BULLHEAD CITY MODERATE AREA PM_{10} MAINTENANCE PLAN AND REQUEST FOR REDESIGNATION TO ATTAINMENT

Air Quality Division
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BULLHEAD CITY MODERATE PM_{10} MAINTENANCE PLAN AND REQUEST TO REDESIGNATE TO ATTAINMENT

I. EXECUTIVE SUMMARY

The Clean Air Act (CAA) states that an area can be redesignated to attainment if specific conditions are met. This document demonstrates that all CAA requirements for attainment have been met, summarizes the progress of the area in attaining the PM_{10} standard, demonstrates that the Bullhead City area qualifies for EPA's Clean Data Policy and Limited Maintenance Plan (LMP) option, and includes a maintenance plan to assure continued attainment for ten years after the redesignation. This document includes a formal request to the U.S. Environmental Protection Agency (EPA) to redesignate the Bullhead City, Arizona PM_{10} nonattainment area to attainment for the health-based 24-hour average and annual average PM_{10} National Ambient Air Quality Standard (NAAQS). In addition, this document includes a formal request to revise the nonattainment area boundary, as currently defined in 40 CFR 81.303, to exclude three townships (108 square miles) in the east and south of the nonattainment area. The rationale for eliminating the three townships is that the land contains undisturbed desert terrain. The majority of the three townships is federal land managed by the Bureau of Land Management and state land managed by the Arizona State Land Department.

Analyses included in this document show that ambient air quality measurements have remained below the NAAQS for PM_{10}, and both the 24-hour average design value and annual average PM_{10} design value are below EPA's LMP allowable limits.[1] This document also demonstrates that the emission reduction control measures responsible for the air quality improvement are both permanent and enforceable. The primary control measures to achieve attainment include implementing reasonably available control measures (RACM) to reduce fugitive dust emissions from unpaved roads, parking lots, and cleared construction areas.

Air quality monitors located in the Bullhead City, Arizona PM_{10} nonattainment area recorded exceedances of the 24-hour NAAQS for PM_{10} on June 21, 1989 (183 $\mu g/m^3$) and May 30, 1991 (188 $\mu g/m^3$), and an exceedance of the annual PM_{10} NAAQS for calendar

[1]The method for calculating design values for PM_{10} is detailed in *PM_{10} SIP Development Guideline*, EPA-450/2-86-001, June 1987.

year 1989 (52 Fg/m^3). On December 21, 1993 (58 FR 67334), EPA designated the Bullhead City, Arizona area as a moderate PM_{10} area, effective January 20, 1994. As a result of this action, the State was required to submit to EPA an attainment demonstration plan for the area.

In June 1995, the Arizona Department of Environmental Quality (ADEQ) submitted to EPA the PM_{10} State Implementation Plan (SIP) for the Bullhead City Nonattainment Area. The SIP contained dispersion modeling for the design year 1989 and projected attainment in the year 2001. The 1989 base year emissions inventory attributed PM_{10} emissions predominately to cleared areas, and also to paved and unpaved roads. The attainment demonstration was based upon the impact of implemented RACM that reduced PM_{10} emissions generated from the identified source categories. The demonstration also took into account the increases or decreases in PM_{10} that would result from changing land use patterns and the growth in population and vehicle traffic between 1990 and 2001 in the Bullhead City area.

Attainment of the 24-hour standard is determined when the expected number of days per year with levels above 150 Fg/m^3 (average over a three year period) is less than or equal to one. Attainment of the annual PM_{10} standard is achieved when the expected annual arithmetic mean PM_{10} concentration over a three year period is equal to or less than 50 Fg/m^3.

PM_{10} concentrations reported at the Bullhead City monitoring site between 1998 and 2000, showed no measured exceedance of the 24-hour PM_{10} NAAQS. Thus, the three-year average was less than one exceedance per year, which indicates Bullhead City attained the 24-hour PM_{10} NAAQS. Review of the annual standard for calendar years 1998, 1999 and 2000 reveals that the 3-year annual average was 13Fg/m^3; thus, the Bullhead City area also attained the annual PM_{10} NAAQS. As a result, on July 25, 2001, EPA proposed to determine that the Bullhead City PM_{10} nonattainment area did attain the 24-hour and annual PM_{10} NAAQS by December 31, 2000 (66 FR 38603).

In order to be eligible for EPA's LMP option, an area should be attaining the NAAQS and the average PM_{10} design value for the area, based upon the most recent 5 years of air quality data at all monitors in the area, should be at or below 98 Fg/m^3 for the 24-hour and 40 Fg/m^3 for the annual PM_{10} NAAQS with no violations at any monitor. Based on the most recent 5 years of air quality data, 1996-2000, the 24-hour average design value for the Bullhead City area is 79 Fg/m^3 and the annual average PM_{10} design

value is 17 Fg/m^3. Both the annual average and the 24-hour average PM_{10} design values are within EPA's LMP allowable limits.

With this submittal, ADEQ requests that EPA approve this limited maintenance plan for the Bullhead City PM_{10} nonattainment area and redesignate the area as revised to attainment for the 24-hour and annual NAAQS.

II. INTRODUCTION

A. Description of Bullhead City PM_{10} Nonattainment Area

1. Location

Bullhead City is located in Mohave County along the Colorado River, the border of Arizona and Nevada (Figure II-1). On the west side of the Colorado River, is Laughlin, Nevada.[2] Although Bullhead City developed with the construction of Davis Dam and Lake Mohave in the 1940s, it was not incorporated until 1984.

Because of the year-round recreational opportunities and the appeal to retirees, population in this area has grown rapidly. The area is part of the Colorado River resort area that extends from Lake Mead National Recreation Area south to Yuma.[3]

The Bullhead City nonattainment area is more than 200 square miles in size. The Bullhead City nonattainment area is defined by the following townships:

T21N, R20-21W, excluding Lake Mead National Recreational Area
T20N, R20-22W
T19N, R21-22W, excluding the Fort Mohave Indian Reservation

2. Proposed Revised Nonattainment Area

In the SIP submitted to EPA in 1995, ADEQ requested that EPA revise the Bullhead City PM_{10} nonattainment area boundary and redesignated the excluded portion of the nonattainment area to unclassified status. The proposed revised area excludes three townships (108 square miles) in the east and south of the nonattainment area (Figure II-1). The rationale for eliminating the three townships in 1995 was that the land contained undisturbed desert terrain (for example, the area east of Bullhead City is steep sloping

[2]Laughlin, Nevada is a Census Designated Place (CDP) with a 2000 population of 7,076 (U.S. Bureau of Census, 2000 Census counts, Summary File 1).

[3]In the Bullhead City area, the following attractions provide visitors with year-round recreation: Lake Mead National Recreation Area, Lake Mohave, Black Mountain Range, Havasu National Wildlife Refuge, Lake Havasu State Park, Fort Mojave Indian Reservation, and of course the Colorado River. Lake Mohave (67 miles long) is the gateway to the Lake Mead National Recreation Area.

volcanic mountains with shallow soils that cannot be easily developed). A July 2001 field study confirmed this is still the case and no development is anticipated in the foreseeable future. The majority of the three townships is federal land managed by the Bureau of Land Management and state land managed by the Arizona State Land Department.

In conformance with the CAA's requirement that the boundary revision "shall not affect the effectiveness or enforceability of the applicable implementation plan for the State," ADEQ provides the following analysis to show that the area being removed will not contribute to exceedances in the
nonattainment area now or in the foreseeable future.

a. Population density. The excluded area has a very low population and has no employment sites.
b. Traffic congestion. The excluded area has extremely low traffic levels on paved and unpaved roads.
c. Commercial development. There is no commercial development in the area proposed for exclusion from the Bullhead City nonattainment area.
d. Industrial development. There is no industrial development in the area, including agriculture, mining, and point sources.
e. Meteorological conditions. There is no reason why shrinking the area would be inappropriate based on the area's meteorology. The entire area is arid and typically has relatively low wind speeds, therefore meteorology is not an issue for the area.
f. Pollution transport. There is no information to suggest that potential exceedances are apt to occur in the remaining Bullhead City area because of transport from the excluded area, or that emissions from the excluded area could cause violations in the remaining Bullhead City nonattainment area.

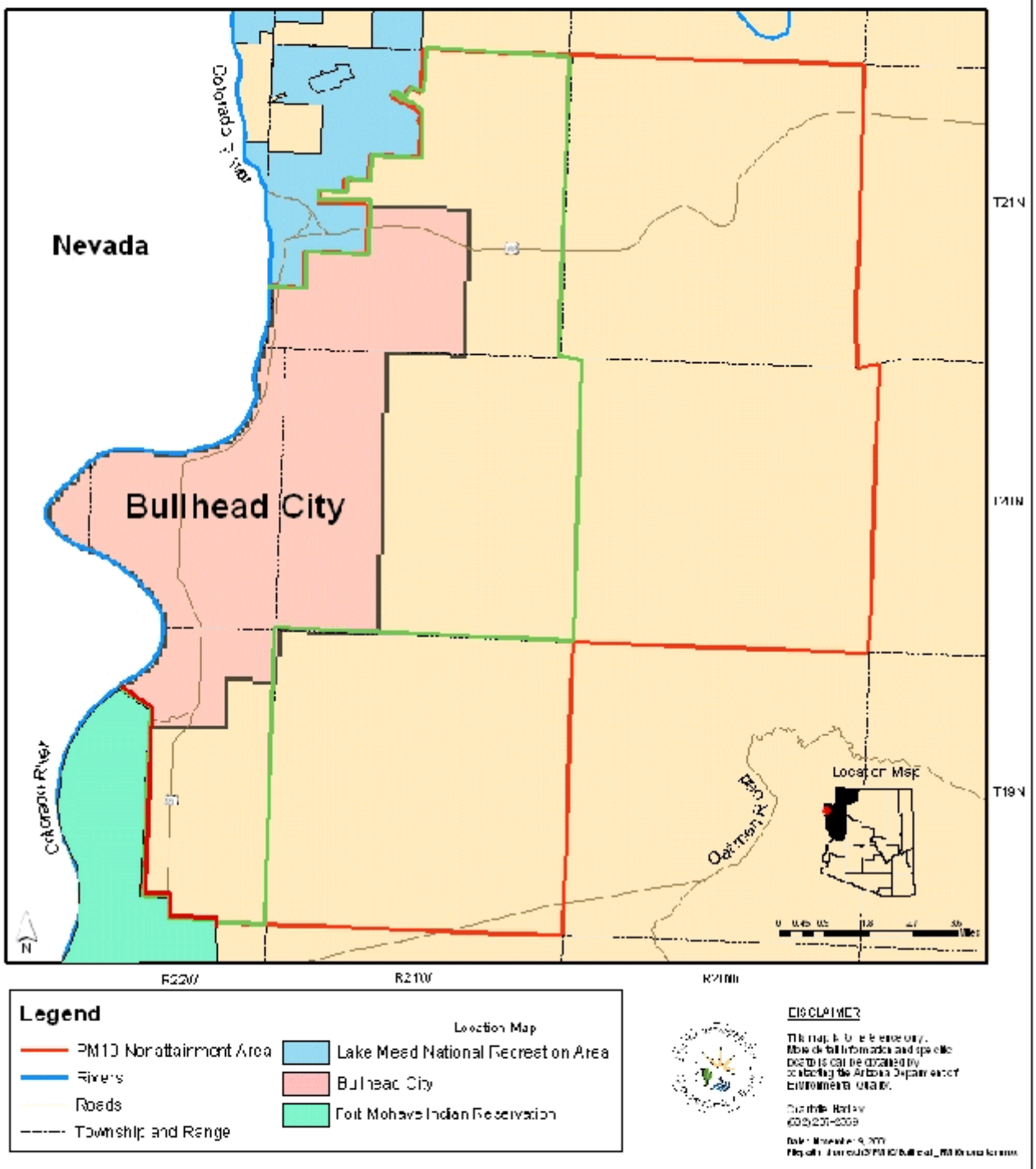
Finally, EPA approval of the boundary revision and redesignation to attainment of the remaining Bullhead City area will not change applicable regulations in the excluded area or in any other way adversely impact the effectiveness or enforceability of the applicable SIP.

The Arizona Department of Environmental Quality (ADEQ), formally requests, pursuant to CAA section 107(d)(3)(D), that the Bullhead City PM_{10} area boundary be

revised to exclude the following from the nonattainment area as defined in 40 CFR 81.303: T21N, R20W; T20N,R20W; and T19N, R21W. As such, the nonattainment and maintenance area would be (Figure II-1):

T21N, R21W, excluding Lake Mead National Recreational Area
T20N, R21-22W
T19N, R22W, excluding the Fort Mohave Indian Reservation.

Figure II-I Bullhead City PM10 Nonattainment Area Boundary



3. Population

Since 1980, the population of Bullhead City more than tripled from 10,719 to 33,769 in 2000. During the 1990s, Bullhead City grew at a rate of more than 50 percent. Mohave County also is experiencing a high growth rate; Mohave County grew at a rate of more than 65 percent during the 1980s and the 1990s. The state grew 34.9 percent during the 1980s, and 40 percent during the 1990s. Decennial census data for Bullhead City and Mohave County are shown in Table I-1.

Table I-1
Decennial Census Population of Bullhead City and Mohave County: 1960-2000

Year	April 1 1960	April 1 1970	April 1 1980	April 1 1990	April 1 2000
Bullhead City			10,719	21,951	33,769
Bullhead City's decennial change				104.8%	53.8%
Mohave County	7,736	25,857	55,865	93,497	155,032
Mohave County's decennial change		234.2%	116.1%	67.4%	65.8%

SOURCE: U.S. Bureau of the Census, decennial census counts. Bullhead City incorporated in 1984. Prior to that time, it was part of the Kingman Census County Division.

Table I-2 portrays the projected growth of Bullhead City and Mohave County in five-year increments from 2000 to 2015. Bullhead City is projected to slightly outpace the county's population growth between 2000 and 2015. According to Arizona Department of Economic Security's projections, Mohave County is expected to grow at a rate of 46.4 percent compared to Bullhead City's rate at 56.6 percent. Since the 2000 Census count was almost 4,000 higher than the projected population for 2000, the projections may understate the actual population in the future.

Table I-2
Population Projections for Bullhead City and Mohave County: 2000-2015

Year	July 1 2000	July 1 2005	July 1 2010	July 1 2015
Bullhead City	30,789	35,926	41,899	48,206
Mohave County	147,529	171,504	194,403	215,988

SOURCE: Arizona Department of Economic Security, August 1, 1997.

4. Economics

Economic activity in the Bullhead City area is related to the following: tourism; the Laughlin, Nevada, resort and gaming industry; hydroelectric power production at Davis Dam; and electricity production at the Mohave Generating Station, a power plant located across the Colorado River in Laughlin, Nevada. Because of the attractiveness of this area, from gaming to recreation and retirement, there have been increased demands for housing, lodging, restaurants, and associated service businesses.[4] As reported by Arizona Department of Commerce, Bullhead City-Laughlin attracted about 6 million visitors in 1995.[5]

Table I-3 shows a selected time series of civilian labor force data. The labor force has increased while the unemployment rate has fallen from a high of 9.6 % in 1994 to a low of 4.7% in 2000.

Table I-3
Civilian Labor Force Data for Bullhead City

Year	1990	1994	1996	1998	2000
Civilian Labor Force	11,863	14,650	16,183	15,594	16,734
Number Unemployed	649	1,406	1,296	747	788

[4]According to Arizona Department of Revenue, taxable sales in Bullhead City have increased from $204,852,050 in 1990 to $341,308,000 in 1999, an increase of 66.6%. In addition, the number of new building permits issued for Bullhead City is relatively constant. For example, in 1998 and 1999, annual permits issued were 1,291 and 1,282, respectively (Arizona State University).

[5]In the early 1990s, the U.S. Office of Management and Budget noted the economic-demographic link between Mohave County and the Las Vegas Metropolitan Area. As a result, Mohave County recently was made part of the Las Vegas Metropolitan Area.

Unemployment Rate	5.5%	9.6%	8.0%	4.8%	4.7%

SOURCE: Arizona Department of Economic Security. Data represent annual averages. Numbers for 2000 are preliminary. Preliminary data for first quarter 2001 show a labor force of 17,376 and an unemployment rate of 5.1%.

B. Applicable CAA Requirements

Section 107(d)(3)(E) of the CAA, as amended, states that an area can be redesignated to attainment if the following conditions are met:

1. The NAAQS has been attained[6];
2. The applicable implementation plan has been fully approved under Section 110(k);
3. The improvement in air quality is due to permanent and enforceable reductions in emissions;
4. The State has met all applicable requirements for the area under Section 110 and Part D; and
5. A maintenance plan with contingency measures has been fully approved under Section 175A.

C. Applicable EPA Guidance

PM_{10} SIP Development Guideline, U.S. Environmental Protection Agency, OAQPS, EPA-450/2-86-001, Research Triangle Park, NC, June 1987.

Procedures for Processing Requests to Redesignate Areas to Attainment, John Calcagni, Director, Air Quality Management Division, memorandum dated September 4, 1992.

PM_{10} Emission Inventory Requirements, U.S. Environmental Protection Agency, OAQPS, Research Triangle Park, NC, September 1994.

[6]Attainment of the 24-hour standard is determined by calculating the expected number of days in a year with PM_{10} concentrations greater than 150 Fg/m^3. The 24-hour standard is attained when the expected number of days with levels above 150 Fg/m^3 (average over a three year period) is less than or equal to one. Attainment of the annual PM_{10} standard is achieved when the expected annual arithmetic mean PM_{10} concentration over a three year period is equal to or less than 50 Fg/m^3 [40 CFR 50.6 (a) and (b)].

Reasonable Further Progress, Attainment Demonstration, and Related Requirements for Ozone Nonattainment Areas Meeting the Ozone National Ambient Air Quality Standard, John S. Seitz, Director, Office of Air Quality Planning and Standards (MD-10), May 15, 1995.

Limited Maintenance Plan Option for Moderate PM_{10} Nonattainment Areas, Lydia Wegman, Director, AQSSD (MD-15), memorandum dated August 9, 2001.

D. Requirements for Nonattainment Areas that Have Attained the NAAQS

EPA's clean data policy applies to ozone nonattainment areas that are meeting the ozone NAAQS. Specifically, it addresses whether such areas must develop an attainment demonstration.[7] Similarly, PM_{10} nonattainment areas with simple PM_{10} source problems, such as fugitive dust problems and residential wood combustion, that meet the following requirements will no longer be required to develop an attainment demonstration. The requirements for the approach and how the Bullhead City area meets the requirements are described below:

1. The area must be attaining the PM_{10} NAAQS based on the three most recent years of quality assured monitored air quality data.

PM_{10} concentrations reported at the Bullhead City monitoring site between 1998 and 2000, showed no measured exceedance of the 24-hour PM_{10} NAAQS. Thus, the three-year average number of exceedances was less than 1.0, which indicates Bullhead City attained the 24-hour PM_{10} NAAQS. Review of the annual standard for calendar years 1998, 1999 and 2000 reveals that the 3-year annual average was 13Fg/m^3, thus, the Bullhead City area also attained the annual PM_{10} NAAQS.

2. The State must continue to operate an appropriate PM_{10} air quality monitoring network, in accordance with 40 CFR part 58, in order to verify the attainment status of the area.

[7] Reasonable Further Progress, Attainment Demonstration, and Related Requirements for Ozone Nonattainment Areas Meeting the Ozone National Ambient Air Quality Standard, John S. Seitz, Director, Air Quality Planning and Standards (MD-10), memorandum dated May 25, 1995.

The State intends to continue to operate the Bullhead City monitoring network, in accordance with 40 CFR part 58, in order to verify the attainment status of the area. The Bullhead City monitoring network is described in Section III (A) of this plan.

3. The control measures for the area, which were responsible for bringing the area into attainment, must be approved by EPA as meeting reasonably available control measures (RACM) and reasonably available control technology (RACT) requirements.

The control measures for the area, which were responsible for bringing the area into attainment, are described in Section V of this plan. The State anticipates that EPA will approve these measures as meeting RACM and RACT requirements.

4. An emissions inventory must be completed for the area.

An emissions inventory has been completed for the Bullhead City area and a detailed description is contained in Section IV of this plan.

5. EPA must make a finding that the area attained the 24-hour and annual PM_{10} NAAQS.

On July 25 2001, EPA proposed to determine that the Bullhead City PM_{10} nonattainment area has attained the 24-hour and annual PM_{10} NAAQS by December 31, 2000 (66 FR 38603).

In addition to the above requirements, any requirements that are connected solely to designation or classification, such as new source review (NSR) and RACM/RACT, must remain in effect. However, certain requirements under CAA Section 172(c), including developing attainment demonstrations, and reasonable further progress (RFP) demonstrations, are waived due to the fact that the areas which are eligible under this approach have already attained the PM_{10} NAAQS and have met RFP. Finally, general conformity requirements continue to apply. The use of the clean data policy does not constitute a CAA Section 107(d) redesignation, but only serves to approve nonattainment area SIPs required under Part D of the CAA.

E. Limited Maintenance Plan Option

The LMP option applies to certain moderate PM_{10} nonattainment areas seeking redesignation to attainment. If the area meets certain criteria, the State may submit a maintenance plan at the time it is requesting redesignation that is more streamlined than would ordinarily be permitted. To qualify for the LMP option an area should meet the following applicability criteria. The Bullhead City area qualifies for the LMP option in the following manner:

1. The area should be attaining the NAAQS.[8]

As described above, the PM_{10} concentrations reported at the Bullhead City monitoring site showed no measured exceedance of the 24-hour PM_{10} NAAQS between 1998 and 2000. Thus, the three-year average number of exceedances was less than 1.0, which indicates Bullhead City attained the 24-hour PM_{10} NAAQS. In addition, review of the annual standard for calendar years 1998, 1999 and 2000 reveals that Bullhead City also attained the annual PM_{10} NAAQS and there was no violation of the annual standard for the three-year period from 1998 through 2000.

2. The average PM_{10} design value for the area, based upon the most recent 5 years of air quality data at all monitors in the area, should be at or below 40 Fg/m^3 for the annual and 98 Fg/m^3 for the 24 hour PM_{10} NAAQS with no violations at any monitor in the nonattainment area.[9]

Based on the most recent 5 years of air quality data, 1996-2000, the 24-hour average design value for the Bullhead City area is 79 Fg/m^3 and the annual average PM_{10} design value is 17 Fg/m^3. Both the 24-hour average and annual average PM_{10} design values fall below EPA's LMP allowable limits of 98 Fg/m^3 for the 24-hour and 40 Fg/m^3 for the annual PM_{10} NAAQS.

3. The area should expect only limited growth in on-road motor vehicle PM_{10} emissions (including fugitive dust) and should pass a motor vehicle regional

[8]See footnote # 6.

[9]The design value is the mathematically derived pollutant concentration at a given site that is used to determine the level of control needed to reduce pollutant concentrations enough to attain the NAAQS.

emissions analysis test.[10]

The motor vehicle regional analysis for the Bullhead City area was performed using the methods described in Attachment B of the LMP Option for Moderate PM_{10} Nonattainment Areas memorandum. The following equation was used:

$$DV + (VMT_{pi} \times DV_{mv}) \leq MOS$$

where:

DV = the area's design value based on the most recent 5 years of quality assured data in $\mu g/m^3$

VMT_{pi} = the projected percentage increase in VMT over the next ten years

DV_{mv} = motor vehicle design value based on on-road mobile portion of the attainment year inventory in $\mu g/m^3$

MOS = margin of safety for the relevant PM_{10} standard for a given area: 40 $\mu g/m^3$ for the annual standard or 98 $\mu g/m^3$ for the 24-hour standard

Applying the test for the 24-hour average PM_{10} standard yields the following result:

DV = 79 $\mu g/m^3$ (24-hour average)

VMT_{pi} = 36 percent

DV_{mv} = 13.02 $\mu g/m^3$ (estimated using the PM_{10} emissions in Table IV-1).

MOS = 98 $\mu g/m^3$ for 24-hour average PM_{10} standard

Because the number is less than 98, the area passes the regional analysis criterion for the 24-hour average PM_{10} standard.

$$79 + (.36 \times 13.02) = 84\ \mu g/m^3$$

Applying the test for the annual average PM_{10} standard yields the following result:

DV = 17 $\mu g/m^3$

VMT_{pi} = 36 percent

DV_{mv} = 2.8 $\mu g/m^3$ (estimated using the PM_{10} emissions in Table IV-1)

MOS = 40 $\mu g/m^3$ for the annual average PM_{10} standard

[10]The regional emission analysis test is used to determine whether increased emissions from on-road mobile sources could, in the next 10 years, increase concentrations in the area and threaten the assumption of maintenance that underlies the LMP policy.

$$17 + (.36 \ (\ 2.8) = 18 \ F g / m^3$$

Because the number is less than 40, the area passes the regional analysis criterion for the annual average PM_{10} ambient standard.

III. AIR QUALITY

A. Monitoring Network and Quality Assurance Procedures

The Desert Research Institute (DRI), associated with the University of Nevada, began monitoring total suspended particulates (TSP) in the Bullhead City area in 1969. In 1988, DRI switched from monitoring TSP to monitoring PM_{10} to comply with EPA's revision of the particulate NAAQS to a PM_{10} standard.

Prior to 1998, ADEQ operated a PM_{10} monitoring site located at 224 N. Main Street. In November 1997, the ADEQ monitoring site was moved 0.5 miles north to the United States Post Office building located at the northeast corner of State Route 95 and 7th Street. The new monitoring site address is 990 Highway 95. Concentrations at the site have been quite low in recent years, approximately 20 percent to 30 percent of the standard. It is the intent of ADEQ to operate the Bullhead City location for the long-term. The site is operated on a once every sixth-day sampling period. The location, method, and parameters measured are detailed below. Figure III-1 shows the location of the 990 Highway 95 monitor site.

Site Address	**Began Operating**	**Latitude**	**Longitude**	**Type of Device**	**Pollutants Measured**	**Classification**	**Scale**	**Objective**
Bullhead City, 990 Highway 95	1998	35E 05'	114E 35'	Dichotomous sampler	PM_{10}, $PM_{2.5}$	State and Local Air Monitoring Station	neighborhood	general population exposure

Southern California Edison (SCE) also operates a PM_{10} monitoring site in the Bullhead City nonattainment area. Prior to 1995, SCE operated a PM_{10} monitoring site located at 224 N. Main Street. That site was terminated in 1995.[11] The new SCE monitoring site address is 1285 Alonas Way. The site is located behind (east of) the Bullhead City

[11]The 224 N. Main Street location was the site listed as "downtown site" on page 14 of the June 1995, PM_{10} SIP for the Bullhead City Nonattainment Area.

Animal Control building at 2270 Trane Road. The site consists of collocated Hi-Vol PM_{10} samplers, wind system, and temperature sensors. A site review conducted by ADEQ on September 24, 2001, determined that the site meets applicable EPA siting requirements. The site is operated on a once every sixth-day sampling period. The location, method, and parameters measured are detailed below. Figure III-1 shows the location of the Alonas Way monitor site.

Site Address	Began Operating	Latitude	Longitude	Type of Device	Pollutants Measured	Classification	Scale	Objective
Bullhead City, 1285 Alonas Way	1995	35E 07'	114E 35'	Hi-Volume sampler	PM_{10}	Special Purpose Monitor	Neighborhood	general population exposure

B. Historical Air Quality Data for 24-hour and Annual Standards

Air quality monitors located in Bullhead City indicated that the 24-hour average PM_{10} levels were in compliance with NAAQS for the years 1988 to 1994, except for two days: June 21, 1989, which recorded a 24-hour PM_{10} level of 183 Fg/m^3 and May 30, 1991, which recorded a 24-hour PM_{10} level of 188 Fg/m^3. Annual PM_{10} levels were in compliance during 1988 to 1994, except for 1989 which had an annual PM_{10} level of 52 Fg/m^3 (see Table III-1).

Examination of the June 21, 1989, PM_{10} exceedance at SCE's 224 N. Main Street monitoring site indicated that the causes and the extent of the PM_{10} exceedance were localized in nature. One large construction project and two smaller construction projects were active on that day: 1) Construction on a new and larger airport for Bullhead City, which disturbed approximately 200 acres; 2) Construction on 1,151 meters of U.S. Route 95; and 3) Construction of Davis Dam campground, which disturbed approximately 10 acres. All construction projects were north of SCE's 224 N. Main Street monitoring site. Weather records for June 21, 1989, indicated that Bullhead City experienced a strong north to northeast wind for most of that day, with maximum wind speeds ranging from 21 mph to 32 mph. Based on an analysis of wind direction and potential sources, ADEQ concluded that this PM_{10} exceedance was primarily attributable to local sources, particularly the following construction projects: construction of Bullhead

City Airport; road construction on Highway 95; and construction of Davis Dam Campground.

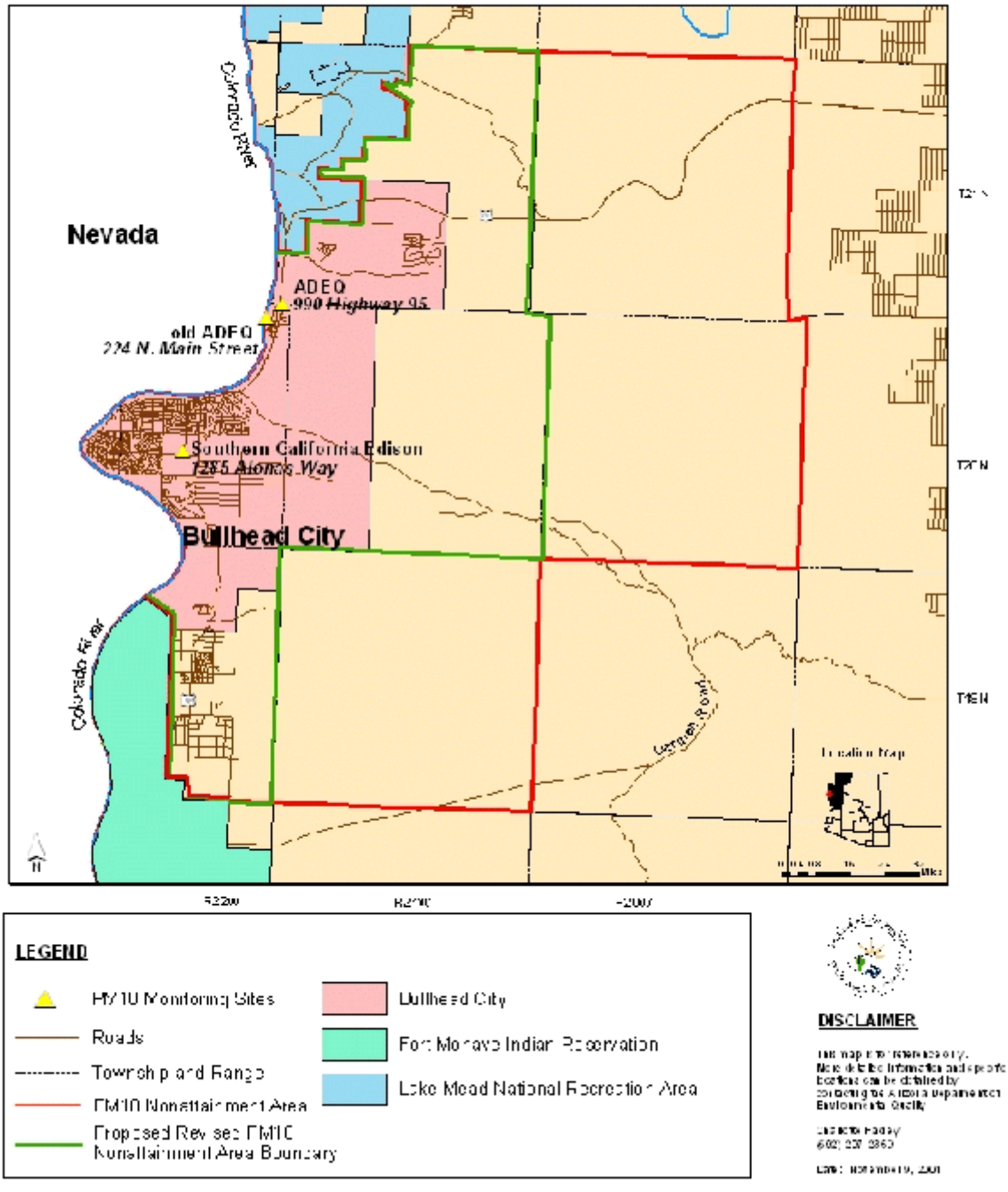
The May 30, 1991, PM_{10} exceendance at SCE's 224 N. Main Street monitoring site, on the other hand, was associated with a wind storm. Peak wind speeds at the five weather stations in Southern California and one station in Arizona ranged from 21 mph to 38 mph on May 30, 1991.[12] May 30, 1991, PM_{10} levels ranged from 149 to 367 Fg/m^3 for four Arizona sites, five California sites and one Nevada site. The occurrence of simultaneous PM_{10} exceedances at nine sites which were geographically widely separated from each other, points to the possibility of a region wide weather pattern causing the PM_{10} exceedances. The combination of PM_{10} exceedances at nine PM_{10} monitoring sites and high winds at six weather stations in the same region demonstrates that the May 30, 1991, PM_{10} exceedance in Bullhead City was part of a regional high PM_{10} episode and was most likely due to high winds/dust storm on that day.

As a result of the two 24-hour PM_{10} exceedances, EPA designated the Bullhead City, Arizona area as a moderate PM_{10} nonattainment area, effective January 20, 1994 (58 FR 67334; December 21, 1993).

Since 1991, the 24-hour and annual average PM_{10} levels have been in compliance with the NAAQS. This is due in part to the completion of the aforementioned construction activities, which ended in 1991, as well as the implementation of measures to control fugitive PM_{10} emissions (see Section V).

[12]The five Southern California weather stations were located in 1) Trona, 2) Barstow, 3)Victorville, 4) Hesperia, and 5) Twentynine Palms. The Arizona weather station was located in Bullhead City.

Figure III-1 Bullhead City PM10 Monitor Sites



and Request For Redesignation to Attainment

C. Air Quality Data for 24-hour and Annual Standards

Table III-2 provides summary statistics from PM_{10} ambient air quality measurements in Bullhead City during 1996 through 2000. The 1996 and 1997 PM_{10} data are from the 1285 Alonas Way monitoring site which is located in Bullhead City and operated by Southern California Edison (SCE). The 1998, 1999, and 2000 PM_{10} data are from the Bullhead City Post Office site located at 990 Highway 95 and operated by ADEQ. The ADEQ and SCE data for Bullhead City have been collected and quality assurance procedures have been conducted in accordance with 40 CFR part 58. The 990 Highway 95 site and the 1285 Alonas Way site are both in close proximity to vacant grounds, residential areas and commercial areas. A five mile radius analysis was used to determine that the population represented by the Alonas Way site is equivalent to or slightly greater than the population represented by the Highway 95 site. The sites are separated by less than five miles. Each site is within 1-2 miles of the Colorado River and likely experience similar wind flow patterns. Based upon the location and siting details, the Alonas Way site adequately represents general exposure of the Bullhead City population to PM_{10} and the data can be used in coordination with the data collected at the Highway 95 site.

PM_{10} concentrations reported at the 990 Highway 95 monitoring site between 1998 and 2000, showed no measured exceedance of the 24-hour PM_{10} NAAQS. Thus, the three-year average number of exceedances was less than 1.0, which indicates Bullhead City attained the 24-hour PM_{10} NAAQS. Review of the annual standard for calendar years 1998, 1999 and 2000 reveals that the 3-year annual average was 13 $\mu g/m^3$, thus the Bullhead City area also attained the annual PM_{10} NAAQS There was no violation of the annual standard for the three-year period from 1998 through 2000.

Based on the most recent 5 years of air quality data, 1996-2000, the 24-hour average design value for the Bullhead City area is 79 $\mu g/m^3$ and the annual average PM_{10} design value is 17 $\mu g/m^3$. Both the 24-hour average and annual average PM_{10} design values fall below EPA's Limited Maintenance Plan allowable limits of 98 $\mu g/m^3$ for the 24-hour and 40 $\mu g/m^3$ for the annual PM_{10} NAAQS.

D. Improvements in Air Quality Not Due to Temporary Economic Downturn or Unusually Favorable Meteorology

Section II contains Bullhead City and Mohave County population and economic data. The data show that since 1980, the population of Bullhead City more than tripled.

During the 1990s, Bullhead City grew at a rate of more than 50 percent. Whereas, the state grew 34.9 percent during the 1980s and 40 percent during the 1990s. Civilian labor force data for Bullhead City shows the labor force has increased while the unemployment rate has fallen from a high of 9.6 percent in 1994 to a low of 4.7 percent in 2000. Clearly, no economic downturn has occurred in the area over the past 10 years when clean air was reached. In addition, during a ten year period the area will have experienced the full range of meteorological conditions. Both favorable and unfavorable conditions would have existed, and yet attainment has been achieved.

Table III-1
Exceedances of the PM_{10} NAAQS in the
Bullhead City Nonattainment Area 1989 - 2000

24-hour PM_{10} Standard = 150 $\mu g/m^3$	
Date	**PM_{10} Concentration ($\mu g/m^3$)**
June 21, 1989	183
May 30, 1991	188
Annual PM_{10} Standard = 50 $\mu g/m^3$	
Year	**PM_{10} Concentration ($\mu g/m^3$)**
1989	52

Table III-2
1996-2000 PM_{10} Summary Statistics for the Bullhead City Nonattainment Area
PM_{10} Concentrations are for Standard Conditions (Fg/m^3) [13]

Year	Quarter	# of Observations	Average Concentration (Fg/m^3)	Max 24-hour Concentration	2nd Highest Concentration	# of Exceedances
1996	1	15	26.1	50	50	0
	2	15	21.7	29	29	0
	3	16	28.9	79	36	0
	4	15	19.7	42	39	0
	Annual	61	24.1	79	50	0
1997	1	15	14.7	33	22	0
	2	14	26.6	54	39	0
	3	13	21.5	37	33	0
	4	15	21.8	42	39	0
	Annual	57	21.2	54	42	0
1998	1	14	8.6	22	15	0
	2	12	11.5	26	16	0
	3	15	12.6	21	19	0
	4	15	9.8	26	19	0
	Annual	56	10.7	26	26	0
1999	1	15	12.5	22	22	0
	2	14	12.2	19	19	0
	3	12	14.5	27	22	0
	4	14	12.4	20	20	0
	Annual	55	12.9	27	22	0
2000	1	15	11.6	24	22	0
	2	14	16.6	28	24	0
	3	15	20.4	42	29	0
	4	14	12.5	27	26	0

[13] Source: 1996 - 1997 PM_{10} data from Southern California Edison, 1285 Alonas Way monitoring site. 1998 - 2000 PM_{10} data from Arizona Department of Environmental Quality, 990 Highway 95 monitoring site.

Year	Quarter	# of Observations	Average Concentration (Fg/m^3)	Max 24-hour Concentration	2nd Highest Concentration	# of Exceedances
	Annual	58	15.3	42	29	0

IV. EMISSIONS INVENTORY

A. 1999 Base-Year Emissions

Table IV-1 shows the 1999 base-year emission estimates for the Bullhead City area. For the highway vehicle categories, PM_{10} emissions are estimated using Bullhead City vehicle miles traveled (VMT) estimates multiplied by PM_{10} emission factors estimated for Arizona in EPA's 1999 National Emission Inventory (NEI). For other source categories, the April 1, 2000, population estimates were used to apportion emissions from the county to the nonattainment area level. Mohave County emissions were obtained from the 1999 NEI Version 1.0 and were scaled to the Bullhead City area, using the ratio of the Bullhead City population to the Mohave County population in 1999.

For VMT related activities:

1999 Bullhead City Area VMT = 346.8 million miles per year (ADEQ)

For population related activities (i.e. Construction):

1999/2000 Bullhead City Area Population = 30,789
1999/2000 Mohave County Population = 147,529

Therefore, a ratio of (30,789/147,529), or 0.209, was used to allocate Mohave County emissions to the Bullhead City area.

Unless otherwise noted, EPA-accepted emission factors in this section were derived using methodologies from the *Procedures Document for National Emission Inventory, Criteria Air Pollutants 1985-1999 (NEI Procedures)*(EPA, 2001).

It should also be noted that the Mohave Generating Station, a 1580 MW coal-fired power plant operated by Southern California Edison Company, is located across the Colorado River in Laughlin, Nevada. The Mohave Generating Station, a major PM_{10} source, is regulated by the State of Nevada and outside of the jurisdiction of Mohave County and ADEQ. In addition, adjacent to the southern boundary of the Bullhead City PM_{10} Nonattainment Area lies the Fort Mohave Indian Reservation where PM_{10} generating agricultural activities, including agricultural burning occur. The Fort Mohave Indian Reservation is likewise outside of the jurisdiction of Mohave County and ADEQ

and is regulated by the Fort Mohave Tribe and EPA.

Table IV-1
Bullhead City PM_{10} Nonattainment Area - 1999 Emissions Estimates

Source Category	PM_{10} Emissions (tons per year)	PM_{10} Emissions (tons per day)
Unpaved Roads/Parking Areas-Fugitive Dust	178	0.49
Paved Roads- Fugitive Dust	619	1.70
Paved Roads-Exhaust, Brake, and Tire Wear	32	0.09
Construction	240	0.66
Cleared Areas	2,875	7.88
Industrial Sources	7	0.02
Total	**3,951**	**10.82**

Descriptions of emission estimation methods by source category are described under separate heading below:

Unpaved Roads-fugitive dust: EPA's emission factor equation depends upon the surface material silt content, the mean weight of vehicles traveling on the unpaved roads, the surface material moisture content, and the number of days with measurable precipitation. Emissions are calculated by month at the State/road type level for the average vehicle fleet and then allocated to the county/road type level. The activity factor for calculating reentrained road dust emissions on unpaved roads is the VMT accumulated on these roads. ADEQ estimates the annual unpaved road VMT in the Bullhead City area to be 869,000 miles, based on a paved-to-unpaved ratio of 398 to 1.

The calculated emission factor is representative of a fleet average emission factor rather than a vehicle-specific emission factor. A default value of 2.2 tons is used nationally as the mean vehicle weight, as recommended in EPA's AP-42 documentation for travel on publicly accessible unpaved roads. The value of one percent (1 percent) for the surface material moisture content was chosen to be representative of State-wide conditions. A silt content value of three percent (3 percent) is representative of State-

wide conditions in Arizona. This value is based on unpaved road silt content values from samples collected by the Illinois State Water Survey as part of the 1985 National Acid Precipitation Assessment Program (NAPAP) Inventory.

Using this methodology, an emission factor of 198.1 grams/mile was calculated, based on a design day in the month of June, which had no days with precipitation greater than 0.01 inches. Precipitation data for unpaved roads are from a site in Winslow, Arizona. This emission factor was used to compute the tons-per-day PM_{10} emissions estimate shown in Table IV-1. The annual average emission factor was 185.3 grams per mile.

Paved Roads-fugitive dust: The 1999 NEI estimates fugitive dust emissions for mobile sources on paved roads. Using EPA's PART5 model, the PM_{10} emission factor depends on road surface silt loading, vehicle weight, and precipitation. A silt loading of 0.20 (g /m2) was used based on an ADTV (average daily traffic volume) of less than 5,000 vehicles per day. ADTV is calculated by dividing daily VMT by state and functional class (from Highway Statistics, Table VM-2 20), by State specific functional class roadway mileage (from Highway Statistics, Table HM-20 20). ADEQ estimates paved road VMT for the Bullhead City area to be 345.9 million miles annually.

The PM emission factor equation for paved roads is representative of a fleet average emission factor rather than a vehicle-specific emission factor. A value of 3.2 tons is the mean vehicle weight for paved roads. The emission factors obtained from PART5 are modified to account for the number of days with a sufficient amount of precipitation to prevent road dust resuspension. The PART5 emission factors are multiplied by the fraction of days in a month with less than 0.01 inches of precipitation. Precipitation data for paved roads are measured at a site in Phoenix, Arizona.

Paved road PM_{10} emission factors were calculated for each month in 1999. An emission factor of 1.8 grams per mile was calculated based on a design day in the month of June. June 1999 had no days with precipitation greater than 0.01 inches, replicating the worst case scenario for fugitive dust emissions on paved roads. Annual emissions were calculated by summing the emissions for all twelve months. The average annual emission factor is 1.7 grams per mile. The emission factor takes into account the portion of PM_{10} emissions caused by exhaust, brake wear, and tire wear; those emissions are subtracted from the total fugitive dust emissions for paved roads and are discussed below.

Paved Roads-exhaust, brake, and tire wear: EPA calculates monthly, county-level, Source Classification Code (SCC) specific PM emissions from on-road vehicle exhaust components by multiplying year specific monthly, county-level, SCC-specific VMT by State-level, SCC-specific exhaust PM emission factors generated using PART5. Since none of the inputs affecting the calculation of the PM exhaust emission factors varies by month, EPA only calculates annual PM exhaust emission factors. The exhaust emission factor is 0.063 grams/mile.

The PART5 model generates PM emission factors for brake wear of 0.013 grams per mile for PM_{10}. This value is used to estimate brake wear emissions for all vehicle types.

The emission factors for tire wear generated by the PART5 model are proportional to the average number of wheels per vehicle. The emission factor is 0.002 grams per mile per wheel for PM_{10}. EPA calculates separate tire wear emission factors for each vehicle type. Estimates of the average number of wheels per vehicle by vehicle class were developed using information from the Truck Inventory and Use Survey; an average vehicle weight of 3.2 tons was used for this calculation. Tire wear PM emissions were then estimated by multiplying the VMT by the tire wear emission factor for the appropriate vehicle type.

Construction Activities: The 1999 NEI estimates Mohave County construction emissions to be 1,146 tons/year. Bullhead City area emissions were calculated by multiplying the County totals by the ratio of population in the area to the population in Mohave County; that ratio is 0.209.

The NEI Procedures document explains that PM_{10} emissions for construction activities are calculated from an emission factor, an estimate of the acres of land under construction, and the average duration of construction activity. The acres of land under construction are estimated from the dollars spent on construction. The PM_{10} emission factor is calculated from the total suspended particulates (TSP) emission factor for construction (equation 4.8-13) obtained from AP-42 and data on the PM_{10}/TSP ratio for various construction activities. The PM_{10} emission factor for construction activities is 1.2 tons/acre/month of activity.

Cleared Areas: Cleared Areas - areas with high potential for wind erosion- were identified from satellite images of Bullhead City and from field surveys by ADEQ staff

(ADEQ, 2001). Table IV-2 shows the specific land use types and amounts of land designated as Cleared Areas.

Table IV-2
Bullhead City - Cleared Area Land Use Survey Results

Land Use Type	Area (acres)	Area (square meters)
Misc. disturbed areas (areas over 1/10 acre)	165.1	668,133
Vacant lots - disturbed	351.1	1,421,031
Unpaved parking areas - "unofficial"	12.4	50,155
Housing / business construction	326.5	1,321,173
Surface mining (quarries, rock and gravel)	89.5	362,326
Unpaved parking lots - "official"	56.9	230,255
Total	**1,002**	**4,053,073**

In addition to the amount of Cleared Area, the other major input for calculating PM emissions is wind speed. Wind speed data were obtained from the National Oceanic & Atmospheric Administration's National Climatic Data Center; specifically, 1999 wind speed data was analyzed from the Kingman Airport Weather Station in Kingman, Arizona (approximately 20 miles east of Bullhead City). Hourly wind speed data were collected for the entire year and compared with an entrainment wind speed threshold of 24 miles per hour (20.8 knots). This threshold was used (in accordance with previous, similar studies conducted in both Bullhead City and developed for the Yuma PM_{10} SIP) to account for wind speeds that would produce wind blown dust. The threshold differs from that found in the Phoenix PM_{10} Microscale Study, conducted by ADEQ and the Maricopa County Environmental Services Department in 1995, due to differences in soil surface roughness; Bullhead City more closely resembles Yuma than Phoenix. Over the course of 1999, wind speeds exceeded the 24 miles per hour threshold a total of 291 hours at the Kingman airport.

PM_{10} emissions from this source were calculated using emission factors from the Midwest Research Institute (MRI, 1988). An emission factor of 6.22 (10^{-4} grams per second per square meter was used to determine 1999 emissions for this source.

Industrial Sources: Six industrial PM_{10} sources were identified as operating in the Bullhead City nonattainment area as of September 2001: (a) Benston Contracting - portable hot mix asphalt plant, (b) Spirit Mountain Animal Hospital - animal crematory, (c) McCormick Construction - portable hot mix asphalt plant, (d) United Metro Materials, Inc. - crushing and screening plant, (e) United Metro Materials, Inc. - portable concrete batch plant, and (f) Applied Chemical Magnesias, Inc. - crushing and screening plant.

Four industrial PM_{10} sources contained in the June 1995 Bullhead City SIP closed: (a) Colorado River Materials - hot asphalt plant, closed in May 1992, (b) Ron Lewis Construction - portable hot asphalt, closed in January 1992, (c) Thompson Redi Mix - concrete batch plant & crushing and screening plant, closed in July 1992, (d) Heavy Equipment Rental - portable screening plant, closed in December 1997. One portable PM_{10} source contained in the June 1995 Bullhead City SIP moved to a different location and is no longer operating in the Bullhead City area. Table IV-3 below compares the June 1995 SIP industrial sources and 2001 industrial sources:

Table IV-3
Industrial Sources - Bullhead City Area

SIP Industrial Sources Moderate PM_{10} SIP June 1995		2001 Industrial Sources		Applicable State Regulations	Comments
Benston Contracting, east of Highway 95 off of Silver Creek Road	portable hot asphalt plant	Benston Contracting Company, SE 1/4 Sect. 18, T. 20N, R21W, Silver Cr. Road & statewide. Permit # 1000870.	portable hot mix asphalt plant	R18-2-324[14] R18-2-708[15]	

[14] R18-2-324 Portable Sources was submitted to EPA on August 15, 1994, as part of a SIP revision package pertaining to the New Source Review and Prevention of Significant Deterioration Program; approval is pending.

[15] R18-2-708 Standards of Performance for Existing Asphalt Concrete Plants was submitted to EPA on July 15, 1998, as part of the *SIP Revision pertaining to 1993 Rule-Making Comprised of Articles 6, 7, & 8*; approval is pending.

SIP Industrial Sources Moderate PM_{10} SIP June 1995		2001 Industrial Sources		Applicable State Regulations	Comments
Bullhead City Hospital, 2735 Silver Creek, Bullhead City.	Medical waste incinerator	Spirit Mountain Animal Hospital, 7219 South Ann Road, Mohave Valley, AZ 86446. permit # 1001160	animal crematory	R18-2-704[16] R18-2-730[17]	
McCormick Construction, east of Highway 95 off of Silver Creek Road	portable hot asphalt plant	McCormick Construction Company, Silver Creek Wash, Bullhead City, AZ. Permit # 1001546	portable hot mix asphalt plant	R18-2-324 R18-2-708	
Colorado River Materials	hot asphalt plant	n/a		n/a	Facility closed May 14, 1992.
Ron Lewis Construction, east of Highway 95 off of Silver Creek Road	portable hot asphalt plant	n/a		n/a	Facility closed January 3, 1992.
Thompson Redi Mix, east Highway 95 off of Silver Creek Road	concrete batch, and crusher & screening plant	n/a		n/a	Facility closed July 21, 1992
Heavy Equipment Rental, east Highway 95 off of Silver Creek Road	portable screening plant	n/a		n/a	Facility closed December 9, 1997

[16]R18-2-704 Standards of Performance for Incinerators was submitted to EPA July 15, 1998, as part of the *SIP Revision pertaining to 1993 Rule-Making Comprised of Articles 6, 7, & 8*; approval is pending.

[17]R18-2-730 Standards of Performance for Unclassified Sources was submitted to EPA July 15, 1998, as part of the *SIP Revision pertaining to 1993 Rule-Making Comprised of Articles 6, 7, & 8*; approval is pending.

SIP Industrial Sources Moderate PM_{10} SIP June 1995		2001 Industrial Sources		Applicable State Regulations	Comments
WMK 1, east Highway 95 off of Silver Creek Road. Permit # 4058-94 & 4057-94.	portable concrete batch plant	United Metro Materials, Inc., 1950 Bullhead Parkway, Bullhead City. Permit # 1001016.	portable concrete batch plant	R18-2-723[18] R18-2-324	WMK went out of business in 1997. Operation shut down 1997-1999. Facility was sold to United Metro Materials in 3/99.
WMK 2, east Highway 95 off of Silver Creek Road Permit # 1000425.	crushing and screening plant	United Metro Materials, Inc., 1950 Bullhead Parkway, Bullhead City. Permit # 1001021.	crushing and screening	R18-2-722[19] R18-2-324	WMK sold facility to ARC Materials 4/97 (permit transfer #1000607). Facility was sold to United Metro Materials 3/99.
Sunward Materials, east Highway 95 off of Silver Creek Road	portable concrete batch plant	n/a		n/a	Portable source moved to a different location. Currently, owned by Cemex Cement, Inc.
n/a	n/a	Applied Chemical Magnesias, Inc., 2011 Plata Caleta, Bullhead City. Permit # 1001500	crushing and screening	R18-2-722	

Table IV-4 presents the current estimates of PM_{10} and other criteria air pollutant emissions at the Bullhead City area industrial sources that are still operating.

[18]R18-2-723 Standards of Performance for Existing Concrete Batch Plants was submitted to EPA July 15, 1998, as part of the *SIP Revision Pertaining to 1993 Rule-Making Comprised of Articles 6, 7, & 8*; approval is pending.

[19]R18-2-722 Standards of Performance for Existing Gravel or Crushed Stone Processing Plants was submitted to EPA July 15, 1998, as part of the *SIP Revision Pertaining to1993 Rule-Making Comprised of Articles 6, 7, & 8*; approval is pending.

Table IV-4
Bullhead City Area Industrial Source Emission Estimates

Industrial Sources Emissions Inventory (tons per year)						
SIP Industrial Sources	**PM_{10} Source**	**Year**	**PM_{10}**	**Nox**	**VOC**	**SOx**
Benston Contracting Company	portable hot asphalt plant	1999	2.95	1.31	1.2	0.98
Spirit Mountain Animal Hospital	medical waste incinerator	1999	2.92	5.69	2.41	2.55
McCormick Construction Company	portable hot asphalt plant	1999	0.05	0.12	0.03	0.17
United Metro Materials, Inc.	crushing and screening operation	1999	0.63			
United Metro Materials, Inc.	portable concrete batch plant	1999	0.00			
Applied Chemical Magnesias, Inc.	crushing and screening	2000	0.10			

V. CONTROL MEASURES

A. Reasonably Available Control Measures

The Clean Air Act requires that moderate PM_{10} nonattainment area plans include provisions to ensure that reasonably available control measures (RACM) is implemented no later than 4 years after designation. The Act further requires that the plan provide for implementation of controls on PM_{10} sources, within the same time period, reflecting reasonably available control technology (RACT). RACM and RACT are not required, however, for sources which do not contribute significantly to violations of the 24-hour or annual PM_{10} NAAQS, or where additional controls on the sources would not expedite attainment of the NAAQS. The Clean Air Act Section 189 (e) requires that the RACT provision apply to the gaseous precursors of PM_{10} except where EPA determines that such sources do not contribute significantly to PM_{10} levels which exceed the standard.

As discussed above, the exceedances recorded in the Bullhead City area were the result of primary PM_{10} emissions associated with exceptional construction activities,

which ended in 1991, and which are not anticipated to recur in the future. Emissions from reentrained dust from traffic on paved and unpaved roads also contributed to the exceedances. Therefore, since the exceedances were not the result of significant industrial source contributions, the RACT requirement did not apply to the Bullhead City area either with respect to primary or secondary PM emissions.

In response to the PM_{10} exceedances and nonattainment designation, the following measures were implemented to control fugitive PM_{10} emissions:

1. During active construction projects on State roads, the Arizona Department of Transportation (ADOT) paved intersecting unpaved roads up to the State road alignment. This is being done or has been completed on the following projects: State Route (SR) 95 Central-Marina project, began in October 1997 and was completed in April 1999; SR 95 Courtwright-Central project, began in July 1999 and was completed in July 2000; and SR 68 Design-Build project, began in October 2000 and is projected to be completed in May 2002. ADOT also paved in 2001, driveways along SR 68 to the right of way line between mile post 15 & 27.

2. Mohave County paved unpaved parking areas and roadways, and added sidewalks, curbs, and gutters in Davis Camp Park. Specifically, the North Beach RV area was paved in 1988. During 1989 - 1990, North Beach roads were paved, RV parking was expanded, and a fishing pier was added. During 1990 - 1991, the boat launch and main entry parking were paved; sidewalks, curbs and gutters were added to South Beach road; and the day use area parking area was paved.

3. ADOT paved shoulders and installed curbs along Arizona State Highway 95. Specifically, During October 1997 - April 1999, ADOT installed curbing and gutters on SR 68 & SR 95 under the SR 95 Central Marina project. During July 1999 - July 2000, ADOT installed curbing and gutters in certain areas but mainly stabilized shoulders with vegetation on SR 68 & SR 95 under the SR 95 Courtwright-Central project.

4. Mohave County and private entities paved or surface treated 18.5 miles of roads, in the PM_{10} nonattainment area, that were unpaved in 1989. Paving occurred between 1991 and 1997.

5. Bullhead City paved more than 12 miles of roads that were unpaved in 1989. Specifically, Punta de Vista paved streets installed under a improvement district in 1995;

Havasupai Road was paved in 1989 for the Diamondback School; 0.5 mile of Goldrush Road was paved in 1998.

6. In 1979, ADEQ implemented Arizona Administrative Code R18-2-607 that requires control of storage piles to minimize fugitive emissions (Appendix 2).[20]

Implementation of these measures helped bring the area into timely attainment of both the 24-hour and annual PM_{10} NAAQS, and the measures thus meet the CAA requirement for RACM.

In addition to these RACM controls, the following strategies were also carried out in the Bullhead City area: ADOT established contract specifications requiring erosion control plans for State construction projects in PM_{10} nonattainment areas per standard specification 104.9; ADOT implemented Encroachments in Highway Rights-of-Way, Rule No. R17-3-712, which authorizes ADOT to issue permits to allow private landowners and tenants egress onto the State Highway System (in 1988, the section was renumbered, without change, as R17-3-702) but directs mitigation of trackout nuisances; Bullhead City implemented a grading ordinance requiring control of dust during grading and excavation and requiring that property be left in a condition that prevents dust from arising; and smoke management plan requirements were implemented by the Forest Service, Bureau of Land Management, and Arizona Department of State Lands, in cooperation with ADEQ. These supplemental strategies contributed still further fugitive dust emission reductions and public health protection. Continued implementation of the measures will help ensure that the Bullhead City area maintains the 24-hour and annual PM_{10} NAAQS.

B. Permanent and Enforceable Control Measures

The CAA requires that each maintenance plan demonstrate that those measures that were credited with bringing the area into attainment be federally enforceable and be continued in the future. Measures 1-5 above meet this requirement because they are fully constructed and are permanent by their very nature. Measure 6 has previously been approved by EPA and remains a federally enforceable component of the SIP. Therefore, the Bullhead City plan meets the CAA requirement for permanent and

[20]R18-2-607 Storage Piles was submitted to EPA, on January 4, 1979, and subsequently approved by EPA on April 23, 1982 (47 FR 17485).

enforceable control measures.

C. Contingency Measures

Section 175A of the Act requires that a maintenance plan include contingency provisions, as necessary to promptly correct any violation of the NAAQS which may occur after redesignation of the area to attainment. EPA's memo, Limited Maintenance Plan Option for Moderate PM_{10} Nonattainment Areas (Lydia Wegman, August 9, 2001), states that the contingency measures do not have to be fully adopted at the time of redesignation, but should identify measures to be promptly adopted, if necessary. The State commits to seek an expeditious remedy for any violation of the PM_{10} NAAQS which may occur after redesignation of the area to attainment. Specifically, the State commits to determine whether or not violations have been recorded within 6 months of the close of the calendar year, and to review and determine the appropriate contingency measure(s) by the end of the same calendar year. The state commits to implement the selected contingency measure(s) within 1 year of determining that a violation has occurred.

Under the LMP, an area is required to recalculate the average design value for the area annually and determine if the criteria of 98 Fg/m^3 for the 24-hour and 40 Fg/m^3 for the annual PM_{10} NAAQS for the LMP will still be met. If after performing the annual recalculation, the State determines that the area no longer qualifies for the LMP, the State commits to take action to attempt to reduce PM_{10} concentrations enough to requalify for the LMP.

Table V-1 includes measures that will be considered for implementation in the event of a violation of either the 24-hour or annual PM_{10} standards or in the event the annual recalculation of the area's average design value exceeds the LMP average design value criteria. The cause of the violation or exceedance of the LMP average design value will help determine the appropriate contingency measure(s) to be implemented.

Table V-1
Bullhead City Area Contingency Measures

Contingency Measures	Implementing Entity
If any PM_{10} industrial source operating within the maintenance area is found to be contributing to monitored readings above the limited maintenance plan design value, ADEQ will review existing air quality permit(s) to identify additional PM_{10} control measures which may be needed. If the PM_{10} source does not have a permit, the permitting authority will determine if an air quality permit and PM_{10} controls are needed	ADEQ
Review of Bullhead City grading ordinance to determine if additional action is needed (Bullhead City Zoning Regulation, Chapter 15.40 Grading [September 1998]).	Bullhead City
Pave or stabilize public unpaved roads, vacant lots, or unpaved parking lots located in the PM_{10} maintenance area subject to limits of statutory authority.	Bullhead City and/or Mohave County
Pave additional unpaved parking areas in Davis Camp Park (South Beach parking areas)	Mohave County
Continuation of standards for the installation and maintenance of landscaping and screening (Bullhead City Zoning Regulation, Chapter 17.48, Landscaping and Screening Regulations).	Bullhead City
Continuation of cleanup of roadways after rainstorms.	Mohave County
Continuation of the requirement for all commercial establishments to pave parking lots (Mohave County Zoning Regulations, Section 26 Off-Street Parking Standards).	Mohave County
Continuation of Smoke Management Plan - state and federal land managers conducting prescribed burning must register with ADEQ for proposed burning activities - Arizona Administrative Code (A.A.C) R-18-2-Article 15 (Forest & Range Management Burns).	U.S. Forest Service, U.S. Bureau of Land Management, Arizona State Land Department, ADEQ.
Review of the requirement for dust control measures for material storage piles to determine if additional action is needed (A.A.C. R-18-2-607).	ADEQ

VI. LIMITED MAINTENANCE PLAN ADMINISTRATION

A. Commitment to Calculate PM_{10} Design Values Annually

The State commits to recalculate the area's PM_{10} design values annually to keep track of the area's air quality levels. If the levels rise above the limits qualifying the area for the LMP, the State will act to lower them. If the action fails, the state will be required to submit a full maintenance plan.

B. Discussion of Permitting Program to Ensure that New Sources Will Not Jeopardize Continued Maintenance

Arizona Administrative Code (AAC) R18-2-403 (Permits for Sources Located in Nonattainment Areas) applies to new major sources or major modifications to sources located in nonattainment areas. Following redesignation, Arizona Administrative Code (AAC) R18-2-406 (Permit Requirements for Sources Located in Attainment and Unclassifiable Areas) will apply for any major source or major modification to a source located within the maintenance area.

C. CAA Section 175A Maintenance Plans

ADEQ commits to submit a maintenance plan for the second ten year period (2011-2021) by 2009.

VII. OTHER REQUIREMENTS FOR MODERATE AREA AND MAINTENANCE PLANS

A. CAA Section 110(a)(2)

Section 110(a)(2)(A) of the CAA requires that States provide for enforceable emission limitations and other control measures, means, or techniques, as well as schedules for compliance. Section V includes a list of control measures that helped the Bullhead City area reach and maintain attainment of the NAAQS.

Section 110(a)(2)(B) of the CAA requires that States provide for establishment and operation of appropriate devices, methods, systems, and procedures necessary to monitor, compile, and analyze data on ambient air quality. Under ADEQ's air quality assessment program, ambient monitoring networks for air quality are established to

sample pollution in a variety of representative settings, to assess the health and welfare impacts and to assist in determining air pollution sources. These networks cover both urban and rural areas of the State. The monitoring sites are combined into networks, operated by a number of government agencies and regulated companies. Each network is comprised of one or more monitoring sites, whose data are compared to the NAAQS, as well as being statistically analyzed in a variety of ways. The agency or company operating a monitoring network also tracks data recovery, quality control, and quality assurance parameters for the instruments operated at their various sites. The agency or company often also measures meteorological variables at the monitoring site. Section III includes monitoring network information and data for the Bullhead City area.

The collected data are summarized into the appropriate quarterly or annual averages. The samplers are certified as Federal Reference or Equivalent Methods. Regular checks of the stability, reproducibility, precision, and accuracy of the samplers and laboratory procedures are conducted by either the agency or company network operators. The protocol for PM_{10} monitoring used by the State, local agencies, and companies was established by EPA in the following sections of the Code of Federal Regulations (CFR):

- 40 CFR Part 50, Appendix J, Reference Method for the Determination of Particulate Matter as PM_{10} in the Atmosphere
- 40 CFR Part 50, Appendix K, Interpretation of the National Ambient Air Quality Standards for Particulate Matter
- 40 CFR Part 58, Appendix A, Quality Assurance Requirements for SLAMS
  - Section 2, Quality System Requirements
  - Section 3.3 and 3.4.1, Data Quality Assessment Requirements
  - Section 4.2, Annual Reports
  - Section 5.3, Precision of Manual Methods Excluding $PM_{2.5}$
  - Section 5.4, Accuracy of Manual Methods Excluding $PM_{2.5}$
  - 40 CFR Part 58, Appendix D, Section 2.8, Particulate Matter Design Criteria for SLAMS
  - 40 CFR Part 58, Appendix E, Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring, Section 8, Particulate Matter (PM_{10} and $PM_{2.5}$)

Section 110 (a)(2)(C), Section 110 (a)(2)(E), Section 110 (a)(2)(F), and Section 110 (a)(2)(L) of the CAA requires States to have permitting, compliance, and source reporting

authority. Arizona Revised Statutes (ARS) § 49-402 establishes ADEQ's permitting and enforcement authority. As authorized under ARS § 49-402, ADEQ retains adequate funding and employs adequate personnel to administer the air quality program. Appendix 1 includes organization charts for ADEQ's Air Quality Division.

Under ADEQ's air permits program, sources (e.g., businesses, utilities, government agencies, and universities) that emit significant amounts of regulated air pollutants are required to obtain a permit before constructing, modifying, replacing, or operating any equipment or process which may cause air pollution. Existing sources are also required to obtain a revision or modification to their permit before transferring ownership, relocating, or otherwise significantly changing the method of their operation. Additionally, ADEQ is responsible for assessing fees based on the actual emissions submitted in the emission inventory for all sources under ADEQ jurisdiction pursuant to Arizona Administrative Code (AAC) R18-2-326.

State regulations (AAC R18-2-327) require that any source subject to a permit must complete and submit to the director an annual emissions inventory questionnaire. A current air pollutant emissions inventory of both permitted and non permitted sources within the State is necessary to properly evaluate air quality program effectiveness, as well as assessing emission fees. ADEQ is responsible for the preparation and submittal of an emissions inventory report to the EPA for sources and emission points prescribed in 40 CFR 51.322 and for sources that require a permit under ARS 49-426 for criteria pollutants. This inventory will encompass those sources under State jurisdiction emitting 1 ton/year or more of any individual regulated air pollutant, or 2.5 tons/year or more of any combination of regulated air pollutants. Regulated air pollutant is defined in AAC R18-2-101.92.

Under ADEQ's air quality compliance program, major sources are inspected annually, while minor sources are inspected every two to three years. However, minor sources may be the subject of various initiatives during the year. If a particular sector (e.g., dry cleaners, portable sources) has evidenced problems in the prior year (e.g., failure to submit move notices by portable sources), ADEQ's Air Compliance Section implements initiatives to address the problem (e.g., seminars and workshops for the regulated community explaining the general permit requirements; individual inspections of all portable sources within a geographical area, mailings, etc.). In addition, compliance initiatives are developed to address upcoming or future requirements (e.g., new general permits) and include such actions as training for inspectors; development

of checklists and other inspection tools for inspectors; public education workshops; targeted inspections; mailings, etc. ADEQ's Air Compliance Section also has an internal performance measure to respond to all complaints as soon as possible, but no later than within five working days.

Section 110(a)(2)(G) of the CAA requires that States provide for authority to establish emergency powers and authority and contingency measures to prevent imminent endangerment. AAC R18-2-220 prescribes the procedures the Director of ADEQ shall implement in order to prevent the occurrence of ambient air pollution concentrations which would cause significant harm to the public health. As authorized by ARS § 49-426.07, ADEQ may seek injunctive relief upon receipt of evidence that a source or combination of sources is presenting an imminent and substantial endangerment to public health or the environment.

B. CAA Section 172(c)

Section 172(c) of the CAA requires that nonattainment plan provisions comply with each of the following:

Section 172(c)(1) of the CAA requires that nonattainment plan provisions provide for the implementation of all reasonably available control measures (RACM) as expeditiously as practicable and attainment of the national primary ambient air quality standards. Section V includes a description of RACM implemented in the Bullhead City area to control PM_{10} emissions.

Section 172(c)(3) and Section 172(c)(4) of the CAA requires a current inventory of actual emissions from all sources of relevant pollutant or pollutants and projected emission inventories. The 1999 base-year emission estimates are contained in Section V. By qualifying for the LMP option, the requirement for projecting emissions inventories is waived.

Section 172(c)(5) of the CAA require permits for the construction and operation of new or modified major stationary sources. All new sources and modifications to existing sources in Arizona are subject to State requirements for preconstruction review and permitting pursuant to AAC, Title 18, Chapter 2, Article 1, 3, 4, and 5. All new major sources and modifications to existing major sources in Arizona are subject to the New Source Review (NSR) provisions of these rules, including Nonattainment Area Analysis

(NAA) and Prevention of Significant Deterioration (PSD). The State NSR program was conditionally approved by EPA in 1982, and has been revised and is pending approval from EPA.

REFERENCES

EPA, 2001: U.S. Environmental Protection Agency, "Procedures Document for National Emission Inventory Criteria Air Pollutants, 1985-1999", EPA-454/R-01-006, Office of Air Quality Planning and Standards, Research Triangle Park, NC, 2001.

1999 National Emissions Inventory data base, ftp://ftp:epa.gov/pub/EmisInventory/net99//

ADEQ, 2001: Arizona Department of Environmental Quality Memorandum, July 23, 2001, Re: Bullhead City PM_{10} Redesignation - Land Use Survey Results, From: Mr. Randy Sedlacek, Special Applications Unit, Air Assessment Section, To: Mr. Mike George, Manager, Assessment Section.

EPA, 1995: U.S. Environmental Protection Agency, "Draft User's Guide to PART5: A Program for Calculating Particle Emissions from Motor Vehicles," EPA-AA-AQAB-94-2, Ann Arbor, MI, February 1995.

EPA, 1999: U.S. Environmental Protection Agency, Office of Air Quality Planning Standards, "Estimating Particulate Matter Emissions from Construction Operations," prepared by Midwest Research Institute, Research Triangle Park, NC, September 1999.

EPA, 2000a: U.S. Environmental Protection Agency, "National Air Pollutant Emission Trends, 1900-1998," EPA-454-R-00-002, Office of Air Quality Planning and Standards, Research Triangle Park, NC, March 2000.

EPA, 2000b: U.S. Environmental Protection Agency, "Draft NONROAD Model Release," http://www.epa.gov/oms/nonrdmdl.htm, June 2000.

MRI, 1988: Midwest Research Institute, "Control of Open Fugitive Dust Sources," Kansas City, MO, prepared for U.S. Environmental Protection Agency, Research Triangle Park, NC, September 1988.

APPENDIX 1

Applicable EPA Guidance Documents

Procedures for Processing Requests to Redesignate Areas to Attainment, John Calcagni, Director, Air Quality Management Division, memorandum dated September 4, 1992.

Limited Maintenance Plan Option for Moderate PM_{10} Nonattainment Areas, Lydia Wegman, Director, AQSSD (MD-15), memorandum dated August 9, 2001.

APPENDIX 2

Applicable Arizona Administrative Code

R18-2-324 Portable Sources
R18-2-607 Storage Piles
R18-2-704 Standards of Performance for Incinerators
R18-2-708 Standards of Performance for Existing Asphalt Concrete Plants
R18-2-722 Standards of performance for Existing Gravel or Crushed Stone Processing Plants
R18-2-723 Standards of Performance for Existing Concrete Batch Plants
R18-2-730 Standards of Performance for unclassified Sources

APPENDIX 3

ADEQ Air Quality Division
Organization Chart

APPENDIX 4

Public Hearing Documentation

Appendix 4.A.

Public Notice Proof of Publication

Appendix 4.B.

Public Hearing Agenda

Appendix 4.C.

Public Hearing Presiding Officer Certification

Appendix 4.D.

Public Hearing Transcripts

Appendix 4.E.

Responsiveness Summary

February 4, 2002

RESPONSIVENESS SUMMARY
to
Testimony Taken at Public Hearing and Written Comments Received on
The Bullhead City Moderate Area PM_{10} Maintenance Plan and
Request for Redesignation to Attainment

The public hearing on the Bullhead City Moderate Area PM_{10} Maintenance Plan and Request for Redesignation to Attainment, was held at 6:00 p.m., Tuesday, December 18, 2001, Mohave Community College, Mohave Valley Branch, Room 314, 3400 Highway 95, Bullhead City, Arizona. No oral comments were received during the hearing. The Arizona Department of Environmental Quality (ADEQ) received written comments from one individual during the public comment period, which ended December 19, 2001. The public comment and ADEQ's response are described below.

Comment #1:
One commenter stated that he regrets building a new home in Fort Mohave and is finding it difficult to resale his home because of the extreme dust conditions and lack of general road maintenance. The commenter suggested the following: 1) pave the frequently traveled unpaved roads; 2) prohibit the use of off road vehicles on dirt roads and open fields; and 3) re-route the school buses to paved roads. The commenter also stated that he does not know why more of our tax dollars are not used for road development.

Response:
ADEQ thanks the commenter for the information and suggestions. Cities and counties are responsible for local public road maintenance and road improvements activities within their statutory authority. Counties can only maintain a road to the standard at which the County received it, e.g., if it was a gravel road, the County can only maintain it as a gravel road. Questions and comments regarding public road maintenance and road improvements in Mohave County should be directed to the Mohave County Public Works, P.O. Box 7000, Kingman, AZ 86402, e-mailed to mcpw@co.mohave.az.us or by calling (928) 757-0910.

Fort Mohave is adjacent on the west to the Fort Mohave Indian Reservation and several sections of the reservation are also located south of Fort Mohave. The eastern border of the Los Lagos Development lies adjacent to one section of the Fort Mohave Indian Reservation. All roads located on the reservation are strictly under the control of the Tribe.

Edits to Final Plan:

ADEQ determined that a few minor formatting and grammatical revisions were appropriate. In addition, the following clarifications were made:

- Page 1, added the following sentence to the end of the first paragraph to clarify the ownership of the area proposed to be excluded from the Bullhead City PM_{10} nonattainment area: "The majority of the three townships is federal land managed by the Bureau of Land Management and state land managed by the Arizona State Land Department."

- Page 3, added "(for example, the area east of Bullhead City is steep sloping volcanic mountains with shallow soils that cannot be easily developed)" to the following sentence to clarify the terrain: *The rational for eliminating the three townships in 1995 was that the land contained undisturbed desert terrain (for example, the area east of Bullhead City is steep sloping volcanic mountains with shallow soils that cannot be easily developed).*

- Page 4, added "nonattainment" to the following two sentences:
  c. Commercial development. There is not commercial development in the area proposed for exclusion form the Bullhead City nonattainment area.

  f. Pollution transport. There is no information to suggest that potential exccedances are apt to occur in the remaining Bullhead City area because of transport from the excluded area, or that emissions from the excluded area could cause violations in the remaining Bullhead City nonattainment area.

- Table IV-3 Industrial Sources Bullhead City Area - clarified the status of United Metro Materials, Sunward Materials, and Applied Chemical Magnesias.

- Table IV-4 Bullhead City Area Industrial Source Emission Estimates - clarified emission estimates for United Metro Materials and Sunward Materials.

- Table V-1 Bullhead City Area Contingency Measures - added "public" and "subject to limits of statutory authority" to the following contingency measure: *Pave or stabilize public unpaved roads, vacant lots, or unpaved parking lots located in the PM_{10} maintenance area subject to limits of statutory authority.*

- Table V-1 Bullhead City Area Contingency Measures - added "If the PM_{10} source does not have a permit, the permitting authority will determine if an air quality permit and PM_{10} controls are needed" to the following contingency measure: *If any PM_{10} industrial source operating within*

the maintenance area is found to be contributing to monitored readings above the limited maintenance plan design value, ADEQ will review existing air quality

permit(s) to identify additional PM_{10} control measures which may be needed. If the PM_{10} source does not have a permit, the permitting authority will determine if an air quality permit and PM_{10} controls are needed.

- Page 21, revised footnote number 14 to clarified the status of EPA's approval of Arizona Administrative Code (AAC) R18-2-324 Portable Sources into the SIP.

- Page 24, added footnote #20 to clarify the status of EPA's approval of AAC R18-2-607 Storage Piles into the SIP.