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Pinal County Air Quality Control District

2015 Ambient Monitoring Network Plan and 2014 Data Summary

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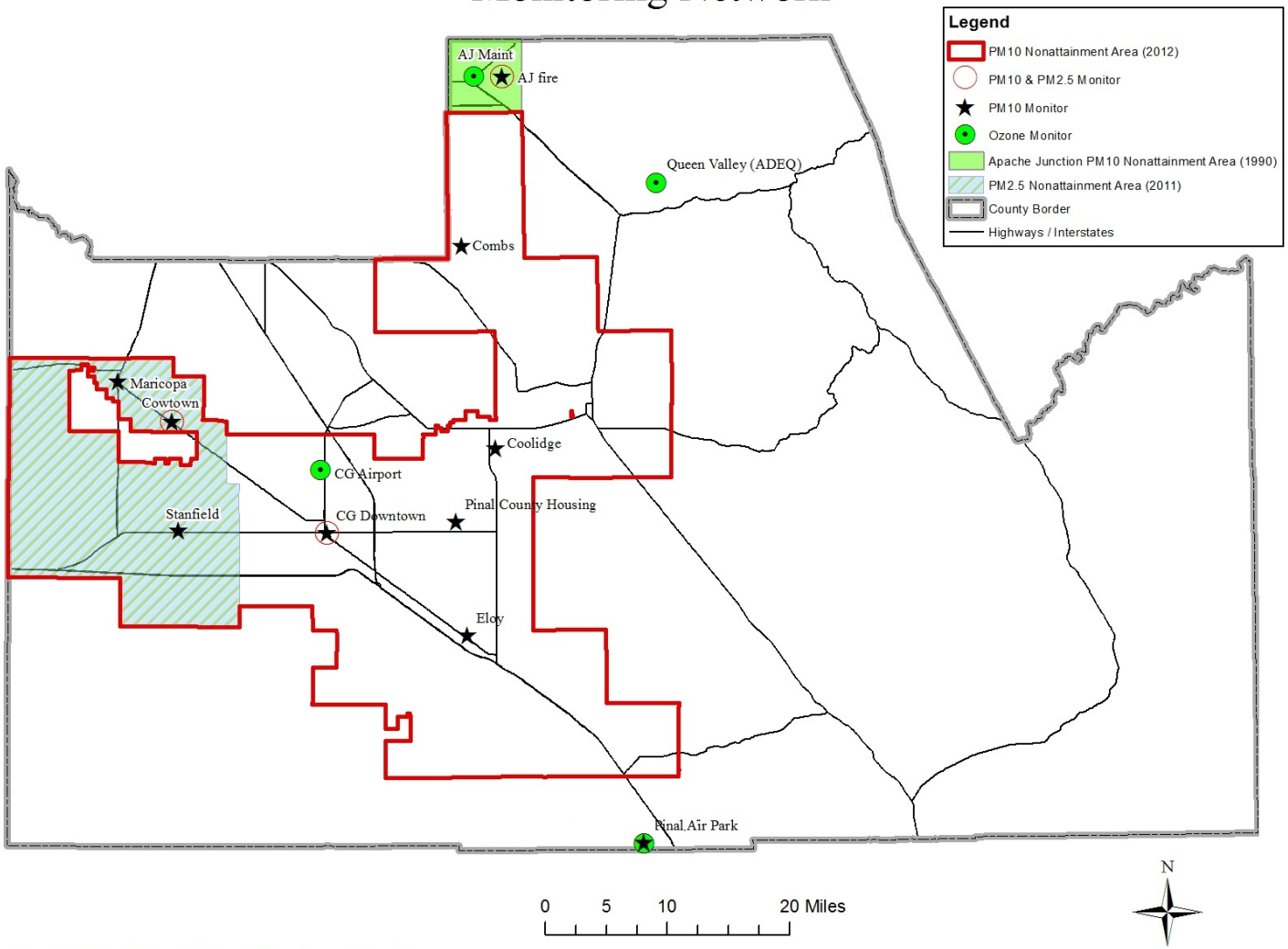
Pinal County Air Quality Control District
Monitoring Network



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Executive Summary

Pinal County Air Quality Control District (PCAQCD) has prepared this annual air quality monitoring network plan to summarize monitoring changes implemented during 2014 and proposed changes for 2015. This document also reports the 2014 air quality monitoring data in a summary format.

At the Apache Junction Fire Station site, the filter based 2000h was replaced with a PM_{10} 1400a TEOM (continuous) at the request of the Arizona Department of Environmental Quality. This change allowed sample frequency to increase from 1 sample every 6 days to daily samples (continuous). The change did not require review and approval by the Environmental Protection Agency (EPA) because the sample frequency increased.

At the Casa Grande Downtown site, the collocated $PM_{2.5}$ 2000h monitors were replaced with one $PM_{2.5}$ 2025a monitor beginning in the 2015 sample year. The EPA provided a comment on the 2013 monitoring plan noting the lack of a continuous $PM_{2.5}$ method in Pinal County's network. In response, a BAM 1020 continuous $PM_{2.5}$ monitor was obtained from ADEQ and installed at the Casa Grande Downtown site on November 8, 2013. The continuous analyzer was operated next to a filter-based monitor for a year to evaluate performance. After a successful evaluation of the instrument in 2014, the data collected will the instrument will be considered regulatory and will be reported to EPA in 2015.

Also in response to EPA comments, Pinal County is required to install a second BAM 1020 continuous $PM_{2.5}$ monitor to meet minimum requirements. We have requested and been approved for EPA funding to purchase the necessary continuous $PM_{2.5}$ monitor in 2015. The preferred site, based on historic concentrations, will likely be the location chosen to replace the Cowtown Road site.

EPA requires at least one collocated site for a $PM_{2.5}$ monitoring method and requires that the collocated monitors be operated at the highest 24-hour site. Collocation is a side by side measurement to provide a comparison of the monitor's accuracy; it does not increase the frequency of sample collection. In response to EPA's comment, Pinal County installed two collocated $PM_{2.5}$ 2025i monitors at the Cowtown Road site in 2014. This satisfies the collocation requirement.

Clarification has been added in this network plan regarding collocated PM_{10} 2000h monitors at Coolidge Maintenance Yard, as requested by EPA.

During the fall of 2013 Pinal County was notified by the landowners of the Cowtown Road site that they did not want to continue the current Pinal County use of the property. Pinal County negotiated a two year extension on the lease so that the Cowtown Road site can be relocated following EPA guidelines. The lease agreement allows Pinal County to use the Cowtown Road site property through January 20, 2016. As part of the relocation process, Pinal County is monitoring PM_{10} and $PM_{2.5}$ at two temporary sites (Hidden Valley and White and Parker) to identify a suitable replacement site.

Pinal County has land use agreements in place at the Hidden Valley and White and Parker sites, and began data collection in June 2014. At the conclusion of the data collection in June of 2015

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an evaluation will be conducted to determine the appropriate replacement site for Cowtown Road.

During the 3rd and 4th quarters of 2014, the Cowtown Road West $PM_{2.5}$ 2025i monitor was operated on a daily basis after several exceedances were recorded. This was an effort to collect additional data points for NAAQS comparison. The monitor sample schedule for this sampler was returned to the original 1-in-3 day frequency in starting January 2015.

On May 9, 2012, a dust storm impacted the filter-based PM_{10} monitor at the Pinal Air Park site. To verify the isolated nature of the event, a continuous PM_{10} TEOM was installed as a special purpose monitor on June 7, 2012, as allowed by EPA regulations. However, additional wind-related PM_{10} exceedances were recorded on April 8, 2013 and October 9, 2013. The TEOM will be maintained at the site as a regulatory monitor. The PM_{10} 2000h at the site was shut down at the end of 2014.

EPA commented on the 2013 network plan that the Combs School, Cowtown Road, Pinal County Housing Complex, City of Maricopa County Complex, and Pinal Air Park sites should be State and Local Air Monitoring Stations (SLAMS) network monitors and not Special Purpose Monitors (SPMs). In response, Pinal County changed the Combs School, City of Maricopa County Complex, and Pinal Air Park sites to SLAMS. The Pinal County Housing Complex site was changed to SLAMS in the 2013 network plan. Pinal County proposes to retain the SPM designation for the Cowtown Road PM_{10} monitor pending completion of the site relocation process currently underway. The monitor type will be evaluated once the final relocation site is determined and regulatory quality data have been collected at the new site.

Historically, the Pinal Air Park ozone monitor was operating on a seasonal schedule from April 1 through October 31. EPA commented that without additional justification, the monitor should operate year-round as required by Federal rules. In response, Pinal County changed the Pinal Air Park ozone monitor from seasonal to year-round starting in 2014.

In response to EPA's comments on the 2014 network plan, information on "distance from supporting structure, distance from obstructions not on roof, and distance from trees" have all been updated in the 2015 network plan.

No changes were made to the network outside of the Annual network Plan that required or received EPA approval during the 2014 calendar year.

Table ES-1: 2014 – 2015 Summary of Monitoring Changes by Site

Site Name	2014 monitors	2015 monitors
Apache Junction Fire Station	PM_{10} – 2000h $PM_{2.5}$ – 2025a	PM_{10} – TEOM 1400a $PM_{2.5}$ - 2025i
Casa Grande Downtown	$PM_{2.5}$ – 2000h (2ea)	$PM_{2.5}$ – 2025a (1ea) $PM_{2.5}$ - Met One BAM 1020
Cowtown Road	$PM_{2.5}$ – 2000h (2ea) 1/1 – 7/31 $PM_{2.5}$ - 2025i (2ea) 8/1 –12/31/14	$PM_{2.5}$ - 2025i (2ea)
Pinal Air Park	PM_{10} – 2000h	PM_{10} – TEOM 1400a

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Introduction

This document provides two distinct products: 1) a description of the Pinal County Air Quality monitoring system in the form of an Annual Monitoring Network Plan, and 2) a summary of data obtained from the network.

40 Code of Federal Regulations (CFR) Part 58.10 requires an annual monitoring network plan to summarize the air quality surveillance system consisting of State and Local Air Monitoring Stations (SLAMS) and Special Purpose Monitors (SPMs) operated under state and local authority. According to the regulation, the Annual Monitoring Network Plan must be submitted to the Environmental Protection Agency (EPA) Regional Administrator by July 1 each year.

The annual monitoring network plan must identify the purpose of each monitor and provide evidence that both the siting and the operation of each monitor meet the requirements in 40 CFR Part 58 appendices A, C, D, and E below:

- Appendix A – Quality Assurance Requirements for SLAMS, SPMs, and Prevention of Significant Deterioration (PSD) Air Monitoring
- Appendix C – Ambient Air Quality Monitoring Methodology
- Appendix D – Network Design Criteria for Ambient Air Quality Monitoring
- Appendix E – Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring

Pinal County Air Quality operates air quality monitors that record ambient concentrations of several criteria pollutants. Criteria pollutants are those that the EPA has defined as a potential risk to health, and correspondingly defined a National Ambient Air Quality Standard (NAAQS).[1] 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 less than or equal to 10 microns in diameter (PM_{10}), particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$), ozone (O_3), carbon monoxide (CO), sulfur dioxide (SO_2), nitrogen dioxide (NO_2), and lead (Pb).

Areas in which monitored air quality shows that the NAAQS are violated are defined as nonattainment for the offending pollutant. A nonattainment designation requires an area-specific curative implementation plan, typically including stricter air quality permitting regulations on industrial facilities, mobile source emission controls and additional regulations on development. Generally, areas with monitored air quality that meet the standards are defined as attainment. Areas without sufficient monitoring data may also be defined as unclassifiable. Figure i-1 illustrates the current pollutant-specific nonattainment areas in Pinal County.

This document is arranged with several sections. Each section will address specific requirements of 40 CFR Part 58 or provide summary air quality data. The sections are organized accordingly.

Section 1 describes the NAAQS standard for each pollutant monitored by Pinal County Air Quality. Section 2 describes 40 CFR Part 58 defined monitoring objectives, site types and scales of representation. Section 3 provides Pinal County's network design, measures compliance with minimum site requirements, and provides an overview of how the Pinal County Air Quality

[1] See Clean Air Act ("CAA") §§ 108,109, and 40 CFR §50.1 *et seq.*

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network achieves precision measurements. Section 4 describes each site in the Pinal County network and evaluates the sites for compliance with siting requirements set forth by EPA. Section 5 describes the proposed changes to the monitoring network. Section 6 analyzes data trends and compares the data collected to the NAAQS.

The appendices of this document present a list of abbreviations used in the document (Appendix A), a picture and summary table for each monitoring site operated by Pinal County Air Quality (Appendix B), a tabular summary of the monitoring data (Appendix C), and a summary of the public comment period and hearing conducted in relation to this document (Appendix D).

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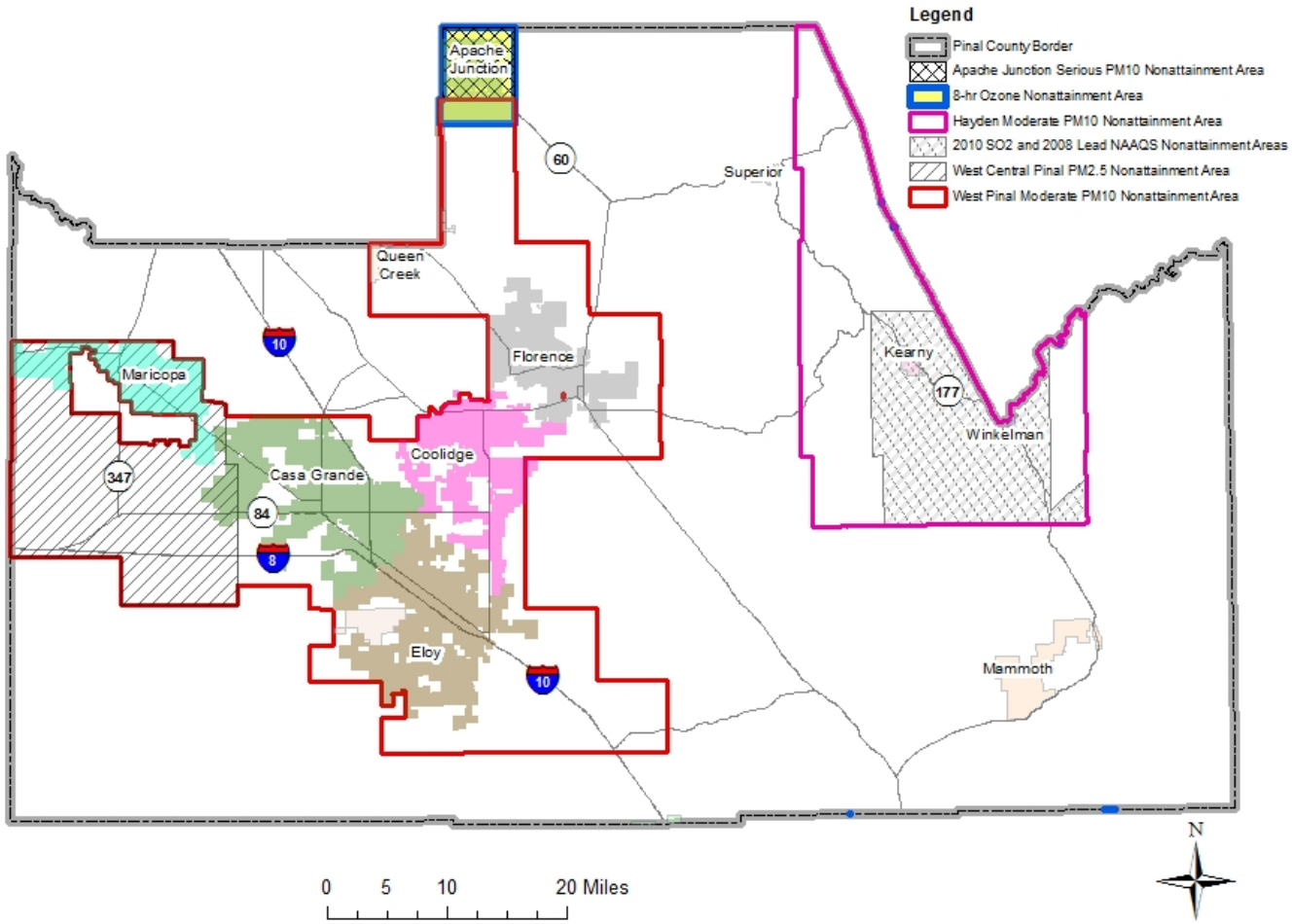
Figure i-1

Pinal County Nonattainment Areas



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1.0 National Ambient Air Quality Standards (NAAQS)

This section provides a brief description of the National Ambient Air Quality Standards (NAAQS). As background, the Clean Air Act (CAA) requires EPA to set NAAQS for six criteria pollutants: ozone, particulate matter, lead, nitrogen dioxide, sulfur dioxide and carbon monoxide. The CAA established two types of NAAQS for these pollutants. Primary standards are set to protect public health, including the health of sensitive populations such as asthmatics, children, and the elderly. Secondary standards are set to protect public welfare, including protection against visibility impairment, or damage to animals, crops, vegetation, and buildings.

Ozone

Ozone (O_3) has been shown to cause various health effects. Symptoms can include chest pain, congestion, coughing, and throat irritation. Ozone exposure can also increase the effects of asthma, bronchitis and emphysema and extended exposure can result in permanent lung damage and reduced lung function.

The 1-hour standard was established in 1971 and set at a level of 0.08 parts per million (ppm). In 1979, the standard was revised to 0.12 ppm and was an exceedance based standard, which required that the number of expected exceedances be less than or equal to 1. An exceedance of the 1-hour ozone standard occurred if an observed 1-hour average was greater than 0.12 ppm. Generally, the number of daily exceedances (only the daily maximum counted as an exceedance) equals the expected exceedance rate. Thus, the standard effectively allowed only one exceedance to be recorded per calendar year.

EPA updated the ozone standard in 1997 and created an 8-hour standard. The 8-hour primary ozone standard was 0.08 ppm. The decision to revise the standard was challenged in court by a number of parties and ultimately reached the U.S. Supreme Court. In 2001, the Supreme Court unanimously upheld the constitutionality of the 1970 CAA provision that authorizes EPA to set NAAQS to protect public health and welfare. EPA proceeded with implementing the 8-hour standard by making nonattainment designations in April 2004 and revoking the 1-hour standard in August 2005.

The latest revision to the ozone NAAQS was made on March 12, 2008. The 8-hour standard was set to a level of 0.075 ppm. In addition to changing the level of the standard, EPA specified the level of the standard to the third decimal. An area will meet the revised standard if the 3-year average of the annual fourth-highest daily maximum 8-hour average at every ozone monitor is less than or equal to 0.075 ppm. In 2010 EPA agreed to review the 2008 ozone NAAQS but subsequently retracted the proposed revisions and held the standard at the 2008 level. EPA is expected to revise the 8-hour ozone standard again in 2015, to a proposed level between 0.060 and 0.070 ppm.

The CAA requires EPA to designate areas as attainment (meeting the standards), nonattainment (not meeting the standards), or unclassifiable (insufficient data to classify) after the Agency sets a new standard, or revises an existing standard.

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Table 1-1

National Ambient Air Quality Standards for Ozone			
Primary Standards	**Averaging Time**	**Secondary Standards**	**Averaging Time**
0.075 ppm (2008 std)	8-hour [1]	Same as Primary	Same as Primary
0.08 ppm (1997 std)	8-hour [2]	Same as Primary	Same as Primary
0.12 ppm	1-hour [3] (Applies only in limited areas)	Same as Primary	Same as Primary

1 To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.075 ppm. (effective May 27, 2008)

2 To attain this standard, the 3-year average of the fourth-highest daily maximum 8-hour average ozone concentrations measured at each monitor within an area over each year must not exceed 0.08 ppm.

3 The standard was attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1. As of June 15, 2005 EPA revoked the 1-hour ozone standard in all areas except the 8-hour ozone nonattainment Early Action Compact (EAC) areas.

Particulate Matter (PM_{10} and $PM_{2.5}$)

Particulate matter (PM) less than or equal to 10 microns in diameter (PM_{10}) has been shown to cause health effects in the lungs and heart. Health effects can include an increase in asthma symptoms, decreased lung function, irregular heartbeats and heart attacks.

The NAAQS for PM were first established in 1971 and were not significantly revised until 1987, when EPA changed the indicator of the standards to regulate inhalable particles smaller than, or equal to, 10 microns in diameter (that's about 1/4 the size of a single grain of table salt).

In 1997 EPA revised the PM standards, setting separate standards for fine particles smaller than, or equal to, 2.5 microns in diameter ($PM_{2.5}$). The 1997 NAAQS also retained slightly revised standards for PM_{10} which were intended to regulate "inhalable coarse particles" that ranged from 2.5 to 10 microns in diameter. PM_{10} measurements, however, contain both fine and coarse particles.

EPA revised the air quality standards for PM again in 2006. The 2006 standards tightened the 24-hour $PM_{2.5}$ standard from 65 micrograms per cubic meter ($\mu g/m^3$) to 35 $\mu g/m^3$, and retained the annual $PM_{2.5}$ standard at 15 $\mu g/m^3$. EPA retained the existing 24-hour PM_{10} standard of 150 $\mu g/m^3$ and revoked the annual PM_{10} standard, because available evidence does not suggest a link between long-term exposure to PM_{10} and health problems.

In December of 2012 EPA again revised the $PM_{2.5}$ standard. The annual $PM_{2.5}$ standard was lowered to 12 $\mu g/m^3$. The annual secondary standard was set at 15 $\mu g/m^3$, and the 24-hour standard of 35 $\mu g/m^3$ remained the same.

The CAA requires EPA to review the latest scientific information and NAAQS every five years. Before new standards are established, policy decisions undergo rigorous review by the scientific community, industry, public interest groups, the general public and the Clean Air Scientific Advisory Committee (CASAC).

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Table 1-2

National Ambient Air Quality Standards for Particulate Matter Pollution			
Pollutant	**Primary Standard**	**Averaging Time**	**Secondary Standard**
Particulate Matter (PM_{10})	150 µg/m^3 (1997 std)	24-hour [1]	Same as Primary
Particulate Matter ($PM_{2.5}$)	12 µg/m^3 (2012 std)	Annual [2] (Arithmetic Mean)	15 µg/m^3 (1997 std)
Particulate Matter ($PM_{2.5}$)	35 µg/m^3 (2006 std)	24-hour [3]	Same as Primary

Footnotes:

1 - Not to be exceeded more than once per year on average over 3 years.

2 - To attain this standard, the 3-year average of the weighted annual mean $PM_{2.5}$ concentrations from single or multiple community-oriented monitors must not exceed 12 µg/m^3 (effective March 18, 2013).

3 - To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m^3 (effective December 17, 2006).

PM_{10} Nonattainment Status

On May 22, 2012 the EPA Region 9 Administrator signed the West Pinal PM_{10} 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.

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_{10} standard in Pinal County and did not re-designate these areas.

Eastern Pinal County also contains portions of the Hayden PM_{10} nonattainment area. The Arizona Department of Environmental Quality (ADEQ) is responsible for the monitoring and State Implementation Plan (SIP) for this area, since Hayden is in Gila County and the nonattainment area is related to a source that is regulated by ADEQ.

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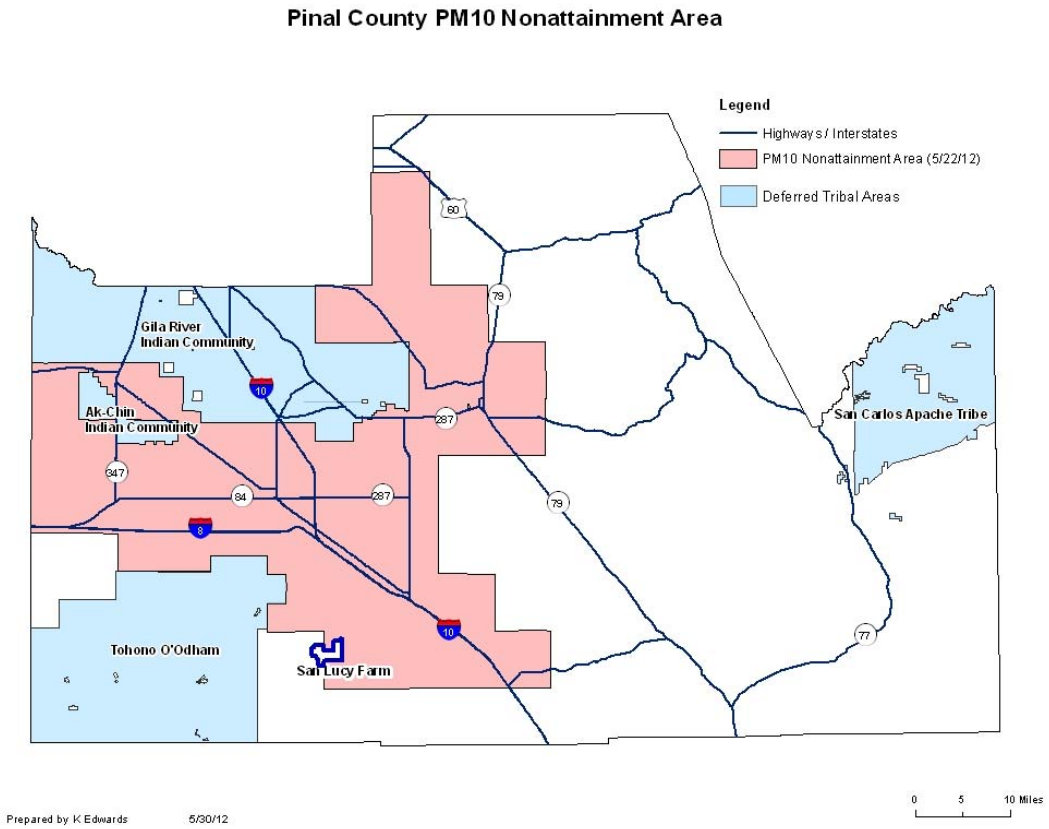
Figure 1-1



$PM_{2.5}$ Nonattainment Designation

On February 3, 2011, the EPA issued final air quality designations for the 2006 24-hour $PM_{2.5}$ NAAQS for Pinal County, as well as Plumas and Shasta counties in California. The designations became effective March 7, 2011.

EPA deferred final designations for these areas in November 2009 when the Agency designated all other areas of the country. EPA deferred action on Pinal County to evaluate the reasons for high fine particulate concentrations measured by the violating monitor. The Pinal County nonattainment designation included a portion of the county (Figure 1-2) based upon air quality monitoring data from 2006-2008.

On October 4, 2013, the EPA determined that the West Central Pinal County nonattainment area attained the 2006 24-hour fine particle ($PM_{2.5}$) 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 $PM_{2.5}$ NAAQS.

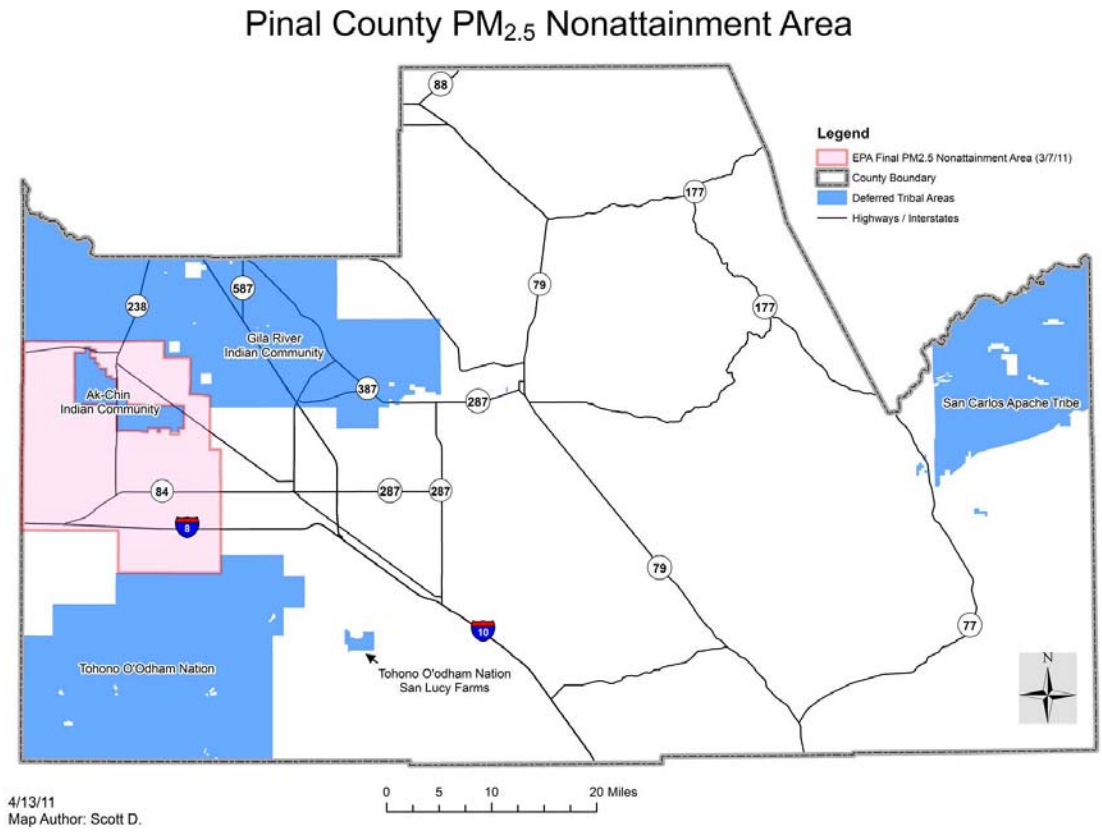
Based on EPA's clean data determination, the requirements for this area to submit an attainment demonstration, together with Reasonably Available Control Measures (RACM), a Reasonable Further Progress (RFP) plan, contingency measures, and attainment deadlines were suspended for so long as the area continues to attain the 2006

24-hour $PM_{2.5}$ NAAQS. The clean data determination suspends most of the SIP planning requirements but does not re-designate areas as attainment.

ADEQ published a proposed revision to the SIP for the West Central Pinal County $PM_{2.5}$ nonattainment area in February of 2014. A public hearing was held on March 13, 2014.

In 2013 the three year average of the 98th percentile value at Cowtown Road site remained below the standard at 32.4 µg/m^3 and met the $PM_{2.5}$ 24-hour NAAQS. However, in 2014 the 98th percentile value increased to 36.8 µg/m^3 and the three year average of the 98th percentile value increased to 35.6 µg/m^3 which is above the NAAQS.

Figure 1-2



Lead

Lead (Pb) is abundant in the environment and has some negative health effects. High levels of lead in the body can cause damage to the immune system, kidneys and nervous system. Studies have also shown that high lead levels can impact the reproductive system and the blood's capacity to carry oxygen.

On October 15, 2008, EPA substantially strengthened the NAAQS for lead. The revised standards are 10 times tighter than the previous standards, set in 1978. EPA revised the level of the primary (health-based) standard from 1.5 µg/m^3 to 0.15 µg/m^3 measured as

total suspended particles (TSP). The secondary (welfare-based) standard is identical in all respects to the primary standard.

The averaging time and form of the lead standard were also revised. The calculation method for the averaging time was changed to use to a 'rolling' 3-month period with a maximum (not-to-be-exceeded) form, evaluated over a 3 year period. This replaces the previous approach of using calendar quarters. A rolling 3-month average considers each of the 12 3-month periods associated with a given year, not just the four calendar quarters within that year.

See Section 3.8 of the document for additional information on lead monitoring.

Table 1-3

National Ambient Air Quality Standards for Lead		
Primary Standard	**Averaging Time**	**Secondary Standard**
0.15 $\mu g/m^3$ (2008 standard)	Rolling 3-Month Avg.[1]	Same as Primary

1 – Form of the standard requires evaluation of data collected over a 3 year period

Nitrogen Dioxide

Nitrogen dioxide (NO_2) has been shown to have negative impacts on the respiratory system. Short-term exposure can cause irritation to the airway and an increase in asthma symptoms. Long-term exposure can lead to permanent respiratory damage.

On January 22, 2010, EPA strengthened the health-based NAAQS for NO_2. EPA set a new 1-hour NO_2 standard at the level of 100 parts per billion (ppb). In addition to establishing an averaging time and level, EPA also set a new form for the standard. The form for the 1-hour NO_2 standard is the 3-year average of the 98th percentile of the annual distribution of daily maximum 1-hour average concentrations. EPA retained, with no change, the current annual average NO_2 standard of 53 ppb.

To determine compliance with the new standard, EPA established new ambient air monitoring and reporting requirements for NO_2. In urban areas, monitors are required near major roads as well as in other locations where maximum concentrations are expected. Additional monitors are required in large urban areas to measure the highest concentrations of NO_2 that occur more broadly across communities. These changes will not affect the secondary NO_2 standard, set to protect public welfare.

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Monitoring guidance provided by EPA targets new monitoring in large population centers and near-roadway measurements. The monitoring requirements are as follows: 1) Core Based Statistical Areas (CBSAs) greater that 500,000 will require 1 monitoring site, 2) population centers greater than 2,500,000 will require 2 sites. Based upon current population Pinal County will not be required to implement NO_2 monitoring, and these sites have been installed in Maricopa County for the CBSA.

Table 1-4

National Ambient Air Quality Standards for Nitrogen Dioxide		
Primary Standard	**Averaging Time**	**Secondary Standard**
100 ppb (2010 std)	1-hour	N/A
53 ppb (1996 std)	Annual	Same as Primary

Carbon Monoxide

Carbon monoxide (CO) reduces the ability of blood to carry oxygen. Short-term effects include chest pain and the inability of the body to respond after exercise or stress. Long-term effects can include permanent damage to organs including the heart and brain. Extreme exposure can even cause death.

On August 31, 2011 EPA finalized a revision to the CO standard that retained the current standards and added minimum monitoring requirements. The primary standards for CO include both 1-hour and 8-hour standards. EPA has not set a secondary standard for CO. The 1-hour CO standard is 35 ppm and the 8-hour is 9 ppm with both not be exceeded more than once per year.

The ambient air monitoring requirements for CO require that one CO monitor be collocated with a near-road NO_2 monitor for any CBSA greater than 1,000,000 people. Based upon current population Pinal County will not be required to implement CO monitoring, and the required site has been installed in Maricopa County.

Table 1-5

National Ambient Air Quality Standards for Carbon Monoxide		
Primary Standard	**Averaging Time**	**Secondary Standard**
35 ppm (2011 std)	1-hour	N/A
9 ppm (2011 std)	8-hour	N/A

Sulfur Dioxide

Sulfur dioxide (SO_2) has been shown to have heath effects on the respiratory system. Short-term exposure has been shown to increase the effects of asthma and increase the difficulty of breathing. Long-term exposure can result in permanent damage to the respiratory system as well as exacerbating asthma, bronchitis and heart disease.

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On June 22, 2010 EPA finalized a revision to the primary SO_2 standard. The current primary SO_2 standard is 75 ppb averaged over 1-hour. In order to meet the standard the 99th percentile of 1-hour daily maximum concentrations averaged over 3 years must be less than 75 ppb. The secondary SO_2 standard is 0.5 ppm averaged over 3-hours and is not to be exceeded more than once per year.

The primary source of SO_2 in Pinal County is copper mining operations and copper smelters. Since Arizona Revised Statues (ARS) retains the authority to regulate copper smelters at the State level, ADEQ has historically conducted any SO_2 monitoring that has occurred in Pinal County. ADEQ operated an SO_2 monitor in San Manuel, Pinal County, until December of 2007. The San Manuel site was discontinued as proposed in the SIP and ADEQ Network Plan and subsequent attainment finding by EPA for the area.

Table 1-6

National Ambient Air Quality Standards for Sulfur Dioxide			
Primary Standard	**Averaging Time**	**Secondary Standard**	**Averaging Time**
75 ppb	1-hour	0.5 ppm	3-hour

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2.0 Monitoring Objectives, Site Types and Spatial Scales

The design of an Ambient Air Quality Monitoring Network should meet the basic monitoring objectives listed in Appendix D of 40 CFR Part 58. These objectives are:

1. Provide air pollution data to the general public in a timely manner. Data can be presented to the public in a number of attractive ways including through air quality maps, newspapers, internet sites, and as part of weather forecasts and public advisories.
2. Support compliance with NAAQS and emissions strategy development. Data from monitors for NAAQS pollutants will be used for comparing an area's air pollution levels against the NAAQS. Data from monitors of various types can be used in the development of attainment and maintenance plans. SLAMS, and especially national core (NCore) station data, will be used to evaluate the regional air quality models used in developing emission strategies, and to track trends in air pollution abatement control measures' impact on improving air quality. In monitoring locations near major air pollution sources, source-oriented monitoring data can provide insight into how well industrial sources are controlling their pollutant emissions.
3. Support for air pollution research studies. Air pollution data from the NCore network can be used to supplement data collected by researchers working on health effects assessments and atmospheric processes, or for monitoring methods development work.

In order to support the air quality management work indicated in the three basic air monitoring objectives, a network must be designed with a variety of types of monitoring sites. Monitoring sites must be capable of informing managers about many things including the peak air pollution levels, typical levels in populated areas, air pollution transported into and outside of a city or region, and air pollution levels near specific sources. To summarize some of these sites, here is a listing of six general site types:

1. Determine the highest concentrations expected to occur in the areas covered by the network.
2. Determine representative concentrations in areas of high population density.
3. Determine the impact on ambient pollution levels of significant sources or source categories.
4. Determine general background concentration levels.
5. Determine the extent of regional pollutant transport among populated areas.
6. Determine the welfare related impacts in more rural and remote areas in support of secondary standards.

A SLAMS network consists of monitoring stations that provide data to meet these monitoring objectives. Monitoring stations 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 2-1 lists these spatial scales.

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Table 2-1: 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 2-2 summarizes this relationship.

Table 2-2: 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 Part 50 and 53 define Federal Reference Method (FRM) and Federal Equivalent Method (FEM) designations for monitors, 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_{10} and $PM_{2.5}$ samples and automated FEMs for continuous PM_{10}, $PM_{2.5}$ and ozone. In November 2013 Pinal County installed a Met One beta attenuation monitor (BAM) 1020 FEM continuous $PM_{2.5}$ monitor at the Casa Grande Downtown site. This was done to address comments received from EPA that Pinal County lacked a continuous $PM_{2.5}$ method. Based on one year of data collection in 2014 and evaluation of the instrument to determine comparability to the $PM_{2.5}$ NAAQS, Pinal County concludes that the $PM_{2.5}$ BAM 1020 at Casa Grande Downtown should be considered a regulatory SLAMS monitor. .

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Two types of PM_{10} monitors are currently used in the Pinal County monitoring network: a filter based medium volume monitor (R&P 2000h), and the Tapered Element Oscillating Microbalance (R&P TEOM) which measures PM_{10} on a continuous basis.

Two types of $PM_{2.5}$ monitors are currently being used in the Pinal County monitoring network: filter based medium volume monitors equipped with the appropriate size fractioning device (R&P 2025) and the Met One BAM 1020 which measures $PM_{2.5}$ on a continuous basis.

A process for relocating violating $PM_{2.5}$ monitors is described at 40 CFR Part 58.10 (c). The rule requires that the annual monitoring network plan must document how States and local agencies provide for the review of changes to a $PM_{2.5}$ monitoring network that impact the location of a violating $PM_{2.5}$ monitor or the creation/change to a community monitoring zone, including a description of the proposed use of spatial averaging for purposes of making comparisons to the annual $PM_{2.5}$ NAAQS as set forth in Appendix N to 40 CFR Part 50. The affected State or local agency must document the process for obtaining public comment and include any comments received through the public notification process within their submitted plan.

Pinal County Air Quality does not intend to establish community monitoring zones as described in the rule or utilize spatial averaging for comparison to the $PM_{2.5}$ annual NAAQS. In 2015, Pinal County Air Quality does intend to relocate the violating $PM_{2.5}$ monitors currently at the Cowtown Road site. Pinal County will follow EPA's recommended relocation process.

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3.0 Network Design and Measurement Quality

3.1 Network Design

This section provides a list of monitoring site designations. Table 3-1 and Table 3-2 identify Pinal County Air Quality's current SLAMS and SPM designations, respectively.

The SIP as it applies to Pinal County does not make any SLAMS designations. In 2000 Pinal County Air Quality compiled its first annual network review which included SLAMS/SPM site designations. The past annual network reviews have been submitted to both ADEQ and EPA for comment.

Table 3-1: Pinal County SLAMS Summary

Site Name	AQS ID	Classification	Site Type	Site Scale	Pollutant
Apache Junction Fire Station	040213002	SLAMS	Population	Neighborhood	$PM_{2.5}$ PM_{10}
Apache Junction Maintenance Yard	040213001	SLAMS	Population	Neighborhood	O_3
Casa Grande Airport	040213003	SLAMS	Regional Transport	Regional	O_3
Casa Grande Downtown	040210001	SLAMS	Population	Neighborhood	$PM_{2.5}$ PM_{10}
Combs School TEOM	040213009	SLAMS	Population	Neighborhood	PM_{10}
Coolidge Maintenance Yard	040213004	SLAMS	Population	Neighborhood	PM_{10}
Cowtown Road	040213013	SLAMS	Highest Concentration / Source Oriented	Middle	$PM_{2.5}$
Eloy County Complex	040213014	SLAMS	Population	Neighborhood	PM_{10}
City of Maricopa County Complex	040213010	SLAMS	Population	Neighborhood	PM_{10}
Pinal Air Park	040213007	SLAMS	Background Transport	Regional	PM_{10} O_3
Pinal County Housing Complex	040213011	SLAMS	Population	Neighborhood	PM_{10}
Stanfield County Complex TEOM	040213008	SLAMS	Population	Neighborhood	PM_{10}

Table 3-2: SPM Summary

Site Name	AQS ID	Classification	Site Type	Site Scale	Pollutant
Cowtown Road TEOM	040213013	SPM	Highest Concentration / Source Oriented	Middle	PM_{10}

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Pinal County proposes to retain the SPM designation for the Cowtown Road PM_{10} monitor pending completion of the relocation process currently underway. Details are provided in Sections 4.0 and 5.0.

3.2 Air Quality System (AQS) Requirements

In 2002 Pinal County Air Quality began entering local monitoring data into the EPA's AQS database. 40 CFR 58.16 requires that all ambient air quality data and associated quality assurance checks for all criteria pollutants be submitted to EPA via AQS. Additionally, an annual data certification is required by 40 CFR 58.15. The certification must be sent to EPA Region 9 by May 1 stating that the data have been submitted correctly. Pinal County Air Quality submitted an annual data certification for 2014 on April 27, 2015. Precision data for 2014 were submitted to AQS as of March 2015.

3.3 Minimum Network Requirements

40 CFR Part 58 Appendix D defines minimum monitoring requirements based on the population of the Metropolitan Statistical Area (MSA) and the design value for each NAAQS. Pinal County is part of the Phoenix-Mesa-Scottsdale MSA, which has a population of 4,192,887 (US Census Bureau, 2010 Census data, http://www.census.gov/population/www/cen2010/cph-t/cph-t-5.html). Within Appendix D the EPA recognizes that State or local agencies must consider MSA and Combined Statistical Area (CSA) boundaries and their own political boundaries and geographical characteristics in designing their air monitoring networks. Appendix D states that there may be situations where the EPA Regional Administrator and the affected State or local agencies may need to augment or to divide the overall MSA/CSA monitoring responsibilities and requirements among these various agencies to achieve an effective network design. Full monitoring requirements apply separately to each affected State or local agency in the absence of an agreement between the affected agencies and the EPA Regional Administrator.

Based on similar comments received on the 2013 Network Plan, ADEQ, Maricopa County Air Quality Department (MCAQD) and Pinal County Air Quality began working on a document that clearly defines each organization's monitoring requirements under the MSA/CSA. At this time the first draft of the document is under review by each agency. The document will be included in the network plan when it has been finalized.

The design value (DV) is a calculated value based upon the highest recorded concentration at a site in the attainment or nonattainment area. The process for computing the value for each criteria pollutant is described in the appendices of 40 CFR Part 50. For the purpose of this document the DVs listed are the highest calculated concentrations recorded in Pinal County. Tables 3-3 through 3-5 lists the minimum population based monitor requirements for $PM_{2.5}$, PM_{10}, and ozone respectively.

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Table 3-3 $PM_{2.5}$ Monitoring Requirements (SLAMS)

Population (MSA)	Most recent 3 yr design value ≥ 85% NAAQS	Most recent 3 yr design value <85% NAAQS
>1M	3	2
500K-1M	2	1
50K-500K	1	0

Table 3-4 PM_{10} Monitoring Requirements (SLAMS)

Population (MSA)	High Concentration Exceeds NAAQS by 20% or more (>180µg/m^3)	Medium Concentration Exceeds 80% of NAAQS (>120µg/m^3)	Low Concentration Less than 80% of NAAQS (<120 µg/m^3)
>1M	6-10	4-8	2-4
500K-1M	4-8	2-4	1-2
250K-500K	3-4	1-2	0-1
100K-250K	1-2	0-1	0

Table 3-5 Ozone Monitoring Requirements (SLAMS)

Population (MSA)	Most recent 3 yr design value ≥ 85% NAAQS	Most recent 3 yr design value <85% NAAQS
>10M	4	2
4-10M	3	1
350K-4M	2	1
50K-350K	1	0

Tables 3-6 through 3-8 depict Pinal County's minimum monitoring requirements for $PM_{2.5}$, PM_{10} and ozone respectively. The tables below show that the minimum monitoring requirements are being met, with the exception of an additional $PM_{2.5}$ continuous monitor.

These tables include SLAMS and SPM monitors operated by Pinal County (with the addition of Queen Valley which is operated by ADEQ for ozone), and do not include monitors operated in other areas of the MSA. 40 CFR 58.20 states that SPM monitors may not be used to show compliance with the minimum monitoring requirements but EPA commented on the 2011 plan that SPM data must be included when computing the area DV. This plan re-evaluates the minimum requirement for each pollutant according to EPA direction. The results show no change in the required number of sites for $PM_{2.5}$, PM_{10}, or ozone in the network.

Table 3-6a and Table 3-6b illustrate the minimum monitoring requirements for $PM_{2.5}$. The highest 24-hour $PM_{2.5}$ 3-year average recorded at a Pinal County SLAMS or SPM site was at Cowtown Road. Because the Cowtown Road site is not comparable to the annual $PM_{2.5}$ NAAQS, the next highest site is the Casa Grande Downtown site. The calculated $PM_{2.5}$ DV for the Cowtown Road and Casa Grande Downtown sites are as follows: 1) 3-year average of the annual means is 8.6 µg/m^3 (Casa Grande Downtown); 2) 3-year average of the 24-hour 98th percentiles is 35.6 µg/m^3 (Cowtown Road). The 24-hour DV is > 85% of the NAAQS and the annual DV is <85% of the NAAQS. Considering the 24 hour and annual DVs the network requires three SLAMS monitors in the Pinal County portion of the MSA.

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Table 3-6a: Minimum Monitoring Requirements for $PM_{2.5}$ SLAMS (FRM/FEM/ARM)

MSA	Counties	Population & Census year	Annual Design Value [µg/m3] DV Years[1]	Annual Design Value Site (name, AQS ID)	Daily Design Value [µg/m3] DV years	Daily Design Value Site (name, AQS ID)	Required SLAMS Sites	Active SLAMS Sites	Additional SLAMS Sites Needed
Phoenix-Mesa-Scottsdale	Pinal and Maricopa	4,192,887 2010	8.6 (2012-2014)	Casa Grande 04-021-0001	35.6 (2012-2014)	Cowtown Road 04-021-3013	3	3	0

[1]DV Years = the three years over which the design value (DV) was calculated (e.g., 2008-2010)
(Note: see 40CFR 58 App D Sections 4.7.1, 4.7.2 and Table D-5)

Table 3-6b: Minimum Monitoring Requirements for Continuous $PM_{2.5}$ Monitors (FEM/ARM and non-FEM)

MSA	Counties	Population & Census year	Annual Design Value [µg/m3] DV Years[1]	Annual Design Value Site (name, AQS ID)	Daily Design Value [µg/m3], DV years	Daily Design Value Site (name, AQS ID)	Required Continuous Monitors	Active Continuous Monitors[2]	Additional Continuous Monitors Needed
Phoenix-Mesa-Scottsdale	Pinal and Maricopa	4,192,887 2010	8.6 (2012-2014)	Casa Grande 04-021-0001	35.6 (2012-2014)	Cowtown Road 04-021-3013	2	1	1

[1]DV Years = the three years over which the design value (DV) was calculated (e.g., 2008-2010)
[2] Only count one continuous monitor per site.
(Note: see 40CFR 58 App D Section 4.7.2)
$PM_{2.5}$ monitors required for SIP or Maintenance Plan: N/A at this time

Table 3-7 lists the minimum monitoring requirements for PM_{10}. The highest PM_{10} 24-hour concentration recorded at a SLAMS or SPM site over the last 3 years of operation (2012-2014) was 1007 µg/m^3 at Cowtown Road (June 30, 2013 flagged as an Exceptional Event in AQS). The value exceeds the NAAQS by 20% or more and is considered a high concentration area. The high concentration designation requires 6 to 10 monitors in the MSA.

Table 3-7: Minimum Monitoring Requirements for PM_{10}

MSA	Counties	Population & Census year	Max Concentration [µg/m^3]	Max Concentration Site (name, AQS ID)	Required Sites	Active Sites	Additional Sites Needed
Phoenix-Mesa-Scottsdale	Pinal and Maricopa	4,192,887 2010	1007	Cowtown Road 04-021-3013	6-10	10	0

(Note: see 40CFR 58 App D Section 4.6 and Table D-4)
PM_{10} monitors required for SIP or Maintenance Plan: N/A at this time

Table 3-8 lists the minimum monitoring requirements for ozone. The highest 8-hour ozone concentration site in Pinal County is the ADEQ Queen Valley site. The calculated ozone DV using the Queen Valley 3-year average of the 4th highest 8-hour average for

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the period of 2012-2014 is 0.073 ppm. This value is ≥ 85% of the NAAQS, which requires a minimum of three ozone monitors in the MSA.

Table 3-8: Minimum Monitoring Requirements for Ozone (O_3)

MSA	Counties	Population & Census year	8-hr Design Value [ppb], DV Years[1]	Design Value site (name, AQS ID)	# Required Sites	# Active Sites	# Additional Sites Needed
Phoenix-Mesa-Scottsdale	Pinal and Maricopa	4,192,887 2010	0.073 2012-2014	Queen Valley 04-021-8001	3	4	0

[1]DV Years = the three years over which the design value (DV) was calculated (e.g., 2008-2010)
(Note: see 40CFR 58 App D Section 4.1 and Table D-2)

3.4 Minimum Sample Frequency

$PM_{2.5}$ - The monitoring rule at 40 CFR 58.12 (d)(1) states that required manual $PM_{2.5}$ monitors at SLAMS stations must operate on at least a 1-in-3 day schedule at sites without a collocated continuously operating $PM_{2.5}$ monitor. For SLAMS sites with both manual and continuous $PM_{2.5}$ monitors operating, the monitoring agency may request approval from the EPA Regional Administrator for a reduction to 1-in-6 day or for seasonal sampling. The EPA Regional Administrator may grant sampling frequency reductions after consideration of factors including, but not limited to, the historical $PM_{2.5}$ data quality assessments, the location of current $PM_{2.5}$ DV sites, and their regulatory data needs. Sites that have DVs that are within plus or minus 10 percent of the NAAQS (±10% of 35 $\mu g/m^3$ is 31.5-38.5 $\mu g/m^3$) and sites where the 24-hour DVs exceed the NAAQS for a period of 3 years are required to maintain at least a 1-in-3 day sampling frequency. Sites that have a DV within plus or minus 5 percent of the daily $PM_{2.5}$ NAAQS (±5% of 35$\mu g/m^3$ is 33.25-36.75 $\mu g/m^3$) must have an FRM or FEM operating on a daily schedule.

In 2008 Pinal County proposed and received approval from EPA Region 9 to reduce the sample frequency at the Casa Grande Downtown site from 1-in-3 to 1-in-6 day after the end of the 2008 sample year. Prior to 2007 the site operated at a 1-in-6 day frequency for 8 years. This change was implemented on January 1, 2009. During 2007, samples were collected on the 1-in-3 day schedule. This was achieved by installing a second sampler and having them alternate sample days. With the change in sample frequency, one of the monitors was made available to begin collecting precision $PM_{2.5}$ measurements at the Casa Grande Downtown site. During the time this site has been in operation, the 3-year average of the 98th percentile $PM_{2.5}$ value has not exceeded 21 $\mu g/m^3$.

EPA commented on the 2012 Monitoring Plan that Pinal County was deficient by not having a continuous $PM_{2.5}$ method in the network (Reference 40 CFR Part 58 Appendix D Section 4.1.7). To correct this deficiency, Pinal County installed a continuous $PM_{2.5}$ Met One BAM 1020, method 170 at the Casa Grande Downtown site on November 8, 2013. Pinal County operated the continuous method for a one year period to evaluate it, and during 2014 it was not considered a regulatory method for comparison to the applicable NAAQS. In 2015 Pinal County will report the continuous $PM_{2.5}$ Met One BAM 1020 as a SLAMS monitor and is returning the Casa Grande Downtown site to a 1-in-3 sampling schedule for filter-based method 145. The collocated site for method 145 is currently Cowtown Road. Sample frequencies for $PM_{2.5}$ are summarized in Table 3-9.

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The Cowtown Road $PM_{2.5}$ sample frequency had been 1-in-6 day since the monitor was installed in August 2006. According to 40CFR 58.12 (d) (1) 1-in-3 day sampling is required based upon the current DV. In February of 2011 a Filter Dynamics Measurement System (FDMS) TEOM was installed at the site. Pinal County evaluated the operation of the instrument for several months and determined the performance was not adequate to represent PM_{10} and $PM_{2.5}$ concentrations on an ongoing basis. Because the instrument performance was not acceptable, it was removed from the site for future evaluation. The filter based PM_{10} 2000h monitor at the site was discontinued at the close of 2011 and converted to $PM_{2.5}$. That monitor and a new 2000h $PM_{2.5}$ filter based monitor began alternate sampling on January 1, 2012 to meet a 1-in-3 day sample schedule. In response to comments made by EPA on the 2011 Network Plan, Pinal County purchased a Thermo Scientific 2025i, method 145, to replace the two alternating monitors located at the site. That monitor was installed in August 2014 along with a second 2025i, method 145, to meet collocation requirements.

Additionally, EPA commented on the 2013 Network Plan that Pinal County should have two continuous $PM_{2.5}$ monitors instead of one that is in operation currently. 40 CFR 58 Appendix D Section 4.7.2 states that the number of continuous $PM_{2.5}$ monitors must equal at least one half (rounding up) of the minimum required monitoring sites. The Cowtown Road site is the DV site and it is characterized as a "local hot spot" site and is therefore not comparable to the $PM_{2.5}$ annual standard. Pinal County conferred with EPA Region 9 and was instructed to use the 24-hr DV. Table 3-6 shows that the 24-hr DV for the Cowtown Road site is 35.6 $\mu g/m^3$, which is more than 85% of the NAAQS. Accordingly, using table D-5 of Appendix D of 40CFR58 (pictured below), Pinal County is required to have two continuous $PM_{2.5}$ monitors. In both 2013 and 2014 the 3 year average at Cowtown was above 85% of the 24-Hour NAAQS. In order to meet this requirement, a continuous $PM_{2.5}$ monitor will likely be installed at the Cowtown Road replacement site in 2016 corresponding to the site relocation.

TABLE D-5 OF APPENDIX D TO PART 58—$PM_{2.5}$ MINIMUM MONITORING REQUIREMENTS

MSA population[1] [2]	Most recent 3-year design value ≥85% of any $PM_{2.5}$ NAAQS[3]	Most recent 3-year design value <85% of any $PM_{2.5}$ NAAQS[3] [4]
>1,000,000	3	2
500,000-1,000,000	2	1
50,000-<500,000[5]	1	0

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Table 3-9 $PM_{2.5}$ Sampling Frequencies

Site Name	3-Year Average of 98th Percentile 2012-2014	Current Sample Frequency	Required Frequency
Apache Junction	12.8	1-in-3	1-in-3
Casa Grande	17.3	1-in-3, continuous	1-in-3
Cowtown Road	35.6	1-in-3, 1-in-6 (collocated)	1-in-3

PM_{10} - The monitoring rule at 40 CFR 58.12 (e) states that for PM_{10} sites, the minimum monitoring schedule for the site in the area of expected maximum concentration shall be based on the relative level of that monitoring site concentration with respect to the 24-hour standard. Pinal County currently operates a continuous monitor at its maximum PM_{10} concentration site. Therefore, no change to the PM_{10} sample frequency is required.

3.5 Measurement Quality Checks

Appendix A of 40 CFR Part 58, Section 3.3.1 requires a minimum number of collocated sampling sites to provide a quality assurance demonstration, based on the total number of manual (filter-based) PM monitoring sites in the network. Generally, precision sampling involves operating two identical collocated monitors at the same location on the same sampling schedule.

Appendix A requires 15 percent of the filter based PM_{10} monitoring sites, by collection method, in a network to be collocated. Additionally, the sites having annual mean PM_{10} concentrations among the highest 25 percent for all the sites in the network must be selected. Pinal County Air Quality currently operates two filter based PM_{10} sites that utilize medium-volume monitors. Table 3-10 represents the requirement for medium-volume collocation.

The Pinal County Housing Complex site was historically used as the high-volume filter-based collocation site. In 2013. the filter-based monitors were removed leaving only an SPM TEOM. The PM_{10} TEOM is now the SLAMS monitor of record at Pinal County Housing Complex. The Coolidge Maintenance Yard site was chosen for the medium-volume collocation site because it had the highest annual mean of the remaining filter-based sites. Table 3-10 summarizes the status of collocated sites in the PM_{10} network

Table 3-10: Minimum Collocated Monitoring Requirements for PM_{10}

Sampling Method	Method Code	# Primary Monitors	# Required Collocated Monitors	# Active Collocated Monitors
Medium-Volume (Partisol 2000h)	098	2	1	1 (Coolidge)

<u>Summary of PM_{10} Collocation as described in 40 CFR 58 Appendix A, Section 3.3.1</u>

- Only manual PM_{10} samplers are required to meet a collocation requirement.
- Each manual method designation in the Primary Quality Assurance Organization (PQAO) must have 15 percent of monitors collocated.
- Each PQAO with a PM_{10} network must have at least one collocated PM_{10} monitor.

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- Collocated samplers are required to run on at least a 12-day schedule.
- Collocated sites must be within the highest 25 percent annual mean concentrations, unless alternatives are approved by the Regional Administrator.

Appendix A of 40 CFR Part 58 does not require collocation of continuous PM_{10} monitors. Measurement quality of continuous TEOM monitors is achieved through flow verification checks conducted at least once per month.

Appendix A of 40 CFR Part 58 Section 3.2.5 requires $PM_{2.5}$ networks to include collocated sampling at 15 percent of the monitoring sites in a network. Pinal County Air Quality currently operates three $PM_{2.5}$ filter-based monitoring sites with one collocated measurement made at Cowtown Road. Additionally, 80 percent of the collocated audit monitors should be deployed at sites with annual average or daily concentrations estimated to be within ±20 percent of the applicable NAAQS and the remainder at those sites which the monitoring organization has designated as high value sites.

Table 3-11a: Minimum Collocated Monitoring Requirements for $PM_{2.5}$

Sampling Method	Method Code	# Primary Monitors	# Required Collocated Monitors	# Active Collocated Monitors
Medium-Volume (R&P Model 2025)	145	3	1	1 (Cowtown)

Table 3-11b: Minimum Collocated Continuous Monitoring Requirements for $PM_{2.5}$

Sampling Method	Method Code	# Primary Monitors	# Required Collocated Monitors	# Active Collocated FRM Monitors	# Active Collocated FEM Monitors (same method designation as primary)
Met One BAM 1020	170	0	0	1	0

<u>Summary of $PM_{2.5}$ Collocation as described in 40 CFR 58 Appendix A, Sections 3.2.5 & 3.3.5</u>

- Collocation requirements apply to primary monitoring networks and on a method basis
- For each manual FRM designated method (considering primary monitors only):
    - Collocate at 15 percent of monitors (values of 0.5 or greater round up).
    - Must have at least one collocated monitor per PQAO.
    - Collocated monitor must be same FRM method designation as the primary monitor.
- For each continuous FEM designated method (considering primary monitors only):
    - Collocate at 15 percent of monitors (values of 0.5 or greater round up) or at least one collocated monitor.
    - The first collocated monitor must be an FRM.
    - Half of collocated monitors must be FRMs, and half must be the same FEM method as the primary monitor.
    - If an odd number of collocated monitors are required, the additional monitor must be a FRM.

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- Collocated FRM samplers are required to run on at least a 12-day sampling frequency.
- 80 percent of the collocated samplers should be located at sites that have DVs within ± 20 percent of either the annual or 24-hour $PM_{2.5}$ NAAQS.
- If an agency has no sites within ± 20 percent of either the annual or 24-hour $PM_{2.5}$ NAAQS, 60 percent of the collocated monitors should be located at sites with annual mean concentrations among the 25 percent highest in the network.
- In addition to the requirements in 40 CFR 58 Appendix A, Section 3.2.5, 40 CFR 58 Appendix D, Section 4.7.2 also requires at least one of the continuous $PM_{2.5}$ monitors in each MSA to be at the same site as a required FRM/FEM/ARM. If one of the required FRM/FEM/ARM monitors is a continuous FEM or ARM, the collocation requirement in 40 CFR 58 Appendix D, Section 4.7.2 does not apply.

Pinal County currently has one continuous $PM_{2.5}$ Met One BAM 1020 at the Casa Grande Downtown site, and plans to purchase and install another $PM_{2.5}$ Met One BAM 1020 at the Cowtown Road replacement site in 2016.

3.6 Ozone Season Definition

Beginning in 2015, Pinal County is operating the Pinal Air Park ozone site on a year-round schedule. The Casa Grande Airport and Apache Junction Maintenance Yard ozone monitors will continue to operate on a year-round schedule.

3.7 Quality System Requirements

Pinal County Air Quality submitted a Quality Assurance Project Plan (QAPP) to EPA Region 9 in January 2007. The QAPP covered all aspects of the ambient monitoring network operations, filter weighing process, and data quality review. All instrument standard operating procedures (SOPs) were completed and included in the QAPP. EPA provided feedback on the QAPP in July of 2008. Pinal County Air Quality revised the QAPP in response to EPA comments and re-submitted the document on October 16th, 2012. The QAPP was approved by EPA on January 3rd, 2013. Pinal County Air Quality revised appropriate sections of the QAPP to address comments received during the most recent Technical System Audit (TSA) and the addition of new equipment to the network. This revised QAPP was submitted to EPA in December 2013 and was conditionally approved on February 19, 2015. Pinal County will make the requested revisions and re-submit the QAPP to EPA by September 2015.

All flow rate standards used by Pinal County are traceable to National Institute of Standards and Technology (NIST) and are recertified annually. The ozone standard is verified by the California Air Resource Board (CARB) on an annual basis and the ozone transfer standard is verified by Pinal County Air Quality monthly.

Through ADEQ, Pinal County is a participant in the EPA National Performance Audit Program (NPAP) and the PM Performance Evaluation Program (PEP). Pinal County sites are included in the EPA sponsored audit programs. The most recent semi-annual flow audits and annual performance audits are shown below in Tables 3-12 and 3-13. ADEQ conducts performance audits of Pinal County monitors according to frequencies

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described in 40 CFR Part 58. All flow rate standards used by ADEQ are traceable to NIST and are recertified annually. The ozone standard used by ADEQ is certified twice per year.

Currently, EPA does not consider Pinal County Air Quality a PQAO as defined by 40 CFR Part 58 Appendix A, paragraph 3.1.1. On February 13, 2013 Pinal County and ADEQ entered into a memorandum of agreement (MOA) addressing a number of technical and administrative items pertinent to establishing PQAO status. The MOA was extended to June 30, 2015 and another extension is currently on the Board of Supervisors agenda scheduled for May 27, 2015. The MOU also creates a mechanism to pass through EPA $PM_{2.5}$ funding to Pinal County. This information has been made available to EPA Region 9 as supporting information to support the PQAO designation request.

Table 3-12: Semi-Annual Flow Rate Audits

Site	AQS ID	Parameter	Audit Date 1	Audit Date 2
Apache Junction Fire Station	04-021-3002	$PM_{2.5}$	01/22/2014	07/24/2014
Apache Junction Fire Station	04-021-3002	PM_{10}	01/22/2014	07/24/2014
Apache Junction Fire Station TEOM	04-021-3002	PM_{10}	a	a
Casa Grande Downtown (POC 1 & 2)	04-021-0001	$PM_{2.5}$	04/09/2014	10/15/2014
Casa Grande Downtown TEOM	04-021-0001	PM_{10}	04/09/2014	10/15/2014
Combs School TEOM	04-021-3009	PM_{10}	04/16/2014	10/21/2014
Coolidge Maintenance Yard (POC 1 & 2)	04-021-3004	PM_{10}	04/09/2014	10/21/2014
Cowtown Road (POC 1 & 2 - 2000, 2025i)	04-021-3013	$PM_{2.5}$	01/14/2014	07/15/2014
Cowtown Road TEOM	04-021-3013	PM_{10}	01/14/2014	07/15/2014
Eloy County Complex	04-021-3014	PM_{10}	01/14/2014	07/08/2014
City of Maricopa County Complex TEOM	04-021-3010	PM_{10}	04/09/2014	10/15/2014
Pinal Air Park	04-021-3007	PM_{10}	01/14/2014	07/17/2014
Pinal Air Park TEOM	04-021-3007	PM_{10}	01/14/2014	07/17/2014
Pinal County Housing Complex TEOM	04-021-3011	PM_{10}	04/09/2014	10/21/2014
Stanfield County Complex TEOM	04-021-3008	PM_{10}	01/14/2014	07/15/2014

a – monitor from ADEQ was re-installed on 12/11/2014

Table 3-13: Annual Performance Audits

Site	AQS ID	Parameter	Audit Date
Apache Junction Maintenance Yard	04-021-3001	O_3	07/24/2014
Casa Grande Airport	04-021-3003	O_3	04/10/2014
Pinal Air Park	04-021-3007	O_3	07/17/2014

3.8 Lead Monitoring Network Description

The strengthening of the Lead NAAQS resulted in a revision to 40 CFR Part 58.10. The revision requires state and local agencies to describe required lead monitoring networks in the annual monitoring network plan and submit the description to the Regional Administrator by July 1, 2009. Additionally on December 14, 2010 the EPA revised the ambient monitoring requirements for measuring airborne lead. These rule amendments improved the lead monitoring network to better assess compliance with the revised NAAQS established in November 2008. EPA lowered the lead emissions monitoring threshold from 1.0 tons per year (tpy) to 0.5 tpy. Air quality monitoring agencies will use this threshold to determine if an air quality monitor is required to be placed near a facility emitting lead.

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Appendix D to Part 58 entitled "Network Design Criteria for Ambient Air Quality Monitoring" requires states and local agencies to establish ambient lead monitoring under two specific conditions:

> 1) Source-oriented SLAMS level monitoring located to measure the maximum lead concentration in ambient air resulting from each lead source which emits 0.5 tpy or more based on either the most recent National Emission Inventory (NEI) (*http://www.epa.gov/ttn/chief/net/2011inventory.html*) or other scientifically justifiable methods and data (such as improved emissions factors or site-specific data), and
>
> 2) Lead monitoring in each CBSA with a population equal to or greater than 500,000 people as determined by the latest available census figures. At a minimum, there must be one non-source-oriented SLAMS site located to measure neighborhood scale lead concentrations in urban areas impacted by re-entrained dust from roadways, closed industrial sources which previously were significant sources of lead, hazardous waste sites, construction and demolition projects, or other fugitive dust sources of lead.

To assess a potential point-source triggered requirement for ambient lead monitoring in Pinal County the 2011 NEI and internal emission inventory reports were reviewed by Pinal County Air Quality staff. Table 3-14 summarizes lead emissions reported to NEI in 2011. The NEI 2011 report shows that no Pinal County source exceeded the 0.5 tpy threshold. Casa Grande Airport reported 0.33 tpy and Asarco Ray Complex reported 0.25 tpy. A review of the Asarco LLC Ray Operations Mine 2013 emission inventory report, which is required under an air quality operating permit, shows the annual lead emission rate to be 0.25 tpy. Pinal County Air Quality permit management reviewed and accepted the emission rate.

The second pathway for required ambient lead monitoring arises through CBSA/MSA population. Pinal County is included in the Phoenix-Mesa-Scottsdale MSA with a 2010 population of 4,192,887 million people. This is above the 500,000 person population threshold described above. Although Pinal County is included in the MSA, the majority of the population resides in Maricopa County.

After review of the NEI data and MSA population, Pinal County Air Quality has concluded that monitoring for ambient lead in the county will not be conducted. This conclusion is based upon the following; 1) no point source in the county emits lead above the 0.5 tpy threshold and, 2) the MSA required monitoring is currently conducted in Maricopa County. Pinal County Air Quality will revisit the need and feasibility of lead monitoring as source emissions and economic conditions change.

Table 3-14: NEI 2011 Point Source Lead Emissions in Pinal County

Facility Name	2011 NEI Emissions (tpy)
Casa Grande Airport	0.33
Asarco LLC Ray Operations Mine	0.25

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4.0 Monitoring Site Descriptions

This section describes the purpose, site types, monitor types, and scale of each monitoring site operated by Pinal County Air Quality. All Pinal County air monitoring sites have the basic monitoring objective of NAAQS comparison. Appendix B contains images and summary tables for each site. The changes that have occurred or are planned at each site are detailed within each subsection. Each site has been evaluated for compliance with the siting criteria listed in 40 CFR Part 58 Appendix D (Network Design) and Appendix E (Probe and Path Siting).

4.1 Apache Junction Fire Station

This site is located behind Apache Junction Fire Station #2 on Bureau of Land Management (BLM) property. Apache Junction lies at the fringe of the Phoenix metropolitan area, where urban development meets the Tonto National Forest and Superstition Wilderness. The site sits on the eastern boundary of the City of Apache Junction with residential homes to the east. Undisturbed desert immediately surrounds the site to the north, south and west with residential homes beyond that. The Superstition Mountain Range is located approximately one mile east of the site. The purpose of the site is to quantify $PM_{2.5}$ and PM_{10} concentrations affecting the surrounding population on a neighborhood scale. This NAAQS site is included in the statewide $PM_{2.5}$ network.

The site consists of two SLAMS monitors: a sequential FRM 2025i $PM_{2.5}$ monitor and a PM_{10} TEOM (FEM). The $PM_{2.5}$ monitor operates on a 1-in-3 day schedule.

The site was established in 1999 and consisted of two high-volume Andersen FRM $PM_{2.5}$ monitors, one of which operated every third day. The monitors did not take precision samples; instead their operation alternated. One monitor was operated on each run day so that the number of site visits was reduced. In June 2004 a sequential 2025a FRM $PM_{2.5}$ monitor was installed to replace the Andersen $PM_{2.5}$ monitors.

One high-volume PM_{10} monitor from the Apache Junction Maintenance Yard (described in section 4.2) was moved to this site on July 1, 2003. Samples were collected at both sites until January 1, 2004 to develop a correlation between the two sites. The correlation was discussed further in the July 2004 version of the Ambient Monitoring Network Review and Data Summary document in section 5.3.1. As of January 1, 2004 the Apache Junction Fire Station site is the only PM_{10} site in Apache Junction.

On August 20, 2011, a PM_{10} TEOM began operation at this site in response to a recorded exceedance at the filter based PM_{10} monitor on July 8, 2011. The TEOM was in operation for more than the 4 consecutive quarters as required by 50 CFR App. K 3.1 (f) (1)-(3). This portion of the regulation encourages monitoring agencies to implement continuous monitoring after a measured exceedance and generally states that EPA will not calculate expected exceedances from that monitor if everyday sampling is subsequently initiated and maintained for 4 calendar quarters (and 75% completeness is maintained). The extended operation was due to 5 exceedances recorded on August 26, August 28, September 2, September 6, and November 4 of 2011. In January of 2013 ADEQ submitted documentation and received approval from EPA to exclude a number

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of exceedances in the Phoenix area as windblown dust exceptional events. Four of the five exceedances recorded in Apache Junction were included in EPA's concurrence with ADEQ's exemption request. This results in only one recorded exceedance at Apache Junction occurring on September 6, 2011.

Because the TEOM monitor was operated in a discretionary manor and no exceedances had been recorded since September 6, 2011, the monitor was discontinued July 01, 2013. The high-volume monitor remained in operation until July 01, 2013 when it was replaced with a medium-volume PM_{10} monitor, method 098. The 1-in-6 day filter based 2000h PM_{10} monitor remained in place through the end of 2014, when it was replaced by a TEOM 1400a at the request of ADEQ. See Section 5.0 for a related description.

The site meets 40 CFR Part 58 Appendix D and E criteria.

4.2 Apache Junction Maintenance Yard

This site is located within the Pinal County Public Works Yard and is in the center of Apache Junction. Three major roads surround the site: State Highway 88, Idaho Road, and Superstition Boulevard. The maintenance yard area is graveled, well maintained, and historically activity in the yard has not adversely affected the monitors. The historical purpose of this site was to quantify PM_{10} concentrations affecting the surrounding population on a neighborhood scale, quantify carbon monoxide concentrations near a major intersection on a middle scale, and quantify ozone concentrations on the eastern boundary of the Phoenix metropolitan area. The ozone concentration at this site reflects regional transport and neighborhood scale population exposure.

Historically, the site consisted of two Wedding high-volume PM_{10} monitors that collected precision samples on a 1-in-6 day schedule, an ozone monitor, a carbon monoxide monitor, a wind system, a barometric pressure sensor, and a temperature and relative humidity sensor. The inlet funnel on the ozone monitor was changed from stainless steel to Pyrex glass in 2001. The site has met 40 CFR Part 58 Appendix D and E criteria since then.

In an effort to better utilize the resources available to Pinal County Air Quality, the carbon monoxide monitor was removed from the site on May 28th, 2002. The reasoning behind this is discussed in detail in section 6.1 of this document.

One of the PM_{10} high-volume monitors located at this site was moved to the Apache Junction Fire Station site on July 1, 2003. PM_{10} monitoring took place at both sites until January 1, 2004, so that a correlation between the two sites could be developed. After January 1, 2004 the remaining PM_{10} high-volume monitor was moved to the Pinal County Housing Complex site in order to create a collocated PM_{10} site. Refer to section 4.11 of this document for details on the Pinal County Housing Complex site.

The existing tower at the Apache Junction Maintenance Yard site, on which the wind system is mounted, historically was not stable enough to produce accurate wind direction measurements. The mounting of the meteorological equipment was reconfigured in May 2007 so that accurate measurements could be taken.

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The site meets 40 CFR Part 58 Appendix D and E criteria.

4.3 Casa Grande Airport

This site is located within the Casa Grande Municipal Airport. Casa Grande lies about 20 miles south of the Phoenix urban area, in a broad desert plain largely dominated by open field agriculture. A small industrial park is located within the airport complex and there are residential subdivisions to the north, south, and east of the airport. The airport is on the north edge of Casa Grande, although the entire surrounding area is being developed. To the east of the airport approximately a quarter of a mile is a major thoroughfare, Pinal Avenue (SR 387).

The purpose of this site is to quantify ozone concentrations south of the Phoenix metropolitan area. The ozone concentration at this site reflects regional transport on a regional scale.

In the past carbon monoxide was also monitored at this site. In an effort to better utilize the resources available to Pinal County Air Quality, the District removed the carbon monoxide monitor located at this site on October 11, 2002.

In August 2006 a new site shelter was installed. On May 20th, 2010 the wind system, barometric pressure sensor and a temperature and relative humidity sensor were removed for cost saving reasons. There is a National Weather Service site on the airport property that is currently being used for meteorological data. The site currently consists of only a Teledyne 400E ozone analyzer.

The site meets 40 CFR Part 58 Appendix D and E criteria.

4.4 Casa Grande Downtown

This site is located on the roof of an Arizona Department of Economic Security building in the downtown area of Casa Grande. A core business district surrounds the site followed by residential areas in all directions. The purpose of this NAAQS site is to quantify $PM_{2.5}$ and PM_{10} concentrations affecting the surrounding population on a neighborhood scale.

Historically, the site consisted of a high-volume PM_{10} monitor and a $PM_{2.5}$ FRM monitor. The monitors were moved further away from a nearby furnace flue in September of 2001. The high-volume PM_{10} monitor operated on a 1-in-6 day schedule. The $PM_{2.5}$ monitor at this site was upgraded from an Andersen $PM_{2.5}$ FRM monitor to a single channel R&P 2000h $PM_{2.5}$ FRM monitor in March 2004. The $PM_{2.5}$ FRM monitor had operated on a 1-in-6 day schedule since 1999. On January 1, 2007 the sample frequency was changed to 1-in-3 days to meet new monitoring requirements. In March of 2007 a second $PM_{2.5}$ FRM 2000h monitor was installed so that operation could alternate between the two and reduce trips to the site. A continuous PM_{10} TEOM was also installed in March of 2007.

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For the first sample of 2009, the sample frequency of the two $PM_{2.5}$ monitors was changed from a frequency of 1-in-3 to 1-in-6 to allow for precision measurement. This change was proposed in the 2007 network plan.

On December 31, 2008 the high-volume PM_{10} monitor was moved from Casa Grande Downtown to Stanfield County Complex and replaced with a PM_{10} 2000h Partisol. On December 31, 2010 the PM_{10} 2000h monitor at Casa Grande Downtown was discontinued. The PM_{10} TEOM was designated as a SLAMS monitor as of January 1, 2011.

Pinal County acquired a continuous $PM_{2.5}$ Met One BAM 1020, method 170, which was installed at the Casa Grande Downtown site on November 8, 2013. Pinal County operated the continuous method for a one year period for evaluation. During this time the monitor was not considered a regulatory method for comparison to the applicable NAAQS. In 2015 the $PM_{2.5}$ Met One BAM 1020 will be considered a regulatory method for comparison to the applicable NAAQS.

In December 2014, a sequential $PM_{2.5}$ FRM 2025a monitor was installed at Casa Grande Downtown and is operating on a 1-in-3 day schedule for 2015. Along with the continuous $PM_{2.5}$ monitor operating in 2015, this satisfies part of the network collocation requirements at this site.

The site meets 40 CFR Part 58 Appendix D and E criteria.

4.5 Combs School

This site is located within the J.O. Combs Unified School District campus and is approximately 10 miles south of Apache Junction in an area that is rapidly being developed for residential use. The area has historically been dominated by open field agriculture, although residential developments have been built or are being planned to the north, south, east and west of the site. Historically this site has been used to quantify both ozone and PM_{10} concentrations southeast of the Phoenix metropolitan area. The ozone concentration at this site reflected regional transport and neighborhood population exposure. The PM_{10} concentration at this NAAQS site reflects neighborhood scale population exposure.

This site was installed in June of 2002 and ozone data recording began in July 2002, thus data for a portion of the 2002 ozone season are missing. In March of 2007 a continuous PM_{10} TEOM was added at the site. The ozone analyzer was discontinued May 18, 2011.

The site meets 40 CFR Part 58 Appendix D and E criteria.

4.6 Coolidge Maintenance Yard

This site is located within the Pinal County Public Works Yard on the east side of Coolidge. Coolidge lies about 30 miles southeast of the Phoenix urban area in a desert basin largely dominated by open field agriculture. Residential homes surround the site to the north, south, and east. West of the site is a railroad track with a business district on

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the west side of the tracks. The purpose of this site is to quantify PM_{10} concentrations affecting the surrounding population on a neighborhood scale.

The site originally had a high-volume PM_{10} monitor, which collected samples on a 1-in-6 day schedule. Due to a scheduled demolition, the monitor was moved from the roof of a cargo trailer to a ground level stand in June of 2002. The monitor was moved approximately 15 meters to the south and the inlet height was reduced from 5.6 meters to 3.4 meters.

On July 01, 2013 the high-volume monitor was replaced with two medium-volume PM_{10} 2000h monitors, method 098. The two medium-volume monitors are operated on a 1-in-6 day schedule and meet the network collocation requirement for the method.

The site meets 40 CFR Part 58 Appendix D and E criteria.

4.7 Cowtown Road

This site is located approximately four miles southeast of the City of Maricopa. The site also lies within an irrigated agricultural plain, with active and retired agricultural operations to the north, northwest and east. Feedlots, a grain processing complex, an ethanol plant, and a commercial composting facility operate to the west, south, southwest and southeast. The site is also in proximity to an unpaved agricultural road and to the Casa Grande-Maricopa Highway (SR 238), a paved two lane roadway, both situated to the south of the monitoring site. This is the network's highest PM concentration site, and is used to look at several PM_{10} sources in the area, including agriculture, the grain-processing complex, the feedlots and unpaved roads.

The site was installed and data recording began in November of 2001. Since neither a quarterly nor annual average can be obtained from the two months of 2001 data this document contains 2002 and subsequent data from this site. The site first consisted of a TEOM that collected continuous PM_{10} data, a wind system, and a temperature and relative humidity sensor. The area immediately surrounding the site was fenced off (at least 100 feet in all directions) in September of 2003 in order to stabilize the surrounding soil. The surrounding soil has subsequently been stabilized relatively well with the exception of the area to the south of the monitors. This area is a right of way that runs along the Casa Grande–Maricopa Highway and it was regularly disturbed by farm machinery (for instance a tractor and disc) in order to control weeds. In December of 2006 the right of way area adjacent to the site was fenced off to prevent this activity. Since December 2006 this site meets 40 CFR Part 58 Appendix D and E criteria.

A new shelter was installed at this site in August 2003 to accommodate additional equipment. A time-lapse video system was installed at this time and was operated until July 2006. The TEOM at this site was upgraded to a new unit in June 2004. The new unit still sampled PM_{10} and had the FDMS installed as an option. This option is designed to better account for particles that are in a gaseous form. The FDMS unit had difficultly operating in the harsh environment at this site from the beginning. Due to the maintenance problems with the FDMS unit, a TEOM unit without the FDMS option was set up as the primary monitor in January 2005.

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The FDMS TEOM was operated periodically during 2005 in an effort to find ways to maintain the monitor in this harsh environment. During May and June of 2005 the FDMS TEOM was operated along with the collocated regular TEOM unit, both collecting PM_{10}. During this time it was found that the regular TEOM unit was reading approximately 30% higher than the FDMS TEOM unit. District staff worked with representatives from the manufacturer of the units, R&P, to determine the cause of this discrepancy.

Two issues were identified with the regular TEOM unit. First, it was found that the 5-minute averages of this unit often recorded a large negative number directly after an extremely large positive number (1000 $\mu g/m^3$ or more). The manufacturer of the unit concluded that the flow controllers were over correcting for the extremely large PM concentrations and correspondingly creating the negative numbers. The second issue identified was that the unit often recorded elevated noise vibrations when extremely large concentrations were recorded. This was a result of a large amount of PM being deposited on the oscillating microbalance in a short amount of time. In order to correct both of these discrepancies the main inlet flow on the regular TEOM unit was reduced to 1 liter per minute (from 3 liters per minute) in August 2005. The manufacturer has used this alternate setting in other areas with extremely high PM concentrations. The main flow setting of 1 liter per minute still retains the FEM status of the unit.

A filter based Andersen FRM PM_{10} unit and a filter based Andersen FRM $PM_{2.5}$ unit were installed at this site in August of 2005. The units were both operated on a 1-in-6 day schedule. This allowed PM_{10}, $PM_{2.5}$ and surrogate coarse data to be collected. Coarse material refers to particulate matter that is between 2.5 and 10 microns in size. The surrogate coarse data is calculated by subtracting the $PM_{2.5}$ concentration from the PM_{10} concentration.

Comparing the regular PM_{10} TEOM data (with the main flow set at 1 liter per minute) to the FRM filter based PM_{10} data yielded an excellent correlation. The average percent error between the two was 7.0% for calendar year 2009. This demonstrated that setting the main flow to 1 liter per minute on a regular PM_{10} TEOM is an appropriate operating method in this harsh environment. During 2009 the average concentration at the site decreased compared to prior years. As the trend continued the 1 liter flow adjustment had to be reassessed as described below.

Subsequent attempts during 2005 to build a suitable correlation between the regular PM_{10} TEOM and the FDMS PM_{10} TEOM unit were not successful. The FDMS PM_{10} TEOM continued to read approximately 15% below the regular PM_{10} TEOM. This does not appear to be a logical relationship since the FDMS unit is designed to better account for particles that are in a gaseous form and thus should be slightly higher than the regular PM_{10} TEOM. Further conversations with the manufacturer of the unit suggest the dryer that is built into the FDMS unit is scavenging coarse material. At this time Pinal County Air Quality has concluded that the FDMS TEOM unit is not suitable for measuring PM_{10} in this harsh environment that has a large coarse fraction. (The manufacturer may have a second-generation drier available in the future that would prevent the scavenging of coarse material in situations like this.) Due to the difficulty and expense of operating the FDMS TEOM in this environment, the instrument was shut down in May of 2007.

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The time-lapse video system was relocated to the Stanfield County Complex site in July of 2006. The Cowtown Road site was several hundred yards from the feedlots being observed and did not allow the camera to record an overall view of the dust events.

On January 15, 2009 the PM_{10} and $PM_{2.5}$ Andersen monitors were replaced with Thermo PM_{10} and $PM_{2.5}$ Partisol 2000h monitors which also hold an EPA FRM designation. Both the PM_{10} and $PM_{2.5}$ monitors operated on a 1-in-6 day schedule.

On August 12, 2010 the main flow of the TEOM was changed from 1 liter per minute to 3 liters per minute. A review of the data indicated that typical concentrations had decreased to a level where the 3 liters per minute flow was appropriate. The PM_{10} values collected with the on-site filter based instrument compared well to the TEOM. No adverse conditions or readings have been observed since the change was made.

In September of 2010 a fixed location digital camera system was installed at the site and collects an image every 15 minutes.

In February of 2011 a Thermo-Fisher 1405DF FDMS TEOM was installed at the site. Pinal County evaluated the operation of the instrument for a 10 month period to determine if performance was adequate to represent PM_{10} and $PM_{2.5}$ concentrations. Additional details are provided below.

The 2011 Network Review proposed to revise the scale classification of the Cowtown Road site from micro scale to middle scale. An evaluation of the site characteristics, specifically removal of cattle and related facilities adjacent to the site, necessitated this proposed change.

In May of 2011 the Thermo-Fisher 1405DF FDMS TEOM was discontinued and removed from the site. Pinal County determined that the cost of operation was excessive, comparison to filter measurements lacked necessary accuracy, and daily performance of the instrument was not reliable enough to utilize the instrument in the short term. When time, staffing, and funds are available the instrument will be re-evaluated.

On December 31, 2011 the filter based PM_{10} 2000h monitor at the site was discontinued. This was done in order to convert the monitor to $PM_{2.5}$ and collect more frequent $PM_{2.5}$ samples using two units. $PM_{2.5}$ sample frequency changed to 1-in-3 days effective January 1, 2012. EPA commented on the 2011 plan that SPM data must be included when computing the area design value. The results showed a shortage of one $PM_{2.5}$ SLAMS monitor in the network. To correct this, Pinal County changed the Cowtown Road $PM_{2.5}$ monitors from SPM to SLAMS. The PM_{10} TEOM remains a SPM.

In August 2014, the two $PM_{2.5}$ 2000h monitors were replaced with two $PM_{2.5}$ 2025i sequential monitors to allow collection of daily samples while meeting collocation requirements for method 145. During 2014 several $PM_{2.5}$ exceedances were recorded at this site and are being evaluated to determine if daily sampling will be required in 2015. Currently the POC 1 2025i monitor is operating 1-in-3 days while POC 2 is operating 1-in-6 days.

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Details on the planned relocation of the Cowtown Road site can be found in Section 5.3.

The site meets 40 CFR Part 58 Appendix A, D and E criteria.

4.8 Eloy County Complex

This NAAQS site is located on the roof of the Pinal County Justice Court building. Eloy also lies in the agricultural basin of the County. A small business district to the north and south and residential homes to the east and west surround the site. The purpose of this site is to quantify PM_{10} concentrations affecting the surrounding population on a neighborhood scale.

This site replaced the Eloy City Complex site, which was approximately 300 yards to the south, in March 2007. On July 01, 2013 the high-volume monitor was replaced with a medium-volume PM_{10} monitor, method 098. The site currently consists of a 2000h PM_{10} monitor, which collects samples on a 1-in-6 day schedule.

The site meets 40 CFR Part 58 Appendix D and E criteria.

4.9 City of Maricopa County Complex

This NAAQS site is adjacent to the County Complex in the City of Maricopa. Maricopa lies about 15 miles south of the Phoenix urban area. Historically the area was a small residential area surrounded by pecan orchards, cattle feedlots, and open-field agriculture. In the early 2000s, a substantial number of additional subdivisions were built in every direction near the monitoring site. This site was used to quantify ozone concentrations and is currently used to quantify PM_{10} concentrations in the area. The ozone concentration at this site reflected both regional transport and neighborhood scale population exposure. The PM_{10} concentration at this site reflects neighborhood scale population exposure.

This site was installed in June of 2002 and ozone sampling began in July 2002, thus data for a portion of the 2002 ozone season are missing. The ozone monitor was operated seasonally. In December 2004 a PM_{10} TEOM unit was installed. PM_{10} data beginning January 2005 are included in the document.

In June of 2010 the shelter housing the ozone and TEOM equipment was moved approximately 50 yards from a location on the east side of the complex to a location on the south side of the complex. The move did not result in substantial changes in site exposure or pollutant concentrations, a change of address or a change in AQS site ID.

The ozone analyzer was discontinued May 18, 2011.

The site meets 40 CFR Part 58 Appendix D and E criteria.

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4.10 Pinal Air Park

This site is located at water well number two within the Pinal Air Park complex. Pinal Air Park lies about 20 miles northwest of Tucson, at the Pinal/Pima County line. The site is immediately surrounded by undisturbed desert on all sides with an industrial park and airport to the west. The purpose of this site is to quantify background PM_{10} concentrations and transport ozone concentrations on a regional scale. This site serves as a background PM_{10} site for the central and western portion of the county, which is dominated by agriculture and low elevations (generally around 1500 feet).

The site originally had a high-volume PM_{10} monitor that collected samples on a 1-in-6 day schedule and an ozone monitor that was operated seasonally. The ozone monitor was installed in June of 2002 to assess regional transport from the Tucson metropolitan area. Data collection from this ozone monitor did not begin until July of 2002, thus the data set for 2002 only includes a portion of the ozone season. The ozone monitor is currently operating year round. See Section 5.4 for additional details.

On June 7, 2012, a PM_{10} TEOM began operation in response to a recorded exceedance at the filter based PM_{10} monitor. The TEOM has continued to operate and is now considered a PM_{10} SLAMS monitor. See Section 5.2 for additional details.

On July 01, 2013 the high-volume monitor was replaced with a medium-volume PM_{10} 2000h monitor, method 098. At the end of 2014, the PM_{10} 2000h was shut down and the TEOM remained as the monitor of record at the site.

The site meets 40 CFR Part 58 Appendix D and E criteria.

4.11 Pinal County Housing Complex

This site is located within the Pinal County Housing Complex and is approximately 11 miles east of Casa Grande in the heart of the agricultural basin of the County. The site was installed in July 2002 to replace the Eleven Mile Corner site, which was approximately 1 mile to the south. The Pinal County Housing site better represents the PM_{10} impact on the surrounding population at the neighborhood scale since the site is adjacent to a subdivision. The site was originally located within a fenced area that houses the sewer lift station for the subdivision. The enclosure is immediately surrounded by native desert growth with active and retired agricultural areas beyond that in all directions. The County Housing subdivision lies southeast of the enclosure. A small dairy, two cotton gins, and the Pinal County Fairgrounds are approximately one mile to the south of the Pinal County Housing site. This site is impacted by several PM_{10} sources in the area, including cotton gins, fairground activity, unpaved roads and agricultural activity.

The site originally consisted of a high-volume PM_{10} monitor running on a 1-in-6 day schedule, a continuous PM_{10} TEOM, a wind system, and a relative humidity and temperature sensor. On January 1, 2004 a second high-volume PM_{10} monitor was installed to collect precision samples. This replaced the Apache Junction Maintenance Yard as the precision site in the network.

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During 2005 it was discovered that one of the high-volume PM_{10} monitors, PCH West, was not operating properly; the second high-volume monitor, PCH East, operated within specifications throughout this time period. The malfunctioning high-volume PM_{10} monitor was removed from service in July 2006. This particular unit had a quick connect device to secure the inlet that none of the other high-volume units operated by the District had. It appears this quick connect device deteriorated over time and was causing the unit to operate outside of the required specifications. Two Wedding high-volume units were installed at this site in July 2006 to collect precision samples.

In 2009 the site was moved approximately 20 yards to the south. A new fenced area and shelter were installed. The move did not result in substantial changes in site exposure or pollutant concentrations, a change of address or a change in AQS site ID.

In December of 2012 the meteorological system was upgraded. A new 10 m tower was installed and a new set of instruments was installed. Currently the site has a wind system, barometric pressure sensor and a temperature and relative humidity sensor.

On July 01, 2013 the TEOM was changed from an SPM to a SLAMS monitor and the high-volume monitors, which previously carried a SLAMS designation, were shut down.

The site meets 40 CFR Part 58 Appendix D and E criteria.

4.12 Stanfield County Complex

This site is located behind the Stanfield County Complex. Stanfield lies about 15 miles west of Casa Grande, and about 30 miles south of the Phoenix urban area. Residential homes surround the site on all sides, but the surrounding landscape is dominated by open-field agriculture. Sizeable feedlot and dairy operations lie about three miles to the north, east and west. The purpose of this site is to quantify PM_{10} concentrations affecting the surrounding population on a neighborhood scale.

Historically, the site consisted of a high-volume PM_{10} monitor, which collected samples on a 1-in-6 day schedule. In February 2006 a PM_{10} TEOM was installed at this site to collect continuous data. In April 2006 the Wedding high-volume monitor was replaced with a medium volume Andersen FRM monitor. The Andersen monitor was replaced with an FRM Partisol medium volume monitor in November 2007.

A time-lapse video system which was previously installed at the Cowtown Road site (described in section 4.7) was added to this site in July 2006. The new location allowed the camera to record an overall view of the dust events observed at the feedlots that are approximately three miles west of the site. The video system was removed from the site in September 2010.

On December 31, 2008 the PM_{10} Partisol monitor at Stanfield County Complex was replaced with the high-volume monitor from Casa Grande Downtown. On December 31, 2009 the PM_{10} high-volume monitor at Stanfield was discontinued and the PM_{10} TEOM was designated as a SLAMS monitor as of January 1, 2010.

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The site meets 40 CFR Part 58 Appendix D and E criteria.

4.13 Queen Valley

This site is located at the Queen Valley water tank. Queen Valley is approximately 16 miles southeast of Apache Junction and just south of the Superstition Wilderness Class I area. The site is on the south edge of Queen Valley and is surrounded by rugged terrain and native vegetation. The equipment at the site is owned and operated by ADEQ. This is an ADEQ SLAMS site which is part of the Photochemical Assessment Monitoring Station (PAMS) network that provides data regarding ozone transport from the Phoenix urban area. ADEQ operates instruments at this site to measure ozone, reactive nitrogen oxides (NOy), and PAMS volatile organic compounds (VOCs). ADEQ also operates wind, temperature and relative humidity sensors at the site. The ozone data from this site are included in Appendix B of this document because the site demonstrates ozone transport into Pinal County. Please refer to the State of Arizona Air Monitoring Network Plan for additional information.

Queen Valley is also the location for an Interagency Monitoring of Protected Visual Environments (IMPROVE) monitor. This monitor provides particulate matter and speciation data for assessing the impact of particulates on visibility at the nearby Superstition Wilderness Class I area. Historically Pinal County Air Quality served as the operator for the IMPROVE monitor. Due to budget cuts and personnel shortages primary responsibility for operations was returned to ADEQ on June 1, 2011.

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5.0 Proposed Changes to the Network

This section describes any new sites and/or equipment that Pinal County Air Quality plans to install and summarizes recent changes to the network.

5.1 Replacement of Three R&P 2000h's with 2025 $PM_{2.5}$ Monitors

EPA commented on the 2011 plan and noted a lack of a collocated site using filter-based monitors, method 145. To correct this, Pinal County proposed adding two medium-volume filter based $PM_{2.5}$ monitors, method 145 to the Cowtown Road site. The collocated 2025i monitors were installed in August 2014.

In addition EPA commented in their 2011 Network Plan review that the Casa Grande Downtown $PM_{2.5}$ site should be operating on a 1-in-3 day schedule. Pinal County had previously received permission from EPA in 2008 to operate on a 1-in-6 day schedule. In 2012 Pinal County requested funding for an additional 2025 monitor. The replacement monitor was installed in December 2014 and is operating on a 1-in-3 day sampling frequency in 2015.

5.2 Cowtown Road Site Relocation Study

During the fall of 2013 Pinal County was notified by the current landowner of the Cowtown Road site that they did not want to continue the current Pinal County use of the property. Pinal County negotiated a two year extension on the lease so that the Cowtown Road site can be relocated following EPA guidelines. The new lease extends use of the site through January 20, 2016.

As part of the relocation process, Pinal County is monitoring PM_{10} and $PM_{2.5}$ at two temporary sites (Hidden Valley and White and Parker) to find a suitable replacement site. Pinal County is planning to collect and analyze concurrent data for a period of one year, in coordination with EPA Region 9.

Pinal County has use agreements in place at the Hidden Valley and White and Parker sites, and began data collection in June 2014. At the conclusion of the data collection an evaluation will be conducted to determine the appropriate replacement site for Cowtown Road. All three sites (Cowtown Road, Hidden Valley and White and Parker) are equipped with PM_{10} and $PM_{2.5}$ E-BAM monitors, which were loaned to Pinal County by ADEQ and MCAQD. The Cowtown Road E-BAM monitors are operating on line power, while the other two sites are relying on solar panels and batteries to run the E-BAMs. This has resulted in data collection challenges during the winter months, when there is less sunlight to charge the batteries. Data collection began in June of 2014 and will conclude in June of 2015. At the conclusion of the field measurements a site selection process will begin that will determine the appropriate replacement for the Cowtown site.

5.3 Installation of $PM_{2.5}$ BAM at Casa Grande Downtown

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Pinal County installed a continuous $PM_{2.5}$ BAM 1020, method 170, at the Casa Grande Downtown site in November, 2013. The addition of this method is required by 40 CFR Part 58 Appendix D 4.1.7. Pinal County operated the continuous method for a one year period in 2014 and evaluated the monitor's performance. During 2014 the monitor was not considered a regulatory method for comparison to the applicable NAAQS. The monitor is considered a regulatory method beginning in 2015. See section 3.4 for additional details.

5.4 Re-installation of PM_{10} TEOM at Apache Junction Fire Station

A PM_{10} TEOM monitor was operated at the Apache Junction Fire Station in response to several exceedances recorded in 2011. The PM_{10} TEOM monitor and the high-volume monitor were both discontinued July 01, 2013 when they were replaced with a medium-volume PM_{10} monitor, method 098. The 1-in-6 day filter based 2000h PM_{10} monitor remained in place through the end of 2014. At the request of ADEQ and MAG, a TEOM 1400a was reinstalled at the site in order to support on-going compliance with the Phoenix-Mesa serious PM10 non-attainment area and to support exceptional event documentation. The installation of the instrument was discussed with and approved by the Pinal County Board of Supervisors. The TEOM began operation again on January 1, 2015.

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6.0 Data Trends

This section provides an overall description of the pollutant data currently collected and provides trends for O_3, PM_{10} and $PM_{2.5}$ in Pinal County. Appendix C of the document includes a complete data set for each NAAQS pollutant.

In order to discuss this information, it is necessary to clarify the dual meanings for the word exceedance. The common understanding is that an exceedance occurs whenever a value exceeds a reference value. However, for purposes of defining what constitutes a violation of several of the ambient air quality standards, relevant EPA regulations define exceedances as discrete events, and the various standards define a violation as respectively occurring when either the actual or the expected number of exceedances is greater than one per year.

In contrast, all other ambient air quality standards rely on numerical averaging to define what complies with or violates the standard. For those standards, a monitored value above the defined standard may contribute toward an average that violates the standard, but that monitored value does not constitute an exceedance in a regulatory sense.

In the case of the 8-hour ozone standard, the first three observed 8-hour concentrations above the standard reference value are not even considered for purposes of determining compliance, and only the fourth high value each year counts towards the calculated 3-year average that may violate the standard. This document will use the term excursion to denote values that are greater than a numerical averaging standard.

6.1 Carbon Monoxide

The largest source of carbon monoxide is vehicles, which produce the pollutant through the incomplete combustion of fuels. Elevated levels generally occur near major intersections where large numbers of vehicles pass through at a slow rate. Peak concentrations are generally recorded between November and February. This is caused by vehicles producing more carbon monoxide in cold weather and the inversion conditions at this time of year trapping a stable and stagnant layer of air near the earth's surface.

The carbon monoxide NAAQS has two forms: a 1-hour standard of 35 ppm, and an 8-hour standard of 9 ppm. Carbon monoxide monitoring was discontinued at the Apache Junction Maintenance Yard and Casa Grande Airport sites as of May 2002 and October 2002, respectively. Between 1996 and 2002, the highest 1-hour average recorded at either monitoring site was approximately 10% of the standard and the highest 8-hour average recorded was approximately 15% of the standard. Considering the relatively low concentrations and to better utilize resources, the carbon monoxide monitors were discontinued. If the NAAQS or conditions change and carbon monoxide monitoring is potentially required, Pinal County will evaluate the possibility of resuming data collection.

Refer to Section 1.0 for a detailed description of the carbon monoxide standards and Appendix C for data summaries.

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6.2 Ozone

Ozone can be found both as a natural component of the atmosphere and as a pollutant. The ozone layer located in the stratosphere, approximately 8 to 30 miles above the earth's surface, absorbs harmful ultraviolet radiation before it can reach the earth's surface. The ozone found at the earth's surface is a pollutant produced through chemical reactions that involve VOCs, nitrogen oxides, and sunlight. Sources of VOCs include vehicles and other gasoline powered motors, industrial processes, and biogenic emissions from plants. Sources of nitrogen oxides include vehicles, construction equipment, trains, electric power plants, industrial sources, and biogenic emissions from soil.

The official ozone season in Arizona, as defined by EPA, is January through December. Most ozone monitors in Arizona operate year round, however when reviewing historic ozone data it can be seen that the highest concentrations generally occur during the months of April through October when temperatures are highest. Refer to Section 1.0 for a detailed description of the ozone standards and Appendix C for 8-hour data summaries.

The 8-hour average ozone concentrations showed little change at all Pinal County monitoring sites in 2014. In general, the 8-hour average ozone concentrations have decreased over the long-term at the two sites with the greatest period of record, Apache Junction Maintenance Yard and Casa Grande Airport. Overall, 2009 was a low ozone year across all networks in Arizona.

Figure 6-1 shows the fourth highest 8-hour average concentrations recorded at Apache Junction Maintenance Yard, Casa Grande Airport, Queen Valley, and Pinal Air Park. Combs School and City of Maricopa County Complex ozone monitors were discontinued in 2011.

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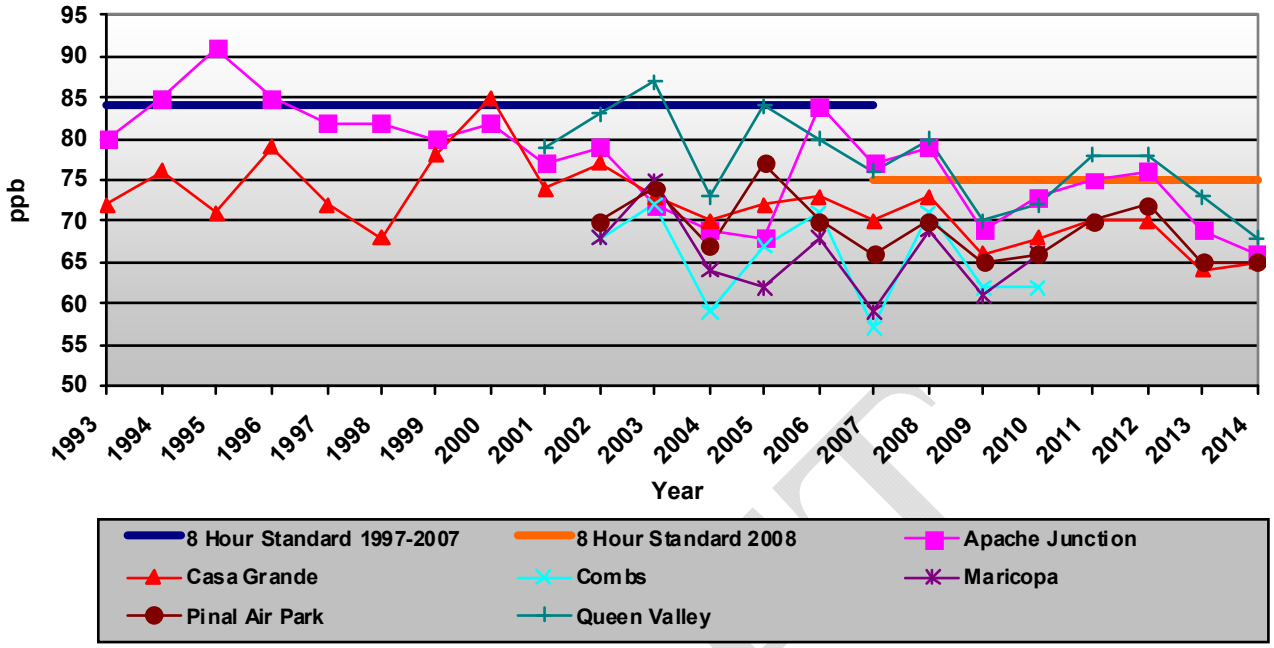
Figure 6-1: 8-Hour Ozone Trends – 4th Highest Concentrations



6.3 Particulate Matter Less Than or Equal to 10 Microns (PM_{10})

PM_{10} refers to airborne particles less than or equal to ten microns (1 micron = 10^{-4} centimeters) in diameter. PM_{10} can result from many sources, such as re-entrained dust from vehicles traveling on paved roads, vehicles traveling on unpaved roads, earth moving activities, bulk material handling, windblown dust, and combustion processes.

Refer to section 1.0 for a detailed description of the PM_{10} standards and Appendix C for a summary of PM_{10} data collected throughout Pinal County. The following subsections discuss the values, trends and contributing sources for each PM_{10} monitoring site.

An initial Pinal County Natural Events Action Plan (NEAP) was adopted in 1997. EPA guidance calls for a five-year review of such a plan. In 2002 Pinal County Air Quality proposed to renew the existing NEAP. Although EPA did not comment on the 1997 Pinal County NEAP, the EPA expressed a number of concerns as part of the review process in 2002. As a result of the review, the EPA informed Pinal County Air Quality that it would not approve a NEAP for the area at that time. The data included in this document invoke the 1997 NEAP in reporting data through the five-year anniversary date of December 5, 2002. However, none of the data collected after this date have been subjected to the 1997 NEAP.

In 2006 ADEQ initiated a NEAP program to identify regional windblown events, or natural events that resulted in elevated PM_{10} concentrations. Pinal County continuous PM_{10} TEOM data were reviewed as part of this process. When a regional windblown event was identified as a contributor to elevated PM_{10} concentrations or exceedances, the continuous TEOM data were submitted to the EPA Region 9 office for concurrence. The

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EPA did not concur that the 2006 Pinal County data should be flagged as natural events since Best Available Control Measures (BACM) were not implemented in Pinal County during this time period. The data presented in this document include all PM_{10} concentrations recorded in 2006; the natural events have not been removed.

In March of 2007 EPA replaced the NEAP with the Treatment of Data Influenced by Exceptional Events Rule. This new rule allows monitoring agencies to submit documentation to EPA that shows an exceedance would not have occurred "but for" the exceptional event. Pinal County Air Quality submitted Exceptional Events packages to EPA asking that 32 events from the 2007 PM_{10} data set and 16 events from the 2008 PM_{10} data set be excluded. EPA did not offer concurrence on the submittal. Events which have occurred after 2008 have been flagged in AQS.

This trend analysis and data summary tables includes all 2007 - 2014 PM_{10} exceedances except for the events that received EPA concurrence listed below. On May 6th, 2013 EPA did concur with multiple exceptional events submitted by ADEQ that included the Apache Junction Fire Station site. The concurred dates are on August 26, August 28, September 2, and November 4 of 2011. These dates are not included in the summary data for that site.

6.3.1 24-Hour PM_{10} Trends

Figures 6-2 and 6-3 illustrate different methods for discerning trends in 24-hour PM_{10} concentrations. See Appendix C for the complete PM_{10} data tables. The annual expected exceedance rate shown in Figure 6-2 is calculated based on the number of 24-hour concentrations collected by site for each year. For sites with continuous TEOM monitors, the expected exceedance rate is equal to the actual exceedance rate because concentrations are expected to be collected for each day of the year. For filter-based monitors that operate less than every day, the expected exceedance rate is calculated based on a ratio of the number of actual 24-hour periods collected to the maximum number of 24-hour periods in each year. To be in compliance with the NAAQS, the 3-year average of the annual expected exceedance rate must be ≤ 1.

The annual expected exceedance rate shows a better illustration of long-term trends than the maximum 24-hour PM_{10} concentrations for sites that often exceed the PM_{10} standard. Maximum 24-hour PM_{10} concentrations typically vary from year to year because they result from local sources or high wind events.

Figure 6-2 illustrates trends in the annual expected exceedance rate for 24-hour average PM_{10} values collected throughout Pinal County with continuous monitors. It is evident from the illustration that each of these sites has recorded 24-hour average concentrations in excess of the PM_{10} standard of 150 $\mu g/m^3$. Note that for 2007-2014 days flagged as exceptional events by Pinal County were not removed from the data set. The overall trend over time in annual expected exceedance rate is lower for each of the continuous monitoring sites.

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Figure 6-2 Annual Expected Exceedance Rate – All Continuous Monitors

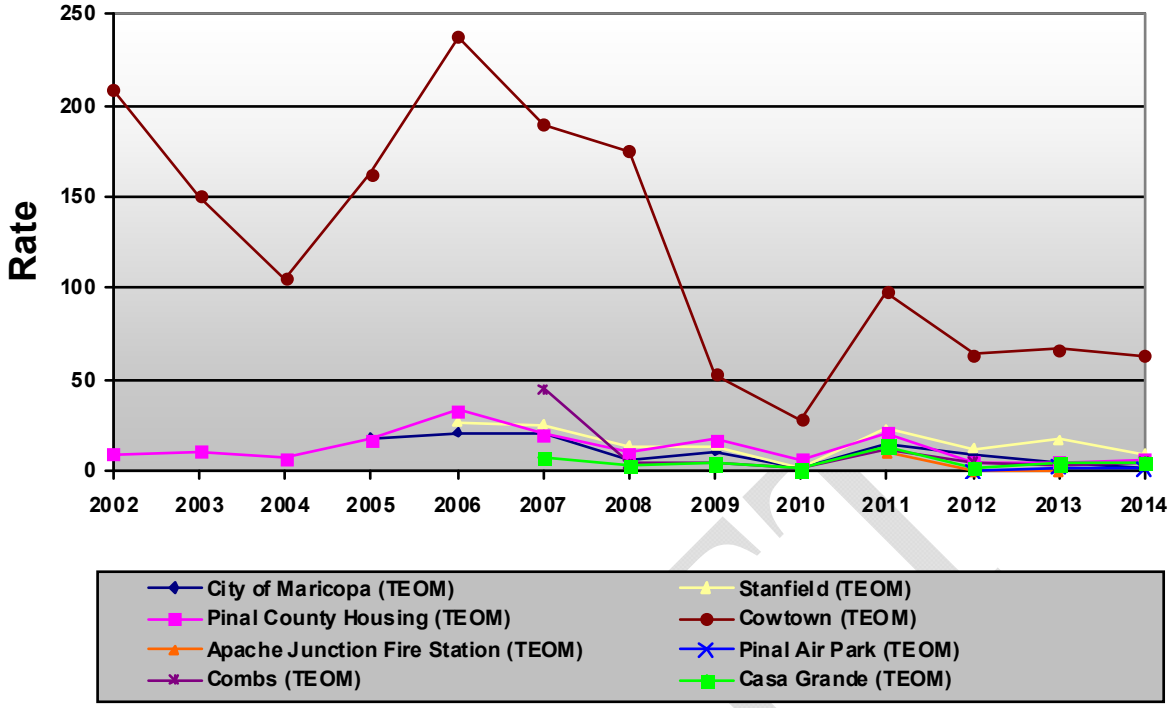

Figure 6-3 shows the maximum 24-hour concentration trends for Pinal County's filter based PM_{10} monitor sites. This graphic gives a better illustration of trends, since the annual expected exceedance rate would be equal to zero (0) for most years at these sites. Eloy County Complex, Coolidge Maintenance Yard, Apache Junction Fire Station, and Pinal Air Park have historically remained below the standard.

In 2011 the first 24-hour PM_{10} exceedance ever recorded for the Apache Junction Fire Station site prompted the installation of a PM_{10} TEOM continuous monitor in August 2011 (TEOM was discontinued in 2014, reinstalled in 2015). In 2012 Pinal Air Park had the first exceedance ever recorded for the site which prompted the installation of a PM_{10} TEOM continuous monitor. In 2014 most sites had relatively similar readings to 2013. Apache Junction Fire Station, Coolidge Maintenance Yard, and Eloy County Complex decreased slightly while Pinal Air Park increased. Pinal County Housing Complex filter based monitors were no longer operating in 2014. For 2015, Coolidge Maintenance Yard and Eloy County Complex are the only remaining PM_{10} filter based sites. Both of these sites have an annual expected exceedance rate of zero for 2014.

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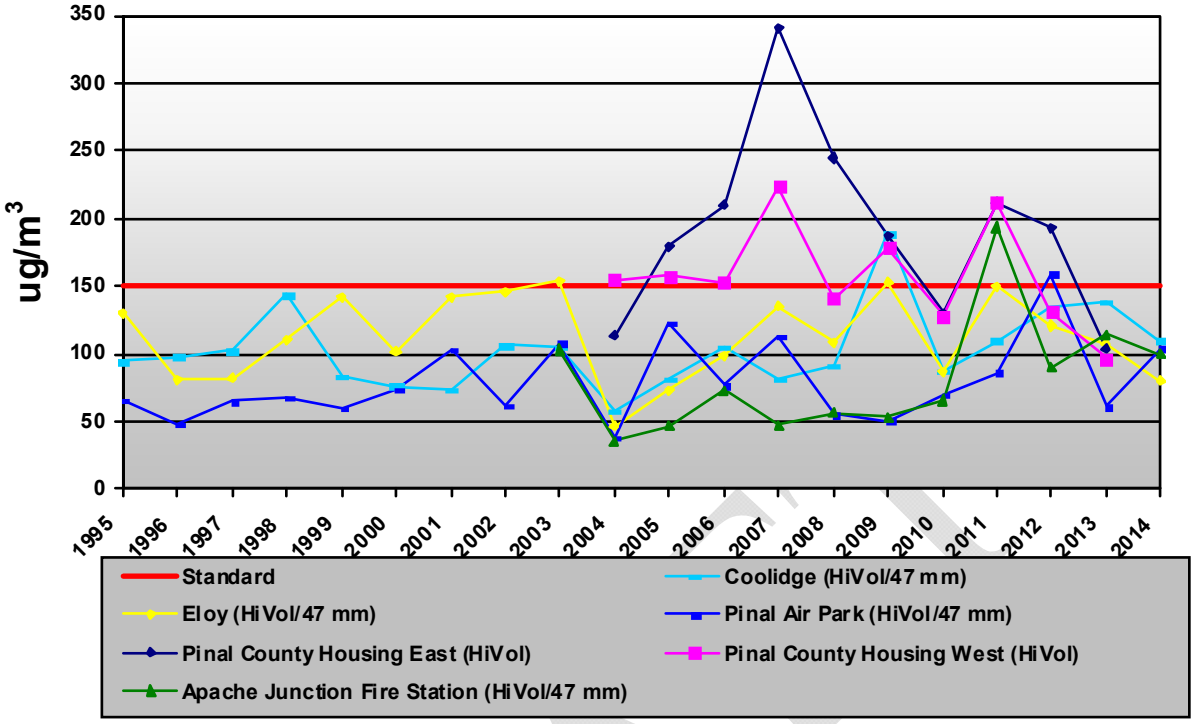
Figure 6-3: Maximum 24-Hour PM_{10} Concentration - Filter Based Sites



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6.4 Particulate Matter Less Than or Equal to 2.5 Microns ($PM_{2.5}$)

$PM_{2.5}$ refers to airborne particles less than or equal to 2.5 microns (1 micron = 10^{-4} centimeters) in diameter. $PM_{2.5}$ generally results from the combustion of fuels in motor vehicles, power generation, industrial processes, and from burning wood in residential fireplaces. Refer to Section 1.0 for a detailed description of the $PM_{2.5}$ standards and Appendix C for a summary of $PM_{2.5}$ data collected throughout Pinal County.

Special considerations for comparing $PM_{2.5}$ data to the standard are described at 40 CFR 58.30. The regulation states that $PM_{2.5}$ sites with unique middle-scale or micro-scale representation and hot-spot sites are only eligible for comparison to the 24-hour $PM_{2.5}$ standard. The Cowtown Road site is characterized as a local hot spot site according to this definition and can only be used for comparison to the 24-hour $PM_{2.5}$ standard.

6.4.1 $PM_{2.5}$ 24-Hour Trends

Figure 6-4 illustrates the 98th percentile $PM_{2.5}$ values collected at Apache Junction Fire Station, Casa Grande Downtown, and Cowtown Road. It is evident from the illustration that the Apache Junction Fire Station and Casa Grande Downtown sites are typically below the standard over the period of record. Both sites show a historical concentration range between 9 and 27 µg/m^3. The significant increase in the Apache Junction Fire Station 2011 concentration is related to a series of exceptionally strong thunderstorms July 5th thru July 8th where the monitor recorded two consecutive run days above the standard. The Apache Junction Fire Station three year average of the 98th percentile value is still well below the standard at 12.8 µg/m^3. The 24-hour values at Casa Grande Downtown are typically higher than Apache Junction Fire Station by approximately 25%.

The Cowtown Road site shows values above 35 µg/m^3 for the first four years of operation followed by the 2009 24-hour 98th percentile value falling below 35 µg/m^3. The three year average of the 98th percentile value dropped from 61 µg/m^3 in 2007, to 40 µg/m^3 in 2009, to below the standard in 2010 at 31 µg/m^3 and remained below the standard at 27.5 µg/m^3 in 2012. In 2013 Apache Junction and Casa Grande concentrations continued to decline while the Cowtown Road site had its highest concentration since 2007. Some of the high values can be attributed to the numerous thunderstorm generated dust storms that impacted the county. Even with the elevated concentration in 2013, the three year average remained below the standard at 32.4 µg/m^3 and met the $PM_{2.5}$ 24-hour NAAQS. However, in 2014 the 98th percentile value increased to 36.8 µg/m^3 and the three year average of the 98th percentile value increased to 35.6 µg/m^3 which is above the NAAQS.

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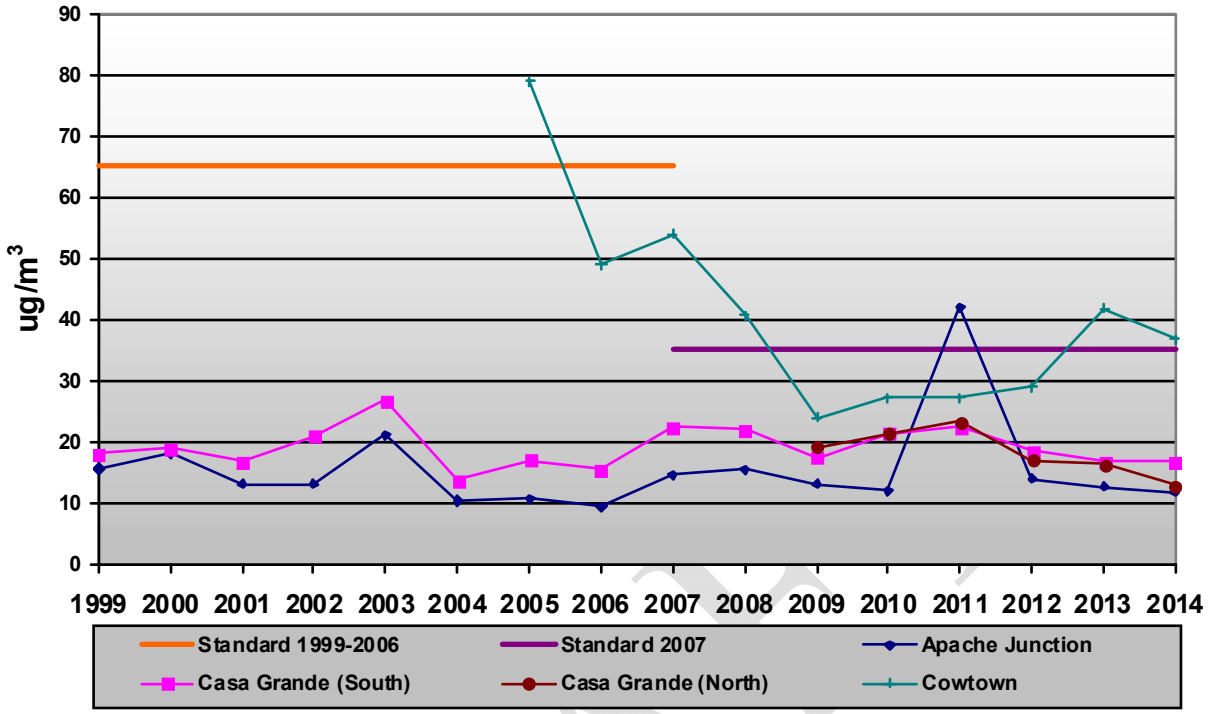
Figure 6-4: Network-Wide 24-Hour 98th Percentile $PM_{2.5}$ Trends



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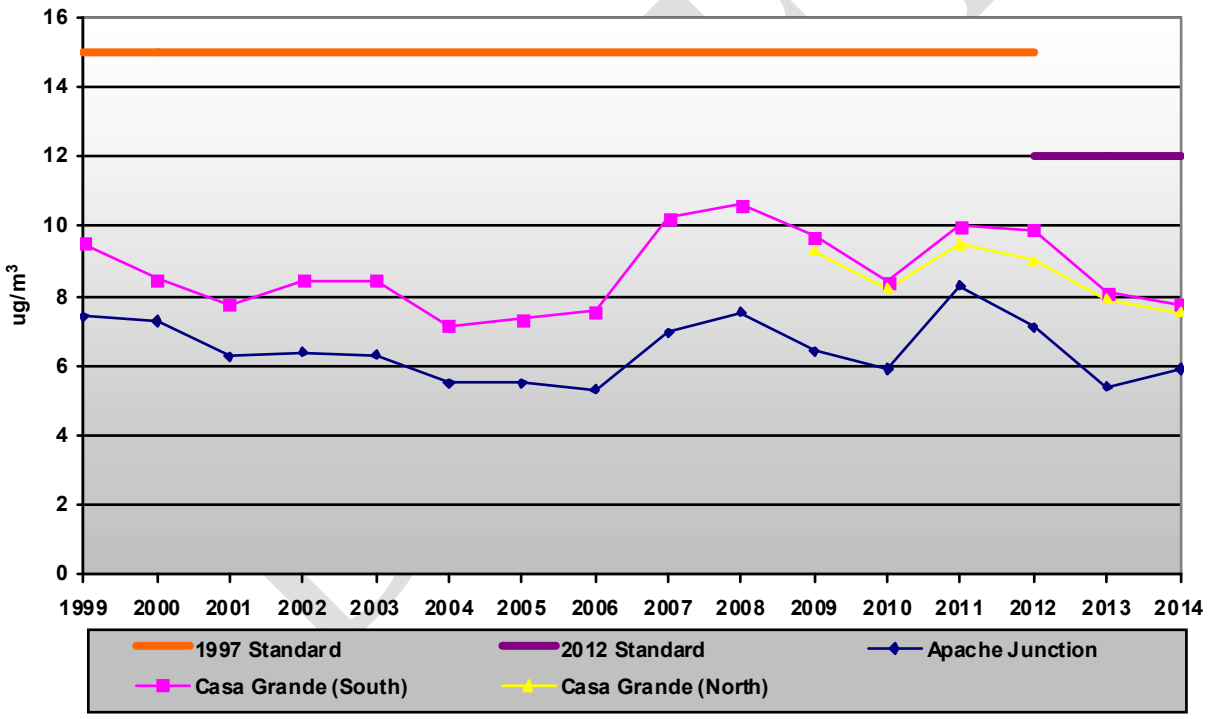
6.4.2 $PM_{2.5}$ Annual Trends

Figure 6-5 illustrates annual average $PM_{2.5}$ values collected at Apache Junction Fire Station and Casa Grande Downtown. Both sites show concentrations with a range between 5 and 11 µg/m^3. Concentrations trended downward starting in 2008 with a low in 2010 which was associated with a rainy spring pattern. From 2010 the concentration trended upward in 2011 primarily due to dust outflows associated with an above average summer thunderstorm season. 2012 to 2014 has generally shown a slight downward trend. As was seen in the 24-hour averages, the values at Casa Grande Downtown are typically higher than Apache Junction Fire Station by approximately 25%. Both sites remain below the 2012 annual standard of 12 µg/m^3.

As described in the introduction to this section, Cowtown Road is not comparable to the annual standard.

Figure 6-5: Network-Wide Annual Average $PM_{2.5}$ Trends



Appendix A

Acronyms & Abbreviations

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Acronyms & Abbreviations used in this document

AADT	Average Annual Daily Traffic
AQS	Air Quality System
ADEQ	Arizona Department of Environmental Quality
ARM	Approved Regional Method
ARS	Arizona Revised Statutes
BACM	Best Available Control Measures
BAM	Beta Attenuation Monitor
BLM	Bureau of Land Management
CAA	Clean Air Act
CARB	California Air Resources Board
CASAC	Clean Air Scientific Advisory Committee
CBSA	Core Based Statistical Area
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CSA	Combined Statistical Area
DV	Design Value
EPA	Environmental Protection Agency
FDMS	Filter Dynamics Measurement System
FEM	Federal Equivalent Method
FRM	Federal Reference Method
GPS	Global Positioning System
HiVol	High-volume PM_{10} monitor
IMPROVE	Interagency Monitoring of Protected Visual Environments
MCAQD	Maricopa County Air Quality Department
MET	Meteorological
MOU	Memorandum of Understanding
MSA	Metropolitan Statistical Area
N/A	Not Applicable
NAAQS	National Ambient Air Quality Standards
NCore	National Core
NEAP	Natural Events Action Plan
NEI	National Emissions Inventory
NIST	National Institute of Standards and Technology
NO_2	Nitrogen Dioxide
NOy	Reactive nitrogen oxides
NPAP	National Performance Audit Program
O_3	Ozone
PAMS	Photochemical Assessment Monitoring Station
Pb	Lead
PCAQCD	Pinal County Air Quality Control District
PEP	Performance Evaluation Program
PM	Particulate Matter
PM_{10}	Particulate Matter less than or equal to 10 microns
$PM_{2.5}$	Particulate Matter less than or equal to 2.5 microns
POC	Parameter Occurrence Code
ppm	parts per million
ppb	parts per billion

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PQAO	Primary Quality Assurance Organization
PSD	Prevention of Significant Deterioration
QAPP	Quality Assurance Project Plan
QC	Quality Control
RACM	Reasonably Available Control Methods
RFP	Reasonable Further Progress
R&P	Rupprecht and Patashnick
SIP	State Implementation Plan
SLAMS	State and Local Air Monitoring Stations
SO_2	Sulfur Dioxide
SOP	Standard Operating Procedure
SPM	Special Purpose Monitor
TEOM	Tapered Element Oscillating Microbalance
tpy	tons per year
TSA	Technical Systems Audit
TSP	Total Suspended Particulate
$\mu g/m^3$	micrograms per cubic meter
VOC	Volatile Organic Compound

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Appendix B

PCAQCD Monitoring Site Descriptions

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All sites in this appendix have the following common characteristics, with the exception of Queen Valley:

Table B-1 Common Site Information

Parameter	Description
Representative statistical area name	Phoenix-Mesa-Scottsdale MSA (Pinal Portion)
Collecting Agency	PCAQCD
Reporting Agency	PCAQCD
Analytical Lab for filter sites	PCAQCD
Basic Monitoring Objective	NAAQS

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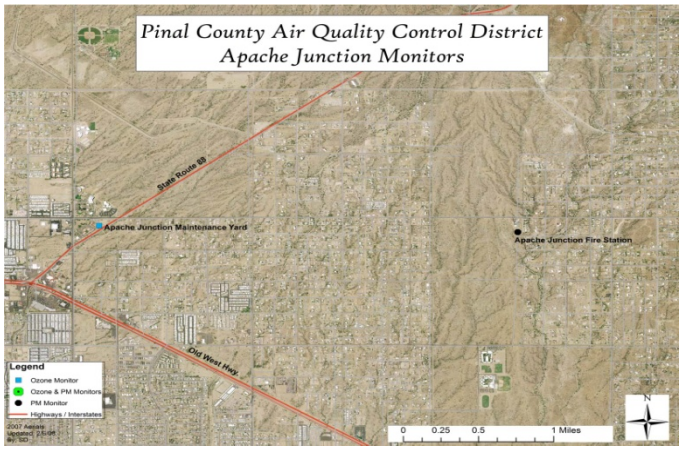
Apache Junction Fire Station – AJFS



Apache Junction Fire Station is comparable to the 24-hour and annual $PM_{2.5}$ NAAQS.

Local site name	Apache Junction Fire Station (AJFS)	
AQS ID (XX-XXX-XXXX)	04-021-3002	
GPS coordinates (decimal degrees)	33.421194, -111.503222	
Street Address	3955 E Superstition Blvd TE, Apache Junction, AZ	
County	Pinal	
Distance to roadways (meters)[1]	36.6 m (Arroya Rd)	
Traffic count (AADT, year)[1]	17 cars per day (estimated)	
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Gravel, vegetative	
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA	
Pollutant, POC	$PM_{2.5}$, 1	PM_{10}, 3
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary	Primary
Parameter code[2]	88101	81102
Basic monitoring objective(s) [3]	NAAQS	NAAQS
Site type(s)[4]	Population	Population
Monitor type[5]	SLAMS	SLAMS
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none	none
Instrument manufacturer and model	R&P 2025i	R&P TEOM 1400a
Method code[7]	145	079
FRM/FEM/ARM/other	FRM	FEM
Collecting Agency	PCAQCD	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	PCAQCD	N/A
Reporting Agency	PCAQCD	PCAQCD
Spatial scale (e.g. micro, neighborhood)[8]	Neighborhood	Neighborhood
Monitoring start date (MM/DD/YYYY)	01/06/1999	08/20/2011
Current sampling frequency (e.g. 1:3, continuous)	1:3	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	1:3 excluding exceptional events	Continuous
Sampling season (MM/DD-MM/DD)	01/01-12/31	01/01-12/31
Probe height (meters)	3.7	3.5
Distance from supporting structure (meters)	2.2	1.9

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Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from trees (meters)	21.3	18.9
Distance to furnace or incinerator flue (meters)	N/A	N/A
Distance between monitors fulfilling a QA collocation requirement (meters).	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A	N/A
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	Y	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	monthly	N/A
Frequency of flow rate verification for automated PM analyzers [10]	N/A	monthly
Frequency of one-point QC check for gaseous instruments [10]	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	01/22/2014, 07/24/2014	N/A

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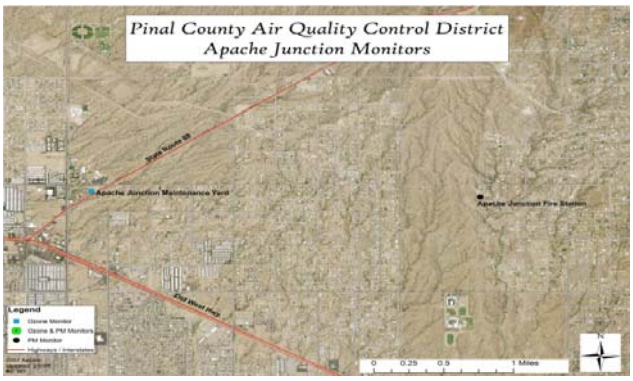
Apache Junction Maintenance Yard -AJMY



Local site name	Apache Junction Maintenance Yard (AJ)	
AQS ID (XX-XXX-XXXX)	04-021-3001	
GPS coordinates (decimal degrees)	33.4214, -111.5436	
Street Address	305 E. Superstition Blvd., Apache Junction, AZ	
County	Pinal	
Distance to roadways (meters)[1]	35 m (SR 88)	
Traffic count (AADT, year)[1]	4332 (2013, ADOT)	
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Gravel	
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA	
Pollutant, POC	O_3, 1	Wind
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	N/A	N/A
Parameter code[2]	44201	N/A
Basic monitoring objective(s) [3]	NAAQS	N/A
Site type(s)[4]	Population	N/A
Monitor type[5]	SLAMS	N/A
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none	none
Instrument manufacturer and model	API 400E	RM Young 05305 AQ
Method code[7]	087	N/A
FRM/FEM/ARM/other	FEM	other
Collecting Agency	PCAQCD	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	N/A	N/A
Reporting Agency	PCAQCD	N/A
Spatial scale (e.g. micro, neighborhood)[8]	Neighborhood	N/A
Monitoring start date (MM/DD/YYYY)	05/13/1992	1993
Current sampling frequency (e.g. 1:3, continuous)	Continuous	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	Continuous	N/A
Sampling season (MM/DD-MM/DD)	01/01-12/31	01/01-12/31
Probe height (meters)	3.5	10 (wind)
Distance from supporting structure (meters)	1	10 (wind)
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	Building – 5 m SW, 4 m above probe	Building – 5 m SW, 4 m above probe
Distance from trees (meters)	23.5	23.5
Distance to furnace or incinerator flue (meters)	N/A	N/A

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Distance between monitors fulfilling a QA collocation requirement (meters).	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	Glass, Teflon	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	5.7 (with 20 ft sampling tube)	N/A
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	N/A	N/A
Frequency of flow rate verification for automated PM analyzers [10]	N/A	N/A
Frequency of one-point QC check for gaseous instruments [10]	bi-weekly	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	07/24/2014	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	N/A

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Casa Grande Airport - CGA

Local site name	Casa Grande Airport (CGA)
AQS ID (XX-XXX-XXXX)	04-021-3003
GPS coordinates (decimal degrees)	32.954361, -111.76225
Street Address	660 W Aero Dr, Casa Grande, AZ
County	Pinal
Distance to roadways (meters)[1]	494 m (SR 387)
Traffic count (AADT, year)[1]	20,301 (2013, ADOT)
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Paved
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA
Pollutant, POC	O_3, 1
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	N/A
Parameter code[2]	44201
Basic monitoring objective(s) [3]	NAAQS
Site type(s)[4]	Population/Regional Transport
Monitor type[5]	SLAMS
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none
Instrument manufacturer and model	API 400E
Method code[7]	087
FRM/FEM/ARM/other	FEM
Collecting Agency	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	N/A
Reporting Agency	PCAQCD
Spatial scale (e.g. micro, neighborhood)[8]	Regional
Monitoring start date (MM/DD/YYYY)	05/01/1992
Current sampling frequency (e.g. 1:3, continuous)	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	Continuous
Sampling season (MM/DD-MM/DD)	01/01-12/31
Probe height (meters)	4.1
Distance from supporting structure (meters)	1
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A
Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	Tower – 6 m N, 14 m above probe
Distance from trees (meters)	15

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Distance to furnace or incinerator flue (meters)	N/A
Distance between monitors fulfilling a QA collocation requirement (meters).	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	Glass, Teflon
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	5.9 (with 20 ft sampling tube)
Will there be changes within the next 18 months? (Y/N)	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	N/A
Frequency of flow rate verification for automated PM analyzers [10]	N/A
Frequency of one-point QC check for gaseous instruments [10]	bi-weekly
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	04/10/2014
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A

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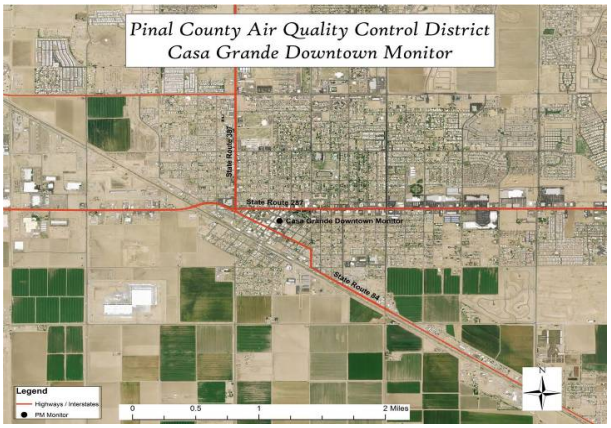
Casa Grande Downtown – CGD



Casa Grande Downtown is comparable to the 24-hour and annual $PM_{2.5}$ NAAQS.

Local site name	Casa Grande Downtown (CGD)	
AQS ID (XX-XXX-XXXX)	04-021-0001	
GPS coordinates (decimal degrees)	32.877583, -111.752222	
Street Address	401 Marshall St, Casa Grande, AZ	
County	Pinal	
Distance to roadways (meters)[1]	18.4 m (Marshall)	
Traffic count (AADT, year)[1]	3777 (2010, City of Casa Grande)	
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Paved	
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA	
Pollutant, POC	$PM_{2.5}$, 1	$PM_{2.5}$, 3
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10\text{-}2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary	QA Collocated
Parameter code[2]	88101	88101
Basic monitoring objective(s) [3]	NAAQS	NAAQS
Site type(s)[4]	Population	Population
Monitor type[5]	SLAMS	SLAMS
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none	none
Instrument manufacturer and model	R&P 2025a	Met One BAM 1020
Method code[7]	145	170
FRM/FEM/ARM/other	FRM	FEM
Collecting Agency	PCAQCD	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	PCAQCD	N/A
Reporting Agency	PCAQCD	PCAQCD
Spatial scale (e.g. micro, neighborhood)[8]	Neighborhood	Neighborhood
Monitoring start date (MM/DD/YYYY)	01/01/2009	01/01/2015
Current sampling frequency (e.g. 1:3, continuous)	1:3	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	1:3	Continuous
Sampling season (MM/DD-MM/DD)	01/01-12/31	01/01-12/31
Probe height (meters)	6.1	6.2
Distance from supporting structure (meters)	1.4	1.2
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A

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Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from trees (meters)	21.3	24
Distance to furnace or incinerator flue (meters)	Furnace flue 5.1 m S	Furnace flue 9.1 m S
Distance between monitors fulfilling a QA collocation requirement (meters).	5.8	5.8
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A	N/A
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	Y	Y
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	monthly	N/A
Frequency of flow rate verification for automated PM analyzers [10]	N/A	monthly
Frequency of one-point QC check for gaseous instruments [10]	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	01/22/2014, 07/24/2014 (when at AJFS site)	04/24/2014, 10/15/2014

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Casa Grande Downtown continued

Local site name	Casa Grande Downtown (CGD)
AQS ID (XX-XXX-XXXX)	04-021-0001
GPS coordinates (decimal degrees)	32.877583, -111.752222
Street Address	401 Marshall St, Casa Grande, AZ
County	Pinal
Distance to roadways (meters)[1]	18.4 m (Marshall)
Traffic count (AADT, year)[1]	3777 (2010, City of Casa Grande)
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Paved
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA
Pollutant, POC	PM_{10}, 3
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary
Parameter code[2]	81102
Basic monitoring objective(s) [3]	NAAQS
Site type(s)[4]	Population
Monitor type[5]	SLAMS
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none
Instrument manufacturer and model	R&P TEOM 1400a
Method code[7]	079
FRM/FEM/ARM/other	FEM
Collecting Agency	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	N/A
Reporting Agency	PCAQCD
Spatial scale (e.g. micro, neighborhood)[8]	Neighborhood
Monitoring start date (MM/DD/YYYY)	03/30/2007
Current sampling frequency (e.g. 1:3, continuous)	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	Continuous
Sampling season (MM/DD-MM/DD)	01/01-12/31
Probe height (meters)	6.1
Distance from supporting structure (meters)	0.36
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A
Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A
Distance from trees (meters)	24.8
Distance to furnace or incinerator flue (meters)	Furnace flue 11 m S
Distance between monitors fulfilling a QA collocation requirement (meters).	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A

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Will there be changes within the next 18 months? (Y/N)	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	N/A
Frequency of flow rate verification for automated PM analyzers [10]	monthly
Frequency of one-point QC check for gaseous instruments [10]	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	04/09/2014, 10/15/2014

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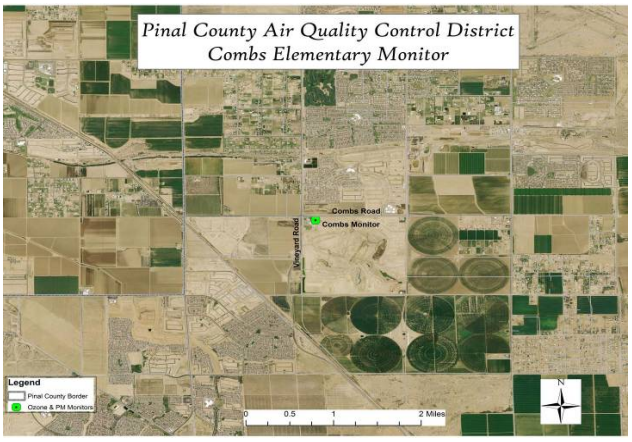
Combs School (CB)



Local site name	Combs School (CB)
AQS ID (XX-XXX-XXXX)	04-021-3009
GPS coordinates (decimal degrees)	33.219111, -111.561111
Street Address	301 E Combs Rd, Queen Creek, AZ
County	Pinal
Distance to roadways (meters)[1]	89.5 m (Combs Rd)
Traffic count (AADT, year)[1]	11,991 (2013, Pinal County)
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Paved, dirt
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA
Pollutant, POC	PM_{10}, 3
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary
Parameter code[2]	81102
Basic monitoring objective(s) [3]	NAAQS
Site type(s)[4]	Population
Monitor type[5]	SLAMS
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none
Instrument manufacturer and model	R&P TEOM 1400a
Method code[7]	079
FRM/FEM/ARM/other	FEM
Collecting Agency	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	N/A
Reporting Agency	PCAQCD
Spatial scale (e.g. micro, neighborhood)[8]	Neighborhood
Monitoring start date (MM/DD/YYYY)	03/21/2007
Current sampling frequency (e.g. 1:3, continuous)	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	Continuous
Sampling season (MM/DD-MM/DD)	01/01-12/31
Probe height (meters)	4.7
Distance from supporting structure (meters)	2.1
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A

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Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	Building – 7.2 m N, 4 m above probe
Distance from trees (meters)	22.9
Distance to furnace or incinerator flue (meters)	N/A
Distance between monitors fulfilling a QA collocation requirement (meters).	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A
Will there be changes within the next 18 months? (Y/N)	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	N/A
Frequency of flow rate verification for automated PM analyzers [10]	monthly
Frequency of one-point QC check for gaseous instruments [10]	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	04/15/2014, 10/21/2014

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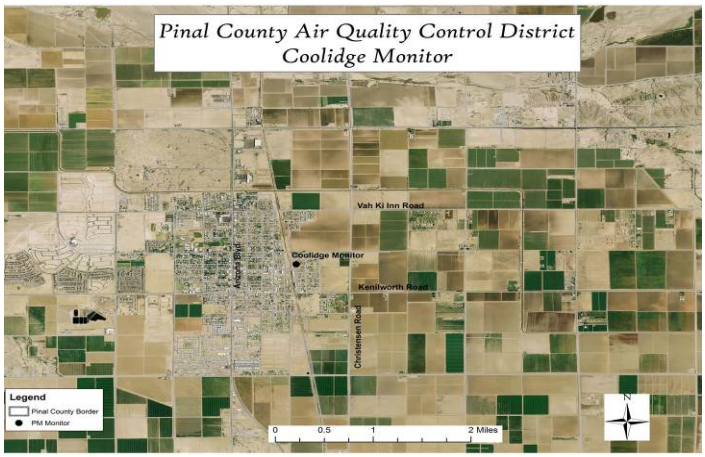
Coolidge Maintenance Yard – CLDG



Local site name	Coolidge Maintenance Yard (CLDG)	
AQS ID (XX-XXX-XXXX)	04-021-3004	
GPS coordinates (decimal degrees)	32.978556, -111.514833	
Street Address	212 E Broadway, Coolidge, AZ	
County	Pinal	
Distance to roadways (meters)[1]	8.8 m (Pacific St)	
Traffic count (AADT, year)[1]	164 cars per day (estimated)	
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Gravel, vegetative	
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA	
Pollutant, POC	PM_{10}, 1	PM_{10}, 2
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary	QA Collocated
Parameter code[2]	81102	81102
Basic monitoring objective(s) [3]	NAAQS	NAAQS
Site type(s)[4]	Population	Population
Monitor type[5]	SLAMS	SLAMS
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none	none
Instrument manufacturer and model	R&P 2000h	R&P 2000h
Method code[7]	098	098
FRM/FEM/ARM/other	FRM	FRM
Collecting Agency	PCAQCD	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	PCAQCD	PCAQCD
Reporting Agency	PCAQCD	PCAQCD
Spatial scale (e.g. micro, neighborhood)[8]	Neighborhood	Neighborhood
Monitoring start date (MM/DD/YYYY)	04/30/1992	07/01/2013
Current sampling frequency (e.g. 1:3, continuous)	1:6	1:6
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	1:6	1:6
Sampling season (MM/DD-MM/DD)	01/01-12/31	01/01-12/31
Probe height (meters)	3.5	3.5
Distance from supporting structure (meters)	1.9	1.9
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from obstructions not on roof. Include horizontal distance +	Building – 6.7 m NE,	Building – 6.5 m NE,

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vertical height above probe for obstructions nearby. (meters)	3.2 m above probe	3.2 m above probe
Distance from trees (meters)	100 (estimated)	100 (estimated)
Distance to furnace or incinerator flue (meters)	N/A	N/A
Distance between monitors fulfilling a QA collocation requirement (meters).	1.3	1.3
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A	N/A
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	monthly	monthly
Frequency of flow rate verification for automated PM analyzers [10]	N/A	N/A
Frequency of one-point QC check for gaseous instruments [10]	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	04/09/2014, 10/21/2014	04/09/2014, 10/21/2014

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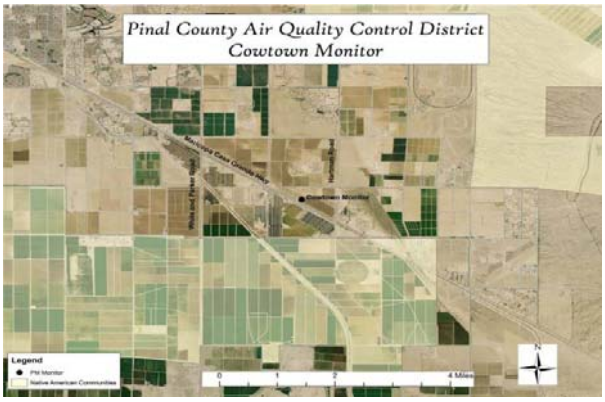
Cowtown Road – CWTN



Cowtown Road is comparable to the 24-hour $PM_{2.5}$ NAAQS

Local site name	Cowtown Road (CWTN)	
AQS ID (XX-XXX-XXXX)	04-021-3013	
GPS coordinates (decimal degrees)	33.01053, -111.97205	
Street Address	37580 W Maricopa-Casa Grande Hwy, Maricopa, AZ	
County	Pinal	
Distance to roadways (meters)[1]	53.6 m (SR 238)	
Traffic count (AADT, year)[1]	4534 (2013, ADOT)	
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Gravel, vegetative	
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA	
Pollutant, POC	$PM_{2.5}$, 1	$PM_{2.5}$, 2
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary	QA Collocated
Parameter code[2]	88101	88101
Basic monitoring objective(s) [3]	NAAQS	NAAQS
Site type(s)[4]	Highest concentration / source oriented	Highest concentration / source oriented
Monitor type[5]	SLAMS	SLAMS
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none	none
Instrument manufacturer and model	R&P 2025i	R&P 2025i
Method code[7]	145	145
FRM/FEM/ARM/other	FRM	FRM
Collecting Agency	PCAQCD	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	PCAQCD	PCAQCD
Reporting Agency	PCAQCD	PCAQCD
Spatial scale (e.g. micro, neighborhood)[8]	Middle	Middle
Monitoring start date (MM/DD/YYYY)	08/14/2005	01/01/2012
Current sampling frequency (e.g. 1:3, continuous)	1:3	1:6
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	1:3 excluding exceptional events	1:6
Sampling season (MM/DD-MM/DD)	01/01-12/31	01/01-12/31
Probe height (meters)	3.4	3.4
Distance from supporting structure (meters)	1.4	1.4
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A

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Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from trees (meters)	100 (estimated)	100 (estimated)
Distance to furnace or incinerator flue (meters)	N/A	N/A
Distance between monitors fulfilling a QA collocation requirement (meters).	1	1
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A	N/A
Will there be changes within the next 18 months? (Y/N)	Y	Y
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N	N
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	monthly	monthly
Frequency of flow rate verification for automated PM analyzers [10]	N/A	N/A
Frequency of one-point QC check for gaseous instruments [10]	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	01/14/2014, 07/15/2014	01/14/2014, 07/15/2014

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Cowtown Road continued:

Local site name	Cowtown Road (CWTN)	
AQS ID (XX-XXX-XXXX)	04-021-3013	
GPS coordinates (decimal degrees)	33.01053, -111.97205	
Street Address	37580 W Maricopa-Casa Grande Hwy, Maricopa, AZ	
County	Pinal	
Distance to roadways (meters)[1]	53.6 m (SR 238)	
Traffic count (AADT, year)[1]	4534 (2013, ADOT)	
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Gravel, vegetative	
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA	
Pollutant, POC	PM_{10}, 3	Wind/Temp/RH
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary	N/A
Parameter code[2]	81102	N/A
Basic monitoring objective(s) [3]	NAAQS	N/A
Site type(s)[4]	Highest concentration / source oriented	N/A
Monitor type[5]	SPM	N/A
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none	none
Instrument manufacturer and model	R&P TEOM 1400a	RM Young 05305 AQ; Vaisala HMP 35C/PTA427
Method code[7]	079	N/A
FRM/FEM/ARM/other	FEM	other
Collecting Agency	PCAQCD	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	N/A	N/A
Reporting Agency	PCAQCD	N/A
Spatial scale (e.g. micro, neighborhood)[8]	Middle	N/A
Monitoring start date (MM/DD/YYYY)	11/01/2001	2002
Current sampling frequency (e.g. 1:3, continuous)	Continuous	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	Continuous	N/A
Sampling season (MM/DD-MM/DD)	01/01-12/31	01/01-12/31
Probe height (meters)	3.2	3.5 (wind); 2.9 (T, RH)
Distance from supporting structure (meters)	1.1	3.5
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from trees (meters)	100 (estimated)	100 (estimated)
Distance to furnace or incinerator flue (meters)	N/A	N/A
Distance between monitors fulfilling a QA collocation requirement (meters).	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A	N/A

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Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A	N/A
Will there be changes within the next 18 months? (Y/N)	Y	Y
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	N/A	N/A
Frequency of flow rate verification for automated PM analyzers [10]	monthly	N/A
Frequency of one-point QC check for gaseous instruments [10]	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	01/14/2014, 07/15/2014	N/A

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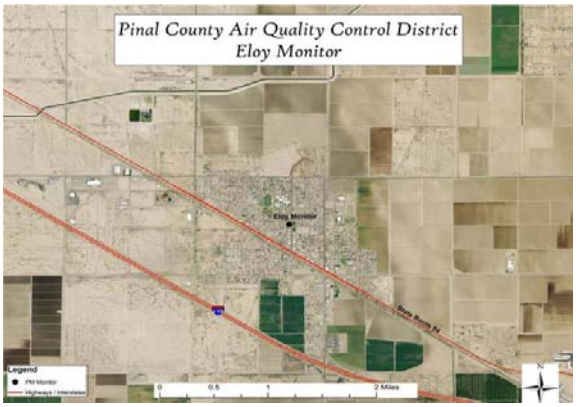
Eloy County Complex - ELY



Local site name	Eloy County Complex (ELY)
AQS ID (XX-XXX-XXXX)	04-021-3014
GPS coordinates (decimal degrees)	32.757639, -111.554861
Street Address	801 N Main St, Eloy, AZ
County	Pinal
Distance to roadways (meters)[1]	31 m (Main St)
Traffic count (AADT, year)[1]	2586 (2007, City of Eloy)
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Paved
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA
Pollutant, POC	PM_{10}, 1
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary
Parameter code[2]	81102
Basic monitoring objective(s) [3]	NAAQS
Site type(s)[4]	Population
Monitor type[5]	SLAMS
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none
Instrument manufacturer and model	R&P 2000-H
Method code[7]	098
FRM/FEM/ARM/other	FRM
Collecting Agency	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	PCAQCD
Reporting Agency	PCAQCD
Spatial scale (e.g. micro, neighborhood)[8]	Neighborhood
Monitoring start date (MM/DD/YYYY)	03/01/2007
Current sampling frequency (e.g. 1:3, continuous)	1:6
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	1:6
Sampling season (MM/DD-MM/DD)	01/01-12/31
Probe height (meters)	5.2
Distance from supporting structure (meters)	2.2
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A
Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A
Distance from trees (meters)	100 (estimated)
Distance to furnace or incinerator flue (meters)	N/A

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Distance between monitors fulfilling a QA collocation requirement (meters).	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A
Will there be changes within the next 18 months? (Y/N)	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	monthly
Frequency of flow rate verification for automated PM analyzers [10]	N/A
Frequency of one-point QC check for gaseous instruments [10]	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	01/14/2014, 07/08/2014

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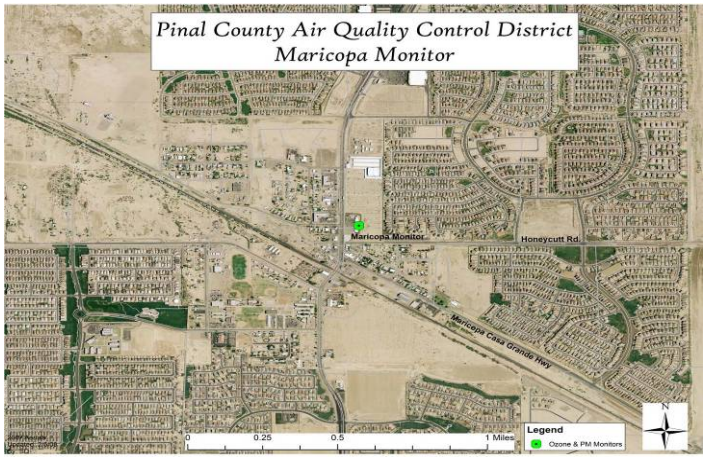
City of Maricopa County Complex - MCPA



Local site name	Maricopa County Complex (MCPA)
AQS ID (XX-XXX-XXXX)	04-021-3010
GPS coordinates (decimal degrees)	33.01053, -111.97205
Street Address	44625 W Garvey Ave, Maricopa, AZ
County	Pinal
Distance to roadways (meters)[1]	63 m (SR 347)
Traffic count (AADT, year)[1]	30,670 (2013, ADOT)
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Gravel, vegetative
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA
Pollutant, POC	PM_{10}, 3
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary
Parameter code[2]	81102
Basic monitoring objective(s) [3]	NAAQS
Site type(s)[4]	Population
Monitor type[5]	SLAMS
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none
Instrument manufacturer and model	R&P TEOM 1400a
Method code[7]	079
FRM/FEM/ARM/other	FEM
Collecting Agency	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	N/A
Reporting Agency	PCAQCD
Spatial scale (e.g. micro, neighborhood)[8]	Neighborhood
Monitoring start date (MM/DD/YYYY)	12/07/2004
Current sampling frequency (e.g. 1:3, continuous)	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	Continuous
Sampling season (MM/DD-MM/DD)	01/01-12/31
Probe height (meters)	3.2
Distance from supporting structure (meters)	1.1
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A
Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	Building 4.8 m W; 5.2 m above probe

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Distance from trees (meters)	35
Distance to furnace or incinerator flue (meters)	N/A
Distance between monitors fulfilling a QA collocation requirement (meters).	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A
Will there be changes within the next 18 months? (Y/N)	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	N/A
Frequency of flow rate verification for automated PM analyzers [10]	monthly
Frequency of one-point QC check for gaseous instruments [10]	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	04/09/2014, 10/15/2014

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Pinal Air Park - PP

Local site name	Pinal Air Park (PP)	
AQS ID (XX-XXX-XXXX)	04-021-3007	
GPS coordinates (decimal degrees)	32.508306, -111.308056	
Street Address	Water Well #2, Pinal Air Park Rd, Marana, AZ	
County	Pinal	
Distance to roadways (meters)[1]	54.2 m (service blacktop); 100 m (Pinal Air Park Rd)	
Traffic count (AADT, year)[1]	1100 cars per day (estimated); 2242 (2013, Pinal County)	
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Dirt, vegetative	
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA	
Pollutant, POC	O_3, 1	PM_{10}, 3
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary	Primary
Parameter code[2]	44201	81102
Basic monitoring objective(s) [3]	NAAQS	NAAQS
Site type(s)[4]	Regional transport	Background
Monitor type[5]	SLAMS	SLAMS
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none	none
Instrument manufacturer and model	API 400E	R&P TEOM 1400a
Method code[7]	087	079
FRM/FEM/ARM/other	FEM	FEM
Collecting Agency	PCAQCD	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	N/A	N/A
Reporting Agency	PCAQCD	PCAQCD
Spatial scale (e.g. micro, neighborhood)[8]	Regional	Regional
Monitoring start date (MM/DD/YYYY)	06/15/2002	06/07/2012
Current sampling frequency (e.g. 1:3, continuous)	Continuous	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	Continuous	Continuous
Sampling season (MM/DD-MM/DD)	01/01-12/31	01/01-12/31
Probe height (meters)	4.1	4.0
Distance from supporting structure (meters)	1	1.2
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from trees (meters)	100 (estimated)	100 (estimated)

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Distance to furnace or incinerator flue (meters)	N/A	N/A
Distance between monitors fulfilling a QA collocation requirement (meters).	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	N/A	No
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	Glass, Teflon	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	6 (with 20 ft sampling tube)	N/A
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	N/A	N/A
Frequency of flow rate verification for automated PM analyzers [10]	N/A	monthly
Frequency of one-point QC check for gaseous instruments [10]	bi-weekly	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	07/17/2014	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	N/A	01/14/2014, 07/17/2014

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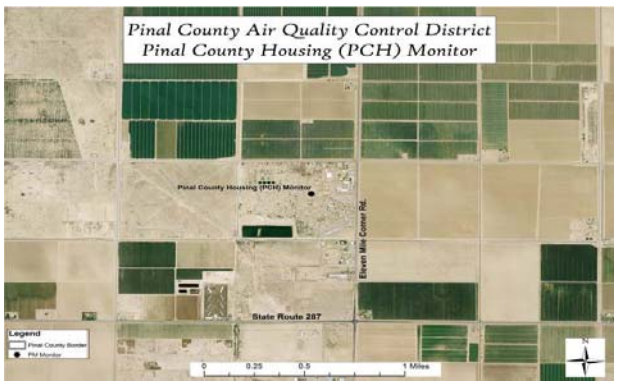
Pinal County Housing Complex - PCH



Local site name	Pinal County Housing Complex (PCH)	
AQS ID (XX-XXX-XXXX)	04-021-3011	
GPS coordinates (decimal degrees)	32.891056, -111.5705	
Street Address	970 N Eleven Mile Corner Rd, Casa Grande, AZ	
County	Pinal	
Distance to roadways (meters)[1]	400 m (Eleven Mile Corner Rd)	
Traffic count (AADT, year)[1]	2534 (2013, Pinal County)	
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Gravel, vegetative	
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA	
Pollutant, POC	PM_{10}, 3	Wind/Temp/RH
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary	N/A
Parameter code[2]	81102	N/A
Basic monitoring objective(s) [3]	NAAQS	N/A
Site type(s)[4]	Population	N/A
Monitor type[5]	SLAMS	N/A
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none	none
Instrument manufacturer and model	R&P TEOM 1400a	RM Young 05305 AQ; Vaisala HMP 35C/PTA427
Method code[7]	079	N/A
FRM/FEM/ARM/other	FEM	other
Collecting Agency	PCAQCD	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	N/A	N/A
Reporting Agency	PCAQCD	N/A
Spatial scale (e.g. micro, neighborhood)[8]	Neighborhood	N/A
Monitoring start date (MM/DD/YYYY)	08/01/2002	2002
Current sampling frequency (e.g. 1:3, continuous)	Continuous	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	Continuous	N/A
Sampling season (MM/DD-MM/DD)	01/01-12/31	01/01-12/31
Probe height (meters)	4.7	10
Distance from supporting structure (meters)	2.1	10
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A

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Distance from trees (meters)	7.3	7.3
Distance to furnace or incinerator flue (meters)	N/A	N/A
Distance between monitors fulfilling a QA collocation requirement (meters).	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A	N/A
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	N/A	N/A
Frequency of flow rate verification for automated PM analyzers [10]	monthly	N/A
Frequency of one-point QC check for gaseous instruments [10]	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	04/09/2014, 10/21/2104	N/A

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Queen Valley – QV
See ADEQ Air Monitoring Network Review for site details

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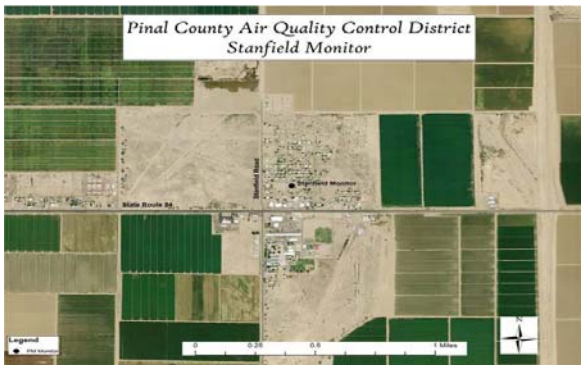
Stanfield County Complex - STNF



Local site name	Stanfield County Complex (STNF)	
AQS ID (XX-XXX-XXXX)	04-021-3008	
GPS coordinates (decimal degrees)	32.881194, -111.962	
Street Address	36697 W Papago Dr, Stanfield, AZ	
County	Pinal	
Distance to roadways (meters)[1]	21.2 m (Navajo Way)	
Traffic count (AADT, year)[1]	91 (estimated)	
Groundcover (e.g. paved, vegetative, dirt, sand, gravel)	Gravel, vegetative	
Representative statistical area name (i.e. MSA, CBSA, other)	Phoenix-Mesa-Scottsdale MSA	
Pollutant, POC	PM_{10}, 3	Wind/Temp/RH
Primary / QA Collocated / Other (provide for all $PM_{2.5}$, PM_{10}, $PM_{10-2.5}$, Pb and NO_2 monitors. Non-PM, Pb, NO_2 monitors should be listed as "N/A".)	Primary	N/A
Parameter code[2]	81102	N/A
Basic monitoring objective(s) [3]	NAAQS	N/A
Site type(s)[4]	Population	N/A
Monitor type[5]	SLAMS	N/A
Network affiliation(s), if applicable (a monitor may have none, one, or multiple) [6]	none	none
Instrument manufacturer and model	R&P TEOM 1400a	RM Young 05305 AQ; Vaisala HMP 45C
Method code[7]	079	N/A
FRM/FEM/ARM/other	FEM	other
Collecting Agency	PCAQCD	PCAQCD
Analytical Lab (i.e. weigh lab, toxics lab, other)	N/A	N/A
Reporting Agency	PCAQCD	N/A
Spatial scale (e.g. micro, neighborhood)[8]	Neighborhood	N/A
Monitoring start date (MM/DD/YYYY)	02/01/2006	2007
Current sampling frequency (e.g. 1:3, continuous)	Continuous	Continuous
Required sampling frequency (e.g. 1:3 excluding exceptional events/1:1 including exceptional events)[9]	Continuous	N/A
Sampling season (MM/DD-MM/DD)	01/01-12/31	01/01-12/31
Probe height (meters)	4.8	9.2 (wind), 3 (T, RH)
Distance from supporting structure (meters)	2.1	9.2 (wind), 3 (T, RH)
Distance from obstructions on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	N/A	N/A
Distance from obstructions not on roof. Include horizontal distance + vertical height above probe for obstructions nearby. (meters)	Carport 3.9 m S, 3.7 m above probe	Carport 2 m S, 3.7 m above probe
Distance from trees (meters)	100 (estimated)	100 (estimated)
Distance to furnace or incinerator flue (meters)	N/A	N/A

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Distance between monitors fulfilling a QA collocation requirement (meters).	N/A	N/A
For low volume PM instruments (flow rate < 200 liters/minute), is any PM instrument within 1 m of the lovol? If yes, please list distance (meters) and instrument(s).	No	N/A
For high volume PM instrument (flow rate > 200 liters/minute), is any PM instrument within 2m of the hivol? If yes, please list distance (meters) and instrument(s).	N/A	N/A
Unrestricted airflow (degrees around probe/inlet or percentage of monitoring path)	360	360
Probe material for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	N/A	N/A
Residence time for reactive gases $NO/NO_2/NO_y$, SO_2, O_3; PAMS: VOCs, Carbonyls (seconds)	N/A	N/A
Will there be changes within the next 18 months? (Y/N)	N	N
Is it suitable for comparison against the annual $PM_{2.5}$? (Y/N)	N/A	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers [10]	N/A	N/A
Frequency of flow rate verification for automated PM analyzers [10]	monthly	N/A
Frequency of one-point QC check for gaseous instruments [10]	N/A	N/A
Date of Annual Performance Evaluation conducted in the past calendar year for gaseous parameters (MM/DD/YYYY)	N/A	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors (MM/DD/YYYY, MM/DD/YYYY)	01/14/2014, 07/15/2104	N/A

[1] List road(s) (street name, AADT, data source). To determine which roads to list, evaluate roads within 250 meters of your monitor(s). List road(s) that have relevance per Appendix E. If none are close to the Appendix E criteria, list the nearest roadway. If monitors at your site are significantly different distances from roadways (for example, if your gaseous instruments are 20 meters from your PM instruments, on opposite sides of a building), provide information for each.
[2] Parameter codes may be found at http://www.epa.gov/ttn/airs/airsaqs/manuals/codedescs.htm
[3] Monitoring objectives: public info, NAAQS comparison, research. Monitors may have more than one monitoring objective. All regulatory monitors should have "NAAQS comparison" as a monitoring objective.
[4] Site types: extreme downwind, highest conc., max ozone conc., max precursor impact, population exposure, source oriented, upwind background, general/background, regional transport, welfare-related impacts, quality assurance, other.
[5] Monitor types: SLAMS, SPM, Tribal, Industrial, Non-EPA Federal, EPA, Other. For the most up-to-date list, please visit http://www.epa.gov/ttn/airs/airsaqs/manuals/codedescs.htm
[6] Network affiliations: NATTS, NCore, near road, PAMS, Unofficial PAMS, CASTNET, CSN STN, CSN supplemental, IMPROVE, PSD, proposed NCore, school air toxics, voluntary school air toxics, border grant. For the most up-to-date list, please visit http://www.epa.gov/ttn/airs/airsaqs/manuals/codedescs.htm
[7] Method codes may be found at http://www.epa.gov/ttn/airs/airsaqs/manuals/codedescs.htm
[8] Spatial scales: micro, middle, neighborhood, urban, regional, national, global. See Table D-1 of 40 CFR part 58 App. D for appropriate siting scales for various site types.
[9] If exceptional events are relevant, include sampling frequency with exceptional events included and excluded.
[10] e.g. weekly, bi-weekly, monthly, etc.

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Appendix C

PCAQCD Ambient Air Monitoring Data

Please refer to Section 1.0 for a detailed description of the NAAQS for ozone, PM_{10} and $PM_{2.5}$.

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Apache Junction Maintenance Yard Carbon Monoxide Data (in ppm)
1 Hour Averages

NAAQS: In order to meet the standard the second highest reading must be less than or equal to 35 ppm.

Table C-1

Year	Maximum Reading	2nd Highest Reading	Number of Daily Exceedances	Number of Sample Hours
1996	2.60	2.60	0	4884
1997	2.20	2.00	0	8675
1998	2.00	2.00	0	8609
1999	1.90	1.70	0	8057
2000	1.48	1.39	0	8543
2001	3.74	3.54	0	6610
2002[a]	1.28	1.21	0	3533

Apache Junction Maintenance Yard Carbon Monoxide Data (in ppm)
8 Hour Averages

NAAQS: In order to meet the standard the second highest reading must be less than or equal to 9 ppm.

Table C-2

Year	Maximum Reading	2nd Highest Reading	Number of Daily Exceedances	Number of Sample Hours
1996	1.08	1.00	0	4873
1997	1.16	1.01	0	8680
1998	1.28	1.08	0	8613
1999	0.91	0.86	0	8017
2000	0.69	0.69	0	8549
2001	1.06	0.90	0	6633
2002 [a]	0.79	0.75	0	3552

Footnotes:
a - Carbon Monoxide monitoring was discontinued at the Apache Junction Maintenance Yard site on 05/28/2002. The 2002 readings only represent part of the 2002 carbon monoxide season.

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Casa Grande Airport Carbon Monoxide Data (in ppm)
1 Hour Averages

NAAQS: In order to meet the standard the second highest reading must be less than or equal to 35 ppm.

Table C-3

Year	Maximum Reading	2nd Highest Reading	Number of Daily Exceedances	Number of Sample Hours
1996	1.60	1.50	0	8728
1997	1.50	1.50	0	8595
1998	3.90	3.60	0	8513
1999	2.10	1.50	0	7625
2000	2.45	2.25	0	8416
2001	1.53	1.10	0	8326
2002[a]	1.23	1.22	0	6715

Casa Grande Airport Carbon Monoxide Data (in ppm)
8 Hour Averages

NAAQS: In order to meet the standard the second highest reading must be less than or equal to 9 ppm.

Table C-4

Year	Maximum Reading	2nd Highest Reading	Number of Daily Exceedances	Number of Sample Hours
1996	1.19	1.16	0	8734
1997	1.29	1.11	0	8634
1998	1.46	1.46	0	8525
1999	0.86	0.80	0	7621
2000	0.95	0.84	0	8420
2001	0.77	0.76	0	8355
2002[a]	0.81	0.76	0	6745

Footnotes:
a - Carbon Monoxide monitoring was discontinued at the Casa Grande Airport site on 10/11/2002. The 2002 readings only represent part of the 2002 carbon monoxide season.

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Apache Junction Maintenance Yard Ozone Data (in ppm)
8 Hour Averages

Table C-5

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	3 Year Avg of the 4th Highest	Number of Daily Excursions
1993	0.086	0.082	0.080	0.080	N/A	1
1994	0.089	0.087	0.085	0.085	N/A	5
1995	0.095	0.093	0.093	0.091	0.085	8
1996	0.092	0.086	0.085	0.085	0.087	6
1997	0.084	0.083	0.082	0.082	0.086	0
1998	0.091	0.089	0.082	0.082	0.083	2
1999	0.091	0.089	0.081	0.08	0.081	2
2000	0.087	0.084	0.082	0.082	0.081	1
2001	0.081	0.081	0.078	0.077	0.079	0
2002	0.081	0.081	0.080	0.079	0.079	0
2003	0.090	0.074	0.072	0.072	0.076	1
2004	0.070	0.070	0.070	0.069	0.073	0
2005	0.076	0.074	0.071	0.068	0.069	0
2006	0.094	0.090	0.087	0.084	0.074	4
2007	0.083	0.080	0.079	0.077	0.076	0
2008[b]	0.082	0.081	0.081	0.079	0.080	7
2009	0.076	0.071	0.070	0.069	0.075	1
2010	0.078	0.077	0.075	0.073	0.074	2
2011	0.079	0.075	0.075	0.075	0.072	1
2012	0.079	0.078	0.077	0.076	0.075	4
2013	0.074	0.073	0.069	0.069	0.073	0
2014	0.074	0.069	0.069	0.066	0.070	0

Footnotes:
b - The 8-hour ozone standard was revised effective May 27, 2008. The previous 8-hour average of 0.080 ppm was lowered to 0.075 ppm.

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Casa Grande Airport Ozone Data (in ppm)
8 Hour Averages

Table C-6

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	3 Year Avg of the 4th Highest	Number of Daily Excursions
1993	0.081	0.074	0.073	0.072	N/A	0
1994	0.079	0.077	0.076	0.076	N/A	0
1995	0.077	0.074	0.073	0.071	0.073	0
1996	0.086	0.081	0.080	0.079	0.075	1
1997	0.075	0.074	0.073	0.072	0.074	0
1998	0.070	0.069	0.069	0.068	0.073	0
1999	0.083	0.083	0.079	0.078	0.072	0
2000	0.087	0.086	0.086	0.085	0.077	5
2001	0.078	0.078	0.074	0.074	0.079	0
2002	0.080	0.079	0.079	0.077	0.078	0
2003	0.077	0.074	0.073	0.073	0.074	0
2004	0.072	0.070	0.070	0.070	0.073	0
2005	0.081	0.075	0.073	0.072	0.071	0
2006	0.076	0.077	0.074	0.073	0.071	0
2007	0.071	0.071	0.071	0.070	0.071	0
2008[b]	0.077	0.077	0.074	0.073	0.072	2
2009	0.068	0.067	0.066	0.066	0.069	0
2010	0.071	0.070	0.068	0.068	0.069	0
2011	0.072	0.070	0.070	0.070	0.068	0
2012	0.073	0.071	0.070	0.070	0.069	0
2013	0.077	0.067	0.065	0.064	0.068	1
2014	0.076	0.066	0.065	0.065	0.066	1

Footnotes:
b - The 8-hour ozone standard was revised effective May 27, 2008. The previous 8-hour average of 0.080 ppm was lowered to 0.075 ppm.

Combs School Ozone Data (in ppm)
8 Hour Averages

Table C-7

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	3 Year Avg of the 4th Highest	Number of Daily Excursions
2002	0.075	0.074	0.071	0.068	N/A	0
2003	0.081	0.073	0.073	0.072	N/A	0
2004	0.064	0.062	0.060	0.059	0.066	0
2005	0.080	0.077	0.069	0.067	0.066	0
2006	0.079	0.073	0.072	0.071	0.066	0
2007	0.063	0.062	0.061	0.057	0.065	0
2008[b]	0.074	0.072	0.071	0.071	0.066	0
2009	0.063	0.063	0.063	0.062	0.063	0
2010	0.067	0.064	0.063	0.062	0.063	0

Footnotes:
b - The 8-hour ozone standard was revised effective May 27, 2008. The previous 8-hour average of 0.080 ppm was lowered to 0.075 ppm.

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City of Maricopa County Complex Ozone Data (in ppm)
8 Hour Averages

Table C-8

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	3 Year Avg of the 4th Highest	Number of Daily Excursions
2002	0.083	0.080	0.073	0.068	N/A	0
2003	0.082	0.077	0.075	0.075	N/A	0
2004	0.072	0.067	0.065	0.064	0.069	0
2005	0.070	0.069	0.067	0.062	0.067	0
2006	0.082	0.077	0.068	0.068	0.065	0
2007	0.061	0.060	0.059	0.059	0.063	0
2008[b]	0.073	0.070	0.070	0.069	0.065	0
2009	0.066	0.062	0.062	0.061	0.063	0
2010	0.068	0.068	0.066	0.066	0.065	0

Footnotes:
b - The 8-hour ozone standard was revised effective May 27, 2008. The previous 8-hour average of 0.080 ppm was lowered to 0.075 ppm.

Pinal Air Park Ozone Data (in ppm)
8 Hour Averages

Table C-9

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	3 Year Avg of the 4th Highest	Number of Daily Excursions
2002	0.080	0.074	0.072	0.070	N/A	0
2003	0.076	0.075	0.075	0.074	N/A	0
2004	0.069	0.069	0.068	0.067	0.070	0
2005	0.079	0.079	0.078	0.077	0.072	0
2006	0.075	0.072	0.071	0.070	0.071	0
2007	0.072	0.071	0.068	0.066	0.071	0
2008[b]	0.071	0.071	0.071	0.070	0.068	0
2009	0.073	0.066	0.065	0.065	0.067	0
2010	0.070	0.069	0.067	0.066	0.067	0
2011	0.073	0.071	0.070	0.070	0.067	0
2012	0.076	0.074	0.074	0.072	0.069	1
2013	0.081	0.067	0.065	0.065	0.069	1
2014	0.075	0.065	0.065	0.065	0.067	1

Footnotes:
b - The 8-hour ozone standard was revised effective May 27, 2008. The previous 8-hour average of 0.080 ppm was lowered to 0.075 ppm.

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Queen Valley Ozone Data (in ppm)
8 Hour Averages

Table C-10

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	3 Year Avg of the 4th Highest	Number of Daily Excursions
2001	0.084	0.084	0.080	0.079	N/A	0
2002	0.085	0.083	0.083	0.083	N/A	1
2003	0.094	0.091	0.090	0.087	0.083	4
2004	0.077	0.076	0.074	0.073	0.081	0
2005	0.097	0.096	0.086	0.084	0.081	3
2006	0.091	0.087	0.080	0.080	0.079	2
2007	0.077	0.077	0.076	0.076	0.080	0
2008[b]	0.085	0.082	0.082	0.080	0.078	9
2009	0.076	0.075	0.071	0.070	0.075	2
2010	0.075	0.074	0.073	0.072	0.074	1
2011	0.083	0.080	0.079	0.078	0.073	5
2012	0.082	0.080	0.079	0.078	0.076	8
2013	0.079	0.077	0.075	0.073	0.076	2
2014	0.080	0.071	0.069	0.068	0.073	1

Footnotes:
b - The 8-hour ozone standard was revised effective May 27, 2008. The previous 8-hour average of 0.080 ppm was lowered to 0.075 ppm.

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24 Hour PM_{10} Averages (in $\mu g/m^3$)

Table C-11

Year	Reading Maximum	Number of Daily Exceedances	Expected Exceedance Rate	3 Year Average of the Expected Exceedance Rate
Apache Junction Maintenance Yard North (HiVol)				
1995	67.72	0	0	N/A
1996	34.05	0	0	N/A
1997	81	0	0	0
1998	61.45	0	0	0
1999	64	0	0	0
2000	111.4	0	0	0
2001	49.1	0	0	0
2002[b]	61.5	0	0	0
2003[j]	94.5	0	0	0
Apache Junction Maintenance Yard South (HiVol)				
1995	67.91	0	0	N/A
1996	36.93	0	0	N/A
1997	81.33	0	0	0
1998	62.73	0	0	0
1999	63.5	0	0	0
2000	107.3	0	0	0
2001	93.5	0	0	0
2002[b]	62.4	0	0	0
2003[b,g]	91.3	0	0	0
Apache Junction Fire Station (HiVol)				
2003[b,h]	103.3	0	0	N/A
2004	35.7	0	0	N/A
2005	47	0	0	0
2006	73	0	0	0
2007	48.2	0	0	0
2008	57	0	0	0
2009	54	0	0	0
2010	66	0	0	0
2011	194	1	5.75	1.9
2012	90	0	0	1.9
2013[t]	115	0	0	1.9
Apache Junction Fire Station (47 mm)				
2013[t]	115	0	0	1.9
2014	99	0	0	0
Apache Junction Fire Station (TEOM)				
2011	283	5	10.2	Avg. > 1.0
2012	131	0	0	Avg. > 1.0
2013[u]	152	0	0	3.4

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Table C-11 Continued

Year	Reading Maximum	Number of Daily Exceedances	Expected Exceedance Rate	3 Year Average of the Expected Exceedance Rate
Casa Grande Downtown (HiVol)				
1999	64.3	0	0	0
2000	82.5	0	0	0
2001	104.2	0	0	0
2002[b]	68.5	0	0	0
2003	98.7	0	0	0
2004	52.8	0	0	0
2005	79.2	0	0	0
2006	81.2	0	0	0
2007	112	0	0	0
2008	74	0	0	0
Casa Grande Downtown (47mm)				
2009	109	0	0	0
2010[q]	136	0	0	0
Casa Grande Downtown (TEOM)				
2007	983	7	7	N/A
2008	203	3	3	N/A
2009	848	4	4	4.7
2010	569	1	1	2.7
2011	479	14	14	6.3
2012	233	2	2	5.6
2013	302	4	4	6.7
2014	929	5	5	3.7
Combs School (TEOM)				
2007	970	31	44.6	N/A
2008	270	4	4	N/A
2009	220	4	4	17.5
2010	366	1	1	3
2011	419	12	12	5.7
2012	206	5	5	6
2013	300	3	3	6.7
2014	247	5	5	4.3

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Table C-11 Continued

Year	Reading Maximum	Number of Daily Exceedances	Expected Exceedance Rate	3 Year Average of the Expected Exceedance Rate
Coolidge Maintenance Yard (HiVol)				
1999	83.6	0	0	0
2000	76.5	0	0	0
2001	73.4	0	0	0
2002[b]	106.4	0	0	0
2003	105.7	0	0	0
2004	57.5	0	0	0
2005	81.4	0	0	0
2006	105.5	0	0	0
2007	82	0	0	0
2008	91	0	0	0
2009	189	1	6	2
2010	87	0	0	2
2011	110	0	0	2
2012	134	0	0	0
2013[t]	139	0	0	0
Coolidge Maintenance Yard (47 mm) North				
2013[t]	139	0	0	0
2014	131	0	0	0
Coolidge Maintenance Yard (47 mm) South				
2013[t]	139	0	0	0
2014	109	0	0	0
Cowtown Road (47mm)				
2005[b,k]	787.9	8	N/A	Avg. > 1.0
2006	606	39	278	Avg. > 1.0
2007	759	24	167	Avg. > 1.0
2008	465	24	146	197
2009	230	5	31	115
2010	275	3	18	65
2011	828	12	79.9	43

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Table C-11 Continued

Year	Reading Maximum	Number of Daily Exceedances	Expected Exceedance Rate	3 Year Average of the Expected Exceedance Rate
Cowtown Road (TEOM)				
2002[a,b]	1390.6	209	209	Avg. > 1.0
2003	718.5	150	150	Avg. > 1.0
2004[b]	600.1	105	105	155
2005[b]	769.6	163	163	139
2006	1078.9	228	238	169
2007	1014	189	190	197
2008	609	173	175	201
2009	631	53	53	139
2010	497	28	28	85
2011	2316	98	98	60
2012	682	64	64	62.3
2013	1007	67	67	76.3
2014	540	63	63	64.7
Eloy (HiVol)				
1999	141.6	0	0	0
2000	102.1	0	0	0
2001	142.2	0	0	0
2002[b]	146.3	0	0	0
2003	153.9	0	0	0
2004	46.8	0	0	0
2005	72.9	0	0	0
2006	98.7	0	0	0
2007[o]	136	0	0	0
2008	109	0	0	0
2009	153	0	0	0
2010	87	0	0	0
2011	155	0	0	0
2012	121	0	0	0
2013[t]	108	0	0	0
Eloy (47 mm)				
2013[t]	108	0	0	0
2014	80	0	0	0

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Table C-11 Continued

Year	Reading Maximum	Number of Daily Exceedances	Expected Exceedance Rate	3 Year Average of the Expected Exceedance Rate
Mammoth (HiVol)				
1999[b]	50	0	0	0
2000	63.5	0	0	0
2001	99.2	0	0	0
2002[b]	52.5	0	0	0
2003	89.4	0	0	0
2004	30.8	0	0	0
2005	32.5	0	0	0
2006	30.7	0	0	0
2007	40	0	0	0
2008	35	0	0	0
2009	42	0	0	0
2010[r]	46	0	0	0
City of Maricopa County Complex (TEOM)				
2005[l]	239.1	18	18	Avg. > 1.0
2006	429	21	21	Avg. > 1.0
2007	724	20	20	21
2008	520	6	6	16
2009	607	11	11	12
2010	172	2	2	6.3
2011	531	15	15	9.3
2012	258	7	9	8.6
2013	334	4	4	9.3
2014	239	2	2	5
Pinal Air Park (HiVol)				
1999	60.4	0	0	0
2000	74.2	0	0	0
2001[b]	103.3	0	0	0
2002[b]	62	0	0	0
2003	107.8	0	0	0
2004	38.8	0	0	0
2005	122.4	0	0	0
2006	76.8	0	0	0
2007	113	0	0	0
2008	55	0	0	0
2009	51	0	0	0
2010	70	0	0	0
2011	86	0	0	0
2012	159	1	6.1	2
2013[t]	61	0	0	2

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Table C-11 Continued

Year	Reading Maximum	Number of Daily Exceedances	Expected Exceedance Rate	3 Year Average of the Expected Exceedance Rate
Pinal Air Park (47mm)				
2013[t]	61	0	0	2
2014	103	0	0	0
Pinal Air Park (TEOM)				
2012	133	0	0	0
2013	262	2	2	1.0
2014	175	1	1	1.0
Pinal County Housing Complex West (HiVol)				
2002[b,f]	166.1	1	N/A	Avg. > 1.0
2003	288.6	2	11.5	Avg. > 1.0
2004	155.1	1	5.8	Avg. > 1.0
2005[b]	157.7	1	6.1	7.8
2006	152.5	0	0	4
2007	224	1	6.5	4.2
2008	141	0	0	3.3
2009	179	2	13.1	6.5
2010	128	0	0	4.4
2011	212	3	18.4	10.5
2012	131	0	0	6.1
2013[v]	97	0	0	6.1
Pinal County Housing Complex East (HiVol)				
2004	113.6	0	0	0
2005	179.4	2	11.9	Avg. > 1.0
2006	209.7	3	20.2	10.7
2007	341	1	6.1	12.7
2008	245	1	5.7	10.7
2009	187	1	6	5.9
2010	130	0	0	3.9
2011	271	3	18.1	8
2012	193	1	6.1	8.1
2013[v]	104	0	0	8.1

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Table C-11 Continued

Year	Reading Maximum	Number of Daily Exceedances	Expected Exceedance Rate	3 Year Average of the Expected Exceedance Rate
Pinal County Housing (TEOM)				
2002[b,f]	394.5	9	9	Avg. > 1.0
2003	357.8	11	11	Avg. > 1.0
2004	490.7	7	7	9
2005	326	17	17	11.7
2006	913	33	33.6	19.2
2007	2253	19	20	23.5
2008	285	10	10	21.2
2009	1445	17	17	15.7
2010	1761	6	6	11
2011	2040	21	21	14.7
2012	538	5	5	10.6
2013	242	5	5	10.3
2014	402	6	6	5.3
Riverside (HiVol)				
2003[b,i]	100.7	0	0	N/A
2004	34.4	0	0	N/A
2005	35.2	0	0	0
2006	82.7	0	0	0
2007	65	0	0	0
2008	52	0	0	0
2009	51	0	0	0
2010[r]	47	0	0	0
Stanfield County Complex (HiVol)				
1999	106.6	0	0	0
2000	148.7	0	0	0
2001	134.2	0	0	0
2002[b]	351.5	2	13	4
2003[b]	170.5	1	6.1	6.1
2004	80.9	0	0	6.1
2005	172.5	1	5.8	4
Stanfield County Complex (47mm)				
2006[m]	182	2	13.1	Avg. > 1.0
2007	374	6	39.6	Avg. > 1.0
2008	201	2	11.8	21.5
2009[p]	121	0	0	17.1

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Table C-11 Continued

Year	Reading Maximum	Number of Daily Exceedances	Expected Exceedance Rate	3 Year Average of the Expected Exceedance Rate
Stanfield County Complex (TEOM)				
2006[b,n]	727.4	25	26.5	Avg. > 1.0
2007	1062	25	25.2	Avg. > 1.0
2008	375	14	14	21.9
2009	815	14	14	17.7
2010	205	1	1	9.7
2011	586	23	23	12.7
2012	343	12	12	12
2013	913	17	17	17.3
2014	343	9	9	12.7

Footnotes:
a - At least one data point during this year was flagged due to a natural event and excluded from calculation.
b - At least one quarter during this year had less than 75% data recovery
f - Monitoring began at the Pinal County Housing Complex site on 08/01/2002. The Pinal County Housing Complex site replaced the Eleven Mile Corner site.
g - The Apache Junction Maintenance Yard South monitor was discontinued on 07/01/2003, and relocated to Apache Junction Fire Station.
h - Monitoring began at the Apache Junction Fire Station site on 07/02/2003.
i - Monitoring began at the Riverside site on 03/10/2003.
j - The Apache Junction Maintenance Yard North monitor was discontinued on 01/01/2004, and relocated to Pinal County Housing Complex.
k - 47mm filter based monitoring began at the Cowtown Road site on 08/14/2005, and data reporting began as of 10/01/2005.
l - Monitoring began at the City of Maricopa County Complex site on 12/04/2004, and data reporting began as of 01/01/2005.
m - The Wedding HiVol monitor was replaced on 04/12/2006 with an Andersen RAAS10-100 monitor at the Stanfield County Complex site.
n - Beginning in February 2006 the R&P TEOM 1400a monitor was installed at the Stanfield County Complex site.
o – On 03/02/2007 the Andersen HiVol was relocated from a City of Eloy building to a Pinal County building approximately 650 feet to the north-northeast.
p – Filter based monitoring was discontinued at Stanfield County Complex on 01/01/2010
q – Filter based monitoring was discontinued at Casa Grande Downtown on 01/01/2010
r – Riverside and Mammoth sites were discontinued on 05/15/2011
s – Continuous PM10 monitoring began at Apache Junction Fire Station on 08/20/2012
t – HiVol monitor was replaced on 07/01/2013 with medium-volume monitor
u – Apache Junction Fire Station TEOM was discontinued on 07/01/2013; restarted on 01/01/2015
v – Pinal County Housing Complex HiVols were discontinued on 07/01/2014

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24 Hour $PM_{2.5}$ Averages (in $\mu g/m^3$)

Table C-12

Year	Maximum Reading	98th Percentile	3 year average of the 98th percentile
Apache Junction Fire Station			
1999	18.7	15.5	N/A
2000	44.5	18	N/A
2001	14	13.1	16
2002	23.5	13.1	15
2003[a]	38	21.1	16
2004	17	10.3	15
2005	12.7	10.6	14
2006	10.7	9.3	10
2007	15.9	14.6	12
2008	23.3	15.4	13
2009	14.6	13.1	14
2010	13.1	11.9	14
2011	67.2	41.9	22
2012	21.1	14	23
2013	14.3	12.6	23
2014	22.2	11.8	12.8
Casa Grande Downtown (South)			
1999	19.5	18.1	N/A
2000	22.2	18.9	N/A
2001	18.1	16.7	18
2002	23.5	20.8	19
2003	32.2	26.7	21
2004	16.6	13.7	20
2005	19.3	16.9	19
2006	16.1	15.4	15
2007	26.6	22.4	18
2008	23.5	22	20
2009	29	17.3	21
2010	25.4	21.4	20
2011	31.1	22.3	20
2012	20.9	18.5	21
2013	17.6	16.6	19
2014	17.5	16.8	17.3
Casa Grande Downtown (North)[c]			
2009	28.9	19	N/A
2010	22.1	21.3	N/A
2011	28.7	23.2	21
2012	18.8	17	24
2013	18	16.3	19
2014	17.1	12.8	15.4

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Table C-12 Continued

Year	Maximum Reading	98th Percentile	3 year average of the 98th percentile
Cowtown Road			
2005[a,b]	144.8	78.9	N/A
2006	69.4	48.9	N/A
2007	59.7	53.9	61
2008	41.7	40.7	48
2009	29.4	24	40
2010	39.5	27.1	31
2011	41.2	27.2	26
2012	32.6	28.3	27.5
2013	43.5	41.7	32.4
2014 [d]	54.2	36.8	35.6

Footnotes:

a – At least one quarter during this year had less than 75% data recovery

b - 47mm filter based $PM_{2.5}$ monitoring began at the Cowtown Road site on August 14, 2005 and data reporting began October 10, 2005.

c – Beginning January 1, 2009 a second $PM_{2.5}$ monitor, Casa Grande Downtown North, began sampling on the same day as Casa Grande Downtown South to collect precision data on a 1-in-6 day schedule.

d – Beginning August, 2014 two 2025 $PM_{2.5}$ monitors were installed and operated as collocated monitors

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Annual $PM_{2.5}$ Averages (in $\mu g/m^3$)

Table C-13

Year	Annual Average	3 year average of the annual means
Apache Junction Fire Station		
1999	7.4	N/A
2000	7.3	N/A
2001	6.3	7
2002	6.4	6.6
2003[a]	6.3	6.3
2004[a]	5.5	6.1
2005	5.5	5.8
2006	5.3	5.4
2007	7	5.9
2008	7.5	6.6
2009	6.4	7
2010	5.9	6.6
2011	8.3	6.8
2012	7.1	7.1
2013	5.4	6.9
2014	5.9	6.1
Casa Grande Downtown (South)		
1999	9.5	N/A
2000	8.5	N/A
2001	7.7	8.5
2002	8.5	8.2
2003	8.4	8.2
2004	7.1	8
2005	7.3	7.6
2006	7.6	7.3
2007	10.3	8.4
2008	10.6	9.5
2009	9.7	10.2
2010	8.4	9.5
2011	10	9.3
2012	9.9	9.4
2013	8.1	9.3
2014	7.7	8.6
Casa Grande Downtown (North)[c]		
2009	9.6	N/A
2010	8.2	N/A
2011	9.5	6.1
2012	9	8.9
2013	7.9	8.8
2014	7.5	8.1

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Table C-13 Continued

Year	Annual Average	3 year average of the annual means
Cowtown Road		
2005[a,b,d]	33.1	N/A
2006[d]	22.7	N/A
2007[d]	22.5	26
2008[d]	19.6	21.6
2009[d]	14.2	18.8
2010[d]	12.4	15.4
2011[d]	13.2	13.2
2012[d]	14.8	13.3
2013[d]	14.9	14.3
2014[d]	13.5	14.4

Footnotes:

a - At least one quarter during this year had less than 75% data recovery

b - 47mm $PM_{2.5}$ filter based monitoring began at the Cowtown Road site on August 14, 2005 and data reporting began October 10, 2005.

c – Beginning January 1, 2009 a second $PM_{2.5}$ monitor, Casa Grande Downtown North, began sampling on the same day as Casa Grande Downtown South to collect precision data on a 1-in-6 day schedule.

d – The Cowtown Road site is not comparable to the $PM_{2.5}$ annual standard. Annual averages are listed here for trend analysis.

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Appendix D

Public Comments

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Appendix D

This appendix summarizes the public comment period and hearing conducted in relation to this document.

D.1 Public Comment Period

Pinal County Air Quality posted the draft 2015 Ambient Monitoring Network Plan and 2014 Data Summary on the department's website for the period starting May 19, 2015 through June 18, 2015. During this time period the document was also be available for review at the Pinal County Air Quality offices located at 31 North Pinal Street, Building F, Florence, Arizona. Public comments were due to Pinal County no later than close of business on June 22, 2015.

PUBLIC NOTICE OF AMBIENT MONITORING NETWORK PLAN

PUBLIC COMMENT PERIOD AND PUBLIC HEARING

Pursuant to 40 Code of Federal Regulations (CFR) §58.10 Pinal County Air Quality will make its annual monitoring network plan available for public inspection for 30 days prior to submission to the United States Environmental Protection Agency. The Annual Ambient Monitoring Network Review and Data Summary present changes to and data collected from the air quality monitoring network. The document will be posted at http://pinalcountyaz.gov/AirQuality/Pages/MonitoringNetworkPublicNotice.aspx for thirty days beginning May 19, 2015. During this time period the document will also be available for review at the Pinal County Air Quality offices located at 31 North Pinal Street, Building F, Florence, Arizona from 8:00 AM to 4:30 PM, Monday thru Friday. Additionally, a public hearing will be held June 16, 2015 at 11:00 AM at 31 North Pinal Street, Building F, Ocotillo Room, Florence, Arizona.

Public comments may be submitted in writing to Pinal County Air Quality, Attention: Josh DeZeeuw, P.O. Box 987, Florence, Arizona, 85132, or comments may be given orally at the scheduled public hearing on June 16, 2015. Written or oral public comments are due before the close of business on June 22, 2015. Additional information is available by calling 520-866-6929.

D.2 Public Hearing

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Hold page for public meeting sign in sheet

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D.3 Public Comment

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