

WASHOE COUNTY, NEVADA

**2002 EMISSIONS INVENTORY
FOR
PARTICULATE MATTER**

July 2004

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ACKNOWLEDGEMENTS

The Air Quality Management Division of the Washoe County District Health Department wishes to extend its appreciation to the following local agencies for their assistance in completing this emission inventory:

Sierra Pacific Power Company

Union Pacific Railroad

City of Reno Building Department

City of Reno Fire Department

City of Sparks Building Department

City of Sparks Fire Department

Washoe County Building Department

Washoe County Department of Community Development

State of Nevada Department of Motor Vehicles and Public Safety

State of Nevada Department of Transportation

Regional Transportation Commission of Washoe County

Truckee Meadows Fire Protection District

Washoe County Airport Authority

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SECTION 1

INTRODUCTION

This emission inventory was compiled for all point and area sources within Washoe County and specifically concentrates on particulate matter sources within the Truckee Meadows PM10 Non-Attainment Area (NAA). The boundaries of the NAA are synonymous with the boundaries of the Truckee Meadows hydrographic basin (hydrographic basin 87 as defined by the Nevada Division of Water Resources). Figure 1-1 is a map of Nevada showing Washoe County and indicating the NAA in relation to Washoe County and the State.

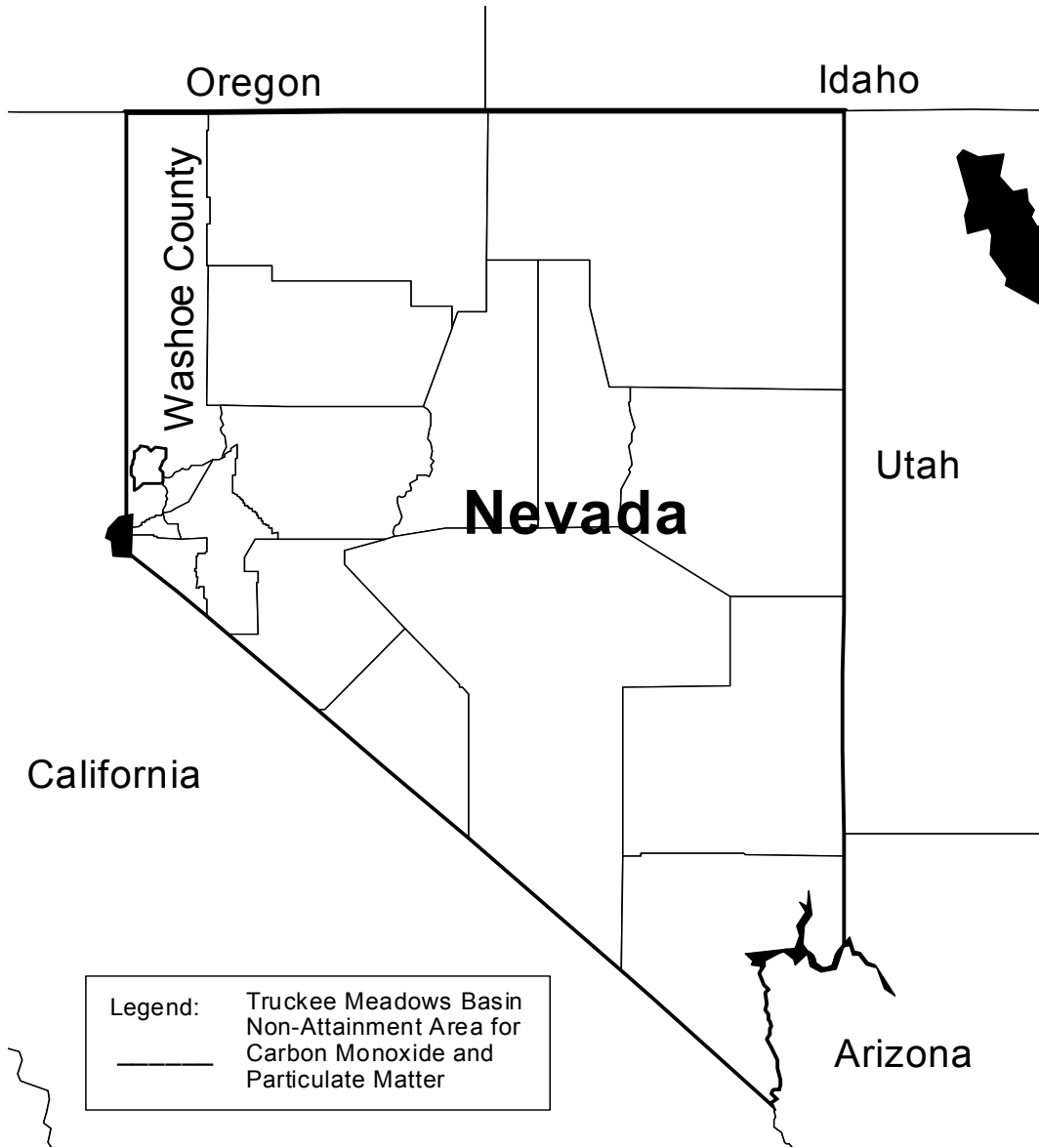
Washoe County is located in the northwestern portion of Nevada. It is bordered by California on the west and Oregon to the North. Within Nevada, Washoe County is bounded by Carson, Storey, Lyon, Churchill, Pershing, and Humboldt Counties. Washoe County encompasses a land area of 6,608 square miles. The NAA is located in the southern part of Washoe County and is comprised of three governmental entities including two incorporated cities, Reno and Sparks, and portions of unincorporated Washoe County.

Demographic data characterizing the three major governmental entities in Washoe County are presented in Table 1-1. Data for the NAA was approximated as closely as possible from the available data.

TABLE 1-1
2002 Washoe County Demographic Data

Demographic Parameter	City of Reno	City of Sparks	PM10 NAA	Washoe County
Population	187,834	75,220	287,538	359,423
Land Area (square miles)	56	20	203	6,608
Number of Households	83,140	30,805	125,697	157,121
2002 PM10 Season Temp Range	57 –23	57 –23	57 –23	57 –23
Mean Temp (°F)	38.3	38.3	38.3	38.3

FIGURE 1-1
State of Nevada



In past years, Washoe County and specifically the Truckee Meadows hydrographic basin has exceeded the National Ambient Air Quality Standards (NAAQS) for carbon monoxide (CO), particulate matter less than ten microns (PM₁₀), and ozone (O₃). Based on those exceedances, the Truckee Meadows hydrographic basin is currently considered non-attainment for CO and PM₁₀, and the entire county is non-attainment for O₃.

The CO NAA was classified as a moderate [< 12.7 ppm] non-attainment area. The last exceedance of the CO NAAQS was recorded on December 13, 1991. The Washoe County Air Quality Management Division (WCAQMD) is considering requesting to be redesignated to attainment status for CO.

Washoe County was designated a Marginal O₃ non-attainment area until June 5, 1998, when the EPA revoked the 1-hour O₃ NAAQS for our area and reclassified Washoe County as an attainment area. On December 20, 2000, the EPA reinstated the 1-hour O₃ NAAQS because the proposed 8-hour NAAQS had been challenged in a U.S. Supreme Court case. Washoe County has not exceeded the 1-hour O₃ NAAQS since February 25, 1990, and has not currently or historically exceeded the proposed 8-hour O₃ NAAQS.

The PM₁₀ NAA was originally designated as a Moderate non-attainment area. However, according to the Clean Air Act Amendments (CAAA) of 1990, if a Moderate area did not attain both the 24-hour and annual PM₁₀ NAAQS by December 31, 1994, the area should be bumped up to the designation of Serious non-attainment. The ambient air quality for the Truckee Meadows did not meet the CAAA deadline. The EPA never acted by bumping the Truckee Meadows up to a Serious PM₁₀ non-attainment area because they realized that the regulations adopted for the Moderate State Implementation Plan were improving the air quality.

In 2000, environmental groups sued the EPA for in-action. Consequently, the Truckee Meadows was bumped up to a Serious PM₁₀ non-attainment area effective February 7, 2001. To further support the bumping, the Truckee Meadows exceeded the 24-hour NAAQS on January 6, 1999 as well as the annual NAAQS for 1999.

The emission year for this inventory is 2002. This is a new inventory, not an update of the 1988 PM₁₀ Emission Inventory. The PM₁₀ season was determined by reviewing the ambient air quality data between 1989 and 1999. The consecutive three-month period with the highest measured PM₁₀ levels was then determined for each year. The data show that during each year the majority of PM₁₀ exceedances occurred during the months of November, December and January. Based on this review, it is evident that the peak PM₁₀ season occurs during the winter months.

The PM₁₀ and PM_{2.5} inventory described herein was the responsibility of the staff of the WCAQMD. However, a number of local agencies were instrumental in compiling the activity data. The Regional Transportation Commission of Washoe County ran all necessary transportation planning models to develop vehicle miles traveled (VMT), vehicle speeds, etc. The WCAQMD ran the MOBILE6 model to determine motor vehicle emission factors. Fire activity data were reported by the three local fire agencies, the City of Reno Fire Department, the City of Sparks Fire Department, and the Truckee Meadows Fire Protection District. Aircraft LTOs were reported by the Washoe County Airport Authority. Railroad activity data were provided by Union Pacific Railroad. The Washoe County Department of Community Development, the City of Reno Community Development Department, and the City of Sparks Planning Department provided demographic data such as population, number of housing units, etc.

Specific responsibilities within the inventory process were assigned in the following manner:

Point Sources, Stationary Area Sources:

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Non-Road Mobile Sources:

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On-Road Mobile Sources:

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(775) 784-7200

VMT and Facility Speed Estimates:

Regional Transportation Commission of Washoe County
(775) 323-2800

EMISSIONS SUMMARY

A summary of the PM emission totals by source category for the NAA and Washoe County as a whole is given in Table 1-2. All values given in these tables and in subsequent tables are in English units. A complete discussion regarding how these values were determined will be given in the following sections. The distribution of these emissions within the NAA by source category is illustrated in Figures 1-2 and 1-3.

Section 2 discusses point sources. Section 3 describes the approach used to compile inventory data for stationary area sources. Section 4 discusses non-road mobile sources. The inventory procedures used to determine on-road mobile source emissions are described in Section 5. Finally, Section 6 will present the results of quality assurance efforts for the inventory process.

Tables 1-3 and 1-4 the PM categories ranked by percent annual contribution. These tables illustrate the difference in relative source contribution between annual emissions, and peak season typical PM10 day emissions.

**TABLE 1-2
PM Emission Summary**

SOURCE CATEGORY	PM10				PM2.5			
	PM10 NAA		County		PM10 NAA		County	
	Annual (tons/year)	Peak Season (lbs/PM day)	Annual (tons/year)	Peak Season (lbs/PM day)	Annual (tons/year)	Peak Season (lbs/PM day)	Annual (tons/year)	Peak Season (lbs/PM day)
	Annual (tons/year)	Peak Season (lbs/PM day)	Annual (tons/year)	Peak Season (lbs/PM day)	Annual (tons/year)	Peak Season (lbs/PM day)	Annual (tons/year)	Peak Season (lbs/PM day)
STATIONARY SOURCES								
Industrial Processes								
Concrete Production	108.7	697	109.1	700	73.3	470	73.5	471
Asphalt Production	1.0	0	2.1	0	0.8	0	1.8	0
Construction-								
Residential	361.1	926	953.5	2,445	75.1	192	198.2	508
Commercial	286.0	733	722.0	1,851	59.4	152	150.1	385
Incinerators	2.0	11	2.0	11	2.0	11	2.0	11
Charbroilers	38.1	209	47.5	261	22.9	126	28.5	157
Sand and Gravel Pits	34.4	88	61.6	158	10.0	26	18.0	46
Sand Blasting	17.4	112	17.4	112	16.0	102	16.0	102
Gold Mining/Assay								
Labs	2.9	19	7.6	49	1.7	11	4.6	29
Gypsum Wallboard Mfg.	0.0	0	5.3	34	0.0	0	3.0	19
Miscellaneous	<u>101.9</u>	<u>653</u>	<u>105.2</u>	<u>674</u>	<u>72.3</u>	<u>463</u>	<u>74.6</u>	<u>478</u>
Subtotal	953.6	3,448	2,033.3	6,294	333.5	1,554	570.2	2,207
Fuel Combustion								
Industrial/Commercial	25.2	202	30.9	247	25.2	202	30.9	247
Residential	23.4	183	34.8	271	23.4	183	34.8	271
Residential Wood								
Combustion	<u>254.5</u>	<u>4,475</u>	<u>445.0</u>	<u>7,824</u>	<u>254.5</u>	<u>4,475</u>	<u>445.0</u>	<u>7,824</u>
Subtotal	303.1	4,859	510.7	8,343	303.1	4,859	510.7	8,343
Miscellaneous Area Sources								
Paved Streets	1,733.4	8,558	2,394.6	11,686	151.1	754	206.8	1,015
Unpaved Roads	126.8	585	7,573.6	31,898	19.0	88	1,133.8	4,775
Street Sanding	4.5	467	8.9	924	0.4	37	0.7	74
Wildfires	7.2	40	7.2	40	6.4	36	6.4	36
Structure Fires	3.3	11	3.4	11	3.1	10	3.2	11
Firefighting/Training	0.0	0	0.0	0	0.0	0	0.0	0
Automobile Fires	2.5	10	2.5	10	2.3	10	2.3	10
Prescribed Burning	0.1	1	0.2	2	0.0	0	0.0	0
Refuse Fires	<u>0.4</u>	<u>1</u>	<u>0.4</u>	<u>1</u>	<u>0.3</u>	<u>1</u>	<u>0.4</u>	<u>1</u>
Subtotal	1,878.2	9,674	9,990.9	44,574	182.6	935	1,353.6	5,921

TABLE 1-2 (continued)
PM Emission Summary

SOURCE CATEGORY	PM10				PM2.5			
	PM10 NAA		County		PM10 NAA		County	
	Annual (tons/year)	Peak Season (lbs/PM day)	Annual (tons/year)	Peak Season (lbs/PM day)	Annual (tons/year)	Peak Season (lbs/PM day)	Annual (tons/year)	Peak Season (lbs/PM day)
MOBILE SOURCES								
Non-Road								
Aircraft	3.7	19	4.8	26	3.5	19	4.7	25
Vehicles/Equip - Gasoline	32.8	150	90.3	319	30.2	138	83.1	294
Vehicles/Equip - CNG	0.1	0	0.1	1	0.1	0	0.1	1
Vehicles/Equip - Diesel	89.5	372	111.9	465	82.4	343	102.9	428
Vehicles/Equip - LPG	0.7	4	0.9	5	0.7	4	0.9	5
Railroads	<u>5.5</u>	<u>30</u>	<u>24.5</u>	<u>135</u>	<u>5.0</u>	<u>27</u>	<u>22.0</u>	<u>121</u>
Subtotal	132.3	577	232.5	950	121.8	531	213.7	873
On-Road								
Diesel	94.0	528	130.5	673	86.7	455	120.3	621
Gasoline	30.5	174	42.3	215	27.6	142	38.2	193
Diesel Idling	<u>3.0</u>	<u>17</u>	<u>6.9</u>	<u>33</u>	<u>2.8</u>	<u>17</u>	<u>5.5</u>	<u>31</u>
Subtotal	127.5	718	179.7	922	117.1	613	164.1	845
GRAND TOTAL	3,394.6	19,276	12,947.2	61,082	1,058.1	8,493	2,812.4	18,190

FIGURE 1-2
2002 PM10 Annual Emissions
PM10 Non-Attainment Area

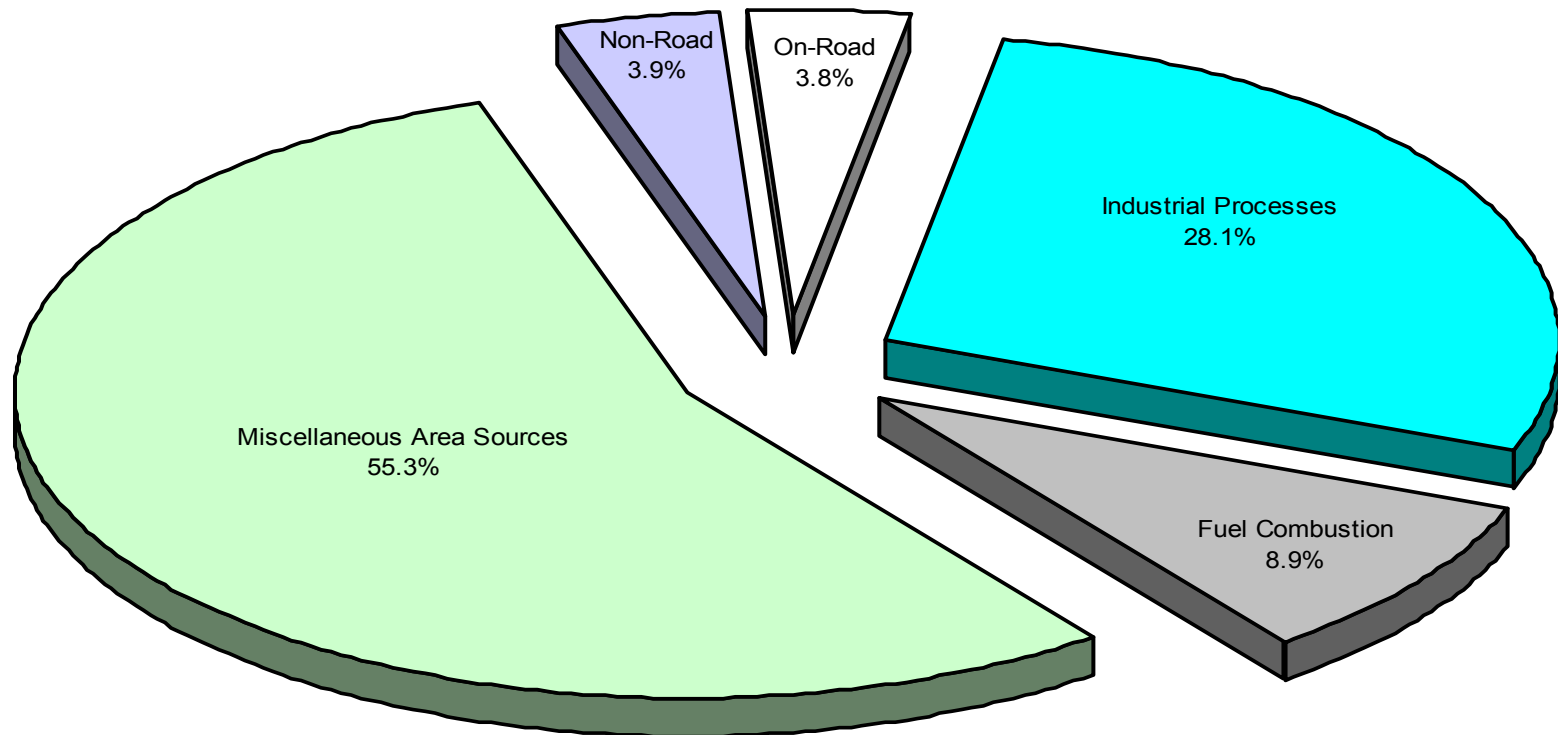


FIGURE 1-3
2002 PM_{2.5} Annual Emissions
PM₁₀ Non-Attainment Area

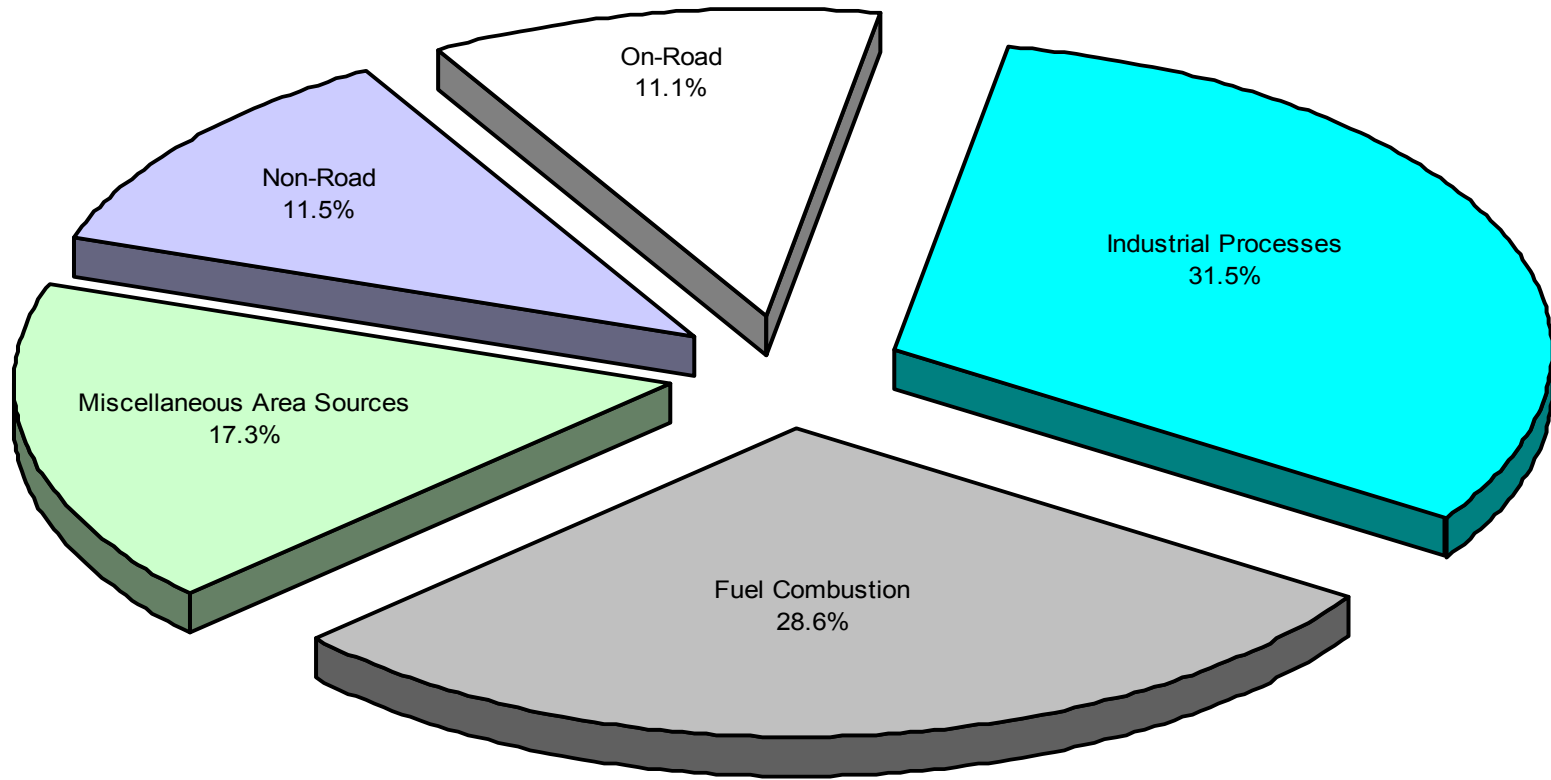


TABLE 1-3
 2002 Peak Season PM Emissions
 PM10 Non-Attainment Area
 Ten Largest Categories

PM10 Non-Attainment Area					
PM10			PM2.5		
Source Category	Peak Season (lbs/day)	% of Total	Source category	Peak Season (lbs/day)	% of Total
Paved Streets	8,558	44.4	Residential Wood Combustion	4,475	52.8
Residential Wood Combustion	4,475	23.2	Paved Streets	754	8.9
Construction-Residential	926	4.8	Concrete Production	470	5.5
Construction-Commercial	733	3.8	Industrial Processes - Miscellaneous	463	5.5
Concrete Production	697	3.6	On-Road Diesel	455	5.4
Industrial Processes - Miscellaneous	653	3.4	Vehicles/Equip - Diesel	343	4.0
Unpaved Roads	585	3.0	Industrial/Commercial	202	2.4
On-Road Diesel	528	2.7	Construction-Residential	192	2.3
Street Sanding	467	2.4	Fuel Combustion - Residential	183	2.2
Vehicles/Equip - Diesel	<u>372</u>	<u>1.9</u>	Construction-Commercial	<u>152</u>	<u>1.8</u>
	17,994	93.2		7,689	90.8