ARIZONA DEPARTMENT
OF
ENVIRONMENTAL QUALITY

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Janice K. Brewer
Governor

Henry R. Darwin
Director

The Honorable Janice K. Brewer, Governor
State of Arizona
1700 West Washington
Phoenix, AZ 85007

RE: *Final Proposed Boundary Recommendations for the Revised Primary Annual Fine Particle ($PM_{2.5}$) Standard (2012 NAAQS)*

Dear Governor Brewer:

In 2012, EPA revised primary annual fine particle ($PM_{2.5}$) National Ambient Air Quality Standard (NAAQS). According to Clean Air Act Section 107(d), states must make recommendations for areas that meet, cannot be classified, or do not meet new or revised NAAQS within one year following the promulgation of such standards.

Under A.R.S. §§ 49-405(C)(4), the Arizona Department of Environmental Quality must finalize its proposed recommendations and supporting documents and submit them to you not later than one month before your recommendations are due to EPA. The EPA deadline for the submission of proposed boundary recommendations is December 13, 2013.

Attached to this letter are ADEQ's analysis of, and proposed boundary recommendations for, the 2012 annual primary $PM_{2.5}$ NAAQS, as well as the response to public comments that have been received. All areas of the State are proposed as attainment/unclassifiable.

If you have any questions, please contact me at (602) 771-2204, or Eric Massey, the Director of the Air Quality Division, at (602) 771-2288.

Sincerely,

Henry R. Darwin
Director

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ADEQ
Arizona Department
of Environmental Quality

FINAL PROPOSED
Arizona State Area Designation Boundary Recommendation Revised Primary Annual Fine Particle ($PM_{2.5}$) Standard (2012 NAAQS)

Air Quality Division
September, 2013

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1.0 Introduction

This document contains the current analysis of, and draft boundary recommendations for, the 2012 primary annual fine particulate matter ($PM_{2.5}$) National Ambient Air Quality Standard (NAAQS). These draft recommendations are offered for public review and to solicit comments.

The U.S. Environmental Protection Agency (EPA) has requested that Governors recommend attainment, unclassifiable, and non-attainment designations, as appropriate for all $PM_{2.5}$ areas under their jurisdiction and submit these recommendations to EPA by December 13, 2013.

The draft recommendations are based on currently available ambient monitoring and emissions data. Currently, the Arizona Department of Environmental Quality (ADEQ) proposes that all counties within the State be designated as attainment/unclassifiable. This recommendation will be forwarded to the Governor of Arizona and the Governor's recommendation will be proposed to EPA.

Arizona does not make recommendations for any tribal lands, as tribal lands are not within the State's jurisdiction. ADEQ respects tribal sovereignty and has worked to develop cooperative relationships with tribal air quality programs throughout the State.

2.0 Background

The U.S. Environmental Protection Agency (EPA) is charged with developing air quality standards for the protection of human health and environment. As required by the Clean Air Act (CAA), EPA set primary and secondary NAAQS for six common air pollutants.[1] Maximum pollution levels or limits that are based on human health are called primary standards. Limits intended to prevent environmental and property damage are called secondary standards. EPA is also required to periodically evaluate those standards and revise them if scientific analyses indicate new standards would be more protective of public health and welfare.

Among the pollutants for which EPA has set air quality standards is fine particulate matter or $PM_{2.5,}$ fine particles of air pollution ranging from 2.5 micrometers in diameter and smaller. The air quality standards for $PM_{2.5}$ are designed to protect against exposure to people most at risk. $PM_{2.5}$ is linked to a number of adverse effects on the respiratory and cardiovascular systems, particularly for at-risk populations, including children, the elderly and those with heart and lung disease. Examples of sources that emit $PM_{2.5}$ are fires, smokestacks, and vehicles.

On December 14, 2012, EPA completed a review of the particulate matter standards to better protect public health and welfare (78 FR 3086; January 15, 2013). At that time EPA strengthened the level of the annual primary $PM_{2.5}$ NAAQS to 12.0 micrograms per cubic meter (ug/m^3), retained the 15 ug/m3 standard as the annual secondary NAAQS, and retained the 24-hour fine particle standard of 35(ug/m^3). EPA also retained the coarse particle (PM_{10}) standards. Additionally, EPA also revised the ambient air monitoring requirements for particulate matter.[2] Table 1 compares the level of the $PM_{2.5}$ standards promulgated in 1997, 2006, and 2012.

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1 See (http://www.epa.gov/air/criteria.html) for a complete list of National Ambient Air Quality Standards.

2 Additional information about the $PM_{2.5}$ standard and EPAs actions is available at (http://www.epa.gov/airquality/particlepollution/actions.html).

Table 1. Particulate Matter (PM) 2.5 Standards					
Final Rule	**Primary and Secondary**	**Indicator**	**Averaging Time**	**Level**	**Form**
1997	Primary and Secondary	$PM_{2.5}$	24-hour	65 ug/m^3	98th percentile, averaged over 3 years
			Annual	15.0 ug/m^3	Annual arithmetic mean averaged 3 years
2006	Primary and Secondary	$PM_{2.5}$	24-hour	35 ug/m^3	98th percentile, averaged over 3 years
			Annual	15.0 ug/m^3	Annual arithmetic mean averaged over 3 years
2012	Primary and Secondary	$PM_{2.5}$	24-hour	35 ug/m^3	98th percentile, averaged over 3 years
	Primary		Annual	12 ug/m^3	Annual mean, averaged over 3 years
	Secondary		Annual	15 ug/m^3	Annual mean, averaged over 3 years

3.0 Area Designation Approach

Under Clean Air Act Section 107(d)(1), states must make recommendations for areas that meet, cannot be classified, or do not meet new or revised National Ambient Air Quality Standards within one year following the promulgation of those standards. Governor recommendations for the 2012 $PM_{2.5}$ standard are due to EPA by December 13, 2013. EPA anticipates promulgating final area designations by December 12, 2014. The Governors area recommendations should be based on the most recent years of quality-assured, certified air quality monitoring data available from 2010, 2011, and 2012.

Specifically, states must submit to EPA recommendations of attainment (meets or does not contribute to ambient air quality in areas that do not meet the air quality standard), unclassifiable (cannot be classified as meeting or not meeting the standard based on available information), and nonattainment for all areas of the state. Section 107(d)(1)(A)(i) of the Clean Air Act defines a nonattainment area as "... *any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant...*"

On April 16, 2013, EPA issued guidance to assist states in making designation recommendations. In the guidance, EPA expressed their intent to finalize area designations by December 12, 2014, using the most recent three years of monitoring data at that time: 2011, 2012 and 2013.[3]

4.0 Ambient Monitoring Network Data

The State and counties annual monitoring network plans describe the current ambient air quality network in Arizona.[4] The NAAQS require monitoring of the six criteria pollutants including fine particulate matter ($PM_{2.5}$). The criteria pollutants are measured using instruments that have been certified by the EPA as

[3] The guidance can be found on EPA's Designations Guidance and Data web page at the following address; (http://www.epa.gov/pmdesignations/2012standards/techinfo.html).

[4] For more information on monitoring networks see; "State of Arizona Air Monitoring Network Plan For the Year 2012", (http://www.azdeq.gov/environ/air/assessment/download/networkplan_2012.pdf).

Federal Reference Methods (FRM), Federal Equivalent Methods (FEM), or Approved Regional Methods (ARMs). The statewide $PM_{2.5}$ monitoring network is based on monitoring requirements set forth in Title 40 Code of Federal Regulations (CFR). ADEQ and local agencies currently operate EPA-approved samplers at eighteen $PM_{2.5}$ monitoring sites. Ambient data from Arizona Department of Environmental Quality (ADEQ), Maricopa County Air Quality Department (MCAQD), Pinal County Air Quality Control District (PCAQCD) and Pima County Department of Environmental Quality (PDEQ) monitors are collected and reported to EPA's Air Quality System (AQS) database by each responsible agency.

Arizona is basing its initial boundary recommendation on available ambient monitoring and emissions information. The draft recommendation includes only attainment and unclassifiable areas. No areas of the state were identified as not meeting the new standard based on monitoring data (see Table 2). According to 40 CFR Part 53, only data collected by certified sampling methods (i.e. Federal Reference, Federal Equivalent, and Approved Regional Methods) are approved for use in determining compliance with the $PM_{2.5}$ standards.

Design values are the statistics that are compared to the level of the air quality standards to determine compliance with the NAAQS. The design value for the new primary $PM_{2.5}$ NAAQS is the 3-year average of the weighted annual arithmetic means of each of the years (rounded to 1 digit after decimal). The 2012 design values are shown in Table 2. Monitor locations are illustrated in Figure 1.

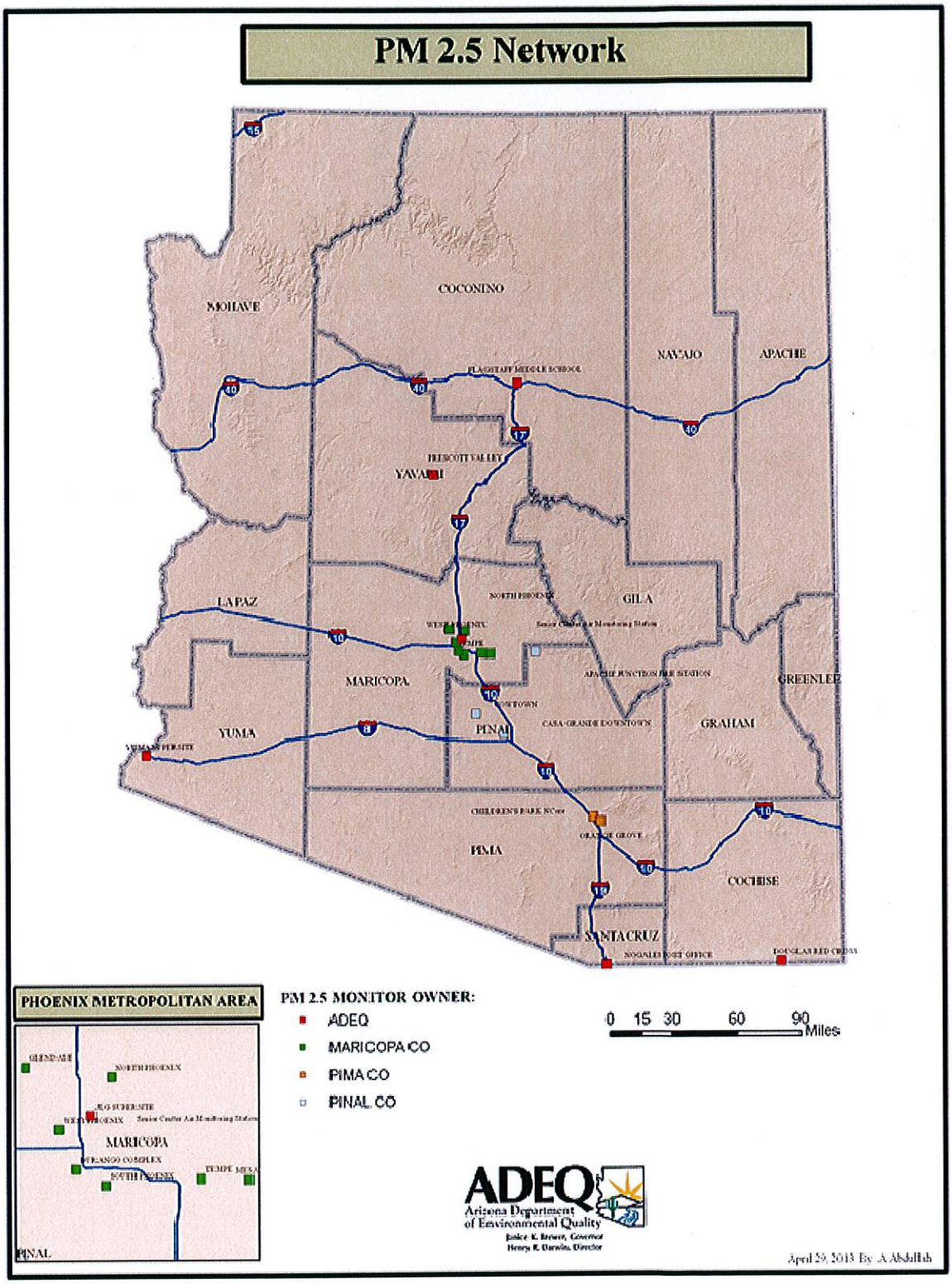
Table 2. *2012 Annual $PM_{2.5}$ Design Values (in $\mu g/m^3$)* *EPA Concurred Exceptional Events Excluded* FRM/FEM Monitors *Bold denotes a value above the standard.* *(Annual $PM_{2.5}$ NAAQS – 12 $\mu g/m^3$)*				
Site Name	**2010**	**2011**	**2012**	**3-Year Average**
Cochise County				
Douglas Red Cross	6.8	6.5	6.7	6.7
Number of Sites in Violation of the NAAQS				0
Coconino County				
Flagstaff Middle School	5.1	5.2	5.4	5.2
Number of Sites in Violation of the NAAQS				0
Maricopa County				
Durango Complex	10.2#	12.4	11.6	11.4#
Glendale (opened 5/19/2011)	N/A	9.1#	8.7	8.9#
JLG Supersite	6.8	9.7	8.2	8.2
Mesa	6.3	8.9	7.2	7.5
North Phoenix	N/A	9.3#	9.3	9.3#
South Phoenix	8.6	9.4	9.2	9.1
West Phoenix	8.1	11.2	11.5	10.3
Tempe (opened 3/11/12)	N/A	N/A	9.3	9.3#
Number of Sites in Violation of the NAAQS				0
Pima County				
Children's Park	5	5.7	5.5	5.4
Orange Grove	5.2	5.7	5.9	5.6
Number of Sites in Violation of the NAAQS				0
Pinal County				
Apache Junction Fire Station	5.9	8.3	6.7	7.0
Casa Grande Downtown	8.4	9.9	10.0	9.4
Cowtown	12.4	13.2	14.8	**13.5**
Number of Sites in Violation of the NAAQS				1
Santa Cruz County				
Nogales Post Office	10.2	9.7	9.6	9.8
Number of Sites in Violation of the NAAQS				0
Yavapai County				
Prescott Valley	3.9	3.8	4.4	4.0
Number of Sites in Violation of the NAAQS				0
Yuma County				
Yuma Supersite (opened 1/1/2010)	7.4	7.6	8.5	7.8
Number of Sites in Violation of the NAAQS				0

# Indicates the data do not satisfy EPA's summary criteria, usually meaning less than 75 percent valid data recovery available in one or more calendar quarters.

N/A - Data are not available.

Note 2012 design values include 3 year averages from 2010, 2011, and 2012.

Figure 1: Arizona's Particulate Matter Ambient Monitoring Networks



An examination of data submitted to EPA including calculated AQS design values, shows that there have been no recorded exceedances or violations of the annual standards from 2010 through 2012 at FRM monitors with sufficient data recovery for comparison to the NAAQS. Analyses of the available data show that ambient concentrations at certified monitoring sites are less than the annual standards with the exception of the Cowtown $PM_{2.5}$ monitor.

The Cowtown $PM_{2.5}$ monitor in Table 2 exceeds the $PM_{2.5}$ primary annual NAAQS of 12.0 ug/m^3 with a design value of 13.5 ug/m^3. ADEQ and EPA previously classified the Cowtown site as a "relatively unique population-oriented microscale" site based on four criteria: the population oriented monitoring, the spatial scale, localized hot spot conditions, and the uniqueness of the site.[5] Therefore, EPA determined that $PM_{2.5}$ data from the Cowtown site should not be compared to the annual $PM_{2.5}$ NAAQS in accordance with 40 CFR 58.30. This determination was based on the uniquely dense population of Concentrated Animal Feeding Operations (CAFOs) in the Cowtown monitoring area as compared to the entirety of Pinal County.

Since this determination, the EPA has revised 40 CFR 58.30 to remove the necessity of "Population Oriented" evaluations, resultantly relying on spatial scale and the uniqueness of the site.[6] Furthermore, in 2011, the Pinal County Air Quality Control District (PCAQCD) proposed to reclassify the Cowtown site from microscale to middle scale classification due to the 2009 and 2010 closure of fundamentally adjacent local CAFO facilities and cattle pens. ADEQ has confirmed through conversations with PCAQCD that of the six CAFOs within close proximity of the Cowtown monitor in 2008, only two are still in operation. During 2008, three businesses operated six different CAFO facilities. Two businesses have closed and only two facilities continue in operation. A current aerial photograph of the Cowtown site is given in Figure 2.

Review of the 2008, cattle population for each of these six facilities reveals that the closure of the four CAFOs would reduce the local 2008, cattle population in the Cowtown region by up to 56.4%. While ADEQ has not, as of yet, completed a $PM_{2.5}$ emission inventory for the Cowtown site, preliminary PM_{10} design day source contribution modeling has been performed at the Cowtown monitoring site for the October 29, 2008, stagnation exceedance date in preparation of the Pinal County PM_{10} Nonattainment Area State Implementation Plan (SIP). For this October 2008, design day, it was estimated that CAFOs contributed 64.7% of the total 24-hour PM_{10} emissions to the monitor. Assuming 56.4% of the cattle were removed from the PM_{10} design day inventory, CAFO emissions would still comprise at least 44.5% of the 24-hour emissions. These estimations of CAFO PM_{10} contribution are similar to the modeled 49% contribution of CAFOs to total $PM_{2.5}$, which was determined by EPA for the year of 2003.[7]

This is in stark contrast to the preliminary estimate of CAFO contribution to annual 2008 PM_{10} emissions in the nonattainment area, for which CAFOs only comprise an estimated 1.1% of total PM_{10}. Therefore, when using PM_{10} emissions as a surrogate for primary $PM_{2.5}$, it is evident that the Cowtown site does not represent area-wide air quality and should still be considered unique in terms of the dominant emitting source's continued overwhelming $PM_{2.5}$ and PM_{10} impacts at the monitor. Due to the close proximity to

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5 See "Technical Support Document for Determination that the Cowtown Monitor is Ineligible for Comparison with the Annual $PM_{2.5}$ NAAQS," EPA Region 9, April 26, 2010 (http://www.epa.gov/pmdesignations/1997standards/rec/letters/9/s/Arizona_R4.pdf) and "Analysis of $PM_{2.5}$ Exceedances in Pinal County Arizona: Demonstration that $PM_{2.5}$ Concentrations are Driven by Local Sources of PM_{10} near the Cowtown monitor," ADEQ, March 15, 2010.

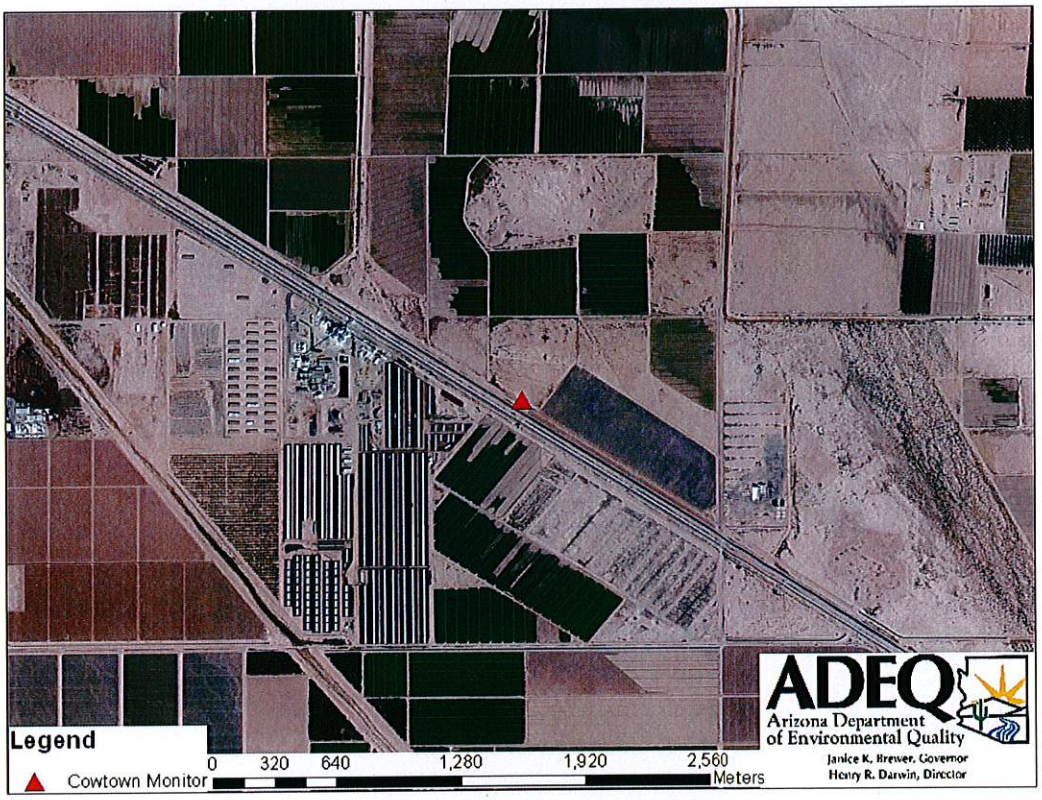
6 See 78 FR 3086; January 15, 2013 (http://www.gpo.gov/fdsys/pkg/FR-2013-01-15/pdf/2012-30946.pdf).

7 See "Technical Support Document for Determination that the Cowtown Monitor is Ineligible for Comparison with the Annual $PM_{2.5}$ NAAQS".

the nearby sources, which includes CAFOs, an ethanol plant, a grain processing facility, and a commercial composting facility, the Cowtown station is unique to the County.

Since the fence line to the closest CAFO is located at a distance of approximately 300 meters from the Cowtown monitor, ADEQ concurs with PCAQCD's determination that the Cowtown monitor should be reclassified as a relatively unique middle scale $PM_{2.5}$ monitor. Given that the source mix of the emissions has not changed over time, but only the magnitude of the emissions, the Cowtown monitor is not representative of area-wide air quality and remains a unique impact site and therefore should still only be eligible for comparison to the 24-hour $PM_{2.5}$ NAAQS in accordance with 40 CFR 58.30.

Figure 2: Current Aerial View of the Cowtown Monitor and Surrounding Areas



5.0 Ambient Air Monitoring Requirements in Near-Road Environments

The final rule for the revised annual $PM_{2.5}$ standard promulgated changes for ambient monitoring, reporting, network design requirements, and near-roadway monitors. One roadway monitor is required and must be collocated with Nitrogen Dioxide (NO_2) or Carbon Monoxide (CO) monitors within each of the Core Based Statistical Areas (CBSAs) with a population of 1 million or more. The near-roadway monitoring will be phased in beginning with the largest urban areas that have a population of 2.5 million or more by January 01, 2015 and extending to the remaining areas no later than January 01, 2017.[8] As shown in Table 3, only one near-roadway monitor will be required in Arizona.

[8] See *National Ambient Air Quality Standards for Particulate Matter; Final Rule,* 40 CFR Parts 50, 51, 52, et al. http://www.gpo.gov/fdsys/pkg/FR-2013-01-15/pdf/2012-30946.pdf and http://www.epa.gov/pmdesignations/2012standards/docs/april2013guidance.pdf

Table 3. Arizona Core Based Statistical Areas				
County	**City**	**Core Based Statistical Area(2013)**	**Core Based Statistical Area Estimations (2012)***	**Required Monitors**
Coconino	Flagstaff	Metropolitan Statistical Area	134,313	0
Mohave	Lake Havasu & Kingman	Metropolitan Statistical Area	203,072	0
Santa Cruz	Nogales	Micropolitan Statistical Area	48,724	0
Gila	Payson	Micropolitan Statistical Area	53,626	0
Maricopa & Pinal	Phoenix-Mesa-Scottsdale	Metropolitan Statistical Area	3,884,705	1
Yavapi	Prescott	Metropolitan Statistical Area	211,583	0
Graham	Safford	Micropolitan Statistical Area	37,314	0
Navajo	Show Low	Micropolitan Statistical Area	107,923	0
Cochise	Sierra Vista-Douglas	Metropolitan Statistical Area	130,752	0
Pima	Tucson	Metropolitan Statistical Area	990,380	0
Yuma	Yuma	Metropolitan Statistical Area	205,174	0
Note- Apache, Greenlee, and La Paz County were not listed as a CBSA according to the 2013 bulletin by the Office of Management and Budget (http://www.whitehouse.gov/sites/default/files/omb/bulletins/2013/b-13-01.pdf). * Core based statistical population estimates (http://dilemma-x.net/2013/03/14/u-s-census-bureau-releases-2012-population-estimates-for-states/).				

6.0 Exclusion of Arizona from the Las Vegas-Henderson, Nevada Combined Statistical Area

EPA guidance on boundary designations for the revised 2012 $PM_{2.5}$ NAAQS requires states to consider areas that violate the standards and nearby areas contributing to violations. After determining which monitors are violating the standard, the next step is to analyze those areas that may contribute to the violating area. This analysis looks at counties including core based statistical areas (CBSAs) and combined statistical areas (CSAs) in which the violating monitor(s) are located, as well as any nearby areas that have the potential to contribute.[9]

In EPA's April 2013 boundary guidance, EPA state's their intent to designate areas using the Office of Management and Budget's (OMB) 2009 urban definitions of CSAs and CBSAs (see footnote 8 of the guidance, page 5). In the 2009 definitions, Mohave County, AZ is not included in the Las Vegas, NV CSA. However, in February 2013, OMB updated urban area definitions and included Mohave County, AZ in the Las Vegas, NV CSA. In spite of EPA's stated intent to use 2009 definitions, the following analysis in support of excluding Mohave County from the Las Vegas area is presented to produce a record of Arizona's position that the county is appropriately excluded from Las Vegas.

According to OMB's February 2013, urban area definitions, the Lake Havasu City-Kingman, Arizona Metropolitan Statistical Area (MSA) is included in the Las Vegas-Henderson, Nevada CSA for statistical purposes.[10] OMB does not attempt to address non-statistical uses of their urban area listing, and does not represent the listing as representing urban-rural classifications. Based on monitoring and population count and distribution data, it is not appropriate to include the Lake Havasu City-Kingman MSA in the air quality planning area boundary for $PM_{2.5}$. It is reasonable to exclude Mohave County from the CSA for this purpose because it does not significantly contribute to $PM_{2.5}$ emissions in the area.

The Las Vegas-Henderson CSA includes a total of 21,202 square miles, with Clark County, Nevada consisting of 7,891.00 square miles. Mohave County, Arizona, is approximately 13,311 square miles and includes expanses of undeveloped public lands or agricultural development and isolated rural communities. A major portion of Mohave County is isolated from the urbanized Las Vegas-Henderson, Nevada area.

Land ownership significantly affects development, and this pattern is expected to continue. Only 17%, of Mohave County is privately owned; federal ownership accounts for 69%, State and Tribal ownership accounts for 7%, each.[11] Tribal lands, as well as State and federal lands, create barriers to contiguous expansion of the urbanized core.[12] As a result, the majority of the Lake Havasu City-Kingman, Arizona MSA is expected to remain as neither a source nor a receptor of $PM_{2.5}$ pollution. Weather and transport patterns, including prevailing winds, location of sources of $PM_{2.5}$ emissions, potential for growth, and jurisdictional boundaries all support the exclusion of the Lake Havasu City-Kingman, Arizona, MSA from the Las Vegas-Henderson, Nevada CSA for $PM_{2.5}$ air quality planning purposes. The recommended area also excludes Indian Country over which Arizona has no jurisdiction.

The population of Clark County, Nevada for 2012 is estimated to be 1,941,259.[13] By comparison, the U.S. Census estimates the population of Mohave County, Arizona, at 200,186.[14] The Arizona portion of this

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9 See EPA Memorandum on Initial Area Designations for the 2012 Revised Primary Annual Fine Particle National Ambient Air Quality Standard; April 16, 2013.

10 See (http://www.whitehouse.gov/sites/default/files/omb/bulletins/2013/b13-01.pdf).

11 See (http://azstateparks.com/ohv/downloads/OHV_EI_mohave.pdf).

12 See (http://www.azland.gov/images/maps/stateimage.pdf).

13 See (http://quickfacts.census.gov/qfd/states/32/32003.html).

CSA is dwarfed by the Nevada portion. According to U.S. Census inventory conducted there are 881,316 people who live and work within Clark County.[15] Daytime population change for Clark County due to commuting is estimated at 13,243 of which 12,701 are in commuters from Arizona. Even if most of the in-commuters are from Arizona, they account for less than 1% of daytime population change due to commuting, which has minimal air quality impacts. The U.S. Census for 2010 also concludes 98.5% of workers in Clark County Nevada, also live in Clark County, Nevada.[10] The activities of those who live and work within Clark County dwarf the interactions of those in-commuters from Arizona.

Air quality monitoring data show that concentrations of $PM_{2.5}$ emissions are elevated in Clark County relative to Mohave County. Anthropogenic sources of $PM_{2.5}$ emissions are located in the heavily urbanized areas of the Las Vegas-Henderson CSA, not in the Arizona portion of the CSA. The highest emission concentrations are collocated with dense residential and commercial development. High $PM_{2.5}$ emissions are also expected along the congested roadways in the Nevada portion of the CSA, which will be determined when the new near-roadway monitoring network is established. Further control of mobile source emissions of $PM_{2.5}$ emissions may occur through federal fuel or engine requirements, not under authority or jurisdiction of the State of Arizona.

Based on these factors, $PM_{2.5}$ emissions are not likely to transport across state boundaries and contribute to violations of the standard and attainment status. Existing information and data from both Arizona and Nevada show that the CSA is attaining the $PM_{2.5}$ NAAQS. Arizona does not significantly contribute to interstate transport of emissions impacting nonattainment or interfere with maintenance of the $PM_{2.5}$ NAAQS in Nevada. The data and information provided supports the exclusion of the Lake Havasu City-Kingman MSA from the Las Vegas-Henderson, Nevada CSA for $PM_{2.5}$ air quality planning purposes.

7.0 Primary and Secondary $PM_{2.5}$ Emissions

Emission estimates were derived from Version 3 of EPA's 2008 National Emission Inventory (NEI). At this time, there is no complete, certified data available for 2011. Table 5 shows Arizona emissions from 2008 for $PM_{2.5}$, for both primary and secondary pollutants in tons per year (tpy). "These particles come in many sizes and shapes and can be made up of hundreds of different chemicals. Some particles, known as primary particles are emitted directly from a source, such as construction sites, unpaved roads, fields, smokestacks or fires. Others form in complicated reactions in the atmosphere of chemicals such as sulfur dioxides and nitrogen oxides that are emitted from power plants, industries and automobiles. These particles, known as secondary particles, make up most of the fine particle pollution in the country".[16] The secondary pollutants of $PM_{2.5}$ are NOX, NH3, SO_2, and VOCs. Volatile Organic Compounds (VOCs) are the largest contributor of emissions and account for over 2 million tons of emissions for 2008. The second largest source of emissions is from nitrogen oxides (NO_X), accounting for 315,089 tons. Sulfur dioxide is the third largest source of $PM_{2.5}$ emissions and contributes 84,826 tpy. The fourth source is primary $PM_{2.5}$, contributing 81,181 tpy. The final source is ammonia (NH_3), contributing 43,059 tons of emissions per year.

The largest anthropogenic source categories contributing to emissions are represented in Tables 6 and 7. Asterisks indicate in the emission column of the following tables, the emissions produced by those sectors are not the primary source of emissions for the corresponding pollutant. They are in fact the secondary or tertiary source of emissions following those emissions produced by biogenic/geogenic sources, wildfires or both. The emissions reported for the purposes of these tables are effectively the largest anthropogenic

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14 See (http://quickfacts.census.gov/qfd/states/04/04015.html).

15 See (http://www.census.gov/hhes/commuting/data/acs2006_2010.html).

16 See (http://www.epa.gov/airquality/particlepollution/basic.html).

source of emissions in their respective pollutant category. The percent illustrates the portion of the emissions per EI for pollutant category.

Table 4. $PM_{2.5}$ Primary and Secondary Emissions Per County 2008 NEI					
County	Primary	Secondary			
	$PM_{2.5}$	NO_X	NH_3	SO_2	VOC
Apache	4,524	28,454	933	22,583	125,879
Cochise	2,764	19,299	3,394	3,081	98,581
Coconino	8,413	19,507	1,494	786	213,189
Gila	5,993	4,082	520	29,176	113,793
Graham	3,987	2,965	502	48	79,013
Greenlee	2,341	1,395	430	212	37,866
La Paz	770	3,609	563	41	122,109
Maricopa	17,785	114,698	19,961	1,641	290,335
Mohave	2,938	16,539	501	345	245,498
Navajo	4,130	23,238	1,295	19,163	121,844
Pima	9,298	35,571	1,955	4,718	217,255
Pinal	7,504	17,539	5,575	381	138,250
Santa Cruz	1,099	2,429	474	105	38,720
Yavapai	6,891	15,920	1,126	2,330	136,705
Yuma	2,741	9,845	4,337	215	161,937
Total	81,181	315,089	43,059	84,826	2,140,973

Maricopa County has the highest level of $PM_{2.5}$, NO_X, NH_3 and VOC emissions. The largest contributing source of primary $PM_{2.5}$ comes from industrial processes and accounts for 5,666 tpy of emissions. Mobile on-road diesel heavy duty vehicles are the largest source of NO_X and contribute 43,377 tpy of emissions. Agriculture and livestock waste generates 9,584 tpy of NH_3 emissions. Approximately 23,534 tpy of VOC emissions are from mobile-on-road gas light duty vehicles. In Gila County, the largest source of SO_2 emissions for sulfur dioxide comes from industrial processes-non-ferrous metals accounting for 28,833 tpy.

Table 5. Largest Contributor of $PM_{2.5}$ & NOx by Sector Per County						
County	PM2.5-PRIMARY			NO_x [Nitrogen]		
	EI Sector	Emissions (Tons)	% of Total	EI Sector	Emissions (Tons)	% of Total
Apache	Industrial Processes NEC	1,351	29.9	Fuel Comb-Elec Gen-Coal	20,502	72.1
Cochise	Dust-Unpaved Road Dust	622	22.5	Fuel Comb-Elec Gen-Coal	6,668	34.6
Coconino	Fires-Prescribed Fires	**2,875	34.2	Mobile-Locomotives	5,000	25.6
Gila	Fires-Prescribed Fires	2,149	35.9	Fires-Prescribed Fires	*839	20.1
Graham	Industrial Processes-Mining	2,924	73.3	Mobile-On-Road Gas Lt Duty Vehicle	*561	18.9
Greenlee	Industrial Process-Mining	**230	9.8	Industrial Processes-Mining	420	30.1
La Paz	Agriculture-Crops & Livestock Dust	423	54.9	Mobile-On-Rd Diesel HD Vehicle	1,582	43.8
Maricopa	Industrial Processes-NEC	5,666	31.9	Mobile-On-Rd Diesel HD Vehicle	43,377	37.8
Mohave	Dust-Construction Dust	688	23.4	Mobile-On-Rd Diesel HD Vehicle	4,407	26.6
Navajo	Dust-Unpaved Road Dust	1,273	30.8	Fuel Comb-Elec Gen-Coal	11,368	48.9
Pima	Dust-Construction Dust	2,169	23.3	Mobile-On-Road Gas Lt Duty Vehicle	11,357	31.9
Pinal	Dust-Construction Dust	1,802	24.0	Mobile-On-Road Gas Lt Duty Vehicle	5,457	31.1
Santa Cruz	Dust-Unpaved Road Dust	**234	21.3	Mobile-On-Rd Diesel HD Vehicle	691	28.4
Yavapai	Dust-Construction Dust	1,723	25.0	Mobile-On-Rd Diesel HD Vehicle	4,380	27.5
Yuma	Dust-Unpaved Road Dust	631	23.0	Mobile-On-Rd Diesel HD Vehicle	2,696	27.4

2008 National Emission Inventory Version 3
* Indicates Biogenics-Vegetaions and Soil are primary contributor to emissions
** Indicates Fires-Wildfires are primary contributor to emissions

Table 6. Largest Contributor of NH_3, SO_2, and VOCs by Sector Per County									
County	NH_3 [Ammonia]			SO_2 [Sulfur Dioxide]			VOCs		
	EI Sector	Emissions (Tons)	% of Total	EI Sector	Emissions (Tons)	% of Total	EI Sector	Emissions (Tons)	% of Total
Apache	Agriculture-Livestock Waste	422	45.2	Fuel Combustion-Electric Gen-Coal	22,456	99.4	Mobile-On-Road Gas Lt Duty Vehicle	*1,141	0.91
Cochise	Industrial Processes-NEC	1,436	42.3	Fuel Combustion-Electric Gen-Coal	1,903	61.8	Mobile-Non-Road Equipment - Gasoline	*1,978	2
Coconino	Agriculture-Livestock Waste	**578	38.7	Fires-Prescribed Fires	308	39.2	Mobile-Non-Road Equipment - Gasoline	*,**2,478	1.2
Gila	Agriculture-Livestock Waste	304	58.5	Industrial Processes-Non-Ferrous Metals	28,833	98.8	Mobile-Non-Road Equipment - Gasoline	*2,418	2.1
Graham	Agriculture-Livestock Waste	371	73.9	Mobile-On-Road Gas Lt Duty Vehicle	**9	18.8	Mobile-Non-Road Equipment - Gasoline	*463	0.29
Greenlee	Agriculture-Livestock Waste	**123	28.6	Industrial Processes-Mining	**49	23.1	Fires-Prescribed Fires	*,**116	0.31
La Paz	Agriculture-Fertilizer Application	292	51.9	Mobile-On-Road Gas Lt Duty Vehicle	12	29.3	Mobile-Non-Road Equipment - Gasoline	*1,007	0.82
Maricopa	Agriculture-Livestock Waste	9,584	48	Fuel Combustion-Indus. Boil., ICEs-Oil	610	37.2	Mobile-On-Road Gas Lt Duty Vehicle	*23,534	8.1
Mohave	Agriculture-Livestock Waste	226	45.1	Fuel Combustion-Indus. Boil., ICEs-Oil	73	21.2	Mobile-Non-Road Equipment - Gasoline	*5,562	2.3
Navajo	Agriculture-Livestock Waste	1,073	82.9	Fuel Combustion-Electric Gen-Coal	16,421	85.7	Mobile-On-Road Gas Lt Duty Vehicle	*1,596	1.3

Table 6. Largest Contributor of NH_3, SO_2, and VOCs by Sector Per County									
County	NH_3 [Ammonia]			SO_2 [Sulfur Dioxide]			VOCs		
	EI Sector	Emissions (Tons)	% of Total	EI Sector	Emissions (Tons)	% of Total	EI Sector	Emissions (Tons)	% of Total
Pima	Agriculture-Livestock Waste	695	35.5	Fuel Combustion-Electric Gen-Coal	2,882	61.1	Mobile-On-Road Gas Lt Duty Vehicle	*9,927	4.6
Pinal	Agriculture-Livestock Waste	4,335	77.8	Fuel Combustion-Indus. Boil., ICEs-Oil	94	24.7	Mobile-On-Road Gas Lt Duty Vehicle	*3,928	2.8
Santa Cruz	Agriculture-Livestock Waste	360	75.9	Fuel Combustion-Indus. Boil., ICEs-Oil	**19	18.1	Waste Disposal	*981	2.5
Yavapai	Agriculture-Livestock Waste	796	70.7	Industrial Processes-NEC	1,954	83.9	Mobile-On-Road Gas Lt Duty Vehicle	*2,365	1.7
Yuma	Agriculture-Fertilizer Application	2,346	54.1	Fuel Combustion-Indus. Boil., ICEs-Oil	48	22.3	Mobile-On-Road Gas Lt Duty Vehicle	*1,904	1.2

2008 National Emission Inventory Version 3
* Indicates Biogenics-Vegetaions and Soil are primary contributor to emissions
** Indicates Fires-Wildifres are primary contributor to emissions

8.0 Area Designation Recommendations

Consistence with previous designations for PM2.5, EPA intends to use the attainment/unclassifiable category for areas that are monitoring attainment and for areas that do not have monitors but, for which, EPA has reason to believe are likely attaining and are not contributing to nearby violations.[17] Based on available ambient monitoring data, and review of emissions, the proposed designation for Arizona is "attainment/unclassifiable" for the 2012 primary annual $PM_{2.5}$ NAAQS.

Arizona recommends that all areas of the State, except for Indian Country, be designated attainment/unclassifible for the primary annual $PM_{2.5}$ National Ambient Air Quality Standards. Arizona is not making a recommendation for any tribal lands located in the described geographical area, as tribal lands are not within State's jurisdiction. ADEQ respects tribal sovereignty and has worked to develop cooperative relationships with tribal air quality programs throughout the State. Table 7 describes by county the areas of the State recommended for Attainment/Unclassifiable.

Table 7. Primary Annual $PM_{2.5}$ NAAQS Recommended Attainment/Unclassifiable Areas - Arizona	
Arizona (except those portions in Indian Country).....	
Apache County	Attainment/Unclassifiable
Cochise County	Attainment/Unclassifiable
Coconino County	Attainment/Unclassifiable
Gila County	Attainment/Unclassifiable
Graham County	Attainment/Unclassifiable
Greenlee County	Attainment/Unclassifiable
La Paz County	Attainment/Unclassifiable
Maricopa County	Attainment/Unclassifiable
Mohave County	Attainment/Unclassifiable
Navajo County	Attainment /Unclassifiable
Pima County	Attainment /Unclassifiable
Pinal County	Attainment/Unclassifiable
Santa Cruz County	Attainment/Unclassifiable
Yavapai County	Attainment/Unclassifiable
Yuma County	Attainment/Unclassifiable

[17] See EPA April 16, 2013Memoandum "Initial Area Designations for the 2012 Revised Primary Annual Fine Particle National Ambient Air Quality Standard."

Responsiveness Summary

to

Testimony Taken at Oral Proceeding and Written Comments Received on *the Draft Proposed Arizona State Area Designation, Boundary Recommendation for the Revised Primary Annual Fine Particle (PM2.5) Standard (2012 NAAQS), August 2013*

A public notice appeared on the Arizona Department of Environmental Quality's (ADEQ) Website announcing the opening of a public comment period on August 13, 2013, and in *The Arizona Republic* on August 13 and 14, 2013. Notice was also provided to county air quality agencies and the U.S. Environmental Protection Agency via e-mail on August 13, 2013.

An oral proceeding on the draft recommendations was held on Wednesday September 18, 2013, at ADEQ, Conference Room 145, 1110 West Washington St, Phoenix, AZ. The public comment period closed on Wednesday September 18, 2013, at 5:00 p.m. The Arizona Department of Environmental Quality received no verbal or written comments on the Proposed Boundary Recommendations and no changes were made in response to public comments. During its final review of the Proposed Boundary Recommendations ADEQ made minor corrections for clarity, grammar and formatting.