



## **Pinal County Air Quality Control District**

### **2020 Ambient Monitoring Network 5-Year Assessment**

**June, 2020**  
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# Table of Contents

<b>Introduction</b>	5
<b>1.0 Background Information</b>	6
1.1 Network Description - PM <sub>10</sub> , PM <sub>2.5</sub> , Ozone	6
1.2 Climatology	10
1.3 Geography	12
1.4 NAAQS Status	13
<b>2.0 Data Evaluation</b>	15
2.1 Population	15
2.2 Emissions	15
<b>3.0 Network Evaluation</b>	17
3.1 40 CFR Part 58 Appendix D Compliance	17
3.2 Evaluation of Monitors for Possible Elimination	17
3.3 Evaluation of Pinal County for Possible Monitor Addition	20
3.4 Seven-Point Network Assessment	22
<b>4.0 Conclusions</b>	24

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## Introduction

This document provides the Pinal County Air Quality Control District (PCAQCD) 5-year Monitoring Network Assessment. 40 Code of Federal Regulations (CFR) Part 58.10 (d) requires an air monitoring network assessment to be conducted on a 5-year cycle with the first due July 1, 2010. This evaluation assessed the air quality monitoring system consisting of State and Local Air Monitoring Stations (SLAMS) and Special Purpose Monitors (SPMs) operated under state and local authority. Pinal County is not required to operate National Core (NCore) or Photochemical Assessment Monitoring Station (PAMS) air monitoring sites.

The monitoring assessment must address the following:

1. Document that the network meets the monitoring objectives defined in Appendix D to 40 CFR Part 58.
2. Evaluate the need for new monitoring sites.
3. Evaluate if existing sites are no longer needed and can be terminated.
4. Determine if new technologies are appropriate for incorporation into the ambient air monitoring network.
5. Consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma).
6. For any sites that are being proposed for discontinuance, consider the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies.
7. For PM<sub>2.5</sub>, the assessment also must identify needed changes to population-oriented sites.

Pinal County Air Quality operates air quality monitors that record ambient concentrations of several criteria pollutants. Criteria pollutants are those that the United States Environmental Protection Agency (EPA) has defined as a potential risk to health, and correspondingly defined a National Ambient Air Quality Standard (NAAQS).<sup>1</sup> The standards are intended to protect public health and welfare by setting limits on the allowable concentration of each pollutant in the ambient air.

The criteria pollutants are particulate matter (PM) less than or equal to 10 microns (PM<sub>10</sub>), particulate matter less than or equal to 2.5 microns (PM<sub>2.5</sub>), ozone (O<sub>3</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), and lead (Pb). Pinal County Air Quality currently monitors PM<sub>10</sub>, PM<sub>2.5</sub> and O<sub>3</sub>.

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<sup>1</sup> See Clean Air Act (“CAA”) §§ 108,109, and 40 CFR §50.1 *et seq.*

## 1.0 Background Information

### 1.1 Network Description – PM<sub>10</sub>, PM<sub>2.5</sub>, Ozone

A SLAMS network consists of ambient air monitoring sites that provide data to meet required monitoring objectives. All Pinal County air monitoring sites have the basic monitoring objective of NAAQS comparison. Monitoring sites generally correspond to a spatial scale identified in 40 CFR Part 58 Appendix D. Spatial scale of representativeness is described in terms of the physical dimension of the air parcel nearest to a monitoring station throughout which actual pollutant concentrations are reasonably similar. Table 1.1 lists these spatial scales.

**Table 1.1: Spatial Scales**

Spatial Scale	Dimension
Microscale	Several meters up to 100 meters
Middle scale	100 meters up to 0.5 kilometers
Neighborhood Scale	0.5 kilometers to 4.0 kilometers
Urban Scale	4 kilometers to 50 kilometers
Regional Scale	Tens to hundreds of kilometers

40 CFR Part 58 Appendix D also describes the relationship between the site type and the spatial scales that are generally most appropriate for each site type. Table 1.2 summarizes this relationship.

**Table 1.2: Site Type and Scales**

Site Type	Appropriate Siting Scales
Highest Concentration	Micro, Middle, Neighborhood (Sometimes Urban)
Population	Neighborhood, Urban
Source Impact	Micro, Middle, Neighborhood
General / Background	Neighborhood, Urban, Regional
Regional Transport	Urban / Regional
Welfare-related Impact	Urban / Regional

A SPM is a monitor that is included in an agency's monitoring network, but not part of the SLAMS network. SPMs are generally used to monitor specific sources, although any of the above siting scales may be appropriate. In December 2006 the EPA revised 40 CFR 58.20 indicating that where a SPM operates for more than 24 months all data collected may be eligible for comparison to the relevant NAAQS.

40 CFR Parts 50 and 53 define Federal Reference Methods (FRMs) and Federal Equivalent Methods (FEMs), which provide precise methodology for quantifying ambient concentrations of air pollutants. FRMs are monitoring methods that are associated with the NAAQS for the pollutant described in the appendices to 40 CFR 50 and determined by EPA to be FRMs. FEMs are alternative monitoring methods that have been designated by EPA as obtaining equivalent results when compared to the FRM, as determined by 40 CFR 53. An additional option for air monitoring agencies is the

Approved Regional Method (ARM). This designation requires the applying agency to conduct specific field testing and evaluation demonstrating that the method meets Class III precision and accuracy requirements listed in Subpart C of 40 CFR Part 53.

Pinal County Air Quality uses FRMs to collect filter based PM<sub>2.5</sub> samples and FEMs for continuous PM<sub>10</sub>, PM<sub>2.5</sub> and ozone. Pinal County Air Quality does not have approval for any ARMs.

Pinal County uses Tapered Element Oscillating Microbalance (TEOM) monitors which measure PM<sub>10</sub> continuously. For PM<sub>2.5</sub> two types of monitors are used throughout the monitoring network: 1) filter based medium volume monitors equipped with the appropriate size fractioning device (very sharp cut cyclone), and 2) Met One Beta Attenuation Monitors (BAMs) 1020 FEMs which measure PM<sub>2.5</sub> continuously.

The Arizona Department of Environmental Quality (ADEQ) operated a sulfur dioxide (SO<sub>2</sub>) monitor in San Manuel, Pinal County until December of 2007. The San Manuel site was discontinued as proposed in the State Implementation Plan (SIP) and Network Plan and subsequent attainment / maintenance finding by EPA for the area. ADEQ retains authority to monitor copper smelters in Arizona.

ADEQ operates an ozone (O<sub>3</sub>) monitor at Queen Valley. There are currently no monitors in Pinal County that measure lead (Pb) although ADEQ and Maricopa County Air Quality Department (MCAQD) operate monitors in other portions of the state that measure lead. Refer to the State of Arizona and MCAQD Monitoring Network Plans for information on these criteria pollutants.

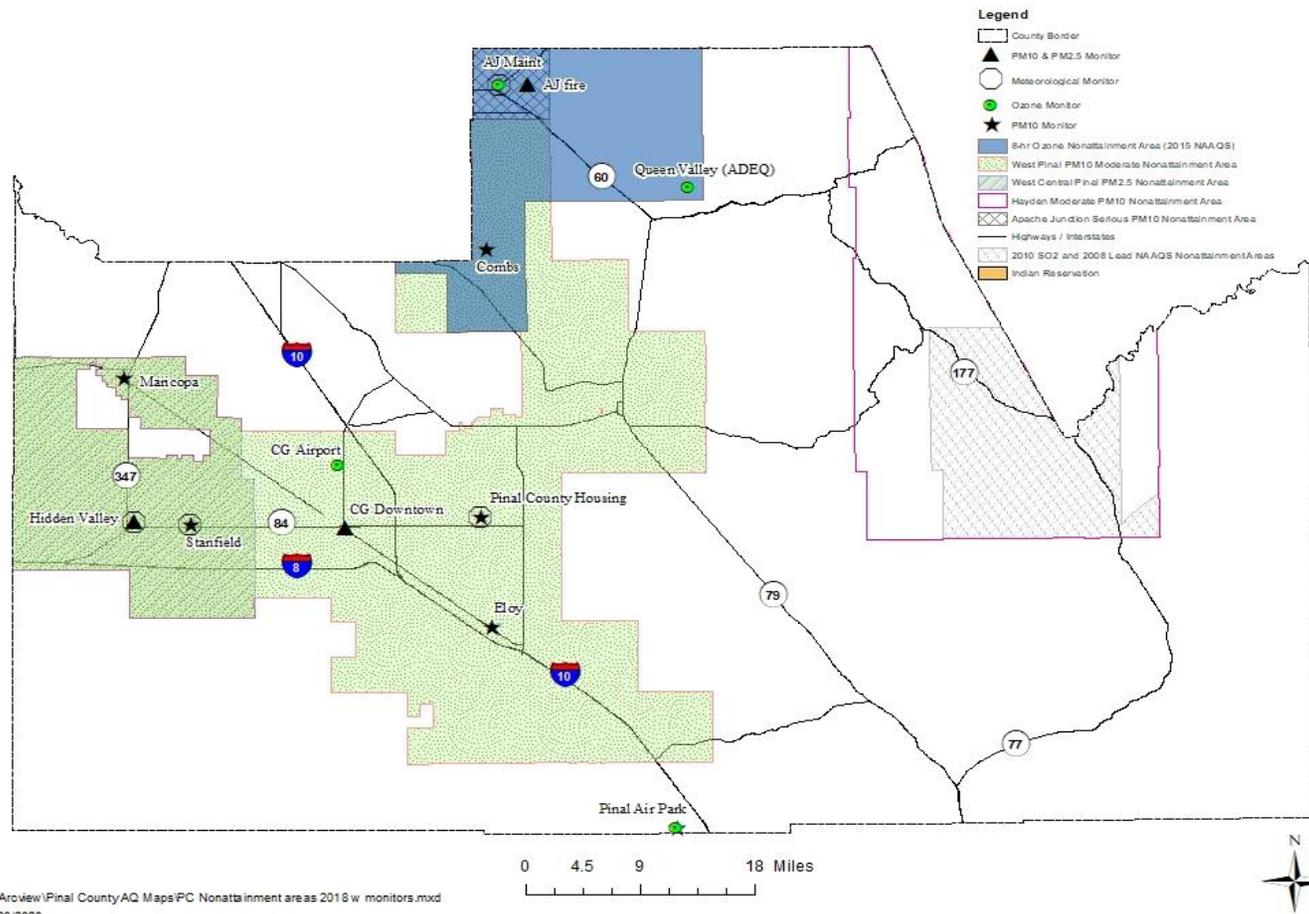
As described in the Pinal County document entitled, "2020 Network Plan and 2019 Data Summary," the monitoring network meets the monitoring objectives defined in Appendix D to 40 CFR Part 58. Table 1.3 is a summary of SLAMS monitoring sites. There are currently no SPM sites operated by Pinal County Air Quality. See Figure 1.1 for monitoring site locations and nonattainment areas in Pinal County.

**Table 1.3: SLAMS Summary**

<b>Site Name</b>	<b>AQS ID</b>	<b>Classification</b>	<b>Site Type</b>	<b>Site Scale</b>	<b>Pollutant</b>
Apache Junction Fire Station	040213002	SLAMS	Population	Neighborhood	PM <sub>2.5</sub> PM <sub>10</sub>
Apache Junction Maintenance Yard	040213001	SLAMS	Population	Neighborhood	O <sub>3</sub>
Casa Grande Airport	040213003	SLAMS	Population	Neighborhood	O <sub>3</sub>
Casa Grande Downtown	040210001	SLAMS	Population	Neighborhood	PM <sub>2.5</sub> PM <sub>10</sub>
Combs School	040213009	SLAMS	Population	Neighborhood	PM <sub>10</sub>
Eloy County Complex	040213014	SLAMS	Population	Neighborhood	PM <sub>10</sub>
Hidden Valley	040213015	SLAMS	Highest Concentration / Source Oriented	Middle	PM <sub>2.5</sub> PM <sub>10</sub>
City of Maricopa County Complex	040213010	SLAMS	Population	Neighborhood	PM <sub>10</sub>
Pinal Air Park	040213007	SLAMS	Background Transport	Regional	PM <sub>10</sub> O <sub>3</sub>
Pinal County Housing Complex	040213011	SLAMS	Population	Neighborhood	PM <sub>10</sub>
Stanfield County Complex	040213008	SLAMS	Population	Neighborhood	PM <sub>10</sub>

**Figure 1.1**

**Pinal County Air Quality Control District Monitoring Network and Nonattainment Areas**



## 1.2 Climatology

Central Arizona experiences periods of significant winds associated with frontal passages, troughs of low pressure, summer monsoon storms and occasional strong pressure gradients. The meteorology associated with winds in Pinal County includes synoptic scale systems such as frontal passages, strong pressure gradients, Mesoscale Convective System (MCS)<sup>2</sup> and regional monsoon storms or microscale storm cells that form locally.

The frontal passages are typically associated with strong Pacific Northwest low pressure systems that develop over the northern Pacific Ocean and move southeast into the western US. Strong winds in advance of the cold fronts can reach speeds over 30 mph which cause significant areas of blowing dust in central Arizona. Additionally the duration of the strong, gusty winds can last up to 8 hours which contribute to elevated hourly PM<sub>10</sub> concentrations. The hourly PM<sub>10</sub> concentrations associated with frontal passages may not match the monsoon PM<sub>10</sub> concentrations in intensity; however their temporal duration can create 24-hr PM<sub>10</sub> concentrations which reach the 99<sup>th</sup> percentile of historical PM<sub>10</sub> 24-hr average data.

Pressure gradient exceptional/natural events result from strong high pressure building over the western US and low pressure to the east. As the high pressure builds a pressure differential is created causing strong winds over Arizona. The result is blowing dust developing locally in addition to transported dust from neighboring areas surrounding Pinal County. Also, similar to frontal passages, duration of strong, gusty winds can last several hours. The combination of the long duration of transported dust and locally derived dust overwhelms the PM<sub>10</sub> monitors.

The monsoon is a seasonal wind that takes place in the southwestern US and northern Mexico during the summer months. The typical diurnal winds in central Arizona are ‘drainage’ in nature, easterly winds originating from the mountains in the morning switch to westerly winds in the afternoon due to the heating of the desert floor. However during the monsoon, winds will shift to an easterly to southeasterly direction. This is due to a ridge of high pressure that sets up over the ‘four corners’ area (Figure 1.2). The result is an influx of atmospheric moisture from the south and east and storm development. The storm development can be synoptic in nature as large lines of storms form either over the Mogollon Rim or northern Mexico/southern Arizona and move into Pinal County. Additionally, monsoon storms can be local in nature with the formation of localized monsoon supported storm cells. Either monsoon setup can pack significant winds (reaching gusts over 60 mph) that cause dust storms to develop and transport dust tens to hundreds of miles (a.k.a. Haboob) and have similar dust causing effects as frontal passages, and strong pressure gradients.

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<sup>2</sup> <http://www.weather.gov/glossary/index.php?letter=m>

Figure 1.2

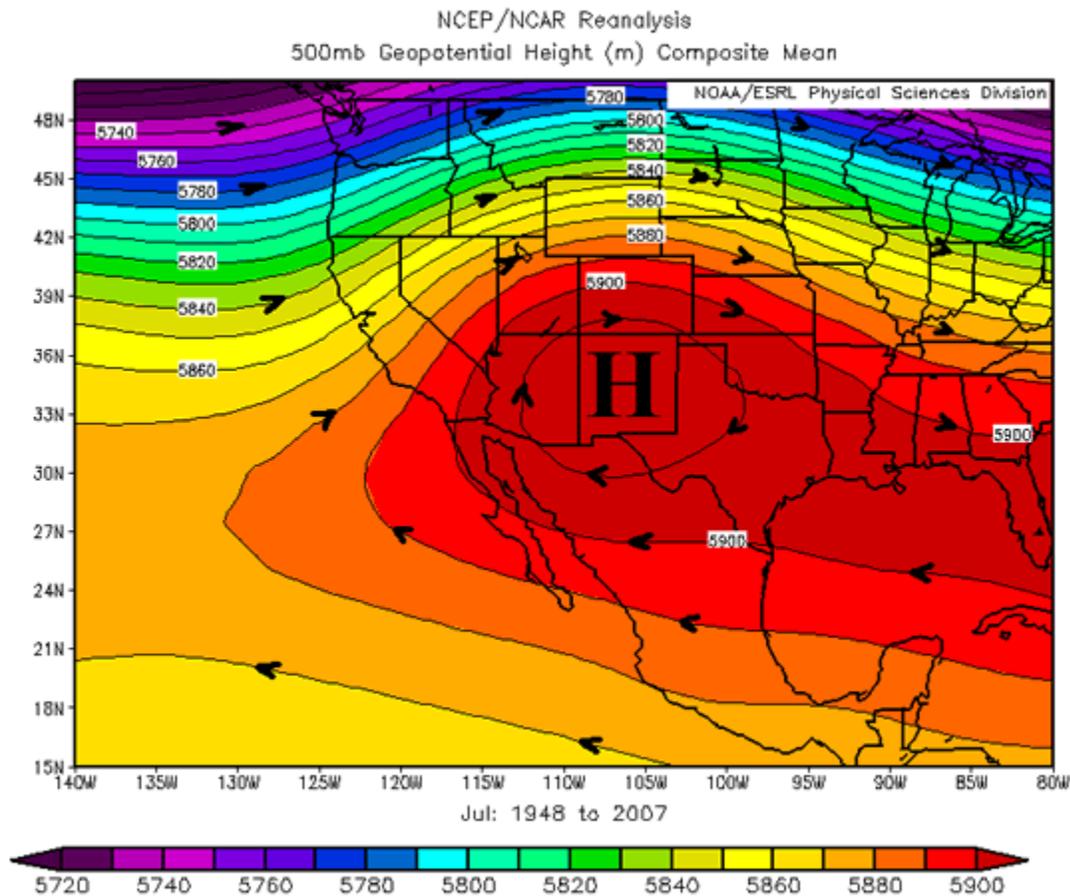


Figure 1.2: Typical Monsoon Setup (500 mb map)

Source: National Weather Service ([http://www.wrh.noaa.gov/twc/monsoon/monsoon\\_NA.php](http://www.wrh.noaa.gov/twc/monsoon/monsoon_NA.php))

The monsoon season, as defined by the National Weather Service, starts on June 15<sup>th</sup> and lasts through September 30<sup>th</sup>. The large scale Haboobs that form are frequent at the beginning of the monsoon and subside as the monsoon progresses and measurable rainfall occurs.

The typical times of year that each meteorological setup results in exceptional/high wind events in Pinal County are:

- Frontal passage – Spring (March-April)
- Strong pressure gradients – Fall (September-November)
- Monsoon – Summer (June-September)

The Pinal County climate is arid. Figure 1.3 illustrates the average monthly rainfall across Pinal County where there are monitoring sites. The driest time period of the year for the county is April through June followed by September through November. The two meteorological regimes which are enhanced by the lack of precipitation are frontal passages (especially in April) and monsoon.

**Figure 1.3**

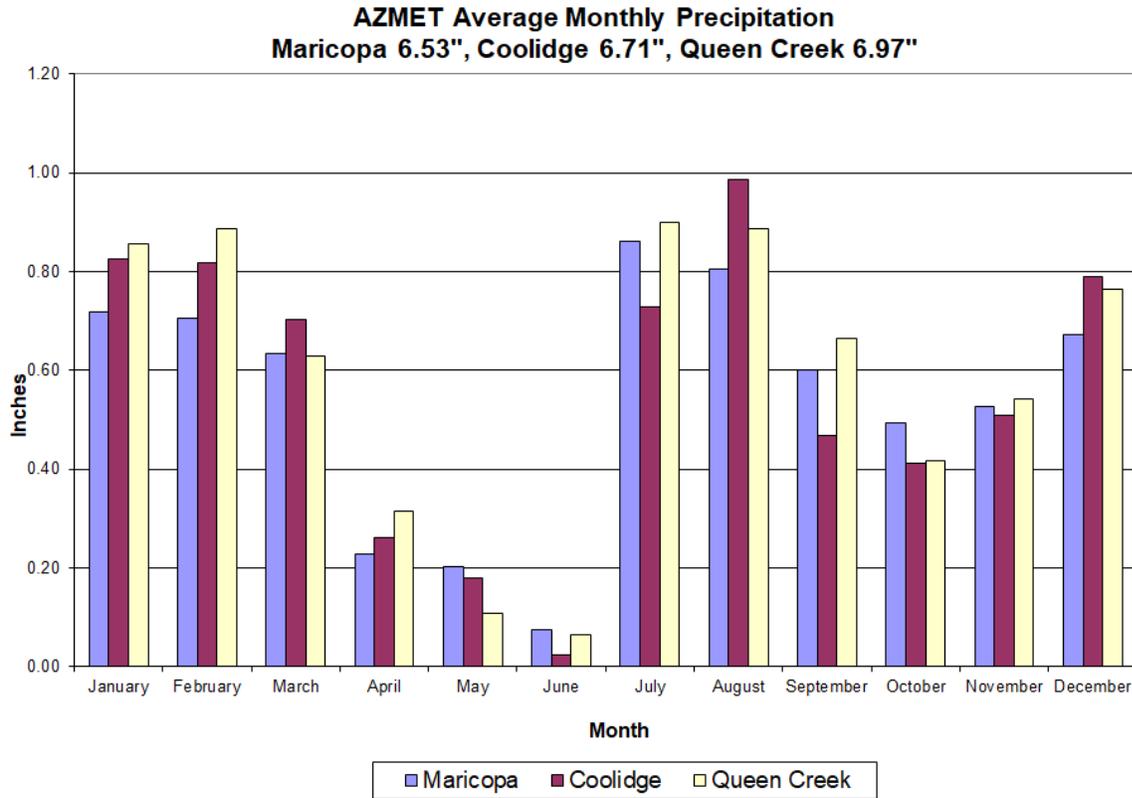


Figure 1.3. AZMET average precipitation  
Source: The Arizona Meteorological Network (<http://ag.arizona.edu/azmet/>)  
Period of record: Maricopa 1988-2008, Coolidge 1987-2008, Queen Creek 1995-2008

### 1.3 Geography

The geography of Pinal County can best be described as a broad basin, low in elevation, surrounded in each direction by mountain ranges. Open-ended valleys characterize the topography of western Pinal County. The area does not have geographical or topographical barriers limiting air-pollution transport within its airshed. The elevation of the basin area of Pinal County is approximately 1,000 feet above sea level.

The mountain ranges that surround the basin area create complex mountain-valley wind patterns. The Estrella Mountains in the northwest portion of the County reach 4,125 feet in elevation and provide a buffer between Pinal and Maricopa Counties. In the northern portion of Pinal County, the Superstition and San Tan Mountains rise to a height of 5,036 and 3,054 feet, respectively. Near the western border of the County, the Table Top Mountains reach 3,392 feet in elevation. To the south, the Black Mountains reach 5,577 feet. The Pinal Mountains in western Gila County, near Pinal County's eastern border, reach 7,848 feet in elevation.

## 1.4 NAAQS Status

On May 22, 2012 the EPA Region IX Administrator signed the West Pinal PM<sub>10</sub> nonattainment designation. Based on 2009 - 2011 data, a significant portion of western Pinal County was included in this new nonattainment area (Figure 1-1). On May 31, 2012 the designation was officially published in the Federal Register.

On April 7, 2020, EPA published a Federal Register notice (85FR19409) proposing to redesignate the area from moderate to serious non-attainment based upon data collected during the period from 2016 - 2018. As of the date this document was released, the action has not been finalized. More detail regarding the data for this period is available in Appendix C of the Pinal County 2020 Ambient Monitoring Network Plan and 2019 Data Summary document.

Designations for the Pinal portions of the Gila River Indian Community, the Ak-Chin Indian Community, and the Florence Village and San Lucy Farms areas of the Tohono O'odham Nation were deferred until completion of the formal consultation process. EPA determined that the tribal areas were not contributing to violations of the PM<sub>10</sub> standard in Pinal County and did not re-designate these areas.

On October 4, 2013, the EPA determined that the West Central Pinal County nonattainment area attained the 2006 24-hour fine particle (PM<sub>2.5</sub>) NAAQS (78FR 54394; Effective Date October 4, 2013). EPA's determination was based upon complete, quality assured, and certified ambient air monitoring data from 2010 – 2012, showing that the area had attained the 2006 24-hour PM<sub>2.5</sub> NAAQS.

On October 3, 2019, the EPA determined that the West Central Pinal County nonattainment area attained the 2006 24-hour fine particle (PM<sub>2.5</sub>) NAAQS (84FR 52766). . EPA's determination was based upon complete, quality assured, and certified ambient air monitoring data from 2015 – 2017, showing that the area had attained the 2006 24-hour PM<sub>2.5</sub> NAAQS.

Based on EPA's clean data determination, the requirements for this area to submit an attainment demonstration, together with Reasonably Available Control Measures (RACM), a Reasonable Further Progress (RFP) plan, contingency measures, and attainment deadlines were suspended for so long as the area continues to attain the 2006 24-hour PM<sub>2.5</sub> NAAQS. The clean data determination suspends most of the SIP planning requirements but does not re-designate areas as attainment.

Eastern Pinal County also contains portions of the Hayden PM<sub>10</sub> nonattainment area. ADEQ is responsible for the ambient air monitoring and SIP for this area, since Hayden is in Gila County and the nonattainment area is related to a source that is regulated by ADEQ.

The only portion of Pinal County included in the designated Phoenix 8-hour ozone nonattainment area is Township 1N, Range 8E and Township 1S, Range 8E (Sections 1 through 12).

On October 1, 2015 the EPA finalized the 2015 8-hour ozone NAAQS. The level of the NAAQS was set to 0.070 ppm. In October of 2016 the Governor (through ADEQ) submitted an attainment/nonattainment/unclassifiable recommendations to EPA. This submittal recommended including a portion of Pinal County in the 2015 8-hour ozone nonattainment area. The proposed boundary includes the communities of Apache Junction, Gold Canyon, San Tan Valley, Queen Creek and Queen Valley. EPA finalized the nonattainment designation that included parts of Pinal County on April 30, 2018.

## 2.0 Data Evaluation

### 2.1 Population

The United States Census Bureau estimates the total population of Pinal County was 462,789 in 2019. Pinal County is significantly less populated than neighboring Pima County (1,047,279) and Maricopa County (4,485, 414). However, Pinal County has seen a larger population increase (23.2%) than either neighboring County since the 2010 census (Pima – 6.8%, Maricopa – 17.5%). The Pinal County population figures for 2010 (Table 2.1) are from the United States Census Bureau and the 2019 population estimates are from the Office of Employment and Population Statistics, the Arizona Department of Administration (ADOA) and the Census Reporter.

**Table 2.1 Pinal County Population comparison of 2010 Census and 2019 Estimates**

Pinal County Place	2010 Census	2019 Estimated	Change	% change from 2010
Apache Junction city	37,339	41,066	3,727	10%
Arizona City <sup>1</sup>	10,475	11,761	1,286	12%
Casa Grande city	50,821	56,962	6,141	12%
Coolidge city	12,027	12,734	707	6%
Eloy city	16,531	19,438	3,087	18%
Florence town	26,828	27,980	1,152	4%
Kearny town	1,989	2,115	126	6%
Mammoth town	1,451	1,546	95	7%
Maricopa city	46,708	54,791	8,083	17%
Queen Creek <sup>2, 3</sup>	459	6,867	6,408	1,496%
San Tan Valley CDP <sup>1</sup>	81,321	105,922	24,601	30%
Superior town	2,869	3,063	194	7%

<sup>1</sup> = Estimated 2018 population from censusreporter.org

<sup>2</sup> = Incorporated city primarily located in another county

<sup>3</sup> = Queen Creek has annexed significant portions of the San Tan Valley unincorporated area since 2010

### 2.2 Emissions

ADEQ and Pinal County during the development of the Moderate Area State Implementation Plan (SIP) developed a preliminary 2018 PM<sub>10</sub> annual emissions inventory for the Western Pinal County PM<sub>10</sub> nonattainment area. Emissions were calculated for two separate scenarios related to stagnation days with low winds and high wind days. Table 2.2, below, illustrates estimated annual PM<sub>10</sub> emissions for both stagnation and high winds. Table 2.3 illustrates the subset of high wind PM<sub>10</sub> emissions and related land types contributing to the wind-blown emissions.

A design day emission inventory was also developed for a subset of the air monitoring sites in the PM<sub>10</sub> nonattainment area. The inventories represent a small scale area around each site and include the following sites (and former site Cowtown road); Combs School, City of Maricopa, Pinal County Housing, and Stanfield. Emission inventories for these inventories will be utilized in future network evaluations.

**Table 2.2 Summary of the Preliminary 2018 Annual PM<sub>10</sub> Emissions in the Western Pinal County Nonattainment Area**

Source Category		PM <sub>10</sub> Emissions	
		Tons/Year	% of Total
Agriculture	Harvesting	313	0.24
	Tilling	2,540	1.91
Concentrated Animal Feeding Operations		1,621	1.22
Paved Roads		1,408	1.06
Unpaved Roads		45,105	33.98
Fuel Combustion		35	0.03
Fires		22	0.02
Open Burning		17	0.01
Nonroad Vehicles		144	0.11
Railroad		45	0.03
Construction		8,500	6.40
Dairy		184	0.14
Permitted Sources		781	0.59
Unpaved Parking		252	0.19
Sub-Total: Low Wind Emissions		60,967	45.93
Windblown Emissions		71,784	54.07
Total Emissions		132,752	100.00

**Table 2.3 Summary of the Preliminary 2018 Annual PM<sub>10</sub> Emissions in the Western Pinal County Nonattainment Area on High Wind Days**

Land Use ID	Land Use Category	Emissions (Tons/Year)	% of Total
A	Developed Urban Lands	248	0.35%
B	Developed Rural Lands (low density residential)	1,960	2.73%
D	Unpaved Roads	4,653	6.48%
E	Cleared Areas	457	0.64%
F	Residential Construction	838	1.17%
G	CAFOs and Dairies	605	0.85%
H	Desert Shrubland	38,277	53.32%
I	Agricultural Croplands	19,510	27.18%
J	Commercial Construction	441	0.61%
K	Other	4,244	5.91%
L	Site Development	552	0.77%
Total Emissions		71,784	100%

### **3.0 Network Evaluation**

#### **3.1 40 CFR Part 58 Appendix D Compliance**

Section 3 The Pinal County Annual Monitoring Network Plan contains an in-depth evaluation and discussion of the network design against the requirements outlined in 40 CFR Part 58 Appendix D. Pinal County concludes that it meets the current CFR requirements.

#### **3.2 Evaluation of Monitors for Possible Elimination**

Site closure procedures and requirements are discussed in 40 CFR Part 58.14. Pinal County recently proposed and got approval to close the Coolidge PM<sub>10</sub> site. There was potential for Pinal County to lose ownership of the site prompting an evaluation of options for the site. Relocation was evaluated but ultimately Pinal County decided to close the site at the end of the calendar year so there would be no partial data sets. The Coolidge site was closed on December 31, 2019 with approval from EPA Region IX.

For this evaluation of sites Pinal County chose to use two primary variables, nonattainment status and NAAQS standard violation status. Neither of these variables are cause to eliminate a site from possible closure under the CFR but Pinal County felt these variables were important given the current nonattainment status. Tables 3.1 thru 3.3 illustrate each site and their nonattainment status and NAAQS violation status for each criteria pollutant monitored by Pinal County.

## Current Site Evaluations

**Table 3.1 PM<sub>10</sub> Non-Attainment Area Status and NAAQS Violation Status**

Site Name	AQS ID	Classification	Scale	Site Type	Is the site within a Non-Attainment Area?	Is the site currently violating the standard?
Apache Junction Fire Station TEOM	40213002	SLAMS	Neighborhood	Population	Yes	Yes
Casa Grande Downtown TEOM	40210001	SLAMS	Neighborhood	Population	Yes	Yes
Combs School TEOM	40213009	SLAMS	Neighborhood	Population	Yes	Yes
Hidden Valley TEOM	40213015	SLAMS	Middle	Highest Concentration / Source Impact	Yes	Yes
Eloy County Complex	40213014	SLAMS	Neighborhood	Population	Yes	Yes
City of Maricopa County Complex TEOM	40213016	SLAMS	Neighborhood	Population	Yes	Yes
Pinal Air Park TEOM	40213007	SLAMS	Regional	Background	No	No
Pinal County Housing Complex TEOM	40213011	SLAMS	Neighborhood	Population	Yes	Yes
Stanfield County Complex TEOM	40213008	SLAMS	Neighborhood	Population	Yes	Yes

Table 3.1 indicates that only the Pinal Air Park PM<sub>10</sub> site is both not in a nonattainment area and not currently violating the NAAQS standards. The Pinal Air Park site serves as the background site for the PM<sub>10</sub> network so Pinal County would not elect or recommend closing this site. Based on the criteria selected for this evaluation there are no PM<sub>10</sub> sites recommended for closing at this time.

**Table 3.2 PM<sub>2.5</sub> Non-Attainment Area Status and NAAQS Violation Status**

Site Name	AQS ID	Classification	Scale	Site Type	Is the site within a Non-Attainment Area?	Is the site currently violating the standard?
Apache Junction Fire Station	40213002	SLAMS	Neighborhood	Population	No	No
Casa Grande Downtown	40210001	SLAMS	Neighborhood	Population	No	No
Hidden Valley	40213015	SLAMS	Middle	Highest Concentration / Source impact	Yes	No <sup>1</sup>

<sup>1</sup> = Hidden Valley currently meets the 24-hour standard. The applicability of the annual standard to the site has not been determined. See the discussion in the 2020 Pinal County Network Plan Section 3.3 for more details

The PM<sub>2.5</sub> sites are not as clear-cut as the PM<sub>10</sub> sites based on the selected criteria. Only the Hidden Valley site is in a nonattainment area and none of the sites are currently violating a NAAQS standard. Apache Junction (4<sup>th</sup>) and Casa Grande (2<sup>nd</sup>) are also two of the most populous

areas within Pinal County and we the most populous when the monitors were installed. Based solely on these criteria one of the sites could be eliminated. Because Pinal County has the minimum required number of sites, eliminating a site would have to correspond with opening a new site. Section 3.3 evaluates potential new site locations.

**Table 3.3 Ozone Non-Attainment Area Status and NAAQS Violation Status**

Site Name	AQS ID	Classification	Scale	Site Type	Is the site within a Non-Attainment Area?	Is the site currently violating the standard?	
						2008	2015
Apache Junction Maintenance Yard	40213001	SLAMS	Neighborhood	Population	Yes	No	Yes
Casa Grande Airport	40213003	SLAMS	Regional	Population/Transport	No	No	No
Pinal Air Park	40213007	SLAMS	Regional	Transport	No	No	No

A review of the Pinal County ozone network reveals on the Apache Junction site being located in a nonattainment area and also currently violating a NAAQS standard. The Casa Grande site is in the second most populous area in Pinal County and is used to monitor transport out of the Phoenix area. Similarly, the Pinal Air Park site is used to monitor transport out of the Tucson area. Both of these sites are very useful in the network and have a long monitoring history. There are currently four monitors (ADEQ operates a monitor in Queen Valley) within the county so one could be eliminated with the County still meeting the minimum monitoring requirements. Section 3.3 will discuss the possible locations to add monitors but based on the function of each current monitor Pinal County does not recommend closing any of them at this time.

### 3.3 Evaluation of Pinal County for Possible Monitor Addition

The evaluation of potential new monitoring sites or locations is shown in Tables 3.4. Population figures from the 2010 US Census and 2019 population estimates were used in the evaluation (where available). Section 1.0 of the Pinal County 2020 Ambient Monitoring Network Plan and 2019 Data Summary document contains an analysis of the NAAQS for each criteria pollutant and Pinal County’s monitoring network. Pinal County reached the conclusion that only particulate matter and ozone required monitoring within the County.

The emissions inventory summary listed in tables 2.2 and 2.3 illustrate that the vast majority of the PM<sub>10</sub> sources within Pinal County are not specific permitted point sources but sources such as unpaved roads, agriculture and desert shrubland. For the particulate matter analysis Pinal County chose to focus primarily on population sources and current monitoring. Table 3.4 lists incorporated and unincorporated areas of Pinal County by 2019 estimated population. The table also includes population growth since the 2010 census and possible sources to consider. The focus of the evaluation will be on areas with a population greater than 10,000 people and the current monitoring in these locations.

**Table 3.4 Pinal County area Populations and Current Monitoring**

Pinal County Place	2019 Estimated Population	Change since 2010	Particulate Matter Sources	Current or Representative Monitoring (Site Location)
San Tan Valley CDP <sup>1,2</sup>	105,922	30%	Agriculture, Some Industry, Unpaved Roads, Desert Shrubland	PM <sub>10</sub> (San Tan Valley)
Casa Grande city	56,962	12%	Agriculture, Some Industry, Unpaved Roads, Desert Shrubland	PM <sub>10</sub> , PM <sub>2.5</sub> , Ozone (Casa Grande)
Maricopa city <sup>2</sup>	54,791	17%	Agriculture, Desert Shrubland	PM <sub>10</sub> (Maricopa)
Apache Junction city	41,066	10%	Some Industry	PM <sub>10</sub> , PM <sub>2.5</sub> , Ozone (Apache Junction)
Florence town	27,980	4%	Agriculture, Some Industry, Unpaved Roads, Desert Shrubland	None
Eloy city	19,438	18%	Agriculture, Some Industry, Unpaved Roads, Desert Shrubland	PM <sub>10</sub> (Eloy)
Coolidge city <sup>3</sup>	12,734	6%	Agriculture, Some Industry, Unpaved Roads, Desert Shrubland	None
Arizona City CDP <sup>1</sup>	11,761	12%	Agriculture, Unpaved Roads, Desert Shrubland	None
Gold Canyon CDP	11,038	8%	Some Industry, Desert Shrubland	PM <sub>10</sub> , PM <sub>2.5</sub> (Apache Junction)
Saddlebrooke CDP	10,530	10%	Desert Shrubland	None
Queen Creek <sup>4,5</sup>	6,867	1,496%	Agriculture, Some Industry, Desert Shrubland	PM <sub>10</sub> (San Tan Valley)

<sup>1</sup> = Estimated 2018 population from censusreporter.org

<sup>2</sup> = Ozone monitoring was in place from 2002 – 2011

<sup>3</sup> = Previously monitored PM<sub>10</sub>. Site was closed on 12/31/2019

<sup>4</sup> = Queen Creek has annexed significant portions of the San Tan Valley unincorporated area since 2010

<sup>5</sup> = Population estimate was not available for 2019

Florence is the only area with a population greater than 20,000 that does not have any monitoring. The Florence areas source profile is similar to Eloy which can be considered a representative monitoring location to assess what PM<sub>10</sub> concentrations might be measured.

Queen Creek, which includes populations in both Maricopa and Pinal Counties, was included in the evaluation because it has recently annexed parts of San Tan Valley thus leading to the large growth in population. Coolidge had PM<sub>10</sub> monitoring until the end of 2019 and only had one exceedance in the history of the monitor. The Arizona City area is very similar to the Eloy area with the Eloy monitoring being representative of the Arizona City area. Based on table 3.4 the Pinal County network covers all of the most populated areas with a potential to have exceedances.

The second part of the evaluation focuses on the type of monitoring in each area. As discussed in Section 3.2, the Apache Junction and Casa Grande areas were the two most populous when the sites were installed. San Tan Valley and Maricopa have significantly increased in size so it is important to evaluate those areas for possible PM<sub>2.5</sub> and ozone monitoring.

Both San Tan Valley and Maricopa had ozone monitoring until 2011. At both locations the measured concentrations were below both the 2008 and 2015 NAAQS standards. The primary method for ozone pollution in Pinal County is transport from neighboring large metropolitan areas. The Apache Junction and Casa Grande sites monitor the ozone coming from the Phoenix metropolitan area while the Pinal Air Park site monitors ozone coming from the Tucson area. The current populations have increased by 17% (Maricopa) and 30% (San Tan Valley) so it would be reasonable to question if ozone monitoring should be conducted in those locations. Adding ozone monitoring at either San Tan Valley or Maricopa would require a significant amount of resources both financially and in staff time. At this time Pinal County does not have either available. All of the current ozone monitors serve an important function in the monitoring network with a long data history and eliminating one would have a negative impact of the network as a whole. At this time Pinal County does not believe that adding new ozone sites would be beneficial to the network. These sites will continue to be evaluated as resources and funding become available in the future and again during the next 5-year assessment.

Similar to ozone, the PM<sub>2.5</sub> network could see expansion into San Tan Valley and Maricopa based on their population growth. The same challenges exist for Pinal County as with ozone in funding and staffing. Adding a new site would most likely require the closing of another site. As discussed in Section 3.2 the Apache Junction or Casa Grande sites could theoretically be closed. Based on the amount of time the monitors have been in place Pinal County does not recommend closing either monitor at this time which makes adding new sites extremely difficult. As with the ozone sites Pinal County will continue to evaluate the San Tan Valley and Maricopa areas over time and make determinations as to when or if more monitoring should be added.

### **3.4 Seven-Point Network Assessment**

40 Code of Federal Regulations (CFR) Part 58.10 (d) requires an air monitoring network assessment to be conducted on a 5-year cycle with the first due July 1, 2010. As provided in the regulation the 5-year monitoring network assessment must address the following:

1. Document that the network meets the monitoring objectives defined in Appendix D to 40 CFR Part 58.
2. Evaluate the need for new monitoring sites.
3. Evaluate if existing sites are no longer needed and can be terminated.
4. Determine if new technologies are appropriate for incorporation into the ambient air monitoring network.
5. Consider the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals (e.g., children with asthma).
6. For any sites that are being proposed for discontinuance, consider the effect on data users other than the agency itself, such as nearby States and Tribes or health effects studies.
7. For PM<sub>2.5</sub>, the assessment also must identify needed changes to population-oriented sites.

In the following sections an item by item review of the seven points will be addressed utilizing information provide in this document and the Pinal County 2020 Ambient Monitoring Network Plan and 2019 Data Summary document.

#### **1 – 40 CFR Part 58 Appendix D Compliance**

EPA regulations require the agency to document that the network meets the monitoring objectives defined in Appendix D to 40 CFR Part 58. The reader is referred to the Pinal County 2020 Ambient Monitoring Network Plan and 2019 Data Summary document wherein compliance with Appendix D is affirmed for all current sites.

#### **2 - Evaluation of the need for new monitoring sites**

Point number two requires evaluation of the need for new monitoring sites. This evaluation was conducted using table 3.4 and is described in Section 3.3. The initial indication from this evaluation is that additional PM<sub>2.5</sub> and ozone sites may be needed in the future. All sites with a population greater than 10,000 were evaluated and only Arizona City, Coolidge, Florence and Saddlebrooke do not currently have monitoring. Of those areas Arizona City, Coolidge and Florence can be represented by other monitoring locations such as Eloy. Coolidge had monitoring until the end of 2019 and had only one exceedance during its operating lifespan. PM<sub>2.5</sub> and ozone could potentially be added in the future in San Tan Valley and Maricopa.

#### **3 - Evaluation of sites that can be terminated**

Point number three requires evaluation of the possibility for existing sites to be terminated. This evaluation was conducted using tables 3.1 thru 3.3 and is described in Section 3.2. The indication from this evaluation is that no sites should currently be terminated based upon the evaluation criteria. The current Pinal County PM<sub>10</sub> monitoring network consists of 9

monitoring sites, which meets the required number of SLAMS sites (6 to 10) under 40 CFR Part 50. The Coolidge site was just also closed at the end of 2019.

#### **4 - New Technologies**

The fourth point requires that we consider if new technologies are appropriate for incorporation into the ambient air monitoring network. Through 103 and 105 grant funds provided by EPA (through ADEQ) Pinal County has upgraded most of the components of the monitoring network over the past three years. To date PM<sub>10</sub> and ozone instruments have been replaced. In addition, modems at every site have been replaced as have dataloggers and meteorological equipment. The Pinal County monitoring network is at its newest state with regards to equipment in the history of the District.

#### **5 - Consideration of Network to Represent Susceptible Individuals**

Point number five requires consideration of the ability of existing and proposed sites to support air quality characterization for areas with relatively high populations of susceptible individuals. Table 3.4 demonstrates that a substantial portion of the County population is represented by an air monitoring site. Currently there is monitoring at 4 of the 5 largest populated areas and 8 of the 11 areas with a population greater than 10,000. Additionally, PM<sub>2.5</sub> and ozone are measured at two of the four largest population centers in the County.

#### **6 - Effect of Closed Site(s) on Data Users**

No sites are currently being proposed for closure.

#### **7 - Assessment of Changes Needed to PM<sub>2.5</sub> Population-Oriented Sites**

Point seven requires the assessment to identify needed changes to PM<sub>2.5</sub> population oriented sites. Pinal County currently measures PM<sub>2.5</sub> in two of the four largest population centers in the County. Based on the current population and projected growth of the San Tan Valley and Maricopa areas, Pinal County should continue to observe population trends and in the future evaluate the population representation of the county PM<sub>2.5</sub> network. This evaluation may suggest adding PM<sub>2.5</sub> in the San Tan Valley area (possibly the Combs School site) and/or Maricopa area. An addition might correspond to the removal of an existing PM<sub>2.5</sub> population based site elsewhere in the network. This would ensure the County maintains minimum monitoring requirements under 40 CFR Part 50. Such a change would be approached with caution considering the loss of long term trend data at existing sites.

## 4.0 Conclusions

After completing this monitoring network assessment Pinal County has made the following conclusions; Pinal County is currently meeting the requirements of 40 CFR Part 58 Appendix D, there are no sites that should be eliminated at this time, there are no sites that should be added at this time but San Tan Valley and Maricopa should continue to be evaluated.

A primary result of the evaluation was a conclusion of limited changes in the existing Pinal County Air Quality  $PM_{10}$ ,  $PM_{2.5}$ , and ozone networks. Considering the evaluation process and status of the  $PM_{10}$  SIP, No changes to the network are being proposed.

Pinal County has seen significant population growth (23.2%) since the 2010 census. This evaluation illustrates that the spatial coverage of the network is well designed to represent a large portion of the County's population centers and various emission areas. In addition to meeting the required monitoring network design, the network provides pollutant concentrations for use in defining boundary conditions and long term trends, such as ozone and  $PM_{10}$  at the Pinal Air Park site which defines concentrations along the Pima/Pinal county boundary. Other network monitoring sites near Pinal County, operated by the Gila River Indian Community, Pima County, and Maricopa County, can be used for spatial analysis and long term trends analysis.

The assessment also identified the San Tan Valley and Maricopa areas as possible locations for expanded monitoring of  $PM_{2.5}$  and ozone in the future. Expansion to those areas would require the closure of an existing site or the addition of new sites. Because of the monitoring history at the existing sites Pinal County prefers not to close any more existing sites. New site construction would require funding and staffing that the County does not currently have. Pinal County will continue to monitor the population growth in the County as a whole and in these two locations to help determine potential future monitoring network changes.