

---

---

**Technical Support Document**

**ARIZONA  
Nonattainment Area Designations for the  
2010 Sulfur Dioxide (SO<sub>2</sub>) Primary National Ambient Air Quality Standard**

**Summary**

Pursuant to section 107(d) of the Clean Air Act (CAA), EPA must initially designate areas as either “nonattainment,” “attainment,” or “unclassifiable” for the 2010 1-hour sulfur dioxide (SO<sub>2</sub>) primary national ambient air quality standard (NAAQS). The CAA defines a nonattainment area as one that does not meet the NAAQS or that contributes to poor air quality in a nearby area that does not meet the NAAQS.

Table 1 below identifies the counties and portions of counties in Arizona that EPA has initially designated “nonattainment” based on monitored violations. EPA is not yet prepared to designate other areas in Arizona, and will address such areas in a subsequent round of final designations.

**Table 1. Nonattainment Designations for Arizona**

Area (listed alphabetically)	Arizona’s Recommendation of Areas/Counties	EPA’s Designated Nonattainment Areas/Counties
Hayden Gila County (partial) Pinal County (partial)	Nonattainment Nonattainment	Nonattainment Nonattainment
Miami Gila County (partial)	Nonattainment	Nonattainment

**Background**

On June 2, 2010, EPA revised the primary SO<sub>2</sub> NAAQS (75 FR 35520, June 22, 2010) by establishing a new 1-hour standard at a level of 75 parts per billion (ppb), which is met at an ambient air quality monitoring site when the 3-year average of the annual 99<sup>th</sup> percentile of the daily maximum 1-hour average concentrations is less than or equal to 75 ppb, as determined in accordance with Appendix T of 40 CFR part 50. 40 CFR 50.17(a)-(b). EPA has determined that this is the level necessary to provide protection of public health with an adequate margin of safety, especially for children, the elderly, and those with asthma. These groups are particularly susceptible to the health effects associated with breathing SO<sub>2</sub>. The Agency is revoking the two prior primary standards of 140 ppb evaluated over 24-hours and 30 ppb evaluated over an entire year because the standards will not add additional public health protection given a 1-hour standard at 75 ppb. Accordingly, EPA has not designated areas in this process on the basis of either of these two prior primary standards. Similarly, the secondary standard for SO<sub>2</sub> has not been revised, so EPA has not designated areas in this process on the basis of the secondary standard.

## EPA's SO<sub>2</sub> Designation Approach

Section 107(d) of the CAA provides that not later than 1 year after promulgation of a new or revised NAAQS, state Governors may submit their recommendations for designations and boundaries to EPA. This deadline was June 3, 2011. Section 107(d) also requires EPA to provide a notification to states of no less than 120 days prior to promulgating an initial area designation that is a modification of a state's recommendation. EPA has reviewed the state's recommendations and has notified the Governor through a letter signed by the Regional Administrator of any intended modifications. While language in section 107 specifically addresses states, we intend to follow the same process for tribes, pursuant to section 301(d) of the CAA and Tribal Authority Rule (40 CFR Part 49). Therefore, we intend to designate tribal areas, in consultation with the tribes, on the same schedule as state designations. If a state or tribe did not submit designation recommendations, EPA will promulgate the designations that it deems appropriate. If a state or tribe disagrees with EPA's intended area designations, it has an opportunity to demonstrate why any proposed modification is inappropriate.

Designations guidance was issued by EPA through a March 24, 2011, memorandum from Stephen D. Page, Director, U.S. EPA, Office of Air Quality Planning and Standards, to Air Division Directors, U.S. EPA Regions I-X. This memorandum identifies factors EPA we are using to evaluate in determining boundaries for areas designated nonattainment. These 5 factors include: 1) air quality data; 2) emissions and emissions-related data (location of sources and potential contribution to ambient SO<sub>2</sub> concentrations); 3) meteorology (weather/transport patterns); 4) geography/topography (mountain ranges or other air basin boundaries); and 5) jurisdictional boundaries (e.g., counties, air districts, pre-existing nonattainment areas, reservations, metropolitan planning organization), among any other information deemed relevant to establishing appropriate area designations and boundaries for the 1-hour SO<sub>2</sub> NAAQS.

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 designation boundaries, in accordance with EPA's December, 2011 *Policy for Establishing Separate Air Quality Designations for Areas of Indian Country*<sup>1</sup>.

The March 24, 2011 designation memo recommended that area boundaries default to the county boundary unless additional provided information justifies a larger or smaller boundary than the county. EPA believes it is appropriate to evaluate each potential area on a case-by-case basis, and to recognize that area-specific analyses conducted by states, tribes and/or EPA may support a different boundary than a default county boundary.

---

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

In this TSD, EPA discusses its review and technical analysis of the nonattainment area recommendations submitted by the state of Arizona for designations of the 1-hour SO<sub>2</sub> standard. Based on our review of information discussed below, EPA agrees with the state's recommendation to designate portions of Gila County and Pinal County nonattainment and has initially designated those areas accordingly. The EPA is not yet reaching conclusions concerning areas in Arizona, and their sources, that are outside of the nonattainment area designations addressed in this TSD. EPA will make final initial designations decisions for the remaining portions of Arizona in the future.

*Definition of important terms used in this document:*

- 1) **Designated nonattainment area** – an area which EPA has determined, based on a state recommendation and/or on the technical analysis included in this document, has violated the 2010 SO<sub>2</sub> NAAQS, based on the most recent three years of air quality monitoring data, or contributes to a violation in a nearby area.
- 2) **Recommended nonattainment area** – an area that a state or tribal government has recommended to EPA to be designated as nonattainment.
- 3) **Violating monitor** – an ambient air monitor meeting all methods, quality assurance and citing criteria and requirements whose valid design value exceeds 75 ppb, as described in Appendix T of 40 CFR part 50.
- 4) **2010 SO<sub>2</sub> NAAQS - 75 ppb**, national ambient air quality standard for SO<sub>2</sub> promulgated in 2010. Based on the 3-year average of the 99<sup>th</sup> percentile of the annual distribution of daily maximum 1-hour average concentrations.
- 5) **Design Value** – a statistic that describes the air quality status of a given area relative to the level of the NAAQS.

## Nonattainment Designations

### Technical Analysis for Hayden, Arizona

#### Introduction

This technical analysis for Hayden, Arizona identifies the partial county with a monitor that violates the 2010 SO<sub>2</sub> NAAQS, and evaluates that county and nearby counties for contributions to SO<sub>2</sub> concentrations in the area. EPA has evaluated this county and nearby counties based on the weight-of-evidence of the factors in EPA's Designation Guidance, issued on March 24, 2011.<sup>2</sup>

Figure 1 shows the Hayden area in Arizona which EPA has initially designated nonattainment. Figure 2 is a map showing the locations of SO<sub>2</sub> monitors in Hayden, Arizona and surrounding counties. Violating monitors are shown with a red icon; monitors attaining the standard are shown with green icons. Design values for each monitor are listed in Figure 2, and in Table 2 below.

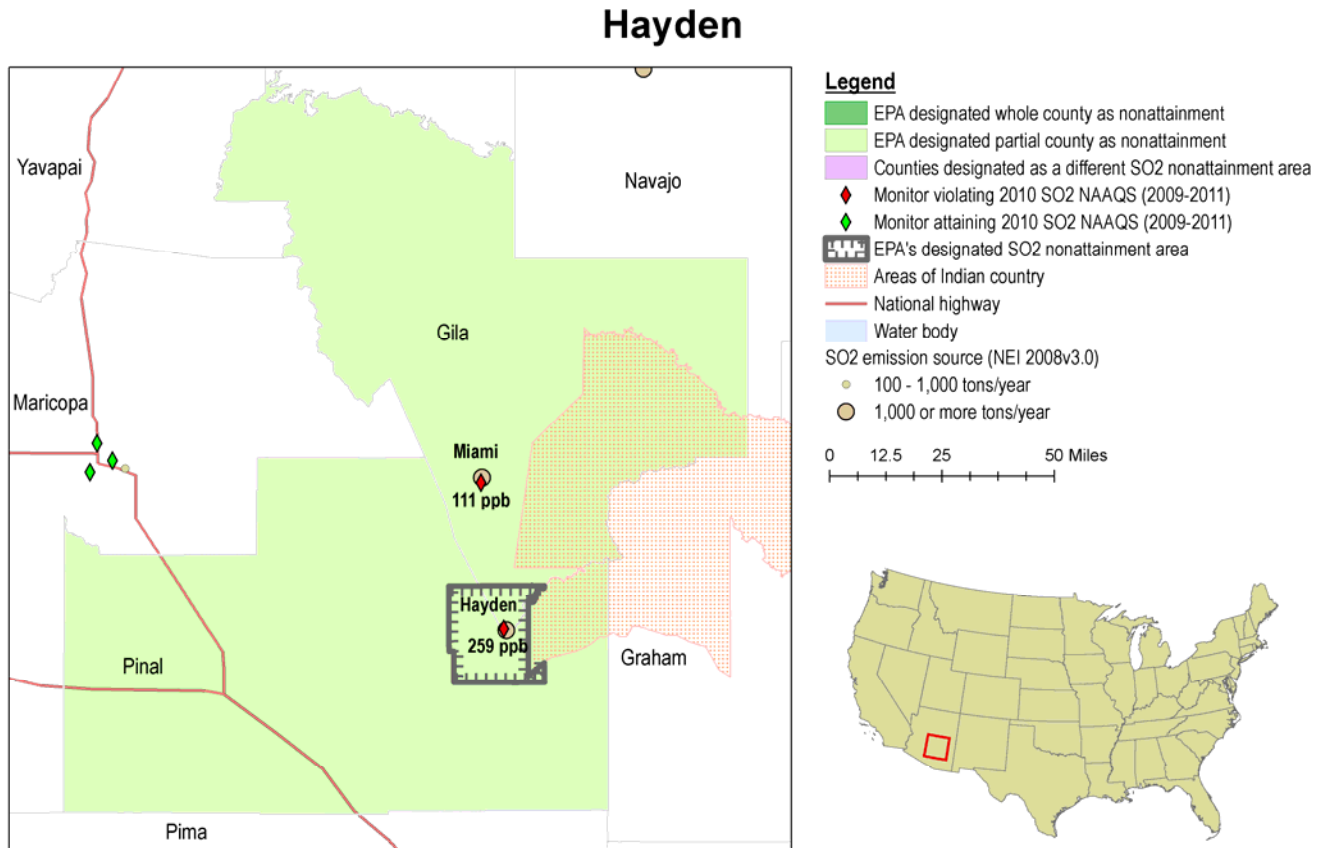


Figure 1

<sup>2</sup> <http://www.epa.gov/air/sulfurdioxide/guidance.html>

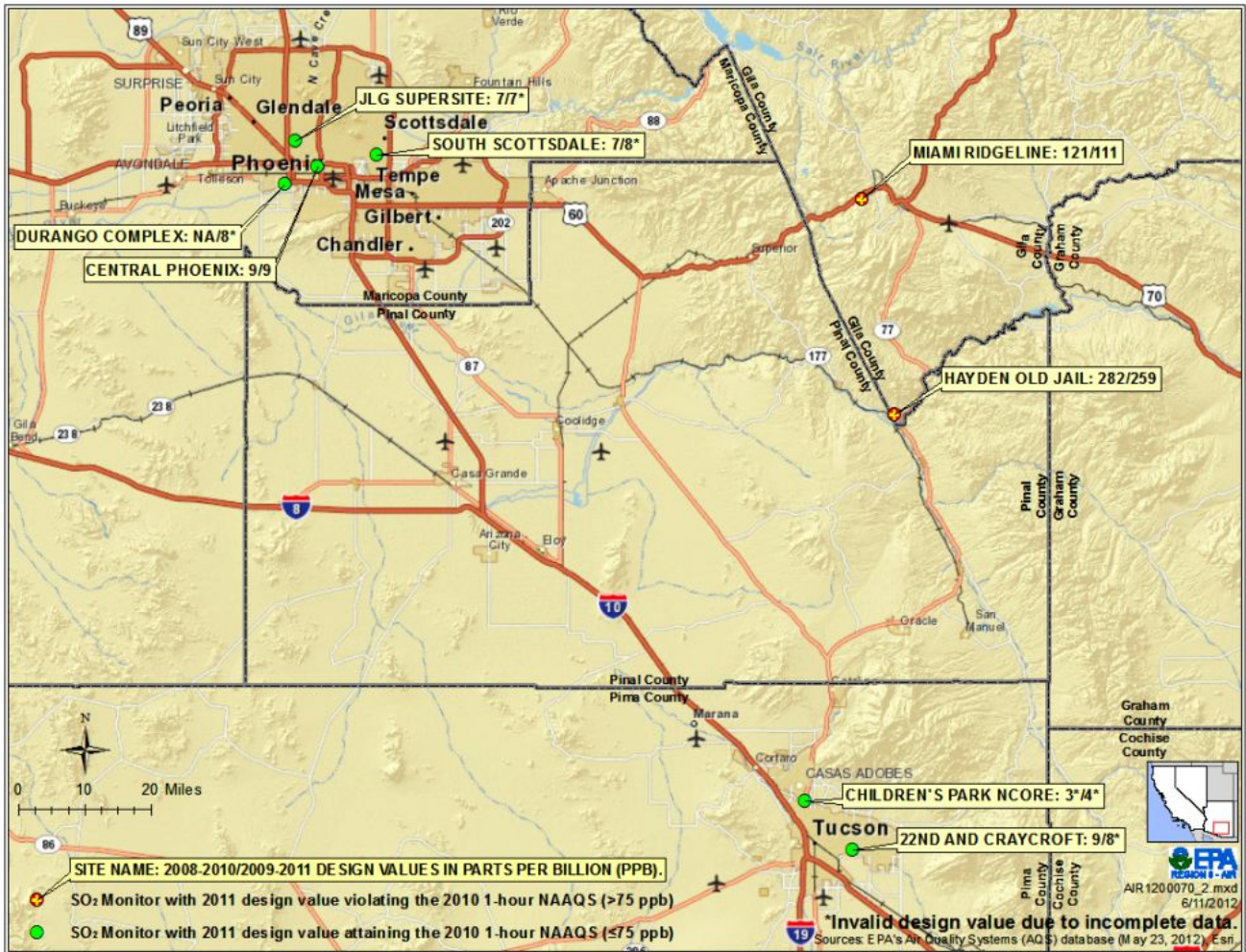


Figure 2

In May 2011, Governor Janice K. Brewer recommended that portions of Gila County and Pinal County be designated as “nonattainment” and the remaining counties and partial counties be designated “unclassifiable” for the 2010 SO<sub>2</sub> NAAQS based on monitored air quality data from 2007-2009 (letter to EPA Region 9 Administrator Jared Blumenfeld from Governor Janice K. Brewer, May 25, 2011). Consistent with the existing Hayden nonattainment area and Miami maintenance area for the 1971 SO<sub>2</sub> NAAQS, the state recommended that the same portions of Gila County and Pinal County (except those portions in Indian country) be designated as the Hayden and Miami nonattainment areas for the 2010 SO<sub>2</sub> NAAQS. The state recommendation was based primarily on monitoring data and consideration of emissions data from the 2005 National Emissions Inventory (NEI).

In February 2013, EPA responded to Governor Brewer’s 2011 recommendation (“120-day” letter to Governor Janice K. Brewer from EPA Region 9 Administrator Jared Blumenfeld, February 6, 2013). The February 2013 letter notified the Governor of EPA’s intentions regarding designations for the 2010 SO<sub>2</sub> NAAQS. As stated in the letter, EPA intended to agree with the Governor’s recommendations for boundaries of the two nonattainment areas the Governor recommended as nonattainment. The Governor replied to EPA’s 120-day letter in April 2013 (letter to EPA Region 9 Administrator Jared Blumenfeld

from Governor Janice K. Brewer, April 2, 2013). In the reply letter, the Governor reaffirmed the 2011 recommendations for all areas of the state, but noted that there was a discrepancy with the maps the state provided in 2011 for the Hayden, Arizona area. The 2011 maps were included in a document titled “Arizona Air Quality Designations, Final Proposed Boundary Recommendation for the 2010 Primary National Ambient Air Quality Standard for Sulfur Dioxide” (state technical support document or state TSD).

The state TSD was attached to a letter from the state’s environmental agency to the Governor (letter to Governor Janice K. Brewer from Henry R. Darwin, Director, Arizona Department of Environmental Quality, letter dated May 2, 2011). In her April 2013 letter, Governor Brewer indicated that EPA would receive a corrected map. EPA received the corrected map in a letter dated April 5, 2013 (letter to EPA Region 9 Administrator Jared Blumenfeld from Eric Massey, Director, Air Quality Division, Arizona Department of Environmental Quality).

Based on EPA's technical analysis described below, EPA concurs with the state’s recommendation to initially designate a portion of Gila County and a portion of Pinal County as nonattainment for the 2010 SO<sub>2</sub> NAAQS, as the Hayden nonattainment area. These counties are listed above in Table 1. We note here that the state’s corrected map agrees with the maps that are contained in this document.

### **Detailed Assessment**

#### ***Air Quality Data***

This factor considers the SO<sub>2</sub> air quality monitoring data, including the design values (in ppb) calculated for all air quality monitors in Gila County in the Hayden nonattainment area and in the surrounding area based on data for the 2009-2011 period.

The Governor’s recommendation was based on 2007-2009 data from Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitors provided in the state letter to EPA Region 9 Administrator Jared Blumenfeld from Governor Janice K. Brewer, May 25, 2011.<sup>3</sup>

The 2011 SO<sub>2</sub> NAAQS design values for counties in the Hayden nonattainment area and surrounding area are shown in Table 2. Design values are calculated using the 3-year average of the annual 99<sup>th</sup> percentile of 1-hour daily maximum SO<sub>2</sub> concentrations, and compared to the NAAQS of 75 ppb, according to requirements of 40 CFR 50.17.

---

<sup>3</sup> 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 4.4) and operating with a FRM or 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 are 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.

**Table 2. Air Quality Data for Nonattainment Designations in Arizona**

County	State Recommended Nonattainment?	Monitor Name	Monitor Air Quality System ID	Monitor Location	SO <sub>2</sub> Design Value, 2009-2011 (ppb)
Gila, Arizona	Yes (partial)	Miami Ridgeline	04-007-0009	4030 Linden Street	111
		<b>Hayden Old Jail</b>	<b>04-007-1001</b>	<b>Jail-Canyon Dr, Hayden</b>	<b>259</b>
Maricopa, Arizona	No	<b>Central Phoenix</b>	<b>04-013-3002</b>	<b>1645 E. Roosevelt St, Central Phoenix</b>	<b>9</b>
		South Scottsdale	04-013-3003	2857 N. Miller Road, South Scottsdale	8*
		Durango Complex	04-013-9812	2702 AC Ester Brook Blvd	8**
		JLG Supersite	04-013-9997	4530 N. 17th Ave	7*
Pima, Arizona	No	22nd and Craycroft	04-019-1011	1237 S. Beverly, Tucson	8*
		Children's Park NCore	04-019-1028	400 W. River Road	4**

Monitors in **Bold** have the highest 2009-2011 design value in the respective county. Pinal County, Arizona did not have any SO<sub>2</sub> monitors collecting data from 2009-2011.

\*Incomplete data, provided for informational purposes only, not relevant for comparison to the NAAQS. These stations stopped monitoring for comparison to the SO<sub>2</sub> NAAQS after December 2010. The South Scottsdale monitor was moved to the Durango Complex station; JLG Supersite started monitoring for trace levels of SO<sub>2</sub> instead of for comparison to the NAAQS; 22<sup>nd</sup> and Craycroft SO<sub>2</sub> monitoring was moved to the Children's Park NCore station.

\*\*Incomplete data, provided for informational purposes only, not relevant for comparison to the NAAQS. These stations began monitoring for comparison to the SO<sub>2</sub> NAAQS in late 2010 or 2011.

Gila County shows monitored violations of the 2010 SO<sub>2</sub> NAAQS. No other SO<sub>2</sub> monitors in Arizona show violations of the 2010 SO<sub>2</sub> NAAQS. Therefore, as an analytical starting point, some areas in Gila County and possibly additional areas in surrounding counties must be designated nonattainment. Note that the absence of a violating monitor alone is not a sufficient reason to eliminate nearby counties as candidates for nonattainment status. This is because the Clean Air Act defines a nonattainment area as any area that violates a NAAQS or contributes to a nearby violation.<sup>4</sup> Each area has been evaluated based on the weight-of-evidence of the five factors and other relevant information.

Two SO<sub>2</sub> monitors are violating the standard in Arizona. Both violating monitors are located in Gila County (see Figure 2 and Table 2, above). The Hayden Old Jail monitor (Air Quality System (AQS) ID 04-007-1001) is a source-oriented monitor located approximately 920 meters (0.57 miles) from the ASARCO, LLC – Hayden smelter stack (see Figure 2). Nestled in the southern, V-shaped tip of Gila County, the monitor is about 860 meters (0.54 miles) from the Pinal County border (see Figure 2). The Miami Ridgeline monitor (AQS ID 04-007-0009) is also a source-oriented monitor, located approximately 1,390 meters (0.86 miles) from the Freeport-McMoRan Miami Smelter. The Freeport-McMoRan Miami Smelter is roughly 45.5 kilometers (28 miles) northwest of the ASARCO, LLC – Hayden smelter.

<sup>4</sup> 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... "

Six additional SO<sub>2</sub> monitors have been operated in recent years in Maricopa and Pima counties. These monitors are not source-oriented and are located in the urban cores of the Phoenix and Tucson metropolitan areas, which are over 50 miles away from the violating monitors located in Gila County (see Figure 2, above). The low concentrations recorded in these locations suggest that their design values are not impacted by the same sources that are impacting the violating monitors.



Figure 3

### *Emissions and Emissions-Related Data*

Evidence of SO<sub>2</sub> emissions sources in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA evaluated county-level emission data for SO<sub>2</sub>, as well as emissions from nearby point sources.

### Emissions

For this analysis, EPA relied on information from the 2008 National Emissions Inventory (NEI) emissions database (NEI08V3). Arizona did not provide updated emissions information.

Table 3 shows total emissions of SO<sub>2</sub> in 2008 (given in tons) for all 15 counties in Arizona and single sources emitting greater than 100 tons per year of SO<sub>2</sub> according to the 2008 NEI. The counties that contain part of the Hayden nonattainment area for the 2010 SO<sub>2</sub> NAAQS are shown in **bold**.



**Table 3. SO<sub>2</sub> Emissions in 2008**

County	Facility Located in State Recommended Nonattainment Area?	Facility > 100 tons per year of SO <sub>2</sub> emissions	Facility Location	SO <sub>2</sub> Air Emissions (2008 NEIV3) (tons)	Total County 2008 SO <sub>2</sub> Emissions (tons)
<b>Gila</b>	Yes (Hayden)	ASARCO, LLC - Hayden Smelter	Hayden	21,742	29,176
	Yes (Miami)	Freeport-McMoRan Miami Smelter	Miami	7,091	
	-	Other point, nonpoint, nonroad, onroad	-	343	
Apache	No	Salt River Project (Coronado)	St. Johns	15,900	22,583
	No	Tucson Electric Power Company	Springerville	6,562	
	-	Other point, nonpoint, nonroad, onroad	-	122	
Navajo	No	Arizona Public Service (Cholla)	Joseph City	16,421	19,163
	No	Catalyst Paper (Snowflake) Inc.	Snowflake	2,556	
	-	Other point, nonpoint, nonroad, onroad	-	186	
Pima	No	Tucson Electric Power (Irvington)	Tucson	2,884	4,718
	-	Other point, nonpoint, nonroad, onroad	-	1,834	
Maricopa	No	Phoenix Sky Harbor International Airport	Phoenix	252	1,641
	-	Other point, nonpoint, nonroad, onroad	-	1,389	
Cochise	No	AZ Electric Power (Apache)	Cochise	1,903	3,081
	No	Chemical Lime Company - Douglas	Douglas	1,013	
	-	Other sources (nonpoint, nonroad, onroad)	-	165	
Yavapai	No	Nelson Lime Plant	Peach Springs	1,955	2,330
	-	Other point, nonpoint, nonroad, onroad	-	375	
<b>Pinal</b>	-	Other point, nonpoint, nonroad, onroad	-	381	381
Mohave	-	Other point, nonpoint, nonroad, onroad	-	345	345
Coconino	-	Other point, nonpoint, nonroad, onroad	-	786	786
Yuma	-	Other point, nonpoint, nonroad, onroad	-	215	215
La Paz	-	Other point, nonpoint, nonroad, onroad	-	41	41
Santa Cruz	-	Other point, nonpoint, nonroad, onroad	-	105	105
Greenlee	-	Other point, nonpoint, nonroad, onroad	-	212	212
Graham	-	Other point, nonpoint, nonroad, onroad	-	48	48

Total emissions of SO<sub>2</sub> are highest in Gila County. In 2008, the ASARCO, LLC – Hayden Smelter emitted over 20,000 tons of SO<sub>2</sub>, three times more than the second largest source (Freeport-McMoRan Miami Smelter) of SO<sub>2</sub> emissions in Gila County. Both smelters in Gila County are primary copper smelters. Apache and Navajo counties also contain coal-fired electric utility generating units that are large sources of SO<sub>2</sub>: Coronado Generating Station (15,900 tons in 2008) and Springerville Generating Station (6,562 tons in 2008) in Apache County, and Cholla Power Plant (16,421 tons in 2008) in Navajo County. Total emissions of SO<sub>2</sub> from Pinal County are low (381 tons in 2008) compared to Gila, Apache, and Navajo counties. Gila, Apache, and Navajo counties together comprise 84% of total SO<sub>2</sub> emissions from the state of Arizona. These five largest stationary sources in the three counties comprised 80% of total SO<sub>2</sub> emissions from state lands in Arizona in 2008. See Figure 4 for the geographic distribution of these stationary sources. One additional source emitted over 100 tons per

year - the Navajo Generating Station (3,816 tons in 2008) located on tribal lands near the city of Page in northern Coconino County, Arizona. The Navajo Generating Station is approximately 240 miles north of Freeport-McMoRan Miami Smelter and 270 miles north of the ASARCO LLC – Hayden Smelter.

The state-recommended Hayden nonattainment area for the 2010 SO<sub>2</sub> NAAQS includes the ASARCO, LLC – Hayden Smelter. As shown in Figure 4 and Table 3, besides the two largest sources in Gila County, both of which EPA is including in nonattainment areas, there are no other facilities emitting greater than 100 tons per year of SO<sub>2</sub> in Gila, Pinal, or Graham County. The San Carlos tribal lands to the east of the state’s recommended Hayden nonattainment area also do not have any facilities emitting greater than 100 tons per year of SO<sub>2</sub> according to the 2008 NEIV3.

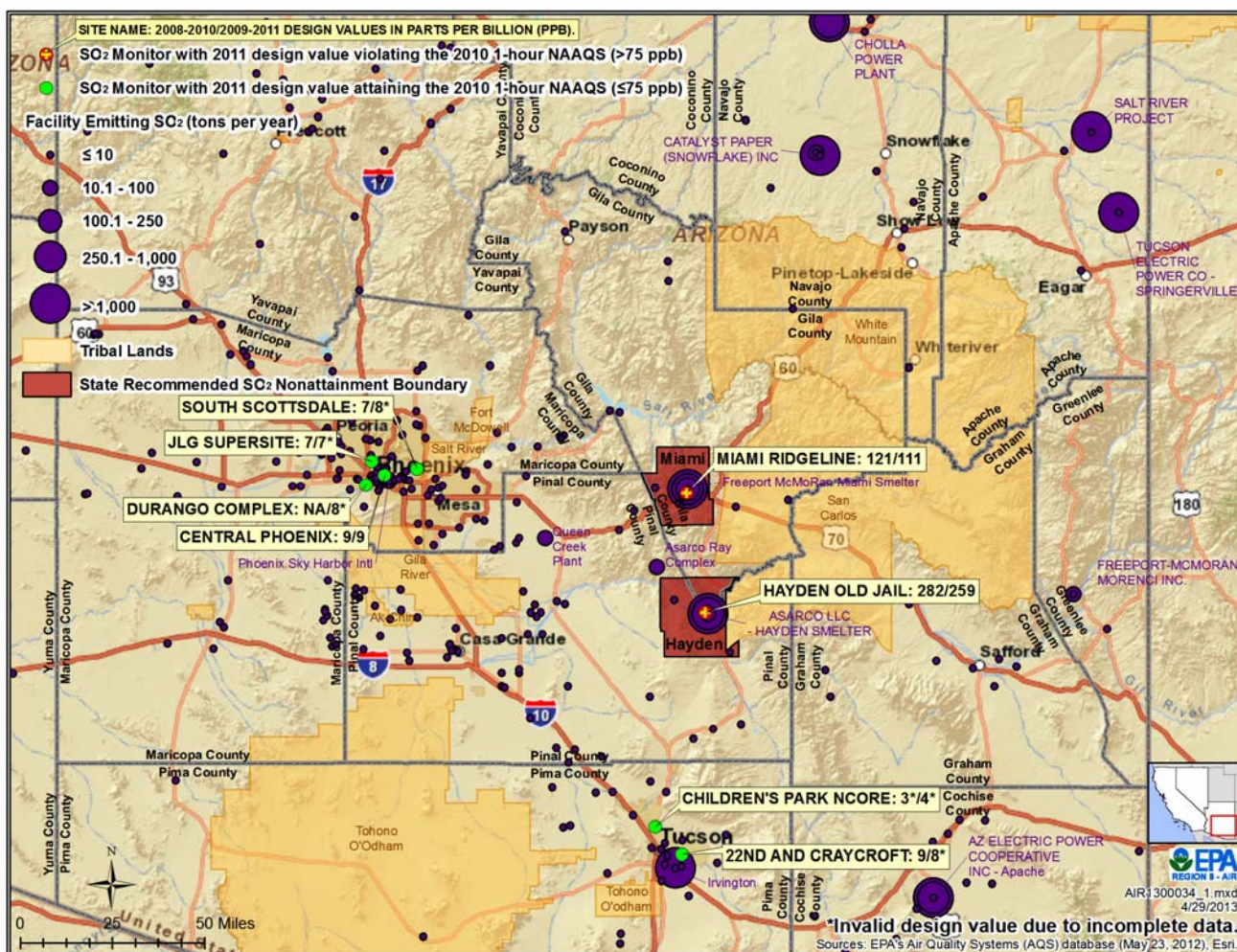


Figure 4

### Emissions Controls

The emissions data used by EPA in this technical analysis and provided in Table 3 represent emissions levels taking into account any control strategies implemented on stationary sources in the Hayden, Arizona nonattainment area up to and including 2008. Since 2008, the ASARCO, LLC – Hayden

Smelter has completed two projects, one in 2010 involving addition of a revert screen, and one in 2012 involving additional ventilation and a baghouse to service three existing anode furnaces. Neither of these projects resulted in changes to permitted SO<sub>2</sub> emissions limits for the facility. See the source's Title V federal operating permit renewal and two ADEQ permit actions/revisions that occurred since 2008 (52397-MPR and 54251-MPR).<sup>5</sup>

### Population

Gila County's population as of the 2010 census was 53,597. From 2000 to 2010 the county grew by 4.4% and had a population density of 11.3 persons per square mile. Pinal County's population as of the 2010 census was 375,770. From 2000 to 2010 the county grew by 109.1% and had a population density of 70.0 persons per square mile.

### ***Meteorology (weather/transport patterns)***

Evidence of source-receptor relationships between specific emissions sources and high SO<sub>2</sub> values at violating monitors is another important factor in determining the appropriate contributing areas and the appropriate extent of the nonattainment area boundary. For this factor, EPA considered meteorological data available for the area. Such data may provide evidence of the potential for SO<sub>2</sub> emissions sources located upwind of a violating monitor to contribute to ambient SO<sub>2</sub> levels at the violation location.

Temperature and precipitation data is available from the nearby Winkelman 6 S station, part of the National Weather Service Cooperative Observer Program. This station typically measures only 14 inches of rain each year, with nearly half of that occurring during the summer months of July through September, coinciding with the Arizona "monsoon" season. There is less than an inch of snow each year. Daily temperature highs range from 64 to 91 degrees Fahrenheit depending on season, and lows range from 31 to 69 degrees Fahrenheit. See Figure 5 for the location of the Winkelman meteorological station.

The varied elevations in the area cause complex wind flow locally. Within and adjacent to the Gila River and San Pedro River valleys, drainage winds tend to dominate at night under stable conditions. To the west of the smelter, drainage flows toward the west, while east of the smelter the drainage flows to the south. Given the smelter's elevated location and plume buoyancy, some emissions would be expected to rise above these surface flows. However, on sunny days the heated ground warms the air and enhances vertical mixing. Under such convective conditions, the plume could nevertheless be mixed down to the ground to varying degrees. This vertical mixing also causes the flow to be coupled with winds aloft, which generally flow toward the east.

Over the years, wind data has been collected at multiple locations in and around Hayden. Sites include the Hayden Maintenance Yard ("Hayden"), Hayden-Winkelman High School ("Winkelman"), and Globe Highway (data prepared for "Draft Report, Remedial Investigation Report for the ASARCO, LLC Hayden Plant Site, Hayden, Gila County, Arizona", Prepared for U.S. Environmental Protection Agency Region IX, San Francisco, CA., CH2M Hill, August 2008). These stations are shown in Figure 5. Wind roses from these stations are shown in Figure 6. The Winkelman site is nearest the junction of

---

<sup>5</sup> Further information about Arizona federal Title V air permits can be found on EPA's website at: <http://www.epa.gov/region9/air/permit/title-v-permits.html>

the Gila and San Pedro River valleys, and the Globe Highway site is in the northeastern portion of the Gila River valley before it joins the San Pedro. All of the dominant wind directions are consistent with the orientation of the valleys. However, when morning and evening wind frequencies are plotted separately, not all of the directions are consistent with slope flow, e.g., afternoon flow at Hayden is toward the east, but downslope flow in the Gila River valley would be toward the northwest. There is a similar evening component toward the east at Winkelman on some days, but more of a downslope flow on other days. At Globe Highway, flow directions are consistent with slope flows. The differences between sites located relatively close together show the complexity of the flow in the area. Transport of pollutants would be expected to occur mainly along the Gila-San Pedro River valleys (northwest-southeast orientation), somewhat circumscribed by the orientations of the valleys and the surrounding mountains.

Terrain Around Hayden, Arizona:  
with SO<sub>2</sub> monitor (red circle), cities (purple circles & labels),  
meteorological stations (blue triangles & labels).

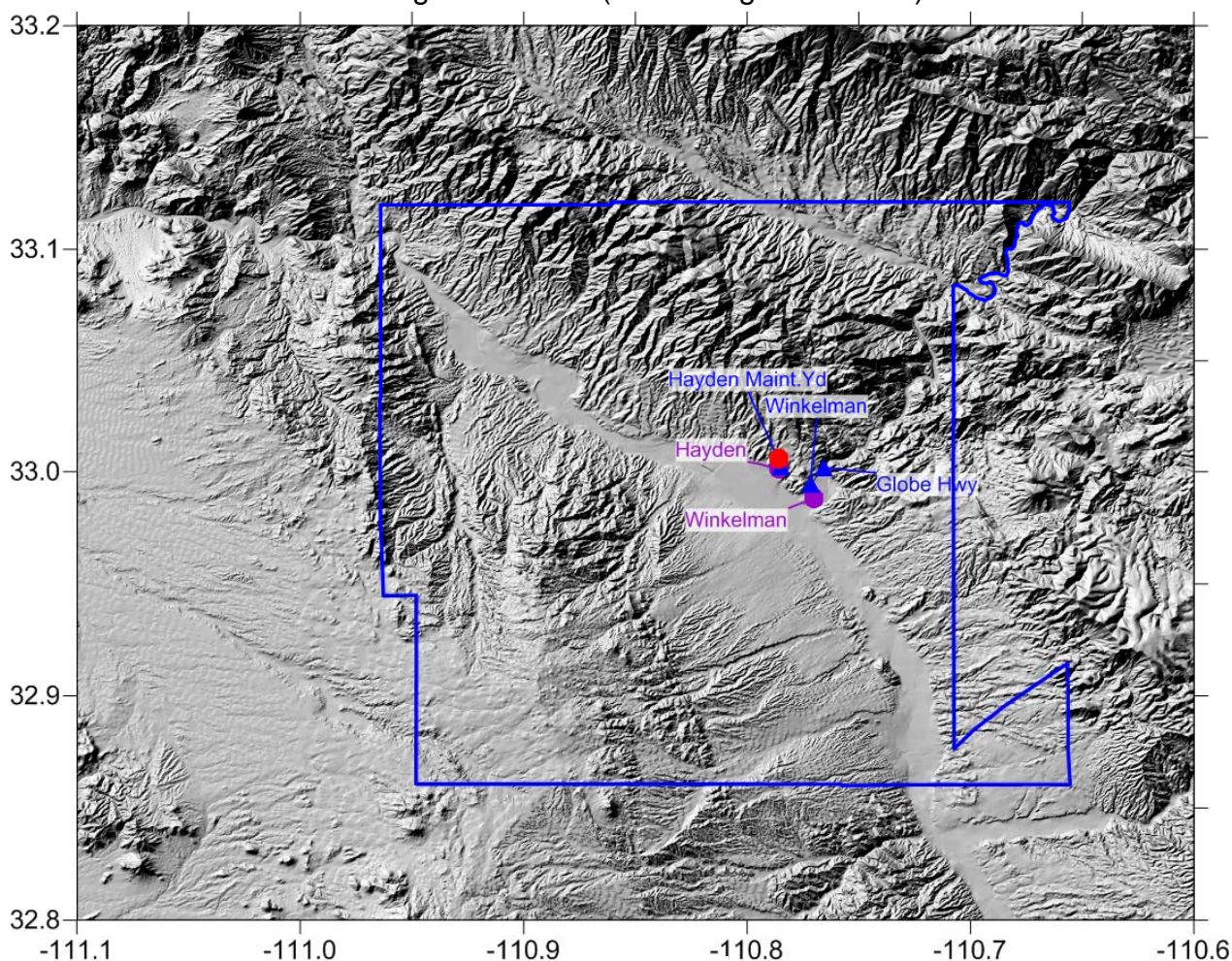
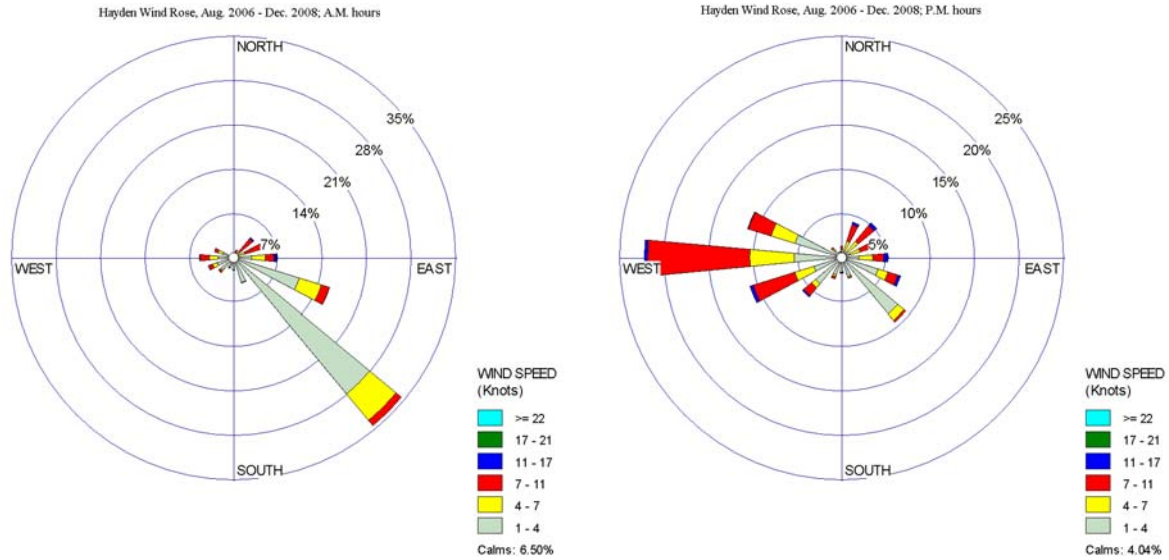


Figure 5

### Hayden a.m. and p.m. wind roses



### Winkelman a.m. and p.m. wind roses

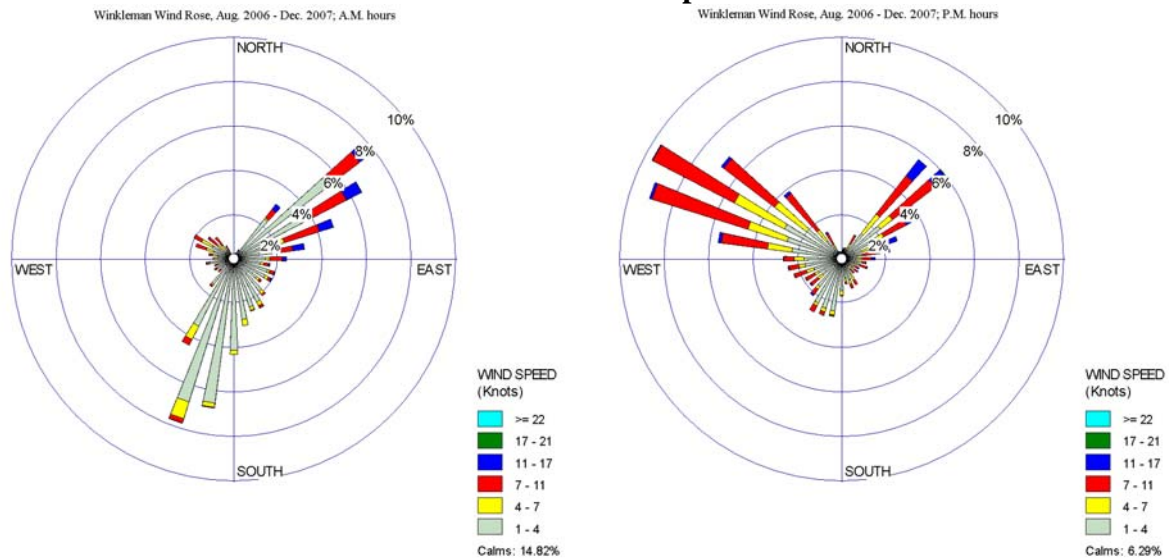


Figure 6

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

As shown in Figure 5 (above) and Figure 7 (below), Hayden and the ASARCO, LLC - Hayden smelter are located in very complex terrain, with the Gila River making a winding semi-circle around the east and south of the facility, and intersected by the San Pedro River valley from the south. The facility itself is elevated relative to the valleys; there is a 200-foot hill just south of the facility. In all directions there is a mountain side. Hayden is at roughly 2,000 feet elevation; the Dripping Springs Mountains to the north rise to 4,000 feet; the Tortilla Mountains on the northwest, west, and south rise 3,300 to 4,000 feet. Terrain rises more gently within the Gila-San Pedro River valleys from the northwest toward the southeast. The nonattainment area encompasses the Gila River valley from where it narrows in the northwest corner of the area, to where it joins with the San Pedro River valley in roughly the center of the area, and to a bend in the San Pedro River in the southeast corner. The surrounding mountains likely limit the extent of the area exceeding the SO<sub>2</sub> standard to a relatively small area around the smelter, the main source of SO<sub>2</sub> emissions. In light of this, we are not yet prepared to conclude whether locations outside the particular valleys intersecting at Hayden contribute to the violating monitor's design value.

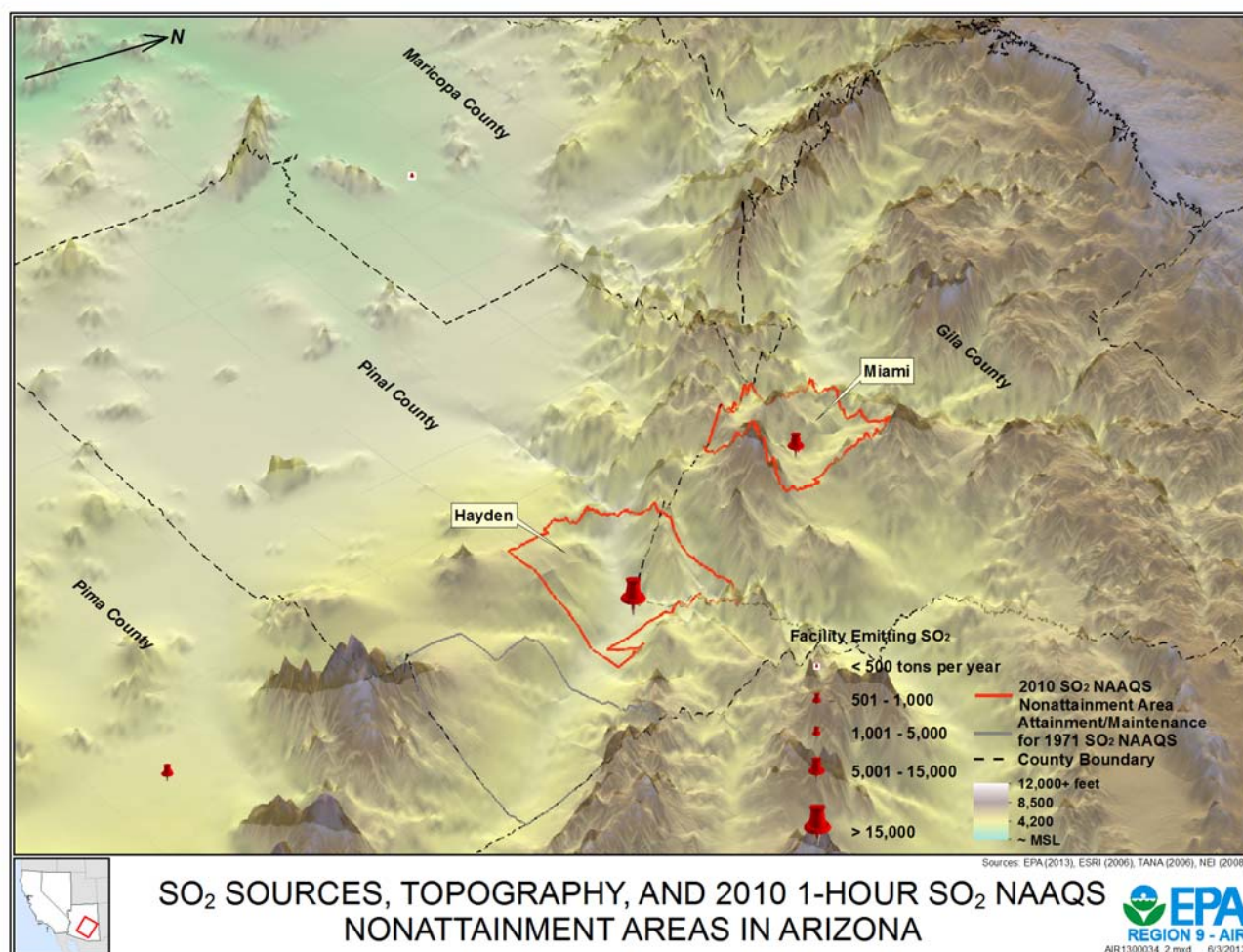


Figure 7

### ***Jurisdictional boundaries***

To manage air quality, the state of Arizona has one state agency, the Arizona Department of Environmental Quality (ADEQ), and three local agencies: Maricopa County Air Quality Department, Pima County Department of Environmental Quality, and Pinal County Air Quality Control District. Air quality planning for the existing Hayden nonattainment area under the 1971 SO<sub>2</sub> NAAQS, composed of the same portions of Gila and Pinal counties as the state's recommended nonattainment area for the 2010 SO<sub>2</sub> NAAQS, is under the jurisdiction of ADEQ. Originally, for the 1971 NAAQS, the Hayden area was split between two county-wide SO<sub>2</sub> nonattainment areas for Gila and Pinal counties (see 43 FR 8968, March 3, 1978). At the request of the state of Arizona, the boundary for the Hayden area was reduced to nine townships in and around the town of Hayden (44 FR 21261, April 10, 1979). Section 107(d)(1)(C) of the 1990 Clean Air Act Amendments (CAAA) brought forward, by operation of law, the nonattainment designations for areas, such as the Hayden SO<sub>2</sub> area, that continued to be designated as nonattainment at the time of enactment of the CAAA, i.e., areas that had not been redesignated to "attainment" prior to the CAAA's November 15, 1990 enactment date. The then-existing nonattainment area for Hayden under the 1971 SO<sub>2</sub> NAAQS included a portion of Indian country along the eastern boundary. The Hayden nonattainment area for the 2010 SO<sub>2</sub> NAAQS includes the same geographic area as the existing nonattainment area for the 1971 SO<sub>2</sub> NAAQS without the portion 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. No areas of Indian country are included in the initial Hayden, Arizona nonattainment area. Figures depicting areas of Indian country in this document are intended for illustrative purposes only and are not an EPA determination of Indian country status or of any Indian country boundary.

### ***Other Relevant Information***

In its May 25, 2011 letter, ADEQ provided additional information to support its assertion that presumptive use of full county boundaries as the nonattainment area boundary is inappropriate for geographically large counties. The state argued that the use of full county boundaries as the presumptive nonattainment area boundary for a violating monitor results in disparities in the size of nonattainment areas. For example, the state compared the area of Gila County (4,796 square miles) with the area of the entire state of Connecticut (4,845 square miles). A violating monitor in Middlesex County, Connecticut, would result in a presumptive nonattainment area boundary encompassing 369 square miles. Applying this presumption in Arizona would result in a nonattainment area (Gila County) that is 13 times larger than a full Middlesex County nonattainment area in Connecticut. The state further highlighted that the violating monitor in its recommended Hayden nonattainment area is

less than 0.5 miles from the southwest border of Gila and Pinal counties, and more than 100 miles from the northern border of Gila and Coconino counties. Therefore, the state concluded that its consideration of partial counties for the Hayden and Miami nonattainment areas was appropriate.

## **Conclusion**

After considering the factors described above, EPA concurs with the state's recommendation to initially designate a portion of Pinal County and a portion of Gila County as the Hayden, Arizona nonattainment area for the 2010 SO<sub>2</sub> NAAQS, based on the violating monitor in Hayden, Arizona. No areas of Indian country are included in the initial Hayden, Arizona nonattainment area. Areas of Indian country in the state of Arizona will be further addressed in a subsequent round of final initial designations.

The air quality monitor in Hayden, Arizona shows a violation of the 2010 SO<sub>2</sub> NAAQS based on 2009-2011 air quality data. EPA concludes that the state's recommended boundary contains the area violating the standard as well as areas causing or contributing to the monitored violation, as assessed using our five-factor methodology. The monitor is source-oriented, and is located in the southernmost tip of Gila County. Due to constraints imposed by the complex terrain in the Hayden area (see Geography/Topography discussion above), it is expected that the extent of the area exceeding the SO<sub>2</sub> standard is confined to a relatively small area around the main source of SO<sub>2</sub> emissions, the ASARCO, LLC - Hayden smelter. In light of this, we are not yet prepared to conclude whether locations outside the particular valleys intersecting at Hayden contribute to NAAQS exceedances recorded at the Hayden monitor. The meteorology factor is not significant in determining a boundary for the nonattainment area, but available data confirms the importance of the topography in limiting the extent of the nonattainment area to the nearby river valleys and their surroundings. Based on this information, we are not yet prepared to conclude that the emissions from sources located outside the state's recommended boundary contribute to the monitored violation or to other possible violations. We will further address such sources and their areas in a subsequent round of final initial designations. The state's recommended boundary for the Hayden nonattainment area is also consistent with the existing Hayden nonattainment boundary for the 1971 SO<sub>2</sub> NAAQS, without areas of Indian country. All non-Indian country lands in the nonattainment area are under the jurisdiction of ADEQ.

Based on the consideration of all the relevant and available information, as described above, EPA's conclusion is that the boundaries described herein encompass an area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the 2010 SO<sub>2</sub> NAAQS, based on the violating monitor information in the Hayden, Arizona area. Areas and sources that EPA is not yet prepared to conclude are contributing to the monitored violation or to other possible violations are not included in this initial nonattainment area. In the future, we will make final initial designation decisions for areas in Arizona not included in the nonattainment area designations addressed in this TSD.



# Technical Analysis for Miami, Arizona

## Introduction

This technical analysis for Miami, Arizona identifies the partial county with a monitor that violates the 2010 SO<sub>2</sub> NAAQS and evaluates nearby counties for contributions to SO<sub>2</sub> concentrations in the area. EPA has evaluated this county and nearby counties based on the weight-of-evidence of the factors in EPA’s Designation Guidance, issued on March 24, 2011.<sup>6</sup>

Figure 8 shows the Miami area in Arizona which EPA has initially designated nonattainment. Figure 9 is a map of SO<sub>2</sub> monitors in the area and the surrounding counties. Violating monitors are shown with a red icon; monitors attaining the standard are shown with green icons. Design values for each monitor are listed in Figure 9 and in Table 4, below.

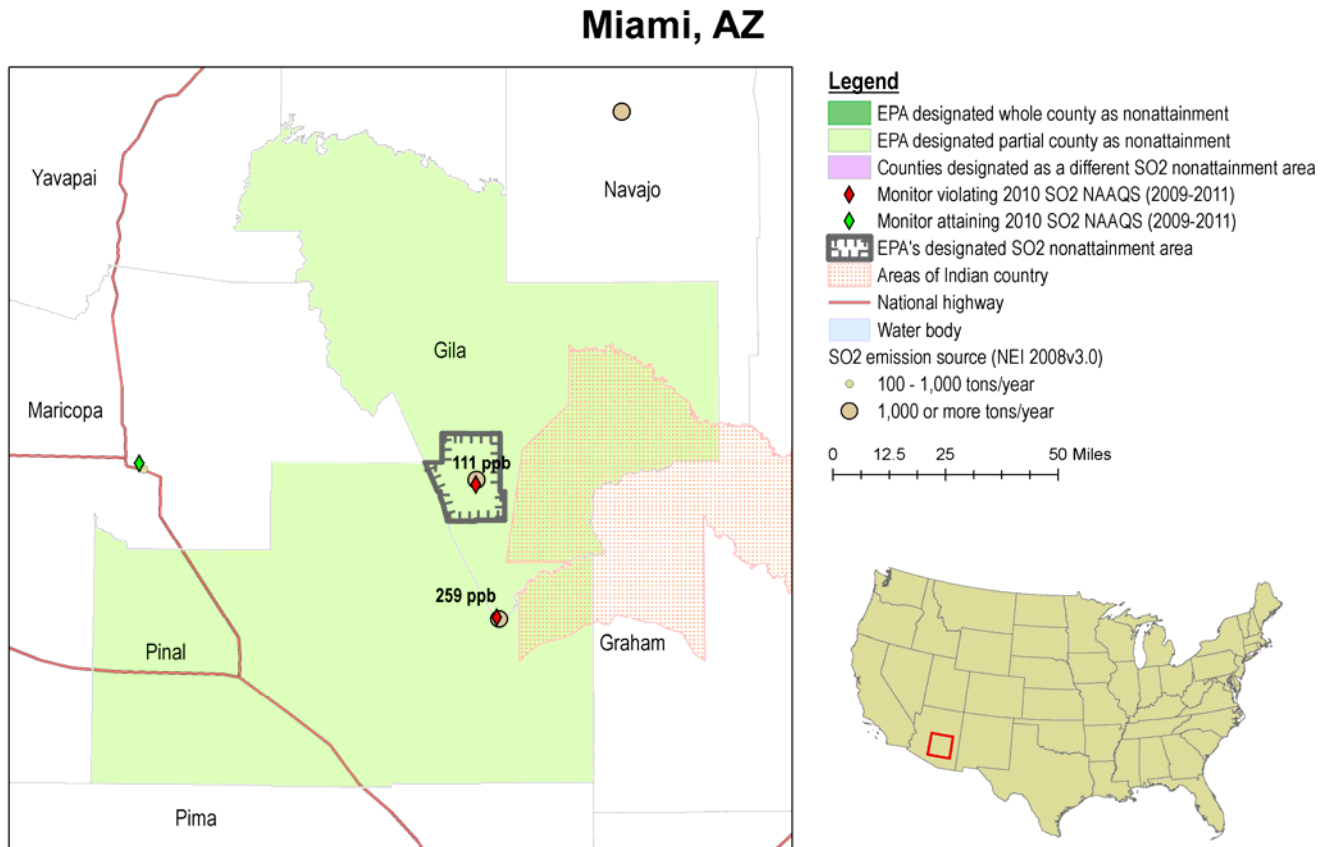


Figure 8

<sup>6</sup> <http://www.epa.gov/air/sulfurdioxide/guidance.html>

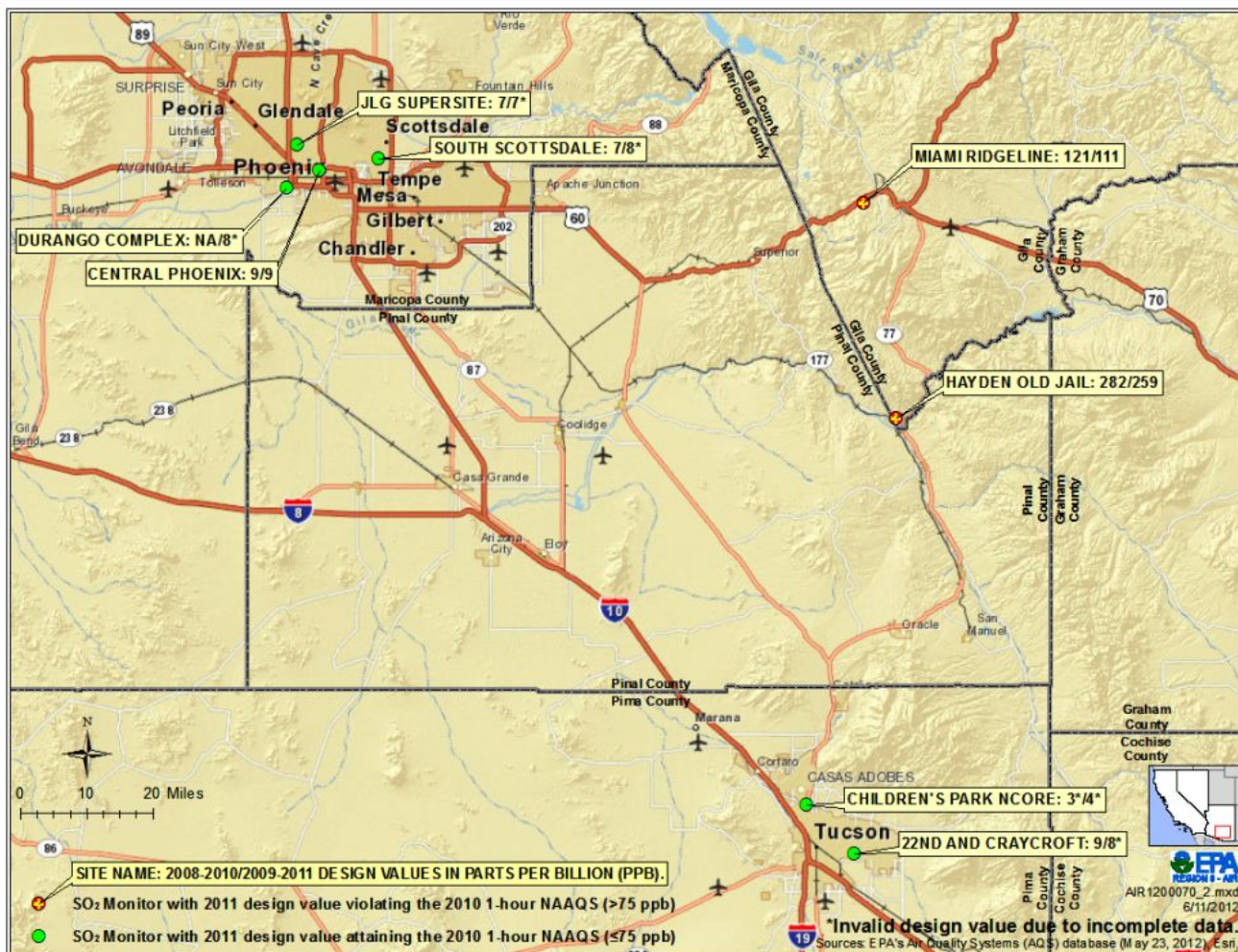


Figure 9

In May 2011, Governor Janice K. Brewer recommended that portions of Gila County and Pinal County be designated as “nonattainment,” and the remaining counties and partial counties be designated “unclassifiable” for the 2010 SO<sub>2</sub> NAAQS based on monitored air quality data from 2007-2009 (letter to EPA Region 9 Administrator Jared Blumenfeld from Governor Janice K. Brewer, May 25, 2011). Consistent with the existing Hayden nonattainment area and Miami maintenance area for the 1971 SO<sub>2</sub> NAAQS, the state recommended that the same portions of Gila County and Pinal County be designated as the Hayden and Miami nonattainment areas for the 2010 SO<sub>2</sub> NAAQS. The state recommendation was based primarily on monitoring data and consideration of emissions data from the 2005 National Emissions Inventory (NEI).

In February 2013, EPA responded to Governor Brewer’s 2011 recommendation (“120-day” letter to Governor Janice K. Brewer from EPA Region 9 Administrator Jared Blumenfeld, February 6, 2013). The February 2013 letter notified the Governor of EPA’s intentions regarding designations for the 2010 SO<sub>2</sub> NAAQS. As stated in the letter, EPA intended to agree with the Governor’s recommendations for boundaries of the two nonattainment areas the Governor recommended as nonattainment. The Governor replied to EPA’s 120-day letter in April 2013 (letter to EPA Region 9 Administrator Jared Blumenfeld

from Governor Janice K. Brewer, April 2, 2013). In the reply letter, the Governor reaffirmed the 2011 recommendations for all areas of the state.

Based on EPA's technical analysis described below, EPA concurs with the state's recommendation to initially designate a portion of Gila County as nonattainment for the 2010 SO<sub>2</sub> NAAQS, as the Miami nonattainment area. The county is listed above in Table 1.

### **Detailed Assessment**

#### ***Air Quality Data***

This factor considers the SO<sub>2</sub> air quality monitoring data, including the design values (in ppb) calculated for all air quality monitors in Gila County, in the Miami nonattainment area and the surrounding area based on data for the 2009-2011 period.

The Governor's recommendation was based on 2007-2009 data from Federal Reference Method (FRM) or Federal Equivalent Method (FEM) monitors provided in the state letter to EPA Region 9 Administrator Jared Blumenfeld from Governor Janice K. Brewer, May 25, 2011.<sup>7</sup>

The 2010 SO<sub>2</sub> NAAQS design values for counties in the Miami nonattainment area and surrounding area are shown in Table 4. Design values are calculated using the 3-year average of the annual 99<sup>th</sup> percentile of 1-hour daily maximum SO<sub>2</sub> concentrations, and compared to the NAAQS of 75 ppb, according to requirements of 40 CFR 50.17.

---

<sup>7</sup> 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 4.4) and operating with a FRM or 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 are 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.

**Table 4. Air Quality Data for Nonattainment Designations in Arizona**

County	State Recommended Nonattainment?	Monitor Name	Monitor Air Quality System ID	Monitor Location	SO <sub>2</sub> Design Value, 2009-2011 (ppb)
Gila, Arizona	Yes (partial)	Miami Ridgeline	04-007-0009	4030 Linden Street	111
		<b>Hayden Old Jail</b>	<b>04-007-1001</b>	<b>Jail-Canyon Dr, Hayden</b>	<b>259</b>
Maricopa, Arizona	No	<b>Central Phoenix</b>	<b>04-013-3002</b>	<b>1645 E. Roosevelt St, Central Phoenix</b>	<b>9</b>
		South Scottsdale	04-013-3003	2857 N. Miller Road, South Scottsdale	8*
		Durango Complex	04-013-9812	2702 AC Ester Brook Blvd	8**
		JLG Supersite	04-013-9997	4530 N. 17th Ave	7*
Pima, Arizona	No	22nd and Craycroft	04-019-1011	1237 S. Beverly, Tucson	8*
		Children's Park NCore	04-019-1028	400 W. River Road	4**

Monitors in **Bold** have the highest 2009-2011 design value in the respective county.

\*Incomplete data, provided for informational purposes only, not relevant for comparison to the NAAQS. These stations stopped monitoring for comparison to the SO<sub>2</sub> NAAQS after December 2010. The South Scottsdale monitor was moved to the Durango Complex station; JLG Supersite started monitoring for trace levels of SO<sub>2</sub> instead of for comparison to the NAAQS; 22<sup>nd</sup> and Craycroft SO<sub>2</sub> monitoring was moved to the Children's Park NCore station.

\*\*Incomplete data, provided for informational purposes only, not relevant for comparison to the NAAQS. These stations began monitoring for comparison to the SO<sub>2</sub> NAAQS in late 2010 or 2011.

Gila County shows monitored violations of the 2010 SO<sub>2</sub> NAAQS. No other SO<sub>2</sub> monitors in Arizona show violations of the 2010 SO<sub>2</sub> NAAQS. Therefore, as an analytical starting point, some areas in Gila County and possibly additional areas in surrounding counties must be designated nonattainment. Note that the absence of a violating monitor alone is not a sufficient reason to eliminate nearby counties as candidates for nonattainment status. This is because the Clean Air Act defines a nonattainment area as any area that violates a NAAQS or contributes to a nearby violation.<sup>8</sup> Each area has been evaluated based on the weight-of-evidence of the five factors and other relevant information.

Two SO<sub>2</sub> monitors are violating the standard in Arizona. Both violating monitors are located in Gila County (see Table 4 and Figure 9, above). The Miami Ridgeline monitor (AQS ID 04-007-0009) is a source-oriented monitor, located approximately 1,390 meters (0.86 miles) from the Freeport-McMoRan Miami Inc. (FMMI) copper smelter (see Figure 10). The FMMI smelter is roughly 45.5 kilometers (28 miles) northwest of the other violating monitor, Hayden Old Jail, a source-oriented monitor located near the ASARCO, LLC – Hayden smelter.

<sup>8</sup> 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..."



Figure 10

Six additional SO<sub>2</sub> monitors have been operated in Maricopa and Pima counties in recent years. These monitors are not source-oriented and are located in the urban cores of the Phoenix and Tucson metropolitan areas, which are over 50 miles away from the violating monitors located in Gila County (see Figure 9, above). The low recorded concentrations in these locations suggest that their design values are not impacted by the same sources that are impacting the violating monitors.

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

Evidence of SO<sub>2</sub> emissions sources in the vicinity of a violating monitor is an important factor for determining whether a nearby area is contributing to a monitored violation. For this factor, EPA evaluated county level emission data for SO<sub>2</sub>, as well as emissions from nearby point sources.

### **Emissions**

For this analysis, EPA relied on information from the 2008 National Emissions Inventory (NEI) emissions database (NEI08V3). Arizona did not provide updated emissions information.

Table 5 shows total emissions of SO<sub>2</sub> (given in tons per year) for all 15 counties in Arizona and sources emitting greater than 100 tons per year of SO<sub>2</sub> according to the 2008 NEI. The county that contains all of the Miami nonattainment area for the 2010 SO<sub>2</sub> NAAQS is shown in **bold**.

**Table 5. SO<sub>2</sub> Emissions in 2008**

County	Facility Located in State Recommended Nonattainment Area?	Facility > 100 tons per year of SO <sub>2</sub> emissions	Facility Location	SO <sub>2</sub> Air Emissions (2008 NEI V3) (tons)	Total County 2008 SO <sub>2</sub> Emissions (tons)
<b>Gila</b>	Yes (Hayden)	ASARCO, LLC - Hayden Smelter	Hayden	21,742	29,176
	Yes (Miami)	Freeport-McMoRan Miami Smelter	Miami	7,091	
	-	Other point, nonpoint, nonroad, onroad	-	343	
Apache	No	Salt River Project (Coronado)	St. Johns	15,900	22,583
	No	Tucson Electric Power Company	Springerville	6,562	
	-	Other point, nonpoint, nonroad, onroad	-	122	
Navajo	No	Arizona Public Service (Cholla)	Joseph City	16,421	19,163
	No	Catalyst Paper (Snowflake) Inc.	Snowflake	2,556	
	-	Other point, nonpoint, nonroad, onroad	-	186	
Pima	No	Tucson Electric Power (Irvington)	Tucson	2,884	4,718
	-	Other point, nonpoint, nonroad, onroad	-	1,834	
Maricopa	No	Phoenix Sky Harbor International Airport	Phoenix	252	1,641
	-	Other point, nonpoint, nonroad, onroad	-	1,389	
Cochise	No	AZ Electric Power (Apache)	Cochise	1,903	3,081
	No	Chemical Lime Company - Douglas	Douglas	1,013	
	-	Other sources (nonpoint, nonroad, onroad)	-	165	
Yavapai	No	Nelson Lime Plant	Peach Springs	1,955	2,330
	-	Other point, nonpoint, nonroad, onroad	-	375	
Pinal	-	Other point, nonpoint, nonroad, onroad	-	381	381
Mohave	-	Other point, nonpoint, nonroad, onroad	-	345	345
Coconino	-	Other point, nonpoint, nonroad, onroad	-	786	786
Yuma	-	Other point, nonpoint, nonroad, onroad	-	215	215
La Paz	-	Other point, nonpoint, nonroad, onroad	-	41	41
Santa Cruz	-	Other point, nonpoint, nonroad, onroad	-	105	105
Greenlee	-	Other point, nonpoint, nonroad, onroad	-	212	212
Graham	-	Other point, nonpoint, nonroad, onroad	-	48	48

Total emissions of SO<sub>2</sub> are highest in Gila County. In 2008, the FMMI copper smelter was the second largest source of SO<sub>2</sub> emissions in Gila County, and the fourth largest source in Arizona. Both smelters (FMMI and ASARCO, LLC) in Gila County are primary copper smelters. Apache and Navajo counties also contain coal-fired electric utility generating units that are large sources of SO<sub>2</sub>: Coronado Generating Station (15,900 tons in 2008) and Springerville Generating Station (6,562 tons in 2008) in Apache County, and Cholla Power Plant (16,421 tons in 2008) in Navajo County. Total emissions of

SO<sub>2</sub> from Pinal County are low (381 tons in 2008) compared to Gila, Apache, and Navajo counties. Gila, Apache, and Navajo counties together comprise 84% of total SO<sub>2</sub> emissions from the state of Arizona. The five largest stationary sources in those three counties comprised 80% of total SO<sub>2</sub> emissions from Arizona in 2008. The existing Miami maintenance area for the 1971 SO<sub>2</sub> NAAQS is identical to the state's recommended Miami nonattainment area for the 2010 SO<sub>2</sub> NAAQS and includes the FMMI smelter. See Figure 11.

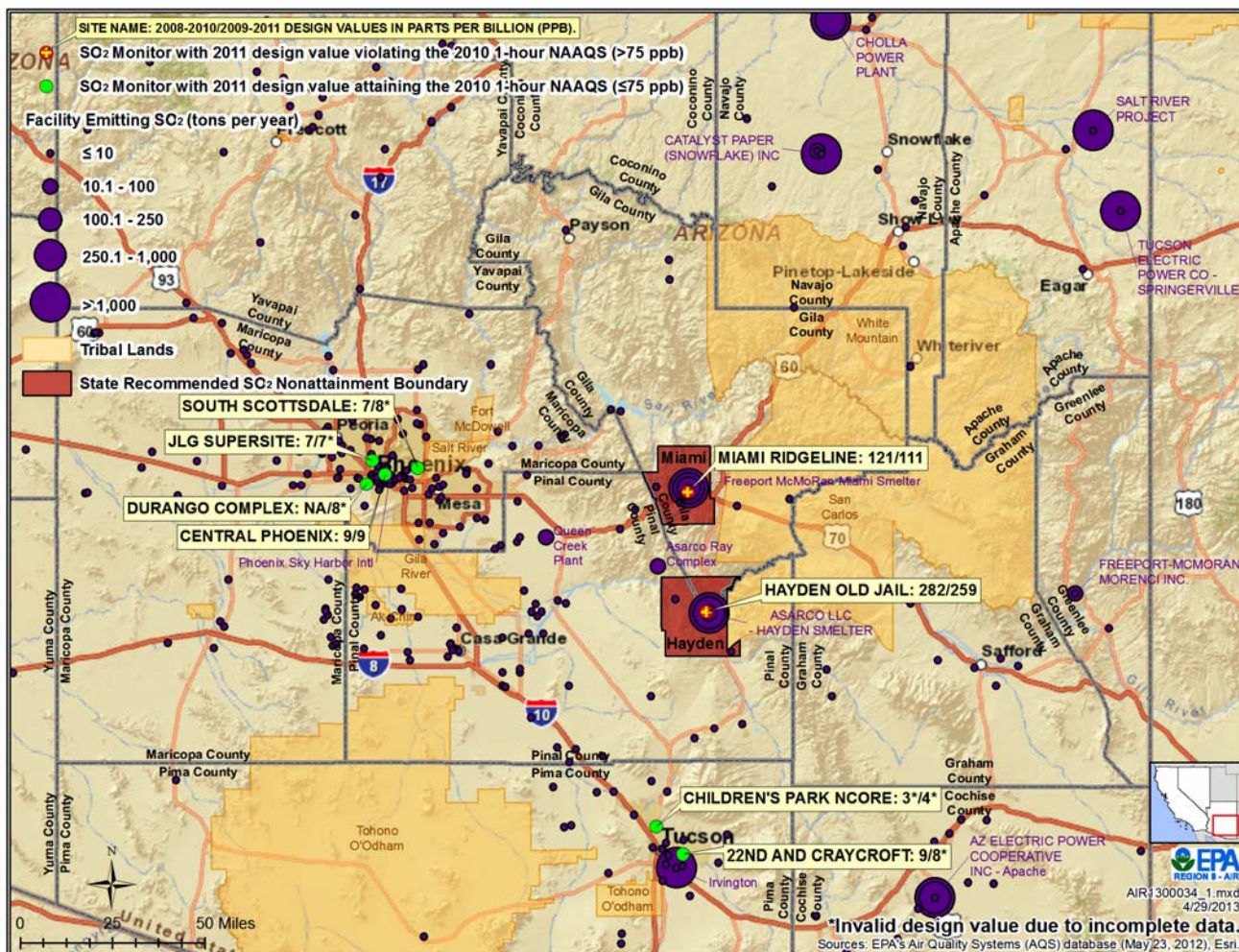


Figure 11

### Emissions Controls

The emissions data used by EPA in this technical analysis and provided in Table 5 represent emissions levels taking into account any control strategies implemented on stationary sources in the Miami, Arizona nonattainment area up to and including 2008. Since 2008, FMMI has had several permit revisions, including: installation of a coal injection system with a dust collector system, clarification and/or correction to existing permit conditions, revision to allow additional use of an existing screening machine, update of the sulfur balance methodology to include a gravimetric method, and addition of small internal combustion engines. None of the permit revisions resulted in changes to permitted SO<sub>2</sub> emission limits. See seven ADEQ permit actions/revisions from 2008 to the present: 43398-SPR,

45593-MPR, 48448-MPR, 49986-MPR, 54218-MPR, 55226-MPR, and 55691-MPR. These seven permit actions/revisions were included in the Title V Renewal Operating Permit 53592 issued November 26, 2012.<sup>9</sup>

### Population

Gila County's population as of the 2010 census was 53,597. From 2000 to 2010 the county grew by 4.4% and had a population density of 11.3 persons per square mile.

### ***Meteorology (weather/transport patterns)***

Evidence of source-receptor relationships between specific emissions sources and high SO<sub>2</sub> values at violating monitors is another important factor in determining the appropriate contributing areas and the appropriate extent of the nonattainment area boundary. For this factor, EPA considered meteorological data available for the area. The data may provide evidence of the potential for SO<sub>2</sub> emissions sources located upwind of a violating monitor to contribute to ambient SO<sub>2</sub> levels at the violation location.

Temperature and precipitation data are available from the Miami station, part of the National Weather Service Cooperative Observer Program. Around 20 inches of rain fall each year at the Miami station, roughly evenly distributed between the months, except in April, May, and June, when less than a half inch of rain falls per month. Normal daily temperature highs range from 96 degrees Fahrenheit (°F) in summer to 62 °F in winter, while normal lows are 65 °F in summer to 34 °F in winter.

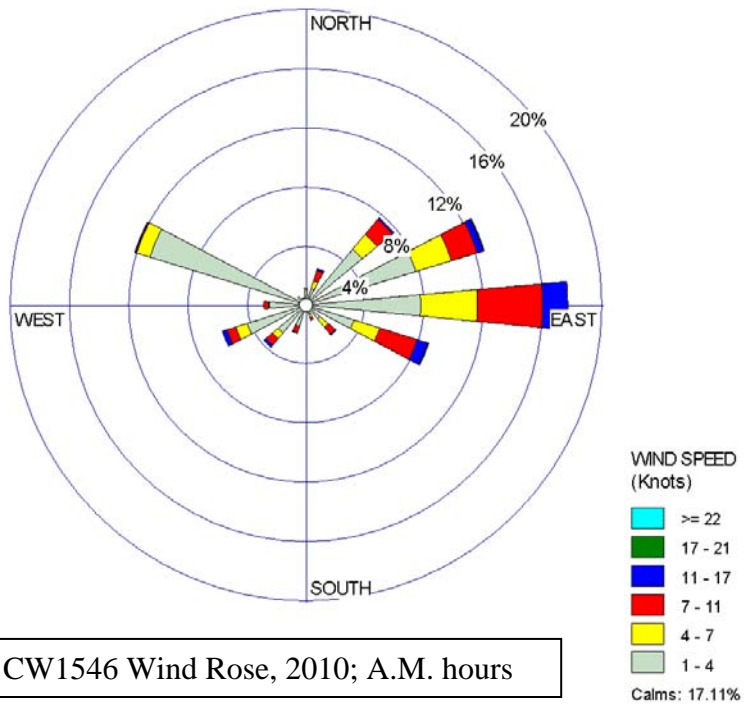
The closest meteorological station to the violating Miami monitor is Globe station CW1546, part of the National Weather Service Cooperative Observer Program. The city of Globe is about five miles from Miami, roughly to the east. Globe is in the Pinal Creek Valley, oriented at right angles to the valley where Miami is located, with a more west-east orientation. The 2010 wind data shows flows consistent with the valley orientation (see Figure 12). Flow toward the west is the most frequent, but flow toward the east-southeast also occurs. Some, but not all of the flows are consistent with diurnal slope flows; the complexity of the surrounding terrain means there are multiple influences controlling the flow. Because of the complex terrain, and the spatial separation from Miami, this data is of limited usefulness for drawing conclusions about the Miami nonattainment area boundary, except to illustrate that flows largely conform to valley orientation, with slope flow being an important phenomenon.

---

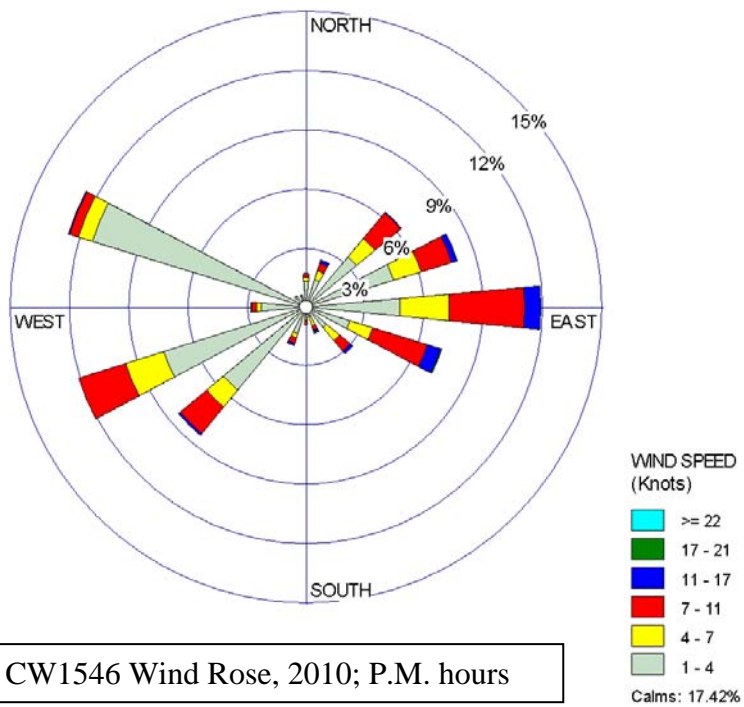
<sup>9</sup> Further information about Arizona federal Title V air permits can be found on EPA's website at: <http://www.epa.gov/region9/air/permit/title-v-permits.html>



### Globe a.m. and p.m. wind roses



Globe CW1546 Wind Rose, 2010; A.M. hours



Globe CW1546 Wind Rose, 2010; P.M. hours

Figure 12

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

As shown in Figures 13 and 14, Miami and the FMMI smelter are located in complex terrain. Miami is at roughly 3,500 feet elevation, located in the southwest-northeast trending river valley of the Bloody Tanks Wash. To the northeast, this valley joins the Pinal Wash at a right angle; the Wash then tends northwest and merges with the Pinal Creek Valley. Northeast beyond this juncture, the Apache Peaks rise to 4,300 feet, and to 6,200 feet a bit outside of the nonattainment area. To the northwest, Webster Mountain rises to 5,000 feet; the Pinal and other mountain ranges to the south and southwest rise to 6,500 feet; there are various other ridges to the southeast. Thus, Miami is essentially surrounded by mountains in all directions; its immediate valley makes a right-angle turn into the Pinal Creek Valley, which is all within the nonattainment area except for a short narrow portion in the north. The existing nonattainment boundaries contain all the areas topographically connected with Miami.

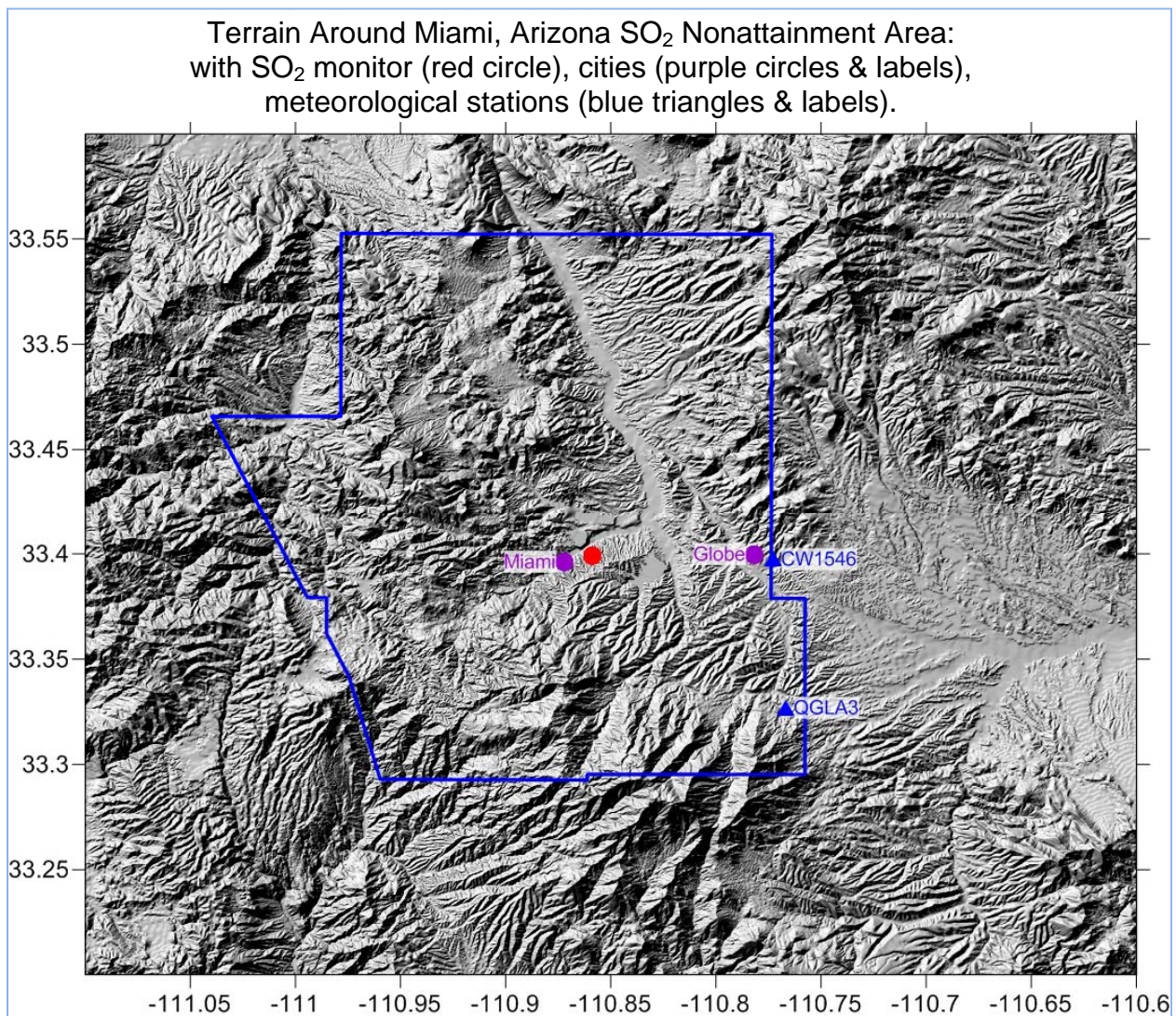


Figure 13

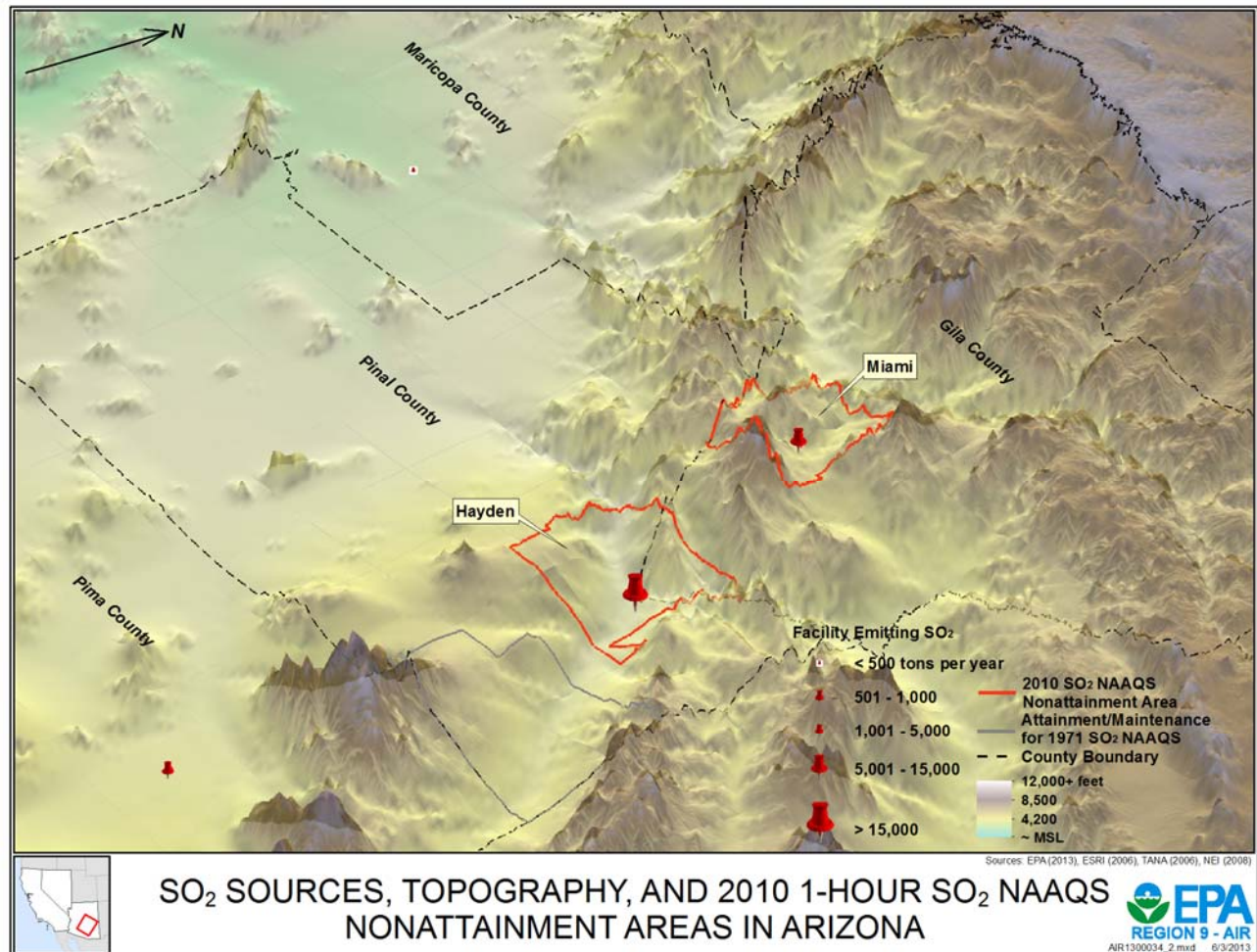


Figure 14

### *Jurisdictional boundaries*

As discussed in the preceding technical analysis for the Hayden nonattainment area, for air quality management purposes, Gila County falls under the jurisdiction of ADEQ. For the 1971 SO<sub>2</sub> NAAQS, the Miami SO<sub>2</sub> nonattainment area was not separately defined but rather that geographic area was included in a county-wide SO<sub>2</sub> nonattainment area (see 43 FR 8968, March 3, 1978). At the request of the state of Arizona, EPA reduced the area's boundaries to include nine townships in and around the city of Miami (44 FR 21261, April 10, 1979). See also, 40 CFR section 81.303. Section 107(d)(1)(C) of the 1990 Clean Air Act Amendments (CAAA) brought forward, by operation of law, the nonattainment designations for areas, such as the Miami SO<sub>2</sub> nonattainment area, that continued to be designated as nonattainment at the time of enactment of the CAAA, i.e., areas that had not been redesignated to "attainment" prior to the CAAA's November 15, 1990 enactment date. The area achieved attainment with the 1971 SO<sub>2</sub> NAAQS in 1984, and ADEQ submitted a maintenance plan to EPA in 2002. In January 2007, EPA redesignated the Miami nonattainment area to attainment (72 FR 3061, January 24, 2007). In this redesignation and maintenance plan approval, EPA also corrected the boundary of the Miami SO<sub>2</sub> nonattainment area to exclude a noncontiguous township that was

erroneously included in the description of the area and to fix a transcription error in the listing of one of the other townships (see 72 FR 3061, January 24, 2007 and 40 CFR section 81.303). The Miami nonattainment area for the 2010 SO<sub>2</sub> NAAQS has the same boundaries as the 1971 SO<sub>2</sub> NAAQS maintenance area.

### ***Other Relevant Information***

In its May 25, 2011 letter, ADEQ provided additional information to support its assertion that presumptive use of full county boundaries as the nonattainment area boundary is inappropriate for geographically large counties. The state argued that the use of full county boundaries as the presumptive nonattainment area boundary for a violating monitor results in regional disparities in the size of nonattainment areas. For example, the state compared the area of Gila County (4,796 square miles) with the area of the entire state of Connecticut (4,845 square miles). A violating monitor in Middlesex County, Connecticut, would result in a presumptive nonattainment area boundary encompassing 369 square miles. Applying this presumption in Arizona would result in a nonattainment area (Gila County) that is 13 times larger than a full-county nonattainment area in Connecticut. Therefore, the state concluded that its consideration of partial counties for the Hayden and Miami nonattainment areas was appropriate.

### **Conclusion**

After considering the factors described above, EPA concurs with the state's recommendation to initially designate a portion of Gila County listed in Table 1 as the Miami, Arizona nonattainment area for the 2010 SO<sub>2</sub> NAAQS, based on the violating monitor in Miami, Arizona.

The air quality monitor in Miami, Arizona shows a violation of the 2010 SO<sub>2</sub> NAAQS, based on 2009-2011 air quality data. The Freeport-McMoRan Miami Inc. (FMMI) copper smelter located less than 1,400 meters (less than 0.86 mile) away from the violating monitor is expected to be the source of the emissions causing the monitored violation. Miami is essentially surrounded by mountains in all directions. Due to the constraints imposed by the complex terrain in the Miami area (see Geography/Topography discussion above), the extent of the area exceeding the SO<sub>2</sub> standard is expected to be confined to a relatively small area around the main source of SO<sub>2</sub> emissions, the FMMI copper smelter. In light of this, we are not yet prepared to conclude whether locations outside the particular valley containing Miami contribute to the Miami monitor's recorded exceedances. The meteorology factor did not play a significant role in determining a boundary for the nonattainment area, but available data confirms the relevance of the topography in limiting the extent of the nonattainment area to the nearby river valleys and their surroundings. The nonattainment boundaries recommended by the state are therefore expected to contain areas topographically connected with Miami and causing or contributing to the monitored violation. We are not yet prepared to conclude that the emissions from sources located outside the state's recommended boundary contribute to the monitored violation or to other possible violations, and will further address such sources and their areas in a subsequent round of final initial designations.

Based on the consideration of all the relevant and available information, as described above, EPA's conclusion is that the boundaries described herein for the Miami, Arizona nonattainment area encompass an area that does not meet (or that contributes to ambient air quality in a nearby area that

does not meet) the 2010 SO<sub>2</sub> NAAQS, based on the violating monitor information. No areas of Indian country are included in the Miami, Arizona nonattainment area. Areas and sources that EPA is not yet prepared to conclude are contributing to the monitored violation or to other possible violations are not included in this initial nonattainment area. In the future, we will make final designation decisions for areas in Arizona not included in the nonattainment area designations addressed in this TSD.