

# 1. Introduction

## 1.1 Overview

This 2008 periodic PM<sub>10</sub> emissions inventory was developed to meet requirements set forth in Title I of the Clean Air Act Amendments of 1990 (CAAA). The CAAA require development of a baseline emission inventory and periodic revisions for areas that fail to meet the National Ambient Air Quality Standards (NAAQS). A portion of Maricopa County is classified as serious nonattainment for PM<sub>10</sub>.

PM<sub>10</sub> is defined as particulate matter less than or equal to ten micrometers in diameter. This inventory includes primary emissions of PM<sub>10</sub> and PM<sub>2.5</sub> as well as three particulate matter precursors: nitrogen oxides (NO<sub>x</sub>), sulfur dioxides (SO<sub>x</sub>) and ammonia (NH<sub>3</sub>). The inventory provides emission estimates from point, area, nonroad mobile, onroad mobile and biogenic sources. Note that totals shown in tables may not equal the sum of individual values due to independent rounding.

## 1.2 Agencies responsible for the emissions inventory

Maricopa County Air Quality Department (MCAQD) has primary responsibility for preparing and submitting the 2008 Periodic PM<sub>10</sub> Emissions Inventory for Maricopa County. Point sources and the majority of area, and nonroad mobile source emission estimates were prepared by MCAQD. The Maricopa Association of Governments (MAG) prepared the emission estimates for onroad mobile, biogenic, and some area and nonroad mobile source categories. Table 1.2–1 lists those responsible for inventory preparation and quality assurance/ quality control activities, which are described in the respective chapters.

**Table 1.2–1. Chapter authors and QA/QC contacts for this report.**

Chapter	Author(s)	QA/QC contacts
2. Point Sources	Matt Poppen, MCAQD (602) 506-6790	–Eric Raisanen and Dena Konopka MCAQD (602) 506-6790
		–Cathy Arthur, MAG (602) 254-6300
3. Area Sources	–Matt Poppen, Eric Raisanen and Dena Konopka, MCAQD (602) 506-6790	–Bob Downing, MCAQD (602) 506-6790
	–Cathy Arthur, MAG (602) 254-6300	–Cathy Arthur, MAG (602) 254-6300
4. Nonroad Mobile Sources	Matt Poppen and Bob Downing MCAQD (602) 506-6790	–Eric Raisanen and Dena Konopka MCAQD (602) 506-6790
		–Cathy Arthur, MAG (602) 254-6300
5. Onroad Mobile Sources	Ieesuck Jung and Cathy Arthur MAG (602) 254-6300	Bob Downing and Dena Konopka MCAQD (602) 506-6790
6. Biogenic Sources	Feng Liu MAG (602) 254-6300	Bob Downing and Dena Konopka MCAQD (602) 506-6790

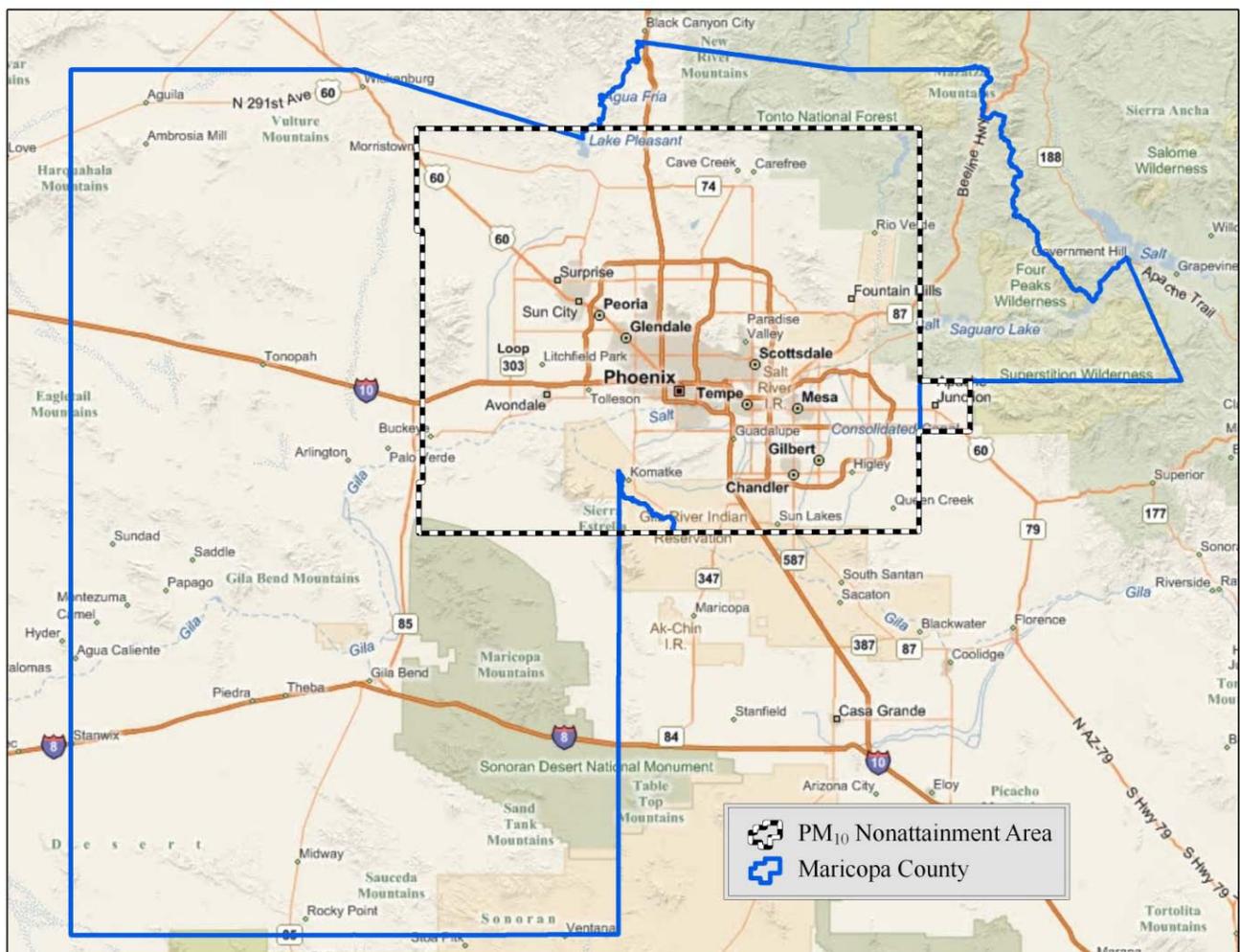
### 1.3 Temporal scope

Annual and typical daily emissions were estimated for the year 2008, for Maricopa County and the Maricopa County PM<sub>10</sub> nonattainment area (NAA).

### 1.4 Geographic scope

This inventory includes emission estimates for Maricopa County and for the Maricopa County PM<sub>10</sub> nonattainment area. Maricopa County encompasses approximately 9,223 square miles of land area, while the Maricopa County PM<sub>10</sub> nonattainment area is approximately 2,880 square miles or approximately 31 percent of the Maricopa County land area. A map of Maricopa County and the PM<sub>10</sub> nonattainment area is provided in Figure 1.4–1.

Figure 1.4–1. Map of Maricopa County and the PM<sub>10</sub> nonattainment area.



## 1.5 Overview of local demographic and land use data

Many of the emissions estimates generated in this report were calculated using demographic and land use data provided by the Maricopa Association of Governments (MAG). These data were used to apportion and/or scale Maricopa County emissions estimates to the nonattainment area and vice versa. (For example, county-level emissions from residential natural gas usage in Maricopa County were apportioned to the nonattainment area using the ratio of total population in each area). Detailed explanations of how emission estimates were apportioned or scaled are presented in each of the following chapters, along with the data sources used.

### 1.5.1 Demographic profile

The demographic data provided by MAG included population, employment data, and single family/multi-family splits for calendar year 2008, for both Maricopa County and the PM<sub>10</sub> nonattainment area. Table 1.5–1 provides an overview of the demographic data used in this report. As noted throughout the text, these data are frequently used to derive estimates of activity or emissions within the PM<sub>10</sub> NAA from county-level calculations. It is important to note, however, that the nonattainment area includes a portion of Pinal County, AZ (Apache Junction) as shown in Figure 1.4–1. Thus in some cases (e.g., those source categories calculated based on total population), the multiplier used to derive nonattainment area estimates from County-level values may be greater than 1, and thus the resulting NAA emission totals are larger than the County-level estimates from which they are derived.

**Table 1.5–1. Demographic profile of Maricopa County and the PM<sub>10</sub> nonattainment area.**

<b>Demographic variable</b>	<b>Maricopa County</b>	<b>PM<sub>10</sub> NAA</b>	<b>Percent within PM<sub>10</sub> NAA</b>
Total resident population	4,026,000	4,024,530	99.96%
Total non-resident population	253,760	272,610	107.43%
<b>Total population:</b>	<b>4,279,760</b>	<b>4,297,140</b>	<b>100.41%</b>
Retail employment	537,430	536,100	99.75%
Office employment	444,170	444,980	100.18%
Industrial employment	412,580	411,520	99.74%
Public employment	278,610	274,500	98.52%
Other employment	191,770	189,010	98.56%
Construction	79,680	78,980	99.12%
Work at Home	65,620	64,940	98.96%
<b>Total employment:</b>	<b>2,009,860</b>	<b>2,000,030</b>	<b>99.51%</b>
<b>Single Family/Multi-Family Household Split:</b>			
Single-Family	75%	75%	
Multi-Family	25%	25%	

Source: Maricopa Association of Governments

### 1.5.2 Land use data

MAG provided draft 2009 land use data (as of March 2010). The draft 2009 land use data was assumed to be representative of 2008. Table 1.5–2 presents a summary of the land use categories and acreages used to develop emissions estimates for this inventory.

**Table 1.5–2. Land use categories used to apportion emissions.**

<b>Land Use Category</b>	<b>Acreage in Maricopa County</b>	<b>Acreage within PM<sub>10</sub> NAA</b>	<b>Percentage within PM<sub>10</sub> NAA</b>
General/active open space/golf course (e.g., parks)	228,295	223,290	97.81%
Passive/restricted open space (e.g., mountain preserves)	2,373,545	302,999	12.77%
Lakes	12,525	9,510	75.93%
Agriculture	295,509	130,445	44.14%
Vacant (e.g., developable land)	2,227,981	472,831	21.22%

## 1.6 Emissions overview by source category

### 1.6.1 Point sources

The point source category includes those stationary sources that emit a significant amount of pollution into the air such as power plants, industrial processes and large manufacturing facilities. MCAQD utilizes the US EPA's Annual Emissions Reporting Requirements (AERR) Rule to define which stationary sources are listed as point sources. A detailed definition of a point source can be found in Section 2.1 of Chapter 2.

Table 1.6–1 summarizes annual and typical daily emissions from point sources in Maricopa County and the PM<sub>10</sub> nonattainment area, respectively. A detailed breakdown of emissions calculations for all point sources is contained in Chapter 2.

**Table 1.6–1. Summary of annual and typical daily emissions from point sources in Maricopa County.**

<b>Geographic Area</b>	<b>Annual (tons/yr)</b>					<b>Typical day (lbs/day)</b>				
	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>NH<sub>3</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>NH<sub>3</sub></b>
Maricopa County	601.27	555.15	2,204.91	81.15	279.06	3,323.2	3,069.1	12,151.5	449.3	1,534.2
PM <sub>10</sub> NAA	149.84	132.94	1,317.85	28.76	132.18	841.2	747.7	7,254.3	158.2	727.0

### 1.6.2 Area sources

Area sources are facilities or activities whose individual emissions do not qualify them as point sources. Area sources represent numerous facilities or activities that individually release small amounts of a given pollutant, but collectively they can release significant amounts of a pollutant. Emissions from stationary sources that were not identified as point sources in this report have been included in the area source inventory. Examples of area source categories include residential wood burning, commercial cooking, waste incineration and wildfires.

Tables 1.6–2 and 1.6–3 summarize annual and season-day emissions of the chief area source categories, for Maricopa County and the PM<sub>10</sub> nonattainment area, respectively. A detailed breakdown of emissions calculations for each area source category is contained in Chapter 3.

**Table 1.6–2. Summary of annual and typical daily emissions from area sources in Maricopa County.**

<b>Category</b>	<b>Annual emissions (tons/yr)</b>					<b>Typical daily emissions (lbs/day)</b>				
	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>NH<sub>3</sub></b>	<b>PM<sub>10</sub></b>	<b>PM<sub>2.5</sub></b>	<b>NO<sub>x</sub></b>	<b>SO<sub>x</sub></b>	<b>NH<sub>3</sub></b>
Fuel combustion	1,303.61	1,271.30	12,289.62	898.83	51.27	9,673.4	9,370.0	78,161.3	5,773.3	328.7
Industrial processes	11,881.57	2,953.30	362.58	129.60	1,731.34	76,667.6	19,048.2	2,816.5	1,005.8	11,077.2
Waste treatmt./disposal	230.52	204.35	77.47	58.20	1,488.07	1,613.0	1,438.8	515.3	320.0	8,131.5
Misc. area sources	29,154.21	4,012.53	126.52	32.64	13,059.05	179,712.0	27,667.0	1,676.1	446.4	71,686.1
<b>All area sources:</b>	<b>42,569.90</b>	<b>8,441.49</b>	<b>12,856.18</b>	<b>1,119.27</b>	<b>16,329.74</b>	<b>267,665.9</b>	<b>57,524.0</b>	<b>83,169.2</b>	<b>7,545.5</b>	<b>91,223.5</b>

**Table 1.6–3. Summary of annual and typical daily emissions from area sources in the PM<sub>10</sub> NAA.**

Category	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>
Fuel combustion	1,300.65	1,268.35	12,248.07	895.83	51.11	9,653.8	9,350.6	77,895.2	5,754.1	327.6
Industrial processes	10,655.39	2,771.19	360.48	129.58	1,724.27	68,764.6	17,877.6	2,802.3	1,005.7	11,034.4
Waste treatmt./disposal	120.77	95.42	50.30	56.85	1,494.12	799.8	630.5	309.9	312.6	8,164.6
Misc. area sources	12,444.36	2,143.52	115.94	29.74	7,693.04	81,929.6	18,879.4	2,318.0	622.4	42,455.4
<b>All area sources:</b>	<b>24,521.17</b>	<b>6,278.48</b>	<b>12,774.79</b>	<b>1,112.00</b>	<b>10,962.54</b>	<b>161,147.8</b>	<b>46,738.0</b>	<b>83,325.3</b>	<b>7,694.7</b>	<b>61,982.0</b>

### 1.6.3 Nonroad mobile sources

Nonroad mobile sources include off-highway vehicles and engines that move or are moved within a 12-month period. Tables 1.6–4 and 1.6–5 summarize annual and season-day emissions from nonroad mobile sources, for Maricopa County and the PM<sub>10</sub> nonattainment area, respectively. A detailed breakdown of emissions calculations for each source category is contained in Chapter 4.

**Table 1.6–4. Annual and typical daily emissions from nonroad mobile sources in Maricopa County.**

Category	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>
Agricultural	34.27	33.24	365.55	0.14	0.67	219.7	213.1	2,343.3	0.9	4.3
Airport GSE (+APU)	27.21	26.68	586.73	26.43		148.7	145.8	3,206.1	144.4	
Commercial	117.97	112.98	1,395.23	2.40	21.12	756.2	724.2	8,943.8	15.4	135.4
Construction & mining	1,260.98	1,220.75	14,796.63	6.60	28.10	8,083.2	7,825.3	94,850.2	42.3	180.1
Industrial	101.69	98.96	2,593.13	3.22	56.23	651.8	634.4	16,622.7	20.6	360.5
Lawn and garden	182.28	168.79	798.14	3.16	19.63	1,250.1	1,156.9	5,571.5	23.1	144.6
Pleasure craft	9.25	8.54	77.74	0.85	1.73	124.5	114.9	1,046.5	11.4	23.3
Railway maintenance	1.13	1.10	9.23	0.00	0.02	7.8	7.6	63.9	0.0	0.1
Recreational equipment	45.58	41.98	63.80	0.42	2.10	389.6	358.8	545.3	3.6	18.0
Aircraft	187.91	181.42	2,625.94	317.64		1,026.8	991.3	14,349.4	1,735.8	
Locomotives	70.21	65.53	1,854.62	18.72	4.45	383.6	358.1	10,134.5	102.3	24.3
<b>All nonroad mobile sources:</b>	<b>2,038.46</b>	<b>1,959.96</b>	<b>25,166.75</b>	<b>379.58</b>	<b>134.06</b>	<b>13,042.0</b>	<b>12,530.3</b>	<b>157,677.4</b>	<b>2,099.8</b>	<b>890.6</b>

**Table 1.6–5. Annual and typical daily emissions from all nonroad mobile sources in the PM<sub>10</sub> NAA.**

Category	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>
Agricultural	15.13	14.67	161.35	0.06	0.30	97.0	94.0	1,034.3	0.4	1.9
Airport GSE (+APU)	26.99	26.48	578.95	26.22		147.5	144.7	3,163.7	143.3	
Commercial	117.66	112.69	1,391.61	2.39	21.06	754.2	722.4	8,920.6	15.3	135.0
Construction & mining	1,249.88	1,210.00	14,666.42	6.55	27.85	8,012.1	7,756.4	94,015.6	42.0	178.5
Industrial	101.42	98.71	2,586.39	3.21	56.09	650.1	632.7	16,579.4	20.6	359.5
Lawn and garden	183.02	169.48	801.41	3.17	19.71	1,255.3	1,161.6	5,594.4	23.2	145.2
Pleasure craft	7.02	6.48	59.03	0.64	1.32	94.5	87.3	794.6	8.6	17.7
Railway maintenance	1.13	1.10	9.26	0.00	0.02	7.8	7.6	64.1	0.0	0.1
Recreational equipment	7.68	7.08	10.76	0.07	0.35	65.7	60.5	91.9	0.6	3.0
Aircraft	183.80	177.61	2,620.31	316.00		1,004.3	970.5	14,318.6	1,726.8	
Locomotives	34.16	31.88	907.76	9.11	2.16	186.7	174.2	4,960.4	49.8	11.8
<b>All nonroad mobile sources:</b>	<b>1,927.89</b>	<b>1,856.18</b>	<b>23,793.26</b>	<b>367.42</b>	<b>128.87</b>	<b>12,275.2</b>	<b>11,812.0</b>	<b>149,537.7</b>	<b>2,030.5</b>	<b>852.9</b>

### 1.6.4 Onroad mobile sources

Emissions from onroad mobile sources were calculated for the PM<sub>10</sub> nonattainment area located primarily within Maricopa County, as well as for Maricopa County as a whole. A detailed breakout of emissions calculations for each area source category is contained in Chapter 5.

Tables 1.6–6 and 1.6–7 summarize annual and typical daily emissions from onroad mobile sources in Maricopa County and the PM<sub>10</sub> nonattainment area, respectively.

**Table 1.6–6. Annual and average daily emissions from all onroad mobile sources in Maricopa County.**

Emission Category	Annual emissions (tons/year)					Average daily emissions (lbs/day)				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>
Exhaust, tire wear, and brake wear	3,295.74	2,417.89	75,033.9	314.5	1,294.1	18,009.2	13,212.4	410,021.3	1,718.2	7,072.1
Paved road fugitive dust	7,227.77	1,912.42	—	—	—	39,496.0	10,450.4	—	—	—
Unpaved road and alley fugitive dust	12,358.20	1,233.60	—	—	—	67,530.9	6,741.0	—	—	—
<b>Totals:</b>	<b>22,881.71</b>	<b>5,563.91</b>	<b>75,033.94</b>	<b>314.45</b>	<b>1,294.12</b>	<b>125,036.1</b>	<b>30,403.8</b>	<b>410,021.3</b>	<b>1,718.2</b>	<b>7,072.1</b>

**Table 1.6–7. Annual and typical daily emissions from all onroad mobile sources in the PM<sub>10</sub> NAA.**

Emission Category	Annual emissions (tons/year)					Average daily emissions (lbs/day)				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>
Exhaust, tire wear, and brake wear	3,144.17	2,300.80	71,444.20	300.66	1,235.28	17,181.3	12,572.9	390,405.5	1,643.0	6,750.5
Paved road fugitive dust	6,694.22	1,774.76	—	—	—	36,580.5	9,698.1	—	—	—
Unpaved road and alley fugitive dust	11,710.70	1,169.00	—	—	—	63,993.1	6,387.8	—	—	—
<b>Totals:</b>	<b>21,549.09</b>	<b>5,244.56</b>	<b>71,444.20</b>	<b>300.66</b>	<b>1,235.28</b>	<b>117,754.9</b>	<b>28,658.8</b>	<b>390,405.5</b>	<b>1,643.0</b>	<b>6,750.5</b>

### 1.6.5 Biogenic sources

The biogenic source category includes emissions from all vegetation (e.g., crops, indigenous vegetation, landscaping, etc.) in Maricopa County and the PM<sub>10</sub> nonattainment area. Emissions were estimated using the Model of Emissions of Gases and Aerosols from Nature (MEGAN). MEGAN is a state-of-the-art biogenic emissions model developed by the National Center for Atmospheric Research (NCAR). Some corrections and improvements were made in the latest version of MEGAN2.04. MEGAN2.04 was used to compute biogenic emissions in Maricopa County and the PM<sub>10</sub> nonattainment area. Annual and daily NO<sub>x</sub> emissions from biogenic sources are shown in Table 1.6–8 for Maricopa County and the PM<sub>10</sub> nonattainment area.

**Table 1.6–8. Annual and season-day NO<sub>x</sub> emissions from biogenic sources.**

Geographic area	Annual emissions (tons/yr)	Typical daily emissions (lbs/day)
Maricopa County	896.27	4,890.0
PM <sub>10</sub> NAA	332.77	1,815.3

### 1.6.6 Summary of all source categories

Tables 1.6–9 and 1.6–10 provide summary totals of annual and typical daily emissions from all emission sources in Maricopa County and the PM<sub>10</sub> nonattainment area, respectively.

**Table 1.6–9. Annual and typical daily emissions from all sources in Maricopa County.**

Section	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>
<b>Point Sources</b>	<b>601.27</b>	<b>555.15</b>	<b>2,204.91</b>	<b>81.15</b>	<b>279.06</b>	<b>3,323.2</b>	<b>3,069.1</b>	<b>12,151.5</b>	<b>449.3</b>	<b>1,534.2</b>
<b>Area Sources:</b>										
<i>Fuel combustion</i>										
Industrial natural gas	30.78	30.78	575.29	2.42	12.70	197.3	197.3	3,687.7	15.5	81.4
Industrial fuel oil	458.79	458.79	6,375.08	609.61	26.25	2,941.0	2,941.0	40,865.9	3,907.8	168.3
Comm./ind. natural gas	66.54	66.54	1,267.11	5.23	4.20	426.5	426.5	8,122.5	33.5	26.9
Comm./ind. fuel oil	224.14	224.14	3,273.40	271.27	8.13	1,436.8	1,436.8	20,983.3	1,738.9	52.1
Residential natural gas	61.75	61.75	763.81	4.88		337.5	337.5	4,173.8	26.6	
Residential wood	461.59	429.28	34.69	5.34		4,334.2	4,030.8	325.7	50.1	
Residential fuel oil	0.01	0.01	0.25	0.10		0.1	0.1	2.3	0.9	
<b>All combustion</b>	<b>1,303.61</b>	<b>1,271.30</b>	<b>12,289.62</b>	<b>898.83</b>	<b>51.27</b>	<b>9,673.4</b>	<b>9,370.0</b>	<b>78,161.3</b>	<b>5,773.3</b>	<b>328.7</b>
<i>Industrial Processes</i>										
Chemical manufacturing	187.43	151.42	0.00	0.34	0.03	1,445.8	1,164.5	0.0	2.6	0.9
Food products										
Commercial cooking	988.99	917.18				5,434.0	5,039.5			
Grain handling	20.59	6.71				149.3	49.5			
Ammonia storage					1,678.43					10,759.2
Secondary metal prod.	60.56	52.16	49.73	18.65	0.04	442.7	386.2	358.8	142.7	0.0
Mineral processes (concrete batch, etc.)	192.82	95.47				1,337.7	659.3			
Mining & quarry (sand & gravel)	181.01	55.20				1,239.2	362.6			
Wood products	217.26	203.25				1,668.6	1,548.3			
Rubber/plastics mfg.	140.94	105.96				953.3	698.8			
Fabricated metal mfg.	51.48	42.62			4.50	538.1	460.6			28.9
Residential const.	1,845.79	184.58				11,832.0	1,183.2			
Commercial const.	4,320.77	432.08				27,697.2	2,769.7			
Road construction	2,695.73	269.57				17,280.3	1,728.0			
Construction – other	194.36	19.44				1,245.9	124.6			
Electric equip. mfg.	13.94	9.64	20.45	0.18	31.55	76.9	53.2	112.4	1.1	193.7
ADEQ portables	59.00	29.50	282.18	88.93		492.9	246.5	2,275.7	721.7	
Unpaved road travel	566.30	271.29				3,880.4	1,847.2			
Industrial proc. NEC	144.60	107.24	10.22	21.49	16.79	953.3	726.4	69.6	137.7	94.6
<b>All Ind. Processes</b>	<b>11,881.57</b>	<b>2,953.30</b>	<b>362.58</b>	<b>129.60</b>	<b>1,731.34</b>	<b>76,667.6</b>	<b>19,048.2</b>	<b>2,816.5</b>	<b>1,005.8</b>	<b>11,077.2</b>
<i>Waste Treatment/Disp.</i>										
On-site incineration	0.06	0.04	5.01	0.01		0.7	0.4	38.9	0.1	
Open burning	111.46	111.46	29.96			902.2	902.2	242.4		
Landfills	86.21	75.92	24.11	7.57		486.1	425.4	132.9	41.7	
POTWs					1,488.07					8,131.5
Other waste	32.78	16.93	18.39	50.62		224.1	110.9	101.0	278.1	
<b>All Waste Treat/Disp.</b>	<b>230.52</b>	<b>204.35</b>	<b>77.47</b>	<b>58.20</b>	<b>1,488.07</b>	<b>1,613.0</b>	<b>1,438.8</b>	<b>515.3</b>	<b>320.0</b>	<b>8,131.5</b>
<i>Misc. Area Sources</i>										
Wildfires	470.39	403.43	103.79	28.46	21.76	6,271.8	5,379.0	1,383.8	379.4	290.2
Prescribed fires	0.51	0.51	0.39	0.11	0.03	169.3	169.3	131.2	36.0	10.6
Structure fires	15.04	15.04	1.95			82.2	82.2	10.7		
Vehicle fires	30.04	30.04	1.20			164.1	164.1	6.6		
Aircraft engine testing	0.18	0.17	6.74	2.49		1.3	1.2	50.5	19.0	
Tilling	2,059.00	308.85				22,932.4	3,439.9			
Harvesting	136.93	20.54				3,938.9	590.8			
Unpaved agric. roads	1,739.52	173.95				11,150.8	1,115.1			
Cotton ginning	17.90	5.11				103.8	29.7			
Fertilizer application					2,276.43					12,439.5
Livestock	455.80	50.14			9,583.89	2,490.7	274.0			52,514.5
Crematories	0.93	0.62	12.39	1.58		7.0	4.7	93.1	11.9	
Accidental releases	0.01	0.01	0.06			0.1	0.1	0.3		
Humans					1,176.93					6,431.3
Leaf blowers fugitive dust	891.36	336.41				4,870.8	1,838.3			
Offroad rec. vehicles fugitive dust	12,082.12	1,200.11				66,022.5	6,558.0			
Travel on unpaved parking lots	4,445.36	446.24				24,291.6	2,438.5			
Windblown dust	6,809.13	1,021.37				37,214.6	5,582.2			
<b>All Misc. Area Sources</b>	<b>29,154.21</b>	<b>4,012.53</b>	<b>126.52</b>	<b>32.64</b>	<b>13,059.05</b>	<b>179,712.0</b>	<b>27,667.0</b>	<b>1,676.1</b>	<b>446.4</b>	<b>71,686.1</b>
<b>All Area Sources:</b>	<b>42,569.90</b>	<b>8,441.49</b>	<b>12,856.18</b>	<b>1,119.27</b>	<b>16,329.74</b>	<b>267,665.9</b>	<b>57,524.0</b>	<b>83,169.2</b>	<b>7,545.5</b>	<b>91,223.5</b>

**Table 1.6–9 (continued). Annual and typical daily emissions from all sources in Maricopa County.**

Section	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>
<b>Nonroad Sources:</b>										
Agricultural equipment	34.27	33.24	365.55	0.14	0.67	219.7	213.1	2,343.3	0.9	4.3
Airport GSE (+APU)	27.21	26.68	586.73	26.43		148.7	145.8	3,206.1	144.4	
Commercial equipment	117.97	112.98	1,395.23	2.40	21.12	756.2	724.2	8,943.8	15.4	135.4
Construction and mining equipment	1,260.98	1,220.75	14,796.63	6.60	28.10	8,083.2	7,825.3	94,850.2	42.3	180.1
Industrial equipment	101.69	98.96	2,593.13	3.22	56.23	651.8	634.4	16,622.7	20.6	360.5
Lawn and garden equipment	182.28	168.79	798.14	3.16	19.63	1,250.1	1,156.9	5,571.5	23.1	144.6
Pleasure craft	9.25	8.54	77.74	0.85	1.73	124.5	114.9	1,046.5	11.4	23.3
Railway maintenance equipment	1.13	1.10	9.23	0.00	0.02	7.8	7.6	63.9	0.0	0.1
Recreational equipment	45.58	41.98	63.80	0.42	2.10	389.6	358.8	545.3	3.6	18.0
Aircraft	187.91	181.42	2,625.94	317.64		1,026.8	991.4	14,349.4	1,735.8	
Locomotives	70.21	65.53	1,854.62	18.72	4.45	383.6	358.1	10,134.5	102.3	24.3
<b>All Nonroad Sources</b>	<b>2,038.46</b>	<b>1,959.96</b>	<b>25,166.75</b>	<b>379.58</b>	<b>134.06</b>	<b>13,042.0</b>	<b>12,530.4</b>	<b>157,677.4</b>	<b>2,099.8</b>	<b>890.6</b>
<b>Onroad Sources:</b>										
Exhaust, tire wear, and brake wear	3,295.74	2,417.89	75,033.94	314.45	1,294.12	18,009.2	13,212.4	410,021.3	1,718.2	7,072.1
Paved road fugitive dust	7,227.77	1,912.42				39,496.0	10,450.4			
Unpaved road and alley fugitive dust	12,358.20	1,233.60				67,530.9	6,741.0			
<b>All Mobile Sources:</b>	<b>22,881.71</b>	<b>5,563.91</b>	<b>75,033.94</b>	<b>314.45</b>	<b>1,294.12</b>	<b>125,036.1</b>	<b>30,403.8</b>	<b>410,021.3</b>	<b>1,718.2</b>	<b>7,072.1</b>
<b>Biogenic Sources:</b>			<b>896.27</b>					<b>4,890.0</b>		
<b>TOTAL, All Sources:</b>	<b>68,091.34</b>	<b>16,520.51</b>	<b>116,158.05</b>	<b>1,894.45</b>	<b>18,036.97</b>	<b>409,067.3</b>	<b>103,527.3</b>	<b>667,909.3</b>	<b>11,812.7</b>	<b>100,720.4</b>

**Table 1.6–10. Annual and typical daily emissions from all sources in the PM<sub>10</sub> nonattainment area.**

Section	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>
<b>Point Sources</b>	<b>149.84</b>	<b>132.94</b>	<b>1,317.85</b>	<b>28.76</b>	<b>132.18</b>	<b>841.2</b>	<b>747.7</b>	<b>7,254.3</b>	<b>158.2</b>	<b>727.0</b>
<b>Area Sources:</b>										
<i><b>Fuel combustion</b></i>										
Industrial natural gas	30.70	30.70	573.79	2.41	12.66	196.8	196.8	3,678.2	15.5	81.2
Industrial fuel oil	457.60	457.60	6,358.50	608.03	26.19	2,933.3	2,933.3	40,759.6	3,897.6	167.9
Comm./ind. natural gas	66.20	66.20	1,260.65	5.20	4.18	424.4	424.4	8,081.1	33.3	26.8
Comm./ind. fuel oil	223.00	223.00	3,256.70	269.88	8.09	1,429.5	1,429.5	20,876.3	1,730.0	51.8
Residential natural gas	61.73	61.73	763.51	4.87		337.3	337.3	4,172.2	26.6	
Residential wood	461.41	429.11	34.67	5.33		4,332.5	4,029.2	325.6	50.1	
Residential fuel oil	0.01	0.01	0.25	0.10		0.1	0.1	2.3	0.9	
<b>All combustion</b>	<b>1,300.65</b>	<b>1,268.35</b>	<b>12,248.07</b>	<b>895.83</b>	<b>51.11</b>	<b>9,653.8</b>	<b>9,350.6</b>	<b>77,895.2</b>	<b>5,754.1</b>	<b>327.6</b>
<i><b>Industrial Processes</b></i>										
Chemical manufacturing	186.94	151.03	0.00	0.34	0.03	1,442.0	1,161.5	0.0	2.6	0.9
Food products										
Commercial cooking	993.04	920.94				5,456.3	5,060.1			
Grain handling	16.73	5.68				125.3	43.0			
Ammonia storage					1,674.07					10,731.2
Secondary metal prod.	60.56	52.16	49.73	18.65	0.04	442.7	386.2	358.8	142.7	0.0
Mineral processes (concrete batch, etc.)	187.73	91.92				1,302.8	635.6			
Mining & quarry (sand & gravel)	156.60	46.81				1,075.7	307.2			
Wood products	216.69	202.72				1,664.3	1,544.3			
Rubber/plastics mfg.	140.57	105.68				950.9	697.0			
Fabricated metal mfg.	51.35	42.51			4.49	536.7	459.4			28.8
Residential const.	1,692.38	169.24				10,920.3	1,092.0			
Commercial const.	4,057.29	405.73				25,897.4	2,589.7			
Road construction	2,051.78	205.18				13,156.8	1,315.7			
Construction – other	162.41	16.24				1,043.9	104.4			
Electric equip. mfg.	13.94	9.64	20.45	0.18	31.55	76.9	53.2	112.4	1.1	193.7
ADEQ portable sources	59.00	29.50	282.18	88.93		492.9	246.5	2,275.7	721.7	
Unpaved road travel	472.36	217.08				3,273.9	1,500.1			
Industrial proc. NEC	136.00	99.12	8.12	21.47	14.10	906.0	681.7	55.4	137.6	79.8
<b>All Ind. Processes</b>	<b>10,655.39</b>	<b>2,771.19</b>	<b>360.48</b>	<b>129.58</b>	<b>1,724.27</b>	<b>68,764.6</b>	<b>17,877.6</b>	<b>2,802.3</b>	<b>1,005.7</b>	<b>11,034.4</b>
<i><b>Waste Treatment/Disp.</b></i>										
On-site incineration	0.06	0.04	5.01	0.01		0.7	0.4	38.9	0.1	
Open burning	27.67	27.67	7.44			232.6	232.6	62.5		
Landfills	60.25	50.78	19.47	6.22		342.4	286.6	107.4	34.3	
POTWs					1,494.12					8,164.6
Other waste	32.78	16.93	18.39	50.62		224.1	110.9	101.0	278.1	
<b>All Waste Treat/Disp.</b>	<b>120.77</b>	<b>95.42</b>	<b>50.30</b>	<b>56.85</b>	<b>1,494.12</b>	<b>799.8</b>	<b>630.5</b>	<b>309.9</b>	<b>312.6</b>	<b>8,164.6</b>
<i><b>Misc. Area Sources</b></i>										
Wildfires	423.56	363.27	93.46	25.62	19.60	9,412.5	8,072.7	2,076.8	569.4	435.5
Prescribed fires	0.21	0.21	0.16	0.04	0.01	104.0	104.0	80.6	22.1	6.5
Structure fires	15.10	15.10	1.96			82.5	82.5	10.7		
Vehicle fires	30.16	30.16	1.21			164.8	164.8	6.6		
Aircraft engine testing	0.18	0.17	6.74	2.49		1.3	1.2	50.5	19.0	
Tilling	834.20	125.13				9,327.3	1,399.1			
Harvesting	54.14	8.12				1,560.0	234.0			
Unpaved agric. roads	731.03	73.10				4,686.1	468.6			
Cotton ginning	4.86	1.39				26.7	7.6			
Fertilizer application					1,004.82					5,490.8
Livestock	260.95	28.70			5,486.90	1,426.0	156.9			30,065.2
Crematories	0.93	0.62	12.36	1.58		7.0	4.6	92.6	11.8	
Accidental releases	0.01	0.01	0.06			0.1	0.1	0.3		
Humans					1,181.71					6,457.5
Leaf blowers fugitive dust	894.98	337.78				4,890.6	1,845.8			
Offroad rec. vehicles fugitive dust	2,014.17	200.09				11,006.4	1,093.4			
Travel on unpaved parking lots	2,365.07	237.45				12,923.9	1,297.5			
Windblown dust	4,814.80	722.22				26,310.4	3,946.6			
<b>All Misc. Area Sources</b>	<b>12,444.36</b>	<b>2,143.52</b>	<b>115.94</b>	<b>29.74</b>	<b>7,693.04</b>	<b>81,929.6</b>	<b>18,879.4</b>	<b>2,318.0</b>	<b>622.4</b>	<b>42,455.4</b>
<b>All Area Sources:</b>	<b>24,521.17</b>	<b>6,278.48</b>	<b>12,774.79</b>	<b>1,112.00</b>	<b>10,962.54</b>	<b>161,147.8</b>	<b>46,738.0</b>	<b>83,325.3</b>	<b>7,694.7</b>	<b>61,982.0</b>

**Table 1.6–10 (cont'd). Annual and typical daily emissions from all sources in the PM<sub>10</sub> nonattainment area.**

Section	Annual emissions (tons/yr)					Typical daily emissions (lbs/day)				
	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>	NO <sub>x</sub>	SO <sub>x</sub>	NH <sub>3</sub>
<b>Nonroad Sources:</b>										
Agricultural equipment	15.13	14.67	161.35	0.06	0.30	97.0	94.0	1,034.3	0.4	1.9
Airport GSE (+APU)	26.99	26.48	578.95	26.22		147.5	144.7	3,163.7	143.3	
Commercial equipment	117.66	112.69	1,391.61	2.39	21.06	754.2	722.4	8,920.6	15.3	135.0
Construction and mining equipment	1,249.88	1,210.00	14,666.42	6.55	27.85	8,012.1	7,756.4	94,015.6	42.0	178.5
Industrial equipment	101.42	98.71	2,586.39	3.21	56.09	650.1	632.7	16,579.4	20.6	359.5
Lawn and garden equipment	183.02	169.48	801.41	3.17	19.71	1,255.3	1,161.6	5,594.4	23.2	145.2
Pleasure craft	7.02	6.48	59.03	0.64	1.32	94.5	87.3	794.6	8.6	17.7
Railway maintenance equipment	1.13	1.10	9.26	0.00	0.02	7.8	7.6	64.1	0.0	0.1
Recreational equipment	7.68	7.08	10.76	0.07	0.35	65.7	60.5	91.9	0.6	3.0
Aircraft	183.80	177.61	2,620.31	316.00		1,004.3	970.5	14,318.6	1,726.8	
Locomotives	34.16	31.88	907.76	9.11	2.16	186.7	174.2	4,960.4	49.8	11.8
<b>All Nonroad Sources:</b>	<b>1,927.89</b>	<b>1,856.18</b>	<b>23,793.26</b>	<b>367.42</b>	<b>128.87</b>	<b>12,275.2</b>	<b>11,812.0</b>	<b>149,537.7</b>	<b>2,030.5</b>	<b>852.9</b>
<b>Onroad Sources:</b>										
Exhaust, tire wear, and brake wear	3,144.17	2,300.80	71,444.20	300.66	1,235.28	17,181.3	12,572.9	390,405.5	1,643.0	6,750.5
Paved road fugitive dust	6,694.22	1,774.76				36,580.5	9,698.1			
Unpaved road and alley fugitive dust	11,710.70	1,169.00				63,993.1	6,387.8			
<b>All Mobile Sources:</b>	<b>21,549.09</b>	<b>5,244.56</b>	<b>71,444.20</b>	<b>300.66</b>	<b>1,235.28</b>	<b>117,754.9</b>	<b>28,658.8</b>	<b>390,405.5</b>	<b>1,643.0</b>	<b>6,750.5</b>
<b>Biogenic Sources:</b>			<b>332.77</b>					<b>1,815.3</b>		
<b>TOTAL, All Sources:</b>	<b>48,147.99</b>	<b>13,512.16</b>	<b>109,662.87</b>	<b>1,808.84</b>	<b>12,458.87</b>	<b>292,019.1</b>	<b>87,956.5</b>	<b>632,338.1</b>	<b>11,526.4</b>	<b>70,312.4</b>

## 1.7 Public review process

Maricopa County Air Quality Department released a draft version of this document, its 2008 PM<sub>10</sub> emission inventory, for a 30-day public review and comment period on April 26, 2010. (The department's news release announcing the availability of the draft report, and outlining the schedule for public review and comment, is contained in Appendix 1). The department held a public workshop on May 14, 2010 to discuss the draft inventory. No formal comments were received during the 30-day public comment period.