

US EPA ARCHIVE DOCUMENT

## Technical Support Document for 2008 Ozone NAAQS Designations

### Arizona Area Designations for the 2008 Ozone National Ambient Air Quality Standards

The table below identifies the areas and associated counties or parts of counties in Arizona that EPA is designating as nonattainment for the 2008 ozone national ambient air quality standards (2008 NAAQS). In accordance with section 107(d) of the Clean Air Act, EPA must designate an area “nonattainment” if it is violating the 2008 ozone NAAQS or if it is contributing to a violation of the 2008 ozone NAAQS in a nearby area. The technical analyses supporting the boundaries for the individual nonattainment areas are provided below.

#### Nonattainment Areas in Arizona

Area	Arizona’s Recommended Nonattainment Counties	EPA’s Nonattainment Counties
Phoenix-Mesa, AZ*	Maricopa County (partial) Pinal County (partial)	Maricopa County (partial) Pinal County (partial)

\*The Phoenix-Mesa area includes areas of Indian country of federally recognized tribes. Table 1 in the Phoenix-Mesa nonattainment area identifies the areas of Indian country of each tribe that EPA is designating as part of the nonattainment area.

Designation of a state area may also affect Indian country. Areas of Indian country are located within the boundaries of the counties EPA is including as the Phoenix-Mesa nonattainment area. Designation of areas of Indian country is discussed further in the following technical analysis. All tribes are being designated in accordance with two guidance documents finalized in 2011 by EPA’s Office of Air Quality, Planning, and Standards: *Guidance to Regions for Working with Tribes during the National Ambient Air Quality Standard (NAAQS) Designations Process*<sup>1</sup> and the *Policy for Establishing Air Quality Designations for Distinct Areas of Indian Country (EPA Tribal Designations Policy)*<sup>2</sup>; in addition to EPA’s *Policy on Coordination and Consultation with Indian Tribes*<sup>3</sup>. EPA has carefully evaluated tribal recommendations. More information can be found under the jurisdictional boundaries section, below.

EPA is designating the remaining counties, portions of counties, and areas of Indian country in Arizona that are not listed in the table above as “unclassifiable/attainment” for the 2008 ozone NAAQS.

The analysis below provides the basis for nonattainment area boundaries. It relies on our analysis of which monitors are violating the 2008 ozone NAAQS, based on certified air quality monitoring data from 2008-2010, and an evaluation of whether nearby areas are contributing to such violations. EPA has evaluated contributions from nearby areas based on a weight of evidence analysis considering the factors identified below. EPA issued guidance on December 4, 2008 that identified these factors as ones

<sup>1</sup> <http://www.epa.gov/ttn/caaa/t1/memoranda/20120117naaqsguidance.pdf>

<sup>2</sup> <http://www.epa.gov/ttn/caaa/t1/memoranda/20120117indiancountry.pdf>

<sup>3</sup> <http://www.epa.gov/tp/pdf/cons-and-coord-with-indian-tribes-policy.pdf>

EPA would consider in determining nonattainment area boundaries and recommended that states consider these factors in making their designations recommendations to EPA<sup>4</sup>:

1. Air quality data (including the design value calculated for each federal reference method (FRM) or federal equivalent method (FEM) monitor in the area);
2. Emissions and emissions-related data (including location of sources and population, amount of emissions and emissions controls, and urban growth patterns);
3. Meteorology (weather/transport patterns);
4. Geography and topography (mountain ranges or other basin boundaries); and
5. Jurisdictional boundaries (e.g., counties, air districts, existing nonattainment areas, Indian country, metropolitan planning organizations (MPOs)).

Ground-level ozone generally is not emitted directly into the air, but is created by chemical reactions between oxides of nitrogen (NO<sub>x</sub>) and volatile organic compounds (VOC) in the presence of sunlight. Because NO<sub>x</sub> and VOC emissions from a broad range of sources over a wide area typically contribute to violations of the ozone standards, EPA believes it is important to consider whether there are contributing emissions from a broad geographic area. Accordingly, EPA chose to examine the five factors with respect to the larger of the Combined Statistical Area (CSA) or Core Based Statistical Area (CBSA) associated with the violating monitor(s).<sup>5</sup> All data and information used by EPA in this evaluation are the latest available to EPA and/or the latest information provided to EPA by states or tribes.

In EPA's designations guidance for the 2008 ozone NAAQS, EPA recommended examining CSA/CBSAs because certain factors used to establish CSAs and CBSAs are similar to the factors EPA is using in this technical analysis to determine if a nearby area is contributing to a violation of the 2008 ozone NAAQS. Congress required a similar approach in 1990 for areas classified as serious or above for the 1-hour ozone standard and EPA used the same basic approach in the designation process for the 1997 ozone NAAQS. Where a violating monitor is not located in a CSA or CBSA, EPA's guidance recommended using the boundary of the county containing the violating monitor as the starting point for considering the nonattainment area's boundary. Phoenix-Mesa-Glendale is defined by the Office of Management and Budget (OMB) as a metropolitan statistical area (MSA) and is composed solely of Maricopa and Pinal counties. The Phoenix-Mesa-Glendale MSA is not part of a larger CSA or CBSA.

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<sup>4</sup> The December 4, 2008 guidance memorandum "Area Designations for the 2008 Revised Ozone National Ambient Air Quality Standards" refers to 9 factors. In this technical support document we have grouped the emissions-related factors together under the heading of "Emissions and Emissions-Related Data," which results in 5 categories of factors.

<sup>5</sup> Lists of CBSAs and CSAs and their geographic components are provided at [www.census.gov/population/www/metroareas/metrodef.html](http://www.census.gov/population/www/metroareas/metrodef.html). The lists are periodically updated by the Office of Management and Budget. EPA used the most recent update, based on 2008 population estimates, issued on December 1, 2009 (OMB Bulletin No. 10-02).

## Technical Support Document for 2008 Ozone NAAQS Designations

### Arizona Area Designations for the 2008 Ozone National Ambient Air Quality Standards

#### Technical Analysis for Phoenix-Mesa

Figure 1 is a map of the existing Phoenix-Mesa, AZ nonattainment area. The map provides other relevant information including the locations and design values of air quality monitors, county names and boundaries, and indicates EPA's 2008 ozone NAAQS nonattainment designation. Also shown is the boundary of the existing area that is designated nonattainment. See Map 1 in Appendix 1 (also included in Factor 1 below) for a detailed map of the partial county boundaries that EPA is using for the nonattainment area boundary.

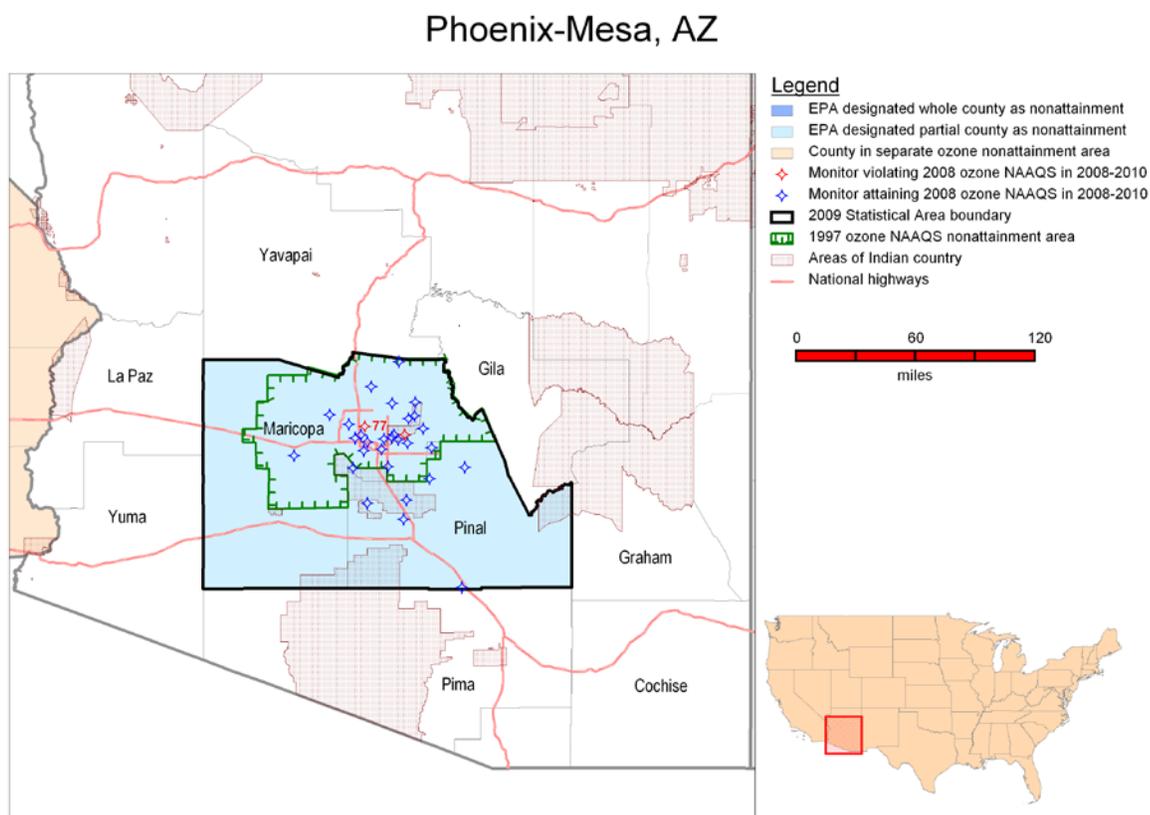


Figure 1

For purposes of the 1997 8-hour ozone NAAQS, portions of Maricopa and Pinal Counties were designated nonattainment. Pinal County was not included in the nonattainment area for the 1-hour ozone NAAQS. However, for the 1997 8-hour ozone NAAQS, EPA designated an area that included the 1-hour nonattainment area and added Apache Junction, a portion of Pinal County. This small city was part of the Phoenix PM<sub>10</sub> (particulate matter greater than 10 micrometers) nonattainment area. The Apache Junction portion of Pinal County was added to the Phoenix 1997 8-hour ozone nonattainment area partly because of its PM<sub>10</sub> nonattainment status, and partly because its population is associated with the greater Phoenix metropolitan area.

In March 2009, Arizona recommended that the same two partial counties, Maricopa and Pinal, be designated as “nonattainment” for the 2008 ozone NAAQS based on air quality data from 2006-2008, and additionally recommended extending the nonattainment boundaries at two locations in Maricopa County, and one location in Pinal County (letter from Janice Brewer, Governor, State of Arizona, to Laura Yoshii, Acting Regional Administrator, U.S. EPA Region IX, March 12, 2009 (hereafter, “ADEQ 2009 Recommendations”). ADEQ updated its 2009 recommendation on December 1, 2011 based on air quality data from 2008-2010 and preliminary data for 2009-2011. In its updated recommendation, the State continued to recommend extending the nonattainment boundary in two locations in Maricopa County, but withdrew its previous recommendation to extend the nonattainment boundary in Pinal County (letter from Henry R. Darwin, Director, Arizona Department of Environmental Quality, to Jared Blumenfeld, Regional Administrator, U.S. EPA Region IX, December 1, 2011 (hereafter, “ADEQ 2011 Recommendations”). The 2009 and 2011 recommendations are based on data from Federal Equivalent Method (FEM) monitors sited and operated in accordance with 40 CFR Part 58.

In March 2009, the Gila River Indian Community of the Gila River Indian Reservation recommended that reservation lands in Maricopa and Pinal counties be designated as “attainment” for the 2008 ozone NAAQS (letter from William Rhodes, Governor, Gila River Indian Community of the Gila River Reservation, to Laura Yoshii, Acting Regional Administrator, U.S. EPA Region IX, March 11, 2009).

In March 2009, the Salt River Pima-Maricopa Indian Community of the Salt River Reservation recommended that reservation lands in Maricopa County be designated as “attainment/unclassifiable” for the 2008 ozone NAAQS (letter from Martin Harvier, Vice President, Salt River Pima-Maricopa Indian Community of the Salt River Reservation, to Laura Yoshii, Acting Regional Administrator, U.S. EPA Region IX, March 9, 2009).

In March 2009, the Tohono O’odham Nation of Arizona recommended that reservation lands in Maricopa, Pinal, and Pima counties be designated as “attainment/unclassifiable” for the 2008 ozone NAAQS (letter from Ned Norris, Chairman, Tohono O’odham Nation of Arizona, to Laura Yoshii, Acting Regional Administrator, U.S. EPA Region IX, March 11, 2009).

After considering these recommendations and based on EPA's technical analysis described below, EPA is designating two partial counties in Arizona and areas of Indian country (identified in Table 1 below) as “nonattainment” for the 2008 ozone NAAQS as the Phoenix-Mesa multi-jurisdictional nonattainment area.

Table 1. State's and Tribe's Recommended and EPA's 2008 ozone NAAQS Nonattainment Counties or Areas of Indian country for Phoenix-Mesa.

Phoenix-Mesa, AZ	State and Tribe's Recommended Nonattainment Counties or Areas of Indian country	EPA's Nonattainment Counties or Areas of Indian country
Maricopa County	Maricopa County (p)	Maricopa County (p)
Pinal County	Pinal County (p)	Pinal County (p)
Fort McDowell Yavapai Nation	N/A	Fort McDowell Yavapai Nation
Salt River Pima-Maricopa Indian Community of the Salt River Reservation	Attainment/unclassifiable	<b>Salt River Pima-Maricopa Indian Community of the Salt River Reservation</b>
Tohono O'odham Nation of Arizona <sup>1</sup>	Attainment/unclassifiable	<b>Tohono O'odham Nation of Arizona (p)</b>

p = partial

N/A = Tribe did not submit a recommendation.

EPA modifications to state or tribe recommendations are shown in **bold**.

<sup>1</sup> The Tohono O'odham Nation of Arizona (Tohono O'odham) has non-contiguous land in the Phoenix-Mesa nonattainment area, in the unclassifiable/attainment area portions of Pinal County and the unclassifiable/attainment area of Pima County. Non-contiguous lands of Tohono O'odham are being designated with the surrounding areas. This technical analysis addresses only those areas of Indian country within the Phoenix-Mesa 2008 ozone NAAQS nonattainment area.

## Factor Assessment

### *Factor 1: Air Quality Data*

For this factor, we considered 8-hour ozone design values for air quality monitors in counties in the existing 1997 8-hour ozone Phoenix-Mesa nonattainment area, based on data from the 2008-2010 period (i.e., the 2010 design value, or DV), which are the most recent years with fully-certified air quality data. A monitor's DV is the metric or statistic that indicates whether that monitor attains a specified air quality standard. The 2008 ozone NAAQS are met at a monitor when the annual fourth-highest daily maximum 8-hour average concentration, averaged over 3 years, is 0.075 parts per million (ppm) (75 parts per billion (ppb)) or less. A DV is only valid if minimum data completeness criteria are met. See 40 CFR part 50 Appendix P. Where several monitors are located in a county (or a designated nonattainment area or maintenance area), the DV for the county or area is determined by the monitor with the highest level.

[Note: Monitors that are eligible for providing design value data generally include State and Local Air Monitoring Stations (SLAMS) that are sited in accordance with 40 CFR Part 58, Appendix D (Section 4.1) and operating with a federal reference method (FRM) or federal equivalent method (FEM) monitor that meets the requirements of 40 CFR part 58, Appendix A. All data from a special purpose monitor (SPM) using an FRM or FEM which has operated for more than 24 months is eligible for comparison to the NAAQS unless the monitoring agency demonstrates that the data came from a particular period during which the requirements of Appendix A (quality assurance requirements) or Appendix E (probe and monitoring path siting criteria) were not met.]

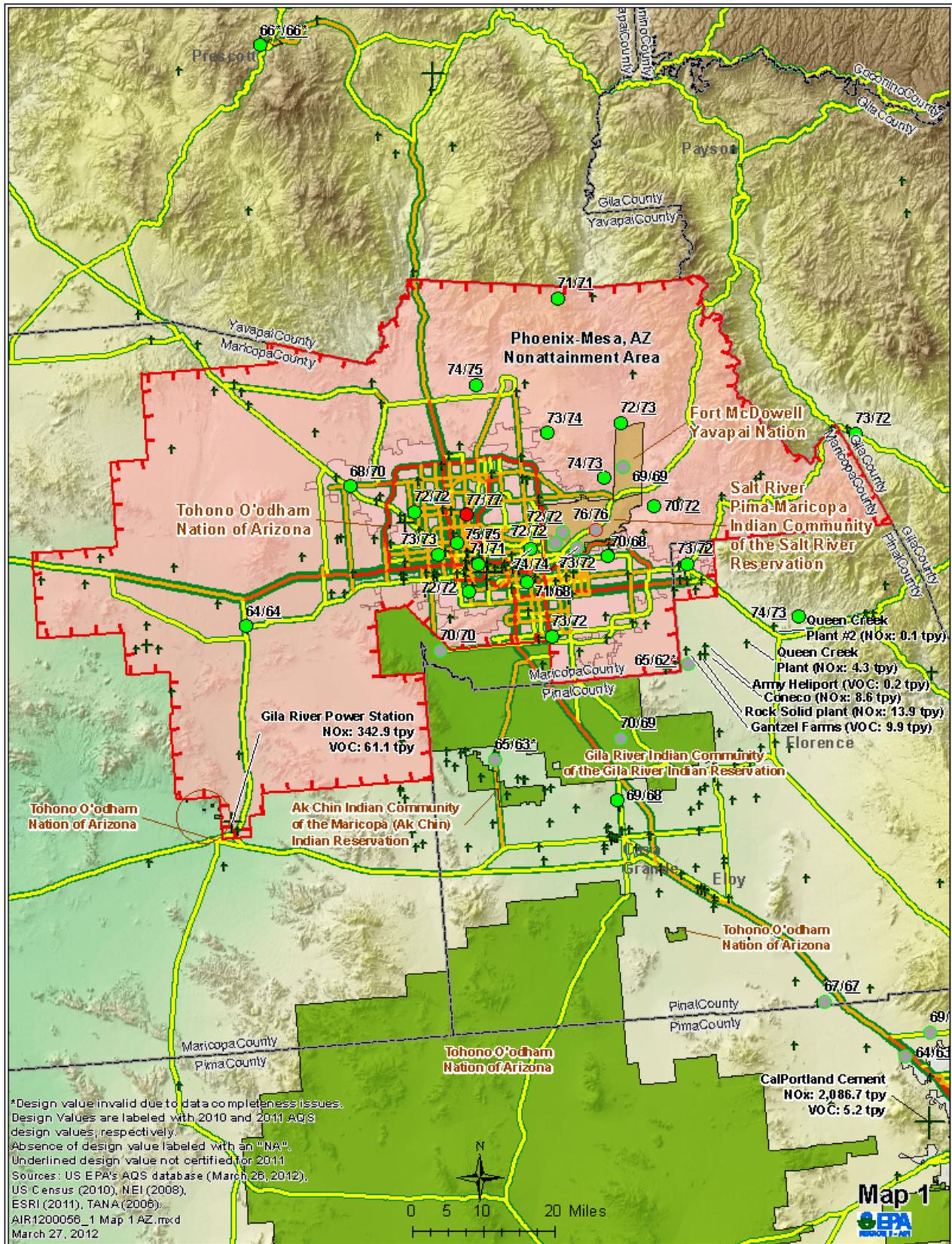
The existing Phoenix-Mesa nonattainment area for the 1997 ozone NAAQS comprises the central portion of Maricopa County and a small portion of northern Pinal County (see Map 1a in Appendix 2). The 2010 DVs for the ozone NAAQS for counties in the existing Phoenix-Mesa nonattainment area are shown in Table 2.

Table 2. Air Quality Data.

County	State Recommended Nonattainment?	2008-2010 Design Value (ppb)
Maricopa, AZ	Yes (partial)	77
Pinal, AZ	Yes (partial)	74

Ozone monitors relevant for comparison to the NAAQS and information from additional data sources within the existing Phoenix-Mesa nonattainment area and the surrounding area are shown in Appendix 1, Map 1 (also inserted below). Arizona's ozone season encompasses the entire year, but some ozone monitors in the existing Phoenix-Mesa nonattainment area have been approved to operate on a seasonal schedule per 40 CFR part 58, Appendix D, section 4.1(i). Certified, quality assured data are available in EPA's Air Quality System (AQS) for all areas through calendar year 2010. The Appendix 1 map includes preliminary 2011 DVs for the existing Phoenix-Mesa nonattainment area for informational purposes only. For each monitor, Appendix 1 lists the monitor, the 2008-2010 DV (certified and quality assured in AQS) and the preliminary 2009-2011 DV (data that are not yet certified and quality assured in AQS are denoted with an underline). Absence of a DV is symbolized with an "x".

Appendix 3 lists the DVs for monitors in the existing Phoenix-Mesa nonattainment area. Monitors shown in bold are the DV monitors (i.e., the monitor with the highest DV) for each individual county. Monitors shown in red font are the DV monitor for the nonattainment area. Values with an asterisk do not meet data completeness, and therefore those DVs are not relevant for comparison to the NAAQS and are solely provided for informational purposes.



From Appendix 1, Map 1: For map legend describing monitors, emissions, traffic, population, and boundaries, see Appendix 1.

Monitors in Maricopa County show a violation of the 2008 8-hour ozone standard based on 2008-2010 data. These violating monitors are located within the portion of Maricopa County that was included as part of the designated nonattainment area for the 1997 ozone standard. Since the County contains violating monitors, Factor 1 supports including Maricopa County, in whole or in part, in the Phoenix-Mesa nonattainment area. A county (or partial county) must also be designated nonattainment if it contributes to a violation in a nearby area. Each county without a violating monitor that is located near a county with a violating monitor has been evaluated based on the weight of evidence of the five factors and other relevant information to determine whether it contributes to the nearby violation (see Factor 2 discussion, below). In addition, we evaluate those factors to determine whether to include all of Maricopa County or just a part within the designated nonattainment area.

***Factor 2: Emissions and Emissions-Related Data***

EPA evaluated emissions of ozone precursors, nitrogen oxides (NO<sub>x</sub>) and volatile organic compounds (VOC), and other emissions-related data that provide information on areas contributing to violating monitors.

**Emissions data**

EPA evaluated county-level emission data for NO<sub>x</sub> and VOC derived from the 2008 National Emissions Inventory (NEI), version 1.5. This is the most recently available NEI (see <http://www.epa.gov/ttn/chief/net/2008inventory.html>). Emissions in a nearby area indicate the potential for the area to contribute to observed violations. Table 3 shows emissions of NO<sub>x</sub> and VOC (given in tons per year) for Maricopa and Pinal counties.

Table 3. Total 2008 NO<sub>x</sub> and VOC Emissions.

County	State Recommended Nonattainment?	NO <sub>x</sub> (tpy)	VOC (tpy)
Maricopa, AZ	Yes (partial)	89,020	90,615
Pinal, AZ	Yes (partial)	11,668	11,531
Areawide:		100,688	102,146

Maricopa and Pinal counties, with an area of approximately 9,200 square miles and 5,366 square miles, respectively, are among the largest counties in the nation, and, aside from the urban core, are composed entirely of desert terrain. Emissions of ozone precursors shown in Table 2 represent emissions from the entire counties of Maricopa and Pinal, not just the portions of those counties recommended by the State for inclusion in the Phoenix-Mesa nonattainment area. Emissions of NO<sub>x</sub> and VOC from Maricopa County are nearly eight times larger than NO<sub>x</sub> and VOC emissions from Pinal County. Most of the stationary source emissions of ozone precursors are located in the center of the State-recommended nonattainment area (see Map 1 of Appendix 1), with additional stationary sources scattered in the western portion of the State-recommended nonattainment area of Maricopa County, and fewer stationary sources in the eastern and northern portions of the State-recommended nonattainment area of Maricopa County. Additional stationary sources are located in the small section of Pinal County that is included in the existing Phoenix-Mesa 1997 ozone nonattainment area. Numerous stationary sources are located in Pinal County outside of EPA’s boundary for the 2008 ozone NAAQS Phoenix-Mesa nonattainment area, but are widely scattered and generally located near roadways. In 2009, the State recommended expanding the existing ozone nonattainment area in the southwest portion of the area, in order to include the Gila River Power Station (see Map 1 of Appendix 1). Additionally, the State recommended extending the western boundary of the nonattainment area farther west into Maricopa County by 5 - 10

miles. This expansion incorporates a small (less than 100 tpy) power plant. In its updated recommendation submitted to EPA on December 1, 2011, the State continued to recommend extending the nonattainment boundary to incorporate these two areas of Maricopa County.

In 2009, the State had also recommended that the existing 1997 ozone nonattainment boundary be extended to the southeast to incorporate a larger portion of Pinal County. In 2011, the State's updated recommendation excluded this area. Several small (less than 15 tpy of NO<sub>x</sub> or VOC) stationary sources of ozone precursor emissions are located in this area of Pinal County (see Map 1 of Appendix 1). These sources are more widely distributed geographically compared to the small portion of Pinal County that is part of the existing 1997 ozone nonattainment area.

In its February 2009 redesignation request and maintenance plan for the 1997 8-hour ozone NAAQS, the State provided information on the proportion of point source emissions from the entire county of Maricopa County compared to the those from the existing (for the 1997 ozone NAAQS) ozone nonattainment area<sup>6</sup>. Based on its 2005 periodic emission inventory, the State determined that the existing ozone nonattainment area, composed of portions of Maricopa and Pinal counties, captured the majority of point sources of emissions from Maricopa County – the county that contributes dominantly to total emissions from Maricopa and Pinal counties (see Table 3). For 2005, the existing ozone nonattainment area represented 99% of VOC emissions from Maricopa County, and nearly 87% of NO<sub>x</sub> emissions from Maricopa County. The State's recommendation to expand the Maricopa County portion of the nonattainment area to encompass new sources of ozone precursor emissions to the west and southwest of the existing nonattainment area should continue to ensure that relevant emissions sources are included in the nonattainment area designation.

#### **Population density and degree of urbanization**

EPA evaluated the population and vehicle use characteristics and trends of the area as indicators of the probable location and magnitude of non-point source emissions. These include ozone-creating emissions from on-road and off-road vehicles and engines, consumer products, residential fuel combustion, and consumer services. Areas of dense population or commercial development are an indicator of area source and mobile source NO<sub>x</sub> and VOC emissions, which contribute to ozone formation. Rapid population or growth in vehicle miles traveled (VMT) (see below) in a county on the urban perimeter signifies increasing integration with the core urban area, and indicates that it may be appropriate to include the area associated with area source and mobile source emissions as part of the nonattainment area. Table 4 shows the population, population density, and population growth information for Maricopa and Pinal counties.

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<sup>6</sup> See March 23, 2009 submittal of the 8-hour ozone redesignation request and maintenance plan for the Maricopa nonattainment area from Patrick Cunningham, Acting Director, ADEQ to Laura Yoshii, Acting Regional Administrator, EPA Region IX. The maintenance plan and redesignation request are available from the Maricopa Association of Governments at: <http://www.azmag.gov/Projects/Project.asp?CMSID2=1120&MID=Environmental%20Programs>

Table 4. Population and Growth.

County	State Recommended Nonattainment?	2010 Population	2010 Population Density (1000 pop/sq mi)	Absolute change in population (2000-2010)	Population % change (2000-2010)
Maricopa, AZ	Yes (partial)	3,817,117	0.41	719,617	+23%
Pinal, AZ	Yes (partial)	375,770	0.07	194,494	+107%
Areawide:		4,192,887	0.29	914,111	+28%

Sources: U.S. Census Bureau population estimates for 2010 as of August 4, 2011

([http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC\\_10\\_PL\\_GCTPL2.STO5&prodType=table](http://factfinder2.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=DEC_10_PL_GCTPL2.STO5&prodType=table))

Population information shown in Table 4 represents all of Maricopa and Pinal counties, not just the portions of those counties recommended by the State for inclusion in the 2008 ozone Phoenix-Mesa nonattainment area. Similar to the stationary source emissions of ozone precursors, the population of Maricopa County is substantially larger and denser than Pinal County. Although the percent change in population over 2000-2010 in Pinal County was very large (107%), its absolute change in population was still much smaller than Maricopa County's – less than a third. The largest population centers are located in Maricopa County (see Map 1a in Appendix 2). The eastern portion of the Phoenix metropolitan area extends into the Apache Junction portion of Pinal County and is included in the existing nonattainment area, as well as the State's recommended nonattainment area. Aside from the urbanized Phoenix area, the rest of both Maricopa and Pinal counties are sparsely populated. The portion of Pinal County, which was included in the State's 2009 recommendation but excluded in the 2011 recommendation, contains a few population centers, but is generally more sparsely populated compared to Apache Junction, the portion of Pinal County that is part of the existing 1997 ozone nonattainment area.

In its February 2009 redesignation request and maintenance plan for the 1997 8-hour ozone NAAQS, the State also provided information on populations within the existing 1997 ozone nonattainment area and Maricopa County – the county that contributes dominantly to total emissions from Maricopa and Pinal counties. Based on 2004 demographic data, the resident and non-resident populations within the existing ozone nonattainment area were 100.52% and 109.09% of the resident and non-resident populations of Maricopa County, respectively. Therefore, in 2004, the population of the existing 1997 ozone nonattainment area (consisting of portions of Maricopa and Pinal counties) was greater than the population of Maricopa County.

**Traffic (VMT) data**

EPA evaluated the commuting patterns of residents in the area, as well as the total VMT for each county. In combination with the population/population density data and the location of main transportation arteries (see above), this information helps identify the probable location of non-point source emissions. A county with high VMT is generally an integral part of an urban area and indicates the presence of motor vehicle emissions that may contribute to ozone formation and nonattainment in the area. Rapid population or VMT growth in a county on the urban perimeter signifies increasing integration with the core urban area, and indicates that the associated area source and mobile source emissions may be appropriate to include in the nonattainment area. Table 5 shows total 2008 VMT for Maricopa and Pinal counties.

Table 5. Traffic (VMT) data.

County	State Recommended Nonattainment?	2008 VMT* (million miles)
Maricopa, AZ	Yes (partial)	33,393
Pinal, AZ	Yes (partial)	3,972
Areawide:		37,365

\*MOBILE model VMTs are those inputs into the NEI version 1.5.

The total 2008 VMT in Maricopa County was over eight times higher than the 2008 VMT in Pinal County. The highest non-truck traffic volume occurs within the population centers located in the Maricopa County portion of the nonattainment area, with some heavy traffic on roads that run south, north, and to a lesser extent, west from the population centers (see Map 1 of Appendix 1).

### ***Factor 3: Meteorology (weather/transport patterns)***

EPA evaluated available meteorological data to help determine how meteorological conditions, such as weather, transport patterns and stagnation conditions would affect the fate and transport of precursor emissions contributing to ozone formation.

Maricopa and Pinal counties lie in a hot desert area of Arizona, where summer temperatures regularly exceed 100 degrees F. In the absence of the strong winds associated with summer storms that sometimes occur in the area, the high temperatures are conducive to ozone formation. ADEQ has described the basic flow pattern that results in “sloshing” of pollutant towards the west, and then later in the day back toward the east:

“The mountain-valley flow defines the daily surface wind patterns in the Phoenix area in the absence of synoptic weather systems with associated cold fronts. As a result, Phoenix has a typical diurnal wind pattern that exists nearly year-round due to its geographical position within the valley. ... When the sun rises over the Superstitions in the east, the east-facing mountains in the west valley such as the White Tank Mountains begin to heat up. As the morning progresses, an energy imbalance is created where the warmer air over the White Tank Mountains rises while the cooler air over the east mountains such as the Superstition mountains sinks. This causes the surface winds across the valley to move from east to west.... By about 2 p.m., the mountains in the east part of the valley have more direct sunlight than the west. This imbalance in energy leads to a shift in surface winds from out of the west during the afternoon period. As the sun goes down, equal cooling takes place and winds decrease to nearly calm.”<sup>7</sup>

While the mountains to east and west provide partial barriers to transport of pollutants in certain directions (especially the northeast), they do not form a closed basin. There is opportunity for emissions from outside the immediate metropolitan Phoenix area to contribute to ozone formation. “Wind patterns in Phoenix suggest that ozone and ozone precursors can be transported in the morning from the far west and southern portions of the valley and impact monitors in the Phoenix valley.”<sup>8</sup> In recognition of this, the State recommended extending the boundaries of the previous ozone nonattainment area. The recommendation included several new point sources to the west and southwest, as discussed above under Factor 2.

<sup>7</sup> ADEQ 2009 Recommendations, p.44-45

<sup>8</sup> ADEQ 2009 Recommendations, p.42

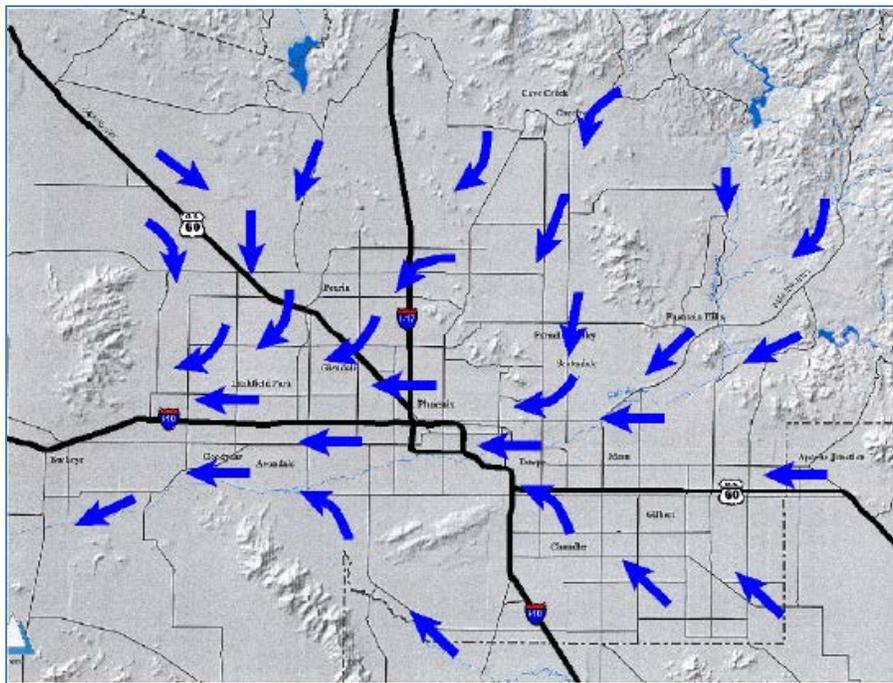


Figure 2

Source: ADEQ 2009 Recommendations, p.54 Figure III.36: “High mountain slopes to the west of Phoenix are heated in the morning and surface air is drawn towards the west.”

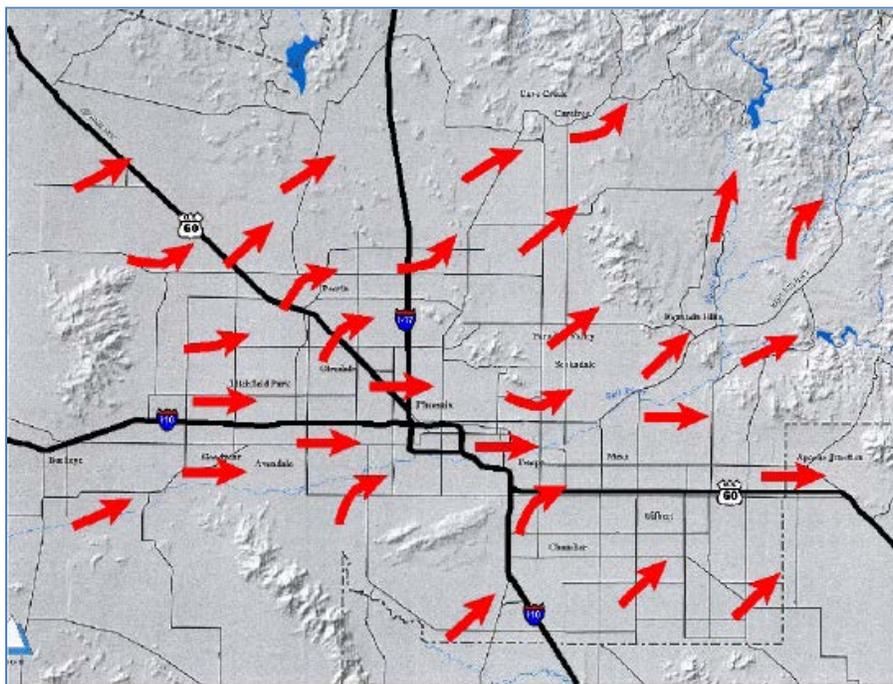


Figure 3

Source: ADEQ 2009 Recommendations, p.54 Figure III.37: “High mountain slopes to the east of Phoenix are heated in the late afternoon and surface air is drawn towards the east.”

The west-east flow pattern is generally consistent with the 30-year average of National Weather Service summer wind direction frequencies computed by EPA, as shown in the “radar”-style wind rose diagram below (Figure 4).

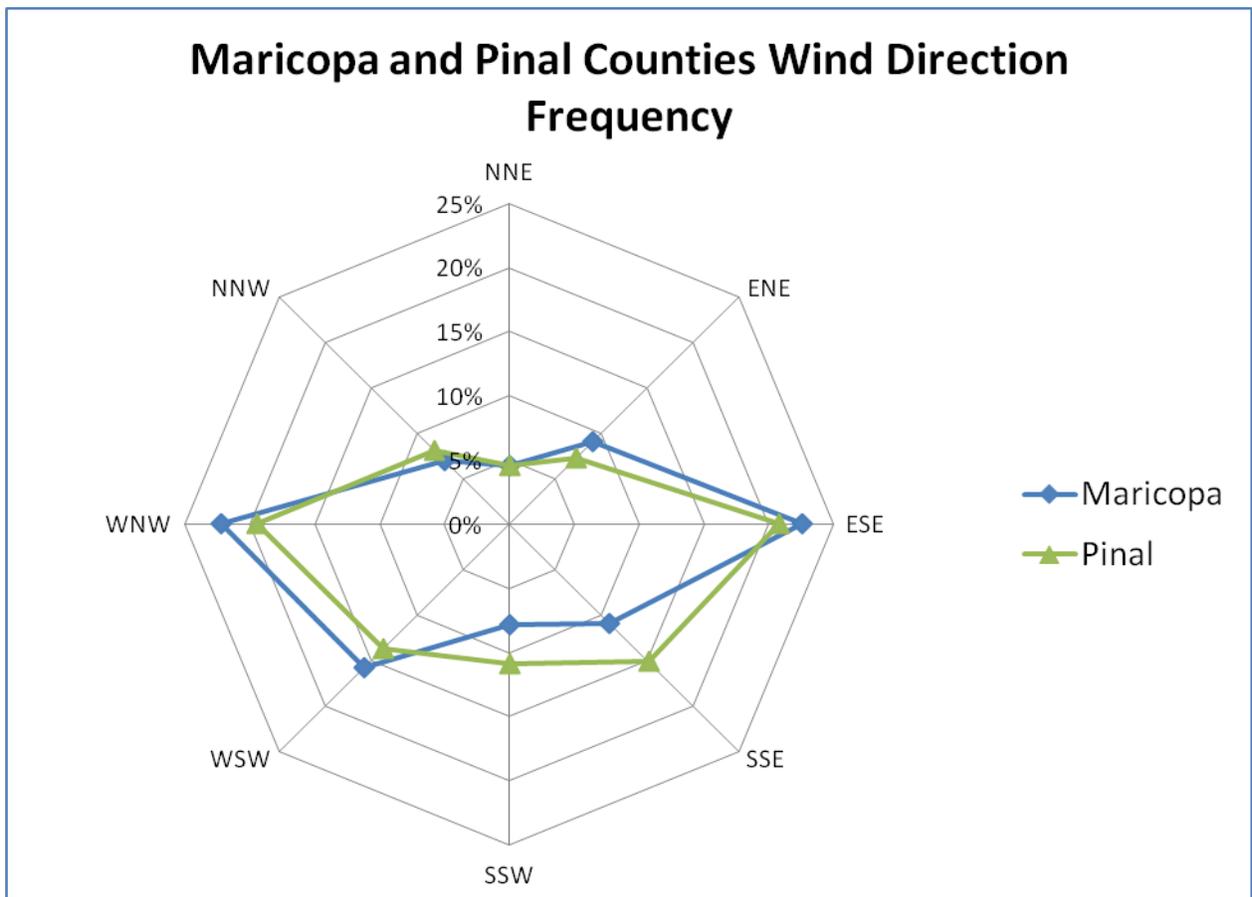


Figure 4

**Factor 4: Geography/topography (mountain ranges or other air basin boundaries)**

The geography/topography analysis evaluates the physical features of the land that might affect the airshed and, therefore, the distribution of ozone over the area.

The Phoenix-Mesa area is partly surrounded by mountains of varying heights. As described by the State:

“The Phoenix metropolitan area lies in a valley bordered by the Superstition Mountains to the east, the New River Mountains to the north and northeast, the Hieroglyphic Mountains to the northwest near Lake Pleasant, the White Tank Mountains in the west, the Estrella Mountains to the southwest, and the South Mountains to the south. The Salt River runs through the southern part of the metropolitan area and exits to the southwest with the Gila and Agua Fria Rivers joining it near Goodyear, and the Hassayampa River joining west of Palo Verde.”<sup>9</sup>

While the mountains to the east and west provide partial barriers to transport of pollutants in certain directions (especially the northeast), they do not form a closed basin. There is opportunity for emissions from outside the immediate metropolitan Phoenix area to contribute to ozone formation. “Wind patterns in Phoenix suggest that ozone and ozone precursors can be transported in the morning from the far west

<sup>9</sup> ADEQ 2009 Recommendations, p.44

and southern portions of the valley and impact monitors in the Phoenix valley.”<sup>10</sup> In recognition of this, the State recommended a nonattainment area which incorporates source areas that are relatively far from central metropolitan Phoenix and the highest ozone concentrations.

### ***Factor 5: Jurisdictional boundaries***

For each potential nonattainment area, we considered existing jurisdictional boundaries to provide a clearly defined legal boundary and to help identify the areas appropriate for carrying out the air quality planning and enforcement functions for nonattainment areas. Examples of jurisdictional boundaries include existing/prior nonattainment area boundaries for ozone or other urban-scale pollutants, county lines, air district boundaries, township boundaries, areas covered by a metropolitan planning organization, state lines, areas of Indian country, and urban growth boundaries. Where existing jurisdictional boundaries were not adequate or appropriate to describe the nonattainment area, other clearly defined and permanent landmarks or geographic coordinates were considered.

The Phoenix-Mesa nonattainment area has previously established nonattainment boundaries associated with both the 1-hour and 1997 8-hour ozone NAAQS. The boundary of the Phoenix-Mesa nonattainment area for the 1997 ozone NAAQS includes a large portion of Maricopa County and a small portion of Pinal County (Apache Junction). The State has recommended a slightly different boundary for the 2008 ozone NAAQS. The State has requested that EPA expand the boundary of the nonattainment area for the 2008 ozone NAAQS, relative to the boundary established for the 1997 ozone NAAQS.

The Phoenix-Mesa-Glendale metropolitan statistical area (MSA) is composed solely of Maricopa and Pinal counties. The Phoenix-Mesa-Glendale MSA is not part of a combined statistical area (CSA). The majority of the urban area lies mainly in Maricopa County, with a portion of the eastern urbanized area extending into Pinal County. The Maricopa Association of Governments (MAG), a metropolitan planning organization (MPO), has jurisdiction of both air and transportation planning for the metropolitan area. Together, Maricopa and Pinal counties comprise the Phoenix-Mesa-Glendale Metropolitan Statistical Area.<sup>11</sup> The cities of Phoenix, Mesa and Glendale are entirely contained within Maricopa County. But, as noted above, the urbanized area extends into Pinal County.

The Maricopa County partial county boundary, for both the recommended area and the existing nonattainment area for the 1997 ozone NAAQS, follows the county boundary to the north, east and southeast (excluding Gila River Indian Community, see discussion below, and including a small portion of Pinal County that bounds the eastern edge of the Phoenix-Mesa urbanized area). The boundaries for this area are consistent with MAG’s north, east, and southeast planning area boundaries. To the west and southwest, the ozone nonattainment area boundary follows township and range boundaries in a way that encompasses stationary and mobile sources and population centers. MAG defined an “Area A” for air pollution control purposes in the past, mainly associated with dust controls and other restrictions (e.g., no-burn days). Area A became part of the 1-hour ozone as well as the 1997 8-hour ozone nonattainment area. Area A is bounded to the west by township and range boundaries. For the western and southwestern boundaries for the designated Phoenix-Mesa nonattainment area for the 2008 ozone NAAQS, the State recommended including the entire existing area and two expanded areas in the east and south. This includes all of Area A, several township and ranges on the west that were included in

<sup>10</sup> ADEQ 2009 Recommendations, p.42

<sup>11</sup> The Office of Management and Budget names such areas in decreasing ranking of populated areas within the MSA. Phoenix is therefore larger than Mesa, which is larger than Glendale.

prior ozone designations (for 1-hour and the 1997 8-hour ozone NAAQS), and several newly added township and range areas to the west and to the southwest. The State recommended these expanded boundaries because there are several large stationary sources located in those areas (e.g., power plants).

In 2009, the State recommended expanding the Pinal County portion of the existing ozone boundary to encompass a violating monitor and a planned power plant. However, on December 1, 2011, in an update to its 2009 recommendation, the State reverted to the existing Pinal partial county boundary, which includes only the Apache Junction portion. The State explained that more recent air quality monitoring in the formerly recommended area shows the previously violating monitor is now attaining the standard. In addition, economic conditions put the development of a power plant in the area in doubt.

The Phoenix-Mesa nonattainment area also includes an area of Indian country. As defined at 18 U.S.C. 1151, "Indian country" refers to: "(a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same." EPA recognizes the sovereignty of tribal governments, and has attempted to take the desires of the tribes into account in establishing appropriate nonattainment area boundaries.

### ***Evaluation of Recommendation from Gila River Indian Community of the Gila River Indian Reservation***

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. EPA has evaluated the recommendation of the Gila River Indian Community of the Gila River Indian Reservation (Gila River) based on currently available information.

In 2004, EPA established the Phoenix-Mesa nonattainment area boundaries for the 1997 ozone NAAQS that excluded the portions of Maricopa and Pinal counties that encompass the Gila River.

In March 2009, Gila River recommended that portions of Gila River in Maricopa and Pinal counties be designated as "attainment" for the 2008 ozone NAAQS (letter from William Rhodes, Governor, Gila River Indian Community, to Laura Yoshii, Acting Regional Administrator, U.S. EPA Region IX, March 11, 2009).

Gila River is a federally recognized tribe with reservation lands in Maricopa and Pinal counties. The majority of the Indian country is located in Pinal County and has not been subject to urbanization and is mainly a rural environment with two main population centers in St. Johns and Sacaton and over 35,000 acres of agricultural lands. Gila River has an on-reservation population of approximately 22,000 people. These population centers are not integrated within the Phoenix metropolitan area and pale in comparison to the 3,800,000 people living in the adjacent Maricopa County. Also, The South Mountains to the north and the Estrella Mountains in the west may provide some geographical and topographic barriers between the Phoenix-Mesa nonattainment area and the majority of Gila River reservation lands. These areas of Indian country and the adjacent Phoenix-Mesa nonattainment areas are shown in Map 1a in Appendix 2.

Currently, Gila River operates a network of two ozone monitors within the tribal boundaries that represent both the northwestern and the central portions of the Gila River lands. The map in Appendix 1 shows monitor locations for the Phoenix-Mesa nonattainment area, including Gila River monitors. EPA anticipates relying on 2008-2010 data to designate this area. Appendix 1 provides preliminary 2011 data for informational purposes only. Based on the information currently available, both monitors operated by Gila River in their area of Indian country indicate that the area is attaining the 2008 ozone NAAQS for 2008-2010.

Because monitors located in Gila River's area of Indian country indicate the area is attaining the 2008 ozone NAAQS, based on the low population, the largely rural environment, and the presence of some topographical barriers that separate Gila River from the adjacent nonattainment area, EPA continues to agree that that Gila River's area of Indian country has different ozone concentrations than surrounding areas and is not affected by the poor air quality present in the Phoenix-Mesa nonattainment area. Therefore, consistent with the EPA Tribal Designations Policy, EPA is designating the Gila River Indian Community of the Gila River Indian Reservation unclassifiable/attainment for the 2008 ozone NAAQS, consistent with the designation of the adjacent areas in Pinal County.

### *Evaluation of Recommendation from Tohono O'odham Nation of Arizona*

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. EPA has evaluated the recommendation of the Tohono O'odham Nation of Arizona (Tohono O'odham) based on currently available information.

In 2004, EPA established the Phoenix-Mesa nonattainment area boundaries for the 1997 ozone NAAQS. This nonattainment area included the portion of Maricopa County that encompassed the non-contiguous lands of Tohono O'odham, however, this land was not taken into trust for the Tribe by the Department of Interior until 2010<sup>12</sup>, and was therefore not considered to be an area of Indian country until that time.

In March 2009, Tohono O'odham recommended that the portions of Tohono O'odham in Maricopa, Pinal, and Pima counties be designated as "attainment/unclassifiable" for the 2008 ozone NAAQS (letter from Ned Norris, Chairman, Tohono O'odham Nation, to Laura Yoshii, Acting Regional Administrator, U.S. EPA Region IX, March 11, 2009).

EPA has included a portion of Tohono O'odham lands located in Maricopa County (specifically, areas of Indian country located near Glendale, Arizona) as part of the Phoenix-Mesa nonattainment area. Tohono O'odham's remaining Indian country in Maricopa, Pinal and Pima

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<sup>12</sup> On June 23, 2010 the U.S. Department of Interior (DOI) approved a request from the Tohono O'odham Nation to take 53.54 acres of land held in fee by the Tribe and located in Maricopa County, AZ near Glendale, into trust (75 FR 21130). DOI made this approval pursuant to the *Gila Bend Indian Reservation Lands Replacement Act, P.L. 99-503, Stat 100 1798 (1986), Section 6(d)*, which mandates the following: "Any land which the Department of Interior holds in trust for the Tribe shall be deemed to be a Federal Indian Reservation for all purposes." EPA is designating this trust land along with the surrounding Phoenix-Mesa nonattainment area. EPA notes that it is not making any determination on the Tribe's Reservation boundary through this designation process.

counties are not contiguous and EPA is designating these lands as “unclassifiable/attainment”, consistent with the designation of the surrounding area.

### **Air Quality Data**

Currently, Tohono O’odham does not operate any air quality monitors. However, monitors near the Tribe’s area of Indian country near Glendale in Maricopa County show a violation of the 2008 8-hour ozone standard based on 2008-2010 data. Map 1 in Appendix 1 shows monitor locations for the Phoenix-Mesa nonattainment area. For each monitor, Appendix 1 lists the monitor, the 2008-2010 DV (certified and quality assured in AQS) and the 2009-2011 DV (data that are not yet certified and quality assured in AQS are denoted with an underline).

Based on the lack of topographic barriers, similarities in meteorology and transport patterns to the surrounding area, Tohono O’odham’s Indian country near Glendale is expected to have similar air quality as the surrounding area.

### **Emissions and Emissions-Related Data**

The lands of Tohono O’odham near Glendale consist of 53.54 acres of reservation lands. EPA is not aware of any sources of ozone precursor emissions within this area of Indian country. Information on emissions, population density and degree of urbanization, traffic and commuting patterns for the Phoenix area can be found in Factor 2 of the Phoenix-Mesa nonattainment area technical analysis, above.

### **Meteorology (Weather/Transport Patterns)**

Tohono O’odham’s Indian country near Glendale is located in central Maricopa County and experiences similar meteorology and transport patterns as the Phoenix metropolitan area. Therefore, the information for the Phoenix-Mesa nonattainment area discussed in Factor 3 above, also characterizes the meteorology and transport patterns for this part of Tohono O’odham.

### **Geography/Topography**

Tohono O’odham’s Indian country near Glendale does not have any geographical or topographical barriers that would prevent air pollution transport from the surrounding Phoenix-Mesa nonattainment area. Therefore, geography and topography support including this portion of Tohono O’odham with the surrounding area.

### **Jurisdictional Boundaries**

Tohono O’odham is a federally recognized tribe with non-contiguous reservation land in Maricopa, Pinal, and Pima counties. These areas of Indian country and the surrounding nonattainment areas are shown on Map 1a in Appendix 2. The majority of the Tribe’s reservation lands are located in Pinal and Pima counties, outside of the Phoenix-Mesa nonattainment area. However, the 53.54 acres of Indian country taken into trust by the U.S. Department of Interior for the Tribe in 2010 are located near Glendale, Arizona, which is about nine miles northwest of downtown Phoenix and near the center of the Phoenix-Mesa nonattainment area. There are no geographic or topographical barriers that preclude air pollution transport from the surrounding Phoenix-Mesa nonattainment area.

## **Conclusion for Tohono O'odham**

Based upon currently available information, it appears that Tohono O'odham's area of Indian country near Glendale, AZ is affected by the poor air quality that exists within the Phoenix-Mesa nonattainment area. Therefore, while the Tribe has recommended its areas of Indian country be designated "attainment/unclassifiable", consistent with the EPA Tribal Designations Policy, EPA is including a portion of Tohono O'odham lands located in Maricopa County (specifically, areas of Indian country located near Glendale, Arizona) as part of the Phoenix-Mesa nonattainment area. The remaining lands located in Maricopa, Pinal and Pima counties are not contiguous and EPA is designating these lands as unclassifiable/attainment, consistent with the designation of the surrounding area.

## ***Evaluation of Recommendation from Salt River Pima-Maricopa Indian Community of the Salt River Reservation***

Pursuant to section 107(d) of the Clean Air Act, EPA must designate as nonattainment those areas that violate the NAAQS and those areas that contribute to violations. EPA has evaluated the recommendation of the Salt River Pima-Maricopa Indian Community of the Salt River Reservation (Salt River) based on currently available information.

In 2004, EPA established the Phoenix-Mesa nonattainment area boundaries for the 1997 ozone NAAQS that included portions of Maricopa County that encompass Salt River.

In March 2009, the Salt River Pima-Maricopa Indian Community recommended that portions of Salt River in Maricopa County be designated as "attainment/unclassifiable" for the 2008 ozone NAAQS (letter from Martin Harvier, Vice President, Salt River Pima-Maricopa Indian Community, to Laura Yoshii, Acting Regional Administrator, U.S. EPA Region IX, March 9, 2009). Based on the factors discussed below, EPA has concluded that Salt River's Indian country should be designated nonattainment as part of the Phoenix-Mesa nonattainment area for the 2008 ozone NAAQS.

### **Air Quality Data**

Currently, Salt River operates a network of four ozone monitors within its areas of Indian country. Map 1 in Appendix 1 shows monitor locations for the Phoenix-Mesa nonattainment area, including Salt River monitors. For each monitor, Appendix 1 lists the monitor, the 2008-2010 design value (DV) and the preliminary 2009-2011 DV (data that are not yet certified and quality assured in AQS are denoted with an underline). Values with an asterisk do not meet data completeness, and therefore those DVs are not relevant for comparison to the NAAQS and are solely provided for informational purposes. Absence of a DV is indicated with an "x." EPA is designating Arizona for the 2008 ozone NAAQS using certified 2008-2010 DV data; preliminary 2011 data are provided for informational purposes.

Based on the information currently available, the Red Mountain ozone monitor (AQS ID: TT6157021; see Appendix 3) operated by Salt River on tribal lands has a 2008-2010 8-hour design value of 0.076 ppm, which constitutes a violation of the 2008 ozone NAAQS.

## **Emissions and Emissions-Related Data**

Salt River consists of 54,000 acres of reservation lands, which is home to over 10,000 tribal members. Salt River has some emissions sources within its area of Indian country, including aggregate mining facilities, asphalt and concrete batch plants, and landfills. Also, two major roadways, the Pima Loop 101 (Highway 101- Pima Freeway) and the Beeline Highway (Arizona Highway 87), pass through Salt River.

General information on emissions, population density and degree of urbanization, traffic and commuting patterns for the Phoenix-Mesa nonattainment area can be found in the general Phoenix-Mesa nonattainment area Factor 2 discussion above and is applicable to Salt River. We do not have independent information solely for the Salt River reservation lands.

## **Meteorology (Weather/Transport Patterns)**

Salt River is fairly integrated within the surrounding urban area and therefore the information for the Phoenix-Mesa nonattainment area discussed in Factor 3 also characterizes the meteorology and transport patterns for Salt River.

## **Geography/Topography**

Salt River area does not have any geographical or topographical barriers that would prevent air pollution transport from the surrounding Phoenix-Mesa nonattainment area. Therefore, geography and topography support including Salt River's Indian country with the surrounding area.

## **Jurisdictional Boundaries**

Salt River is a federally recognized tribe located in the eastern portion of the Phoenix metropolitan area. Map 1a shows the locations and the area of Indian country within the Phoenix-Mesa nonattainment area.

## **Conclusion for Salt River**

While Salt River has recommended an "attainment/unclassifiable" designation, based on the information currently available and the five factor analysis above, including a violating monitor located in Salt River's area of Indian country and the presence of several sources of ozone precursor emissions, consistent with the EPA Tribal Designations Policy, EPA is designating Salt River's Indian country as part of the Phoenix-Mesa nonattainment area for the 2008 ozone NAAQS.

## Conclusion

Based on the assessment of factors described above, EPA has concluded that the following counties and areas of Indian country should be included as part of the Phoenix-Mesa, AZ nonattainment area because they are either violating the 2008 ozone NAAQS or contributing to a violation in a nearby area:

Maricopa County (partial), Pinal County (partial), the Fort McDowell Yavapai Nation (Fort McDowell), Salt River, and Tohono O'odham (partial).

Based on 2008-2010 DV data (Factor 1), Maricopa County contains two violating monitors and Pinal County does not contain any violating monitors. Consideration of only air quality data and the location of violating monitors indicate that all or part of Maricopa County should be included in the 2008 8-hour ozone nonattainment area.

Emissions of ozone precursors (Factor 2) from Maricopa County are over ten times larger than from Pinal County. The State's partial boundary recommendations for Maricopa and Pinal Counties include the dense population centers and roadways, as well as the majority of the stationary sources of ozone precursor emissions in Maricopa and Pinal counties. Maricopa and Pinal counties are geographically large. Outside of the densely populated urban Phoenix core, these counties are sparsely populated with relatively few stationary and mobile sources of ozone precursor emissions. The distribution of stationary and mobile emission sources (Factor 2) and information provided by the State in its redesignation request and maintenance plan for the 1997 8-hour ozone NAAQS – indicating that the majority of emissions in Maricopa County are well represented by the 1997 ozone nonattainment area – supports the State's recommendation to use the existing 1997 8-hour ozone nonattainment boundary while also expanding the boundaries in Maricopa County to encompass additional stationary sources located to the west and southwest. Because Pinal County contributes a small fraction to total ozone precursor emissions from Maricopa and Pinal counties, and because stationary and mobile sources in Pinal County, outside the State-recommended nonattainment area, are widely distributed throughout the large county area, Factor 2 supports the State's recommendation to maintain the existing 1997 8-hour ozone nonattainment boundary around the Apache Junction area.

Meteorology and weather or transport patterns (Factor 3) and geography and topography (Factor 4) show that there is the potential for some contribution to ozone violations from emissions occurring toward the southeast, in Pinal County. In considering jurisdictional boundaries (Factor 5), EPA notes that the State's recommended nonattainment area boundaries expands the Maricopa County portion of the nonattainment area, but is otherwise consistent with the 1997 8-hour ozone nonattainment area.

Based on our analysis of all five factors, EPA supports the State's recommendation for the nonattainment area boundary in Maricopa and Pinal counties.

Three tribes located within or near the boundaries of the Phoenix-Mesa nonattainment area submitted recommendations to EPA. EPA has concluded that Gila River's Indian country, located in Maricopa and Pinal counties, should be excluded from the Phoenix-Mesa nonattainment area and designated unclassifiable/attainment based on air quality data, the low population, the largely rural environment, and the presence of some topographical barriers. Based upon currently available information, it appears that the portion of Tohono O'odham's Indian country located in Maricopa County experiences similar poor air quality as the Phoenix-Mesa nonattainment area. Therefore, EPA has concluded that the portions of Tohono O'odham located in Maricopa County (specifically, areas of Indian country located in Glendale, Arizona) should be included as part of the Phoenix-Mesa nonattainment area. Because the remaining portions of Tohono O'odham are non-contiguous and are not located within the Phoenix-

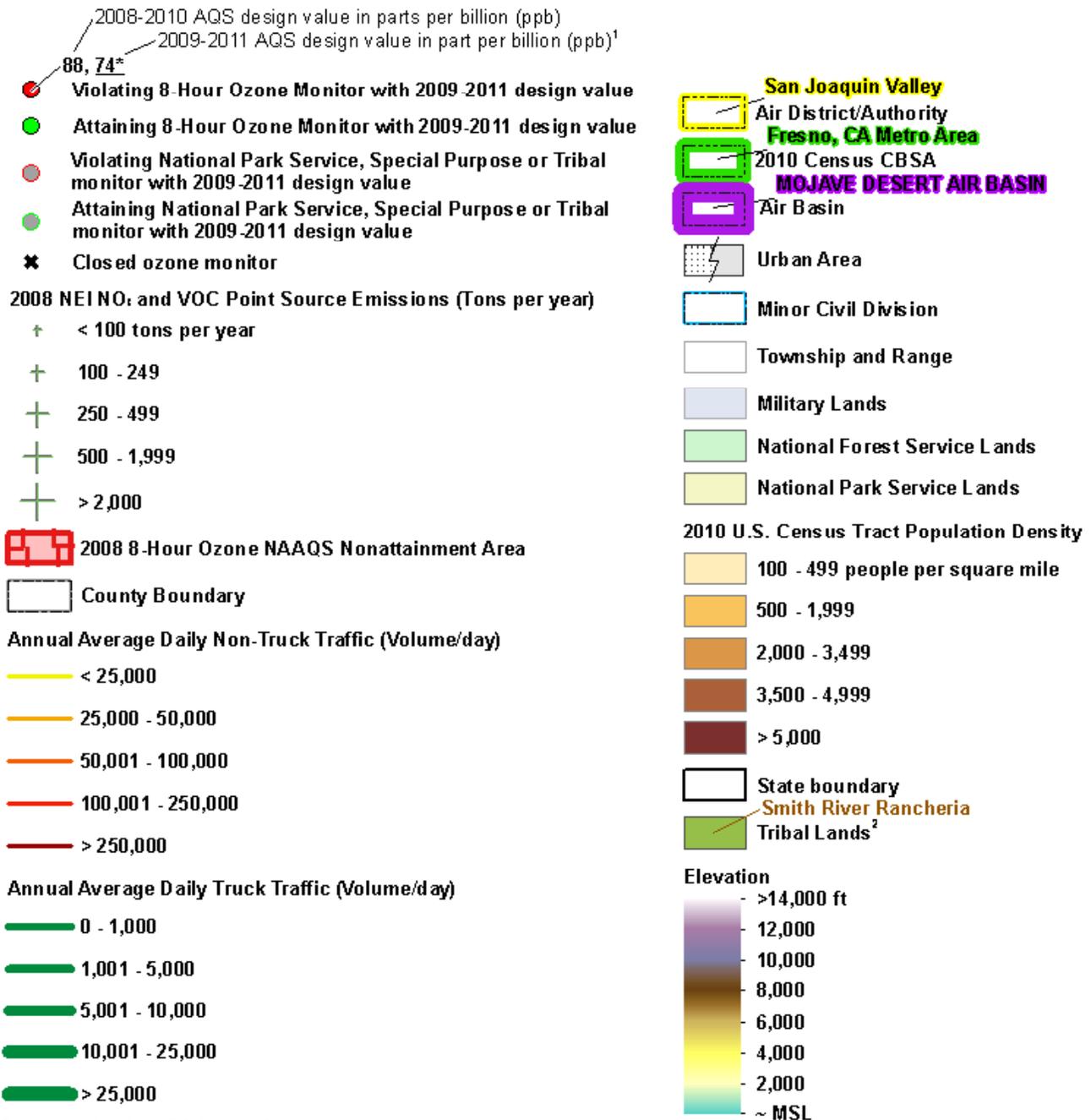
Mesa nonattainment area for the 2008 ozone NAAQS, EPA is designating all other portions of Tohono O’odham located in Maricopa, Pinal, and Pima counties as “unclassifiable/attainment” consistent with the surrounding areas. EPA has also concluded that Salt River’s Indian country should be designated as “nonattainment” as part of the Phoenix-Mesa nonattainment area for the 2008 ozone NAAQS, due to a violating monitor on tribal lands and consideration of other factors discussed above. Fort McDowell did not submit a recommendation, and consistent with the EPA Tribal Designations Policy, EPA has concluded that Fort McDowell’s area of Indian country should be designated nonattainment as part of the Phoenix-Mesa nonattainment area for the 2008 ozone NAAQS.

Based on our consideration of all five factors, EPA concludes that Maricopa (partial) and Pinal (partial) counties in Arizona and areas of Indian country – Fort McDowell, Salt River, and Tohono O’odham (partial) – should be designated nonattainment for the 2008 ozone NAAQS as the Phoenix-Mesa, AZ multi-jurisdictional nonattainment area.

Appendix 1:

Map showing Monitors, Emissions, Vehicle Traffic, and General Population

## Legend



\*Design value invalid due to data completeness issues.

Design Values are labeled with 2010 and 2011 design values, respectively.

Absence of design value labeled with "NA".

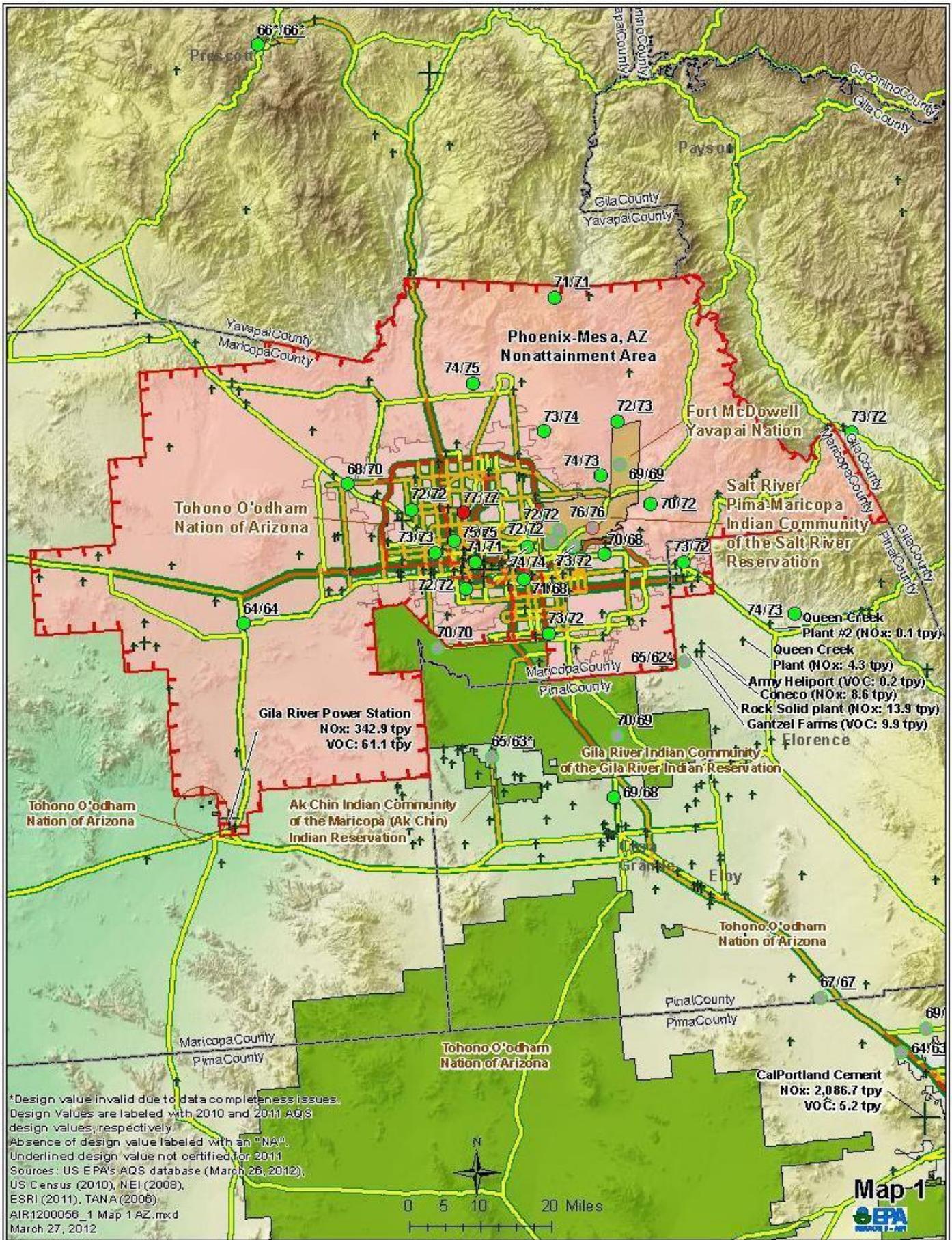
Sources: US EPA's AQS database (March 26, 2012), US EPA's National Emissions Inventory (2008), U.S. Census (2010), ESRI (2012), Teledyne Atlas (2006), U.S. Department of Transportation (2007).

<sup>1</sup> Underlined 2009-2011 monitor design value labels have not been certified by EPA for 2011.

<sup>2</sup> Areas of Indian country displayed here are intended for illustrative purposes only. EPA does not have the authority to define official boundaries for areas of Indian country. Hence, EPA does not guarantee the accuracy or completeness of Indian country boundaries displayed in this map.

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 March 29, 2012





\*Design value invalid due to data completeness issues.  
 Design Values are labeled with 2010 and 2011 AQIS design values, respectively.  
 Absence of design value labeled with an "NA".  
 Underlined design value not certified for 2011.  
 Sources: US EPA's AQIS database (March 26, 2012),  
 US Census (2010), NEI (2008),  
 ESRI (2011), TANA (2006).  
 AIR1200056\_1 Map 1 AZ.mxd  
 March 27, 2012

Appendix 2:

Map showing Jurisdictional Boundaries and Detailed Population

## Legend

- 

 2008-2010 AQS design value in parts per billion (ppb)  
 2009-2011 AQS design value in part per billion (ppb)<sup>1</sup>  
88, 74\*  
**Violating 8-Hour Ozone Monitor with 2009-2011 design value**
- 
**Attaining 8-Hour Ozone Monitor with 2009-2011 design value**
- 
**Violating National Park Service, Special Purpose or Tribal monitor with 2009-2011 design value**
- 
**Attaining National Park Service, Special Purpose or Tribal monitor with 2009-2011 design value**
- 
**Closed ozone monitor**

### 2008 NEINO<sub>x</sub> and VOC Point Source Emissions (Tons per year)

-  < 100 tons per year
-  100 - 249
-  250 - 499
-  500 - 1,999
-  > 2,000

 2008 8-Hour Ozone NAAQS Nonattainment Area

 County Boundary

### Annual Average Daily Non-Truck Traffic (Volume/day)

-  < 25,000
-  25,000 - 50,000
-  50,001 - 100,000
-  100,001 - 250,000
-  > 250,000

### Annual Average Daily Truck Traffic (Volume/day)

-  0 - 1,000
-  1,001 - 5,000
-  5,001 - 10,000
-  10,001 - 25,000
-  > 25,000

**\*Design value invalid due to data completeness issues.**

**Design Values are labeled with 2010 and 2011 design values, respectively.**

**Absence of design value labeled with "NA".**

Sources: US EPA's AQS database (March 26, 2012), US EPA's National Emissions Inventory (2008), U.S. Census (2010), ESRI (2012), Teledyne Atlas (2006), U.S. Department of Transportation (2007).

<sup>1</sup> Underlined 2009-2011 monitor design value labels have not been certified by EPA for 2011.

<sup>2</sup> Areas of Indian country displayed here are intended for illustrative purposes only. EPA does not have the authority to define official boundaries for areas of Indian country. Hence, EPA does not guarantee the accuracy or completeness of Indian country boundaries displayed in this map.

-  **San Joaquin Valley**
-  Air District/Authority
-  **Fresno, CA Metro Area**
-  2010 Census CBSA
-  **MOJAVE DESERT AIR BASIN**
-  Air Basin

 Urban Area

 Minor Civil Division

 Township and Range

 Military Lands

 National Forest Service Lands

 National Park Service Lands

### 2010 U.S. Census Tract Population Density

-  100 - 499 people per square mile
-  500 - 1,999
-  2,000 - 3,499
-  3,500 - 4,999
-  > 5,000

 State boundary

 **Smith River Rancheria**

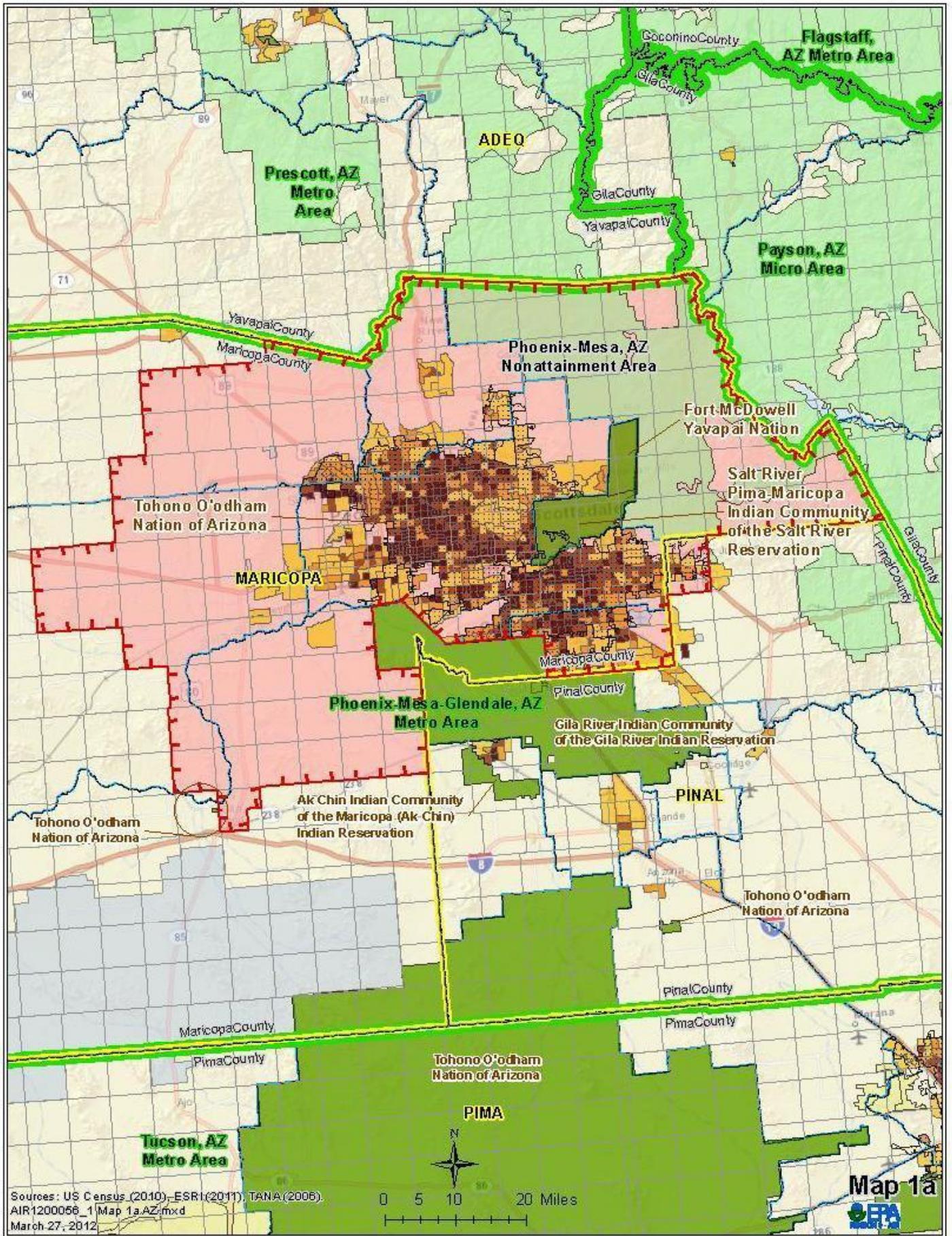
 Tribal Lands<sup>2</sup>

### Elevation

-  >14,000 ft
-  12,000
-  10,000
-  8,000
-  6,000
-  4,000
-  2,000
-  ~ MSL

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March 29, 2012





Sources: US Census (2010), ESRI (2011), TANA (2006).  
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 March 27, 2012



**Map 1a**

Appendix 3: Air Quality Monitoring Data Table

State	2008 8-hour ozone NAAQS Nonattainment Area (if applicable)	County	AQS ID	DV	DV Source (2008-2010 AQS)
Arizona	Phoenix-Mesa	Maricopa	040131004	77	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040139997	75	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040133003	74	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040134008	74	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040139704	74	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040130019	73	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040132005	73	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040134004	73	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040132001	72	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040134003	72	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040139706	72	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040133002	71	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040134005	71	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040139508	71	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040131010	70	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040139702	70	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040134010	68	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	040134011	64	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	TT6157021	76	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	TT6157020	72	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	TT6157024	72	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	TT6147003	70	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Maricopa	TT6135100	69	2008-2010 AQS DV
Arizona	Phoenix-Mesa	Pinal	040213001	73	2008-2010 AQS DV
Arizona	-	Cochise	040038001 <sup>a</sup>	68	2008-2010 AQS DV
Arizona	-	Coconino	040051008	69	2008-2010 AQS DV
Arizona	-	Coconino	040058001 <sup>a</sup>	68	2008-2010 AQS DV
Arizona	-	Gila	040070010	73	2008-2010 AQS DV

State	2008 8-hour ozone NAAQS Nonattainment Area (if applicable)	County	AQS ID	DV	DV Source (2008-2010 AQS)
Arizona	-	La Paz	040128000	72	2008-2010 AQS DV
Arizona	-	Navajo	040170119 <sup>a</sup>	67	2008-2010 AQS DV
Arizona	-	Pima	040190021	69	2008-2010 AQS DV
Arizona	-	Pima	040191018	69	2008-2010 AQS DV
Arizona	-	Pima	040191020	68	2008-2010 AQS DV
Arizona	-	Pima	040191028	67	2008-2010 AQS DV
Arizona	-	Pima	040191011	65	2008-2010 AQS DV
Arizona	-	Pima	040191030	65	2008-2010 AQS DV
Arizona	-	Pima	040191032	64	2008-2010 AQS DV
Arizona	-	Pima	040191034	64	2008-2010 AQS DV
Arizona	-	Pinal	040218001	74	2008-2010 AQS DV
Arizona	-	Pinal	040213003	69	2008-2010 AQS DV
Arizona	-	Pinal	040213007	67	2008-2010 AQS DV
Arizona	-	Pinal	040213009	65	2008-2010 AQS DV
Arizona	-	Pinal	040213010	65	2008-2010 AQS DV
Arizona	-	Pinal	TT6147001	70	2008-2010 AQS DV
Arizona	-	Yavapai	040258033	66*	2008-2010 AQS DV
Arizona	-	Yuma	040278011	73	2008-2010 AQS DV

<sup>a</sup> = Clean Air Status and Trends Network (CASTNET) monitor.

<sup>b</sup> = Other National Park Service monitors.

\* = Design Value (DV) does not meet data completeness requirements.

- = monitor is not within a nonattainment area

AQS IDs that start with "TT" are tribal monitors.

**BOLD = DV monitor for the County**

**RED = DV for the Nonattainment Area**

**BOLD AND RED = DV monitor for the Nonattainment Area and the County**

Grouped by monitors within a Nonattainment Area, then by County.