Pinal County Air Quality Control District

2012 Ambient Monitoring Network Plan And 2011 Data Summary

July 2, 2012
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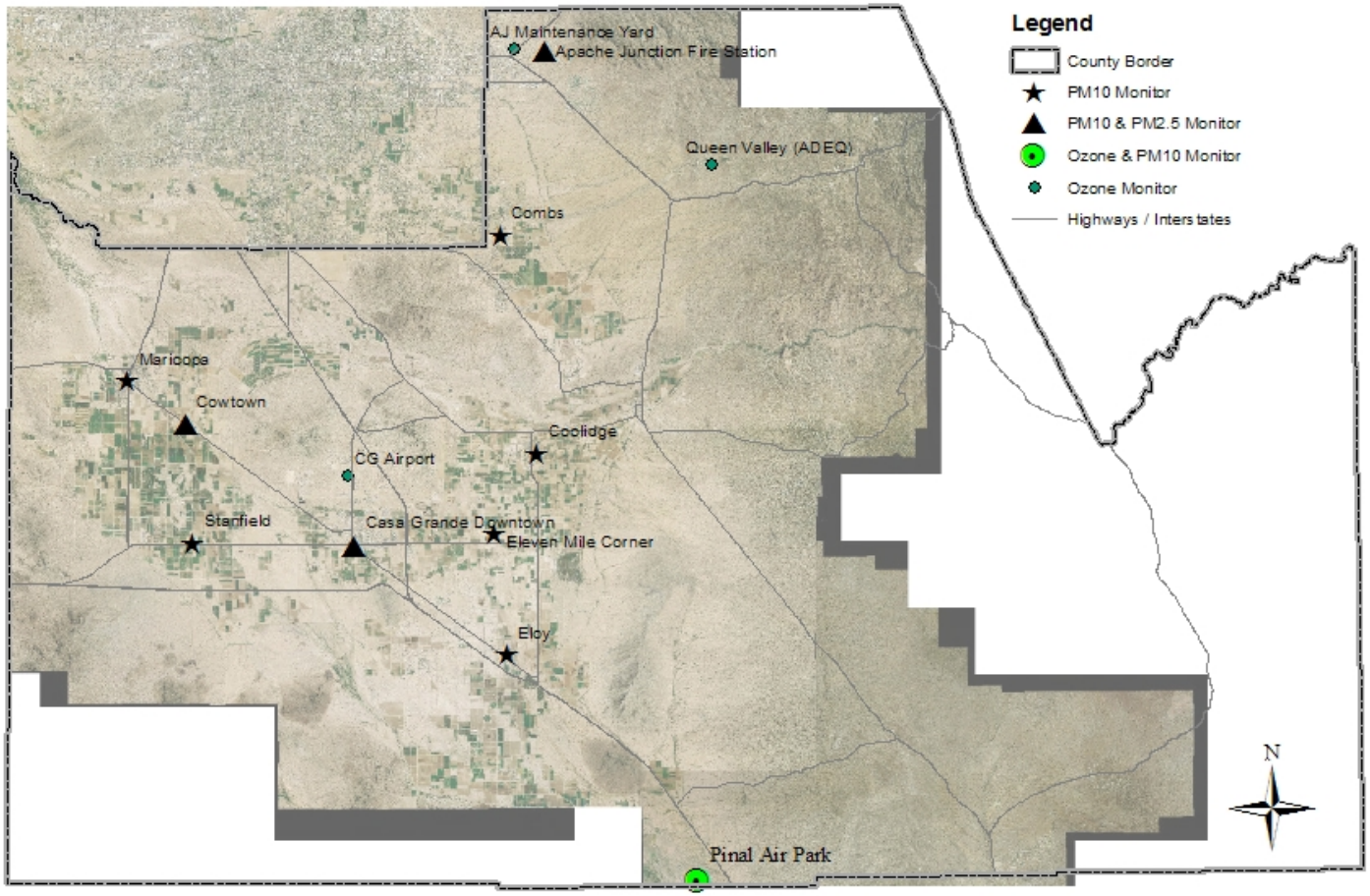
Pinal County Air Quality Control District
Monitoring Network



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Appendices

Executive Summary

This executive summary provides a brief review of major network changs proposed for the next monitoring year and those implemented during the current year.

EPA provided comment on the 2011 plan indicating that data collected from special purpose monitoring sites must be included when computing the area design value. This plan re-evaluates the minimum requirement for each pollutant according to EPA direction. The results show a shortage of one $PM_{2.5}$ SLAMS monitor in the network. To correct this, Pinal County proposes to change the Cowtown $PM_{2.5}$ samplers from SPM to SLAMS after accepting comment regarding the issue. Additional detail is provided in Section 3.0 and 5.0.

On December 31, 2011 the filter based PM_{10} sampler at the Cowtown site was discontinued. This was done in order to convert the sampler 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 effective January 1, 2012. The continuous TEOM will remain in place to evaluate PM_{10} concentrations. Additional detail is provided in Section 3.0 and 5.0.

The 2011 plan proposed to revise the scale classification of the Cowtown 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 the change. No comments were received concerning the change. The revision to Middle Scale was made in the EPA data in January 2012.

On August 20, 2011, a PM_{10} TEOM began operation at the Apache Junction Fire Station site in response to a recorded exceedance at the filter based PM_{10} sampler. The TEOM will be maintained as an SPM monitor for a 24 month period. A decision to maintain the monitor or discontinue it will be made prior to the 24 month period passing. During this period the filter based sampler will continue to operate. Additional detail is provided in Section 4.0 and 5.0.

Due to budget shortages and subsequent personnel reductions the Riverside and Mammoth PM_{10} samplers were discontinued effective May 16, 2011. This was described in the 2011 Network Plan. Because the sites were designated as SLAMS, EPA concurrence was necessary. Concurrence was provided by EPA on February 10, 2012.

Due to budget shortages and subsequent personnel reductions the Maricopa and Combs ozone analyzers were discontinued effective May 18, 2011. This was described in the 2011 Network Plan. The sites were designated Special Purpose Monitors (SPM), therefore, concurrence from EPA was not required. The sites will remain closed.

Preliminary data from the May 9, 2012 filter based PM_{10} sampler at Pinal Air Park indicates an exceedance. Pinal County Air Quality is considering adding a continuous PM_{10} sampler to this site. Additional details will be provided in future versions of this document.

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 (SPM) operated under state and local authority. According to the regulation, the Annual Monitoring Network Plan must be submitted to the 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 PSD (Prevention of Significant Deterioration) 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 United States Environmental Protection Agency (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 level of each pollutant in the ambient air.

The criteria pollutants are particulate matter less than or equal to 10 microns (PM_{10}), particulate matter less than or equal to 2.5 microns ($PM_{2.5}$), 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 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 network

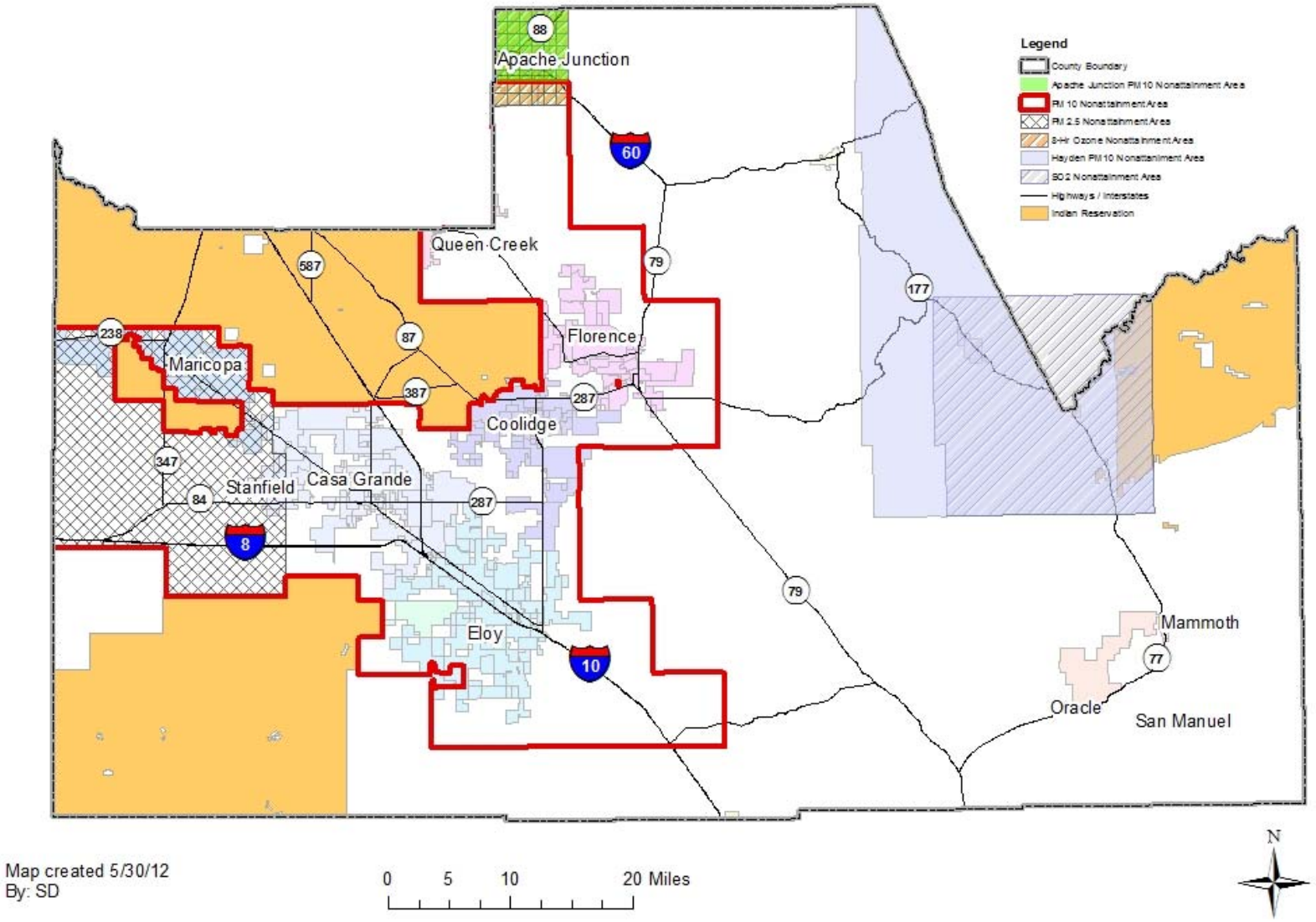
[1] See Clean Air Act ("CAA") §§ 108,109, and 40 CFR §50.1 *et seq.*

achieves precision measurements. Section 4 describes each site in the 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 standard.

The appendices of this document presents a list of all the 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 summarizes the public comment period and hearing conducted in relation to this document (Appendix D).

Figure i-1

Pinal County Nonattainment Areas



1.0 National Ambient Air Quality Standards (NAAQS)

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

Ozone

The one-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 0.12ppm and was an exceedance based standard, which required that the number of expected exceedance be less than or equal to 1.0. An exceedance of the one-hour ozone standard occurred if an observed one-hour average was greater than 0.120 ppm. Generally, the number of daily exceedances (only the daily maximum counts 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 standards was challenged in court by a number of parties and ultimately reached the U.S. Supreme Court. In 2001, the Court unanimously upheld the constitutionality of the 1970 Clean Air Act 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 three-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.

The Clean Air Act 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.

Table 1-1

Ozone Standard History				
Key Year	**Action**	**Level**	**Averaging Period**	**Form**
1979	1-hour standard revised	0.120ppm	1 hour	Expected exceedance
1997	8-hour standard proposed	0.08ppm	8 hour	3year average of the 4th highest value
2005	1-hour standard revoked (Applies only in limited areas)			
2008	8-hour standard revised	0.075ppm	8 hour	3year average of the 4th highest value

Table 1-2

National Ambient Air Quality Standards for Ozone			
Ozone Primary Standards		**Secondary Standards**	
Level	**Averaging Time**	**Level**	**Averaging Time**
0.075 ppm (2008 std)	8-hour [1]	Same as Primary	
0.08 ppm (1997 std)	8-hour [2]	Same as Primary	
0.12 ppm	1-hour [3] (Applies only in limited areas)	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 (a) 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. (b) The 1997 standard—and the implementation rules for that standard—will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

3 (a) The standard was attained when the expected number of days per calendar year with maximum hourly average concentrations above 0.12 ppm is ≤ 1. (b) 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 $PM_{2.5}$)

The nation's air quality standards for particulate matter 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 micrometers in diameter (that's about 1/4 the size of a single grain of table salt).

Ten years later, after a lengthy review, EPA revised the PM standards, setting separate standards for fine particles ($PM_{2.5}$) based on their link to serious health problems ranging from increased symptoms, hospital admissions and emergency room visits for people with heart and lung disease, to premature death in people with heart or lung disease.

The 1997 standards also retained slightly revised standards for PM_{10} which were intended to regulate "inhalable coarse particles" that ranged from 2.5 to 10 micrometers in diameter. PM_{10} measurements, however, contain both fine and coarse particles.

EPA revised the air quality standards for particle pollution in 2006. The 2006 standards tightened the 24-hour fine particle standard from 65 micrograms per cubic meter ($\mu g/m^3$) to 35 $\mu g/m^3$, and retained annual fine particle standard at 15 $\mu g/m^3$. The Agency decided to retain the existing 24-hour PM_{10} standard of 150 $\mu g/m^3$. The Agency revoked the

annual PM_{10} standard, because available evidence does not suggest a link between long-term exposure to PM_{10} and health problems.

The Clean Air Act requires EPA to review the latest scientific information and standards 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).

Table 1-3

National Ambient Air Quality Standards for Particle Pollution			
Pollutant	**Primary Standard**	**Averaging Times**	**Secondary Standard**
Particulate Matter (PM_{10})	Revoked (1)	Annual (1) (Arith. Mean)	
	150 $\mu g/m^3$	24-hour (2)	Same as Primary
Particulate Matter ($PM_{2.5}$)	15.0 $\mu g/m^3$	Annual (3) (Arith. Mean)	Same as Primary
	35 $\mu g/m^3$	24-hour (4)	Same as Primary

Footnotes:
(1) - Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the Agency revoked the annual PM_{10} standard in 2006 (effective December 17, 2006).

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

(3) - 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 15.0 $\mu g/m^3$.

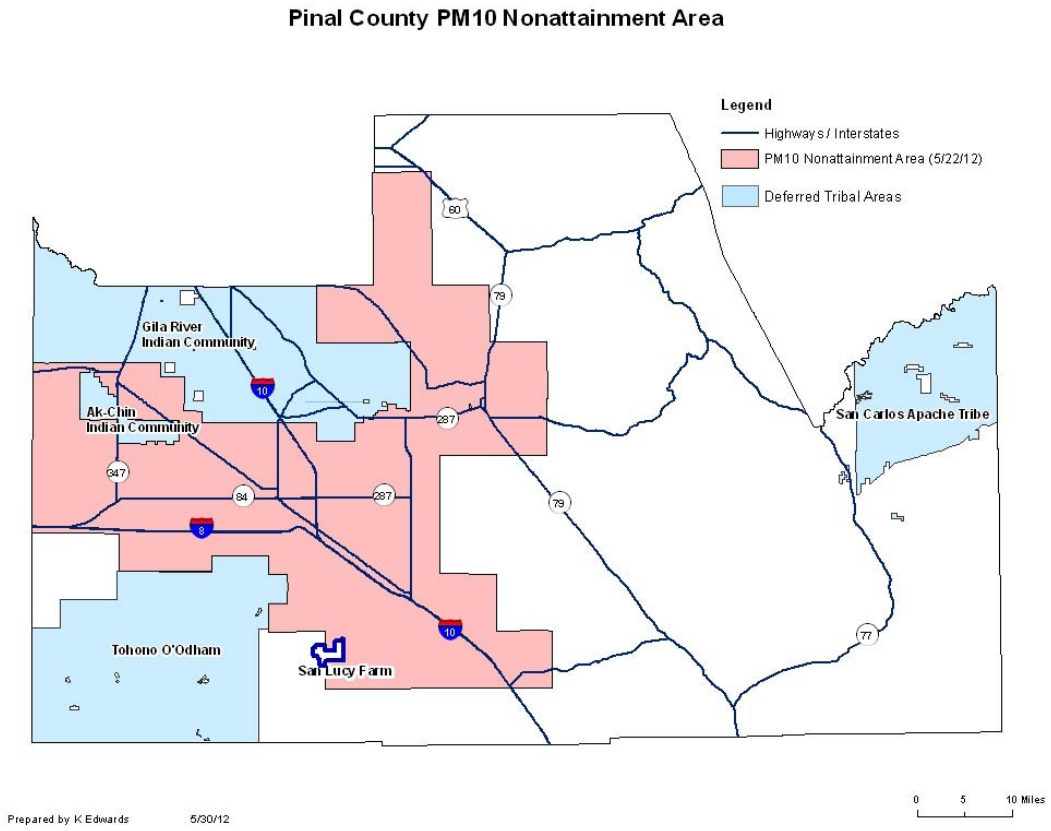
(4) - To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35$\mu g/m^3$ (effective December 17, 2006).

PM10 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). At the time this document was prepared the designation had not yet been 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 San Carlos Apache Nation and the main portion of the Tohono O'odham Nation were not contributing to violations of the PM10 standard in Pinal County and did not redesignate these areas.

Figure 1-1

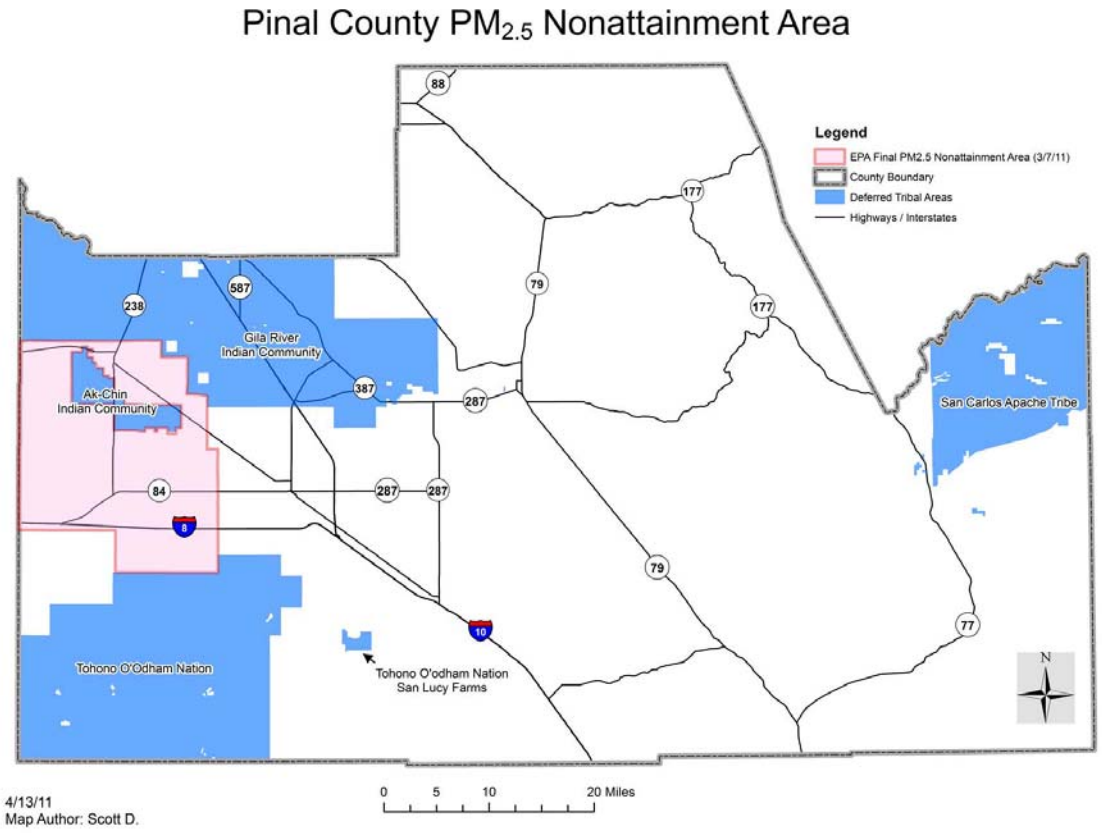


PM2.5 Nonattainment Designation

On February 3, 2011, the U.S. Environmental Protection Agency (EPA) issued final air quality designations for the 2006 24-hour $PM_{2.5}$ National Ambient Air Quality Standards (NAAQS) for Pinal County, Plumas County, California and Shasta County, 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 particle concentrations measured by the violating monitor. The Pinal County designation included a portion of the county (Figure 1-2) based upon air quality monitoring data from 2006-2008. Designations for the Pinal portions of the Gila River Indian Community and the Ak-Chin Indian Community were deferred until completion of the formal consultation process.

Figure 1-2



Lead

On October 15, 2008, EPA substantially strengthened the national ambient air quality standards 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 micrograms per cubic meter ($\mu g/m^3$), to 0.15 $\mu g/m^3$ 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' three month period with a maximum (not-to-be-exceeded) form, evaluated over a three-year period. This replaces the previous approach of using calendar quarters. A rolling three month average considers each of the 12 three-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			
Pollutant	**Primary Standard**	**Averaging Times**	**Secondary Standard**
Lead (as measured by TSP)	1.5 μg/m^3 (1978 standard)	Avg. of Calendar Quarter	Same as Primary
Lead (as measured by TSP)	0.15 μg/m^3 (2008 standard)	Rolling 3-Month Avg.[1]	Same as Primary

Footnotes: (1) – Form of the standard requires evaluation of data collected over a 3 year period

Nitrogen Dioxide

On January 22, 2010, EPA strengthened the health-based National Ambient Air Quality Standard (NAAQS) for nitrogen dioxide (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 a 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.

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 (CBSA) greater that 500,000 will require 1 monitoring site, 2) population center greater than 2,500,000 will require 2. Based upon current population Pinal County will not be required to implement NO_2 monitoring as these sites will be installed in Maricopa County.

Carbon Monoxide

On August 31, 2011 EPA finalized a revision to the carbon monoxide (CO) standard that retained the current standards and added minimum monitoring requirements. The primary standard for CO consists of a 1-hour standard and an 8-hour standard. 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 one per year.

The ambient air monitoring requirements for CO require 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 as the required site will be installed in Maricopa County

Sulfur Dioxide

On June 22, 2010 EPA finalized a revision to the primary Sulfur Dioxide (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 equal or be less than 75 ppb. The secondary SO_2 standard is 0.5 ppm averaged over 3-hours and is not 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, the Arizona Department of Environmental Quality (ADEQ) has historically conducted any SO_2 monitoring that has occurred in Pinal County. ADEQ operated a sulfur dioxide (SO_2) analyzer in San Manuel, Pinal County, until December of 2007. The San Manuel site was discontinued as proposed in the State Implementation Plan (SIP) and ADEQ Network Plan and subsequent attainment finding by EPA for the area.

2.0 Monitoring Objectives and Spatial Scales

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

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 State and Local Air Monitoring Station (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.

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 monitoring objectives and the spatial scales that are generally most appropriate for each objective. Table 2.2 summarizes this relationship.

Table 2-2: Monitoring Objectives

Monitoring Objective	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 Special Purpose Monitor (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 Methods (FRM) and Federal Equivalent Methods (FEM), 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} and ozone.

Three types of PM_{10} monitors are used throughout the monitoring network: 1) the filter-based high-volume sampler, 2) filter based medium volume sampler, and 3) the Tapered Element Oscillating Microbalance (TEOM) which measures PM_{10} on a continuous basis.

Two types of $PM_{2.5}$ monitors are used throughout the monitoring network: 1) the filter based medium volume sampler equipped with the appropriate size fractioning device, and 2) the FDMS TEOM (Filter Dynamic Measurement System) which measure $PM_{2.5}$ 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 $PM_{2.5}$ NAAQS. For the time period covered by this plan, Pinal County Air Quality does not intend to relocate any violating $PM_{2.5}$ monitors. In the event that a violating $PM_{2.5}$ monitor is relocated the following process will be utilized to address the required public comment process:

1. Evaluation of the potential replacement site will include review and comparison of available pollutant data, meteorology, climatology, terrain, and siting characteristics. This information will be documented in a brief report.
2. Make notice of such a change in the annual monitoring plan.
3. If the change must be accomplished prior to annual monitoring plan submittal, Pinal County will make appropriate notice via the agency Web page and invite participation from the public prior to relocation of the affected site.
4. Relocation of affected monitor.

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 compiled its first annual network review which included SLAM/SPM site designations. The past annual network reviews have been submitted to both ADEQ and EPA for comment.

Table 3-1: SLAMS Summary

Site Name	AQS ID	Classification	Scale	Objective	Pollutant
Apache Junction Fire Station	040213002	SLAMS	Neighborhood	Population	$PM_{2.5}$
Apache Junction Fire Station	040213002	SLAMS	Neighborhood	Population	PM_{10}
Apache Junction Maint.Yard	040213001	SLAMS	Neighborhood	Population	O_3
Casa Grande Airport	040213003	SLAMS	Neighborhood	Population	O_3
Casa Grande Downtown	040210001	SLAMS	Neighborhood	Population	$PM_{2.5}$
Coolidge Maintenance Yard	040213004	SLAMS	Neighborhood	Population	PM_{10}
Eloy City Complex	040213014	SLAMS	Neighborhood	Population	PM_{10}
Pinal Air Park	040213007	SLAMS	Regional	Background	PM_{10}
Pinal County Housing Complex (HiVol)	040213011	SLAMS	Neighborhood	Population	PM_{10}
Stanfield County Complex TEOM	040213008	SLAMS	Neighborhood	Population	PM_{10}
Casa Grande Downtown TEOM	040210001	SLAMS	Neighborhood	Population	PM_{10}
Cowtown Road	040213013	Proposed SLAMS	Middle Scale	SourceImpact	$PM_{2.5}$

Table 3-2: SPM Summary

Site Name	AQS ID	Classification	Scale	Objective	Pollutant
Apache Junction Fire Station TEOM	040213002	SPM	Neighborhood	Population	PM_{10}
Combs School TEOM	040213009	SPM	Neighborhood	Population	PM_{10}
County Complex Maricopa TEOM	040213010	SPM	Neighborhood	Population	PM_{10}
Pinal Air Park	040213007	SPM	Regional	Transport	O_3
Pinal County Housing Complex TEOM	040213011	SPM	Neighborhood	Population	PM_{10}
Cowtown Road TEOM	040213013	SPM	Middle Scale	SourceImpact	PM_{10}

Pinal County Air Quality proposes to retain the SPM designation for the monitors listed in Table 3.2. The ozone analyzer at Pinal Air Park will operate from April 1 through October 31, the seasonal schedule. The PM_{10} TEOM analyzers at Maricopa, Combs School, and Pinal County Housing will also retain SPM designation. The Cowtown medium volume FRM (47mm) and TEOM samplers are operated to monitor specific sources near the site. This plan proposes to revise the classification of the Cowtown $PM_{2.5}$ sampler from SPM to SLAMS. Additional detail is provided in Section 5.0.

3.2 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 IX by May 1 stating that the data has been submitted correctly. Pinal County Air Quality submitted an annual data certification for 2011 on May 1, 2012. Precision data for 2011 were submitted to AQS as of January 2012.

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-Glendale MSA, which has a population of 4,192,887 (US Census Bureau, 2010 Census data, http://2010.census.gov/2010census/data/index.php). Within Appendix D the EPA recognizes that State or local agencies must consider MSA/CSA boundaries and their own political boundaries and geographical characteristics in designing their air monitoring networks. The Appendix 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.

The design value 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 design values listed are the highest calculated concentrations recorded in Pinal County. Tables 3.3 through 3.5 list the minimum monitor requirements for $PM_{2.5}$, PM_{10}, and Ozone, respectively.

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% 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, 3.7 and 3.8 depict Pinal County's minimum monitoring requirements for PM_{10}, $PM_{2.5}$ and ozone. The tables below show the minimum monitoring requirements are being met.

These tables include SLAMS and SPM monitors operated in Pinal County, 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 design value. This plan re-evaluates the minimum requirement for each pollutant according to EPA direction. The results show a shortage of one $PM_{2.5}$ SLAMS monitor in the network, no change in the required number of sites for PM_{10}, and no change required number of sites for ozone. To correct this, Pinal County will propose to change the Cowtown $PM_{2.5}$ sampler from SPM to SLAMS. See Section 5.0 for additional description.

Table 3.6 lists the minimum monitoring requirements for ozone. The highest 8-hour ozone concentration site in Pinal County is the Queen Valley ozone site. The calculated ozone design value using the Queen Valley 3-year average of the 4th highest 8-hour average for the period of 2009-2011 is 0.073 ppm. This value is ≥ 85% of the NAAQS, which requires a minimum of three ozone monitors in the MSA.

Table 3-6: Minimum Monitoring Requirements for Ozone (O_3)

MSA	Counties	Population (US Census 2010)	8-hour Design Value (2009-2011)	Design Value Site (Pinal County)	Minimum Monitors Required	# of Active SLAMS Monitors	Monitors Needed
Phoenix-Mesa-Glendale	Pinal and Maricopa	4,192,887	0.074	Queen Valley 04-021-8001	3	3	0

Table 3.7 lists the minimum monitoring requirements for PM_{10}. The highest PM_{10} concentration recorded at a SLAMS or SPM site over the last 3 years of operation (2009-

2011) was 2315.7 µg/m^3 at Cowtown (July 5th, 2011 and 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 six to ten monitors in the MSA.

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

MSA	Counties	Population (US Census 2010)	Design Value (2009-2011)	Design Value Site (Pinal County)	Minimum Monitors Required	# of SLAMS Active Monitors	Monitors Needed
Phoenix-Mesa-Glendale	Pinal and Maricopa	4,192,887	2315.7	Cowtown 04-021-3013	6 to 10	7	0

Table 3.8 illustrates the minimum monitoring requirements for $PM_{2.5}$. The highest $PM_{2.5}$ 3-year average recorded at a Pinal County SLAMS or SPM site was at Cowtown. The calculated $PM_{2.5}$ design value for the Cowtown site is as follows: 1) 3-year average of the annual means is 13.2 µg/m^3, 2) 3-year average of the 98th percentiles is 26 µg/m^3. The 24-hour design value is > 85% of the NAAQS and the annual design value is >85% of the NAAQS. Considering the 24 hour and annual values the network requires three SLAMS monitors in the MSA. This plan proposes to revise the classification for the Cowtown $PM_{2.5}$ samplers from SPM to SLAMS, resulting in compliance with the minimum requirements.

Table 3-8: Minimum Monitoring Requirements for $PM_{2.5}$

MSA	Counties	Population (US Census 2010)	Design Value (2009-2011)	Design Value Site (Pinal County)	Minimum Monitors Required	# of Active SLAMS Monitors	Monitors Needed
Phoenix-Mesa-Glendale	Pinal and Maricopa	4,192,887	13.2 (annual) 26 (24-hour)	Cowtown 04-021-3013	3	2	1

3.4 Minimum Sample Frequency

$PM_{2.5}$ - The monitoring rule at 40 CFR 58.12 (d)(1) states that required manual $PM_{2.5}$ samplers 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 $PM_{2.5}$ 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 $PM_{2.5}$ sampling at SLAMS stations 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 $PM_{2.5}$ design value sites, and their regulatory data needs. Sites that have design values that are within plus or minus 10 percent of the NAAQS (±10% of 35µg/m^3 is 31.5-38.5) and sites where the 24-hour values 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 design value within plus or minus 5 percent of the daily $PM_{2.5}$ NAAQS (±5% of 35µg/m^3 is 33.25-36.75) must have an FRM or FEM operating on a daily schedule.

In 2008 Pinal County proposed and received approval from EPA Region IX to reduce the sample frequency at the Casa Grande site from 1 in 3 to 1 in 6 after the end of the 2008 sample year. This change was implemented on January 1, 2009. During 2007 samples were collected on the 1 in 3 schedule. Prior to 2007 the site operated at a 1 in 6 frequency for 8 years. During the time this site has operated the 3 year average of the 98th percentile value has not exceeded 21$\mu g/m^3$. With this change in sample frequency equipment was made available to begin collecting precision $PM_{2.5}$ measurements at the site. Sample frequencies are summarized in Table 3.9.

The 1 in 3 sample frequency at Apache Junction will not change.

The Cowtown $PM_{2.5}$ sample frequency has been 1 in 6 since the sampler was installed in August 2006. According to 40CFR 58.12 (d)(1) 1 in 3 sampling is required based upon the current design value. In February of 2011 an FDMS TEOM was installed at the site. Pinal County evaluated the operation of the instrument for several months and determined the performance is 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} sampler at the site was discontinued at the close of 2011 and converted to $PM_{2.5}$. The existing and new $PM_{2.5}$ samplers began alternate sampling on January 1, 2012 to meet a 1 in 3 sample schedule.

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

Site Name	3-Year Average of 98th percentile 2008-2010	Current Sample Frequency	Required Frequency
Casa Grande	20.0	1 in 6[a]	1 in 3 [a]
Apache Junction	14.0	1 in 3	1 in 3
Cowtown	26	1 in 3	1 in 3

Footnotes:
a – 1 in 6 sampling approved by EPA R9 in 2008

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

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

Appendix A of 40 CFR Part 58 Section 3.3.1 requires fifteen percent of the filter based PM_{10} monitoring sites, by collection method, in a network to be collocated. Pinal County Air Quality currently operates five filter based PM_{10} sites that utilize high-volume samplers. Historically up to two PM_{10} sites utilized medium-volume samplers (47mm). . As of December 31, 2011, Pinal County Air Quality does not operate medium volume

filter based PM_{10} monitors (47mm) and, therefore, does not have a requirement for collocation. This topic is described further in Section 5.0, Proposed Changes to the Network.

The Pinal County Housing site is utilized to collect the required PM_{10} collocated High-Volume samples. 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	Parameter Code	Total Number of Sites	Required Collocated Sites	Number of Collocated Sites
High-Volume (Wedding or Anderson)	062 and 063	5	1	1 (Pinal County Housing)
Medium-Volume (Partisol)	143	0	0	0

Appendix A of 40 CFR Part 58 does not require collocation of continuous PM_{10} monitors. Measurement quality of continuous TEOM instrument 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 fifteen percent of the monitoring sites in a network. Pinal County Air Quality operates three $PM_{2.5}$ sites with one collocated measurement made at Casa Grande Downtown. This was a change made in 2009 to correct a deficiency noted in the 2007 plan.

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

Sampling Method	Parameter Code	Total Number of Sites	Required Collocated Sites	Number of Collocated Sites
Medium-Volume (Partisol)	143 and 145	3	1	1 (Casa Grande Downtown)

3.6 Ozone Season Definition

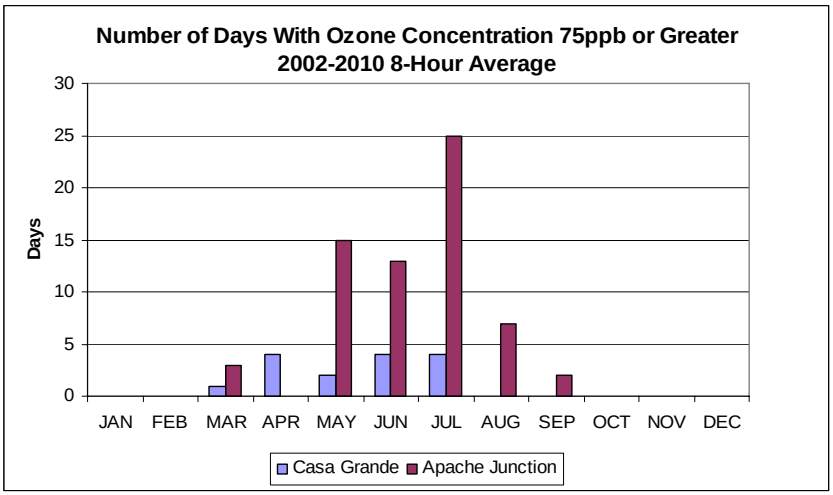
In the 2011 Annual Ambient Monitoring Network Plan Pinal County requested and was granted a modification to the area ozone season in accordance with 40 CFR Part 58, Appendix D, Paragraph 4.1(i). The modification to the ozone season defined the season as April 1 through October 31.

Pinal County operates a portion of the ozone network on a seasonal basis from April 1 through October 31 each year. This is based upon the data summary below from the Casa Grande and Apache Junction ozone sites for years 2002 through 2010. These results demonstrate that ozone concentrations have not routinely exceeded 75 ppb during the period from October through March. See Figure 3.1 below. Recent reductions in the ozone monitoring network negate the need for additional review of the Pinal County ozone monitoring season. No change to the current season will be proposed. Additionally, a 1998 EPA guidance document entitled, “Guideline for Selecting and

Modifying the Ozone Monitoring Season Based on an 8-Hour Ozone Standard" supports a shorter ozone season for Arizona based upon data collected from 1990 through 1995.

The modified seasonal schedule is applied to Pinal Air Park. The Casa Grande Airport and Apache Junction Maintenance Yard will continue to operate on a January to December schedule. With the past approval of this modification, Pinal County made appropriate corrections to the seasonal definition in the AQS database and annual monitoring plan.

Figure 3-1



3.7 Quality System Requirements

Pinal County Air Quality submitted a Quality Assurance Project Plan (QAPP) to EPA Region IX in January 2007. The QAPP covered all aspects of the ambient monitoring network operations, filter weighing process, and data quality review. All instrument SOPs were completed and included in the QAPP. EPA provided feedback on the QAPP in July of 2008. Pinal County Air quality is currently revising appropriate sections of the QAPP to address the comments. All flow rate standards used by Pinal County are traceable to NIST Standards and are recertified annually. The ozone standard is verified by the California Resource Board on an annual basis and the ozone transfer standard is verified by Pinal County Staff 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 3.11 and 3.12. ADEQ conducts performance audits of Pinal County monitors according to frequencies described in 40 CFR Part 58. All flow rate standards used by ADEQ are traceable to NIST Standards and a recertified annually. The ozone standard used by ADEQ is checked twice per year.

Currently, EPA does not consider Pinal County Air Quality a primary quality assurance organization as defined by 40 CFR Part 58 Appendix A, paragraph 3.1.1. Pinal County and EPA Region IX are currently discussing how this designation can be obtained.

Table 3-11: Semi-Annual Flow Rate Audits

Site	AQS ID	Parameter	Audit Date 1	Audit Date 2
Apache Junction Fire Station	04-021-3002	$PM_{2.5}$	2/22/2012	7/27/2011
Apache Junction Fire Station	04-021-3002	PM_{10}	2/22/2012	7/27/2011
Apache Junction Fire Station TEOM **(Installed 8/20/11)**	04-021-3002	PM_{10}	2/22/2012	N/A
Casa Grande Downtown	04-021-0001	$PM_{2.5}$	5/1/2012	10/20/2011
Casa Grande Downtown TEOM	04-021-001	PM_{10}	5/1/2012	10/20/2011
Combs TEOM	04-021-3009	PM_{10}	4/25/2012	11/15/2011
Coolidge	04-021-3004	PM_{10}	1/11/2012	7/13/2011
Cowtown **(Discontinued on 1/1/12)**	04-021-3013	PM_{10}	7/13/2011	1/12/2011
Cowtown	04-021-3013	$PM_{2.5}$	1/11/2012	7/13/2011
Cowtown TEOM	04-021-3013	PM_{10}	1/11/2012	7/13/2011
Eloy	04-021-3014	PM_{10}	1/11/2012	7/13/2011
Mammoth **(Discontinued on 5/15/11)**	04-021-3006	PM_{10}	5/12/2011	N/A
(City of) Maricopa TEOM	04-021-3010	PM_{10}	1/11/2012	7/13/2011
Pinal Air Park	04-021-3007	PM_{10}	1/11/2012	7/14/2011
Pinal County Housing (POC 1 & 2)	04-021-3011	PM_{10}	11/15/2011	5/25/2011
Pinal County Housing TEOM	04-021-3011	PM_{10}	11/15/2011	5/25/2011
Riverside **(Discontinued on 5/15/11)**	04-021-3012	PM_{10}	5/11/2011	N/A
Stanfield TEOM	04-021-3008	PM_{10}	1/11/2012	7/13/2011

Table 3-12: Annual Performance Audits

Site	AQS ID	Parameter	Audit Date
Apache Junction Maint.Yard	04-021-3001	O_3	7/27/2011
Casa Grande Airport	04-021-3003	O_3	5/1/2012
Pinal Air Park	04-021-3007	O_3	8/2/2011

3.8 Lead Monitoring Network Description

The strengthening of the Lead NAAQS resulted in a revision to 40CFR 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 Environmental Protection Agency (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 National Ambient Air Quality Standards (NAAQS) established in November 2008. EPA lowered the lead emissions monitoring threshold from 1.0 tons per year (tpy) to 0.50 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.

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 tons or more tons per year based on either the most recent National Emission Inventory (NEI) (*http://www.epa.gov/ttn/chief/ eiinformation.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 2005 NEI and internal emission inventory reports were reviewed by Pinal County Air Quality Staff. Table 3.11 summarizes lead emission calculated by NEI or reported through the Toxics Release Inventory (TRI) in 2005. As reported to NEI in 2005 only one source in Pinal County exceeded the 0.5 ton per year threshold. A review of the ASARCO LLC Ray Operations Mine 2007 emission inventory report, which is required through an air quality operating permit, shows a revision to the annual lead emission rate from 1.27tpy to 0.014tpy. The revision was described in a May 12, 2008 letter accompanying the annual emission inventory submittal. Air Quality permit management reviewed and accepted the revised emission rate.

The second pathway for required ambient lead monitoring arises through CBSA/MSA population. Pinal County is included in the Phoenix-Mesa-Glendale, AZ 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 inventory 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 ton per year threshold and, 2) Pinal County assumes that the MSA required monitoring will be 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 3-11: NEI 2005 Point Source Lead Emissions in Pinal County

Facility Name	2005 NEI v 2 Emissions (tpy)	TRI2005 TRI Emissions (tpy)
FABRICATED PRODUCTS INC. DBA S EAFAB METALS CO.	0.00555	0.00555
ASARCO LLC RAY OPERATIONS MINE	0.00025	1.27275
OWENS CORNING ELOY PLANT	0.0411	0.0542
WESTILE INC.	0.00005	0.00005

4.0 Monitoring Site Descriptions

This section describes the purpose and classification of each monitoring site operated by Pinal County Air Quality. 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 site is included in the statewide $PM_{2.5}$ network.

The site consists of a High-Volume PM_{10} sampler, a sequential $PM_{2.5}$ sampler and a PM_{10} TEOM. The High-Volume PM_{10} sampler operates on a one in six day schedule and the $PM_{2.5}$ sampler operates on a one in three day schedule.

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

One High-Volume PM_{10} sampler 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 site in response to a recorded exceedance at the filter based PM_{10} sampler. The TEOM will be maintained as an SPM monitor for 24 month period. A decision to maintain the monitor or discontinue it will be made prior to the 24 month period passing. During this period the filter based sampler will continue to operate. See section 5.0 for additional 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 samplers. 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 both 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 one in six-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 District removed the carbon monoxide monitor located at this 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. On January 1, 2004 the remaining PM_{10} High Volume monitor was moved to the Pinal County Housing site in order to create a co-located PM_{10} site. Refer to section 4.12 of this document for details on the Pinal County Housing 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.

4.3 Casa Grande Airport

This site is located within the Casa Grande Municipal Airport. Casa Grande lies about twenty 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 growing rapidly. To the east of the airport approximately a quarter of a mile is a major thoroughfare, Pinal Avenue.

The objective of this site is to quantify ozone concentrations south of the Phoenix metropolitan area. The ozone concentration at this site reflects both regional transport and neighborhood scale population exposure.

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.

The site currently consists of an ozone analyzer, a wind system, a barometric pressure sensor and a temperature and relative humidity sensor. In August 2006 a new site shelter was installed. 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 the 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} sampler and a $PM_{2.5}$ FRM sampler. The samplers were moved further away from a nearby furnace flue in September of 2001. The High-Volume PM_{10} sampler operated on a one in six-day schedule. The $PM_{2.5}$ monitor at this site was upgraded from an Andersen $PM_{2.5}$ FRM sampler to a single channel R&P $PM_{2.5}$ FRM sampler in March 2004. The $PM_{2.5}$ FRM sampler had operated on a one in six day schedule since 1999. On January 1, 2007 the sample frequency was changed to one in three days to meet new monitoring requirements. In March of 2007 a second $PM_{2.5}$ FRM sampler was installed so that operation could alternate between the two and reduce trips to the site. A continuous PM_{10} TEOM was installed in March of 2007.

For the first sample of 2009, the sample frequency of the two $PM_{2.5}$ samplers 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} sampler was moved from Casa Grande Downtown to Stanfield and replaced with a PM_{10} Thermo Partisol.

On December 31, 2010 the PM_{10} Partisol sampler at Casa Grande Downtown was discontinued. The PM_{10} TEOM was designated as a SLAMS monitor as of January 1, 2011 (see section 5.0 for additional detail).

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 Elementary School District campus and is approximately ten 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 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 site meets 40 CFR Part 58 Appendix D and E criteria.

The ozone analyzer was discontinued May 18, 2011.

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

The site consists of a High-Volume PM_{10} sampler, which collects samples on a one in six-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 fifteen meters to the south and the inlet height was reduced from 5.6 meters to 3.4 meters.

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, and a commercial composting facility operate to the south, southwest and southeast. This site is used to look at several PM_{10} sources in the area, including agriculture, the grain-processing complex, the feedlots and county dirt 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 will contain 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 samplers. 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 filter dynamics measurement system (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.

The FDMS TEOM was operated periodically during 2005 in an effort to find ways to maintain the sampler 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 five-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 particulate matter 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 particulate matter 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 particulate matter 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 one in six 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 microns and 10 microns in size. The surrogate coarse data is extrapolated by subtracting the PM_{10} concentration from the $PM_{2.5}$ 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 is 7.0% for calendar year 2009. This demonstrates 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.

The time-lapse video system was relocated to the Stanfield site in July of 2006. The Cowtown 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 $PM_{2.5}$ Anderson samplers were replaced with Thermo PM_{10} and $PM_{2.5}$ Partisol samplers which also hold an EPA Federal Reference Method designation. Both the PM_{10} and $PM_{2.5}$ instruments operated on a 1 in 6 day schedule.

On August 12, 2010 the main flow of TEOM was changed from 1 liter per minute to 3 liters per minute. The instrument was set to 1 liter per minute in 2005 to address instrument response to very high concentrations. A review of the instrument and data indicated that typical concentrations had decrease to a level where the 3 liters per minutes was appropriate. A comparison to PM_{10} values collected with the on-site filter based instrument compares well to the TEOM. No adverse conditions or readings have been observed after 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-Fischer 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 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-Fischer 1405DF FDMS TEOM was discontinued and removed from the site. Pinal County determined that the cost of operation was excessive, comparison to filter measurements lack 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} sampler at the site was discontinued. This was done in order to convert the sampler 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 effective January 1, 2012. EPA commented on the 2011 plan that SPM data must be included when computing the area design value. This plan re-evaluates the minimum requirement for each pollutant according to EPA direction. The results show a shortage of one $PM_{2.5}$

SLAMS monitor in the network. To correct this, Pinal County proposes to change the Cowtown $PM_{2.5}$ samplers from SPM to SLAMS.

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

4.8 Eloy County Complex

This 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. The site consists of a High-Volume PM_{10} sampler, which collects samples on a one in six-day schedule.

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

4.9 Mammoth County Complex

This site was located on the roof of the Mammoth County Complex. Mammoth lies near the southeast corner of the County, approximately thirty miles northeast of Tucson and eighty-five miles southeast of Phoenix. Residential homes surrounded the site on all sides. The purpose of this site was to quantify PM_{10} concentrations affecting the surrounding population on a neighborhood scale. This site also served as a background site for the eastern portion of the county, which historically has been economically dominated by copper mining. The surrounding elevations range from 2000 to 5500 feet. Aside from the mining operations, the landscape is dominated by native vegetation.

The site consisted of a High-Volume PM_{10} sampler, which collected samples on a one in six-day schedule. The site meet 40 CFR Part 58 Appendix D and E criteria.

The PM_{10} sampler was discontinued effective May 16, 2011.

4.10 Maricopa County Complex (City of Maricopa)

This site is adjacent to the County Complex in city of Maricopa. Maricopa lies about fifteen 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, development added a substantial number of houses near the monitoring site and additional subdivisions were built in every direction. 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 reflects 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 an ozone sampling began in July 2002, thus data for a portion of the 2002 ozone season are missing. The ozone monitor is operated

seasonally. In December 2004 a PM_{10} TEOM unit was installed. Therefore, only 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 site meets 40 CFR Part 58 Appendix D and E criteria.

The ozone analyzer was discontinued May 18, 2011.

4.11 Pinal Air Park

This site is located at water well number two within the Pinal Air Park complex. Pinal Air Park lies about twenty 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 lying 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 particulate matter site for the central and western portion of the county, which is dominated by agriculture and low elevations (generally around 1500 feet).

The site includes a High-Volume PM_{10} sampler, which collects samples on a one in six-day schedule and an ozone monitor that is operated seasonally. An ozone analyzer 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 concentration at this site reflects both regional transport and neighborhood scale population exposure.

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

4.12 Pinal County Housing Complex

This site is located within the Pinal County Housing Complex and is approximately eleven miles east of Casa Grande in the heart of the agricultural basin of the County. The site was installed in July of 2002 to replace the Eleven Mile Corner site, which was approximately 1 mile to the south. The Pinal County Housing site better represents the particulate matter impact on the surrounding population 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 just to the 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 Complex site. This site is used to evaluate several PM_{10} sources in the area, including cotton gins, fairground activity, and agricultural activity.

The site originally consisted of a High-Volume PM_{10} sampler running on a one in six 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} sampler was installed to collect precision samples. This replaced the Apache Junction Maintenance Yard as the precision site in the network.

During 2005 it was discovered that one of the High-Volume PM_{10} samplers, PCH West, was not operating properly; the second High-Volume sampler, PCH East, has operated within specifications throughout this time period. The malfunctioning Anderson High-Volume PM_{10} sampler was removed from service in July 2006. This particular unit had a quick connect device to secure the inlet that none of the other Andersen High-Volume units operated by the District have. It appears this quick connect device has deteriorated over time and was causing the unit to operate outside of the required specifications. Since one of the Anderson High-Volume units was retired, 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.

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

4.13 Riverside Maintenance Yard

This site was located at the Pinal County Public Works Yard in Riverside. The site was approximately thirteen miles southeast of Superior and four miles northwest of Kearny. The Ray Mine, an active open pit copper mine, is approximately two miles east of the monitoring site. The monitor was located in the Mineral Creek valley, down slope from the mine operations. The purpose of this site was to analyze off-site source impacts of the mine's tailing impoundments (neighborhood scale).

This site was installed in March of 2003 and consisted of an Andersen High-Volume PM_{10} sampler collecting samples on a one in six-day schedule. In early 2006, Pinal County Public Works Department moved a mobile office building onto the site. The addition of this building did not affect the siting of the sampler. The site meets 40 CFR Part 58 Appendix D and E criteria.

The PM_{10} sampler was discontinued effective May 16, 2011.

4.14 Stanfield County Complex

This site is located behind the Stanfield County Complex. Stanfield lies about fifteen miles west of Casa Grande, and about thirty 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} sampler, which collected samples on a one in six-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 sampler was replaced with a medium volume Anderson FRM sampler. The Anderson sampler was replaced with an FRM Partisol medium volume sampler in November 2007.

A time-lapse video system which was previously installed at the Cowtown site (described in section 3.9) was added to this site in July 2006. The new location will allow 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 sampler at Stanfield was replaced with the High-Volume sampler from Casa Grande Downtown. On December 31, 2009 the PM_{10} High-Volume sampler at Stanfield was discontinued and the PM_{10} TEOM was designated as a SLAMS monitor as of January 1, 2010.

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

4.15 Queen Valley

This site is located at the Queen Valley water tank. Queen Valley is approximately sixteen 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. ADEQ also operates a nephelometer, temperature and relative humidity sensors at the site. The ozone data from this site is included in Appendix B of this document because the site demonstrates ozone transport into Pinal County. Please refer to the State of Arizona Monitoring Network Plan for additional information.

Queen Valley is also the location for an Interagency Monitoring of Protected Visual Environments (IMPROVE) sampler. This sampler 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 sampler. Due to budget cuts and personnel shortages primary responsibility for operations was returned to ADEQ on June 1, 2011.

5.0 Proposed Changes to the Network

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

5.1 Proposed Change of $PM_{2.5}$ Monitor Classification at the Cowtown Site

EPA commented on the 2011 plan that SPM data must be included when computing the area design value. This plan re-evaluates the minimum requirement for each pollutant according to EPA direction. The results show a shortage of one $PM_{2.5}$ SLAMS monitor in the network. To correct this, Pinal County proposes to change the Cowtown $PM_{2.5}$ samplers from SPM to SLAMS after accepting comment regarding the issue.

5.2 Closure of Cowtown PM_{10} Filter Sampler; Install 2nd $PM_{2.5}$ Sampler

On December 31, 2011 the filter based PM_{10} sampler at the site was discontinued. This was done in order to convert the sampler 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 effective January 1, 2012.

5.3 Change of Monitoring Scale of the Cowtown Site

The 2011 plan proposed to revise the scale classification of the Cowtown 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 the change. No comments were received concerning the change. The revision to Middle Scale was made in the EPA data in January 2012.

5.4 Addition of Continuous PM10 at the Apache Junction Fire Station Site

On August 20, 2011, a PM_{10} TEOM began operation at site in response to a recorded exceedance at the filter based PM_{10} sampler. The TEOM will be maintained as an SPM monitor for 24 month period. A decision to maintain the monitor or discontinue it will be made prior to the 24 month period passing. During with period the filter based sampler will continue to operate.

5.5 Closure of Riverside and Mammoth PM_{10}

Due to budget shortages and subsequent personnel reductions the Riverside and Mammoth PM_{10} samplers were discontinued effective May 16, 2011. This was described in the 2011 Network Plan. Because the sites were designated as SLAMS, EPA concurrence was necessary. Concurrence was provided by EPA on February 10, 2012.

5.6 Closure of Maricopa and Combs Ozone

Due to budget shortages and subsequent personnel reductions the Maricopa and Combs ozone analyzers were discontinued effective May 18, 2011. This was described in the 2011 Network Plan. The sites were designated Special Purpose (SPM), therefore, no EPA concurrence was required. The sites will remain closed.

5.7 Addition of Continuous PM10 at the Pinal Air Park Site

Preliminary data from the May 9, 2012 HiVol run at Pinal Air Park showed an exceedance of the PM_{10} standard. This is the first exceedance recorded since this site was installed in 1993 and the data point may be submitted as an exceptional event. Pinal County Air Quality is considering installing a PM_{10} TEOM at this site to collect continuous data. At the time that this document was written budgetary and scheduling issues were still being researched. Additional detail will be provided in future versions of this document.

6.0 Data Trends

This section provides an overall description of the pollutants 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 pollutant.

In order to discuss this information, it is necessary to clarify the dual meanings for the word “exceedance”. The common understanding, 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 eight-hour ozone standard, the first three observed eight-hour concentrations above the standard reference value are not even considered for purposes of determining compliance, and only the fourth high value counts towards the calculated 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

Carbon monoxide is a tasteless, odorless, colorless gas that competes with oxygen in the bloodstream. Carbon monoxide binds to hemoglobin in the bloodstream and thereby impairs oxygen transport. This decrease in oxygen transport can result in a reduction of exercise tolerance, an increase in the visual threshold for light awareness, headaches, and dizziness.

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 stagnate layer of air near the earth's surface.

The carbon monoxide NAAQS has two forms, a one-hour standard of 35 ppm, and an eight-hour standard of 9 ppm.

Carbon Monoxide monitoring was discontinued at the Apache Junction and Casa Grande sites as of May of 2002 and October of 2002, respectively.

Between 1996 and 2002, the highest one-hour average recorded at either monitoring site was approximately 10% of the standard and the highest eight-hour average recorded was approximately 15% of the standard. Considering the relatively low levels 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.

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 eight to thirty 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 volatile organic compounds, nitrogen oxides, and sunlight. Sources of volatile organic compounds 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. Exposure to elevated ozone concentrations leads to impaired lung function in humans and plant damage by impairing plant respiration.

The official ozone season in Arizona, as defined by EPA, is January through December. Many 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. In Section 3.6, Ozone Season Definition, a request and justification are presented to designate the Pinal County ozone season to be April through October.

Refer to Section 1.0 for a detailed description of the ozone standards and Appendix C for 1-hour and 8-hour data summaries. The following subsections discuss the ozone trends in Pinal County. Generally, Pinal County easily meets the former one-hour standard and meets the current eight-hour standard by a small margin.

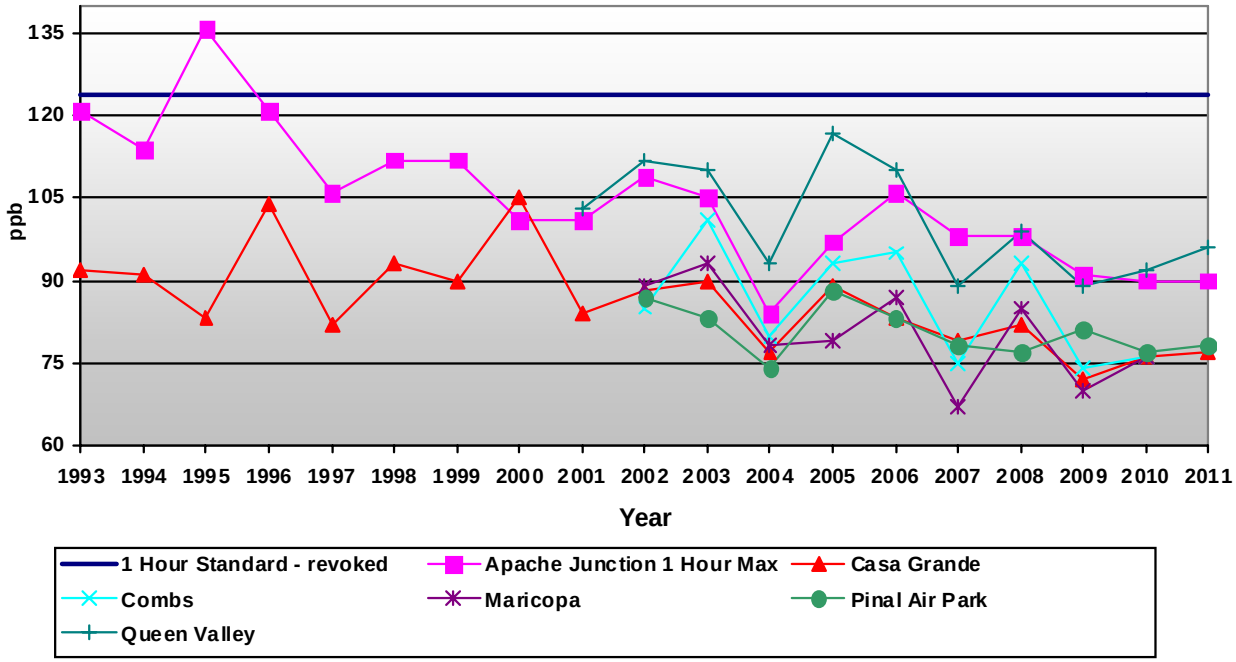
6.2.1 One-Hour Ozone

Pinal County met the former one-hour ozone standard. Even though this standard has been revoked, one-hour ozone data will continue to be reported in this document to assess trends. A single exceedance of the one-hour standard was recorded in Apache Junction in 1995 but was not a violation because the standard allowed one exceedance per calendar year. No exceedances of the 1-hour standard were recorded at Casa Grande, Queen Valley, Combs, Maricopa, or Pinal Air Park.

Daily maximum one-hour averages at Apache junction and Queen Valley in 2011 were among the highest downwind of the Phoenix metropolitan area. The sites recorded concentrations of 90 and 96 PPB, respectively. In most locations the 1 hour average ozone concentrations have generally decreased over time. The trend for 2011 at Queen Valley increased more than observed in past years. The remaining sites increase slightly or remained constant compared to 2010. In general, the long term trend is downward as evident with Casa Grande and Apache Junction, the two long term sites.

Figure 6-1 shows the one-hour maximum readings recorded at Apache Junction, Casa Grande, Queen Valley, and Pinal Air Park. 2011 Combs and Maricopa data are not included in the plot since the sites were discontinued in 2011.

Figure 6-1: One-Hour Ozone Trends – Maximum Concentration

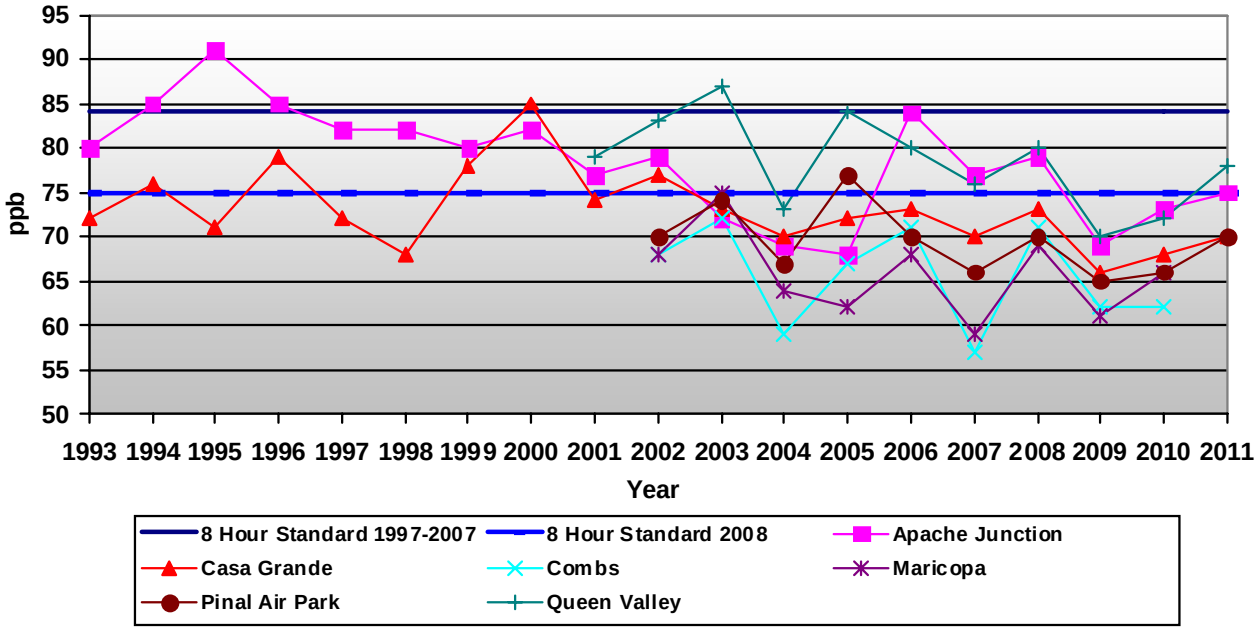


6.2.2 Eight-Hour Ozone

Daily maximum 8-hour averages increased at all Pinal County monitoring site in 2011. 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 and Casa Grande. The increasing trend, looking back to 2009, continued in 2011. Overall, 2009 was a low ozone year across all networks in Arizona while 2011 was one the highest recorded in many years.

Figure 6-2 shows the fourth highest eight-hour average recorded at Apache Junction, Casa Grande, Queen Valley, and Pinal Air Park. 2011 Combs and Maricopa data are not included in the plot since the sites were discontinued in 2011.

Figure 6-2: Eight-Hour Ozone Trends – 4th Highest Concentrations



6.3 Particulate Matter smaller than 10 microns (PM_{10})

PM_{10} is 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, wind blown dust, and combustion processes, notably power plants and diesel engines.

When particulate matter is inhaled into the respiratory tract the health effects depend on the size of the particle. Particles larger than ten microns are generally removed from the respiratory system by sneezing. Particles between five microns and ten microns in size can either be removed from the respiratory system by sneezing or moved up the respiratory tract by cilia (hair like projections) in the lung. Once the particulates have been moved back up the respiratory tract they may be swallowed and absorbed in the gastrointestinal tract, where they may be excreted. Particles ranging from two microns to five microns are generally deposited deeper into the respiratory tract. Still, cilia action has the potential to move the particles back up the respiratory tract, where they may be swallowed and absorbed in the gastrointestinal track. Particulates smaller than two microns may reach an area of the lung called the alveolar region. This is the region of the lung where absorption into the bloodstream is most likely.

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. The data presented here reflects the application of Pinal County's Natural Events Action Plan (NEAP). Generally, the Pinal County NEAP allowed for exclusion of data where the elevated particulate concentrations resulted from certain defined high wind conditions.

An initial Pinal County NEAP was adopted in 1997. Underlying 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 invokes 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 has been subjected to the 1997 NEAP.

In 2006 ADEQ initiated a NEAP program to identify regional wind blown events, or natural events that resulted in elevated PM_{10} concentrations. Pinal County continuous PM_{10} TEOM data was reviewed as part of this process. When a regional wind blown event was identified as a contributor to elevated PM_{10} concentrations or exceedances, the continuous TEOM data was submitted to the EPA Region IX office for concurrence. The EPA did not concur that the 2006 Pinal County data should be flagged as a natural event since Best Available Control Measures (BACM) were not implemented in Pinal County during this time period. The data presented in this document includes all PM_{10} concentrations recorded in 2006; the natural events have not been removed.

In March of 2007 EPA replaced the Natural Events Action Plan 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 thirty two events be excluded from the 2007 PM_{10} data set, sixteen events from the 2008 PM_{10} data set, twelve events from the 2009 PM_{10} data set, ten events from the 2010 PM_{10} data set and forty events from the 2011 PM_{10} data set. The 2007, 2008, 2009, 2010 and 2011 Exceptional Events packages assert that the exceedances listed would not have occurred "but for" the exceptional events (namely elevated wind speeds). If EPA concurs with Pinal County Air Quality's conclusion that these are exceptional events the exceedances listed in the packages will be excluded from the data set used for determining compliance with the NAAQS. This document does not exclude any of the 2007 - 2011 PM_{10} exceedances since EPA has yet to concur with our assertions.

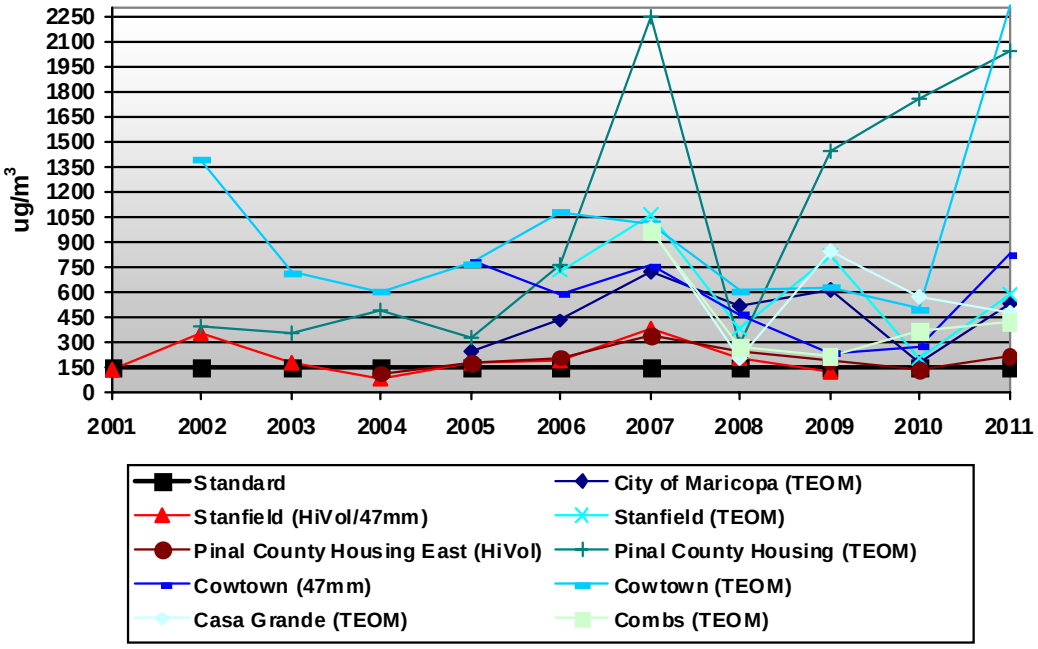
6.3.1 24-Hour PM_{10} Trends

Figure 6-3, 6-4a, and 6-4b illustrate maximum 24-hour average PM_{10} values collected throughout Pinal County. To better illustrate the range in concentrations the figures are separated into two categories, highest and lowest concentration sites. Maximum PM_{10} concentrations typically vary from year to year because they result from local sources or high wind events.

Figure 6-3 shows trends at the highest concentration sites. It is evident from the illustration that the each of the sites has recorded 24-hour average concentrations in excess of the PM_{10} standard of 150µg/m^3. The 2011 record shows a marked increase in maximum concentration that is directly related to a exceptionally large thunderstorm caused dust storm that occurred on July 5th.

Note that for 2007-2011 days flagged as exceptional event by Pinal County were not removed from the data set. The events are pending concurrence from EPA Region IX. The Casa Grande continuous PM_{10} TEOM sampler is included in this group since inclusion of the natural event data results in the monitor exceeding the standard.

Figure 6-3: Maximum 24-Hour PM_{10} Concentration at Highest Sites



Figures 6-4a and 6-4b show 24-hour trends for sites with concentrations typically less than the standard. Apache Junction and the Casa Grande filter based data, shown in figure 6-4a, are historically below the standard for the period of record. The first exception is July 8, 2011 at the Apache Junction site. This was the first exceedance ever recorded in Apache Junction and prompted the installation of a PM_{10} TEOM continuous monitor in August 2011. Casa Grande filter based data and Riverside and Mammoth data are not included in figure 6-4a and 6-4b since the monitors were discontinued in 2011.

Figure 6-4a: Maximum 24-Hour PM_{10} Concentration - Lowest Sites Group A

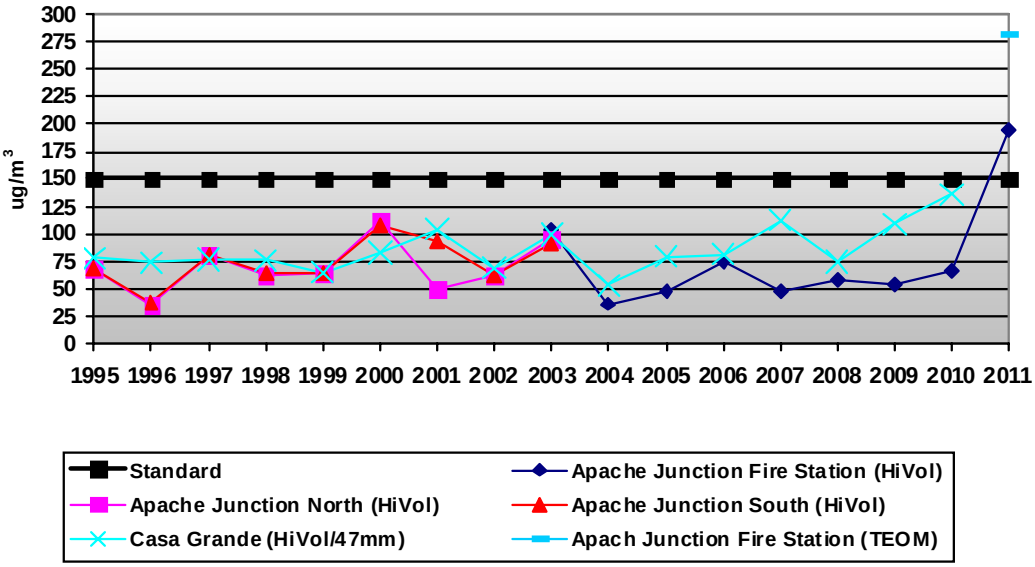
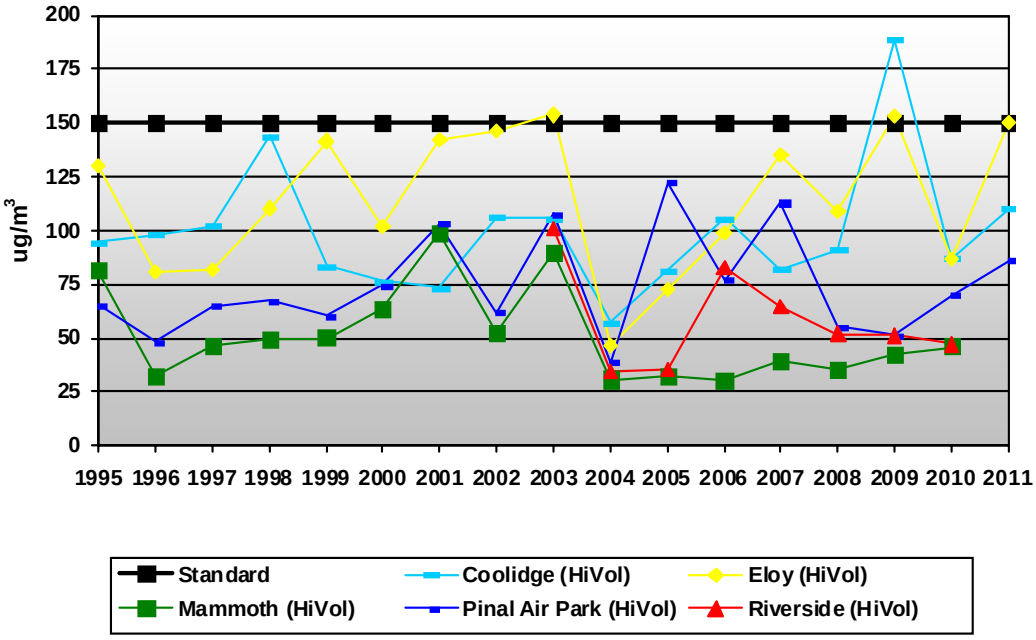


Figure 6-4b: Maximum 24-Hour PM_{10} Concentration - Lowest Sites Group B

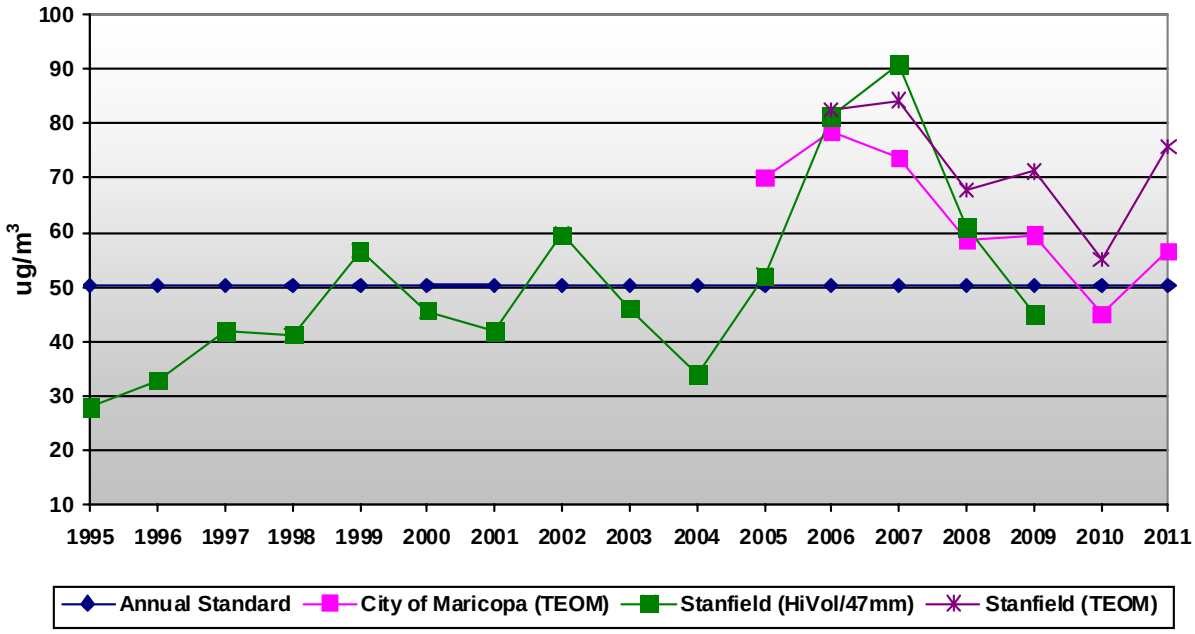


6.3.2 Annual PM_{10} Trends

Figure 6-5, 6-6a, and 6-6b illustrate annual average PM_{10} values collected throughout Pinal County. To better illustrate the range in concentrations the figures are separated into regional categories, Western sites, Central and Southern sites, and Eastern sites. Annual averages are no longer comparable to a Federal standard, but offer a valuable measure for trend analysis. Before being revoked the annual standard was 50µg/m^3.

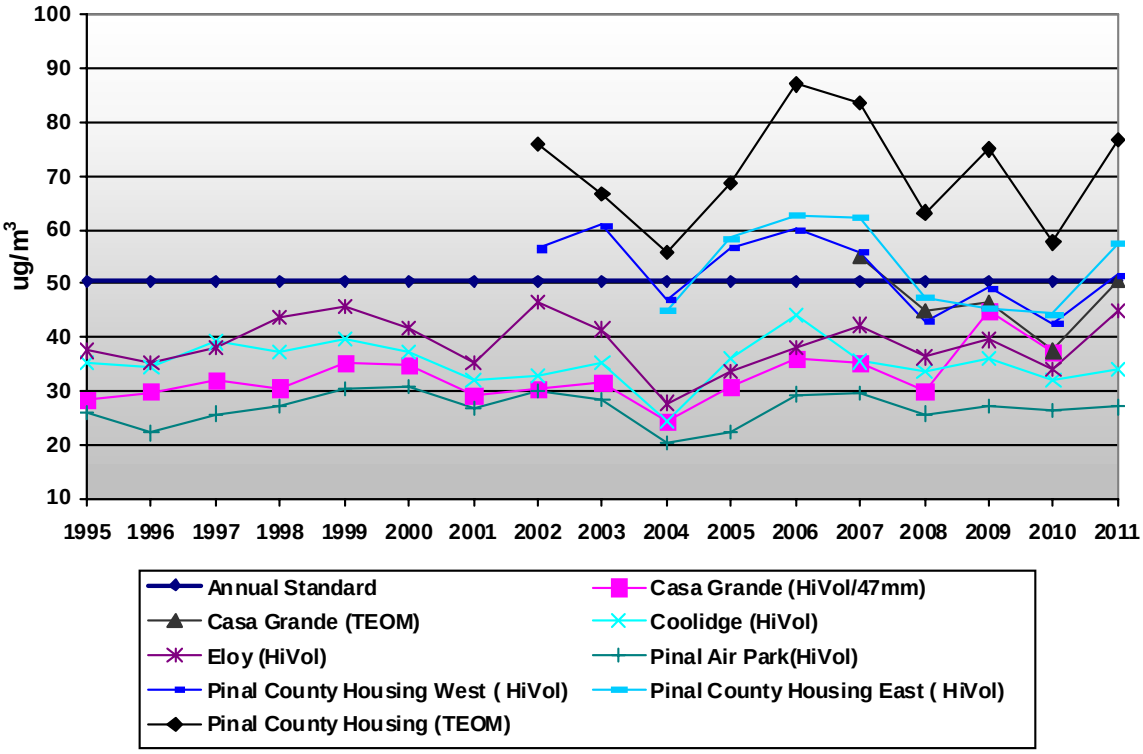
Figure 6-5 shows trends at the highest western sites; Stanfield and City of Maricopa. Of these sites Stanfield has the longest data record. Although the collection method changed in 2006, the increasing trend at Stanfield is evident. Annual averages in the mid-1990s were between 30 and 40µg/m^3 compared to values ranging from 80 to 90µg/m^3 in 2006 and 2007. 2008 thru 2010 showed significant decreases in the annual averages followed by an increase in 2011. Annual averages at Maricopa are comparable to Stanfield, but lack a longer term record.

Figure 6-5: Annual PM_{10} Average at Western Sites



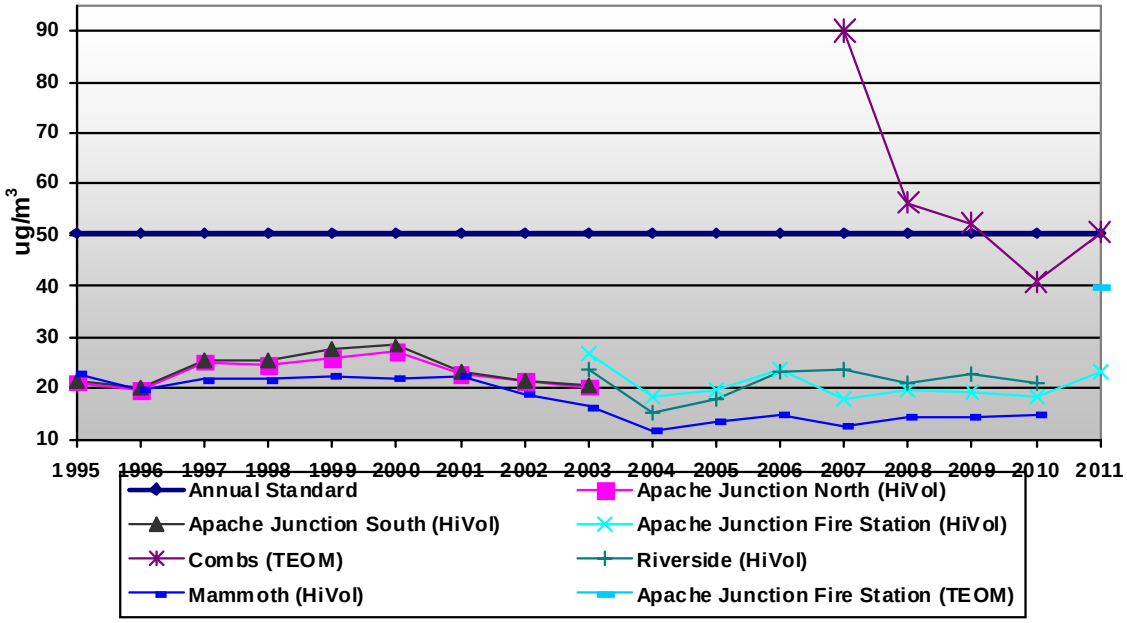
The Central and Southern sites, shown in Figure 6-6, include Casa Grande, Coolidge, Eloy, Pinal County Housing, and Pinal Air Park. Among these sites Pinal County Housing records the highest concentrations, above the revoked annual standard. All sites in this group show a generally increasing trend from a rather low year in 2004 through 2007. In 2010 the annual averages at all the monitors showed a slight decrease followed by an increase in 2011.

Figure 6-6: Annual PM_{10} Average at Central and Southern Sites



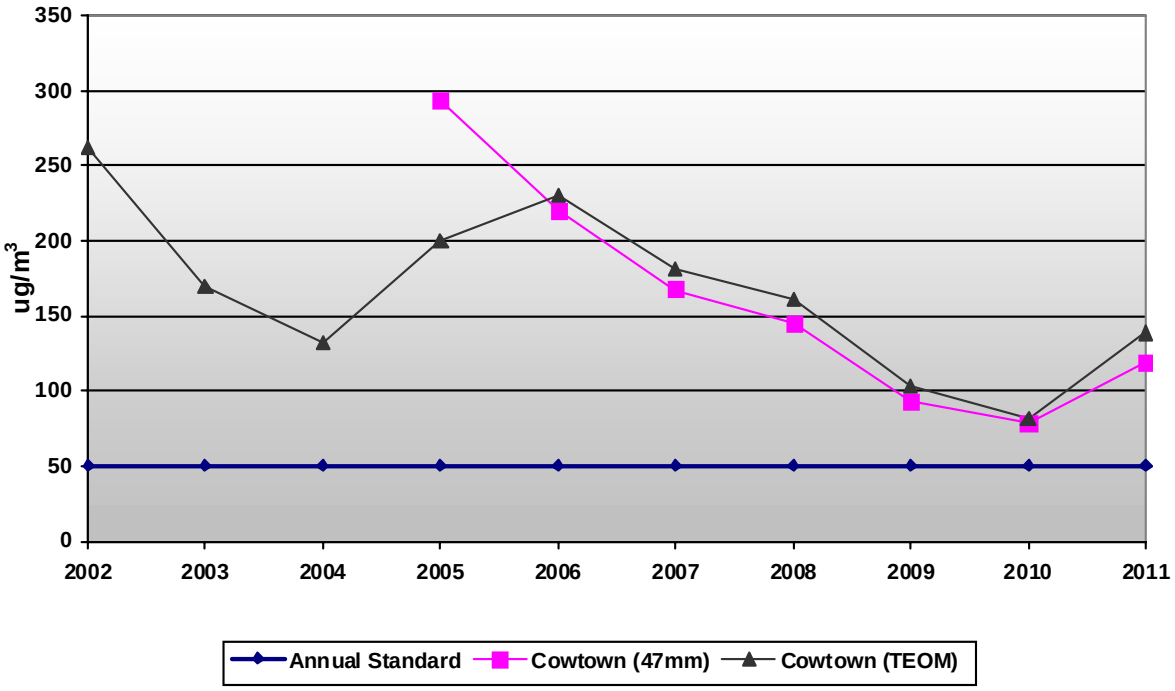
The Eastern sites, shown in Figure 6-7, include Apache Junction, Combs, Mammoth and Riverside. PM_{10} measurement at Combs was added during the spring of 2007 so only a partial year of data is available. Values at Combs decreased for three years followed by a modest increase in 2011. Apache Junction, Mammoth and Riverside are all well below the revoked annual standard. 2011 Riverside and Mammoth data are not included in figure 6-7 since the monitors were discontinued in 2011. The Apache Junction Fire Station TEOM 2011 annual average only includes a portion of year since it was installed in August 2011.

Figure 6-7: Annual PM_{10} Average at Northern and Eastern Sites



Because past values at Cowtown were a factor of 2 to 3 higher than other sites, the site is shown alone in Figure 6-8. Annual concentrations through 2008 were 4 to 5 times higher than the revoked standard. The long term trend at Cowtown shows a slight decrease in 2004 followed by a gradual increase in 2005 and 2006. The 2007 – 2010 averages show a steady decrease in concentration with a modest increase in 2011.

Figure 6-8: Annual PM_{10} Average at Cowtown



6.4 Particulate Matter smaller than 2.5 microns ($PM_{2.5}$)

$PM_{2.5}$ is airborne particles less than or equal to 2.5 microns (1 micron = 10^{-4} centimeters) in diameter. $PM_{2.5}$ can result from the combustion of fuels in motor vehicles, power generation, industrial processes, and from burning wood in residential fireplaces. As explained in Section 6.3, the health effects of inhaling particulate matter depends on the size of the particle. $PM_{2.5}$ particles are small enough to reach an area of the lung called the alveolar region. This is the region of the lung where absorption into the bloodstream is most likely. Elevated $PM_{2.5}$ levels may aggravate respiratory and cardiopulmonary problems.

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.

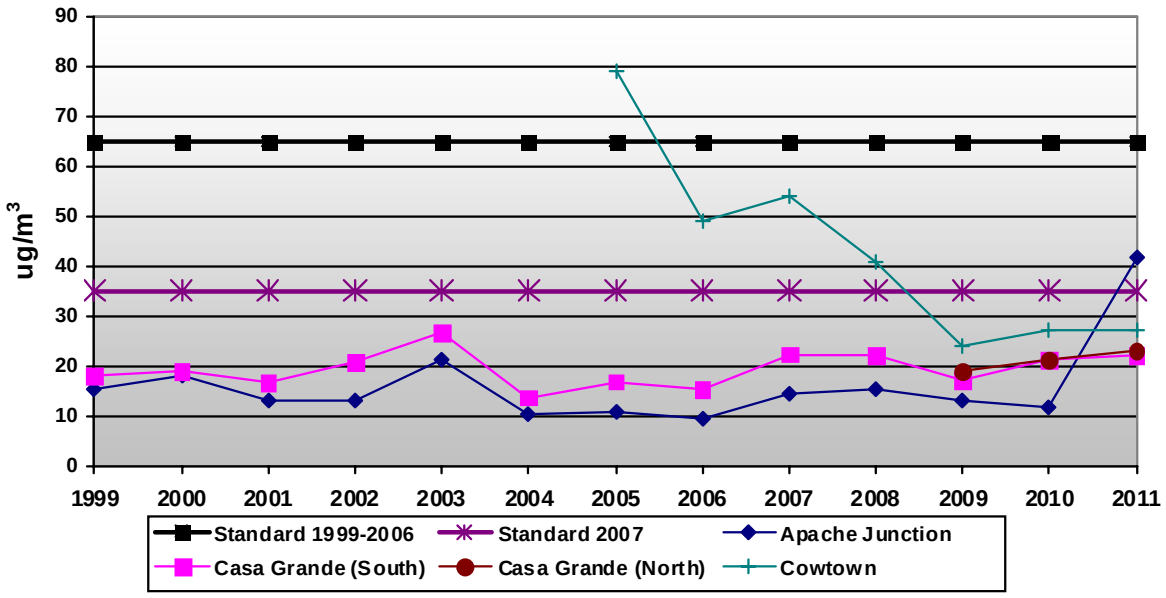
Special considerations for comparing $PM_{2.5}$ data to the standard are described at 40 CFR Subpart D (58.30). The subpart states that $PM_{2.5}$ sites with unique-middle scale or micro-scale representation and hot-spot sites are only eligible for comparison to the 24-hour $PM_{2.5}$ standard. The Cowtown 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 6-9 illustrates 98th percentile $PM_{2.5}$ values collected at Apache Junction, Casa Grande, and Cowtown. It is evident from the illustration that the Apache Junction and Casa Grande sites are typically below the standard over the period of record. Both sites show a historical concentration range between 9 and 27µg/m^3. The significant increase in the Apache Junction 2011 concentration is related to a series of exceptionally strong thunderstorms July 5th thru July 8th were the monitor recorded two consecutives runs above the standard. The Apache Junction three year average of the 98th percentile value is still well below the standard at 22µg/m^3. The 24-Hour values at Casa Grande are typically higher than Apache Junction by approximately 25%.

The Cowtown site shows values above 35µg/m^3 for the first four years of operation followed by the 2009 24-hour 98th percentile value falling below 35µg/m^3. The three year average of the 98th percentile value dropped from 61µg/m^3 in 2007, to 40 in µg/m^3 in 2009, to below the standard in 2010 at 31µg/m^3 and remained below the standard at 26µg/m^3 in 2011. The site now meets the $PM_{2.5}$ 24-hour NAAQS.

Figure 6-9: Network-Wide 24-Hour 98th Percentile $PM_{2.5}$ Trends

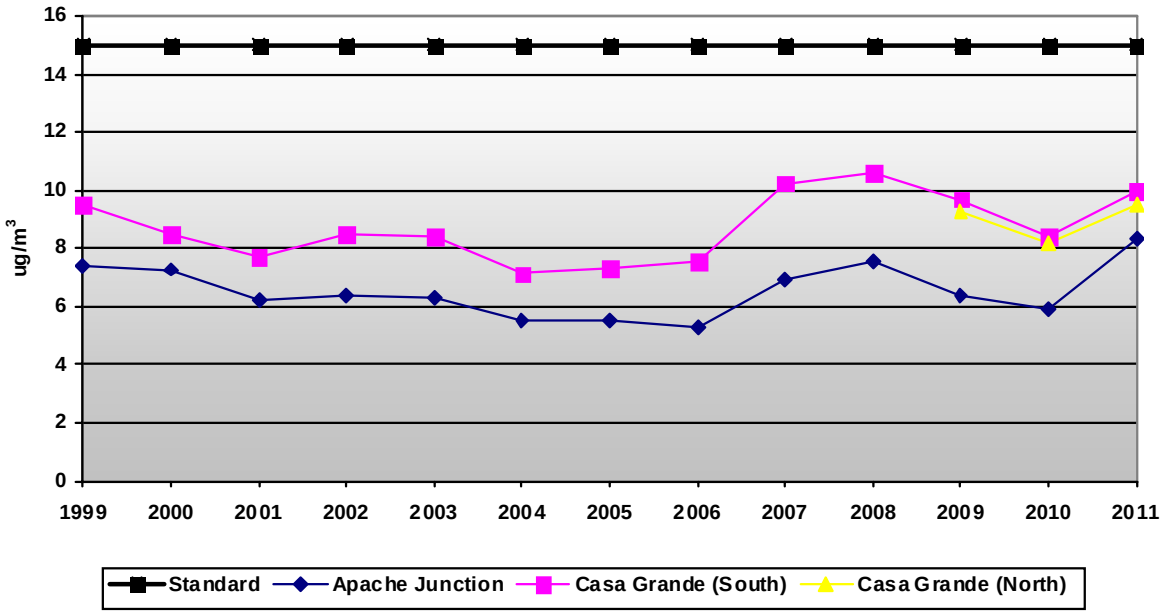


6.4.2 $PM_{2.5}$ Annual Trends

Figure 6-10 illustrates annual average $PM_{2.5}$ values collected at Apache Junction and Casa Grande. Both sites show concentrations with a range between 5 and 11µg/m^3. A slight decrease is apparent in 2009 and 2010 with a modest increase in 2011. As with seen in the 24-Hour averages, the values at Casa Grande are typically higher than Apache Junction by approximately 25%.

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

Figure 6-10: Network-Wide Annual Average $PM_{2.5}$ Trends



Appendix A

Acronyms & Abbreviations

Acronyms & Abbreviations used in this document

ADT	Average Daily Traffic
AQS	Air Quality System
ADEQ	Arizona Department of Environmental Quality
ARM	Approved Regional Method
BACM	Best Available Control Measures
CAA	Clean Air Act
CASAC	Clean Air Scientific Advisory Committee
CBSA	Core Based Statistical Area
CFR	Code of Federal Regulations
CO	Carbon Monoxide
EPA	Environmental Protection Agency
FDMS	Filter Dynamics Measurement System
FEM	Federal Equivalent Methods
FRM	Federal Reference Methods
HiVol	High Volume PM_{10} sampler
IMPROVE	Interagency Monitoring of Protected Visual Environments
MET	Meteorological
MSA	Metropolitan Statistical Area
N/A	Not Applicable
NAAQS	National Ambient Air Quality Standards
NEAP	Natural Events Action Plan
NO_2	Nitrogen Dioxide
O_3	Ozone
PAMS	Photochemical Assessment Monitoring Station
PCAQCD	Pinal County Air Quality Control District
Pb	Lead
PM_{10}	Particulate Matter less than or equal to 10 microns
$PM_{2.5}$	Particulate Matter less than or equal to 2.5 microns
ppm	Parts Per Million
ppb	Parts Per Billion
PSD	Prevention of Significant Deterioration
QAPP	Quality Assurance Project Plan
R&P	Rupprecht and Patashnick
SLAMS	State and Local Air Monitoring Stations
SO_2	Sulfur Dioxide
SPM	Special Purpose Monitor
TEOM	Tapered Element Oscillating Microbalance
$\mu g/m^3$	Micrograms per Cubic Meter

Appendix B

PCAQCD Monitoring Site Descriptions

All sites in this appendix have the following common characteristics:

Table B-1 Common Site Information

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

Apache Junction Fire Station – AJFS **AQS Site ID: 04-021-3002**

3955 E. Superstition Blvd. TE, Apache Junction, Arizona

Latitude: 33.421194° **Longitude:** -111.503222° **Map Datum:** WGS 84

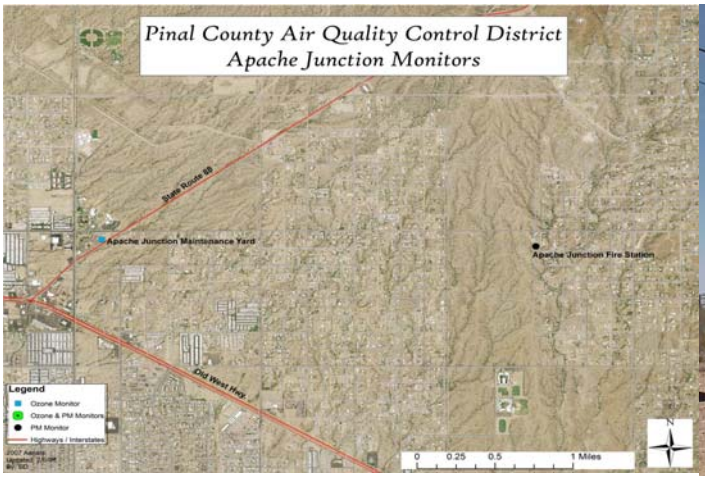


Table B-2 Apache Junction Fire Station (AJFS)

Parameter	Instrument #1	Instrument #2	Instrument #3
Pollutant/Monitor Type	PM_{10} FRM	$PM_{2.5}$ FRM	PM_{10} FEM
AQS IDs (Parameter /Method /POC)	881102/062/POC1	88101/145/POC1	88102/079/ POC3
Date Parameter Established	2003	1999	2011
County ID	AJ	AJE	AJ TEOM PM_{10}
Sampler Make & Model	Wedding HiVol	R&P 2025	R&P 1400a (A/B)
Classification	SLAMS	SLAMS	SPM
Scale	Neighborhood	Neighborhood	Neighborhood
Site Type / Objective	Population	Population	Population
Inlet Height	3.5 meters	3.7 meters	3.5
Distance from Tree Dripline	21.9 meters	25.7 meters	31.3
Obstacle Description	None	None	None
Height of Obstacle	N/A	N/A	N/A
Distance and Direction	N/A	N/A	N/A
Airflow Arch	360°	360°	360°
Furnace or Incinerator Flue	None	None	None
Distance and Direction	N/A	N/A	N/A
Distance Between Samplers	6.7 meters	6.7 meters	9.4
Nearest Road	Arroya	Arroya	Arroya
Distance and Direction to Road	43.6 meters - NE	39.9 meters - NE	36.6
Traffic Count (ADT)	17 cars per day	17 cars per day	17 cars per day
Schedule	1 in 6 days	1 in 3 days	Continuous
Surrounding Area	Residential / Desert	Residential / Desert	Residential / Desert
Site Groundcover	Gravel / Vegetative	Gravel / Vegetative	Pavement
Frequency of flow rate verifications	Quarterly	Monthly	Monthly
Last two flow rate audits	2/22/12, 7/27/11	2/22/12, 7/27/11	2/22/12, N/A
Does Site Meet App D&E Criteria	Yes	Yes	Yes

Notes: *The photo was taken while facing southwest.
*The site is comparable to the 24-hour and annual PM2.5 NAAQS

Apache Junction Maintenance Yard -AJ AQS Site ID: 04-021-3001
305 E. Superstition Blvd., Apache Junction, Arizona
Latitude: 33.4214° **Longitude:** -111.5436°' **Map Datum:** WGS 84

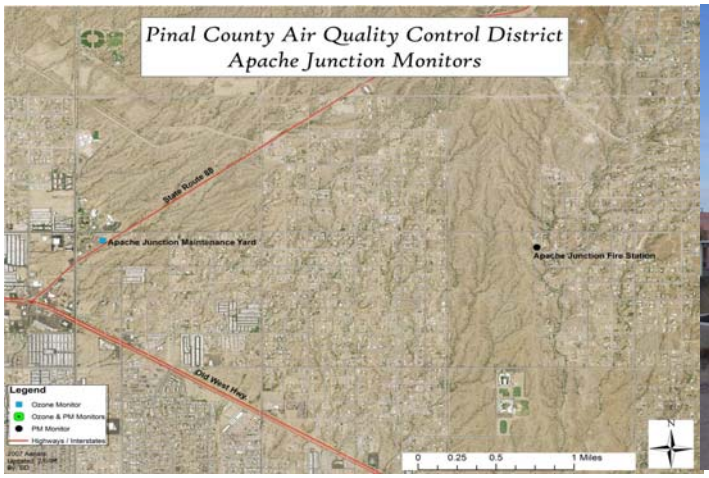


Table B-3 Apache Junction Maintenance Yard (AJ)

Parameter	Instrument #1	Instrument #2	Instrument #3
Pollutant/Monitor Type	O_3 FEM	Wind	Temp & RH / Pressure
AQS IDs (Parameter /Method /POC)	44201/112/ POC1	N/A	N/A
Date Parameter Established	1992	1993	1994
County ID	AJ O_3	AJ MET	AJ MET
Sampler Make & Model	API 400	RM Young 05305 AQ	Vaisala HMP 45C/CS105
Classification	SLAMS	N/A	N/A
Scale	Neighborhood	N/A	N/A
Site Type / Objective	Population	N/A	N/A
Inlet Height	3.5 meters	10 meters	3.8 meters
Distance from Tree Dripline	12 meters	20 meters	12 meters
Obstacle Description	Building	None	Building
Height of Obstacle	4 meters	N/A	4 meters
Distance and Direction	5meters –SW	N/A	5 meters-SW
Airflow Arch	360°	360 °	360 °
Furnace or Incinerator Flue	None	None	None
Distance and Direction	N/A	N/A	N/A
Distance between Collocated Samplers	N/A	N/A	N/A
Nearest Road	Hwy 88	Hwy 88	Hwy 88
Distance and Direction to Road	35 meters - E	27meters - E	35 meters - E
Traffic Count (ADT)	17466 (2008)	17466 (2008)	17466 (2008)
Schedule	Jan-Dec	Continuous	Continuous
Probe Material	Glass	N/A	N/A
Residence Time	5.6 sec	N/A	N/A
Surrounding Area	Gravel lot	Gravel lot	Gravel lot
Site Groundcover	Gravel	Gravel	Gravel
Frequency of one point QC check	Bi-weekly	N/A	N/A
Last annual performance evaluation	7/27/11	N/A	N/A
Does Site Meet App D&E Criteria	Yes	N/A	N/A

Notes: The photo was taken while facing west.

Casa Grande Airport - CGA **AQS Site ID: 04-021-3003**

660 W. Aero Dr., Casa Grande, Arizona

Latitude: 32.954361° **Longitude:** -111.76225° **Map Datum:** WGS 84

Table B-4 Casa Grande Airport (CGA)

Parameter	Instrument #1
Pollutant/Monitor Type	O_3 FEM
AQS IDs (Parameter /Method /POC)	44201/112/ POC1
Date Parameter Established	1991
County ID	CG O_3
Sampler Make & Model	API 400E
Classification	SLAMS
Scale	Neighborhood
Site Type / Objective	Population/Transport
Inlet Height	4.1 meters
Distance from Tree Dripline[2]	8.1 meters
Obstacle Description	Tower
Height of Obstacle	14 meters
Distance and Direction	6 meters - N
Airflow Arch	360°
Furnace or Incinerator Flue	None
Distance and Direction	N/A
Distance between Collocated Samplers	N/A
Nearest Road	SR387
Distance and Direction to Road	494 meters - E
Traffic Count (ADT)	19965 (2008)
Schedule	Jan-Dec
Probe Material	Glass
Residence Time	5.6 sec
Surrounding Area	Parking Lot / Tarmac
Site Groundcover	Pavement
Frequency of one point QC check	Bi-weekly
Last annual performance evaluation	5/1/12
Does Site Meet App D&E Criteria	Yes

Notes: *The photo was taken while facing northeast.

* The tree indicated is a bank of bushes to the north of the shelter; the height of the bushes is below the inlet and therefore, does not constitute an obstruction.

Casa Grande Downtown – CGD **AQS Site ID: 04-021-0001**

401 Marshall St., Casa Grande, Arizona

Latitude: 32.877583° **Longitude:** -111.752222° **Map Datum:** WGS 84

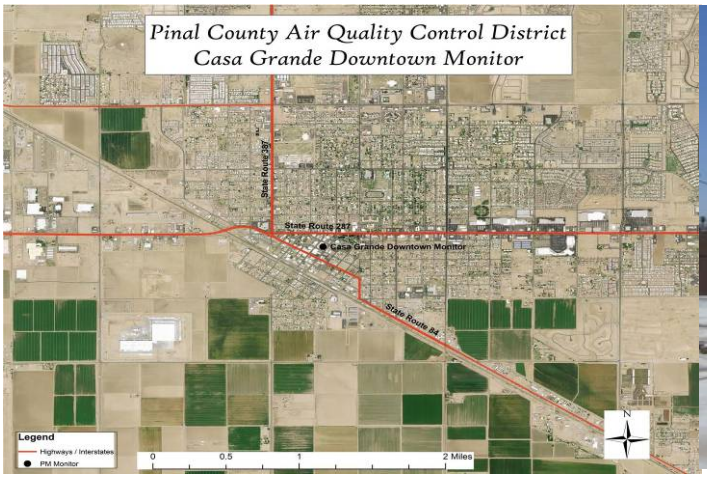


Table B-5 Casa Grande Downtown (CGD)

Parameter	Instrument #1	Instrument#2	Instrument #3	Instrument #4
Pollutant/Monitor Type	PM_{10}	$PM_{2.5}$	$PM_{2.5}$	PM_{10}
AQS IDs (Parameter /Method /POC)	Discontinued	88101/143/POC 2	88101/143/POC 1	81102/079/POC 3
Date Parameter Established	1989	1999	2007	2007
County ID	CG PM_{10}	CGN $PM_{2.5}$	CGS $PM_{2.5}$	CG PM_{10}
Sampler Make & Model	R&P 2000-H	R&P 2000-H	R&P 2000-H	R&P 1400a (A/B)
Classification	SLAMS	SLAMS	SLAMS	SLAMS
Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Site Type/Objective	Population	Population	Population	Population
Inlet Height	6.1 meters	6.1 meters	6.1 meters	6.1 meters
Distance from Tree Dripline	19.6 meters	16.4 meters	19.0 meters	24.8 meters
Obstacle Description	None	None	None	None
Height of Obstacle	N/A	N/A	N/A	N/A
Distance and Direction	N/A	N/A	N/A	N/A
Airflow Arch	360 °	360°	360°	360°
Furnace or Incinerator Flue	Furnace Flue	Furnace Flue	Furnace Flue	Furnace Flue
Distance and Direction	6.1 meters - S	9.1 meters - S	5.1 meters - S	11.0 meters - S
Distance between Collocated Samplers	3.5 meters to CGS	2.8 meters (QA Collocated)	2.8 meters (QA Collocated)	3.4 meters to CGN
Nearest Road	Marshall St.	Marshall St.	Marshall St.	Marshall St.
Distance and Direction to Road	20.6 meters – E	18.4 meters – E	19.5 meters - E	20.1 meters - E
Traffic Count (ADT)	4022 (2009)	4022 (2009)	4022 (2009)	4022 92009)
Schedule	1 in 6 days	1 in 6 days	1 in 6 days	Continuous
Surrounding Area	Business District	Business District	Business District	Business District
Site Groundcover	Pavement	Pavement	Pavement	Pavement
Frequency of flow rate verifications	Quarterly	Monthly	Monthly	Monthly
Last two flow rate audits	N/A	5/1/12, 10/20/11	5/1/12, 10/20/11	5/1/12, 10/20/11
Does Site Meet App D&E Criteria	Yes	Yes	Yes	Yes

Notes: *The photo was taken while facing west.
*The site is comparable to the 24-hour and annual PM2.5 NAAQS

Combs School – CB **AQS Site ID: 04-021-3009**

301 E. Combs Rd., Queen Creek, Arizona

Latitude: 33.219111° **Longitude:** -111.561111° **Map Datum:** WGS 84

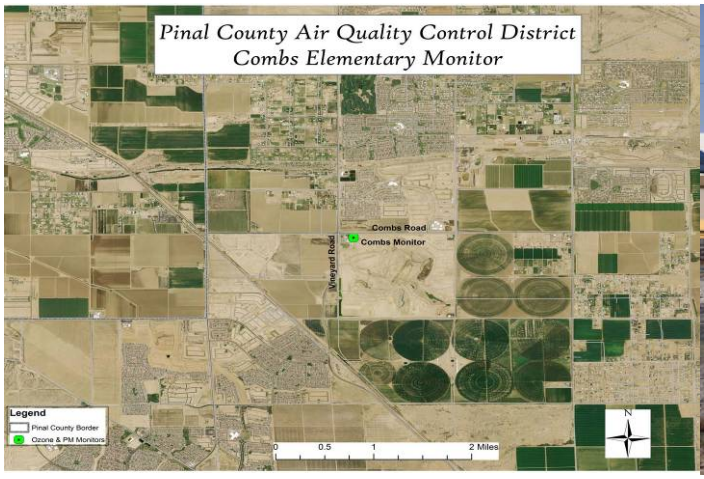


Table B-6 Combs School (CB)

Parameter	Instrument #1	Instrument #2
Pollutant/Monitor Type	PM_{10} FEM	O_3 FEM
AQS IDs (Parameter /Method /POC)	81102/079/POC 3	Discontinued
Date Parameter Established	2007	2002
County ID	CB PM_{10}	CB O_3
Sampler Make & Model	R&P 1400a (A/B)	API 400E
Classification	SPM	SPM
Scale	Neighborhood	Neighborhood
Site Type / Objective	Population / Transport	Population / Transport
Inlet Height	4.1 meters	4.6 meters
Distance from Tree Dripline	22.9 meters	22.9 meters
Obstacle Description	School Building	Playground Canopy
Height of Obstacle	4.0 meters	4.5 meters
Distance and Direction	7.2 meters - N	4.3 meters - S
Airflow Arch	360°	360°
Furnace or Incinerator Flue	None	None
Distance and Direction	N/A	N/A
Distance between Collocated Samplers	N/A	N/A
Nearest Road	Combs Rd.	Combs Rd.
Distance and Direction to Road	89.5 meters - N	89.5 meters - N
Traffic Count (ADT)	11069 cars per day	11069 cars per day
Schedule	Continuous	Apr-Oct
Probe Material	N/A	Glass
Residence Time	N/A	5.6 sec
Surrounding Area	School Grounds / Residential	School Grounds / Residential
Site Groundcover	Concrete / Dirt Road	Concrete / Dirt Road
Frequency of flow rate verifications	Monthly	N/A
Last two flow rate audits	4/25/12, 11/15/11	N/A
Frequency of one point QC check	N/A	Bi-weekly
Last annual performance evaluation	N/A	N/A
Does Site Meet App D&E Criteria	Yes	Yes

Notes: The picture was taken facing west.

Coolidge Maintenance Yard – CLDG **AQS Site ID: 04-021-3004**

212 E. Broadway, Coolidge, Arizona

Latitude: 32.978556° **Longitude:** -111.514833° **Map Datum:** WGS 84

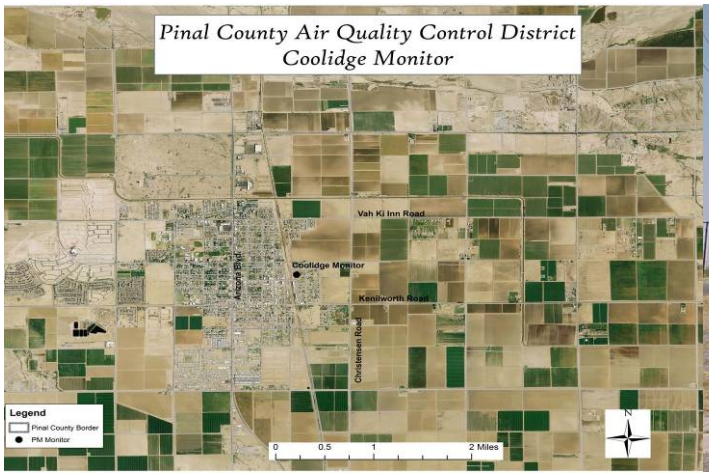


Table B-7 Coolidge Maintenance Yard (CLDG)

Parameter	**Instrument #1**
Pollutant/Monitor Type	PM_{10} FRM
AQS IDs (Parameter /Method /POC)	81102/062/POC 1
Date Parameter Established	1992
County ID	CLDG
Sampler Make & Model	Wedding HiVol
Classification	SLAMS
Scale	Neighborhood
Site Type / Objective	Population
Inlet Height	3.5 meters
Distance from Tree Dripline	None
Obstacle Description	Building
Height of Obstacle	3.2 meters
Distance and Direction	6.7 meters - NE
Airflow Arch	360°
Furnace or Incinerator Flue	None
Distance and Direction	N/A
Distance between Collocated Samplers	N/A
Nearest Road	Pacific St.
Distance and Direction to Road	8.8 meters – W
Traffic Count (ADT)	164 cars per day
Schedule	1 in 6 days
Surrounding Area	Residential
Site Groundcover	Gravel / Vegetative
Frequency of flow rate verifications	Quarterly
Last two flow rate audits	1/11/12, 7/13/11
Does Site Meet App D&E Criteria	Yes

Notes: The photo was taken facing north.

Cowtown Road – CWTN AQS ID: 04-021-3013

1.1 37580 W. Maricopa-Casa Grande Highway, Maricopa, Arizona

Latitude: 33.01053 **Longitude:** -111.97205° **Map Datum:** WGS 84

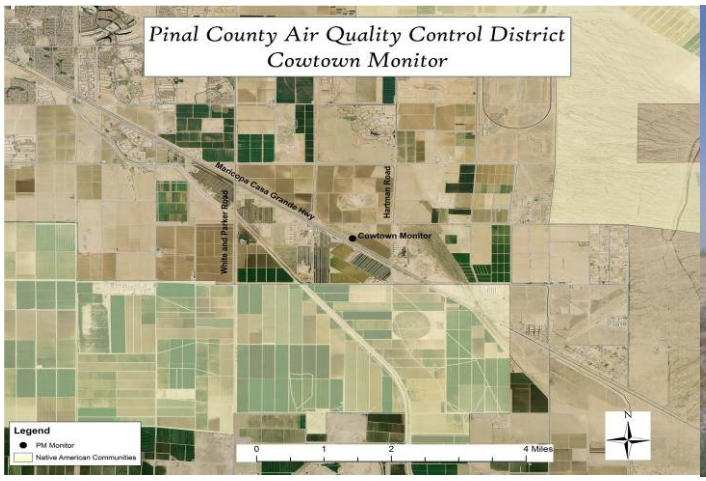


Table B-8 Cowtown Road (CWTN)

Parameter	Instrument #1		Instrument #2	Instrument #3
Pollutant/Monitor Type	PM_{10} FEM	PM_{10} FRM	$PM_{2.5}$ FRM	$PM_{2.5}$ FRM
AQS IDs (Parameter /Method /POC)	81102/079/POC 3	Discontinued	88101/143/POC 2	88101/143/POC 1
Date Parameter Established	2001	2005	2012	2005
County ID	CWTN TEOM	CWTN PM10	CWTN EAST PM2.5	CWTN WEST PM2.5
Sampler Make & Model	R&P 1400a (A/B)	R&P 2000-H	R&P 2000-H	R&P 2000-H
Classification	SPM	SPM	SPM	SPM
Scale	Middle Scale	Middle Scale	Middle Scale	Middle Scale
Site Type / Objective	Population/Source Impact	Population/Source Impact	Population/Source Impact	Population/Source Impact
Inlet Height	3.2 meters	3.4 meters	3.4 meters	3.4 meters
Distance from Tree Dripline	None	None	None	None
Obstacle Description	None	None	None	None
Height of Obstacle	N/A	N/A	N/A	N/A
Distance and Direction	N/A	N/A	N/A	N/A
Airflow Arch	360°	360°	360°	360°
Furnace or Incinerator Flue	None	None	None	None
Distance and Direction	N/A	N/A	N/A	N/A
Distance between Collocated Samplers	0.7 meters	1.6 meters	1.6 meters (QA Collocated)	1.6 meters (QA Collocated)
Nearest Road	Casa Grande-Maricopa Hwy	Casa Grande-Maricopa Hwy	Casa Grande-Maricopa Hwy	Casa Grande-Maricopa Hwy
Distance and Direction to Road	53.6 meters - S	65.5 meters - S	65.5 meters - S	65.5 meters - S
Traffic Count (ADT)	5394 (2009)	5394 (2009)	5394 (2009)	5394 (2009)
Schedule	Continuous	1 in 6 days	1 in 6 days	1 in 6 days
Surrounding Area	Agricultural/Feedlots	Agricultural/Feedlots	Agricultural/Feedlots	Agricultural/Feedlots
Site Groundcover	Vegetative	Vegetative	Vegetative	Vegetative
Frequency of flow rate verifications	Monthly	Monthly	Monthly	Monthly
Last two flow rate audits	1/11/12, 7/13/11	7/13/11, 1/12/11	1/11/12, 7/13/11	1/11/12, 7/13/11
Does Site Meet App D&E Criteria	Yes	Yes	Yes	Yes

Notes: *The picture was taken facing north.
*The site is only comparable to the 24-hour PM2.5 NAAQS. Since it is a middle scale, hot spot site it is not comparable to the annual PM2.5 NAAQS

Table B-8 continued Cowtown Road (CWTN)

Parameter	Instrument #4	Instrument #5
Pollutant Type	Wind	Temp&RH/Pressure
Date Established	2002	2002
County ID	CWTN MET	CWTN MET
Sampler Make & Model	RM Young 05305 AQ	Viasala HMP35C/PTA427
Classification	N/A	N/A
Scale	N/A	N/A
Site Type / Objective	N/A	N/A
Inlet Height	3.5 meters	2.9 meters
Distance from Tree Dripline	None	None
Obstacle Description	None	None
Height of Obstacle	N/A	N/A
Distance and Direction	N/A	N/A
Airflow Arch	360^{o}	360^{o}
Furnace or Incinerator Flue	None	None
Distance and Direction	N/A	N/A
Distance between Collocated Samplers	N/A	N/A
Nearest Road	Casa Grande-Maricopa Hwy	Casa Grande-Maricopa Hwy
Distance and Direction to Road	53.6 meters - S	53.6 meters - S
Traffic Count (ADT)	5394 (2009)	5394 (2009)
Schedule	Continuous	Continuous
Surrounding Area	Agricultural / Feedlots	Agricultural / Feedlots
Site Groundcover	Vegetative	Vegetative
Frequency of flow rate verifications	N/A	N/A
Last two flow rate audits	N/A	N/A
Does Site Meet App D&E Criteria	N/A	N/A

Eloy County Complex - ELY **AQS Site ID: 04-021-3014**

801 N. Main St, Eloy, Arizona

Latitude: 32.757639° **Longitude:** -111.554861° **Map Datum:** WGS 84

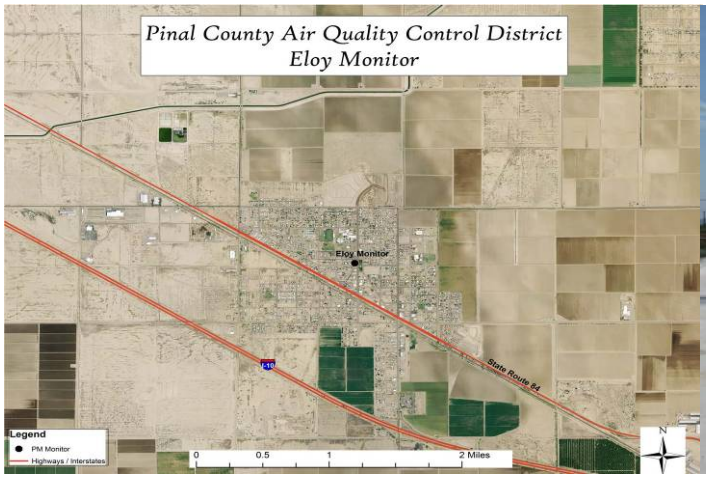


Table B-9 Eloy County Complex (ELY)

Parameter	Instrument #1
Pollutant/Monitor Type	PM_{10} FRM
AQS IDs (Parameter /Method /POC)	81102/063/POC 1
Date Parameter Established	2007
County ID	ELY
Sampler Make & Model	Andersen HiVol
Classification	SLAMS
Scale	Neighborhood
Site Type / Objective	Population
Inlet Height	5.2 meters
Distance from Tree Dripline	N/A
Obstacle Description	None
Height of Obstacle	N/A
Distance and Direction	N/A
Airflow Arch	360°
Furnace or Incinerator Flue	None
Distance and Direction	N/A
Distance between Collocated Samplers	N/A
Nearest Road	Main St.
Distance and Direction to Road	31.0 meters – W
Traffic Count (ADT)	Not available
Schedule	1 in 6 days
Surrounding Area	Residential / Business
Site Groundcover	Pavement
Frequency of flow rate verifications	Quarterly
Last two flow rate audits	1/11/12, 7/13/11
Does Site Meet App D&E Criteria	Yes

Notes: The picture was taking facing east.

Mammoth County Complex -MAM AQS Site ID: 04-021-3006
118 S. Catalina, Mammoth, Arizona
Latitude: 32.719639° **Longitude:** -110.643° **Map Datum:** WGS 84

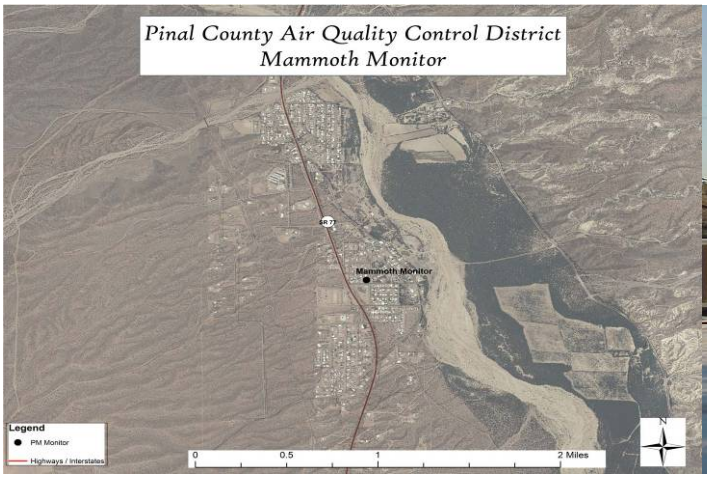


Table B-10 Mammoth County Complex (MAM)

Parameter	Instrument #1
Pollutant/Monitor Type	PM_{10} FRM
AQS IDs (Parameter /Method /POC)	Discontinued
Date Parameter Established	1995
County ID	MAM
Sampler Make & Model	Andersen HiVol
Classification	SLAMS
Scale	Neighborhood
Site Type / Objective	Population / Background
Inlet Height	5.0 meters
Distance from Tree Dripline	10.8 meters
Obstacle Description	None
Height of Obstacle	N/A
Distance and Direction	N/A
Airflow Arch	360°
Furnace or Incinerator Flue	Furnace
Distance and Direction	5 meters – W
Distance between Collocated Samplers	N/A
Nearest Road	Catalina St.
Distance and Direction to Road	18.9 meters – SE
Traffic Count (ADT)	Not available
Schedule	1 in 6 days
Surrounding Area	Residential
Site Groundcover	Pavement
Frequency of flow rate verifications	Quarterly
Last two flow rate audits	5/12/11, N/A
Does Site Meet App D&E Criteria	Yes

Notes: The picture was taken facing north.

(City of) Maricopa County Complex - MCPA AQS Site ID: 04-021-3010
44625 W. Garvey Rd., Maricopa, Arizona

Latitude: 33.058972° **Longitude:** -112.046917° **Map Datum:** WGS 84

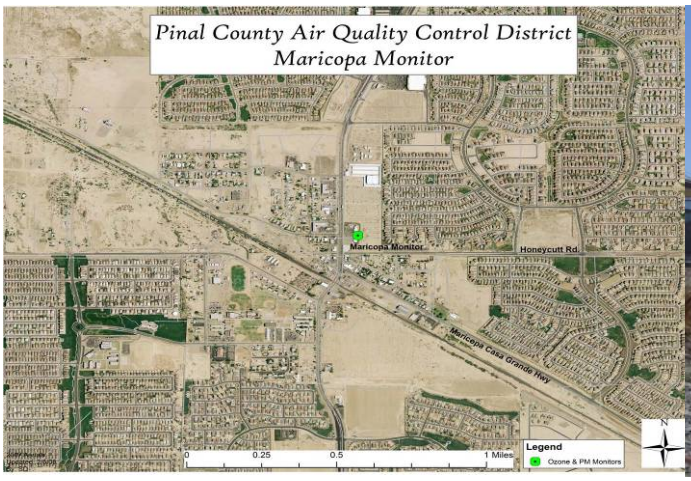


Table B-11 (City of) Maricopa County Complex (MCPA)

Parameter	Instrument #1	Instrument #2
Pollutant/Monitor Type	PM_{10} FEM	O_3 FEM
AQS IDs (Parameter /Method /POC)	81102/079/POC 3	Discontinued
Date Parameter Established	2005	2002
County ID	MCPA PM_{10}	MCPA O_3
Sampler Make & Model	R&P 1400a (A/B)	API 400
Classification	SPM	SPM
Scale	Neighborhood	Neighborhood / Regional
Site Type / Objective	Population	Population / Transport
Inlet Height	3.2 meters	3.9 meters
Distance from Tree Dripline	None	None
Obstacle Description	Building	Building
Height of Obstacle	5.2 meters	5.2 meters
Distance and Direction	4.8 meters – W	4.8 meters - W
Airflow Arch	360º	360º
Furnace or Incinerator Flue	None	None
Distance and Direction	NA	NA
Distance between Collocated Samplers	1.4 meters	1.4 meters
Nearest Road	Maricopa Road (SR 347)	Maricopa Road (SR 347)
Distance and Direction to Road	63 meters - W	63 meters - W
Traffic Count (ADT)	33547 (2009)	33547 (2009)
Schedule	Continuous	Apr-Oct
Probe Material	N/A	Glass
Residence Time	N/A	5.6 sec
Surrounding Area	Vacant Lot / Business	Vacant Lot / Business
Site Groundcover	Gravel / Vegetative	Gravel / Vegetative
Frequency of flow rate verifications	Bi-weekly	N/A
Last two flow rate audits	current	N/A
Frequency of one point QC check	N/A	Bi-weekly
Last annual performance evaluation	1/11/12, 7/13/11	N/A
Does Site Meet App D&E Criteria	Yes	Yes

Notes: The picture was taken facing east.

Pinal Air Park – PP **AQS Site ID: 04-021-3007**

Water Well #2, Pinal Air Park Rd., Marana, Arizona

Latitude: 32.508306° **Longitude:** -111.308056° **Map Datum:** WGS 84

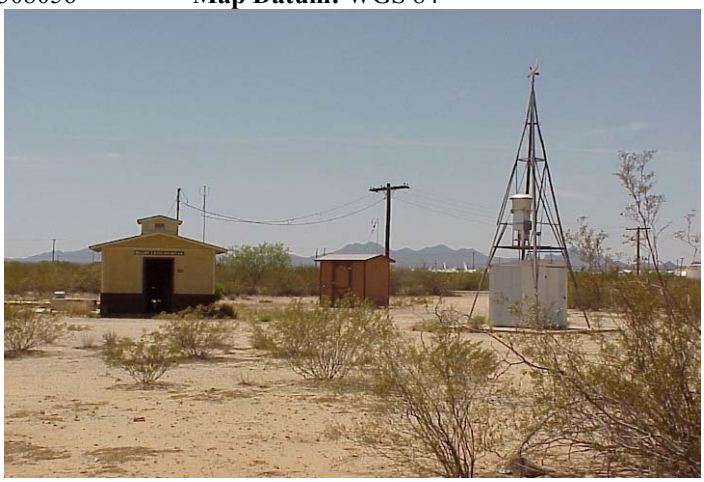


Table B-12 Pinal Air Park (PP)

Parameter	Instrument #1	Instrument #2
Pollutant/Monitor Type	PM_{10} FRM	O_3 FEM
AQS IDs (Parameter /Method /POC)	81102/063/POC 1	44201/112/POC 1
Date Parameter Established	1993	2002
County ID	PP PM_{10}	PP O_3
Sampler Make & Model	Andersen HiVol	API 400
Classification	SLAMS	SPM
Scale	Regional	Regional
Site Type / Objective	Background	Transport
Inlet Height	4 meters	4.1 meters
Distance from Tree Dripline	None	None
Obstacle Description	None	None
Height of Obstacle	N/A	N/A
Distance and Direction	N/A	N/A
Airflow Arch	360°	360°
Furnace or Incinerator Flue	None	None
Distance and Direction	N/A	N/A
Distance between Collocated Samplers	16.1 meters	16.1 meters
Nearest Road	Service blacktop	Service blacktop
Distance and Direction to Road	65 meters – E	54.2 meters – E
Traffic Count (ADT)	Not available	Not available
Schedule	1 in 6 days	Apr-Oct
Probe Material	N/A	Glass
Residence Time	N/A	5.6 sec
Surrounding Area	Desert	Desert
Site Groundcover	Vegetative	Vegetative
Frequency of flow rate verifications	Quarterly	N/A
Last two flow rate audits	1/11/12, 7/14/11	N/A
Frequency of one point QC check	N/A	Bi-weekly
Last annual performance evaluation	N/A	8/2/11
Does Site Meet App D&E Criteria	Yes	Yes

Notes: The picture was taken facing southwest.

Pinal County Housing Complex - PCH **AQS Site ID: 04-021-3011**

970 N. Eleven Mile Corner Rd., Casa Grande, Arizona

Latitude: 32.891056° **Longitude:** -111.5705° **Map Datum:** WGS 84

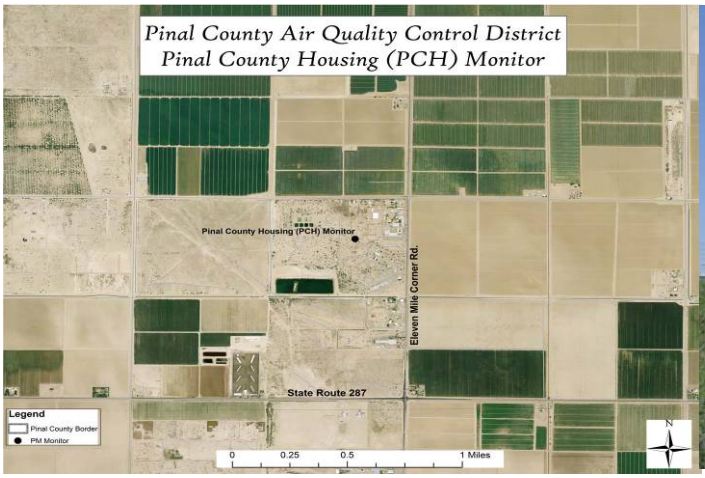


Table B-13 Pinal County Housing Complex (PCH)

Parameter	Instrument #1	Instrument #2	Instrument #3
Pollutant/Monitor Type	PM_{10} FEM	PM_{10} FRM	PM_{10} FRM
AQS IDs (Parameter /Method /POC)	81102/079/POC 3	81102/062/POC 2	81102/062/POC 1
Date Parameter Established	2002	2002	2004
County ID	PCH TEOM	PCHE PM_{10}	PCHW PM_{10}
Sampler Make and Model	R&P 1400a (A/B)	Wedding HiVol	Wedding HiVol
Classification	SPM	SLAMS	SLAMS
Scale	Neighborhood	Neighborhood	Neighborhood
Site Type / Objective	Population	Population	Population
Inlet Height	2.9 meters	3.4 meters	3.4 meters
Distance from Tree Dripline	7.3 meters (below inlet)	3.7 meters (below inlet)	5.7 meters (below inlet)
Obstacle Description	Shelter	Shelter	Shelter
Height of Obstacle	2.6 meters	2.6 meters	3.9 meters
Distance & Direction	5.5 meters – W	5.7 meters – SW	2.3 meters – SW
Airflow Arch	360°	360 °	360 °
Furnace or Incinerator Flue	None	None	None
Distance & Direction	N/A	N/A	N/A
Distance between Collocated Samplers	3.7 meters to HiVol	2.3 meters (QA Collocated)	2.3 meters (QA Collocated)
Nearest Road	Eleven Mile Corner Rd.	Eleven Mile Corner Rd.	Eleven Mile Corner Rd.
Distance & Direction to Road	400 meters – E	400 meters – E	400 meters – E
Traffic Count (ADT)	4141 (2009)	4141 (2009)	4141 (2009)
Schedule	Continuous	1 in 6 days	1 in 6 days
Surrounding Area	Agricultural / Residential	Agricultural / Residential	Agricultural / Residential
Site Groundcover	Gravel / Vegetative	Gravel / Vegetative	Gravel / Vegetative
Frequency of flow rate verifications	Monthly	Quarterly	Quarterly
Last two flow rate audits	11/15/11, 5/25/11	11/15/11, 5/25/11	11/15/11, 5/25/11
Does Site Meet App D&E Criteria	Yes	Yes	Yes

Notes: The picture was taken facing south.

Table B-13 Pinal County Housing Complex (PCH) cont.

Parameter	Instrument#4	Instrument #5
Pollutant Type	Wind	Temp & RH/Pressure
Date Parameter Established	2002	2002
County ID	PCH MET	PCH MET
Sampler Make and Model	RM Young 05305 AQ	Viasala HMP35C/PTA427
Classification	N/A	N/A
Scale	N/A	N/A
Site Type / Objective	N/A	N/A
Measurement Height	3.3 meters	2.9 meters
Distance from Tree Dripline	7.3 meters	7.3 meters
Obstacle Description	Shelter	Shelter
Height of Obstacle	2.6 meters	2.6 meters
Distance & Direction	6.1 meters – W	5.7 meters – W
Airflow Arch	360^{o}	360^{o}
Furnace or Incinerator Flue	None	None
Distance & Direction	N/A	N/A
Distance between Collocated Samplers	N/A	N/A
Nearest Road	Eleven Mile Corner Rd.	Eleven Mile Corner Rd.
Distance & Direction to Road	400 meters – E	400 meters – E
Traffic Count (ADT)	4141 (2009)	4141 (2009)
Schedule	Continuous	Continuous
Surrounding Area	Agricultural / Residential	Agricultural / Residential
Site Groundcover	Gravel / Vegetative	Gravel / Vegetative
Frequency of flow rate verifications	N/A	N/A
Last two flow rate audits	N/A	N/A
Does Site Meet App D&E Criteria	N/A	N/A

Queen Valley - QV AQS Site ID: 04-021-8001

10 S. Queen Anne Dr., Queen Valley, Arizona

Latitude: 33.293465° **Longitude:** -111.285594° **Map Datum:** WGS 84

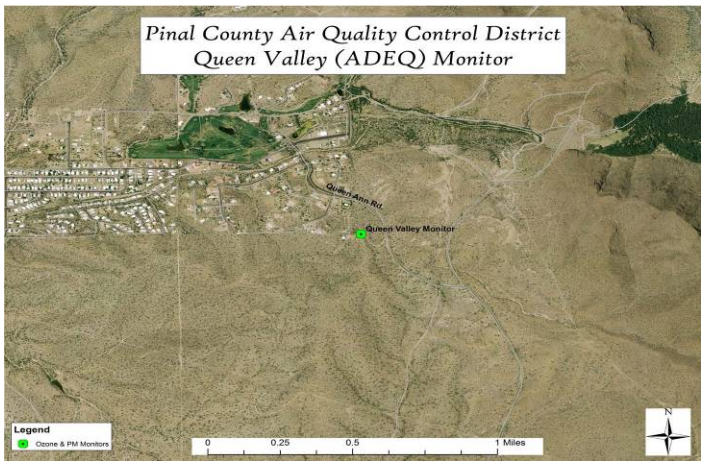


Table B-14 QueenValley (QV)

Parameter	Instrument #1	Instrument #2
Pollutant/Monitor Type	O_3 *	$PM_{2.5}$, PM_{10}
AQS IDs (Parameter /Method /POC)	*	N/A
Date Parameter Established	2001	2001
County ID	QV	QVA
Sampler Make & Model	TEI 49C	Version II IMPROVE
Classification	SLAMS	SPM
Scale	Urban	Urban
Site Type / Objective	Highest Concentration	Visibility
Inlet Height	4.7 meters	5.4 meters
Distance from Tree Dripline	2.3 meters	6.0 meters
Obstacle Description	None	None
Height of Obstacle	N/A	N/A
Distance and Direction	N/A	N/A
Airflow Arch	360°	360°
Furnace or Incinerator Flue	None	None
Distance and Direction	N/A	N/A
Distance between Collocated Samplers	2.1 meters	2.1 meters
Nearest Road	Queen Anne Dr.	Queen Anne Dr.
Distance and Direction to Road	93 meters – E	93 meters – E
Traffic Count (ADT)	785 cars per day	785 cars per day
Schedule	Apr-Oct	1 in 3 days
Surrounding Area	Desert / Residential	Desert / Residential
Site Groundcover	Vegetative	Vegetative
Frequency of one point QC check	Bi-weekly	N/A
Last annual performance evaluation	Unknown*	N/A
Does Site Meet App D&E Criteria	Yes	N/A

Notes: The picture was taken facing east.

*For additional detail refer to ADEQ's State of Arizona Monitoring Network Plan.

Riverside Maintenance Yard - RVSD **AQS Site ID: 04-021-3012**

54964 E. Florence-Kelvin Hwy., Kearny, Arizona

Latitude: 33.105806° **Longitude:** -110.974194° **Map Datum:** WGS 84

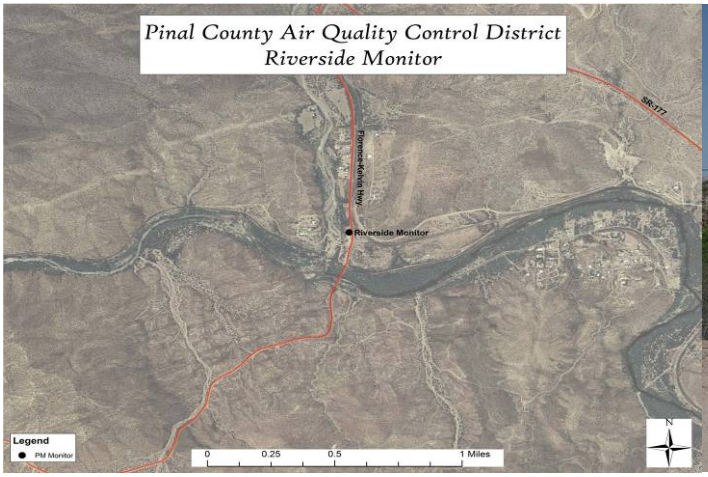


Table B-15 Riverside Maintenance Yard (RS)

Parameter	Instrument #1
Pollutant/Monitor Type	PM_{10} FRM
AQS IDs (Parameter /Method /POC)	Discontinued
Date Parameter Established	2003
County ID	RVSD
Sampler Make & Model	Anderson HiVol
Classification	SLAMS
Scale	Neighborhood
Site Type / Objective	Source Impact
Inlet Height	3.0 meters
Distance from Tree Dripline	10.2 meters
Obstacle Description	Building
Height of Obstacle	3.8 meters
Distance and Direction	8.5 meters - NE
Airflow Arch	360°
Furnace or Incinerator Flue	None
Distance and Direction	N/A
Distance between Collocated Samplers	N/A
Nearest Road	Florence-Kelvin Hwy.
Distance and Direction to Road	24.7 meters - E
Traffic Count (ADT)	75 cars per day
Schedule	1 in 6 days
Surrounding Area	Residential / Desert
Site Groundcover	Gravel
Frequency of flow rate verifications	Quarterly
Last two flow rate audits	5/11/11, N/A
Does Site Meet App D&E Criteria	Yes

Notes: The picture was taken facing north.

Stanfield County Complex - STNF AQS Site ID: 04-021-3008

36697 W. Papago Dr., Stanfield, Arizona

Latitude: 32.881194° **Longitude:** -111.962° **Map Datum:** WGS 84

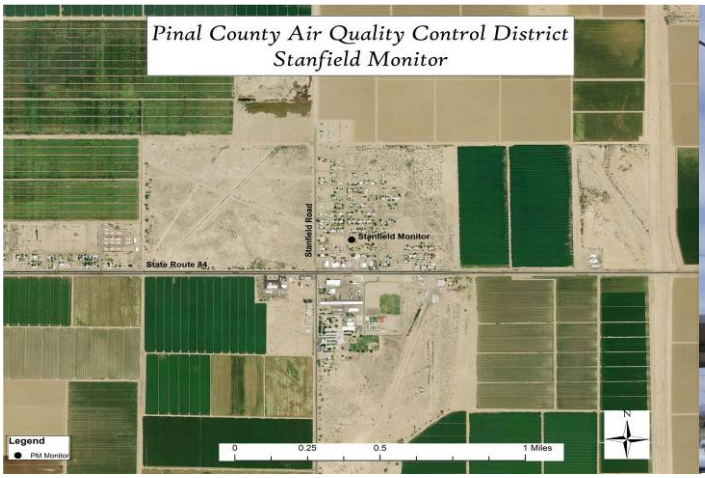


Table B-16 Stanfield County Complex (STNF)

Parameter	Instrument#1	Instrument#2	Instrument#3	Instrument#4
Pollutant/Monitor Type	PM_{10} FEM	PM_{10} FRM	Wind	Temp & RH/Pressure
AQS IDs(Parameter/Method/POC)	81102/079/POC 3	Discontinued		
Date Parameter Established	2006	1988	2007	2007
County ID	STNF TEOM	STNF PM_{10}	STNF MET	STNF MET
Sampler Make & Model	R&P 1400a (A/B)	Wedding HiVol	RM Young 05305 AQ	Viasala HMP45C
Classification	SLAMS	SLAMS	N/A	N/A
Scale	Neighborhood	Neighborhood	N/A	N/A
Objective	Population	Population	N/A	N/A
Inlet Height	4.8 meters	4.3 meters	9.2 meters	3.0 meters
Distance from Tree Dripline	None	None	None	None
Obstacle Description	FD Engine Carport	FD Engine Carport	FD Engine Carport	FD Engine Carport
Height of Obstacle	3.7 meters	3.7 meters	3.7 meters	3.7 meters
Distance and Direction	3.9 meters – S	3.9 meters – S	7 meters – W	2.0 meters – W
Airflow Arch	360°	360°	360°	360°
Furnace or Incinerator Flue	None	None	None	None
Distance and Direction	N/A	N/A	N/A	N/A
Distance between Collocated Samplers	2.3 meters	N/A	N/A	N/A
Nearest Road	Navajo Way	Navajo Way	Navajo Way	Navajo Way
Distance and Direction to Road	21.2 meters – W	21.2 meters – W	400 meters – E	400 meters – E
Traffic Count (ADT)	91 cars per day	91 cars per day	91 cars per day	91 cars per day
Schedule	Continuous	1 in 6 days	Continuous	Continuous
Surrounding Area	Residential	Residential	Residential	Residential
Site Groundcover	Gravel/Vegetative	Gravel/Vegetative	Gravel/Vegetative	Gravel/Vegetative
Frequency of flow rate verifications	Monthly	Monthly	N/A	N/A
Last two flow rate audits	1/11/12, 7/13/11	N/A	N/A	N/A
Does Site Meet App D&E Criteria	Yes	Yes	Yes	Yes

Notes: The picture was taken facing northwest.

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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 $PM_{2.5}$.

APACHE JUNCTION CARBON MONOXIDE DATA (in ppm)
1 HOUR AVERAGES

STANDARD: 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 CARBON MONOXIDE DATA (in ppm)
8 HOUR AVERAGES

STANDARD: 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 site on 5/28/2002. The 2002 readings only represent part of the 2002 carbon monoxide season.

CASA GRANDE CARBON MONOXIDE DATA (in ppm)
1 HOUR AVERAGES

STANDARD: 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 CARBON MONOXIDE DATA (in ppm)
8 HOUR AVERAGES

STANDARD: 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 site on 10/11/2002. The 2002 readings only represent part of the 2002 carbon monoxide season.

APACHE JUNCTION OZONE DATA (in ppm)
1 HOUR AVERAGES

Table C-5

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	Number of Daily Exceedances	Expected Exceedance Rate
1993	0.121	0.110	0.106	0.103	0	0
1994	0.114	0.110	0.108	0.108	0	0
1995	0.136	0.122	0.121	0.114	1	1
1996	0.121	0.115	0.114	0.114	0	0
1997	0.106	0.097	0.096	0.096	0	0
1998	0.112	0.112	0.111	0.106	0	0
1999	0.112	0.111	0.109	0.105	0	0
2000	0.101	0.101	0.098	0.096	0	0
2001	0.101	0.096	0.095	0.092	0	0
2002	0.109	0.097	0.095	0.095	0	0
2003	0.105	0.096	0.094	0.091	0	0
2004	0.084	0.079	0.079	0.079	0	0
2005	0.097	0.089	0.085	0.083	0	0
2006[a]	0.106	0.105	0.104	0.095	N/A	N/A
2007	0.098	0.096	0.095	0.094	N/A	N/A
2008	0.098	0.094	0.092	0.091	N/A	N/A
2009	0.091	0.089	0.085	0.080	N/A	N/A
2010	0.090	0.087	0.086	0.084	N/A	N/A
2011	0.090	0.088	0.086	0.084	N/A	N/A

Footnotes:
a - The 1-hour ozone standard was revoked in August 2005. One-hour averages are listed here for trend analysis.

APACHE JUNCTION 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	0.086	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	0.080	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

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

CASA GRANDE OZONE DATA (in ppm)
1 HOUR AVERAGES

Table C-7

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	Number of Daily Exceedances	Expected Exceedance Rate
1993	0.092	0.090	0.084	0.082	0	0
1994	0.091	0.091	0.090	0.088	0	0
1995	0.083	0.083	0.081	0.080	0	0
1996	0.104	0.091	0.085	0.084	0	0
1997	0.082	0.082	0.080	0.079	0	0
1998	0.093	0.079	0.076	0.075	0	0
1999	0.090	0.087	0.084	0.084	0	0
2000	0.105	0.094	0.090	0.089	0	0
2001	0.084	0.084	0.083	0.083	0	0
2002	0.088	0.088	0.083	0.083	0	0
2003	0.090	0.089	0.086	0.083	0	0
2004	0.077	0.077	0.076	0.074	0	0
2005	0.089	0.088	0.081	0.080	0	0
2006[a]	0.083	0.083	0.082	0.080	N/A	N/A
2007	0.079	0.078	0.075	0.074	N/A	N/A
2008	0.082	0.080	0.080	0.079	N/A	N/A
2009	0.072	0.071	0.071	0.070	N/A	N/A
2010	0.076	0.073	0.073	0.072	N/A	N/A
2011	0.077	0.074	0.073	0.073	N/A	N/A

Footnotes:
a - The 1-hour ozone standard was revoked in August 2005. One-hour averages are listed here for trend analysis.

CASA GRANDE 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
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

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

COMBS OZONE DATA (in ppm)
1 HOUR AVERAGES

Table C-9

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	Number of Daily Exceedances	Expected Exceedance Rate
2002	0.085	0.080	0.080	0.078	0	0
2003	0.101	0.096	0.090	0.086	0	0
2004	0.080	0.069	0.068	0.067	0	0
2005	0.093	0.091	0.088	0.087	0	0
2006[a]	0.095	0.091	0.089	0.086	N/A	N/A
2007	0.075	0.072	0.071	0.070	N/A	N/A
2008	0.093	0.092	0.086	0.085	N/A	N/A
2009	0.074	0.070	0.070	0.069	N/A	N/A
2010	0.076	0.073	0.070	0.069	N/A	N/A

Footnotes:
a - The 1-hour ozone standard was revoked in August 2005. One-hour averages are listed here for trend analysis.

COMBS 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
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 eight-hour average of 0.080 ppm was lowered to 0.075 ppm.

CITY OF MARICOPA OZONE DATA (in ppm)
1 HOUR AVERAGES

Table C-11

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	Number of Daily Exceedances	Expected Exceedance Rate
2002	0.089	0.086	0.077	0.075	0	0
2003	0.093	0.092	0.085	0.085	0	0
2004	0.078	0.072	0.072	0.071	0	0
2005	0.079	0.078	0.075	0.069	0	0
2006[a]	0.087	0.080	0.0074	0.074	N/A	N/A
2007	0.067	0.065	0.064	0.063	N/A	N/A
2008	0.085	0.078	0.076	0.075	N/A	N/A
2009	0.070	0.069	0.068	0.066	N/A	N/A
2010	0.076	0.073	0.072	0.071	N/A	N/A

Footnotes:
a - The 1-hour ozone standard was revoked in August 2005. One-hour averages are listed here for trend analysis.

CITY OF MARICOPA OZONE DATA (in ppm)
8 HOUR AVERAGES

Table C-12

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 eight-hour average of 0.080 ppm was lowered to 0.075 ppm.

PINAL AIR PARK OZONE DATA (in ppm)
1 HOUR AVERAGES

Table C-13

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	Number of Daily Exceedances	Expected Exceedance Rate
2002	0.087	0.085	0.079	0.078	0	0
2003	0.083	0.080	0.080	0.079	0	0
2004	0.074	0.073	0.072	0.072	0	0
2005	0.088	0.085	0.084	0.084	0	0
2006[a]	0.083	0.079	0.077	0.076	N/A	N/A
2007	0.078	0.073	0.070	0.070	N/A	N/A
2008	0.077	0.077	0.075	0.074	N/A	N/A
2009	0.081	0.074	0.072	0.071	N/A	N/A
2010	0.077	0.075	0.073	0.072	N/A	N/A
2011	0.078	0.076	0.076	0.075	N/A	N/A

Footnotes:
a - The 1-hour ozone standard was revoked in August 2005. One-hour averages are listed here for trend analysis.

PINAL AIR PARK OZONE DATA (in ppm)
8 HOUR AVERAGES

Table C-14

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

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

QUEEN VALLEY OZONE DATA (in ppm)
1 HOUR AVERAGES

Table C-15

Year	Maximum Reading	2nd Highest Reading	3rd Highest Reading	4th Highest Reading	Number of Daily Exceedances	Expected Exceedance Rate
2001	0.103	0.103	0.098	0.093	0	0
2002	0.112	0.110	0.106	0.099	0	0
2003	0.110	0.110	0.107	0.107	0	0
2004	0.093	0.092	0.092	0.087	0	0
2005	0.117	0.113	0.110	0.105	0	0
2006[a]	0.110	0.109	0.103	0.102	N/A	N/A
2007	0.089	0.088	0.088	0.087	N/A	N/A
2008	0.099	0.095	0.093	0.091	N/A	N/A
2009	0.089	0.089	0.087	0.080	N/A	N/A
2010	0.092	0.089	0.085	0.082	N/A	N/A
2011	0.096	0.092	0.087	0.086	N/A	N/A

Footnotes:
a - The 1-hour ozone standard was revoked in August 2005. One-hour averages are listed here for trend analysis.

QUEEN VALLEY OZONE DATA (IN ppm)
8 HOUR AVERAGES

Table C-16

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

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

24 HOUR PM_{10} AVERAGES (IN $\mu g/m^3$)

Table C-17

Year	Reading Maximum	Number of Daily Exceedances	Expected Exceedance Rate	3 Year Average of the Expected Exceedance Rate
Apache Junction North (HiVol)				
1995	67.72	0	0	N/A
1996	34.05	0	0	N/A
1997	81.0	0	0	0
1998	61.45	0	0	0
1999	64.0	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 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	0
2006	73.0	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
Apache Junction Fire Station (TEOM)				
2011	283	5	10.2	Avg. > 1.0
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 (TEOM)				
2007	983	7	7	N/A
2008	203	3	3	N/A
2009	848	4	4	4.7

Year	Reading Maximum	Number of Daily Exceedances	Expected Exceedance Rate	3 Year Average of the Expected Exceedance Rate
2010	569	1	1	2.7
2011	479	14	14	6.3
Combs (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
Coolidge (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
Cowtown (47mm)				
2005 [b,k]	787.9	8	N/A	Avg. > 1.0
2006	606.0	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
Cowtown (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
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	154.8	0	0	0

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	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 (TEOM)				
2005 [l]	239.1	18	18	Avg. > 1.0
2006	429.0	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
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	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
Pinal County Housing 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	4.0
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
Pinal County Housing 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	8.0

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	326.0	17	17	11.7
2006	913.0	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
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 (HiVol)				
1999	106.6	0	0	0
2000	148.7	0	0	0
2001	134.2	0	0	0
2002 [b]	351.5	2	13.0	4.0
2003 [b]	170.5	1	6.1	6.1
2004	80.9	0	0	6.1
2005	172.5	1	5.8	4.0
Stanfield (47mm)				
2006 [m]	182.0	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
Stanfield (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

Footnotes:
a - At least one data point during this year was flagged due to an exceptional 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 site on 8/1/2002. The Pinal County Housing site replaced the Eleven Mile Corner site.
g - The Apache Junction South monitor was discontinued on 7/1/2003, and relocated to Apache Junction Fire Station.
h - Monitoring began at the Apache Junction Fire Station site on 7/2/2003.
i - Monitoring began at the Riverside site on 3/10/2003.
j - The Apache Junction North monitor was discontinued on 1/1/2004, and relocated to Pinal County Housing.
k - 47mm filter based monitoring began at the Cowtown site on 8/14/05, and data reporting began as of 10/1/05.
l - Monitoring began at the (City of) Maricopa site on 12/4/04, and data reporting began as of 1/1/05.
m - The Wedding HiVol sampler was replaced on 4/12/06 with an Andersen RAAS10-100 sampler at the Stanfield site.
n - Beginning in February of 2006 a R&P TEOM 1400a sampler was installed at the Stanfield site.
o – On 3/2/07 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 on 1/1/10
q – Filter based monitoring was discontinued at Casa Grande Downtown on 1/1/10

r – Riverside and Mammoth were discontinued on 5/15/11
s – Continuous PM10 monitoring began at Apache Junction Fire Station on 8/20/12

ANNUAL PM_{10} AVERAGES (IN $\mu g/m^3$)

Table C-18

	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Apache Junction North (HiVol)	25.8	27.4	22.7	21.3 [b]	20.3 [h]								
Apache Junction South (HiVol)	27.5	28.4	23.4	21.5 [b]	20.4 [b,e]								
Apache Junction Fire Station (HiVol)					26.7 [b,f]	18.4	19.9	23.6	18.1	19.6	19.2	18.4	23.3
Apache Junction Fire Station (TEOM)													40.1 [b,r]
Casa Grande Downtown (HiVol/47mm)	35.3	34.7	29.2	30.4 [b]	31.5	24.4	30.8	35.9	35.3	29.9	45.0	37.1	[p]
Casa Grande Downtown (TEOM)									55.2 [b]	45.0	46.6	37.5	51.6
Combs School (TEOM)									89.9 [b]	56.4	52.3	41.0	50.6
Coolidge (HiVol)	39.6	37.4	32.0	32.8 [b]	35.3	24.5	36.0	44.0	35.5	33.5	36.2	31.9	34.0
Cowtown (47mm)							294.4 [b,i]	220.1	167.5	145.3	93.7	78.4	120.1
Cowtown (TEOM)				261.7 [a,b]	170.1	132.2 [b]	200.4 [b]	230.4	181.3	160.5	103.9	81.2	139.1
Eloy (HiVol)	45.9	41.7	35.1	46.5 [b]	41.5	27.8	33.5	38.3	42.3 [m]	36.3	39.5	34.0	44.9
Mammoth (HiVol)	22.5 [b]	22.0	22.6	18.8 [b]	16.4	11.8	13.5	14.8	12.7	14.6	14.6	14.8	[q]
City of Maricopa (TEOM)							70.1 [j]	78.6	73.7	58.6	59.6	44.9	56.8
Pinal Air Park(HiVol)	30.3	30.9	26.7 [b]	30.2 [b]	28.6	20.3	22.4	29.5	29.5	25.8	27.1	26.3	27.0
Pinal County Housing West (HiVol)				56.6 [b,d]	61.0	47.1	56.7 [b]	64.3	56.0	43.1	49.3	42.6	51.7
Pinal County Housing East (HiVol)						45.1	58.5	62.8	62.3	47.5	45.4	44.4	57.6
Pinal County Housing (TEOM)				75.9 [b,d]	66.6	55.9	68.7	87.1	83.7	63.3	75.2	57.7	76.9
Riverside (HiVol)					23.9 [b,g]	15.2	18.1	23.3	23.6	20.9	22.7	21.0	[q]
Stanfield (HiVol/47mm)	56.6	45.7	41.9	59.7 [b]	46.1 [b]	33.9	52.1	81.4 [k]	90.9	61.0	45.1	[o]	
Stanfield (TEOM)								82.6 [b,l]	84.3	67.8	71.2	55.3	75.9

Footnotes:

a - At least one data point during this year was flagged due to an exceptional event and excluded from calculation.

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

d - Monitoring began at the Pinal County Housing site on 8/1/2002. The Pinal County Housing site replaced the Eleven Mile Corner site.

e - The Apache Junction South monitor was discontinued on 7/1/2003, and relocated to Apache Junction Fire Station.

f - Monitoring began at the Apache Junction Fire Station site on 7/2/2003.

g - Monitoring began at the Riverside site on 3/10/2003.

h - The Apache Junction North monitor was discontinued on 1/1/2004, and relocated to Pinal County Housing.

i - Filter-based sampling began at the Cowtown site on 8/14/05, and data reporting began 10/1/05.

j - Monitoring began at the (City of) Maricopa site on 12/4/04, and data reporting began 1/1/05.

k - The Wedding HiVol sampler was replaced on 4/12/06 with an Andersen RAAS10-100 sampler at the Stanfield site.

l - In February of 2006 a R&P TEOM 1400a sampler was installed at Stanfield.

m - On 3/2/07 the Andersen HiVol was relocated from a City of Eloy building to a Pinal County building approximately 650 feet to the north-northeast. The annual average is from the three quarters at the new location.

o – Filter based monitoring was discontinued at Stanfield on 1/1/10

p – Filter based monitoring was discontinued at Casa Grande Downtown on 1/1/10

q – Riverside and Mammoth were discontinued on 5/15/11

r – Continuous PM10 monitoring began at Apache Junction Fire Station on 8/20/12

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

Table C-19

Year	Maximum Reading	98th Percentile	3 year average of the 98th percentile
Apache Junction			
1999	18.7	15.5	N/A
2000	44.5	18.0	N/A
2001	14.0	13.1	16
2002	23.5	13.1	15
2003 [a]	38.0	21.1	16
2004	17.0	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
Casa Grande (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	22.0	20
2009	29.0	17.3	21
2010	25.4	21.4	20
2011	31.1	22.3	20
Casa Grande (North) [c]			
2009	28.9	19	N/A
2010	22.1	21.3	N/A
2011	28.7	23.2	21
Cowtown			
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

Footnotes:

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

b - 47mm filter based monitoring began at the Cowtown site on August 14, 2005 and data reporting began October 10, 2005.

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

ANNUAL $PM_{2.5}$ AVERAGES (in $\mu g/m^3$)

Table C-20

Year	Annual Average	3 year average of the annual means
Apache Junction		
1999	7.4	N/A
2000	7.3	N/A
2001	6.3	7.0
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	7.0	5.9
2008	7.5	6.6
2009	6.4	7.0
2010	5.9	6.6
2011	8.3	6.8
Casa Grande (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	8.0
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	10.0	9.3
Casa Grande (North) [c]		
2009	9.6	N/A
2010	8.2	N/A
21011	9.5	6.1
Cowtown		
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

Footnotes:

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

[b] - 47mm filter based monitoring began at the Cowtown site on August 14, 2005 and data reporting began October 10, 2005.

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

d – The Cowtown site is not comparable to the annual standard. Annual averages are listed here for trend analysis.

Appendix D

Public Comments

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 2012 Ambient Monitoring Network Review and 2011 Data Summary on the department's website for the period starting May 30, 2012 through June 30, 2012.

D.2 Public Hearing

Pinal County Air Quality also conduced a public hearing concerning the draft 2012 Ambient Monitoring Network Review and 2011 Data Summary on June 22, 2012 at 9:00a.m. The sign in sheet from this meeting is included in this appendix.

D.3 Public Comment

None received.

PINAL • COUNTY

Wide open opportunity

PINAL COUNTY DEPARTMENT OF DEVELOPMENT SERVICES
AIR QUALITY CONTROL DISTRICT
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2012 ANNUAL MONITORING NETWORK PLAN PUBLIC MEETING SIGN-IN SHEET
JUNE 22, 2012

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