CHAPTER 3 – AIR QUALITY AND CLIMATE

3.1 INTRODUCTION

The Moab FO and Monticello FO planning areas are addressed together in the characterization of potential effects of projected emissions on air quality. Although the Moab FO and Monticello FO planning areas have well defined boundaries, their respective airsheds are not confined to the planning areas, nor can they be delineated by administrative boundaries. Meteorological and topographical characteristics within planning areas and the surrounding lands affect the transport, deposition and dispersion of emissions within both the Moab FO and the Monticello FO planning areas. Projected air quality effects described in this document are intended to provide a general overview of cumulative air quality impacts specific to the projected levels of growth, and are reflective of air quality conditions from both the Moab FO and Monticello FO planning areas, and from sources throughout the overall airsheds. The effects of both emissions and management decisions within the airsheds will influence air quality throughout the area, not just within the boundaries of the specific planning areas.

3.2 RESOURCES OVERVIEW

3.2.1 Natural Setting Affecting Air Quality

The Moab FO planning area is located in the Colorado Plateau physiographic province (BLM 2002a). The area is located in southeastern Utah, bounded by the East Tavaputs Plateau and Book Cliffs to the north, the Colorado border to the east, Harts Draw and Lisbon Valley to the south, and the Green River to the west. Elevations within the Moab FO planning area range between 3,871 near the confluence of the Green and Colorado Rivers and 12,721 feet at Mount Peale (located in the Manti LaSal National Forest). The climate in this area varies widely with altitude (World Climate 2003).

Like most of the Moab FO planning area, the southeastern section experiences wide temperature variations between seasons and climate varies with elevation. Precipitation averages 13.9 inches annually. In the higher elevations, precipitation comes in the form of snow, with deep accumulations in the late fall and winter. Snowmelt in the higher elevations is generally complete by mid to late June. Afternoon thunderstorms often resulting in flash flooding, are common from late spring through early fall. Summer high temperatures in the higher elevations often reach 85°F, with lows in the 50s. Low elevation high temperatures can reach over 100°F. Winters are cold, with highs averaging 30°F to 50°F, and lows averaging 0°F to 20°F.

The western section of the Moab FO planning area receives an average of 9.2 inches of precipitation a year. Most of this moisture comes in the form of melting winter snows. Dry air, high elevations (4,000 to 6,000 feet) and winter snowfall combine to create a cold or high desert. Most precipitation falls in late summer and early autumn thunderstorms. Maximum summer temperatures in the higher elevations range from 85°F to 90°F, low elevation maximum summer temperatures can reach over 100°F. Winters are cold and relatively dry, with highs around 40°F and lows in the low to mid teens.

The middle section of the Moab FO planning area (near Moab) receives an average of 9.0 inches of precipitation a year, most of which comes in the form of late spring rains and fall and winter snows. Maximum summer temperatures average 95°F. Winter high temperatures average 50°F, and lows average 21°F.

The northern section of the Moab FO planning area receives an average of 7.2 inches of precipitation a year, most of which comes in the form of late spring rains and fall thunderstorms. Maximum summer temperatures hover in the high 90s, cooling off to the low 60s at night. Winter high temperatures are generally in the high 30s, with nighttime temperatures dipping into the low teens.

Across the Moab FO planning area, summer precipitation is often in the form of short, intermittent thunderstorms, while winter precipitation results in accumulated snowpack that infiltrates the soil and recharges the aquifers. Air temperature and precipitation data collected from 1889 through 2003 for three locations in the Moab FO planning area are displayed in Table 3.1 and Figure 3-1 (WRCC 2004). Peak elevation temperature and precipitation information was not available.

Table 3.1. Temperature and Precipitation Data Available for Three Locations in the Moab Field Office (Moab FO) Planning Area (WRCC 2004)

Temperature (°F)

Station	General Location	Elevation (feet)	Summer Means		Winter Means		Extremes	
			High	Low	High	Low	High	Low
Thompson	Northern	6,100	90.1	60.8	41.0	18.3	108	-23.0
Moab	Middle	4,025	95.3	59.9	45.9	20.9	114	-24.0
La Sal	Southern	7,125	83.5	51.1	38.5	14.4	101	-25.0

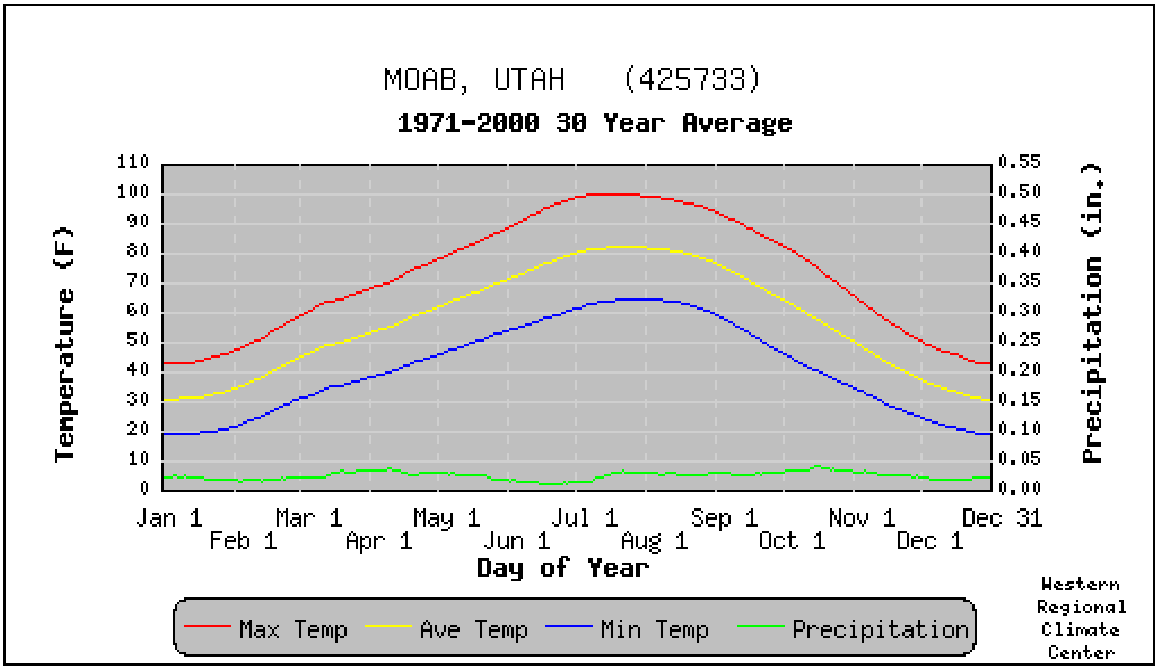
Precipitation (inches)

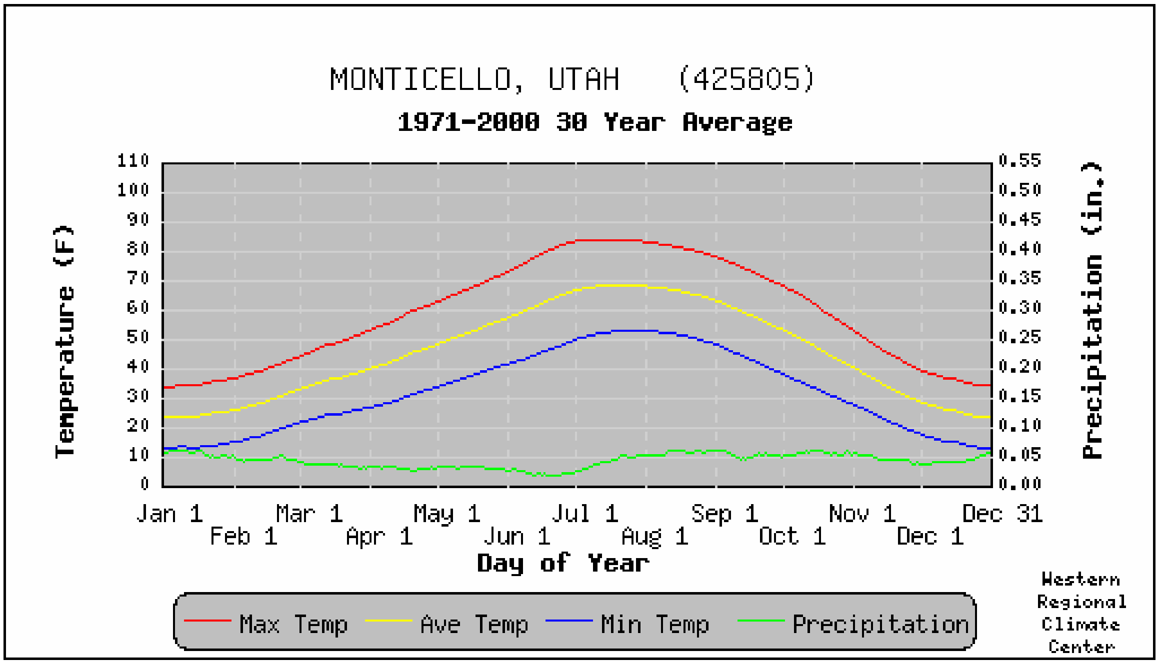
Station	Mean				Annual		
	Winter	Spring	Summer	Fall	Mean	High	Low
Thompson	1.9	2.5	2.1	2.7	9.2	14.8	2.0
Moab	2.0	2.4	2.1	2.6	9.0	16.4	4.3
La Sal	2.5	3.0	3.8	4.7	13.9	20.1	6.5

The Monticello FO planning area is located in the southeastern corner of Utah, adjacent to the Colorado and Arizona borders. A part of the Colorado Plateau region, the Monticello FO planning area is bounded by the Colorado River to the west, Canyonlands National Park and the Moab FO planning area to the north, and the Colorado and Arizona state borders to the east and the south, respectively (BLM 2002b). The Abajo Mountains are situated in the heart of the Monticello FO planning area. Elevations within the Monticello FO planning area range between 3,700 at Lake Powell (near Bullfrog) and 11,360 feet at Abajo Peak (located in the Manti LaSal National Forest).

Similar to the Moab FO planning area, the climate of the Monticello FO planning area shows wide seasonal temperature variations and both temperature and precipitation vary with elevation. Across the Monticello FO planning area, summer precipitation is generally comes from brief, heavy thunderstorms. Accumulated winter snowpack melts early in the spring and acts to infiltrate dry desert soils and recharge aquifers.

Figure 3-1. Thirty-year precipitation and air temperature plots for Moab and Monticello, Utah (WRCC 2004).





- Max. Temp. is the average of all daily maximum temperatures recorded for the day of the year between the years 1971 and 2000.

- Ave. Temp. is the average of all daily average temperatures recorded for the day of the year between the years 1971 and 2000.

- Min. Temp. is the average of all daily minimum temperatures recorded for the day of the year between the years 1971 and 2000.

- Precipitation is the average of all daily total precipitation recorded for the day of the year between the years 1971 and 2000.

Precipitation in the southern section of the Monticello FO planning area (near Bluff) averages 7.8 inches annually with most falling as rain in the late autumn months. Spring and summer thunderstorms are generally brief and violent, often resulting in flash flooding. Summers are hot, with daytime highs averaging 94°F and lows in the high 50s, although extreme highs over 110°F are not uncommon. Winters are cold, with highs averaging 46°F, and lows averaging 20°F.

The western section of the Monticello FO planning area receives an average of 5.9 inches of precipitation a year, mostly in the late fall as snow. However, rain is not uncommon in the spring and late summer. Summers are very warm and winters quite cold, with below zero temperatures not unusual. Maximum summer temperatures average in the high 90s. Winter highs average 48°F, and lows are generally in the high 20s.

The middle section of the Monticello FO planning area (near Blanding) has a pleasant climate with low humidity, warm summer temperatures and cool winters. Precipitation averages 13.3 inches a year, most of which comes in the form of fall rains and winter snows (11.3 inches). Maximum summer temperatures average 81°F. Winter high temperatures average 38°F, and lows average 16°F.

The northern section of the Monticello FO planning area (near Monticello) receives an average of 15 inches of precipitation a year, most of which comes in late summer thunderstorms and fall snows, which can leave heavy accumulations in the higher elevations. Maximum summer temperatures are generally in the high 80s, cooling off to the low 50s at night. Winter high temperatures average 42°F, with nighttime temperatures in the high teens.

Air temperature and precipitation data collected from 1948 through 2003 for four locations in the Monticello FO planning area are displayed in Table 3.2 and Figure 3-1 (WRCC 2004). Peak elevation temperature and precipitation information was not available.

Both the Moab FO and Monticello FO planning areas have been experiencing drought for much of the last five years, with extreme low water conditions occurring during the summer of 2002, when the Palmer Drought Severity Index (PDSI) reached near-record severity based on the last 100 years of instrumental data (NCDC 2004). The low water conditions have resulted in an increase of wind-blown dust and associated particulates in the Moab and Monticello FO planning areas and adjacent areas.

When the air temperature near the ground is lower than the air temperature above, a phenomenon called an *inversion* occurs. Inversions may occur in winter when snow accumulation on the ground combines with short daylight hours to impede the sun's ability to warm the lower atmosphere. In most areas of the Moab and Monticello FO planning areas, inversions are a fairly typical winter occurrence, but usually inversions dissipate rapidly when early morning sunlight warms the air near the ground surface. In areas where the local topography acts to pool and trap cold air (deep valleys surrounded by steep mountains) however, cold temperatures associated with stationary or slow moving high pressure systems can last for days or (rarely) even weeks and create inversions that result in poor air quality due to the compression of cold air masses and lack of circulation.

Inversions can hinder air pollutant dispersion by preventing emissions from mixing with the ambient air in the vertical direction. The mixing height of the plume is the height above the surface through which free vertical mixing occurs. Mixing height is often bounded by the inversion layer in the atmosphere. The dispersion of air pollutants is confined within the mixing height of the atmosphere. High mixing heights promote emissions dispersion and result in low ground level pollutant concentration. On the other hand, low mixing heights often trap emissions and result in high ground level concentration. Areas such as Moab (located in a lower valley) can experience inversions during the winter season, while Monticello,

Table 3.2. Temperature and Precipitation Data Available for Four Locations in the Monticello FO Planning Area (WRCC 2004)

Temperature (°F)								
Station	General Location	Elevation (feet)	Summer Means		Winter Means		Extremes	
			High	Low	High	Low	High	Low
Monticello	Northern	7,066	86.0	54.8	41.6	19.4	110	-23.0
Blanding	Middle	6,105	81.4	50.0	37.9	16.0	101	-22.0
Bullfrog	Western	3,712	96.5	67.5	48.4	27.2	110	0
Bluff	Southern	4,440	93.6	58.6	46.2	20.3	109	-22.0

Precipitation (inches)

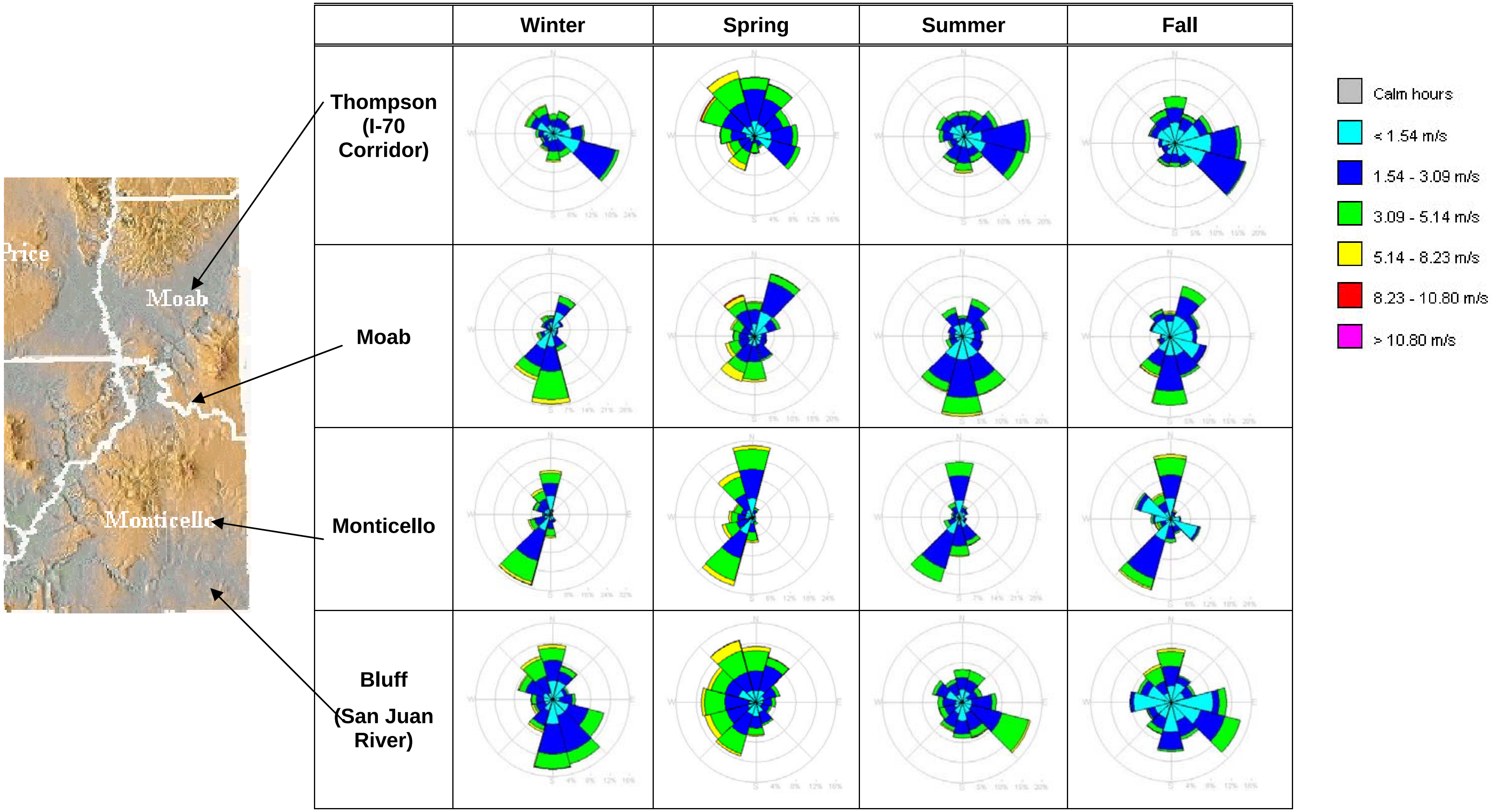
Station	Mean				Annual		
	Winter	Spring	Summer	Fall	Mean	High	Low
Monticello	3.8	2.9	4.0	4.3	15.0	23.1	6.6
Blanding	3.9	2.6	3.0	3.8	13.3	24.4	4.9
Bullfrog	1.3	1.2	1.1	2.2	5.9	11.5	2.2
Bluff	2.1	1.5	1.8	2.4	7.8	15.7	3.0

Blanding and Bluff are not as prone to inversions due to local topography, minimal snowfall, warmer wintertime low temperatures and other climatological conditions.

Air pollutant dispersion is also dependent on the wind. The pollutant path is determined by the wind direction, and the speed of transport is determined by the wind speed. Wind directions in the Moab and Monticello FO planning areas are highly influenced by the local terrain. For example, the winds along the I-70 corridor in Grand County and along the San Juan River in San Juan County tend to blow from the west and the northwest in the spring and blow from the east and the southeast in other seasons (1996 MM5 data from the CALMET model, Trinity 2003). The city of Moab and the city of Monticello are located on the flanks of the La Sal Mountains and the Abajo Mountains respectively. The winds in Moab and Monticello predominately blow from the south or southwest.

Figure 3-2 presents the windroses for four cities in the Moab and Monticello FO planning areas. Windroses are graphical representations of wind magnitude, frequency, and direction for a given location. As can be seen from the seasonal windroses, the wind patterns in the area vary widely by seasons and local terrain. Therefore, dispersion and transport of pollutants are also variable in this region depending on the locations.

Figure 3-2. Seasonal windroses in the Moab and Monticello FO planning areas.



Data Source: 1996 Mesoscale Model (MM5) data processed using the CALMET meteorological model. The observed data from various meteorological stations are used to generate these windroses. Meteorological stations include Grand Junction, Montrose County Airport, Price/Carbon, etc.

3.2.2 Existing Air Quality

The Code of Federal Regulations (CFR) sets National Ambient Air Quality Standards (NAAQS) in Title 40 of CFR, Part 50 (40 CFR 50). The purpose of primary NAAQS is to protect the welfare of the most sensitive people such as elderly and asthmatic individuals, while the purpose of secondary NAAQS is to protect vegetation, soil, etc. An area that does not meet the NAAQS is designated as a nonattainment area on a pollutant-by-pollutant basis. The Moab and Monticello FO planning areas are located in areas designated as attainment or unclassified for all pollutants (EPA 2003a). Tables 3.3 and 3.4 present the existing ambient air quality in the Moab and Monticello FO planning areas, respectively (EPA 2003b). The NAAQS apply to six pollutants: carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), ozone (O_3), and particulates whose diameter are smaller than 10 micrometers (PM_{10}) or smaller than 2.5 micrometers ($PM_{2.5}$).

Table 3.3. Ambient Air Quality Data for Moab FO Planning Area

Pollutant	Averaging Period [a]	NAAQS	Monitored Concentration [b]	Monitored Location (City, County, State)
CO	1-hour	35 ppm	5.8 ppm	Grand Junction, Mesa Co., CO
	8-hour	9 ppm	3.7 ppm	Grand Junction, Mesa Co., CO
NO_2	Annual	0.053 ppm	0.008 ppm	La Plata Co., CO
			0.014 ppm	Bloomfield, San Juan Co., NM
SO_2	3-hour[c]	0.5 ppm	0.06 ppm	Shiprock, San Juan Co., NM
	24-hour	0.14 ppm	0.017 ppm	Shiprock, San Juan Co., NM
	Annual	0.03 ppm	0.003 ppm	Shiprock, San Juan Co., NM
Ozone	1-hour	0.12 ppm	0.075 ppm	La Plata County, CO
			0.08 ppm	Mesa Verde NP, Montezuma Co., CO
	8-hour	0.08 ppm	0.061 ppm	La Plata County, CO
			0.078 ppm	Mesa Verde NP, Montezuma Co., CO
PM_{10}	24-hour	150 µg/m³	42 µg/m³	Moab, Grand Co., UT
	Annual	50 µg/m³	23 µg/m³	Moab, Grand Co., UT
$PM_{2.5}$	24-hour	65 µg/m³	24 µg/m³	Grand Junction, Mesa Co., CO
	Annual	15 µg/m³	12 µg/m³	Grand Junction, Mesa Co., CO

[a] The concentration values listed in this table are based on the monitored concentrations in 2002.

[b] The concentration listed in this column represents the highest values detected in a city of a county (where more than one monitors are present in a given county or a city). The data from the city or county nearest the boundary of the Moab FO planning area are provided if no monitor is located within the resource planning area boundary.

[c] SO2 3-hour standard is a secondary NAAQS that sets limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

Table 3.4. Ambient Air Quality Data for Monticello FO Planning Area

Pollutant	Averaging Period [a]	NAAQS	Monitored Concentration [b]	Monitored Location (City, County, State)
CO	1-hour	35 ppm	5.8 ppm	Grand Junction, Mesa Co., CO
	8-hour	9 ppm	3.7 ppm	Grand Junction, Mesa Co., CO
NO_2	Annual	0.053 ppm	0.008 ppm	La Plata Co., CO
			0.014 ppm	Bloomfield, San Juan Co., NM
SO_2	3-hour[c]	0.5 ppm	0.06 ppm	Shiprock, San Juan Co., NM
	24-hour	0.14 ppm	0.017 ppm	Shiprock, San Juan Co., NM
	Annual	0.03 ppm	0.003 ppm	Shiprock, San Juan Co., NM
Ozone	1-hour	0.12 ppm	0.075 ppm	La Plata County, CO
			0.08 ppm	Mesa Verde NP, Montezuma Co., CO
			0.087 ppm	Farmington, San Juan Co., NM
			0.078 ppm	Canyonlands NP, San Juan Co, UT
	8-hour	0.08 ppm	0.061 ppm	La Plata County, CO
			0.078 ppm	Mesa Verde NP, Montezuma Co., CO
			0.08 ppm	Farmington, San Juan Co, NM
			0.075 ppm	Canyonlands NP, San Juan Co, UT
PM_{10}	24-hour	150 µg/m³	67 µg/m³ [d]	Telluride, San Miguel Co., CO
			104 µg/m³	Durango, La Plata Co., CO
	Annual	50 µg/m³	19 µg/m³	Telluride, San Miguel Co., CO
			37 µg/m³	Durango, La Plata Co., CO
$PM_{2.5}$	24-hour	65 µg/m³	10 µg/m³	Telluride, San Miguel Co., CO
			26 µg/m³	Durango, La Plata Co., CO
	Annual	15 µg/m³	5.5 µg/m³	Telluride, San Miguel Co., CO
			8.2 µg/m³	Durango, La Plata Co., CO

[a] The concentration values listed in this table are based on the monitored concentrations in 2002.

[b] The concentration listed in this column represents the highest values detected in a city of a county (where more than one monitors are present in a given county or a city). The data from the city or county nearest the boundary of the Monticello FO planning area are provided if no monitor is located within the resource planning area boundary.

[c] SO_2 3-hour standard is a secondary NAAQS that sets limits to protect public welfare, including protection against decreased visibility, damage to animals, crops, vegetation, and buildings.

[d] For this short-term averaging period, the maximum value recorded during the first half of 2003 is higher than the maximum concentration for 2002; therefore 2003 values are used instead.

Applicable air quality criteria also include the criteria for prevention of significant deterioration, known as PSD increments. A PSD increment is the maximum increase in ambient concentrations of a certain pollutant that is allowed to occur above a baseline concentration for a pollutant. Class I areas are areas with pristine air quality, such as wilderness areas, national parks, and Tribal reservation lands, and are accorded the strictest protection. Only very small incremental increases in concentration are allowed to maintain the very clean air quality in these areas.

In Utah, five areas have been designated as Class I areas, all are national parks and are under the administration of the National Park Service (NPS). These areas are: Arches National Park, Bryce Canyon National Park, Canyonlands National Park, Capital Reef National Park, and Zion National Park. PSD Class II areas are essentially all areas that are not designated Class I, and moderate incremental increases in concentration are allowed, although the concentrations are not allowed to reach the concentrations set by federal standards (NAAQS). No areas have yet been designated Class III. Air quality data for Class I areas within the planning areas are also included, where available.

The data listed are the most recent available data for each pollutant. If there is no monitor located within the boundary of the Moab and/or Monticello FO planning area, the data from the nearest representative monitor(s) are chosen. Most of the available monitoring stations are located east or southeast of the planning areas. As outlined in Tables 3.3 and 3.4 of this chapter the air quality in and near the Moab and Monticello FO planning areas meets the NAAQS by a large margin.

3.2.3 Visibility in Class I Areas

Visibility is "the clarity with which distant objects are perceived" (EPA 2001), and is affected by pollutant concentrations, plume impairment, regional haze, relative humidity, sunlight, and cloud characteristics. A natural visual range without any man-made air pollutants would be 140 miles in the Western states (EPA 2001). Aerosols (small particles made of solid and/or liquid molecules dispersed in the air) are the pollutants that most often affect visibility in the Class I areas. Five key contributors to visibility impairments are sulfate, nitrate, organic carbon, elemental carbon, and crustal materials. Their contributions to visibility impacts in the Canyonlands National Park, a Class I area within the planning area of the two field offices, are summarized in Table 3.5 (EPA 2001).

Table 3.5. Summary of Visibility Impairment Pollutants Measured in the Canyonlands National Park [a]

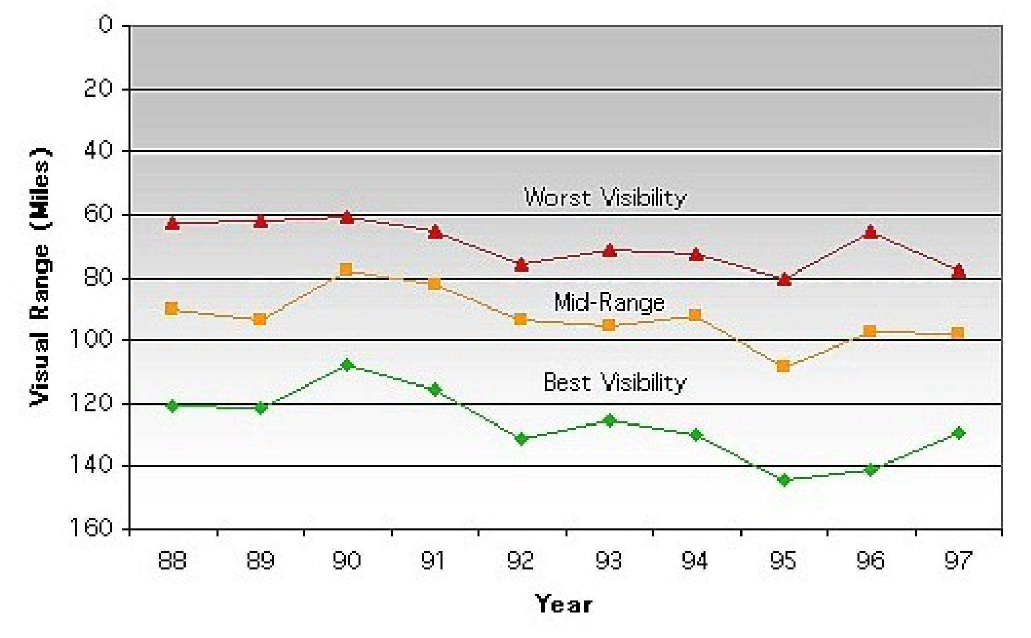
Pollutant	Contribution [b]	Emission Sources
Sulfate	34%	Fossil fuel combustion and forest fires.
Crustal Material	27%	Fugitive dust from roads, agricultural and forestry operations, and wind erosion.
Organic Carbon	22%	Wood burning, open burning, vehicle exhaust, and wildfires and prescribed burning.
Elemental Carbon	10%	Vehicle exhaust, wood burning, and wildfires and prescribed burning.
Nitrate	7%	Motor vehicle exhaust. Secondary sources include fossil fuel combustion and prescribed burning.

[a] Data source: U.S. EPA. 2001. Visibility in Mandatory Federal Class I Areas (1994-1998)- A Report to Congress. Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

[b] Contributions are calculated by pollutant concentrations regularly measured in the Canyonlands National Park. Light extinction coefficients and visibility indices are then calculated from these values.

The 1977 Clean Air Act (CAA) included legislation to prevent future and remedy existing visibility impairment in Class I areas. In 1985, the United States Environmental Protection Agency (EPA) established a collaborative monitoring program called the Interagency Monitoring of Protected Visual Environments (IMPROVE) to monitor visibility in Class I areas. The IMPROVE network has operated a monitor in the Canyonlands National Park, located near the western boundary of the Moab FO and Monticello FO planning areas, since 1988. The most-impaired days in Canyonlands National Park exhibit visual distances between 61 to 80 miles and show improvements over the decade of 1988 to 1997 of approximately 35%. The mid-range days have visual distances of 78 to 109 miles and show no significant change. The least-impaired days has visibility ranges from 107 to 144 and also demonstrate improvements over the decade of approximately 25% (EPA 2003c). The visibility trend from 1988 to 1997 in the Canyonlands National Park is summarized in Figure 3-3.

Figure 3-3. Trend in air pollution impacts on visibility observed in Canyonlands National Park, Utah, 1988 through 1997 (EPA 2003).



3.2.4 Status of Emissions

The Moab FO planning area covers all of Grand County and the northern portion of San Juan County (except for USFS and NPS lands), while the Monticello FO planning area covers the remaining portion of San Juan County (except for USFS and NPS lands). Currently, emission sources within the Moab FO and Monticello FO planning areas consist mostly of oil and gas development facilities and some mineral processing facilities as identified in Table 3.6.

Table 3.6. 2002 Emission Inventories in the Moab FO and Monticello FO Planning Areas [a]

County	Type of Facility (Qty)	2002 Emissions (tpy)					
		CO	NOx[b]	PM_{10}	SOx[c]	VOC[d]	HAPs[e]
Grand	Salt & potash production facility (1)	10.4	15.6	17.2	0.7	1.2	–
	Pipeline compressor stations (2)	107	119	2.5	0.1	8.5	2.0
	Oil & gas wells (5)	33.0	21.6	0.2	–	13.5	0
	Gas plant (1)	77.8	214	2.4	0.1	43.3	10.4
San Juan	Pipeline compressor stations (1)	48.1	394	1.5	0	8.6	3.1
	Gas Plant (1)	534	393	5.4	1453	71.8	10.9
	Uranium processing facility (1)	11.5	9.0	0.7	1.0	–	–

[a] Emission inventory data are provided by Ms. Deborah McMurtrie, Utah DEQ, in August 20, 2002, email to Trinity Consultants.

[b] Nitrogen oxides - one of the main ingredients involved in the formation of ground-level ozone.

[c] Sulfur oxides - contribute to respiratory illness, acid rain, and the formation of atmospheric particles that can cause visibility impairment.

[d] VOC (volatile organic compounds) refers to any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate that participates in atmospheric photochemical reactions.

[e] HAPs (hazardous air pollutants) are generally defined as those pollutants that are known or suspected to cause serious health problems. Section 112(b) of the Clean Air Act identifies a list of 188 pollutants as HAPs.

The Utah Department of Environmental Quality (DEQ) provided the emission inventory for the Moab FO and Monticello FO planning areas (McMurtrie 2003). The types of facilities in each county are summarized in Table 3.6. Of these, only the salt & potash production facility located in Grand County is associated with a geographical area prone to winter inversions. This facility is located approximately 4 miles northeast of Moab. At this distance it is not projected to exert a negative influence on air quality in Moab during the winter months.

3.3 CURRENT MANAGEMENT GUIDELINES

3.3.1 Specific Mandates and Authorities

The BLM currently does not have direct authority to regulate air resources in the Moab FO and Monticello FO planning areas. The U.S. Congress designated the EPA as the regulatory entity for air resources under a framework of environmental laws. The EPA may also delegate regulatory authority to states, tribes, and local agencies. As a federal agency, BLM is required to work cooperatively with the EPA and the delegated state agency in planning resource development to ensure that applicable air quality standards and regulations are met on public lands. The specific mandates and authorities for managing air resources are described below.

Control of Pollution From Federal Facilities. Section 118 of the CAA requires federal facilities to comply with all federal, state, tribal, and local environmental requirements. Federal facilities are required to comply with any reporting, recordkeeping, permitting, inspection, and fee requirements set forth in regulations and statutes. Under special circumstances that are determined to be of "paramount interest" to the nation, the President of the United States may exempt a federal facility from compliance with a CAA requirement for up to one year (EPA 1999a).

The required compliance of federal facilities with environmental regulations is also described in Executive Order (E.O.) 12088, Federal Compliance with Pollution Control Standards. E.O. 12088 requires federal agencies to develop and maintain plans for controlling pollution and ensuring that the federal facilities and activities meet all federal, state, and local environmental requirements.

State Implementation Plan. The EPA delegates the authority to manage air resources to the State when a State Implementation Plan (SIP) is approved and implemented. The Utah DEQ currently has approved SIPs for air quality programs under its jurisdiction, and has received delegated authority from EPA for all air quality issues in the State of Utah, excluding Tribal reservation lands. The air quality in Utah is currently regulated by the Utah DEQ, Division of Air Quality (DAQ). All stationary sources of air pollution are subject to the air quality regulations and standards under the DAQ's administration.

The northern part of the Moab FO planning area abuts the Uintah and Ouray Indian Reservation. The southern portion of the Monticello FO planning area borders the Navajo Indian Reservation and the Ute Mountain Indian Reservation. The Utah DEQ does not have authority to administer air quality programs on Tribal reservation lands. Sources located within Tribal reservation lands are not regulated by any SIP approved programs; and they are subject only to the federal air quality programs under the authority of the EPA Region 8.

3.3.2 Regulatory Resources

The air quality in the Moab FO and Monticello FO planning areas is managed by several federal and state air quality regulations and programs. This section discusses the air quality regulations that are potentially applicable to the emission sources within the Moab FO and Monticello FO planning areas.

New Source Review. Whenever a new stationary source of air pollutant emissions is to be constructed or modified in the state of Utah, the owner of the new emission source must apply for a Notice of Intent (NOI) permit with the Utah DEQ.[1]

New sources of air pollution are also required to provide documentation of hazardous air pollutant increases as part of the NOI. UAC R307-410 requires a comparison of a facility's potential hazardous air pollutants emission increases with emission threshold values. Sources with hazardous air pollutant emissions in excess of the emission threshold values are required to conduct dispersion modeling to demonstrate that the impact of the emissions is in compliance with the applicable toxic screening level.

In addition, all new stationary sources are required to control emissions to Best Available Control Technology (BACT) levels per UAC R307-401-6. BACT is an emission limitation based on the maximum degree of emission reduction for each pollutant taking into account energy, environmental, and economic impacts and other costs.

Prevention of Significant Deterioration (Major New Source Review). If a facility has emission increases of any regulated air pollutant greater than 250 tons per year (tpy), the facility is considered a major source and is subject to the requirements of PSD programs.[2] For an existing major source, if the emission increases from the project are more than the significant emission rates, the project will also need to go through PSD review. The PSD program applies to sources on Tribal reservation lands as well as to other sources in the state of Utah. PSD sources on Tribal reservation lands are under the jurisdiction of the EPA Region 8, while the Utah DEQ manages the other PSD sources.

[1] The Utah Administrative Code (UAC) R307-401 discusses NOI and approval orders necessary for the construction of a new source. The NOI permitting program does not apply on Tribal reservation lands.

[2] The major source threshold is 100 tpy for some specific source categories.

In order to demonstrate that the emission impact from a facility will not significantly degrade the air resources, modeling is required for a new source with an emission rate greater than or equal to the applicable thresholds listed in UAC R307-410. For those sources that require modeling, all modeling must be completed before a source can receive an approval to construct. As a part of PSD review, an applicant for a major new source is required to evaluate the impacts on visibility in Class I areas (discussed previously). Visibility protection in Class I areas in Utah applies to Arches National Park, Bryce Canyon National Park, Canyonlands National Park, Capital Reef National Park, and Zion National Park, and is described in the next section.

Visibility Protection for Class I Areas. Section 169A of the Clean Air Act Amendments of 1977 established national visibility goals and requires the "prevention of any future, and the remedying of any existing, impairment of visibility in mandatory Federal Class I areas which impairment results from manmade air pollution." PSD sources in Utah are required to conduct an analysis of visibility impact review pursuant to UAC R307-405-6(2)(a)(i)(D). UAC R307-405-4 also describes the allowable PSD increment levels (along with the increments for areas that are not classified as Class I or Class II) that cannot be exceeded as the result of any new construction or modification of emission sources.

Regional Haze Regulations. Mandated by the 1990 Clean Air Act Amendment, the EPA promulgated the Regional Haze Regulations to protect visibility in 156 mandatory Class I areas that are managed by four federal land management agencies: National Park Service (NPS), U.S. Fish and Wildlife Service (USFWS), and the BLM. Under the Regional Haze Regulations, states are required to establish visibility goals for the affected areas and develop long-term plans to reduce pollutant emissions that contribute to visibility degradation. The timeframe for the states to submit plans are 2004 to 2006 for attainment and unclassified areas and 2006 to 2008 for nonattainment areas (EPA 1999b). The regulations also require the installation of Best Available Retrofit Technology for facilities built between 1962 and 1977 that emit more than 250 tpy of visibility-impairing pollutants by the year 2013 (Almanac of Policy Issues 2001).

Permit Requirements for Nonattainment Area. UAC R307-305 and R307-403-5 contain rules for emission sources located within a nonattainment area for PM_{10} or in an area that will impact the air quality of a nearby nonattainment area. A source that emits more than 25 tpy of the combination of SO_2, NOx, and PM_{10} is subject to these requirements. Per UAC R307-305, such sources must meet the emission limitation and operating parameters contained in Section IX, Part H of the Utah SIP. The Utah SIP includes rules regarding stack testing, visible emissions, opacity observation, compliance assurance, production records, and fugitive dust. UAC R307-403-5 also provides requirements for emission offset.

There are currently no nonattainment areas within or adjacent to the boundaries of the Moab FO and Monticello FO. The air quality in the field offices is below the NAAQS levels; therefore the nonattainment area regulations will not apply unless the attainment status changes in the future.

New Source Performance Standards. All new and modified emission sources are subject to the New Source Performance Standards (NSPS) listed in 40 CFR Part 60. The NSPS are technology and emission standards for new or modified sources, either identified by type of unit or by industry category. If determined applicable, the sources within the Moab FO and Monticello FO planning areas need to comply with NSPS.

National Emissions Standards for Hazardous Air Pollutants. National Emissions Standards for Hazardous Air Pollutants (NESHAPs) have been established in 40 CFR Part 63 to control the emissions of hazardous air pollutants. NESHAP regulations establish control technology requirements for hazardous air pollutants, or Maximum Achievable Control Technology (MACT) standards, for specific types of equipment at qualifying facilities. These regulations set standards for both new and existing sources. If determined applicable, the sources within the Moab FO and Monticello FO planning areas will need to comply with NESHAP.

Section 112 of the CAA requires that new major sources of hazardous air pollutants fulfill MACT requirements. The requirements of Section 112 apply to equipment at a new major source for which no NESHAP (discussed above) has been promulgated. If an emission source or a group of stationary sources emits more than 10 tpy of any single hazardous air pollutants or more than 25 tpy of total hazardous air pollutants, it may be subject to CAA Section 112 requirements.

However, the regulatory framework of the MACT requirements mandates different implementation paths depending on whether or not the EPA meets promulgation deadlines. Section 112(j) of the CAA, also known as the "MACT Hammer" rule, requires the state and local agencies to establish case-by-case MACT for individual facility if the EPA misses the Section 112(e) deadline of May 15, 2002. Currently, 31 source categories are subject to the "MACT Hammer" rule. Among those 31 source categories are boilers, reciprocating internal combustion engines, and combustion turbines. Sections 112(j) and 112(d) set MACT for these sources. The affected facilities are required to submit Title V application in two parts and air permitting authorities will issue permit applications to include case-by-case MACT determination.

Title V Operating Permit. The Utah Title V Operating Permit program is discussed in UAC R307-415. A Title V Operating Permit may be required if a facility is a major source under the Title V program, is an acid rain program affected source, or is subject to NESHAP requirements under the CAA. A major source is specified in UAC R307-415-3 as any facility that emits 100 tpy of any criteria pollutant, 10 tpy or more of any single HAP, or 25 tpy or more of total HAP. If a facility contains any affected unit under the acid rain program, it is subject to any acid rain emissions reductions or limitations under 40 CFR 72.6 or 40 CFR 74. A Title V facility is required to submit an annual emission inventory to the Utah DEQ and may be subject to more stringent emission monitoring requirements. On Tribal reservation lands, the operating permit program is administered by the EPA Region 8, under 40 CFR Part 71.

Conformity Rule. The transportation conformity rules are described in 40 CFR Parts 51 and 93. The conformity rules require the establishment of criteria and procedures for transportation plans, programs, and projects to conform to air quality SIP. Under the conformity rules, transportation activities shall not contribute to air quality violations or delay attainment of NAAQS in a nonattainment area.

3.4 AIR QUALITY ANALYSIS FORECAST

3.4.1 Air Quality Impact

To accurately evaluate the air quality impact of current and future resource development in the planning areas, a refined model such as the CALPUFF modeling system by EarthTech, Inc., (2001) is recommended. However, a more general qualitative impact assessment can be done by reviewing air emission trends and meteorology in the planning areas.

The seasonal windroses presented in Figure 3-2 for the I-70 corridor and Moab (in the Moab FO planning area) and Monticello and Bluff (in the Monticello FO planning area) show that prevailing wind speeds rarely exceed 5 meters per second, and vary seasonally in direction. Due to prevailing wind direction in the Moab FO planning area, emission sources located in Price, Utah represent a very minor potential for air quality impacts to the northern portion of the planning area in the spring only; emission sources in Page, Arizona, and Las Vegas, Nevada represent essentially no potential for air quality impacts to the planning area as they are located downwind nearly year-round. Due to prevailing wind direction in the Monticello FO planning area, emission sources located in Price, Utah; Page, Arizona; and Las Vegas, Nevada represent only a very minor potential for air quality impacts to the southern portion of the planning area in the spring, and essentially no potential for air quality impacts the remainder of the year as they are located downwind from the planning area in the winter, summer and fall.

Current air quality in the Moab FO and Monticello FO planning areas is, with the exception of ozone, consistently below the NAAQS by a large margin, as shown in Tables 3.3 and 3.4 (Observed ozone concentrations in the vicinity of the Moab FO and Monticello FO planning areas are less than, but near, the NAAQS). General trends in air quality and visibility impacts specific to new emission sources within the Moab FO and Monticello FO planning areas were evaluated. Potential air quality and visibility impacts assessed included emissions from turbines for gas compression, glycol dehydrators, and fugitive dust from new roads. Exhaust from associated construction and mining vehicles was not assessed as part of this analysis.

Air emissions specific to the construction phase of oil and gas resource development include primarily particulate matter (PM_{10} and $PM_{2.5}$), associated with construction equipment and surface disturbance. Estimates of the potential for air quality and visibility impacts were made with the assumption that primary road traffic would occur during working, daylight hours (7 AM to 7 PM), particularly during the construction period. As with PM_{10} emissions, $PM_{2.5}$ emissions from roadway dust were projected to be greater during the construction and early use of new roadways, decreasing over time and with proper maintenance.

Air emissions specific to the operation and maintenance of oil and gas wells (i.e., well operations, compressor engines, etc.), along with increased traffic include carbon monoxide (CO), oxides of nitrogen (NOx), ozone, particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2). Projections of increased oil and gas activity identified in the mineral potential reports for the Moab FO and Monticello FO planning areas were used in the assessment of potential future emissions. Increases in the number of wells, miles of roads and acres of disturbance, along with other related characteristics were identified as a probable range of values in these reports. In an effort to be conservative, the maximum value of potential increase identified within the given range was used to estimate overall emission levels. Therefore, this assessment represents the increases in emissions projected by maximum growth estimates. Actual growth, and corresponding emission levels will most probably be at levels less than those projected by this assessment.

Additionally, all emission sources were assumed to operate at their maximum emission rates simultaneously throughout the lifetime of the project. In reality, some sources will only emit during a portion of any given day or year. It was also assumed that all oil and gas wells projected would go into production (no "dry holes") within 15 years, and operate at full production levels (no "shut ins"). For calculation of particulate emission increases, it was assumed that primary road traffic would occur during working, daylight hours (7 AM to 7 PM), and that 50% control of particulate emissions would be attained by watering.

Under the current development trend, oil and gas development is expected to increase in the Moab FO and Monticello FO planning areas over the next 15 years, resulting in an increase in air emissions. Emissions of carbon monoxide (CO), oxides of nitrogen (NOx), ozone, particulate matter (PM_{10} and $PM_{2.5}$), and sulfur dioxide (SO_2) specific to oil and gas wells were projected to increase (at maximum) by approximately 43% in the Moab FO and approximately 12% in the Monticello FO planning areas over the next 15 years. Emissions of particulate matter (PM_{10} and $PM_{2.5}$ specific to roadways, pipelines, power lines and associated surface disturbance were projected to increase (at maximum) by approximately 17% in the Moab FO and approximately 4% in the Monticello FO planning areas over the next 15 years. The projected emission concentrations from existing sources and projected new (maximum) growth are displayed in Tables 3.7 and 3.8.

Table 3.7. Projected Ambient Air Quality Concentrations for Moab FO Planning Area

Pollutant	Averaging Period	NAAQS	Monitored (current) Concentration [a]	Projected Concentration from Maximum Growth [b]
CO	1-hour	35 ppm	5.8 ppm	2.5 ppm
	8-hour	9 ppm	3.7 ppm	1.6 ppm
NO_2	Annual	0.053 ppm	0.008 ppm	0.003 ppm
SO_2	3-hour[c]	0.5 ppm	0.06 ppm	0.03 ppm
	24-hour	0.14 ppm	0.017 ppm	0.007 ppm
	Annual	0.03 ppm	0.003 ppm	0.001 ppm
Ozone	1-hour	0.12 ppm	0.075 ppm	0.03 ppm
	8-hour	0.08 ppm	0.06 ppm	0.03 ppm
PM_{10}	24-hour	150 µg/m³	42 µg/m³	2.5 µg/m³
	Annual	50 µg/m³	23 µg/m³	1.4 µg/m³
$PM_{2.5}$	24-hour	65 µg/m³	24 µg/m³	1.4 µg/m³
	Annual	15 µg/m³	12 µg/m³	1 µg/m³

[a] The concentration values listed in this table are based on the monitored concentrations in 2002 and represent the highest values detected in a city of a county (where more than one monitors are present in a given county or a city). The data from the city or county nearest the boundary of the Monticello FO planning area are provided if no monitor is located within the resource planning area boundary.

[b] The projected concentrations represent a maximum growth, maximum emission scenario. Actual concentrations are likely to be substantially lower.

Table 3.8. Projected Ambient Air Quality Concentrations for Monticello FO Planning Area

Pollutant	Averaging Period	NAAQS	Monitored (current) Concentration [a]	Projected Concentration from Maximum Growth [b]
Co	1-Hour	35 ppm	5.8 ppm	1.0 ppm
	8-Hour	9 ppm	3.7 ppm	0.6 ppm
No_2	Annual	0.053 ppm	0.008 ppm	0.001 ppm
So_2	3-Hour	0.5 ppm	0.06 ppm	0.01 ppm
	24-Hour	0.14 ppm	0.017 ppm	0.002 ppm
	Annual	0.03 ppm	0.003 ppm	0.0005 ppm
Ozone	1-Hour	0.12 ppm	0.075 ppm	0.013 ppm
	8-Hour	0.08 ppm	0.06 ppm	0.01 ppm
Pm_{10}	24-Hour	150 µg/m³	42 µg/m³	1.3 µg/m³
	Annual	50 µg/m³	23 µg/m³	0.4 µg/m³
$Pm_{2.5}$	24-Hour	65 µg/m³	24 µg/m³	0.2 µg/m³
	Annual	15 µg/m³	12 µg/m³	0.1 µg/m³

[a] The concentration values listed in this table are based on the monitored concentrations in 2002 and represent the highest values detected in a city of a county (where more than one monitors are present in a given county or a city). The data from the city or county nearest the boundary of the Monticello FO planning area are provided if no monitor is located within the resource planning area boundary.

[b] The projected concentrations represent a maximum growth, maximum emission scenario. Actual concentrations are likely to be substantially lower.

All projected emissions in the Moab FO and Monticello FO planning areas specific to projected growth are well below the established NAAQS criteria.

All projected cumulative emission levels (existing sources plus new projected sources) in the Moab FO planning area are below the established NAAQS criteria with the exception of ozone. All projected cumulative emission levels in the Monticello FO planning area are below the established NAAQS criteria.

The available monitored concentration data were collected from both urban and rural residential areas (Tables 3.3 and 3.4). In many cases these data reflect concentrations greater than those expected to occur within the Moab FO and Monticello FO planning areas. As stated previously, in order to be conservative, all emission sources from increased growth were assumed to operate at their maximum emission rates simultaneously throughout the lifetime of the project (when in reality, some sources will only emit during a portion of any given day or year) so actual emission rates will be lower. Additionally, the projected emissions for carbon monoxide (CO), oxides of nitrogen (NOx), ozone, and sulfur dioxide (SO_2) do not reflect reductions from available mitigation mechanisms available to these sources. With mitigation and the permitting requirements imposed by state and federal permitting processes as appropriate, it is highly unlikely that any exceedence of air quality criteria due to cumulative impacts will occur.

Air emissions specific to the extraction of mineral resources are primarily in the form of particulate matter (PM_{10} and $PM_{2.5}$). Growth in mineral resource extraction activities is projected to be low to moderate in all categories with the exception of sand and gravel, limestone and humates in the Moab FO planning area, and sand and gravel and limestone in the Monticello FO planning area, for which growth potential is projected to be high over the next 15 years.

Using the latest available emission inventory (2002) as the baseline, the emission changes from other industrial developments (e.g. uranium processing, sand and gravel, potash facilities, etc.) are expected to increase by less than 40% (assuming maximum projected growth). With such increases in manmade air emissions from industrial development, air quality is anticipated to continually meet NAAQS in the Moab FO and Monticello FO planning areas.

The increase in air emissions from future resource development is not directly proportional to the increase in overall air pollutant concentrations. In order to better reflect actual emissions concentrations, the estimation of change in air quality as the result of change in the level of resource development in the planning areas needs to discount the contributions from other sources that are not included in the planning actions of the Moab FO and Monticello FO. These other sources include natural sources (wind blown dust, erosion, and wildfire), dust emanating from recreational activities such as dirt biking, jeeping and all terrain vehicles, and other related activities. Air quality impacts from maximum projected growth in resource development within the planning areas only accounts for approximately 12% of particulate and 43% of other air pollutant concentrations in the Moab FO planning area, and approximately 4% of particulate and 17% of other air pollutant concentrations in the Monticello FO planning area.

It should be noted that pollutant concentration and dispersion in southeastern Utah are highly influenced by the complex terrain in the region. Actual air quality impact in a given location may vary depending on many factors mentioned above. The Utah DEQ will have the opportunity to more accurately review the impacts of each new and modified source when air permit application is submitted in the future.

An increase in emissions is expected from future resources development due to surface disturbance, vehicle and construction traffic, well testing and construction, and drilling vehicle exhaust occurring during construction and production. Additional emissions would be associated with reasonably foreseeable secondary growth. The magnitude of air pollution occurring during construction is expected to be minimized by watering, applying chemical or physical stabilizers to disturbed soils and/or replacing/improving surface vegetation, and by air emission restrictions imposed by regulatory agencies and management authorities. The actual pollutant loads produced will depend on the number and type of pollutant sources, source location, duration of loading, and local topographical and meteorological conditions.

Additional, short-term air quality impacts have been observed over the last two years along Interstate 70 (I-70) and US Highway 191 (US 191) in southeastern Utah due to severe wind blown dust ("blowout") conditions. Blowout refers to the dusty conditions due to light winds picking up dust in significant quantities, creating the brownout conditions along the roadways for stretches several miles long. There have been increasing numbers of highway closures and accidents related to the blowout from the Mancos Shale landscapes adjacent to I-70 and US 191. The dust problem has resulted in multiple car pile-ups and will likely result in fatalities in the future (Jackson 2003). A preliminary study conducted by BLM indicated that possible causes of the increasing blowout conditions are: loss of vegetation; wind erosion; natural sand particles; topography; and human disturbance related activities such as road construction, off highway recreational vehicles, pipeline and power transmission development, livestock concentration areas, fires, and arroyo cutting (Jackson 2003). BLM has initiated a process to identify areas of concern and determine appropriate management actions.

3.4.2 Visibility Impact

Regional haze degradation is caused by fine particles and gases scattering and absorbing light. Potential changes to regional haze are calculated in terms of a perceptible "just noticeable change" in visibility when compared to background conditions. A 1.0 deciview (dv) change is considered potentially significant in mandatory federal PSD Class I areas as described in the EPA Regional Haze Regulations (40 CFR 51.300 et seq.). A 1.0 dv change is defined as about a 10% change in the extinction coefficient (corresponding to a 2 to 5 percent change in contrast for a black target against a clear sky at the most optically sensitive distance from an observer), which is a small but noticeable change in haziness under most circumstances when viewing scenes in mandatory federal Class I areas. The Federal Land Manager's Air Quality Related Value Workgroup (FLAG) report has identified a 0.5 deciview (5% change in extinction) threshold as their "Limit of Acceptable Change" for a single source impact, and a 1.0 deciview (10% change in extinction) threshold for cumulative impacts.

The theoretical visibility impact has a logarithmical relation to the air pollutant concentrations in the atmosphere. This complex relationship makes it difficult to estimate the change in visibility as the results of emission changes in the planning areas without a dispersion model, because visibility is affected by many factors such as relative humidity, cloud characteristics, sunlight, and pollutant concentrations.

Visibility protection in Class I areas in Utah applies to Arches National Park, Bryce Canyon National Park, Canyonlands National Park, Capital Reef National Park, and Zion National Park. Most of these areas (Bryce Canyon National Park, Canyonlands National Park, Capital Reef National Park, and Zion National Park) are located west and upwind (based on the predominant wind direction) of the Moab FO and Monticello FO planning areas. Arches National Park is centrally located in the Moab FO planning area and is therefore the most probable of all the Class I areas to be influenced by visibility impacts specific to the planning areas. However, since the increase in SO_2, H_2S, and particulate emissions are expected to be small in comparison to existing emissions, visibility is also not expected to degrade significantly in the future.

Dust (from many sources) has increased and visibility has notably decreased, especially in the I-70 corridor, as discussed previously. However, mitigation associated with dust and other particulate sources is relatively straightforward and highly effective.

3.4.3 Socioeconomic Considerations

According to the CAA, the goal of the air quality standards and regulations is "to protect and enhance the quality of the nation's air resources so as to promote the public health and welfare and productive capacity of its population." The population and economic impacts of the development in the Moab FO and Monticello FO planning areas are to be considered in the Analysis of Management Situation.

The development of the natural resources in the Moab FO and Monticello FO planning areas will create additional job opportunities and promote population and economic growth. The increase in emissions from residential growth or in commuting-related mobile source emissions will be related to the population growth in the area. According to the data by the U.S. Department of Census (2000), the annual population growth rates in Grand County and San Juan County in the past decade (1990-2000) are 2.8% and 1.4%, respectively. Based on this small population growth rate, it can be inferred that the emissions increases related to population growth will also be minimal.

3.5 CONSISTENCY WITH NON-BUREAU PLANS

The Moab FO and Monticello FO manage their resources consistent with other plans not administered by BLM. The EPA Region 8 regulates all air quality related issues in the Tribal reservation lands, while the Utah DEQ regulates the air quality related issues in the state of Utah, except on Tribal reservation lands.

In addition to the federal and state air quality programs mentioned in the previous section, BLM is also committed to manage the Moab FO and Monticello FO planning areas consistent with the Utah Smoke Management Plan (SMP). The BLM, USFS, NPS, Utah Department of Natural Resources, USFWS, and the Utah DEQ currently have a signed Memorandum of Understanding (MOU) to regulate prescribed burning activities in Utah (Utah DAQ 1999). The MOU requires BLM to report all prescribed fire activities to the SMP program coordinator. The Utah DEQ has incorporated the SMP into UAC R307-204 in 2001. Each prescribed fire must first be approved by the SMP through issuance of a burn permit in order to assure that the burning activity will not cause dangerous air quality conditions.

3.6 ISSUES OR CONCERNS

The Utah DEQ indicated that ozone concentrations in Class I areas of the western states have shown significant increases in the past decade and are approaching the NAAQS level (Brock LeBaron, pers. comm. 2003). Although the exact source contributing to the high ozone concentrations has not been verified at this time, there are many concerns that oil and gas development activities in the region are contributing to the significant rise in ozone concentrations in these Class I areas. The Moab FO and Monticello FO will need to consider the impact of ozone precursor pollutants (NOx and VOC) from oil and gas development activities in resource planning.

The Western Regional Air Partnership (WRAP), a collaboration of tribal governments, state governments, and federal agencies, is developing tools that will assist states and tribes in complying with the Regional Haze Regulations. WRAP is currently conducting an analysis as a part of the Regional Haze State Implementation program (Cheryl Heying, pers. comm. 2003). The SO_2 and nitric oxide emissions from oil and gas development activities are being evaluated in this program. As regional haze is becoming a rising concern in the western states, WRAP plans to update this impact study and emission inventory every 5 years. Utah BLM will need to work with WRAP and its member entities in providing oil and gas emission information requested by WRAP.

The USFS indicated concerns for potential impacts from oil and gas development activities in the Class I areas they manage. The USFS requests that BLM conduct a comprehensive cumulative impact analysis of visibility and acid deposition for any Class I areas within the project domain and the Weminuche Wilderness Area, Colorado, located in the extreme southwestern corner of Colorado, near the eastern border of the Monticello FO planning area. The analysis should include all nearby sources and other oil and gas development activities managed by BLM in Utah, Colorado, and New Mexico. Information regarding potential effects on USFS Class II areas near the resource development area will also be helpful for USFS (Sorkin 2003).

Additional concerns center around emissions specific to growth in visitation and through traffic within the Moab FO and Monticello FO planning areas. Current Easter weekend visitation in the Moab area is greater than 20,000 visitors. Most recreational visitors engage in motorized activities that represent emission sources in addition to the highway vehicles utilized for transportation. Annual visitation at the Moab FO planning area alone is currently greater than two million. While local residential growth rates are expected to be moderate over the next 15 years, emissions associated with recreational traffic and related activities represent a potentially greater impact on air quality. BLM should consider the potential impact on air quality of visitation and through traffic in the Moab FO and Monticello FO planning areas.

Prescribed fire and naturally caused fires also present a concern to air quality. Prescribed burning is a useful tool for resource management and may be used to achieve a variety of objectives such as restoring a fire-dependent ecosystem, enhancing forage for cattle, improving wildlife habitat, preparing sites for reforestation, or reducing hazardous fuel loads. Fire, for any of these reasons, will produce smoke and other air pollutants. Some short-term air pollutant releases are necessary to achieve the many benefits of prescribed burning. Short-term effects on air quality from prescribed burns include a general increase in particulate, CO2 and ozone emissions. Land managers recognize that smoke management is critical to avoid air quality intrusions over sensitive areas or visibility problems. Vegetation management is an active part of fire management techniques and long-term effects of prescribed burning include a reduction in particulate, CO2 and ozone emissions specific to wildfire in unmanaged areas. As a result of careful management, there is usually less smoke from a prescribed fire than from a wildfire burning over the same area.

3.7 MANAGEMENT OPPORTUNITIES AND LIMITATIONS

As described in the previous subsections, the air quality in the Moab FO and Monticello FO planning areas is currently being managed by the existing air quality programs administered by the Utah DEQ, SMP, and the EPA. The existing air quality programs adequately cover various aspects of air quality issues in the planning area including new source review, Class I area protection, operating permits, equipment emission standards, and prescribed fire activities.

Although the air quality in the Moab FO and Monticello FO planning areas is being managed by other non-BLM agencies, some management opportunities are identified in this Analysis of Management Situation. Since the air quality issues in the Moab FO and Monticello FO planning areas are under direct administration of the Utah DEQ and the EPA Region 8, BLM will need to work closely with the Utah DEQ and the EPA Region 8 in managing the air resources of these planning areas.

In order to address the increasing "blowout" conditions in southeastern Utah, BLM has initiated a process to identify and map these areas of concern to determine the size and scope of the problem. BLM will find out what management actions on these lands are contributing to these "blowout" areas, and work with affected partners to initiate remediation and restoration to reduce these dangerous situations. In addition, BLM is interested in identifying areas of Mancos-derived soils that may be more prone to dust creation after disturbance. The results of this study may be used for other field offices in the Colorado Plateau region (Jackson 2003). The problem of increased dust presents a management opportunity to decrease surface-disturbing activities on BLM land to alleviate creation of dust.

Cumulative visibility impacts are expected to be minimal and primarily the result of particulate emissions from natural, recreational and resource development sources. Mitigation associated with these sources is relatively straightforward and highly effective. Roads and other recreational and resource development activities in areas with soils susceptible to wind erosion could be appropriately cited and managed to reduce fugitive dust generated by traffic and related activities. Roadways and other heavy or sustained-use surfaces could be treated with water, non-saline dust suppressants, or otherwise surfaced. Such treatments could be used as appropriate on local and resource roads that represent a dust problem. Enforced lower speed limits would also act to limit dust in project and adjacent areas.

Regulatory agencies would be able to determine what emissions restrictions were appropriate during the permitting process occurring prior to construction. Visibility impacts would be mitigated by restrictive control measures for PM_{10} and $PM_{2.5}$.

In addition to the above mitigation measures, a variety of multi-level regulatory processes exist to ensure that pollutant levels do not increase above the identified criteria. Pre-construction permitting processes are required to consider cumulative impacts of proposed and surrounding future sources to ensure that proposed sources within the project area would not contribute to exceedences of the ambient air quality standards.

Although some, short-term air pollutant releases are necessary to achieve the many benefits of prescribed burning, land managers recognize that smoke management is critical to avoid air quality intrusions over sensitive areas or visibility problems. The Utah Interagency Smoke Management Program formulated a Smoke Management Plan (SMP) in February of 2000 that contains specific guidelines for prescribed fires, designed to minimize air quality impacts. The SMP was crafted to ensure that mitigation measures are taken to reduce the impacts of prescribed fire and wildland fire used for resource benefits on public health, safety and visibility. The SMP was designed to satisfy Title R307, of the State of Utah Air Quality Rules, EPA's Interim Air Quality Policy on Wildland and Prescribed Fires (IAQPWPF), and policies from all supporting agencies. The Utah DEQ submitted the SMP to the EPA and has received certification under the IAQPWPF (UISMP 2004). Prescribed burning in the Moab FO and Monticello FO planning areas would comply with the requirements of the Utah Interagency Smoke Management Program and the certified SMP.

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