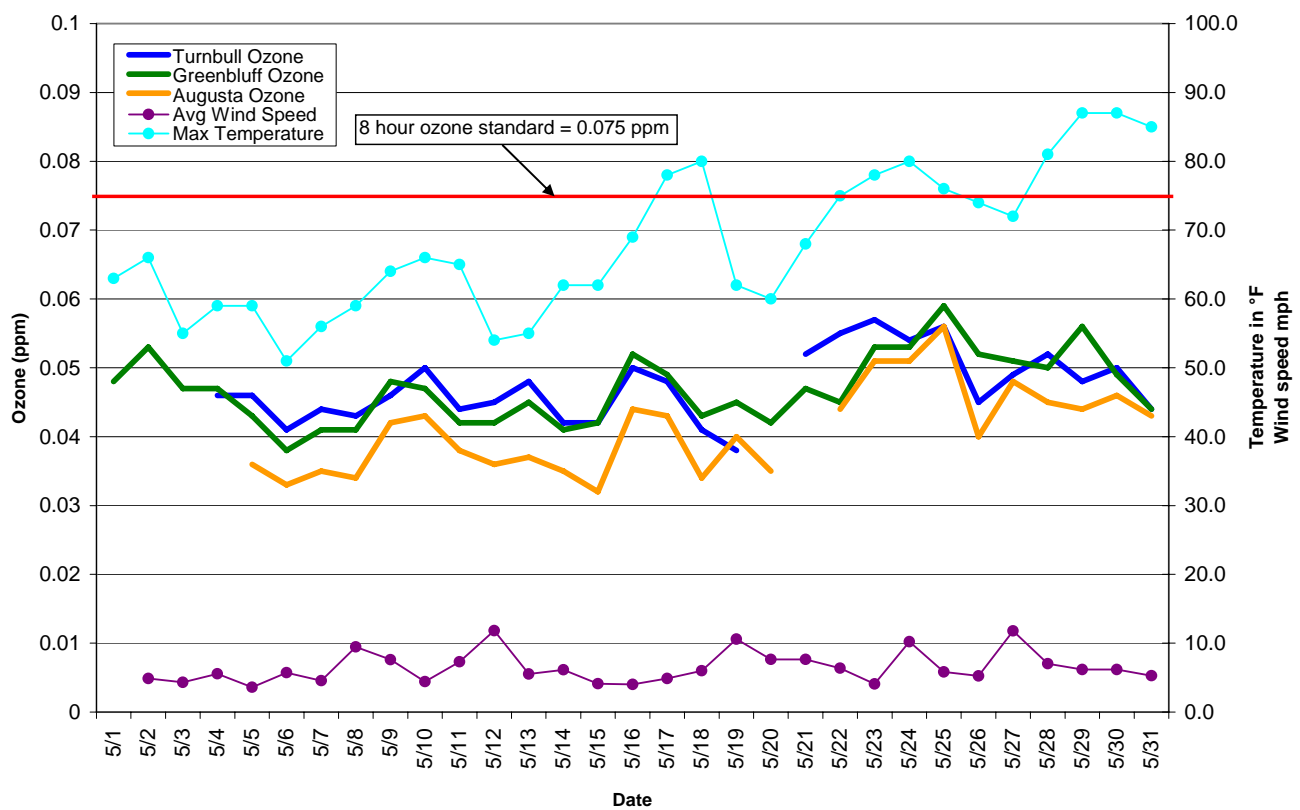


Table 4 summarizes the air quality data measured throughout the monitoring network in May. Some PM<sub>2.5</sub> TEOM data are missing because of monitor malfunctions and data transmission errors. The SRCAA did not operate any PM<sub>10</sub> TEOMs in May. A dichotomous (PM<sub>2.5</sub> and PM<sub>10</sub>) TEOM was installed at the Augusta monitoring station in May and PM<sub>10</sub> continuous data will be reported again soon.

**Table 4: Summary air quality data for May from all of the analyzers operated in Spokane County.** The CO and data are 8-hour maximums in parts per million (ppm) and the PM data are 24-hour averages in micrograms per cubic meter of air (µg/m<sup>3</sup>).

Date	CO 3rd & Washington (ppm)	Ozone Greenbluff (ppm)	Ozone Turnbull Wildlife Refuge (ppm)	Ozone Augusta & Fiske (ppm)	PM10 Augusta & Fiske TEOM (µg/m <sup>3</sup> )	PM10 Augusta & Fiske FRM (µg/m <sup>3</sup> )	PM2.5 Augusta & Fiske TEOM (µg/m <sup>3</sup> )	PM2.5 Augusta & Fiske FRM (µg/m <sup>3</sup> )	PM2.5 Monroe & College TEOM (µg/m <sup>3</sup> )	PM2.5 Monroe & Wellesley Nephelometer (µg/m <sup>3</sup> )	PM10 Turnbull Wildlife Refuge TEOM (µg/m <sup>3</sup> )	PM10 Turnbull Wildlife Refuge FRM (µg/m <sup>3</sup> )	PM2.5 Turnbull Wildlife Refuge (µg/m <sup>3</sup> )	PM10 Liberty Lake (µg/m <sup>3</sup> )	PM10-2.5 Liberty Lake (µg/m <sup>3</sup> )	PM2.5 Liberty Lake (µg/m <sup>3</sup> )	PM2.5 Deer Park TEOM (µg/m <sup>3</sup> )	PM2.5 Spokane Valley TEOM (µg/m <sup>3</sup> )	PM2.5 Airway Heights TEOM (µg/m <sup>3</sup> )
5/1	0.6	0.048		0.02	NA	23	7.8	6.9		5.5		13.1	4.1	14.1	9.6	4.5	7.3	6.8	5.9
5/2	0.5	0.053			NA		8.9			5							7.8	7	8
5/3	0.5	0.047			NA		4.4			3.2							4	4.9	4.2
5/4	0.7	0.047	0.046		NA		5	3.7	5.0	3.3							5	3.9	4.5
5/5	0.4	0.043	0.046	0.036	NA		4.8		2.8	1.4							2.8	4.1	3.7
5/6	1	0.038	0.041	0.033	NA		4.6		4.3	1.9							4.2	4	4
5/7	0.4	0.041	0.044	0.035	NA	9	4.5	2.3	3.7	1.9		3.9	1.7	6.5	5.4	1.1	3.7	5	3.6
5/8	0.6	0.041	0.043	0.034	NA		3.9		4.1	1.8							4.1	4.3	3.7
5/9	0.5	0.048	0.046	0.042	NA		6.5		4.9	3.9							4.9	6	5.7
5/10	0.6	0.047	0.05	0.043	NA		6.8	5.7	6.5	6.1							6.5	7	5.2
5/11	0.5	0.042	0.044	0.038	NA		5.8		5.2	3.3							5.2	5.6	6.1
5/12	0.4	0.042	0.045	0.036	NA		4.5		4.7	1.8							4.6	4.5	4.1
5/13	0.7	0.045	0.048	0.037	NA	11	4.8	2.4	4.0	1.9		4.7	1.4	18.8	17.1	1.7	3.9	4.1	4.2
5/14	0.5	0.041	0.042	0.035	NA		4.8		4.1	2.2							4.1	4.7	10
5/15	0.8	0.042	0.042	0.032	NA		6.2		5.4	3.4							5.4	5.7	5.7
5/16	0.9	0.052	0.05	0.044	NA		7.8	6.0	6.6	5.5							6.6	7.7	6.9
5/17	0.9	0.049	0.048	0.043	NA		9.1		8.3	6.5							8.2	8.7	8.3
5/18	0.6	0.043	0.041	0.034	NA		7.7		7.5	5.3							7.5	7.1	8.4
5/19	0.3	0.045	0.038	0.04	NA	28	5	2.6	4.8	2		13.7	2.2	21.4	19.5	1.9	4.8	4.7	6.2
5/20	0.6	0.042		0.035	NA		5		4.9	1.9							4.9	4.8	5.1
5/21	0.5	0.047	0.052		NA		6.9		5.9	4.1							5.9	6.3	6.2
5/22	0.7	0.045	0.055	0.044	NA		10.2	8.0	8.3	6.4							8.2	8.9	8.1
5/23	0.7	0.053	0.057	0.051	NA		11		8.9	8.7							8.9	10.7	8.6
5/24	0.7	0.053	0.054	0.051	NA		11.4		11.0	8.1							11	12	10.1
5/25	0.5	0.059	0.056	0.056	NA	24	10.5	8.2	10.8	7.3		16.3	6.3	18.4	10.8	7.6	10.7	10.8	10
5/26	0.5	0.052	0.045	0.04	NA		8		7.4	5.2							7.2	7.6	9.3
5/27	0.5	0.051	0.049	0.048	NA		7.7		7.1	4.5							7.1	7	9
5/28	0.6	0.05	0.052	0.045	NA		9.2	6.6	13.6	5.8	29						13.5	8.5	17.9
5/29	0.9	0.056	0.048	0.044	NA		10		10.5	6.2	24						10.4	8.7	12.7
5/30	0.8	0.049	0.05	0.046	NA		6.7		9.6	4.3	27						9.5	7.3	7.3
5/31	0.4	0.044	0.044	0.043		24	7.6	5.3	9.0	4.2	17	18.4					9	8.3	7.2
Maximum	1.0	0.059	0.057	0.056	NA	27.8	11.4	8.2	13.6	8.7	29	16.3	6.3	21.4	19.5	7.6	13.5	12.0	17.9
Average	0.6	0.047	0.047	0.040	NA	18.8	7.0	5.2	6.7	4.3	27	10.3	3.1	15.8	12.5	3.4	6.6	6.6	7.1

# Appendix

**Table A-1: National Ambient Air Quality Standards**

Pollutant	Primary Standards		Secondary Standards	
	Level	Averaging Time	Level	Averaging Time
Carbon Monoxide	9 ppm (10 mg/m <sup>3</sup> )	8-hour <sup>(1)</sup>	None	
	35 ppm (40 mg/m <sup>3</sup> )	1-hour <sup>(1)</sup>		
Lead	0.15 µg/m <sup>3</sup> <sup>(2)</sup>	Rolling 3-Month Average	Same as Primary	
	1.5 µg/m <sup>3</sup>	Quarterly Average	Same as Primary	
Nitrogen Dioxide	0.053 ppm (100 µg/m <sup>3</sup> )	Annual (Arithmetic Mean)	Same as Primary	
Particulate Matter (PM <sub>10</sub> )	150 µg/m <sup>3</sup>	24-hour <sup>(3)</sup>	Same as Primary	
Particulate Matter (PM <sub>2.5</sub> )	15.0 µg/m <sup>3</sup>	Annual <sup>(4)</sup> (Arithmetic Mean)	Same as Primary	
	35 µg/m <sup>3</sup>	24-hour <sup>(5)</sup>	Same as Primary	
Ozone	0.075 ppm (2008 std)	8-hour <sup>(6)</sup>	Same as Primary	
	0.08 ppm (1997 std)	8-hour <sup>(7)</sup>	Same as Primary	
	0.12 ppm	1-hour <sup>(8)</sup> (Applies only in limited areas)	Same as Primary	
Sulfur Dioxide	0.03 ppm	Annual (Arithmetic Mean)	0.5 ppm (1300 µg/m <sup>3</sup> )	3-hour <sup>(1)</sup>
	0.14 ppm	24-hour <sup>(1)</sup>		

<sup>(1)</sup> Not to be exceeded more than once per year.

<sup>(2)</sup> Final rule signed October 15, 2008.

<sup>(3)</sup> Not to be exceeded more than once per year on average over 3 years.

<sup>(4)</sup> To attain this standard, the 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m<sup>3</sup>.

<sup>(5)</sup> To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population oriented monitor within an area must not exceed 35 µg/m<sup>3</sup> (effective December 17, 2006).

<sup>(6)</sup> To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (Effective May 27, 2008)

<sup>(7)</sup> (a) To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.  
(b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

<sup>(8)</sup> (a) The standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1.  
(b) As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) Areas.

**Table A-2: Air pollutant breakpoints for the Air Quality Index.**

Air Quality Index Levels of Health Concern	Color Code	Index Numerical Value	Breakpoints					Health Effects
			O <sub>3</sub> (ppm) 8-hour	O <sub>3</sub> (ppm) 1-hour <sup>(1)</sup>	PM <sub>2.5</sub> (µg/m <sup>3</sup> ) 24-hour	PM <sub>10</sub> (µg/m <sup>3</sup> ) 24-hour	CO (ppm) 8-hour	
<b>Good</b>	Green	0-50	0.000-0.059	<sup>(3)</sup>	0.0-15.4	0-54	0.0-4.4	Air quality is considered satisfactory and air pollution poses little or no risk.
<b>Moderate</b>	Yellow	51-100	0.060-0.075	<sup>(3)</sup>	15.5-35.4	55-154	4.5-9.4	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
<b>Unhealthy for Sensitive Groups</b>	Orange	101-150	0.076-0.095	0.125-0.164	35.5-65.4	155-254	9.5-12.4	People especially sensitive to air pollution may experience health effects. The general public is not likely to be affected. An AQI in this category or above indicates that air pollution exceeds levels acceptable under federal air quality standards.
<b>Unhealthy</b>	Red	151-200	0.096-0.115	0.165-0.204	65.5-150.4	255-354	12.5-15.4	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
<b>Very Unhealthy</b>	Purple	201-300	0.116-0.374	0.205-0.404	150.5-250.4	355-424	15.5-30.4	Health alert: everyone may experience more serious health effects.
<b>Hazardous</b>	Maroon	>300	<sup>(2)</sup>	0.405+	250.5+	425+	30.5+	Health warnings of emergency conditions. The entire population is more likely to be affected.

<sup>1</sup>Areas are generally required to report the AQI based on 8-hour ozone values. However, there are a small number of areas where an AQI based on 1-hour ozone values would be more precautionary. In these cases, in addition to calculating the 8-hour ozone index value, the 1-hour ozone index value may be calculated, and the maximum of the two values reported.

<sup>2</sup>8-hour O<sub>3</sub> values do not define higher AQI values (≥ 301). AQI values of 301 or greater are calculated with 1-hour O<sub>3</sub> concentrations.

<sup>3</sup>There is no AQI for 1-hour O<sub>3</sub> concentrations below the Unhealthy for Sensitive Groups level.