Five-Year Network Assessment
Ambient Air Monitoring Program
Air Quality Bureau
New Mexico Environment Department
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Available online at http://www.nmenv.state.nm.us/aqb/library.htm

1.0 Purpose of 5-Year Assessment

The purpose of the 5-year assessment as per 40 CFR 58.10 is to "determine, at a minimum, if the network meets the monitoring objectives defined in appendix D to this part, whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network. The network assessment must consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma), and, for any sites that are being proposed for discontinuance, the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies. For PM2.5, the assessment also must identify needed changes to population-oriented sites."

"The network assessment should include (1) re-evaluation of the objectives and budget for air monitoring, (2) evaluation of a network's effectiveness and efficiency relative to its objectives and costs, and (3) development of recommendations for network reconfigurations and improvements." [1]

The rationale for an assessment is that ambient air monitoring objectives have shifted over time because air quality has changed, populations and their behaviors have changed, and new air quality objectives have been established.

2.0 Overview of NMED Air Quality Bureau Air Monitoring Network

The mission of the New Mexico Environment Department's (NMED) Air Quality Bureau (AQB) is to protect the inhabitants and natural beauty of New Mexico by preventing the deterioration of air quality. This includes strategic planning to ensure that all air quality standards are met and maintained, issuing air quality Construction and Operating Permits, and enforcing air quality regulations and permit conditions.

The Air Quality Bureau has authority over air quality in all New Mexico except Bernalillo County, which includes Albuquerque, and Tribal Lands.

The NMED/AQB network is a State and Local Air Monitoring Stations (SLAMS) network. The purpose of the network is to support the National Ambient Air Quality Standards (NAAQS). It is designed to:

- determine highest concentrations expected to occur in the area covered by the network
- determine representative concentrations in areas of high population density
- determine the impact on ambient pollution levels of significant sources or source categories
- determine general background concentration levels.

2.1 Network Regions

The NMED/AQB air monitoring network is comprised of nine regions. These regions are:

- San Juan County
- Taos County
- Santa Fe County
- Sandoval County
- Valencia County
- Southeastern New Mexico
- Las Cruces
- Paso del Norte
- Southwestern New Mexico.

Each region has one or more monitoring sites with continuous and/or non-continuous monitors. Depending on the site, parameters monitored are ozone, sulfur dioxide, nitrogen dioxide, PM_{10}, and $PM_{2.5}$. The continuous monitoring sites also monitor meteorological data. Pertinent site information can be found in the "Network Elements" file in Appendix 1. Maps of these areas and their respective sites are found in Appendix 1. The public can retrieve hourly data from the continuous sites at the following link: http://air.nmenv.state.nm.us.

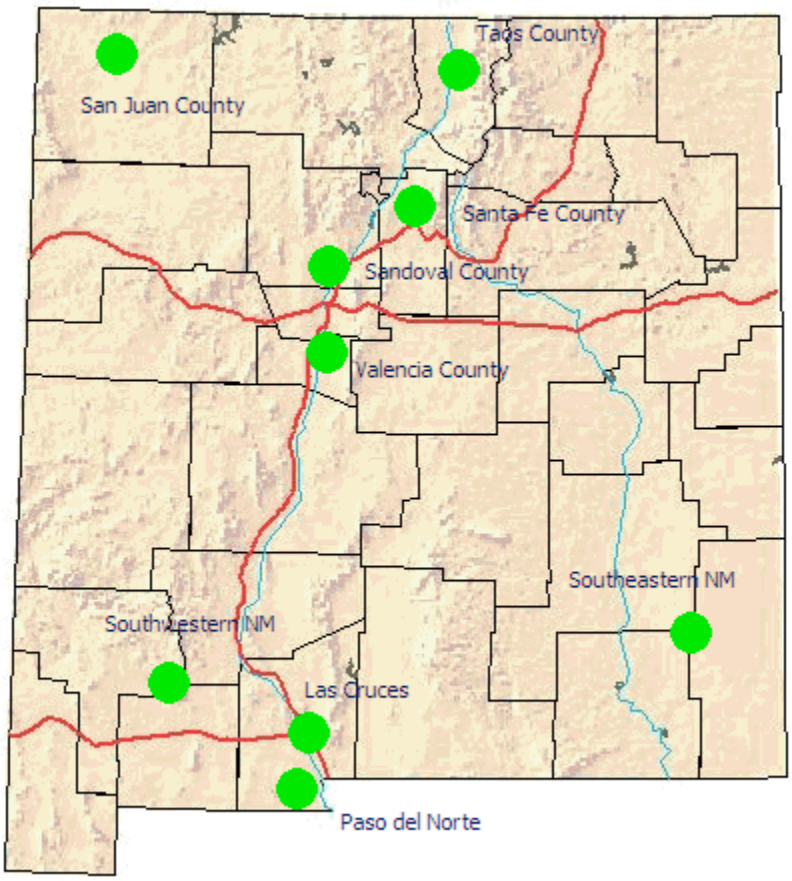


Figure 1 Map of New Mexico Monitoring Regions

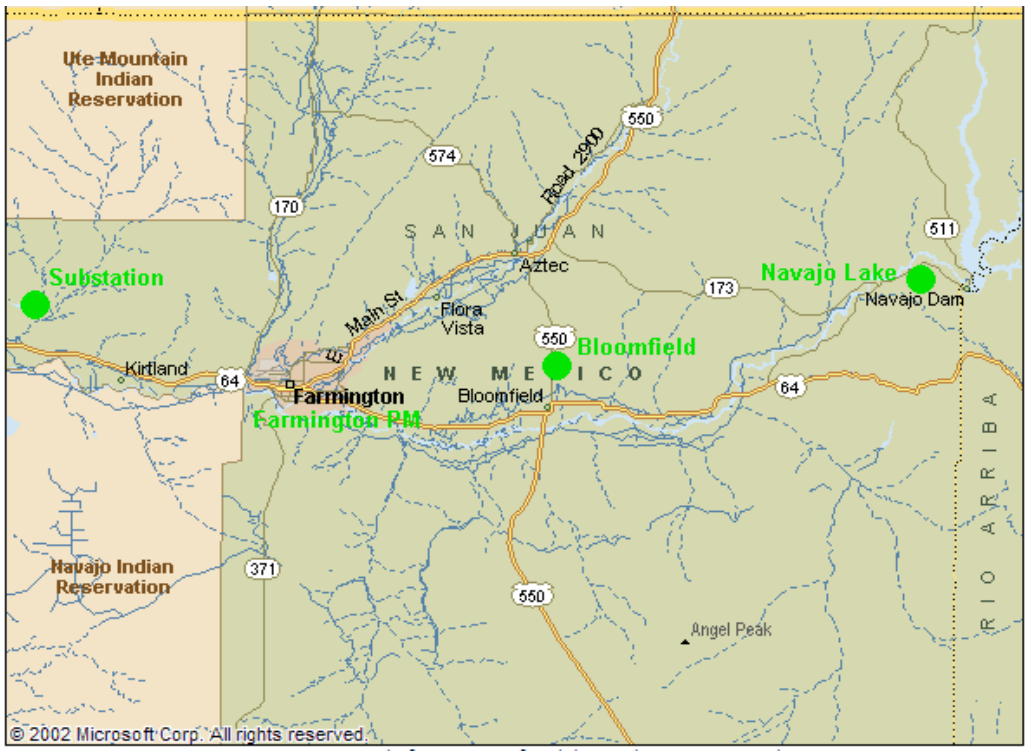


Figure 2 Map of San Juan County Monitoring Sites

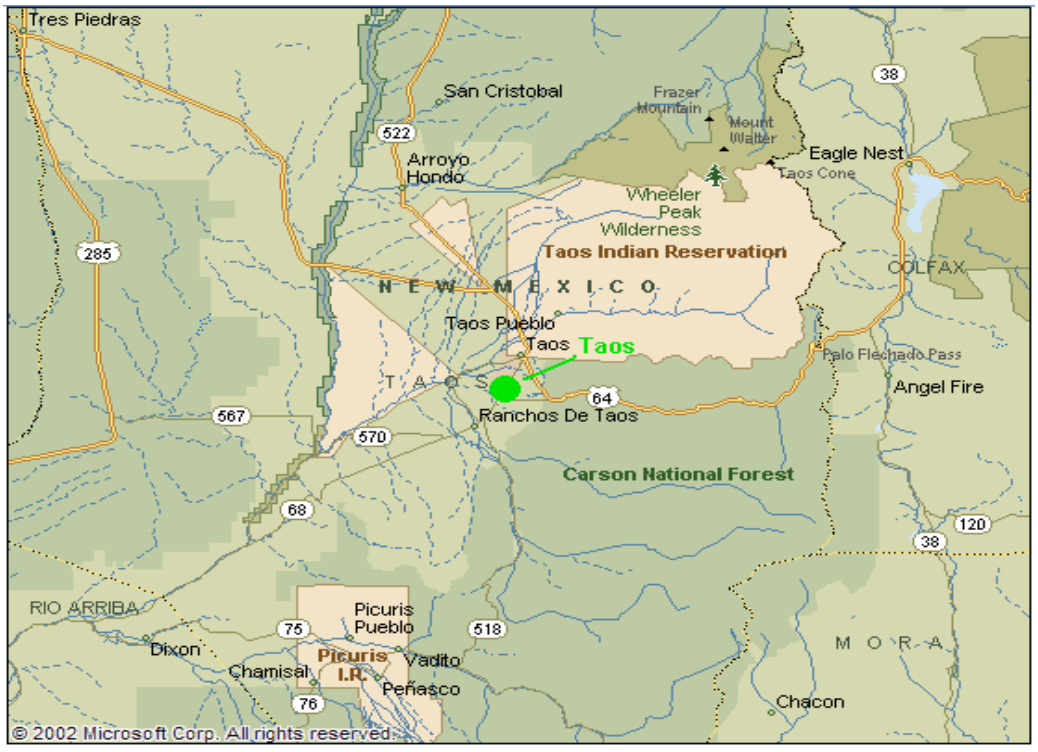


Figure 3 Map of Taos County Monitoring Sites

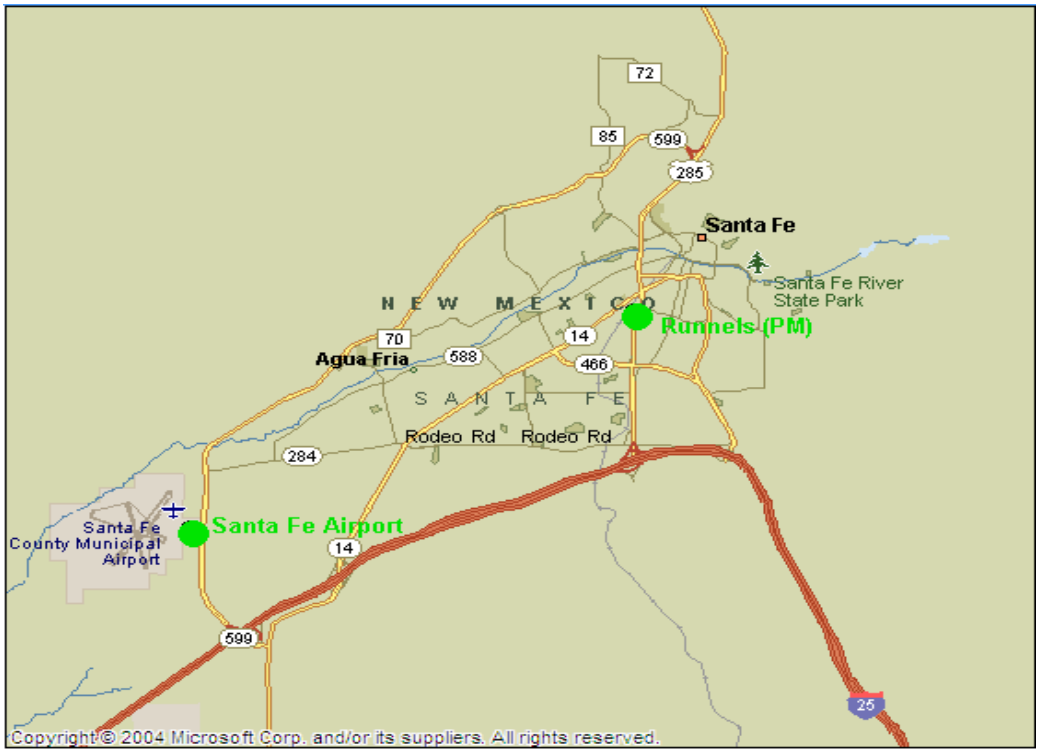


Figure 4 Map of Santa Fe County Monitoring Sites

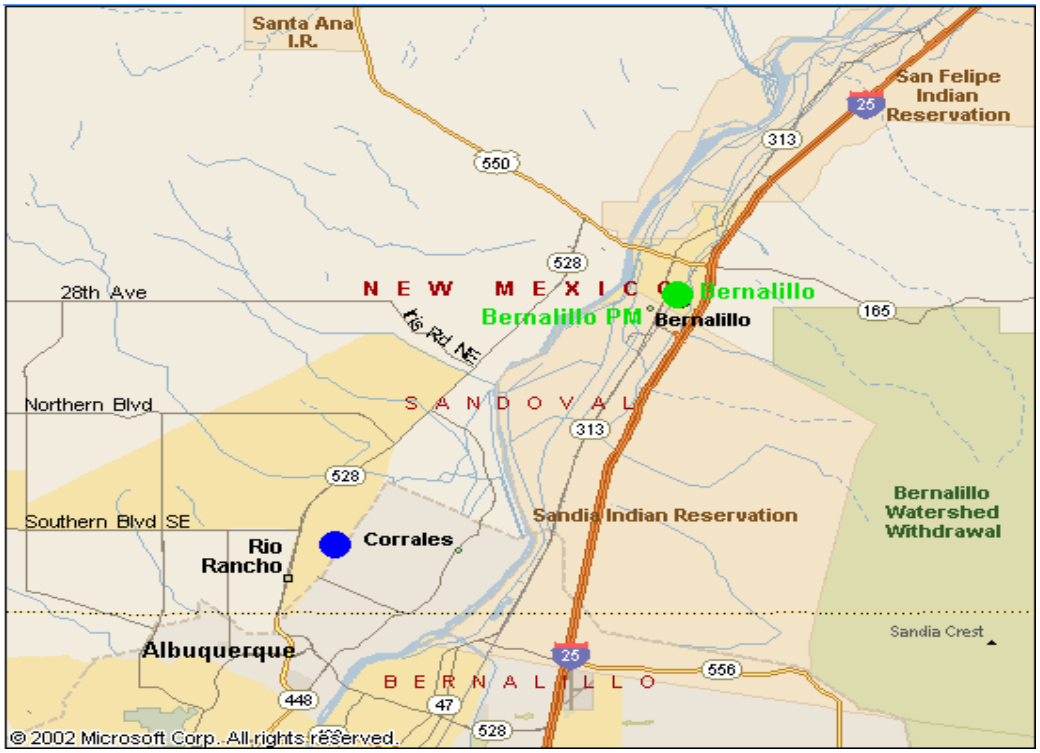


Figure 5 Map of Sandoval County Monitoring Sites

Figure 6 Map of Valencia County Monitoring Sites

Figure 7 Map of Southeastern New Mexico Monitoring Sites

Figure 8 Map of Las Cruces Monitoring Sites

Figure 9 Map of Paso del Norte Monitoring Sites

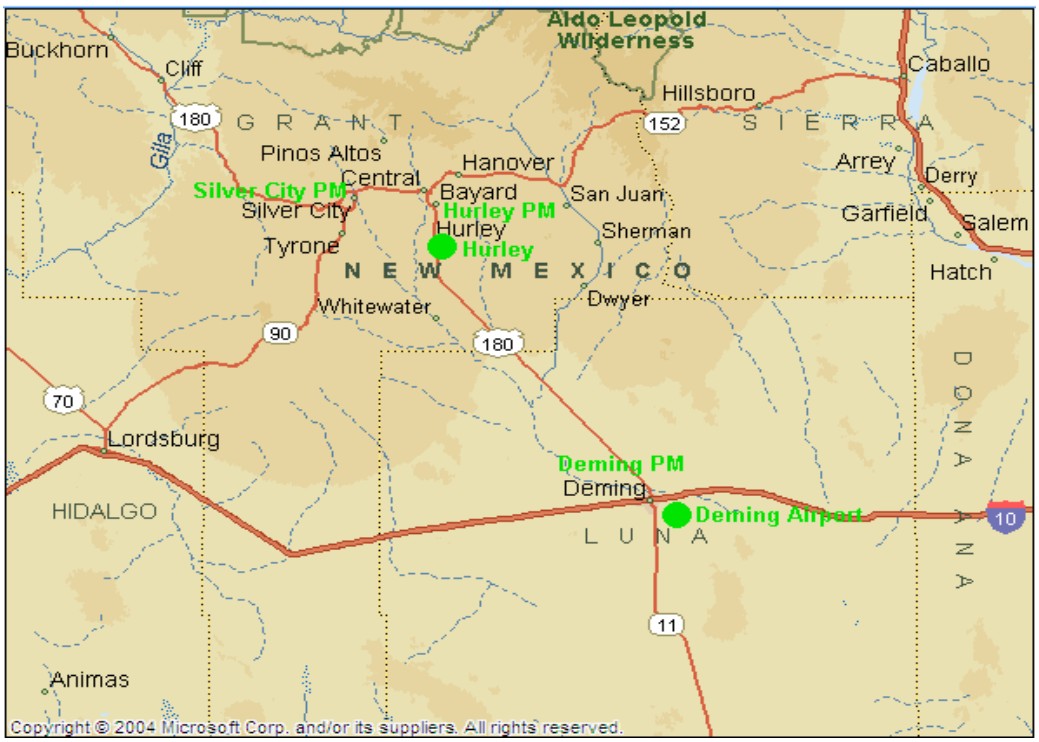


Figure 10 Map of Southwestern New Mexico Monitoring Sites

2.2 Network History

Some of the active sites in the network have been operational since 1974. Most of the sites that have been in operation the longest are PM sites. Exceptions are:

- Sulfur dioxide monitoring at Substation, which commenced in 1974 to determine the impact of the power plants in the area.
- Ozone monitoring at La Union, which commenced in 1979.
- Sulfur dioxide monitoring at Hurley, which commenced in 1997 to determine the impact of local copper smelter.

The history of the network's active sites is found in Appendix 2.

2.3 Air Quality Summary

2.3.1 NAAQS

The major NAAQS concerns for the network have been ozone and PM_{10}.

Sunland Park was officially designated as nonattainment for the 1-hour ozone NAAQS in a Federal Register announcement published June 12, 1995. The nonattainment area included the communities of Sunland Park, Santa Teresa, and La Union. Exceedances of the 1-hour ozone NAAQS occurred at both the Sunland Park City Yards and La Union monitoring sites.

Due to the revocation of the 1-hour NAAQS for ozone in 2005, EPA required that all areas that were currently nonattainment for the 1-hour NAAQS, but in attainment for the new 8-hour NAAQS for ozone, conduct an analysis to re-designate those nonattainment areas to attainment/maintenance status. An attainment plan was submitted to EPA for the Sunland Park area in June 2007. NMED is still waiting for EPA approval of the attainment plan.

All other counties in New Mexico under NMED jurisdiction have been in attainment for ozone.

Anthony was designated "non-attainment" for PM_{10} in 1991 due to high-wind exceedances, and it is still in "non-attainment" due to low-wind exceedances in 2004. None of the other counties in southern New Mexico are considered to be in "non-attainment"; however, the New Mexico Air Quality Bureau has recorded exceedances of PM_{10} in Doña Ana and Luna County. In response to these recorded exceedances of the standard for PM_{10}, Natural Events Action Plans (NEAP) for Doña Ana and Luna County have been prepared and submitted to the U.S. Environmental Protection Agency.

Although the sulfur dioxide NAAQS has not been a concern, Hurley's sulfur dioxide monitor has been "under maintenance" since 2003.

2.3.2 Air Quality Index and Health Issues

2.3.2.1 County-to-County Health Comparisons

The health of citizens in New Mexico is affected by the quality of the air, which can be interpreted using the Air Quality Index (AQI). Although Las Cruces is the only MSA in New Mexico under NMED jurisdiction that is listed in the U.S. EPA's AirNow AQI website, there are county-to-county comparisons listed on the site that can be used by the general public. These comparisons are used to show which criteria pollutants affect certain sub-groups of the population. The sub-groups and pollutants affecting them are:

- Groups with asthma or lung disease: Ozone, PM, and Sulfur Dioxide
- Groups with heart disease: PM and Carbon Monoxide
- Children: Ozone and PM
- Older Adults: Ozone and PM
- Groups engaging in Outdoor Activities: Ozone and Sulfur Dioxide

The county-to-county comparisons for 2009 are shown in Appendix 3 for:

- Chaves County
- Dona Ana County
- Eddy County
- Grant County
- Lea County
- Luna County
- San Juan County
- Sandoval County
- Santa Fe County

A 2000 to 2009 history for each county and its respective sub-groups is shown in Appendix 4.

2.3.2.2 Asthma and Heart Attack Issues

While New Mexico's overall asthma rate is similar to the national rate, there are significant regional, racial/ethnic, gender, and age group variations within the state, including a profound regional disparity.

Although the New Mexico 2004-2006 age-adjusted first-listed asthma hospitalization rate was 10.2 per 10,000 standard population, the asthma hospitalization rate (21.0) in the southeast region of New Mexico was more than double the state rate. All other geographic regions had rates ranging from 7.7 to 9.2.

Among youth under age 15, Lea County had an asthma hospitalization rate (118.2) which was more than five times higher than the state rate (21.7).[2] for this age group.

In addition to the monitored presence of asthma antagonists (ozone and PM) in southeastern New Mexico, there is a presence of hydrogen sulfide, which also seems to affect certain population sub-groups.

The executive summary of a World Health Organization report states: "Since the respiratory tract is the major target organ of hydrogen sulfide toxicity, humans with asthma, the elderly, and young children with compromised respiratory function represent sensitive subpopulations."[3]

New Mexico Department of Health (NMDOH) has expressed concerns about the possible influence of hydrogen sulfide on asthma statistics. Although there is no NAAQS for hydrogen sulfide, the NMED/AQB standard for areas outside of municipalities in the Permian Basin is 0.100 ppm as a ½-hour average. For municipalities, the standard is 0.030 ppm. Because there are no NAAQS for hydrogen sulfide, NMED / AQB does not conduct any monitoring for H_2S at this time.

The NMDOH's Epidemiology Bureau analyzed hospitalizations for heart attack in the state. After incorporating hospitalizations among residents who were seen in Texas (data from Texas Department of State Health Services), the highest rates were among counties in the southeast portion of New Mexico. For example, the state age-adjusted rate in 2006 was 15 heart attack hospitalizations per 10,000 population. In comparison, the rate for Eddy County in the same year was 24.6 heart attack hospitalizations per 10,000. Similarly, Lea County had a rate of 23 per 10,000. Increasingly, investigators both in the United States and abroad have shown significant relationships between air pollutants and increased risk for heart attack and other forms of coronary heart disease.

Models have demonstrated increases in heart attack hospitalization rates in relation to fine particles ($PM_{2.5}$), particularly in sensitive sub-populations such as the elderly, patients with pre-existing heart disease, survivors of heart attack, or those with chronic obstructive pulmonary disease (COPD).

An increase of 10 ug $PM_{2.5}$ /m³ was associated with a 4.5% elevation in risk of unstable angina (chest pain) and heart attack.

Mortality statistics have been linked for a 16-year period to chronic exposure to multiple air pollutants in 500,000 adults who resided across all 50 states.

2.3.3 Air Quality and Environmental Justice

The EPA defines environmental justice as:

"Environmental Justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, culture, education, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair Treatment means that no group of people, including racial, ethnic, or socioeconomic groups, should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal environmental programs and policies. Meaningful Involvement means that: (1) potentially affected community residents have an appropriate opportunity to participate in decisions about a proposed activity that will affect their environment and/or health; (2) the public's contribution can influence the regulatory agency's decision; (3) the concerns of all participants involved will be considered in the decision-making process; and (4) the decision-makers seek out and facilitate the involvement of those potentially affected."[4]

In addressing the "fair treatment" aspect, NMED/AQB received a grant from the EPA to conduct a six-month study to investigate the causes of low-wind PM_{10} exceedances in the northern end of the Paso del Norte air shed surrounding Sunland Park, New Mexico, including adjacent areas of Colonia Anapra, Mexico.

This area of perhaps greater than 10,000 population has very little infrastructure and very few paved roads. As a result, particulate matter probably consisting of smoke from burning for cooking and heating and vehicle-generated dust is persistent.

As stated before, PM has an impact on populations with asthma and heart disease, children, and older adults.

NMED/AQB established a partnership with the Secretaría del Medio Ambiente y Recursos Naturales (SEMARNAT), Mexico's environmental ministry, and Ciudad Juarez Direccion de Normatividad Ambiental (DNA), the local regulatory agency, to design, implement and operate a temporary particulate monitoring network in the Colonia of Anapra, Mexico. After the study, six of the particulate monitors obtained with the grant funds were given to DNA.

A report of the study was prepared by Desert Research Institute for NMED/AQB. Copies of the report may be obtained from Terry Hertel at the New Mexico Environment Department, Air Quality Bureau, 1301 Siler Road, Building B, Santa Fe, NM 87507, email

terry.hertel@state.nm.us, phone (505) 476-4316. The reports are posted at www.nmenv.state.nm.us/aqb/library.htm.

2.4 Population Summary

This section addresses the breakdown of overall and Core-Based Statistical Areas in the state of New Mexico.

There are two Combined Statistical Areas (CSAs), four Metropolitan Statistical Areas (MSAs), and 15 Micropolitan Statistical Areas (μSAs) in the State of New Mexico.[5]

2.4.1 Metropolitan Statistical Areas

The four MSAs in New Mexico are Albuquerque, Farmington, Las Cruces, and Santa Fe. The MSAs are defined as follows:

Albuquerque MSA
- Bernalillo County
- Sandoval County
- Torrance County
- Valencia County

Farmington MSA
- San Juan County

Las Cruces MSA
- Doña Ana County

Santa Fe MSA
- Santa Fe County

The Albuquerque MSA has seen a population increase of 17.58% from 2000 to 2009. In the Albuquerque MSA, NMED/AQB only has monitors in Sandoval and Valencia counties. The City of Albuquerque's air monitoring program covers the rest of this MSA. The Farmington MSA has seen a population increase of 9.08% from 2000 to 2009. The Las Cruces MSA has seen a population increase of 18.17% from 2000 to 2009. The Santa Fe MSA has seen a population increase of 14.11% from 2000 to 2009. The U. S. Census Bureau 2000-2009 population change data of these MSAs is shown in Appendix 5.

2.4.2 Combined Statistical Areas

The two CSAs in New Mexico are Clovis-Portales and Santa Fe-Espanola. The CSAs are defined as follows:

Clovis-Portales CSA
- Clovis Micropolitan Statistical Area
  - Curry County

Portales Micropolitan Statistical Area
Roosevelt County

Santa Fe-Espanola CSA
Santa Fe Metropolitan Statistical Area
Santa Fe County
Espanola Micropolitan Statistical Area
Rio Arriba County

The Clovis-Portales CSA has seen a population increase of 0.26% from 2000 to 2009. The NMED/AQB does not operate any monitors in this CSA. The Santa Fe-Espanola CSA has seen a population increase of 10.40% from 2000 to 2009. The NMED/AQB does not operate any monitors in Rio Arriba County. The U. S. Census Bureau 2000-2009 population change data of these CSAs is also shown in Appendix 5.

2.4.3 Micropolitan Statistical Areas

The fifteen µSAs in New Mexico are defined as follows:

Alamogordo µSA***
Otero County

Carlsbad-Artesia µSA
Eddy County

Clovis µSA***
Curry County

Deming µSA
Luna County

Espanola µSA***
Rio Arriba County

Gallup µSA***
McKinley County

Grants µSA***
Cibola County

Hobbs µSA
Lea County

Las Vegas µSA***
San Miguel County

Los Alamos μSA***
Los Alamos County

Portales μSA***
Roosevelt County

Roswell μSA
Chaves County

Ruidoso μSA***
Lincoln County

Silver City μSA
Grant County

Taos μSA
Taos County

***** The NMED/AQB does not operate any monitors in these μSAs.

The U. S. Census Bureau 2000-2009 population change data of these μSAs is shown in Appendix 6.

2.4.4 Anticipated Growth

The growth of these 2 Combined Statistical Areas (CSAs), 4 Metropolitan Statistical Areas (MSAs), and 15 Micropolitan Statistical Areas (μSAs) is anticipated to maintain a similar trend over the next several years.

2.5 Meteorological Summary

2.5.1 Wind Roses

Wind roses were generated for monitoring sites in counties where the NAAQS for ozone and nitrogen dioxide may potentially be an issue.

As a general rule, wind patterns (annual and seasonal) have remained similar for the sites over the three-year period of 2006 through 2008. Three sites were chosen to illustrate this fact. The sites are:

- Sunland Park in Dona Ana County
- Navajo Lake in San Juan County
- Carlsbad in SE New Mexico

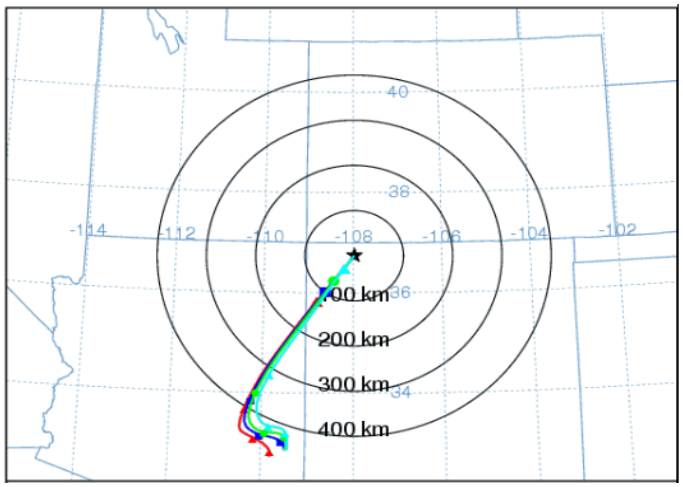
Plots of these wind patterns are shown in Appendix 7. Wind roses for the remaining sites in New Mexico are shown in Appendix 8.

2.5.2 Pollution Roses

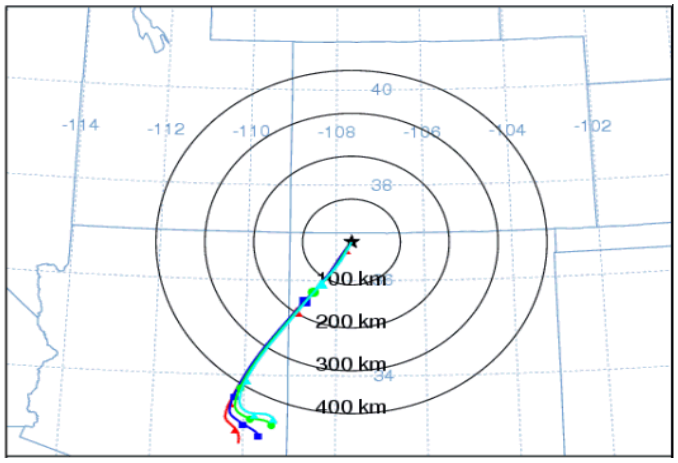
Pollution roses were generated for monitoring sites in counties where the NAAQS for ozone and nitrogen dioxide may potentially be an issue. Pollution roses for these sites are shown in Appendix 9. The ozone and NO_x pollution roses for the Substation site seem to show an influence from the power plant that is located immediately to the east of the site.

2.5.3 Upwind Transport

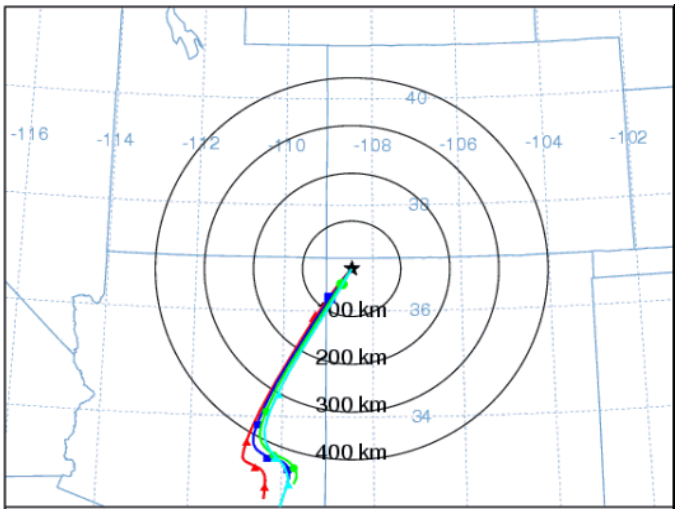
Transport of pollutants is becoming more of an issue. In many cases, it is evident that ozone transport from outside of the network takes place. Figure 1 shows this influence for the San Juan County ozone sites. The NOAA HYSPLIT model shows transport coming from south eastern Arizona for the hours between 9 PM MDT 10/04/09 and 1 AM MDT 10/05/09. Figure 2 shows transport from Mexico affecting the Deming and Hurley sites on 01/22/10. Other transport examples are shown in Appendix 10.



Bloomfield 10PM 10/04/09

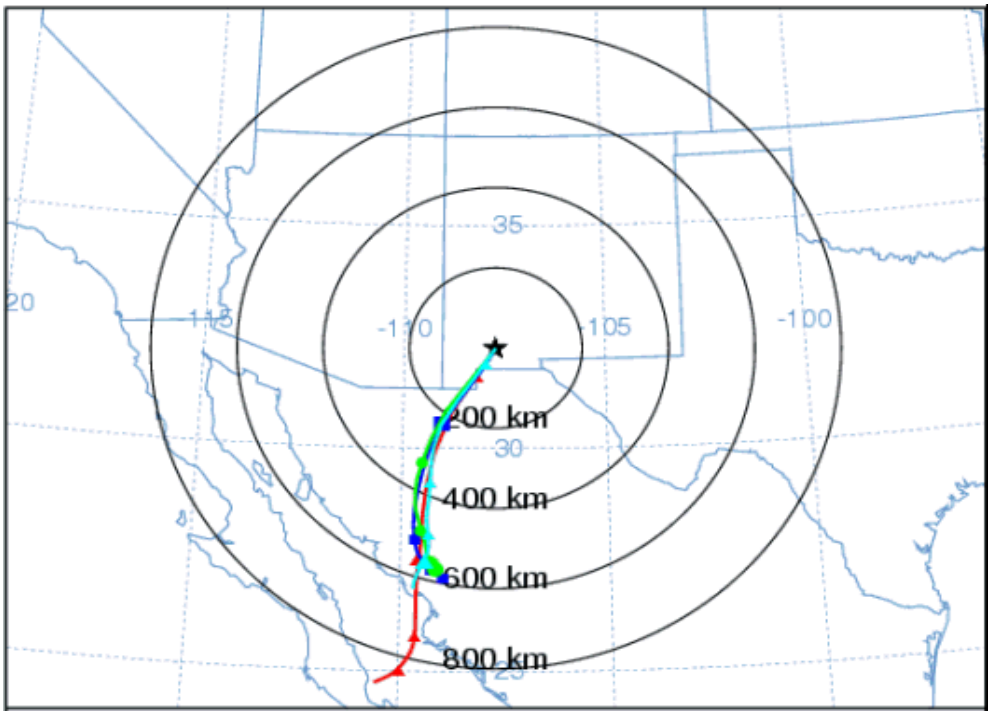


Navajo Lake 1AM 10/05/09

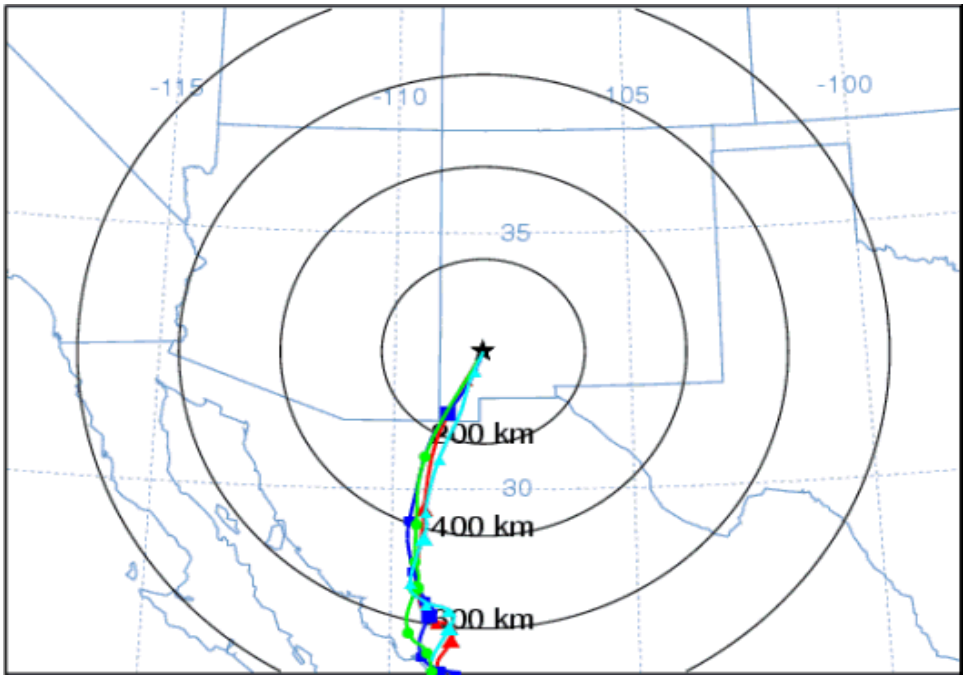


Substation 9PM 10/04/09

Figure 11 NOAA HYSPLIT Trajectories for Four Corners Area



Deming Midnight MST 01/22/10



Hurley Midnight MST 01/22/10

Figure 12 NOAA HYSPLIT Back Trajectories for Southwestern New Mexico

2.5.4 Downwind Transport

Just as the NMED/AQB network is affected by upwind transport from areas outside of the network, certain areas in the network can have downwind impacts on other networks and states. Emissions from the power plants in San Juan County can impact the adjoining states in the Four Corners area. Emissions from vehicle traffic and particulate emissions from housing developments in Sandoval County can impact the city of Albuquerque and Bernalillo County. Particulates generated by the burning of pecan tree cuttings in Dona Ana County can impact the Paso del Norte area in Texas and Mexico.

2.5.5 Forecasting

NMED/AQB does not have any assigned forecasters, so upper air and stagnation data are not used.

2.6 Uses of Network Data

Data collected by the NMED/AQB network has various end uses. Data is submitted to AQS, which in turn determines whether or not network site monitors are in compliance with the NAAQS. AIRNow uses PM and ozone data to generate Air Quality Index forecasts. The Four Corners Air Quality Group reviews air quality data to learn about current conditions which assists in reviewing progress on mitigation of air quality impacts. The New Mexico Department of Health uses data to conduct health outcome modeling.

3.0 Emissions Inventory Summary

NMED/AQB conducts point source emissions inventories for counties in New Mexico, including the following pollutants:

- Nitrogen Dioxide
- Sulfur Dioxide
- PM_{10}
- $PM_{2.5}$

The inventories evaluated are for the years 2004, 2006, and 2008. Figure 3 shows the state-wide emissions trend for the three years. Over the past five years, nitrogen dioxide and sulfur dioxide emissions have decreased. As a result, background concentrations have also decreased. PM_{10} emissions have remained fairly stable. $PM_{2.5}$ emissions for 2006 and 2008 were higher than those of 2004 because in 2004 the point sources had not calculated and reported $PM_{2.5}$ properly.

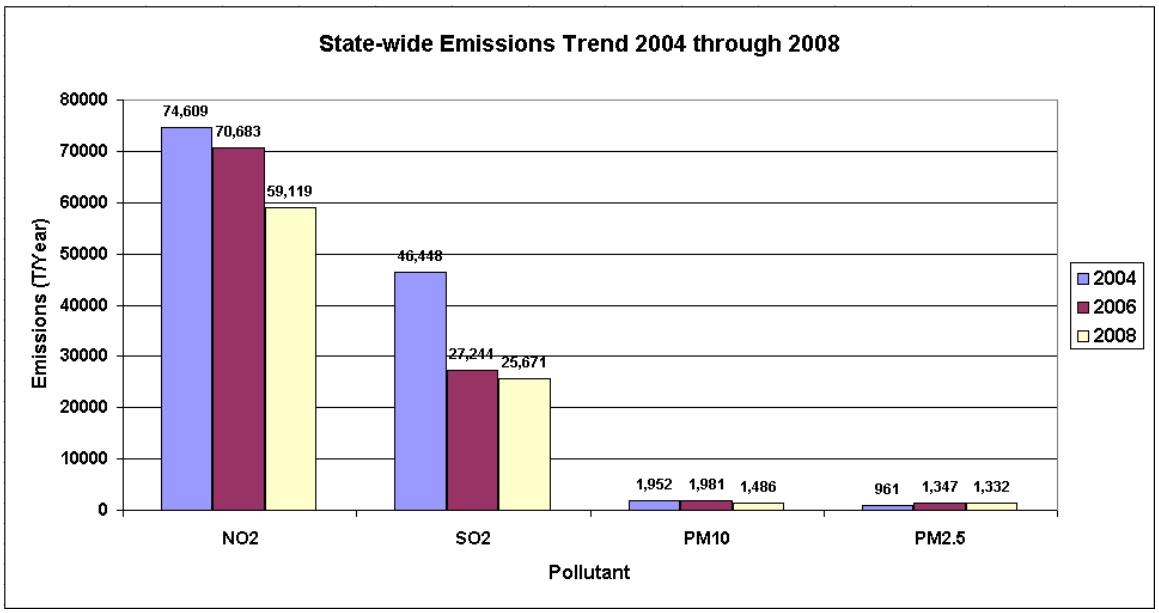


Figure 13 State-wide Emissions Trend 2004 through 2008

Figure 4 and Figure 5 show emissions data for counties with the most significant nitrogen dioxide and sulfur dioxide emissions. Inventory files and graphs are found in Appendix 11.

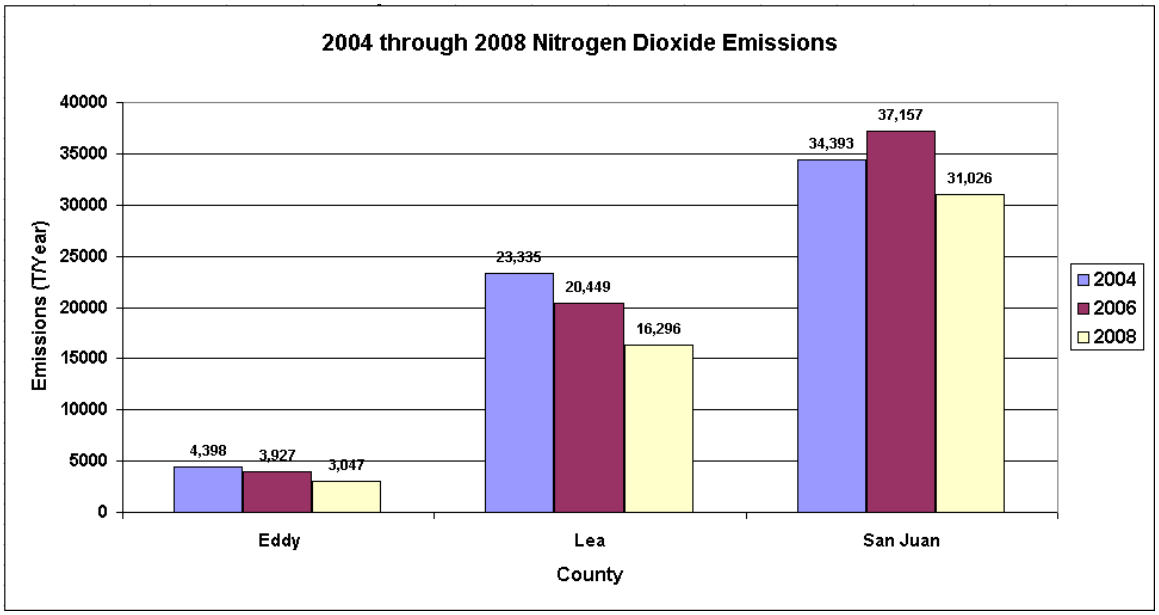


Figure 14 Nitrogen Dioxide Emissions Trend 2004 through 2008

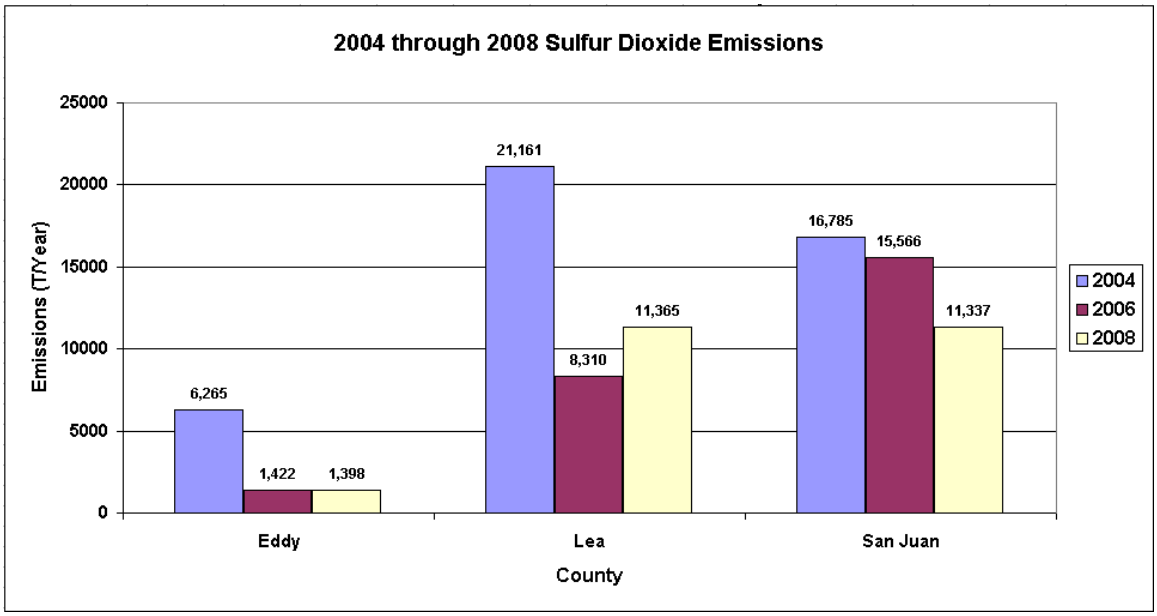


Figure 15 Sulfur Dioxide Emissions Trend 2004 through 2008

4.0 Monitoring Network Ozone Sites

NMED/AQB operates sixteen ozone monitors in eight regions. With the exception of Desert View, the 2006 to 2008 design values for all sites were below the NAAQS of 0.075 ppm.

4.1 San Juan County

4.1.1 San Juan Substation

4.1.1.1 Design Values

The 2006 to 2008 ozone design value for Substation was 0.071 ppm, which was below the NAAQS. The design value and associated data is shown in Appendix 12.

4.1.1.2 Pollutant Trends

The pollutant trend for ozone at Substation has been at or below the NAAQS since 2001. The pollutant trend plot is shown in Appendix 12.

4.1.1.3 Design Requirements

4.1.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.1.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.1.2 Bloomfield

4.1.2.1 Design Values

The 2006 to 2008 ozone design value for Bloomfield was 0.065 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.1.2.2 Pollutant Trends

The pollutant trend for ozone at Bloomfield has been at or below the NAAQS since 2003. The pollutant trend plot is shown in Appendix 12.

4.1.2.3 Design Requirements

4.1.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.1.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.1.3 Navajo Lake

4.1.3.1 Design Values

The 2006 to 2008 ozone design value for Navajo Lake was 0.075 ppm, which was right at the NAAQS. The design value and associated data are shown in Appendix 12.

4.1.3.2 Pollutant Trends

The pollutant trend for ozone at Navajo Lake has been at or below the NAAQS since 2008. The pollutant trend plot is shown in Appendix 12.

4.1.3.3 Design Requirements

4.1.3.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.1.3.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.2 Santa Fe County

4.2.1 Santa Fe Airport

4.2.1.1 Design Values

The 2006 to 2008 ozone design value for Santa Fe Airport was 0.064 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.2.1.2 Pollutant Trends

The pollutant trend for ozone at Santa Fe Airport has been at or below the NAAQS since 2007. The pollutant trend plot is shown in Appendix 12.

4.2.1.3 Design Requirements

4.2.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.2.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.3 Sandoval County

4.3.1 Bernalillo

4.3.1.1 Design Values

The 2006 to 2008 ozone design value for Bernalillo was 0.061 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.3.1.2 Pollutant Trends

The pollutant trend for ozone at Bernalillo has been at or below the NAAQS since 1990. The pollutant trend plot is shown in Appendix 12.

4.3.1.3 Design Requirements

4.3.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.3.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.4 Valencia County

4.4.1 Los Lunas

4.4.1.1 Design Values

There is no 2006 to 2008 ozone design value for Los Lunas because the site was started in 2009.

4.4.1.2 Pollutant Trends

There is no pollution trend data for Los Lunas because the site was started in 2009.

4.4.1.3 Design Requirements

4.4.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.4.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.5 Southeastern New Mexico

4.5.1 Carlsbad

4.5.1.1 Design Values

The 2006 to 2008 ozone design value for Carlsbad was 0.069 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.5.1.2 Pollutant Trends

The pollutant trend for ozone at Carlsbad has been at or below the NAAQS since 1997. The pollutant trend plot is shown in Appendix 12.

4.5.1.3 Design Requirements

4.5.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.5.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.5.2 Hobbs

4.5.2.1 Design Values

The 2006 to 2008 ozone design value for Hobbs was 0.068 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.5.2.2 Pollutant Trends

The pollutant trend for ozone at Hobbs has been at or below the NAAQS since 2004. The pollutant trend plot is shown in Appendix 12.

4.5.2.3 Design Requirements

4.5.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.5.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.6 Las Cruces

4.6.1 Solano

4.6.1.1 Design Values

The 2006 to 2008 ozone design value for Solano was 0.065 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.6.1.2 Pollutant Trends

The pollutant trend for ozone at Solano has been at or below the NAAQS since 2004. The pollutant trend plot is shown in Appendix 12.

4.6.1.3 Design Requirements

4.6.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.6.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.7 Paso del Norte

4.7.1 Chaparral

4.7.1.1 Design Values

The 2006 to 2008 ozone design value for Chaparral was 0.069 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.7.1.2 Pollutant Trends

The pollutant trend for ozone at Chaparral has been at or below the NAAQS since 1991. The pollutant trend plot is shown in Appendix 12.

4.7.1.3 Design Requirements

4.7.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.7.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.7.2 Desert View

4.7.2.1 Design Values

The 2006 to 2008 ozone design value for Desert View was 0.076 ppm, which was above the NAAQS. The design value and associated data are shown in Appendix 12.

4.7.2.2 Pollutant Trends

With the exception of 2004, the pollutant trend for ozone at Desert View has been at or above the NAAQS since 1996. The pollutant trend plot is shown in Appendix 12.

4.7.2.3 Design Requirements

4.7.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.7.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.7.3 La Union

4.7.3.1 Design Values

The 2006 to 2008 ozone design value for La Union was 0.070 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.7.3.2 Pollutant Trends

The pollutant trend for ozone at La Union has been at or below the NAAQS since 2004. The pollutant trend plot is shown in Appendix 12.

4.7.3.3 Design Requirements

4.7.3.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.7.3.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.7.4 Santa Teresa

4.7.4.1 Design Values

The 2006 to 2008 ozone design value for Santa Teresa was 0.072 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.7.4.2 Pollutant Trends

The pollutant trend for ozone at Santa Teresa has been at or below the NAAQS since 2004. The pollutant trend plot is shown in Appendix 12.

4.7.4.3 Design Requirements

4.7.4.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.7.4.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.7.5 Sunland Park

4.7.5.1 Design Values

The 2006 to 2008 ozone design value for Sunland Park was 0.069 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.7.5.2 Pollutant Trends

The pollutant trend for ozone at Sunland Park has been at or below the NAAQS since 2004. The pollutant trend plot is shown in Appendix 12.

4.7.5.3 Design Requirements

4.7.5.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.7.5.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.8 Southwestern New Mexico

4.8.1 Deming Airport

4.8.1.1 Design Values

The 2006 to 2008 ozone design value for Deming Airport was 0.058 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.8.1.2 Pollutant Trends

The pollutant trend for ozone at Deming Airport has been at or below the NAAQS since 2006. The pollutant trend plot is shown in Appendix 12.

4.8.1.3 Design Requirements

4.8.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.8.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

4.8.2 Hurley

4.8.2.1 Design Values

The 2006 to 2008 ozone design value for Hurley was 0.064 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 12.

4.8.2.2 Pollutant Trends

The pollutant trend for ozone at Hurley has been at or below the NAAQS since 2005. The pollutant trend plot is shown in Appendix 12.

4.8.2.3 Design Requirements

4.8.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

4.8.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

5.0 Monitoring Network Nitrogen Dioxide Sites

NMED/AQB operates eight nitrogen dioxide monitors in four regions. The 2007 to 2008 design values for all sites were below the "highest annual average 1-hour concentration during the most recent two years" NAAQS of 0.053 ppm.

5.1 San Juan County

5.1.1 San Juan Substation

5.1.1.1 Design Values

The 2007 to 2008 nitrogen dioxide design value high for Substation was 0.0104 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 13.

5.1.1.2 Pollutant Trends

The pollutant trend for nitrogen dioxide at Substation has been well below the NAAQS since 1997. The pollutant trend plot is shown in Appendix 13.

5.1.1.3 Design Requirements

5.1.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

5.1.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

5.1.2 Bloomfield

5.1.2.1 Design Values

The 2007 to 2008 nitrogen dioxide design value high for Bloomfield was 0.0159 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 13.

5.1.2.2 Pollutant Trends

The pollutant trend for nitrogen dioxide at Bloomfield has been well below the NAAQS since 1997. The pollutant trend plot is shown in Appendix 13.

5.1.2.3 Design Requirements

5.1.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

5.1.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

5.1.3 Navajo Lake

5.1.3.1 Design Values

The 2007 to 2008 nitrogen dioxide design value high for Navajo Lake was 0.0103 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 13.

5.1.3.2 Pollutant Trends

The pollutant trend for nitrogen dioxide at Navajo Lake has been well below the NAAQS since 2006. The pollutant trend plot is shown in Appendix 13.

5.1.3.3 Design Requirements

5.1.3.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

5.1.3.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

5.2 Southeastern New Mexico

5.2.1 Carlsbad

5.2.1.1 Design Values

The 2007 to 2008 nitrogen dioxide design value high for Carlsbad was 0.0031 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 13.

5.2.1.2 Pollutant Trends

The pollutant trend for nitrogen dioxide at Carlsbad has been well below the NAAQS since 1998. The pollutant trend plot is shown in Appendix 13.

5.2.1.3 Design Requirements

5.2.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

5.2.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

5.2.2 Hobbs

5.2.2.1 Design Values

The 2007 to 2008 nitrogen dioxide design value high for Hobbs was 0.0065 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 13.

5.2.2.2 Pollutant Trends

The pollutant trend for nitrogen dioxide at Hobbs has been well below the NAAQS since 2005. The pollutant trend plot is shown in Appendix 13.

5.2.2.3 Design Requirements

5.2.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

5.2.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

5.3 Paso del Norte

5.3.1 Desert View

5.3.1.1 Design Values

The 2007 to 2008 nitrogen dioxide design value high for Desert View was 0.0094 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 13.

5.3.1.2 Pollutant Trends

The pollutant trend for nitrogen dioxide at Desert View has been well below the NAAQS since 1996. The pollutant trend plot is shown in Appendix 13.

5.3.1.3 Design Requirements

5.3.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

5.3.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

5.3.2 Santa Teresa

5.3.2.1 Design Values

The 2007 to 2008 nitrogen dioxide design value high for Santa Teresa was 0.0046 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 13.

5.3.2.2 Pollutant Trends

The pollutant trend for nitrogen dioxide at Santa Teresa has been well below the NAAQS since 1999. The pollutant trend plot is shown in Appendix 13.

5.3.2.3 Design Requirements

5.3.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

5.3.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

5.4 Southwestern New Mexico

5.4.1 Deming Airport

5.4.1.1 Design Values

The 2007 to 2008 nitrogen dioxide design value high for Deming Airport was 0.0054 ppm, which was below the NAAQS. The design value and associated data are shown in Appendix 13.

5.4.1.2 Pollutant Trends

The pollutant trend for nitrogen dioxide at Deming Airport has been well below the NAAQS since 2007. The pollutant trend plot is shown in Appendix 13.

5.4.1.3 Design Requirements

5.4.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

5.4.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

6.0 Monitoring Network Sulfur Dioxide Sites

NMED/AQB operates three sulfur dioxide monitors in two regions. The 2007 to 2008 annual design values for all sites were below the annual NAAQS of 0.03 ppm and the 24-hour design values were below the 24-hour NAAQS of 0.14 ppm.

6.1 San Juan County

6.1.1 San Juan Substation

6.1.1.1 Design Values

The 2007 to 2008 sulfur dioxide annual design value high for Substation was 0.002 ppm, which was below the annual NAAQS. The 2007 to 2008 sulfur dioxide 24-hour design value high for Substation was 0.0084 ppm, which was below the 24-hour NAAQS. The design value and associated data are shown in Appendix 14.

6.1.1.2 Pollutant Trends

The pollutant trend for sulfur dioxide at Substation has been well below the NAAQS since 1990. The pollutant trend plot is shown in Appendix 14.

6.1.1.3 Design Requirements

6.1.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

6.1.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

6.1.2 Bloomfield

6.1.2.1 Design Values

The 2007 to 2008 sulfur dioxide annual design value high for Bloomfield was 0.001 ppm, which was below the annual NAAQS. The 2007 to 2008 sulfur dioxide 24-hour design value high for Substation was 0.0017 ppm, which was below the 24-hour NAAQS. The design value and associated data are shown in Appendix 14.

6.1.2.2 Pollutant Trends

The pollutant trend for sulfur dioxide at Bloomfield has been well below the NAAQS since 1996. The pollutant trend plot is shown in Appendix 14.

6.1.2.3 Design Requirements

6.1.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

6.1.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

6.2 Southwestern New Mexico

6.2.1 Hurley

6.2.1.1 Design Values

The 2007 to 2008 sulfur dioxide annual design value high for Hurley was 0.001 ppm, which was below the annual NAAQS. The 2007 to 2008 sulfur dioxide 24-hour design value high for Substation was 0.0013 ppm, which was below the 24-hour NAAQS. The design value and associated data is shown in Appendix 14.

6.2.1.2 Pollutant Trends

The pollutant trend for sulfur dioxide at Hurley has been well below the NAAQS since 1998. The pollutant trend plot is shown in Appendix 14.

6.2.1.3 Design Requirements

6.2.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

6.2.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

7.0 Monitoring Network Federal Reference Method (FRM) $PM_{2.5}$ Sites

NMED/AQB operates seven Partisol FRM $PM_{2.5}$ monitors in six regions. The 2006 to 2008 design values for all sites were below the NAAQS of 15.0 micrograms per cubic meter.

7.1 San Juan County

7.1.1 Farmington Office

7.1.1.1 Design Values

The 2006 to 2008 annual design value for $PM_{2.5}$ for the Farmington Office was 6.0 micrograms per cubic meter, which was below the annual NAAQS. The design value and associated data are shown in Appendix 15.

7.1.1.2 Pollutant Trends

The pollutant trend for $PM_{2.5}$ for the Farmington Office has been well below the NAAQS since 2000. The pollutant trend plot is shown in Appendix 15.

7.1.1.3 Design Requirements

7.1.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

7.1.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

7.2 Santa Fe County

7.2.1 Runnels Building Roof

7.2.1.1 Design Values

The 2006 to 2008 annual design value for $PM_{2.5}$ for the Runnels Building was 4.8 micrograms per cubic meter, which was below the annual NAAQS. The design value and associated data are shown in Appendix 15.

7.2.1.2 Pollutant Trends

The pollutant trend for $PM_{2.5}$ for the Runnels Building has been well below the NAAQS since 2000. The pollutant trend plot is shown in Appendix 15.

7.2.1.3 Design Requirements

7.2.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

7.2.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

7.3 Southeastern New Mexico

7.3.1 Hobbs

7.3.1.1 Design Values

The 2006 to 2008 annual design value for $PM_{2.5}$ for Hobbs was 6.7 micrograms per cubic meter, which was below the annual NAAQS. The design value and associated data are shown in Appendix 15.

7.3.1.2 Pollutant Trends

The pollutant trend for $PM_{2.5}$ for Hobbs has been well below the NAAQS since 2005. The pollutant trend plot is shown in Appendix 15.

7.3.1.3 Design Requirements

7.3.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

7.3.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

7.3.2 Roswell

7.3.2.1 Design Values

The 2006 to 2008 annual design value for $PM_{2.5}$ for Roswell was 6.4 micrograms per cubic meter, which was below the annual NAAQS. The design value and associated data are shown in Appendix 15.

7.3.2.2 Pollutant Trends

The pollutant trend for $PM_{2.5}$ for Roswell has been well below the NAAQS since 2000. The pollutant trend plot is shown in Appendix 15.

7.3.2.3 Design Requirements

7.3.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

7.3.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

7.4 Las Cruces

7.4.1 Las Cruces Office Roof

7.4.1.1 Design Values

The 2006 to 2008 annual design value for $PM_{2.5}$ for the Las Cruces Office was 6.3 micrograms per cubic meter, which was below the annual NAAQS. The design value and associated data are shown in Appendix 15.

7.4.1.2 Pollutant Trends

The pollutant trend for $PM_{2.5}$ for the Las Cruces Office has been well below the NAAQS since 2001. The pollutant trend plot is shown in Appendix 15.

7.4.1.3 Design Requirements

7.4.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

7.4.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

7.5 Paso del Norte

7.5.1 Sunland Park City Yard

7.5.1.1 Design Values

The 2006 to 2008 annual design value for $PM_{2.5}$ for Sunland Park was 10.5 micrograms per cubic meter, which was below the annual NAAQS. The design value and associated data are shown in Appendix 15.

7.5.1.2 Pollutant Trends

The pollutant trend for $PM_{2.5}$ for Sunland Park has been well below the NAAQS since 2000. The pollutant trend plot is shown in Appendix 15.

7.5.1.3 Design Requirements

7.5.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

7.5.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

7.6 Southwestern New Mexico

7.6.1 Silver City

7.6.1.1 Design Values

The 2006 to 2008 annual design value for $PM_{2.5}$ for Silver City was 5.4 micrograms per cubic meter, which was below the annual NAAQS. The design value and associated data are shown in Appendix 15.

7.6.1.2 Pollutant Trends

The pollutant trend for $PM_{2.5}$ for Silver City has been well below the NAAQS since 2000. The pollutant trend plot is shown in Appendix 15.

7.6.1.3 Design Requirements

7.6.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

7.6.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

8.0 Monitoring Network Continuous $PM_{2.5}$ Sites

NMED/AQB operates eleven continuous TEOM $PM_{2.5}$ monitors in six regions. No EPA design value data or pollution trend data are available.

8.1 Design Requirements

8.1.1 Spatial Scale

All site locations are suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

8.1.2 Setbacks

The setbacks of these sites meet the requirements of Appendix E of 40 CFR 58.

9.0 Monitoring Network FRM PM_{10} Sites

NMED/AQB operates eleven Wedding FRM PM_{10} monitors in seven regions. Two sites are co-located in Farmington.

9.1 San Juan County

9.1.1 Farmington Office

9.1.1.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for the Farmington Office met the NAAQS. The design value and associated data are shown in Appendix 16.

9.1.1.2 Pollutant Trends

The pollutant trend for PM_{10} for the Farmington Office has been well below the NAAQS since 1990. The pollutant trend plot is shown in Appendix 16.

9.1.1.3 Design Requirements

9.1.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.1.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

9.2 Santa Fe County

9.2.1 Runnels Building

9.2.1.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for the Runnels Building met the NAAQS. The design value and associated data is shown in Appendix 16.

9.2.1.2 Pollutant Trends

The pollutant trend for PM_{10} for the Runnels Building has been well below the NAAQS since 1990. The pollutant trend plot is shown in Appendix 16.

9.2.1.3 Design Requirements

9.2.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.2.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

9.3 Sandoval County

9.3.1 Bernalillo City Hall

9.3.1.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for the Bernalillo City Hall met the NAAQS. The design value and associated data is shown in Appendix 16.

9.3.1.2 Pollutant Trends

The pollutant trend for PM_{10} for the Bernalillo City Hall has been well below the NAAQS since 1990. The pollutant trend plot is shown in Appendix 16.

9.3.1.3 Design Requirements

9.3.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.3.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

9.4 Southeastern New Mexico

9.4.1 Roswell

9.4.1.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for the Roswell City Office met the NAAQS. The design value and associated data are shown in Appendix 16.

9.4.1.2 Pollutant Trends

The pollutant trend for PM_{10} for the Roswell City Office has been well below the NAAQS since 1999. The pollutant trend plot is shown in Appendix 16.

9.4.1.3 Design Requirements

9.4.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.4.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

9.4.2 Hobbs

9.4.2.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Hobbs met the NAAQS. The design value and associated data are shown in Appendix 16.

9.4.2.2 Pollutant Trends

The pollutant trend for PM_{10} for Hobbs has been well below the NAAQS since 1999. The pollutant trend plot is shown in Appendix 16.

9.4.2.3 Design Requirements

9.4.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.4.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

9.5 Paso del Norte

9.5.1 Anthony

9.5.1.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Anthony did not meet the NAAQS. The design value and associated data is shown in Appendix 16.

9.5.1.2 Pollutant Trends

The 1990-2008 pollutant trend for PM_{10} for Anthony exceeded the NAAQS in 2003 and 2006. The pollutant trend plot is shown in Appendix 16.

9.5.1.3 Design Requirements

9.5.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.5.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

9.5.2 Sunland Park

9.5.2.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Sunland Park did not meet the NAAQS. The design value and associated data are shown in Appendix 16.

9.5.2.2 Pollutant Trends

The 1990-2008 pollutant trend for PM_{10} for Sunland Park exceeded the NAAQS in 2003. The pollutant trend plot is shown in Appendix 16.

9.5.2.3 Design Requirements

9.5.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.5.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

9.6 Southwestern New Mexico

9.6.1 Deming

9.6.1.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Deming met the NAAQS. The design value and associated data are shown in Appendix 16.

9.6.1.2 Pollutant Trends

The 1990-2008 pollutant trend for PM_{10} for Deming exceeded the NAAQS in 2003. The pollutant trend plot is shown in Appendix 16.

9.6.1.3 Design Requirements

9.6.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.6.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

9.6.2 Hurley

9.6.2.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Hurley met the NAAQS. The design value and associated data are shown in Appendix 16.

9.6.2.2 Pollutant Trends

The 1990-2008 pollutant trend for PM_{10} for Hurley has been well below the NAAQS. The pollutant trend plot is shown in Appendix 16.

9.6.2.3 Design Requirements

9.6.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.6.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

9.6.3 Silver City

9.6.3.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Silver City met the NAAQS. The design value and associated data are shown in Appendix 16.

9.6.3.2 Pollutant Trends

The 1990-2008 pollutant trend for PM_{10} for Silver City has been well below the NAAQS. The pollutant trend plot is shown in Appendix 16.

9.6.2.3 Design Requirements

9.6.3.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.6.3.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

9.7 Taos County

9.7.1 Taos Fire Station

9.7.1.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for the Taos Fire Station met the NAAQS. The design value and associated data are shown in Appendix 16.

9.7.1.2 Pollutant Trends

The 1990-2008 pollutant trend for PM_{10} for the Taos Fire Station was well below the NAAQS. The pollutant trend plot is shown in Appendix 16.

9.7.1.3 Design Requirements

9.7.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

9.7.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

10.0 Monitoring Network Continuous PM_{10} Sites

NMED/AQB operates seven continuous TEOM PM_{10} monitors in three regions.

10.1 Las Cruces

10.1.1 Holman Road

10.1.1.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Holman Road did not meet the NAAQS.

The design value and associated data is shown in Appendix 17.

10.1.1.2 Pollutant Trends

The pollutant trend for PM_{10} for Holman Road has been above the NAAQS since 1996, with the exception of 2005. The pollutant trend plot is shown in Appendix 17.

10.1.1.3 Design Requirements

10.1.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

10.1.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

10.1.2 West Mesa

10.1.2.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for West Mesa did not meet the NAAQS. The design value and associated data are shown in Appendix 17.

10.1.2.2 Pollutant Trends

The pollutant trend for PM_{10} for West Mesa exceeded the NAAQS in 2004 and 2008. The pollutant trend plot is shown in Appendix 17.

10.1.2.3 Design Requirements

10.1.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

10.1.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

10.2 Paso del Norte

10.2.1 Chaparral

10.2.1.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Chaparral did not meet the NAAQS. The design value and associated data are shown in Appendix 17.

10.2.1.2 Pollutant Trends

The pollutant trend for PM_{10} for Chaparral has been above the NAAQS since 2005. The pollutant trend plot is shown in Appendix 17.

10.2.1.3 Design Requirements

10.2.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

10.2.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

10.2.2 Desert View

10.2.2.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Desert View did not meet the NAAQS.

The design value and associated data is shown in Appendix 17.

10.2.2.2 Pollutant Trends

The pollutant trend for PM_{10} for Desert View exceeded the NAAQS in 2008. The pollutant trend plot is shown in Appendix 17.

10.2.2.3 Design Requirements

10.2.2.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

10.2.2.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

10.2.3 Sunland Park

10.2.3.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Sunland Park did not meet the NAAQS. The design value and associated data are shown in Appendix 17.

10.2.3.2 Pollutant Trends

The pollutant trend for PM_{10} for Sunland Park exceeded the NAAQS in 1990 and 2003. The pollutant trend plot is shown in Appendix 17.

10.2.3.3 Design Requirements

10.2.3.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

10.2.3.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

10.2.4 Anthony

10.2.4.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Anthony did not meet the NAAQS. The design value and associated data are shown in Appendix 17.

10.2.4.2 Pollutant Trends

The pollutant trend for PM_{10} for Anthony exceeded the NAAQS in 2003 and 2006. The pollutant trend plot is shown in Appendix 17.

10.2.4.3 Design Requirements

10.2.4.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

10.2.4.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

10.3 Southwestern New Mexico

10.3.1 Deming

10.3.1.1 Design Values

Based on the new EPA "exceedance-based" standard, the 2006 to 2008 annual design value for PM_{10} for Deming did not meet the NAAQS. The design value and associated data are shown in Appendix 17.

10.3.1.2 Pollutant Trends

The pollutant trend for PM_{10} for Deming exceeded the NAAQS in 2008. The pollutant trend plot is shown in Appendix 17.

10.3.1.3 Design Requirements

10.3.1.3.1 Spatial Scale

The site location is suitable to measure the appropriate spatial scale, which is denoted in the "Network Elements" file in Appendix 1.

10.3.1.3.2 Setbacks

The setback of this site meets the requirements of Appendix E of 40 CFR 58.

11.0 Monitoring Network Quality Assurance Checks

All required quality assurance checks for the network are conducted routinely at the required schedules. The annual "255" reports for 2007, 2008, and 2009 can be found in Appendix 18.

12.0 Monitoring Network's New Monitoring Requirements

12.1 Lead (Pb)

Two criteria have been set up for Pb monitoring:

- Source-oriented – for sources over 0.5 tons per year.
- "Non-source"-oriented in every urban area with a population of 500,000 or more.

Based on these criteria, no Pb monitors are required in regions under NMED/AQB jurisdiction.

12.2 Nitrogen Dioxide

Two criteria have been set up for NO_2 monitoring:

- Near-road NO_2 monitoring; 1 micro-scale site would be required in CBSAs >= 350,000 at a location of expected highest hourly NO_2 concentrations sited near a major road with high AADT (Annual Average Daily Traffic) counts.
- Community-wide; required in CBSAs >= 1 million at a location of expected highest NO2 concentrations representing neighborhood or larger (urban) spatial scale.

Based on these criteria, no new NO_2 monitors are required in regions under NMED/AQB jurisdiction.

12.3 Sulfur Dioxide

Two criteria have been set up for SO_2 monitoring:

- Based on population per Core Based Statistical Area (CBSA) and amount of SO_2 emissions within that CBSA (Population Weighed Emissions Index)
- Based on individual state contribution to national SO_2 inventory (2005 NEI)

Based on the PWEI criteria, NMED/AQB does not need to deploy any new monitors.

Based on the 2005 NEI criteria, NMED/AQB would need one monitor. This requirement is already being met by the presence of the Substation site.

12.4 Ozone

Three criteria have been set up for ozone monitoring:

- One monitor in a Micropolitan Statistical Area (10,000-<50,000).

  Three sites already meet this criteria; Hobbs, Deming, and Carlsbad.

- One monitor in an area of high ozone concentration outside of currently monitored MSAs and Micropolitan areas.

  NMED/AQB is working with the US Forest Service to commission a site at the Coyote Ranger Station on the Santa Fe National Forest.

- 1 monitor in an area set aside to conserve scenic value and the natural vegetation and wildlife within such area.

  The existing Navajo Lake site (close to Navajo Lake State Park) fulfills this requirement.

13.0 Technology

13.1 Monitors

13.1.1 Ozone

NMED/AQB operates Thermo Scientific 49C and 49i monitors. Plans are in place to replace all 49C models with the newer 49i models.

13.1.2 Nitrogen Dioxide

NMED/AQB operates Thermo Scientific 42C and 42i NO_2 monitors. Plans are in place to replace all 42C models with the newer 42i models.

13.1.3 Sulfur Dioxide

NMED/AQB operates two Thermo Scientific 43C and one 43A SO_2 monitors. Plans are in place to replace these models with the newer 43i models.

13.1.4 $PM_{2.5}$ Continuous

NMED/AQB utilizes R&P 1440 AB and AT TEOM models for $PM_{2.5}$ sampling. As resources become available, newer models will be purchased.

13.1.5 $PM_{2.5}$ Non-Continuous

NMED/AQB utilizes R&P 2025A Partisol models for $PM_{2.5}$ sampling. As resources become available, newer models will be purchased.

13.1.5 PM_{10} Continuous

NMED/AQB utilizes R&P 1440 AB and AT TEOM models for PM_{10} sampling. As resources become available, newer models will be purchased.

13.1.5 PM_{10} Non-Continuous

NMED/AQB utilizes the Wedding PM_{10} samplers. Impending changes in PM NAAQS will require the purchase of new PM_{10} monitors.

13.2 Field Calibrators

All NMED/AQB ozone, NO_2, and SO_2 sites have Sabio model 4010 gas dilution calibrators, which are capable of gas dilution, ozone, and Gas Phase Titration calibration. These calibrators are prompted by the data acquisition software at each site to automatically perform 2-point calibrations on Thursdays and 3-point calibrations on Sundays.

13.3 Field Zero Air Sources

Each NMED/AQB ozone, NO_2, and SO_2 site utilizes a Sabio model 1001 zero air source that operates in conjunction with the Sabio calibrator.

13.4 Ozone Transfer Standards

Operators and auditors in the network use dated Dasibi model 1008 and 1003 ozone transfer standards. Plans are underway to replace these old units with new transfer standards.

13.5 Airflow Transfer Standards

Operators and auditors in the network use BIOS airflow standards. Models include the DC2 base with high and low flow cells, the DC Lite and the BIOS Defender.

13.6 Gas Mixers

Operators and auditors in the network use five dated CSI model 1700 and one dated Thermo Scientific model 146 gas mixers. As resources become available, newer models will be purchased.

13.7 Analog Data Loggers

All of the sites that have meteorological (Met) capability have dated Campbell Scientific analog data loggers to retrieve Met data. As resources become available, newer models will be purchased.

13.8 Data Acquisition

All of the continuous monitoring sites have DR Das data acquisition systems. This system retrieves data from the ozone, nitrogen dioxide, sulfur dioxide, and TEOM PM monitors via RS232 serial connections. Analog Met data is retrieved and converted to digital form. The data from each site is polled hourly by a server in the Quality Assurance (QA) lab. This data can be accessed on the Bureau's air monitoring website at: http://air.nmenv.state.nm.us.

In addition to data collection, another system allows personnel to remotely perform diagnostics on the site gaseous monitors via "iPort" Thermo Scientific software. RP Comm software by Thermo allows remote diagnostics on the TEOM monitors.

13.9 Gas Cylinder Standards

Nitrogen dioxide and sulfur dioxide EPA protocol standards are used at the respective sites for the bi-weekly auto-calibrations. QA auditors use their own protocol standards for scheduled audits and precision checks. No trace-level or MDL standards are required in the network, therefore they are not used.

13.10 Meteorological Equipment

Anemometers and temperature probes are purchased from RM Young. Solar sensors are purchased from LiCor. Met audits are performed bi-annually to calibrate all sensors and to replace worn equipment and bearings.

13.11 Sampling Manifolds

All manifolds, both glass and Teflon, meet the "<20 second" criteria. All probes and inlets are at acceptable heights.

14.0 Cross-cutting Network Considerations

14.1 Other Monitoring Program Participation

14.1.1 National Atmospheric Deposition Program, National Trends Network

NMED/AQB funds one National Trends Network (NTN) sampling site at Capulin, New Mexico. The site is maintained by the National Park Service. NMED/AQB funds and maintains a second NTN site in the Gila Wilderness.

14.1.2 National Atmospheric Deposition Program, Mercury Deposition Network

NMED/AQB funds and maintains a Mercury Deposition Network (MDN) site at the Navajo Lake air monitoring site. The site is a wet-deposition site.

In addition to maintaining the MDN site, NMED/AQB is participating in a passive reactive gaseous mercury sampling program. Sampling is being conducted at Navajo Lake, Substation, and the Farmington airport.

14.1.3 EPA RadNet

NMED/AQB maintains two RadNet sites; one at the Carlsbad air monitoring site, and one at the Navajo Lake air monitoring site.

15.0 Conclusions

Does the NMED network of SLAMS meet the six minimum objectives put forth in 40 CFR Part 58? Yes.

1. The monitoring locations are appropriately sited to determine highest concentrations expected to occur. See the Network Elements spreadsheet (Appendix 1),
2. The existing network includes monitors in the areas of high population density: Santa, Fe Dona Ana County, and Sandoval County.
3. The monitors in the network are sited to determine the impact on ambient pollution levels of significant sources and source categories, in particular, those in San Juan County, a region of concentrated energy development and generation.
4. The network includes sites that adequately measure general background concentrations, including sites in San Juan County, Artesia and Carlsbad.
5. The current network is capturing data that enables NMED to determine the extent of regional pollutant transport among populated areas. The Navajo Lake site serves this purpose for transport between San Juan Count New Mexico and Southwestern Colorado.
6. Data gathered from the current network of monitoring sites can be used to determine welfare-related impacts in rural and remote areas. Data from the network is being used by citizen groups in both the Four Corners region and the Border Region of New Mexico/US and Mexico.

Are new sites needed? - One new site is required to meet the federal rules for rural monitoring and that is the new proposed ozone site at the US Forest Service's Coyote Ranger Station in Rio Arriba County. NMED is in the process of relocating the Rio Rancho site in Sandoval County to a location that meets federal siting criteria. No other new monitoring sites are required by the new EPA rules. Above and beyond meeting minimum requirements, to increase its knowledge and understanding, NMED would like to add additional sites, both temporary and long-term, as recommended in the following section of this assessment.

Can any sites be terminated? No. All of the data is being used at this time. NMED plans to keep all of it active sites operational.

Are new technologies appropriate for incorporation into the network? NMED's monitoring sites use aging equipment. The effort required to repair and adjust this equipment in order to maintain compliance with federal requirements for continuous data capture is steadily increasing.

The assessment has resulted in the following additional conclusions:

- With the exception of Sunland Park's nonattainment status for ozone, all network ozone monitors meet the NAAQS. All work monitors meet the NAAQS for nitrogen dioxide. With the exception of Anthony's nonattainment designation for PM10, all network monitors meet the NAAQS. All network monitors meet the NAAQS for PM2.5. All network monitors meet the NAAQS for sulfur dioxide.

- Network design requirements comply with Appendix E of 40 CFR 58 in terms of setbacks and spatial scale.

- Some counties in southeastern New Mexico show higher incident rates for asthma and heart attacks than other counties in the state. Monitoring for PM2.5 and H_2S in that region could help the NMDOH in its analysis of this situation.

- Ozone transport is becoming more of an issue in the Four Corners Region and the US Mexico border.

- Point-source emissions have declined overall since 2006.

16.0 Recommendations

To improve its understanding of air quality issues in New Mexico, the NMED recommends the following projects, with the understanding that all of them will require additional resources to implement. The NMED has collaborated with other agencies on air monitoring and data analysis projects, including the U.S. EPA, the U.S. Bureau of Land Management and the U.S. Forest Service. It will continue to seek partners for these projects.

- Conduct a one-year study of the impact of hydrogen sulfide on air quality in southeastern New Mexico.

- Conduct further research and analysis of the Paso del Norte air shed regarding ozone.

- Increase monitoring of PM in the Las Cruces area and the northern and southern areas of the Mesilla Valley, (Don Ana Cuonty) where open burning is part of agricultural practices.

- Expand ozone monitoring in northwestern New Mexico, where historically there have been elevated levels of ozone.

- Increase $PM_{2.5}$ monitoring to assess the impact of agricultural development, particularly confined animal feeding operations (CAFOs) in eastern New Mexico.

- Update the equipment of the permanent monitoring stations and the equipment used by the Quality Assurance auditors.

17.0 References

1. Ambient Air Monitoring Network Assessment Guidance, U.S. Environmental Protection Agency, Washington, DC EPA-454/D-07-001, February 2007, Raffuse et al.

2. Brad Whorton, Ph.D. NMDOH. The Burden of Asthma in New Mexico
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3. World Health Organization. Concise International Chemical Assessment Document 53. Hydrogen Sulfide: Human Health Aspects. Dr C.-H. Selene J. Chou.

4. EPA's Environmental Justice Link: http://www.epa.gov/compliance/environmentaljustice/index.html

5. "Table 1. Annual Estimates of the Population for Counties of New Mexico: April 1, 2000 to July 1, 2009" (CSV). 2009 Population Estimates. United States Census Bureau, Population Division. 2010-03-23. http://www.census.gov/popest/counties/tables/CO-EST2009-01-35.csv. Retrieved 2010-03-28.