Chapter 3
The Resource Bases

3.1 Air Resources

3.1.1 Overview

Air Resources (climate and air quality) represent the physical and chemical characteristics of the atmosphere. They can be affected by BLM actions, and changes in their status can subsequently affect other resources that are managed by BLM. Because short-term weather conditions and long-term climate characteristics affect other resources (such as vegetation, hydrology, local and regional air quality), they are included to present a more through understanding of resource conditions.

This chapter also describes air resource conditions in the planning area and applicable federal and state ambient-air-quality standards, identifies sensitive receptors in the planning area, and describes the overall regulatory framework for air quality management. This chapter then identifies anticipated future conditions relating to air quality in the planning area.

3.1.1.1 Condition of the Resource

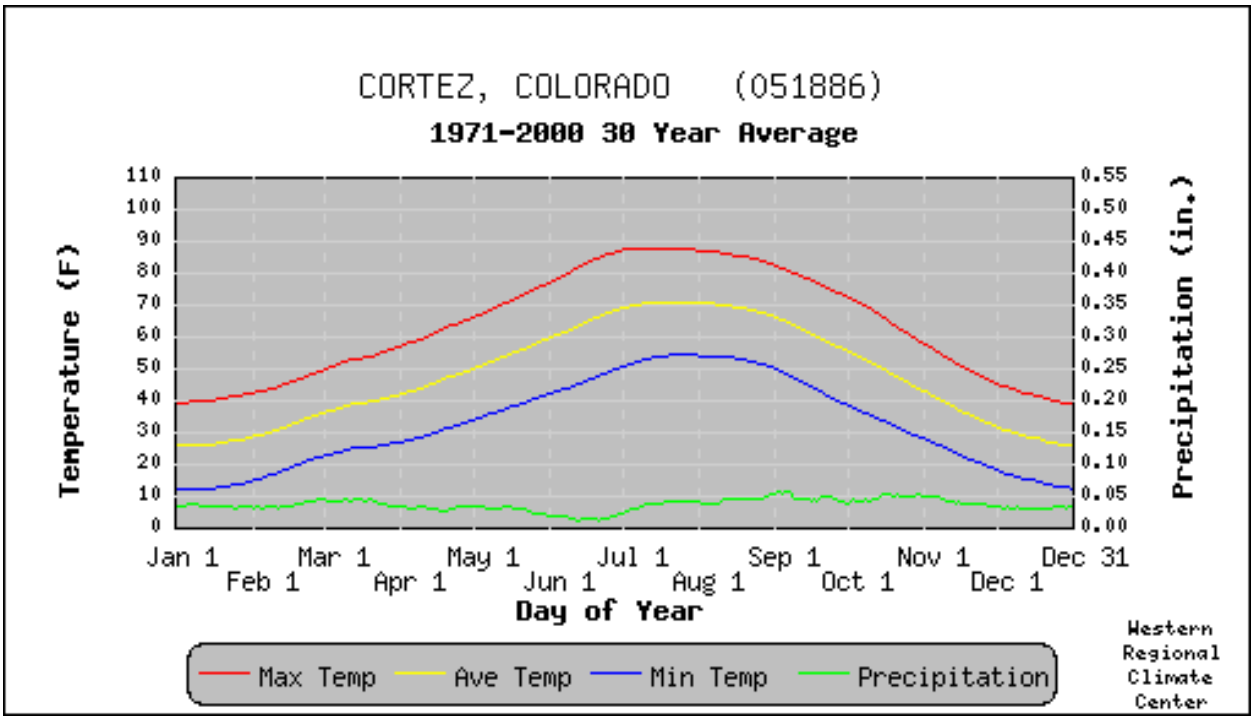
Climate

The Monument planning area is in a mountainous, high-plateau, continental region characterized by high mesas and deserts. Dry, sunny days and clear nights with extreme daily temperature changes characterize the climatic region. There are two long-term National Weather Service Cooperative Observer Program monitoring stations near the project area: one to the east at Cortez, Colorado (6,210 feet in elevation; 1929 through 2004), and one to the west at Hovenweep National Monument, Utah (5,240 feet in elevation; 1957 through 2004).

Average temperature and precipitation data for the period 1971 through 2000 for both of these locations are presented in Figures 3.1-1 and 3.1-2, respectively. Corresponding tabular data are presented in ***Tables 3.1-1*** and ***3.1-2***. In winter, the average daily maximum temperature is nearly 40 degrees Fahrenheit (°F), with the average daily minimum temperature reaching 15 °F. In summer, the average daily minimum

temperature is nearly 55 °F, with the average daily maximum temperature reaching 90 to 95 °F, depending on elevation. (Western Regional Climatic Center; WRCC 2005). Precipitation amounts are generally low, and fairly even throughout the year, except during a typically dry period in May and June when the westerly flow of moisture diminishes and summertime southerly flow has yet to be established. Snowfall is possible from mid-October through April, with an average snow depth of one inch or more from December through February. Total winter snowfall amounts range from 20 to 35 inches from west to east throughout the planning area (depending on elevation).

Figure 3.1-1. 1971–2000 Average Daily Temperature and Precipitation (Cortez, Colorado).



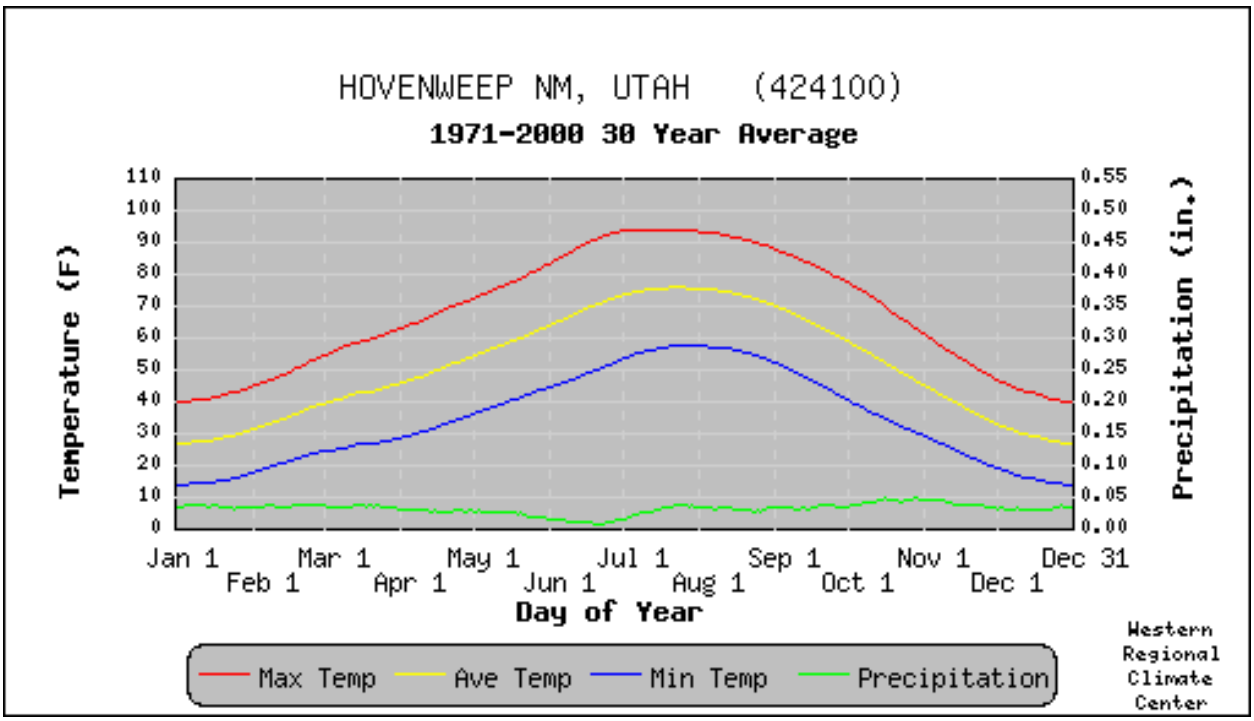
Source: (WRCC 2005)

Table 3.1-1. 1971–2000 Monthly Normals (Cortez, Colorado).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	40.8	45.7	53.4	61.7	71.7	83.3	88.2	85.9	78.5	66.6	51.6	42.4	64.2
Average Min. Temperature (°F)	12.3	18.1	24.3	29.4	37.3	45.5	53.3	52.3	43.8	32.7	22.3	14.5	32.2
Average Total Precipitation (in.)	1.01	0.95	1.37	0.90	1.01	0.43	1.23	1.37	1.31	1.55	1.18	0.90	13.21

Source: National Climatic Data Center, reported in (WRCC 2005).

Figure 3.1-2. 1971–2000 Average Daily Temperature and Precipitation (Hovenweep National Monument, Utah).



Source: (WRCC 2005)

Table 3.1- 2. 1971–2000 Monthly Normals (Hovenweep NM, Utah).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (°F)	41.0	48.2	57.6	66.1	76.7	88.6	93.7	90.9	82.4	69.6	53.3	42.4	67.5
Average Min. Temperature (°F)	15.2	21.3	27.6	32.7	41.6	49.7	57.8	56.9	47.7	35.8	24.8	16.3	35.6
Average Total Precipitation (in.)	1.10	1.07	1.19	0.85	0.77	0.33	1.01	0.97	0.98	1.46	1.19	0.91	11.83

Source: National Climatic Data Center, reported in (WRCC 2005).

The planning area has experienced a period of relatively low precipitation for the last six years. As shown in ***Table 3.1-3***, the annual average precipitation at both monitoring stations has ranged from 49 to 89 percent of normal. In fact, four out of the ten driest years ever measured at Cortez, Colorado, occurred during this period. Although significant periods of missing data have occurred at Hovenweep National Monument, Utah, a similar distribution may be expected west of the planning area. An extended period of low precipitation constitutes a drought condition. The impacts of the drought on the various resources in the planning area are described in each individual resource section in this report.

Table 3.1- 3. 1999–2004 Monthly Precipitation and Percent of 1971–2000 Normals

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual	Percent of Normal
Cortez, CO														
1971–2000	**1.01**	**0.95**	**1.37**	**0.90**	**1.01**	**0.43**	**1.23**	**1.37**	**1.31**	**1.55**	**1.18**	**0.90**	**13.21**	
1999	0.46	0.30	0.22	1.84	1.77	0.41	1.51	1.96	0.77	0.00	0.05	0.07	9.36	71
2000	1.48	1.01	1.83	0.49	0.25	0.13	0.57	0.71	0.43	1.53	0.70	0.32	9.45	72
2001	1.09	0.55	0.59	0.60	0.68	0.05	0.47	2.12	0.39	0.39	0.93	0.67	8.53	65
2002	0.00	0.03	0.73	0.12	0.10	0.00	0.74	0.79	2.65	1.48	0.83	0.58	8.05	61
2003	0.20	2.11	1.28	0.12	0.37	0.09	0.37	1.13	2.70	0.52	0.88	0.49	10.26	78
2004	0.85	1.47	0.29	1.68	0.10	0.21	0.94	0.62	3.05	1.23	1.34	0.15	11.78	89
Hovenweep NM, UT														
1971–2000	**1.10**	**1.07**	**1.19**	**0.85**	**0.77**	**0.33**	**1.01**	**0.97**	**0.98**	**1.46**	**1.19**	**0.91**	**11.83**	
1999	0.27	0.39	0.15	2.25	0.64	0.32	0.98	2.34	0.68	0.00	0.10	0.00	8.12	69
2000	1.79	0.44	2.40	0.57	0.10	0.15	0.69	1.41	0.23	1.63	0.00	inc	inc*	inc
2001	0.13	0.33	0.48	0.52	0.46	0.23	0.18	2.03	0.22	0.39	0.20	0.65	5.82	49
2002	0.04	inc	0.15	0.07	0.05	0.04	0.08	0.96	2.15	1.17	0.48	0.60	inc	inc
2003	0.31	1.71	2.22	0.00	0.14	0.03	0.48	0.55	3.24	0.66	0.64	0.51	10.49	89
2004	0.52	0.63	0.14	1.49	0.06	0.07	0.22	0.08	2.57	2.48	1.12	0.97	9.38	79

** Incomplete data set.*
Source: National Climatic Data Center, reported in (WRCC 2005).

Wind conditions are not monitored in the planning area; however, in the absence of synoptic winds from the west to southwest, winds would be influenced by terrain features (upslope during the day and downslope at night). In addition, the strongest winds will occur during springtime synoptic systems and be associated with summer thunderstorms. Five Remote Automatic Weather Stations (RAWS) operate at elevations between 6,187 and 8,660 feet and are located outside the planning area (WRCC 2005). At those locations, the winds are calm from 5 to 39 percent of the time, most with speeds less than 8 miles per hour (mph).

Air Quality

Federal and state governments have established ambient-air-quality standards for six criteria pollutants: ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter smaller than 10 microns in effective diameter (PM_{10}), particulate matter smaller than 2.5 microns in effective diameter ($PM_{2.5}$), and lead. The EPA also regulates emissions of volatile organic compounds (VOCs). Although the agencies have not set ambient-air-quality standards for VOCs, those compounds are

precursors, along with oxides of nitrogen dioxide (NO_x), to the formation of photochemical smog, ozone, and secondary particulate matter.

Ozone (including its NO_x and VOC precursors), SO_2, $PM_{2.5}$, and PM_{10} are generally considered to be regional pollutants, as these pollutants may form and/or affect air quality on a regional scale. Pollutants such as CO and lead typically affect receptors near their emission sources. Within the planning area, O_3, CO, PM_{10}, $PM_{2.5}$, NO_2 and SO_2 are of particular concern. Further, as described later in this chapter, long-range transport of SO_2, NO_2 and secondary particulate matter can also contribute to regional visibility degradation and atmospheric deposition at sensitive areas many miles downwind of their emission sources.

O_3

O_3 is a strong oxidant that increases susceptibility to respiratory infections due to destruction of mucus membranes, and can substantially damage vegetation and other materials. A severe eye, nose, and throat irritant, it also attacks synthetic rubber, textiles, plants, and other materials. O_3 damages plants extensively through leaf discoloration and cell damage.

O_3 is not emitted directly into the air, but is formed by a photochemical reaction in the atmosphere. Its precursors, which include VOCs and NO_x, react in the atmosphere in the presence of sunlight to form O_3. The precursor VOCs and NO_x are mostly emitted by mobile sources and by stationary combustion equipment. Although O_3may be produced year-round, its levels are generally greatest during the summer, because photochemical-reaction rates depend on the intensity of ultraviolet light and air temperature.

CO

CO is essentially inert to plants and materials but can have significant effects on human health, because it combines readily with hemoglobin and thus reduces the amount of oxygen transported in the bloodstream. Effects on humans can range from slight headaches to nausea and ultimately death.

Motor vehicles and stationary combustion equipment are the dominant source of CO emissions in most areas. High CO levels develop primarily under winter stagnation, when periods of light winds combine with the formation of ground-level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of combustion emissions. Smaller quantities of CO emissions are also created during agricultural and wood-stove burning, and by some industrial processes.

PM_{10}

Health concerns associated with inhalable particulate matter focus on those particles small enough to reach the lungs. Particulate matter may also retard plant growth, reduce visibility, soil buildings and other materials, and corrode specific materials.

PM_{10} emissions are generated by a wide variety of sources, including agricultural activities, industrial emissions, dust suspended by vehicle traffic, and secondary aerosols formed by chemical reactions in the atmosphere. Within the region, primary sources of

PM_{10} are controlled and uncontrolled burning, as well as wind-blown street sand, soil, and road dust.

$PM_{2.5}$

Fine particulate matter tends to pose the greatest health concern because it can pass through the nose and throat and lodge deep in the lungs. In an attempt to better protect the public's health, the U.S. Environmental Protection Agency (EPA) has established $PM_{2.5}$ standards in addition to PM_{10} standards.

SO_2

SO_2 is a colorless gas with a pungent odor. It is a highly soluble compound in water, and, with nitric acid, is a primary constituent of acid rain (atmospheric deposition). Within the atmosphere, SO_2 is converted into sulfuric acid aerosols and particulate sulfate compounds, which are corrosive and reduce visibility. Prolonged exposure to high levels of SO_2 can lead to respiratory failure, and can play an important role in the aggravation of chronic respiratory illnesses such as asthma.

SO_2 is emitted mainly from stationary industrial sources that burn coal and oil containing trace amounts of sulfur. Other sources of SO_2 are smelters and refineries. SO_2 is also emitted from natural sources such as volcanoes.

NO_2

Nitric oxide (NO) and NO_2 are the two compounds of NO_x of primary concern to air quality control programs. NO_x is formed from natural atmospheric nitrogen and oxygen during fuel combustion in automobiles, power plants, industries, homes, and offices. NO reacts with oxygen in the air to produce NO_2 and, in the presence of water, nitric acid.

NO_2 has been associated with adverse effects on health more than any other component of NO_x. At higher exposures, NO_2 causes respiratory-system damage of various types, including bronchial damage and an increased susceptibility to respiratory infection. In the atmosphere, NO_2 often can be seen as a reddish-brown layer over many cities, and when combined with ammonia, can form secondary particulate matter and significantly reduce visibility. NO_2 can also lead to vegetation damage through the formation of acid rain (atmospheric deposition).

Although natural NO_x emission sources exist, research has shown the levels to be many times lower than those found around metropolitan and industrialized areas. The primary sources of NO_x are motor vehicles; electric utilities; and other industrial, commercial, and residential combustion sources.

Lead

Lead is a metal found naturally in certain locations, as well as in a variety of manufactured products. The major historical source of lead emissions was motor vehicle exhaust (such as from cars and trucks) and some industrial sources. Because leaded gasoline has been phased out of use, today the highest atmospheric levels of lead are generally found near lead smelters. Other stationary sources are waste incinerators, utilities, and lead-acid-battery manufacturers. Effects of lead exposure include brain and

other nervous system damage, and children are at special risk. Some chemicals containing lead can cause cancer in animals.

Existing Air Pollutant Emissions

Regional air quality near the planning area, including Mesa Verde National Park and the Weminuche Wilderness Area, is affected mainly by agricultural and industrial emissions, as well as local urban growth. Emissions generated by existing petroleum exploration and production facilities operating in and near the planning area contribute to the regional emissions, but are only a small fraction of the total. ***Table 3.1-4*** shows 1999 regional emissions (the most recent data available) from the 11 counties surrounding Mesa Verde National Park (based on Binkley et al. 1997) and compares the regional emissions with those from area and point sources in Montezuma County alone.

Table 3.1- 4. 1999 Air Pollutant Emissions in the Project Vicinity.

Emission Source	Annual Emissions (tons/year)					
	CO	NO_x	VOC	PM_{10}	$PM_{2.5}$	SO_2
11 counties surrounding Mesa Verde National Park[1]	299,280	153,835	39,866	166,041	44,914	117,745
Montezuma County, Colorado	19,060	1,963	2,312	2,706	947	144
Percent of eleven-county total	6	1	6	2	2	<1

[1] *Including Apache County, Arizona; Archuleta/Dolores/Hinsdale/La Plata/Montezuma /San Juan/San Miguel Counties, Colorado; San Juan/Rio Arriba Counties, New Mexico; and San Juan County, Utah.*

Source: EPA 2004.

Existing Air Quality Concentrations for Criteria Pollutants

There are no air quality monitors operating in the planning area, but existing air quality conditions can be estimated from monitoring data collected throughout the region. All criteria air pollutants are monitored in the region by state and local air quality regulatory agencies. Air quality monitoring data for the three most recent years are presented in ***Table 3.1-5***. None of the regional air quality monitoring stations closest to the planning area has measured any violation of the National Ambient Air Quality Standards (NAAQS) in the past three years.

In the Four Corners region, however, high O_3 levels have been monitored in northern New Mexico and southwestern Colorado. A voluntary agreement to research and analyze air quality with respect to the 8-hour O_3 NAAQS was established in December 2002 by the New Mexico Environment Department (NMED); EPA; the Cities of Aztec, Bloomfield, and Farmington; and San Juan County, New Mexico. This agreement, known as the San Juan County ozone Early Action Compact (EAC), set forth a schedule for the development of technical information regarding the formation of O_3, and the adoption and implementation of any necessary emissions control measures. The goal of

the EAC is to ensure San Juan County's continued compliance with the 8-hour ozone standard through December 31, 2007. The Four Corners Ozone Task Force, organized by the NMED - Air Quality Bureau, heads this program.

Table 3.1-5. Ambient-Air-Quality-Monitoring Data in the Planning-Area Region.

Air Pollutant	Monitoring Location	Year	Averaging Time	Concentration	Applicable Standard
CO	Ignacio, CO	2004	1-hour	0.8 (ppm)	35 (ppm)
	Farmington, NM	2000 1999	1-hour 1-hour	5.1 (ppm) 7.2 (ppm)	35 (ppm) 35 (ppm)
	Ignacio, CO	2004	8-hour	0.7 (ppm)	9 (ppm)
	Farmington, NM	2000 1999	8-hour 8-hour	1.7 (ppm) 2.3 (ppm)	9 (ppm) 9 (ppm)
lead	Mesa Verde NP, CO	1996 1995 1994	quarterly quarterly quarterly	0.1 ($\mu g/m^3$) 0.0 ($\mu g/m^3$) 0.0 ($\mu g/m^3$)	1.5 ($\mu g/m^3$) 1.5 ($\mu g/m^3$) 1.5 ($\mu g/m^3$)
NO_2	Ignacio, CO	2004 2003 2001	annual annual annual	0.005 (ppm) 0.005 (ppm) 0.005 (ppm)	0.053 (ppm) 0.053 (ppm) 0.053 (ppm)
	La Plata Co., CO	2004 2003 2002	annual annual annual	0.007 (ppm) 0.009 (ppm) 0.008 (ppm)	0.053 (ppm) 0.053 (ppm) 0.053 (ppm)
O_3	Ignacio, CO	2004 2003 2002	1-hour 1-hour 1-hour	0.070 (ppm) 0.069 (ppm) 0.066 (ppm)	0.12 (ppm) 0.12 (ppm) 0.12 (ppm)
	La Plata Co., CO	2004 2003 2002	1-hour 1-hour 1-hour	0.065 (ppm) 0.065 (ppm) 0.066 (ppm)	0.12 (ppm) 0.12 (ppm) 0.12 (ppm)
	Mesa Verde NP, CO	2004 2003 2002	1-hour 1-hour 1-hour	0.072 (ppm) 0.075 (ppm) 0.074 (ppm)	0.12 (ppm) 0.12 (ppm) 0.12 (ppm)
	Canyonlands NP, UT	2004 2003 2002	1-hour 1-hour 1-hour	0.072 (ppm) 0.074 (ppm) 0.072 (ppm)	0.12 (ppm) 0.12 (ppm) 0.12 (ppm)
	Ignacio, CO	2004 2003 2002	8-hour 8-hour 8-hour	0.063 (ppm) 0.062 (ppm) 0.060 (ppm)	0.08 (ppm) 0.08 (ppm) 0.08 (ppm)
	La Plata Co., CO	2004 2003 2002	8-hour 8-hour 8-hour	0.060 (ppm) 0.060 (ppm) 0.055 (ppm)	0.08 (ppm) 0.08 (ppm) 0.08 (ppm)
	Mesa Verde NP, CO	2004 2003 2002	8-hour 8-hour 8-hour	0.069 (ppm) 0.067 (ppm) 0.070 (ppm)	0.08 (ppm) 0.08 (ppm) 0.08 (ppm)
	Canyonlands NP, UT	2004 2003 2002	8-hour 8-hour 8-hour	0.072 (ppm) 0.074 (ppm) 0.072 (ppm)	0.08 (ppm) 0.08 (ppm) 0.08 (ppm)

Table 3.1-5. Ambient-Air-Quality-Monitoring Data in the Planning-Area Region, Continued.

Air Pollutant	Monitoring Location	Year	Averaging Time	Concentration	Applicable Standard
$PM_{2.5}$	Durango, CO	2003	24-hour	14 ($\mu g/m^3$)	65 ($\mu g/m^3$)
		2002	24-hour	20 ($\mu g/m^3$)	65 ($\mu g/m^3$)
		2001	24-hour	10 ($\mu g/m^3$)	65 ($\mu g/m^3$)
	Pagosa Springs, CO	2004	24-hour	11 ($\mu g/m^3$)	65 ($\mu g/m^3$)
		2003	24-hour	13 ($\mu g/m^3$)	65 ($\mu g/m^3$)
		2002	24-hour	21 ($\mu g/m^3$)	65 ($\mu g/m^3$)
	Telluride, CO	2004	24-hour	8 ($\mu g/m^3$)	65 ($\mu g/m^3$)
		2003	24-hour	9 ($\mu g/m^3$)	65 ($\mu g/m^3$)
		2002	24-hour	10 ($\mu g/m^3$)	65 ($\mu g/m^3$)
	Farmington, NM	2004	24-hour	15 ($\mu g/m^3$)	65 ($\mu g/m^3$)
		2003	24-hour	16 ($\mu g/m^3$)	65 ($\mu g/m^3$)
		2002	24-hour	21 ($\mu g/m^3$)	65 ($\mu g/m^3$)
	Durango, CO	2003	annual	6.3 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
		2002	annual	6.0 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
		2001	annual	4.9 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
	Pagosa Springs, CO	2004	annual	5.6 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
		2003	annual	5.7 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
		2002	annual	6.5 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
	Telluride, CO	2004	annual	4.4 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
		2003	annual	5.1 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
		2002	annual	5.5 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
	Farmington, NM	2004	annual	6.1 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
		2003	annual	6.7 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
		2002	annual	6.9 ($\mu g/m^3$)	15.0 ($\mu g/m^3$)
PM_{10}	Fort Defiance, AZ	2004	24-hour	52 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2003	24-hour	53 ($\mu g/m^3$)	150 ($\mu g/m^3$)
	Pagosa Springs, CO	2004	24-hour	61 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2003	24-hour	111 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2002	24-hour	82 ($\mu g/m^3$)	150 ($\mu g/m^3$)
	Durango, CO	2004	24-hour	46 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2003	24-hour	72 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2002	24-hour	100 ($\mu g/m^3$)	150 ($\mu g/m^3$)
	Ignacio, CO	2004	24-hour	26 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2003	24-hour	46 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2002	24-hour	18 ($\mu g/m^3$)	150 ($\mu g/m^3$)
	La Plata Co., CO	2004	24-hour	20 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2003	24-hour	57 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2002	24-hour	64 ($\mu g/m^3$)	150 ($\mu g/m^3$)
	Telluride, CO	2004	24-hour	62 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2003	24-hour	74 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2002	24-hour	58 ($\mu g/m^3$)	150 ($\mu g/m^3$)
	Farmington, NM	2004	24-hour	25 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2003	24-hour	41 ($\mu g/m^3$)	150 ($\mu g/m^3$)
		2002	24-hour	38 ($\mu g/m^3$)	150 ($\mu g/m^3$)

Table 3.1-5. Ambient-Air-Quality-Monitoring Data in the Planning-Area Region, Continued.

Air Pollutant	Monitoring Location	Year	Averaging Time	Concentration	Applicable Standard
PM_{10}	Fort Defiance, AZ	2004	annual	25 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2003	annual	23 ($\mu g/m^3$)	50 ($\mu g/m^3$)
	Durango, CO	2004	annual	24 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2003	annual	21 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2002	annual	37 ($\mu g/m^3$)	50 ($\mu g/m^3$)
	Pagosa Springs, CO	2004	annual	25 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2003	annual	25 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2002	annual	24 ($\mu g/m^3$)	50 ($\mu g/m^3$)
	Ignacio, CO	2004	annual	14 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2003	annual	18 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2002	annual	8 ($\mu g/m^3$)	50 ($\mu g/m^3$)
	La Plata Co., CO	2004	annual	10 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2003	annual	16 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2002	annual	21 ($\mu g/m^3$)	50 ($\mu g/m^3$)
	Telluride, CO	2004	annual	18 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2003	annual	22 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2002	annual	21 ($\mu g/m^3$)	50 ($\mu g/m^3$)
	Farmington, NM	2004	annual	15 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2003	annual	20 ($\mu g/m^3$)	50 ($\mu g/m^3$)
		2002	annual	17 ($\mu g/m^3$)	50 ($\mu g/m^3$)
SO_2	Farmington, NM	2003	3-hour	0.019 (ppm)	0.5 (ppm)
		2002	3-hour	0.026 (ppm)	0.5 (ppm)
		2001	3-hour	0.025 (ppm)	0.5 (ppm)
	Bloomfield, NM	2004	3-hour	0.013 (ppm)	0.5 (ppm)
		2003	3-hour	0.015 (ppm)	0.5 (ppm)
		2002	3-hour	0.018 (ppm)	0.5 (ppm)
	Farmington, NM	2003	24-hour	0.007 (ppm)	0.14 (ppm)
		2002	24-hour	0.008 (ppm)	0.14 (ppm)
		2001	24-hour	0.007 (ppm)	0.14 (ppm)
	Bloomfield, NM	2004	24-hour	0.008 (ppm)	0.14 (ppm)
		2003	24-hour	0.006 (ppm)	0.14 (ppm)
		2002	24-hour	0.006 (ppm)	0.14 (ppm)
	Farmington, NM	2003	annual	0.002 (ppm)	0.030 (ppm)
		2002	annual	0.002 (ppm)	0.030 (ppm)
		2001	annual	0.002 (ppm)	0.030 (ppm)
	Bloomfield, NM	2004	annual	0.002 (ppm)	0.030 (ppm)
		2003	annual	0.002 (ppm)	0.030 (ppm)
		2002	annual	0.002 (ppm)	0.030 (ppm)

EPA classifies all locations in the United States as either "attainment" (including "unclassified") or "non-attainment" areas with respect to federal ambient air quality standards. These classifications are determined by comparing actual monitored air pollutant concentrations to their applicable federal standards. Most counties in the entire Four Corners region are classified as attainment for all air pollutants. As seen in ***Table 3.1-5***, most of the planning-area region has not violated the federal CO, lead, NO_2, O_3, $PM_{2.5}$, PM_{10} or SO_2 federal standards. Before 1995, the Colorado towns of Telluride (San Miguel County) and Pagosa Springs (Archuleta County) were designated as moderate non-attainment areas for PM_{10}, due mainly to emissions from local wood stoves and fugitive road sand and dust. Because no PM_{10} violations have been measured since

that time, both towns were formally redesignated as "maintenance" areas in 2001. No management actions in the planning area are expected to have any measurable impact on PM_{10} concentrations within those maintenance areas.

Air-Quality-Related Values

In addition to air-monitoring stations in the region operated by the state air quality agencies to demonstrate compliance with federal air quality standards, air-monitoring stations are operated by the Interagency Monitoring of PROtected Visual Environments (IMPROVE) program, the National Atmospheric Deposition Program (NADP), and the Clean Air Status and Trends Network (CASTNet). These stations focus on monitoring air-quality-related values (AQRVs; primarily visibility and atmospheric deposition). The IMPROVE and NADP monitoring programs were developed to track visibility and atmospheric deposition at sensitive areas, such as the alpine regions of the Weminuche Wilderness Area and the historical features at Mesa Verde National Park. Monitored data regarding visibility-reducing aerosols, particulate matter (PM_{10} and $PM_{2.5}$), visual conditions (measured in deciviews), and atmospheric deposition flux are summarized in ***Tables 3.1-6*** and ***3.1-7***.

Visibility degradation and atmospheric deposition have been monitored since the mid-1980s. In general, regional visibility (quantified in deciviews) has remained fairly constant, with the clearest days (group 10) becoming slightly cleaner, and the haziest days (group 90) becoming slightly dirtier (see *Figures 3.1-3* and *3.1-4*). Similarly, nitrate wet deposition has decreased within Mesa Verde National Park (*Figure 3.1-5*), but has increased somewhat near the Weminuche Wilderness Area (*Figure 3.1-6*). In contrast, sulfate wet-deposition rates have exhibited a generally decreasing trend at both locations (***Figures 3.1-7*** and ***3.1-8***), presumably due to installation of flue gas desulphurization systems at some of the large regional coal-fired power plants.

Regional haze at all mandatory federal Class I areas is an important concern that is being addressed by the federal Regional Haze Rule. The severity of impacts caused by atmospheric deposition varies, depending on the geology of each Class I area. Atmospheric deposition at Mesa Verde National Park is not considered a significant issue, due to the presence of limestone and sandstone geology there, which provides aquatic-buffering capacity adequate to neutralize deposition (Binkley, et al. 1997). In contrast, atmospheric deposition in the Weminuche Wilderness is of concern because the geology in the high-altitude alpine regions provides little acid-neutralization capacity to water bodies (Forest Service 1991).

Table 3.1- 6. AQRV Data Measured in Mesa Verde National Park.

AQRV	Averaging Time	2001	2002	2003
IMPROVE Aerosol-Monitoring Program				
Nitrate ion (µg/m3)	Annual	0.16	0.24	0.21
	24 hours	0.75	1.87	1.41
Sulfate ion (µg/m3)	Annual	0.71	0.59	0.59
	24 hours	1.90	1.35	2.24
PM2.5 (µg/m3)	Annual	3.23	4.65	5.03
	24 hours	18.9	19.5	32.5
PM10 (µg/m3)	Annual	6.27	11.0	12.4
	24 hours	28.8	55.7	117.0
Visibility (dv)	Annual	8	10	10
	24 hours	14	20	27
NADP Wet-Deposition-Monitoring Program				
Nitrate ion (kg/ha)	Annual	3.68	2.30	2.62
Sulfate ion (kg/ha)	Annual	2.51	1.65	1.80
Mercury (kg/ha)	Annual	----	86	109
CASTNet Dry-Deposition-Monitoring Program				
Nitrate ion (µg/m3)	Annual	0.23	0.35	0.29
	7 days	0.73	1.48	0.59
Sulfate ion (µg/m3)	Annual	0.79	0.71	0.69
	7 days	1.58	1.49	1.62
PM2.5 (µg/m3)	Annual	0.85	0.73	0.66
	7 days	2.42	2.06	1.68

Sources: IMPROVE 2005; NADP 2005; CASTNet 2005.

Table 3.1- 7. AQRV-Monitoring Data Measured near the Weminuche Wilderness Area.

AQRV	Averaging Time	2001	2002	2003
IMPROVE Aerosol-Monitoring Program				
Nitrate ion (µg/m^3)	Annual	0.10	0.14	0.12
	24 hours	0.62	0.83	1.80
Sulfate ion (µg/m^3)	Annual	0.57	0.45	0.44
	24 hours	1.58	1.31	1.67
$PM_{2.5}$ (µg/m^3)	Annual	2.62	3.14	2.90
	24 hours	17.5	24.2	30.6
PM_{10} (µg/m^3)	Annual	4.84	6.43	5.97
	24 hours	27.8	34.3	58.6
Visibility (dv)	Annual	8	8	8
	24 hours	15	24	25
NADP Wet-Deposition-Monitoring Program				
Nitrate ion (kg/ha)	Annual	5.83	6.08	5.05
Sulfate ion (kg/ha)	Annual	2.99	3.09	2.58

Sources: IMPROVE 2005; NADP 2005.

Figure 3.1- 3. Visibility Trends in Mesa Verde National Park.

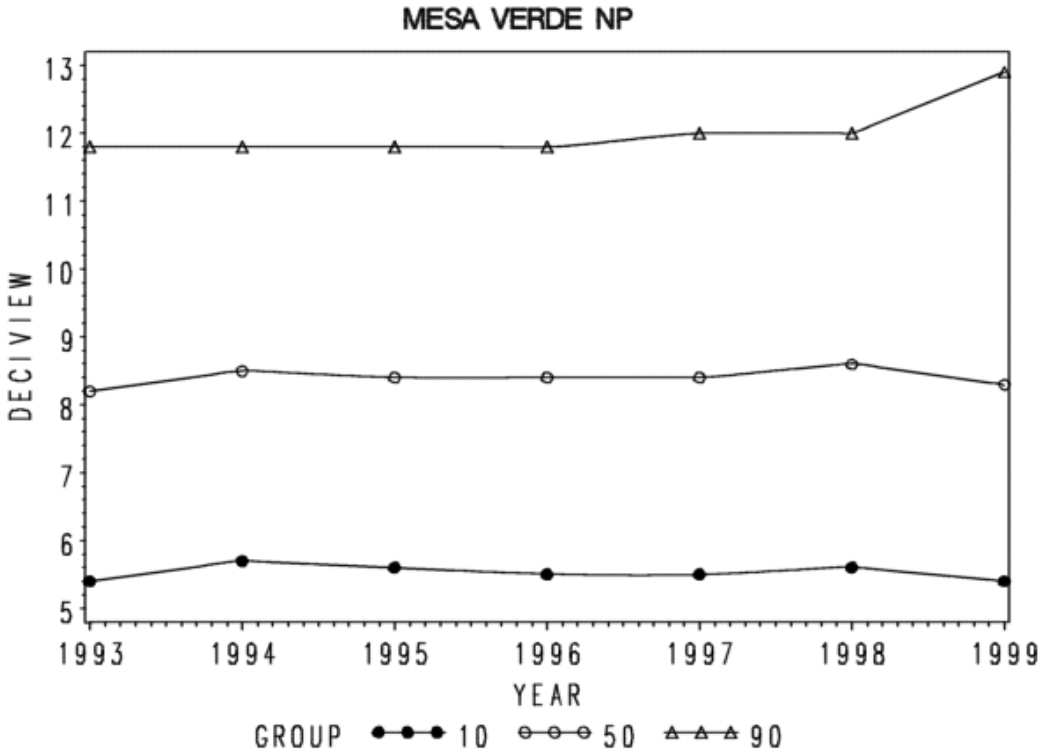


Figure 3.1- 4. Visibility Trends near the Weminuche Wilderness Area.

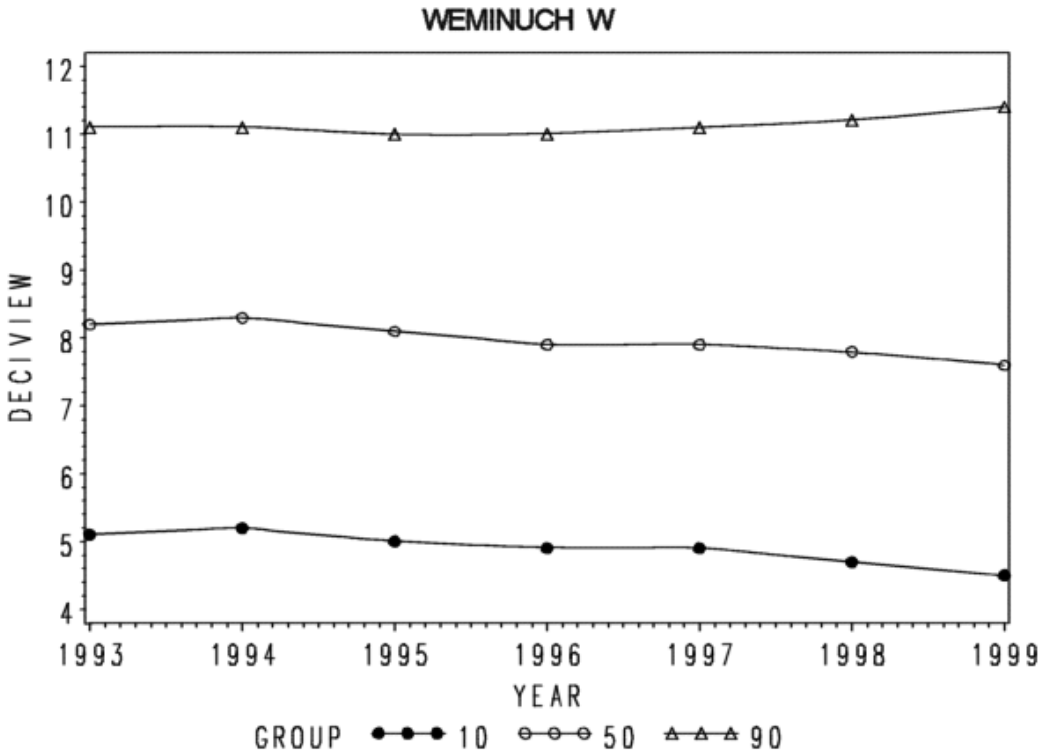


Figure 3.1- 5. Nitrate Wet-Deposition Trends in Mesa Verde National Park.

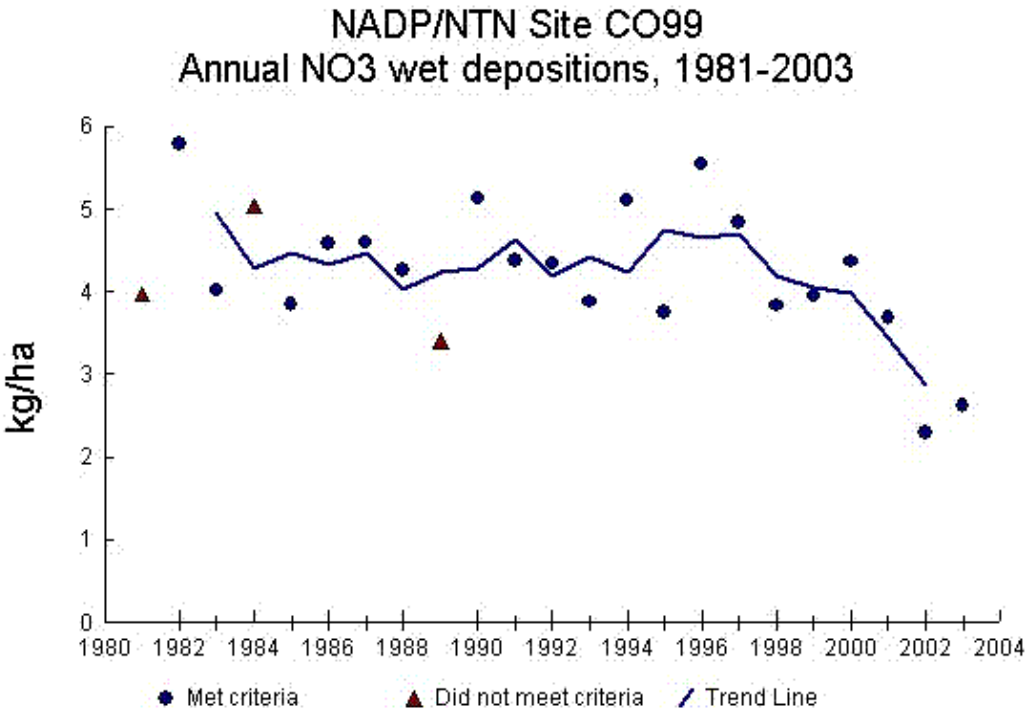


Figure 3.1- 6. Nitrate Wet-Deposition Trends near the Weminuche Wilderness Area.

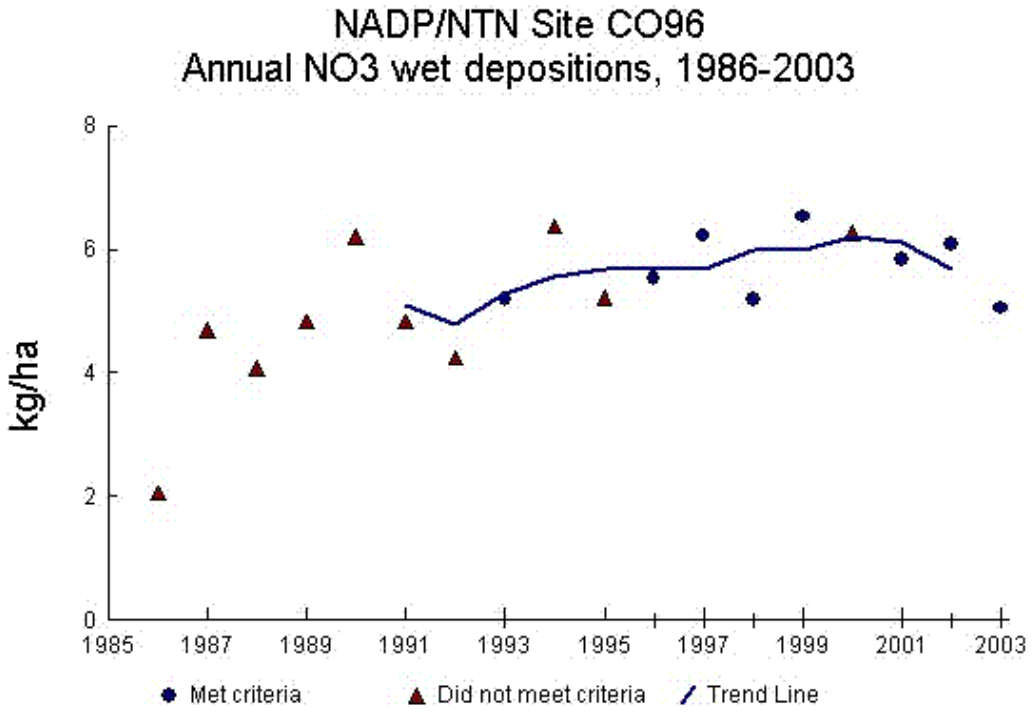


Figure 3.1- 7. Sulfate Wet-Deposition Trends in Mesa Verde National Park.

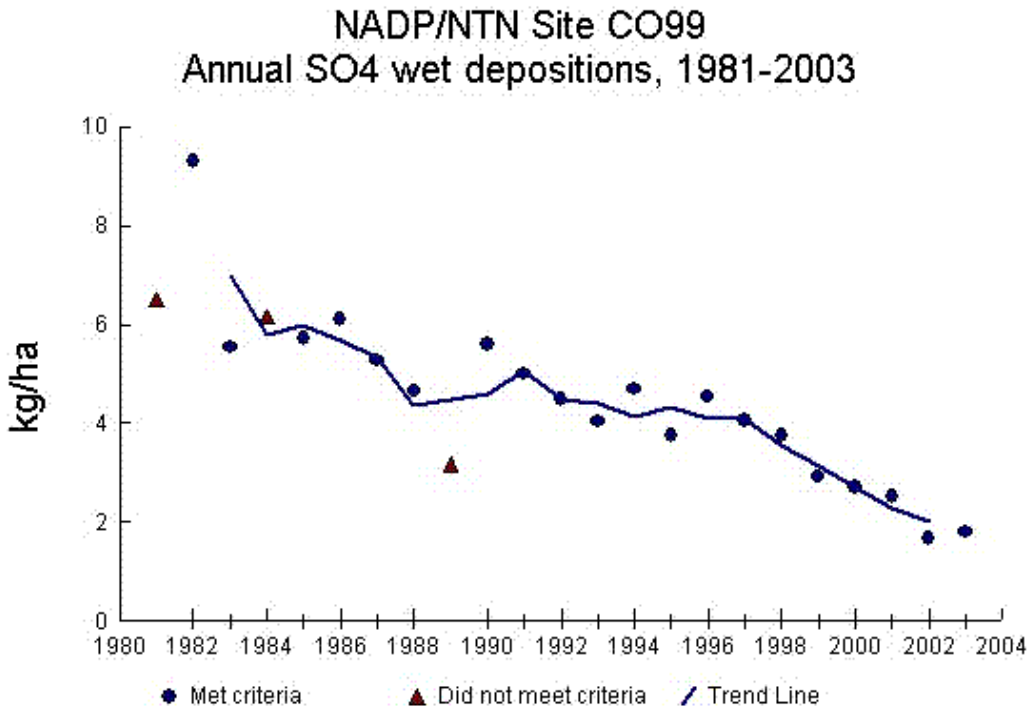
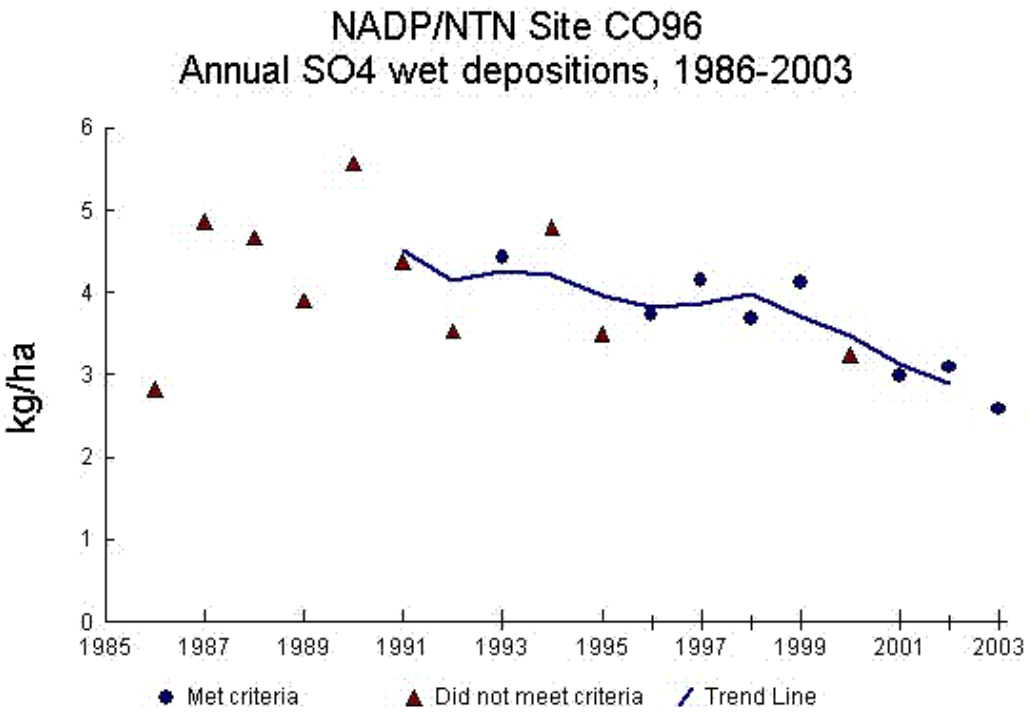


Figure 3.1- 8. Sulfate Wet-Deposition Trends near Weminuche Wilderness Area.



3.1.1.2 Principal Use(s) of the Resource

Neither climate nor air quality is a resource that is "used" in a traditional sense, although a finite amount of air pollution is allowed in the atmosphere. These are environmental conditions that affect resources (e.g., streams, vegetation, recreation) used and managed by BLM. For example, climate and air quality can affect the following resources:

- **Vegetation** and **grazing**: These resources are affected by the extended drought that has occurred for the past five years.
- **Recreation**: Recreationists inside the planning area can be affected by fugitive dust and tailpipe emissions from passenger and all-terrain vehicles. Regional sensitive areas can be affected by regional haze and atmospheric deposition.
- **Sensitive plants**: Lichens and other sensitive species can be affected by air pollutants generated within the planning area or originating from regional sources.
- **Aquatic species** in alpine streams: Fish and invertebrates in sensitive alpine streams can be affected by atmospheric deposition originating from regional population centers or industrial facilities.

Visibility — viewing of scenery in and around the Monument through clean, clear air — is an important value. The BLM and the State of Colorado, Air Pollution Control Division, have recognized the scenic values associated with the Cross Canyon Wilderness Study Area. This site is in the process of being added to the State of Colorado Vista Database of Scenic and/or Important Views. The Air Pollution Control Division uses this database to help ensure Scenic and/or Important Views are considered during the Prevention of Significant Deterioration/New Source Review permitting process, as well as during the development of smoke management plans (CDPHE, 1993). With the addition of the Cross Canyon Wilderness Study Area site, the State of Colorado and the BLM have recognized the importance of visibility protection at selected vistas outside Class I Areas.

3.1.1.3 BLM National and State Goals and Objectives

BLM will manage public land in a manner that reduces significant air quality impacts due to criteria and hazardous air pollutants, as well as other physical or chemical contaminants, with the potential to significantly harm air quality-related values (including visibility, atmospheric deposition, and impacts on flora and fauna) within mandatory federal Class I areas.

1. All BLM actions (either directly or authorized) must comply with applicable air quality laws, statutes, regulations, standards, and implementation plans.
2. Within designated non-attainment and maintenance areas, the BLM will demonstrate that its actions (either directly or authorized) will conform with applicable air quality requirements, before such actions are initiated.

3.1.1.4 Existing Data and Data Needs

3.1.1.4.1 Existing Sources of Data

EPA Greenbook for Non-attainment and Maintenance Areas

EPA website for identifying locations of the country where air pollution levels either persistently violate the NAAQS, or have violated those standards in the past. Available at http://www.epa.gov/oar/oaqps/greenbk/index.html.

EPA AirData - Access to Air Pollution Data

EPA website providing access to historic air pollution data. AirData presents annual summaries of air pollution data for the entire United States in two databases:

- AQS (Air Quality System) database contains air quality monitoring data (ambient concentrations) of criteria air pollutants from locations primarily in cities and towns.
- NEI (National Emission Inventory) database estimates annual emissions of criteria and hazardous air pollutants from point, area, and mobile sources.

Available at http://www.epa.gov/air/data/index.html.

Colorado Climate Center and Western Regional Climate Center

Websites provide climatological data for the State of Colorado and throughout the West.

Available at http://climate.atmos.colostate.edu/index.shtml and http://www.wrcc.dri.edu/index.html.

Interagency Monitoring of PROtected Visual Environments

IMPROVE is a cooperative interagency visibility-monitoring program composed of federal, state, and regional agencies. The IMPROVE monitoring program was established in 1985 to support development of state implementation plans for the protection of visibility in mandatory federal Class I areas, as stipulated in the 1977 amendments to the Clean Air Act. The objectives of IMPROVE are:

1. to establish current visibility and aerosol conditions in mandatory federal Class I areas;
2. to identify chemical species and emission sources responsible for existing human-made visibility impairment;
3. to document long-term trends for assessing progress toward achieving the national visibility goal; and

4. to provide regional haze-monitoring representing all mandatory federal Class I areas where practical, and to support implementation of the Regional Haze Rule.

IMPROVE has also been a key participant in visibility-related research, including the advancement of monitoring instrumentation, analysis techniques, visibility modeling, policy formulation, and source attribution field studies.

Available at http://vista.cira.colostate.edu/improve/.

National Atmospheric Deposition Program

NADP is a cooperative program to measure atmospheric deposition at sensitive areas throughout the United States, composed of federal, state, tribal, and local governments; universities; and schools; as well as research and private organizations. The monitoring stations closest to the planning area include Mesa Verde National Park and Molas Pass (near the Weminuche Wilderness Area).

Available at http://nadp.sws.uiuc.edu.

3.1.1.4.2 Identified Information Gaps

Although air resource data and information are not currently collected within the planning area, regional sources provide an adequate understanding of conditions and trends.

3.1.2 Legal Context Specific to the Resource/Use

3.1.2.1 Mandates and/or Authorities

3.1.2.1.1 Laws

Federal Clean Air Act - National Ambient Air Quality Standards

The federal Clean Air Act, originally promulgated in 1955 and amended numerous times thereafter, establishes the framework for modern air pollution control. The Act directs the EPA to establish NAAQS for six air pollutants: CO, lead, NO_2, O_3, particulate matter, and SO_2. The NAAQS are divided into primary and secondary standards (***Table 3.1-8***); the former are set to protect human health within an adequate margin of safety, and the latter to protect public welfare, including environmental values, such as plant and animal life. Although the EPA is responsible for developing the standards and methods for implementing the Clean Air Act, including oversight, the U.S. Congress delegated primary responsibility for implementing the Clean Air Act to state and local air regulatory agencies.

Any area that consistently violates the NAAQS shown in ***Table 3.1-8*** is designated a "non-attainment" area by the EPA. For these areas, the federal Clean Air Act requires states to develop and adopt State Implementation Plans (SIPs), which are reviewed and approved by the EPA, describing those actions necessary so that the federal standards will be achieved. Failure to submit a plan (or to secure EPA approval) could lead to denial of federal funding and permits for such improvements as highway construction and sewage treatment plants. In cases where the SIP is submitted, but the state fails to demonstrate achievement of the standards, the EPA is directed to prepare a Federal Implementation Plan, showing those actions the EPA will take to achieve the NAAQS. In Colorado, the EPA has delegated authority to prepare SIPs to the Colorado Air Quality Control Commission.

Table 3.1- 8. National Ambient-Air-Quality Standards.

Pollutant	Primary Standards	Averaging Times	Secondary Standards
CO	9 ppm (10,000 ìg/m^3)	8 hour[1]	None
	35 ppm (40,000 ìg/m^3)	1 hour[1]	None
lead	1.5 µg/m^3	Quarterly Average	Same as Primary
NO_2	0.053 ppm (100 µg/m^3)	Annual	Same as Primary
PM_{10}	50 µg/m^3	Annual[2]	Same as Primary
	150 ug/m^3	24 hour[1]	Same as Primary
$PM_{2.5}$	15 µg/m3	Annual[3]	Same as Primary
	65 ìg/m^3	24 hour[4]	Same as Primary
O_3	0.08 ppm (156 ìg/m^3)	8 hour[5]	Same as Primary
	0.12 ppm (235 ìg/m^3)	1 hour[6]	Same as Primary
SO_2	0.03 ppm (80 ìg/m^3)	Annual	None
	0.14 ppm (365 ìg/m^3)	24 hour[1]	None
	None	3 hour[1]	0.5 ppm (1,300 ìg/m^3)

[1] Not to be exceeded more than once per year.

[2] To attain this standard, the expected annual arithmetic mean PM_{10} concentration at each monitor within an area must not exceed 50 ìg/m^3.

[3] To attain this standard, the 3-year average of the annual arithmetic mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 15.0 ìg/m^3.

[4] 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 65 ìg/m^3.

[5] 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.

[6] (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, as determined by 40 CFR 50 (Appendix H).
(b) The 1-hour NAAQS will no longer apply to an area one year after the effective date of the designation of that area for the 8-hour ozone NAAQS. The effective designation date for most areas is June 15, 2004. (40 CFR 50.9; see Federal Register of April 30, 2004 [69 FR 23996].)

Source: 40 CFR 50

Federal Clean Air Act - Prevention of Significant Deterioration

Through the Clean Air Act Amendments of 1977, Congress established a system for the Prevention of Significant Deterioration (PSD) to protect areas that were not classified as non-attainment (cleaner than the NAAQS). A classification system was implemented

based on the amounts of additional NO_2, particulate matter, and SO_2 degradation that would be allowed above existing baseline levels for various areas. A Class I area would have the greatest limitations, where virtually any degradation would be considered significant. A Class II area would permit moderate deterioration and controlled growth. A Class III area would permit the greatest degree of impact, although no such areas have been established. Mandatory federal Class I areas were defined in the 1977 Amendments as national parks over 6,000 acres and wilderness areas and memorial parks over 5,000 acres, whereas all other areas not classified as non-attainment were defined as Class II.

The mandatory federal Class I areas closest to the planning area are:

- Mesa Verde National Park, Colorado (20 miles)
- Weminuche Wilderness Area, Colorado (70 miles)
- Canyonlands National Park, Utah (120 miles)
- San Pedro Parks Wilderness Area, New Mexico (150 miles)

The visibility protection requirements of the Clean Air Act, however, apply only to those mandatory federal Class I areas established under the 1977 Amendments.

The State of Colorado has also established a 3-hour SO_2 ambient air quality standard of 700 ìg/m^3, as well as a program similar to the federal PSD increments limiting additional amounts of SO_2 above baseline conditions. Category I areas have the same values as the federal Class I areas; Category II area values are between those for the federal Class I and Class II areas; and Category III areas have the same values as the federal Class II areas.

State of Colorado - Air Pollution Control and Prevention Act

The Colorado Air Pollution Prevention and Control Act was originally enacted in 1963 to foster the health, welfare, convenience, and comfort of the inhabitants of the State of Colorado, and to facilitate the enjoyment and use of the scenic and natural resources of the state. The Act provides a framework for maintaining and improving air quality within the state, as codified in the Colorado Revised Statutes (Title 25 Health: Environmental Control: Article 7 Air Quality Control).

Available at http://198.187.128.12/colorado/lpext.dll?f=templates&fn=fs-main.htm&2.0

Montezuma County - Land Use Code Threshold Standards for Development

Montezuma County has established a Comprehensive Land Use Plan and Land Use Code to protect the rural character of the county through the enactment of development regulations appropriate for rural areas. Contained in this code are nuisance standards for all development in the unincorporated areas of Montezuma County. The standards are designed to ensure that development does not cause significant adverse impacts on other property. The county's Land Use Code prohibits any perceptible odors, dust, and fumes beyond the boundary of a property. Particulate-matter emissions must be less than

0.2 grain/cf flue gas at 500°F stack temperature, while EPA Opacity System Method 9 must be followed for smoke emissions.

Available at ftp://206.168.68.47/Out/planning/Amended%20LUC.pdf

3.1.2.1.2 Regulations

Clean Air Act – Federal Facilities

Under the Clean Air Act (Section 118), every federal agency (and each employee) engaged in or authorizing any activity is subject to (and must comply with) all federal, state, tribal, or local air quality requirements in the same manner and extent as any nongovernmental entity. This includes requirements respecting obtaining permits or the paying of fees.

Clean Air Act - Conformity Requirements

Federal projects located within air quality non-attainment or maintenance areas are subject to the General Conformity Rule (40 CFR Part 51, Subpart W). The purpose of this rule is to ensure that federal actions (direct or authorized) would not interfere with maintenance of any standard, cause or contribute to the new violation of any standard, increase the frequency or severity of any existing violation, delay timely attainment of any standard by inhibiting milestones (such as demonstrating attainment or delaying reasonable further progress), or interfere with implementation of a maintenance plan. Because the planning area is designated an attainment area, these conformity requirements do not apply.

Colorado Air Quality Regulations

The Colorado Air Quality Control Commission has enacted regulations that control air quality within the state. One regulation establishes state ambient air quality standards and dictates monitoring procedures and data-handling protocols. It also defines non-attainment and maintenance area boundaries that currently or historically have violated federal and state air quality standards. The regulation also contains the state's urban visibility standard and sets emission budgets for non-attainment areas. In addition, the SIP regulation defines specific requirements regarding strategies for air quality control and contingency measures for non-attainment areas in the state.

Available at http://www.cdphe.state.co.us/op/regs/airregs.asp

Colorado Smoke Management Program

Colorado Air Quality Control Commission Regulation No. 9 (Open Burning, Prescribed Fire and Permitting) establishes the state's open-burning program. No open burning activities may be undertaken without first obtaining a proper permit from the state or a

local agency, unless as exempted by the regulation. For example, all open burning related to agricultural operations is exempted from obtaining permits from the state.

Anyone seeking to conduct a prescribed fire must obtain a permit in advance, whether the ignition is planned (Prescribed Fire) or unplanned (Wildland Fire Use for Resource Benefit). Small prescribed fires below a smoke and emissions threshold can use the simpler general-open-burning permit, but large burns with the highest smoke risk rating are subject to a 30-day public-notice, -review, and -comment period of the draft permit. Permits are valid for only certain dates in the calendar year they are issued, and are subject to a application fees. Daily or annual reporting of actual activity is required for all permit holders, regardless of whether the burn was actually completed.

Available at http://apcd.state.co.us/smoke/

3.1.2.1.3 Policy and Interim Guidance

Federal Land Managers Air-Quality-Related Values Work Group

In April 1997, air resource managers representing the Forest Service, the National Park Service, and the U.S. Fish & Wildlife Service initiated the Federal Land Managers AQRV Work Group (FLAG) to "achieve greater consistency in the procedures each agency uses in identifying and evaluating AQRVs." As part of this collaborative effort, FLAG members work together to define sensitive AQRVs, identify the critical loads (or levels) and the criteria that define adverse impacts, and standardize the methods and procedures for conducting AQRV analyses. The guidance developed by FLAG is applicable in the Mesa Verde National Park and Weminuche Wilderness mandatory federal Class I areas.

Available at http://www2.nature.nps.gov/air/permits/flag/flaginfo/

Interim Air Quality Policy on Wildland and Prescribed Fires

In 1998, and in cooperation with several federal land management agencies, the EPA issued the Interim Air Quality Policy on Wildland and Prescribed Fires, establishing a national policy on how best to achieve national clean air goals (including the particulate-matter NAAQS), while improving the quality of natural ecosystems through the increased use of wildland and prescribed fire. It includes guidance for federal land management agencies on how best to manage fires on wildlands, as well as incentives for state and tribal entities to implement programs to minimize smoke impacts and meet air quality goals.

Available at http://www.epa.gov/ttn/oarpg/t1/memoranda/firefnl.pdf

BLM's Soil, Water, and Air Management Manual (7000) identifies the following management objectives:

- To protect, maintain, or improve the quality of the soil, water, and air resources and watershed values associated with public lands, including natural site productivity; air quality; and surface and ground water quality, quantity, and timing.

- To prevent deterioration of soil, air quality, and watershed conditions where technically and economically feasible and to rehabilitate areas where accelerated erosion and runoff have resulted in unacceptable resource conditions.

- To prevent or minimize the threat to public health and safety, damages to natural site characteristics, or economic losses due to: floods, sedimentation, decreased water or air quality, or accelerated runoff and erosion.

BLM's Prescribed Fire Management Handbook (H-9214-1; available at http://www.blm.gov/nhp/efoia/wo/handbook/h9214-1.pdf) contains information on how to use prescribed fire in a safe, controlled, cost-effective manner to achieve management objectives, as defined in applicable Resource and Fire Management Plans. This Handbook also specifies that compliance with federal, state, and local air quality regulations is mandatory, coordination with applicable air regulatory agencies is necessary, and that staff should participate in state and local rule making and periodic reviews. Personnel preparing Prescribed Fire Plans must be aware of state and local smoke management regulations and the impacts that a specific project might have on critical areas. For example, some air quality regulatory agencies require that smoke dispersion modeling be performed before they will issue burning permits.

BLM's Land Use Planning Handbook (H-1601-1; available at http://www.blm.gov/nhp/efoia/wo/handbook/h1601-1.pdf) contains guidance for implementing BLM land use planning requirements. Details on that guidance document are above in Section 3.1.1.3, "BLM National and State Goals and Objectives."

3.1.2.1.4 Instruction Memorandums

Not applicable.

3.1.2.1.5 Executive Orders

Executive Order 11514 - Protection and Enhancement of Environmental Quality

To ensure federal agencies provide leadership in protecting and enhancing the quality of the Nation's environment to sustain and enrich human life, by taking measures needed to direct their policies, plans, and programs so as to meet national environmental goals.

Executive Order 11738 – Federal Procurement Procedures to Achieve Clean Air Act

To ensure the procurement of goods, materials, or services is made in a manner that will result in effective enforcement of the Clean Air Act and the Federal Water Pollution Control Act.

Executive Order 12088 - Compliance with Pollution Control Standards Act

To ensure that all necessary actions are taken for the prevention, control, and abatement of environmental pollution, with respect to federal facilities and activities under the control of the agency.

Executive Order 13148 - Greening the Government through Leadership in Environmental Management

To ensure that all necessary actions are taken to integrate environmental accountability into agency day-to-day decision making and long-term planning processes (across all agency missions, activities, and functions), by making environmental management considerations a fundamental and integral component of policies, operations, planning, and management. In addition, each agency is directed to comply with environmental regulations by establishing and implementing environmental-compliance audit programs and policies that emphasize pollution prevention as a means both to achieve and maintain environmental compliance.

Executive Order 13149 - Greening the Government through Federal Fleet and Transportation Efficiency

To ensure leadership in the reduction of petroleum consumption through improvements in fleet fuel efficiency and the use of alternative-fuel vehicles (AFVs) and alternative fuels, in order to promote markets for more alternative fuel and fuel-efficient vehicles, encourage new technologies, enhance the United States' energy self-sufficiency and security, and ensure a healthier environment through the reduction of greenhouse gases and other pollutants in the atmosphere.

Executive Order 13212 - Actions to Expedite Energy-Related Projects

To expedite the increased supply and availability of energy to our nation in a safe and environmentally sound manner, agencies shall expedite their review of permits or take other actions as necessary to accelerate the completion of such projects, while maintaining safety, public health, and environmental protections.

These Executive Orders are available at
http://www.gsa.gov/Portal/gsa/ep/indexView.do?pageTypeId=8199&channelId=-13339

3.1.2.1.6 Agreements

The Colorado Oil and Gas Conservation Act (34 CRS 60; available at http://oil-gas.state.co.us/ select "Rules") established an Oil and Gas Conservation Commission to regulate "oil and gas operations so as to prevent and mitigate significant adverse environmental impacts on any air, water, soil, or biological resource resulting from oil and gas operations to the extent necessary to protect public health, safety, and welfare, taking into consideration cost-effectiveness and technical feasibility." The Act also established an Oil and Gas Environmental Response Fund that may be used "prior to, during, or after the conduct of oil and gas operations to investigate, prevent, monitor, or mitigate conditions that threaten to cause, or that actually cause, a significant adverse environmental impact on any air, water, soil, or biological resource." In addition, if "the commission determines that mitigation of a significant adverse environmental impact on any air, water, soil, or biological resource is necessary as a result of the conduct of oil and gas operations, the commission shall issue an order requiring the responsible party to perform such mitigation."

Finally, the Oil and Gas Conservation Commission has established rules during drilling, development, producing, and abandonment (General Rule 324A – Pollution), including the following: "the operator shall take precautions to prevent significant adverse environmental impacts to air, water, soil, or biological resources to the extent necessary to protect public health, safety and welfare, by using cost-effective and technically feasible measures to protect environmental quality…" and "no owner, in the conduct of any oil or gas operation, shall perform any act or practice which shall constitute a violation of any comprehensive plan adopted by the Air Quality Control Commission for the prevention, control and abatement of pollution of the air of the state."

3.1.3 Anticipated Future Conditions

Future climate conditions would not be affected by anticipated future actions in the planning area.

Air quality conditions could be affected by relatively small emission sources operating in the planning area, as well as continued increases in regional population growth and regional industrial activity. These future conditions are discussed in the following sections.

3.1.3.1 Natural Factors Causing Change in the Resource/Use

If the ongoing drought continues, then annual precipitation would continue to be well below normal, enhancing the occurrence of windblown dust and probability of wildfires. The potential for periodic drought could also affect the condition and vitality of vegetation and hydrologic resources.

Wildfires resulting from lighting strikes will continue to impact air quality within the region and could affect nearby sensitive areas.

3.1.3.2 Management-Related Factors Causing Change in the Resource/Use

Emissions from In-Monument Recreational Activity

BLM has authority to specify the locations where motorized recreational activity is allowed within the planning area. Tailpipe and fugitive-dust emissions from passenger, all-terrain (ATV), and other vehicles could affect air quality near the campgrounds, roads, and trails on which those vehicles operate. It is anticipated that localized air quality impacts caused by recreational vehicle exhaust would improve due to new control technology, resulting in lower levels of emissions. For example, EPA's new emissions standards for off-highway motorcycles, ATVs, and snowmobiles establish limits on the amount of pollutants generated by these vehicles.

Continued Fluid mineral Exploration and Extraction within the Monument

Fluid mineral exploration, extraction, processing, and transport have traditionally occurred in the planning area, and BLM has leased most of the area for future fluid mineral-resource development. Based on data in the April 2005 "Reasonable, Foreseeable Development: Oil, Natural Gas, and Carbon Dioxide in Canyons of the Ancients National Monument" (RFD) document, it is anticipated that over the next 20 years, another 150 wells would be drilled in the Monument. Sixty-nine of these wells would be carbon dioxide (CO_2) wells, requiring only 40 new well pads. The remaining 81 wells would be oil and natural-gas wells, drilled from 81 new well pads. The 150 new wells would require 67 miles of new access roads and 53 miles of new pipeline right-of-way (ROW).

BLM also anticipates that five 3-D and ten 2-D seismic surveys would be conducted over the next 20 years in the planning area. Finally, BLM estimates that eight new production and compression facilities would be built to treat, store, and transport the produced oil, natural gas, and CO_2. Four of these would support oil and natural-gas production, and four CO_2 production. Treatment and compression facilities would result in increased emissions from construction of facilities, facility operations, and worker commuting. Compression and treatment facilities for CO_2 production would be electric-powered, and their direct contributions to local air emissions would be minimal.

The RFD indicates that one of the current fluid mineral-development leaseholders may construct and operate a local natural-gas-powered generating plant to provide the majority of the necessary electrical power. Construction and operation of the facility would result in increased emissions. The plant would be subject to applicable emission permits; however, that would limit air quality impacts from operation of the plant.

Another mineral development leaseholder operates a dry-ice and compressed-CO_2 plant near the planning area, and derives energy from low-yield natural gas wells on its leases. Continued operation of this facility would result in continuing air pollutant emissions.

The RFD anticipates that future exploration and production of fluid minerals in the planning area would result in some 100 additional truck trips per day. This outcome would produce increased vehicular emissions, especially fugitive dust, as many of the roads used by the trucks are unpaved.

3.1.3.3 Anticipated Foreseeable Condition of the Resource/Use

Air Quality near Motorized Vehicle Recreational Areas within the Monument

Ambient air quality concentrations at campgrounds where motorized vehicle usage occurs may improve in the future due to ongoing tightening of emission standards for passenger vehicles and ATVs, although fugitive-dust emissions are anticipated to remain constant.

Air Quality near Fluid mineral-Development Sites in the Monument

The 150 additional oil, natural-gas, and CO_2 wells anticipated in the Monument have the potential to emit criteria and hazardous air pollutants. All new facilities would, however, be subject to air quality permitting requirements of the Colorado Department of Public Health and Environment (CDPHE). All new major facilities would be required to install Best Available Control Technology to minimize air pollutant emissions, and CDPHE would require each new facility conduct air quality modeling, to demonstrate that downwind ambient concentrations would not exceed allowable NAAQS limits.

Regional Air Quality outside the Monument

As described previously, emissions from the existing fluid mineral developments operating in the planning area contribute a relatively small fraction of the total 11 county emissions that affect air quality throughout the Four Corners region. Therefore, future lease actions are unlikely to add significantly to the overall regional emissions or the regional air quality that impact sensitive receptors such as Mesa Verde National Park or the Weminuche Wilderness Area. There are indications, however, that expanded industrial operations outside the planning area could significantly degrade regional air quality. The draft Northern San Juan Basin Coalbed Methane EIS (BLM 2004) indicates that forecasted growth in regional oil-and-gas development could contribute to degradation of AQRVs, through reduced visibility and increased atmospheric deposition at nearby Class I areas.