May 2023

2023

Air Monitoring Network Plan

Maricopa County
Air Quality Department
Air Monitoring Division

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ABSTRACT

In 2022, the Maricopa County Air Quality Department (MCAQD) Air Monitoring Division successfully operated a robust air quality surveillance system that monitored for regulated ambient air pollutants as per 40 CFR Parts 50 and 58. The air monitoring data produced are intended for regulatory compliance determinations of criteria air pollutants. Unless otherwise noted, each monitor meets the requirements of 40 CFR Part 58 – Subpart G - Appendices A, B, C, D, and E, where applicable.

The MCAQD strives to provide the most reliable and relevant air monitoring data to the public. Air quality issues are diverse and are of great interest to the citizens of Maricopa County. High-quality data are a cornerstone of developing and implementing effective State Implementation Plans (SIPs),Exceptional Event (EE) packages, and operating permits for new and existing sources, for the protection of human health and the environment.

This 2023 Air Monitoring Network Plan provides information regarding the air monitoring surveillance system operating within Maricopa County, covers changes made to the air monitoring network in 2022, and discusses network changes planned for 2023. Please refer to Appendix IV for the glossary of terms and acronyms.

Network Modifications and Site Updates

This section summarizes network modifications and site updates made in 2022, and changes planned for 2023. There were no site closures in 2022.

Summary of Past Network Modifications and Site Updates

Table 1 Summary of Past Network Modifications and Site Updates

Date	Site	Monitor/ Type	Description
2022	Durango Complex	Data Logger	Replaced outdated ESC-8832 data logger with the Agiliare$_{LLC}$/ESC-8864 data logger.
2022	West Phoenix	Site Updates	Replaced the Teledyne CO, NOx, and O_3 analyzers to Thermo-Scientific analyzers. Updated the data logger to an ESC-8864.

Proposed Network Modifications and Site Updates

MCAQD does not anticipate any significant interruptions to monitoring operations in 2023 and plans on continuously updating existing sites and improving site safety and security. Improvements to power supplies or communication systems will occur as needed. The following table lists projects planned for 2023.

Table 2 Projects Planned for 2023

Planned Date	Site	Monitor/ Type	Description
2023	Falcon Field (04-013-1010)	Ozone, Wind Speed, Wind Direction	MCAQD is currently searching for a new site location. This change will improve access and sample line configuration and allow for a wind tower to be secured. Due to safety concerns at the current site location, MCAQD discontinued monitoring for wind speed and wind direction in March of 2021. These measurements will resume once the new shelter is established.
2023	Cave Creek (04-013-4008)	Ozone	MCAQD will be relocating the analyzer and meteorological equipment to a shelter less than 100 feet away. The current location has independable climate control, thus relocation provides better access and data reliability for monitoring at the site.
2023	Scottsdale (04-013-3003)	Ozone, PM_{10}	MCAQD has contacted the City of Scottsdale to obtain permission to place a shelter at the site. This will allow for better placement of the ozone sample cane and PM_{10} sampler. The move is planned as a safety precaution to prevent technicians from having to access the roof of a building.
2023	TBD	Data Loggers	MCAQD plans to continue replacing outdated ESC-8832 data loggers with $Agiliare_{LLC}$/ESC-8864 data loggers.

Introduction

This Annual Monitoring Network Plan (AMNP) addresses the United States Environmental Protection Agency's (U.S. EPA) requirements for operating the surveillance system as per 40 CFR Part 58 - Ambient Air Quality Surveillance. As per 40 CFR Part 58, Subpart B §58.10(a)(1), the EPA requires each air monitoring organization (MO) operating within the U.S. and its territories to develop and submit this Plan annually by July 1st, following a 30-day public comment period. Each year MCAQD solicits comments from the public during the public comment period and holds an open forum public meeting. As needed, MCAQD amends the final draft based on any comments received. The final AMNP is submitted to EPA Region 9 for review and approval. The EPA Region 9 Administrator, or their representative, must approve any requests for network changes and waivers. EPA Region 9 completes the review process within 120 days. MCAQD will post the final AMNP on the MCAQD Air Monitoring website.

In addition to the annual data certification process, the network plan helps MCAQD continuously review, assess, and improve how well the air monitoring surveillance system, or network, is performing. Data certification for 2022 was submitted to EPA Region 9 on April 28, 2023. The design and performance of the ambient air monitoring network and data certification process are covered by the regulatory requirements found in:

- 40 CFR Part 58 – Ambient Air Quality Surveillance: Subpart A (General Provisions), Subpart B (Monitoring Network), Subpart C (Special Purpose Monitors (SPM)), Subpart D (Comparability of Ambient Data to the NAAQS), Subpart F (Air Quality Index (AQI) Reporting), and Subpart G (Federal Monitoring).

The network plan also addresses the following regulatory requirements:

- 40 CFR Part 58 Appendix A - **Quality Assurance Requirements for Monitors used in Evaluations of National Ambient Air Quality Standards**
- 40 CFR Part 58 Appendix C - **Ambient Air Quality Monitoring Methodology**
- 40 CFR Part 58 Appendix D - **Network Design Criteria for Ambient Air Quality Monitoring**
- 40 CFR Part 58 Appendix E - **Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring**
- 40 CFR Part 58, Appendix G – **Uniform Air Quality Index (AQI) and Daily Reporting**

The following information is covered in this network plan:

- Purpose and type of monitoring conducted at each site;
- Detailed descriptions and metadata for each site;
- Metadata for each pollutant monitor;
- Three years of criteria pollutant data from each monitor;
- Design value metrics that identify the monitoring site with the highest O_3, and $PM_{2.5}$ concentrations measured over the past 3 years;
- The minimum quantity of monitors required for each criteria pollutant;
- Summaries of pollutant data by network and required statistical analyses;

- The quality and suitability of pollutant data for comparison to the National Ambient Air Quality Standards (NAAQS);
- The compliance status of monitors, including exceedance days and violations;
- Proposed changes to the pollutant networks, sites and monitoring methods planned for 2023;
- Appendix II contains a report for the discontinuation of the $PM_{2.5}$ monitoring at the Thirty-Third monitoring site.
- Brief information regarding special purpose and/or research-driven air monitors, if operated;
- The reporting of real-time pollutant and meteorological data to the public via the MCAQD web map and AIRNow;
- Any requests for waivers from specific air monitoring requirements, if applicable;
- Public comments received and MCAQD's responses regarding the final draft Annual Monitoring Network Plan.

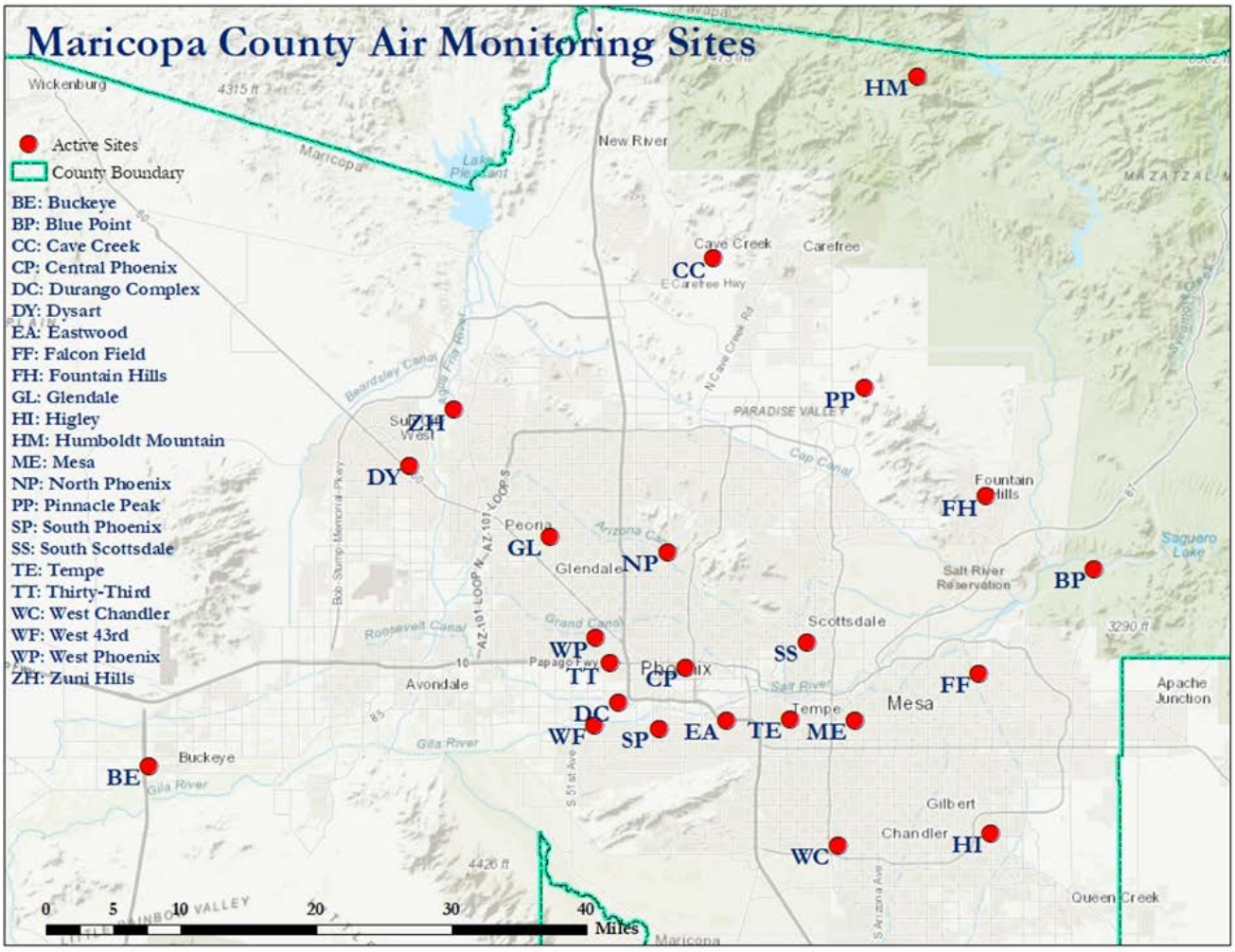


Figure 1 2022 Maricopa County Air Monitoring Sites

Table 3 MCAQD Air Monitoring Instruments by Site

Maricopa County - Air Monitoring Instrumentation																			
Site		AQS Code	CO	NO_2	O_3	SO_2	PM_{10}	$PM_{2.5}$	$PM_{2.5}$ Filter	Black Carbon	WS / WD	Baro Press	Amb Temp	Rel Hum	Rain Gauge	Solar Rad	Shelter Temps	Multi-Gas Calibrator	Active Instruments[2]
Buckeye	BE	04-013-4011	1	1	1		1				1	1	1	1			1	2	11
Blue Point	BP	04-013-9702			1						1		1	1			1		5
Cave Creek	CC	04-013-4008			1						1		1	1	1		1		6
Central Phoenix	CP	04-013-3002	1	1	1	1	1				1	1	1	1			2	2	13
Durango Complex	DC	04-013-9812				1	1	1		*1	1	1	1	1			1	1	9
Dysart	DY	04-013-4010			1		1				1	1	1	1			1		7
Eastwood	EA	04-013-4021	1	1				1			1	1	1	1			1	2	10
Falcon Field	FF	04-013-1010			1								1	1			1		4
Fountain Hills	FH	04-013-9704			1						1	1	1	1			1		6
Glendale	GL	04-013-2001			1		1	1			1	1	1	1			1		8
Higley	HI	04-013-4006					1				1	1	1	1			1		6
Humboldt Mountain	HM	04-013-9508			1								1	1			1	1	5
Mesa	ME	04-013-1003	1		1		1	1		**1	1	1	1	1			1	1	10
North Phoenix	NP	04-013-1004			1		1	1		**1	1	1	1	1			1		8
Pinnacle Peak	PP	04-013-2005			1					**1	1	1	1	1			1		6
South Phoenix	SP	04-013-4003	1		1		1	1		*1	1	1	1	1		1	2	1	12
South Scottsdale	SS	04-013-3003			1		1				1	1	1	1			2		8
Tempe	TE	04-013-4005			1		1	1			1	1	1	1	1		2		10
Thirty-Third[1]	TT	04-013-4020		1							1						1	2	5
West Chandler	WC	04-013-4004	1		1		1				1	1	1	1			2	1	10
West 43rd	WF	04-013-4009					1				1	1	1	1			1		6
West Phoenix	WP	04-013-0019	1	1	1		1	1	1	*1	1	1	1	1			1	2	13
Zuni Hills	ZH	04-013-4016					1				1	1	1	1			1		6
		Active Instruments	7	5	17	2	15	8	1	3	21	18	22	22	2	1	28	15	

Total # of Criteria Pollutant Monitors	55
Total # of Active Instruments	187
Total # of Active Sites	23

NOTES:

Black Carbon 1060 * 04/1 - 09/30 (O_3 Season)
** 10/1 - 03/31 ($PM_{2.5}$)

[1] CO and PM2.5 Analyzers removed from site on 2/28/21

[2] Active instruments will increase and decrease based on location of Black Carbon.

Clean Air Act and Criteria Pollutants

The Clean Air Act (CAA), and its amendments, provide the framework for pertinent State/Local/Tribal agencies to assess and protect air quality through an air monitoring program. Unless generated for research, special studies, or unless otherwise noted, each monitor meets the requirements of 40 CFR Part 58 – Subpart G - Appendices A, B, C, D, and E, where applicable. This means that the data MCAQD produces are of acceptable quality for NAAQS comparisons and compliance determinations, which is the primary purpose for generating the data. Please note that 40 CFR Part 58 Subpart G Appendix B applies to PSD monitoring only, and that no PSD monitoring was conducted within Maricopa County during this time period.

MCAQD monitors for five criteria pollutants, which are:

1. Carbon monoxide (CO)
2. Nitrogen oxides (NO_x) with nitrogen dioxide (NO_2) used as the indicator compound
3. Ozone (O_3)
4. Particulate matter ≤10 micrometers (PM_{10}) and ≤2.5 micrometers ($PM_{2.5}$)
5. Sulfur dioxide (SO_2)

The National Ambient Air Quality Standards

The U.S. EPA regulates criteria pollutants according to the NAAQS, which establish ambient levels for each, using health and welfare-based criteria. There are two sets of NAAQS standards. As per CAA §109(b), the primary NAAQS are designed to provide an adequate margin of safety that is requisite to protecting public health. The secondary NAAQS are designed to protect public welfare from any known or anticipated adverse effects associated with the presence of a pollutant in the ambient air such as damage to properties such as farm crops and buildings, visibility impairment in national parks and wilderness areas, and for the protection of ecosystems. NAAQS are geared toward improving air quality in geographical areas where the current quality is unacceptable as well as preventing air quality deterioration in geographical areas where the air is relatively free of pollution. Since each pollutant has different health effects and environmental damage potential, NAAQS level(s) are different for each pollutant. Some pollutants have standards for both long-term and short-term averaging times. The short-term standards are designed to protect against acute health effects, while the long-term standards are designed to protect against chronic health effects.

The NAAQS are not static. The CAA requires that they undergo periodic review using the most recent medical, epidemiological, physiological, and ecosystem research available. Historically, when a NAAQS level changes; the new level(s) is lower. The NAAQS review is a lengthy process that assesses the science upon which each NAAQS is based as well as the standard itself. The Clean Air Scientific Advisory Committee (CASAC) provides independent advice to the U.S. EPA concerning the need to change a standard. In addition, comments are solicited from the public. More information regarding the **NAAQS review process** is available at EPA's website.

U.S. EPA's Regional Offices oversee the enforcement of the CAA, and MCAQD falls under the jurisdiction of EPA Region 9. U.S. EPA OAQPS oversees the air monitoring program at a national level, leads regulatory and/or policy changes affecting air monitoring operations and quality requirements, and engages in the review of the NAAQS. Table 4 shows a summary of the primary and secondary NAAQS levels for each pollutant.

Table 4 National Ambient Air Quality Standards

Pollutant		Standard Type	Averaging Time	Level	Form
Carbon Monoxide (CO)		primary	8 hours	9 ppm	Not to be exceeded more than once per year
			1 hour	35 ppm	
Lead (Pb)		primary and secondary	Rolling 3-month average	0.15 µg/m^3	Not to be exceeded
Nitrogen Dioxide (NO_2)		primary	1 hour	100 ppb	98th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		primary and secondary	1 year	53 ppb	Annual Mean
Ozone (O_3) *		primary and secondary (2015)	8 hours	0.070 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
		primary and secondary (2008)	8 hours	0.075 ppm	Annual fourth-highest daily maximum 8-hour concentration, averaged over 3 years
Particle Matter (PM)	$PM_{2.5}$	primary	1 year	12.0 µg/m^3	Annual mean, averaged over 3 years
		secondary	1 year	15.0 µg/m^3	Annual mean, averaged over 3 years
		primary and secondary	24 hours	35 µg/m^3	98th percentile, averaged over 3 years
	PM_{10}	primary and secondary	24 hours	150 µg/m^3	Not to be exceeded more than once per year on average over 3 years
Sulfur Dioxide (SO_2)		primary	1 hour	75 ppb	99th percentile of 1-hour daily maximum concentrations, averaged over 3 years
		secondary	3 hours	0.5 ppm	Not to be exceeded more than once per year

* Maricopa County is designated as Moderate for 2008 and Marginal for 2015.

Source: **https://www.epa.gov/criteria-air-pollutants/naaqs-table**

https://www3.epa.gov/airquality/greenbook/anayo_az.html

Forecasting and Reporting Air Quality Conditions

This section provides information regarding the use and reporting of continuous, real-time data at the County and national level. It also provides historical information on how the reporting of air quality conditions has improved over the years.

Air Quality Forecasting

Forecasting air quality depends upon having air quality data available that can be put into a model which generates information needed for meteorologists to make forecasts. Monitoring instrumentation measures and reports hourly data to monitoring organizations (MO) for distribution to AirNow. The readily available data are invaluable to air quality forecasters because they can better predict what the Air Quality Indicators (AQI) will be.

The Arizona Department of Environmental Quality (ADEQ) and MCAQD developed a year-round air quality forecasting and "restriction" reporting process for the Phoenix metropolitan area. In Maricopa County, ADEQ is lead for air quality forecasting and issuing a "High Pollution Advisory" (HPA) or a "Health Watch" (HW), while MCAQD designates a "No Burn Day". MCAQD's **CLEAN AIR MAKE MORE** website provides a description of each of these restrictions and provides helpful information on improving air quality.

The EPA Air Quality Index and NowCast

Since the 1950s, as per **40 CFR Part 58, Appendix G, the Uniform Air Quality Index (AQI) and Daily Reporting**, the EPA has required that MOs report air quality conditions to the public regarding criteria pollutant health risks based upon data from their network. To do so, EPA developed the AQI, which is a health risk communication tool that converts pollutant concentrations into six health-impact related color-coded indices based upon the NAAQS. Members of the public use the AQI forecast to reduce their exposure to air pollution and its associated health effects by modifying their daily activities. The AQI graduated color scheme is shown in Figure 2.

Air Quality Index Levels of Health Concern	Numerical Value	Meaning
Good	0 to 50	Air quality is considered satisfactory, and air pollution poses little or no risk.
Moderate	51 to 100	Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution.
Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is not likely to be affected.
Unhealthy	151 to 200	Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects.
Very Unhealthy	201 to 300	Health alert: everyone may experience more serious health effects.
Hazardous	301 to 500	Health warnings of emergency conditions. The entire population is more likely to be affected.

Note: Values above 500 are considered Beyond the AQI. Follow recommendations for the "Hazardous category." Additional information on reducing exposure to extremely high levels of particle pollution is available here.

Figure 2 The Air Quality Index.
Source: 40 CFR Part 58, Appendix G – Uniform Air Quality Index and Daily Reporting Air Quality Index (AQI) Basics

In the early 2000s, AirNow began using "NowCast" values that tried to reflect current conditions. However, values were based upon each pollutant's NAAQS averaging time, and it was recognized that these formulas do not respond well to real-time, rapidly changing air quality conditions. For instance, in the desert areas of the Southwest during the monsoon season, dust storms often emerge and dissipate within several hours. These events can drive PM_{10}, and sometimes $PM_{2.5}$, concentrations into the unhealthy range. Since the NAAQS averaging time for PM_{10} is 24 hours, a dust storm the evening before can cause air quality conditions to show in the orange range or higher the following day even though the sky is clear and no impact for the prior day's event is affecting present conditions. Smoke from a brief fire can adversely affect air quality for $PM_{2.5}$ likewise.

The abundance of continuous data in the last decade has furthered our understanding of pollutants, especially $PM_{2.5}$. This information helped improve the NowCast formulas so values better reflect rapidly changing conditions. To develop the new formulas, EPA analyzed millions of data points gathered from all parts of the U.S. Since PM_{10}, $PM_{2.5}$, and O_3 make up most air pollution concerns throughout the U.S., the updated NowCast reports on health risks related to these pollutants, only.

The formulas use a shorter averaging time when a pollutant's concentration is high and a longer averaging time when a pollutant's concentration is low, and conditions are stable. To read more about how the most recent NowCast formulas were developed, visit the **AirNow FAQ** section.

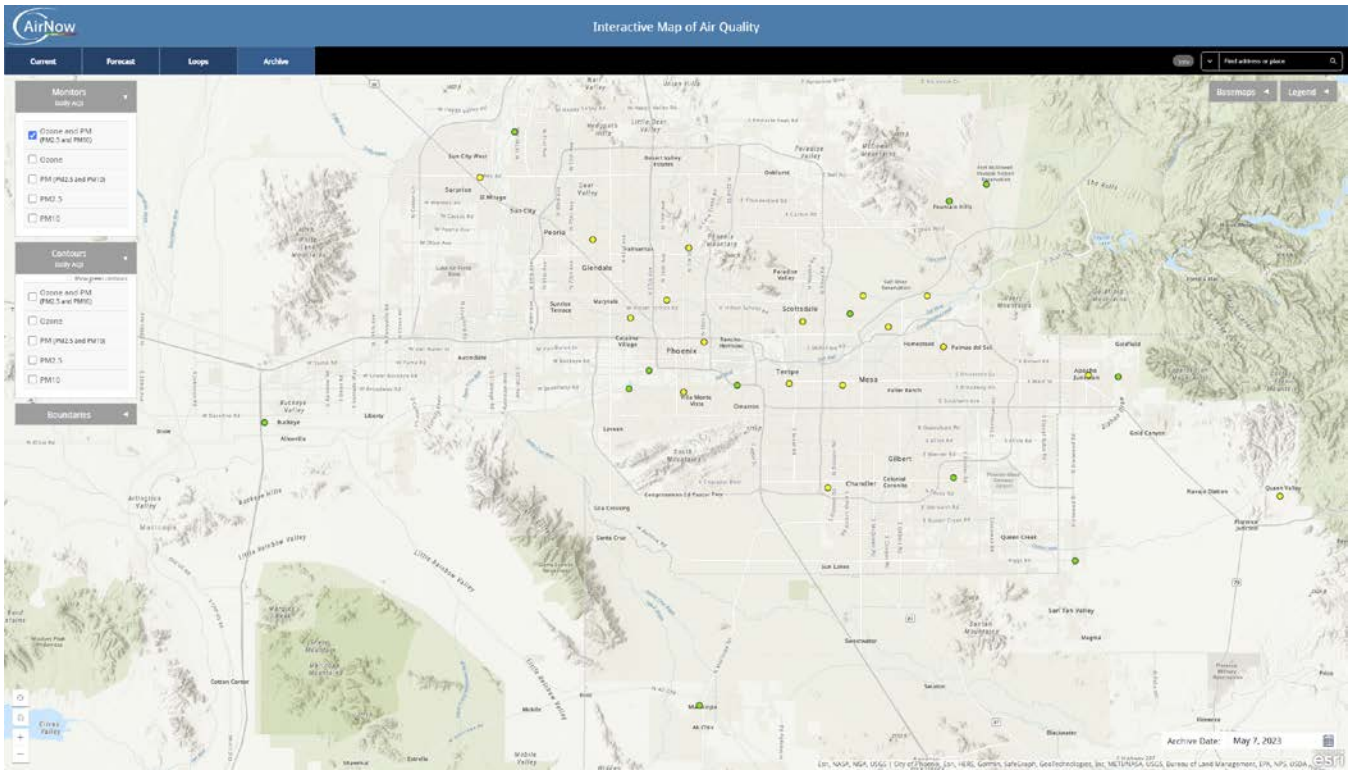


Figure 3 AirNow Web Maps

The EPA's **AirNow website** communicates the status of air quality conditions throughout the country. The MCAQD has participated in the AirNow program since 2001. The MCAQD distributes 1-hour continuous pollutant and select meteorological data to the AirNow website. The AirNow maps cover a geographical area as far east as Queen Creek, as far south as Casa Grande, and as far west as the town of Palo Verde. Air quality data from other Local, Tribal, and National Park Service air monitoring operations within Arizona populate the map as well.

The Maricopa County Interactive Air Quality Map

The MCAQD provides real-time data on our website using an **interactive air quality map** with three layers of information. Figure 3 shows the default 'Current Conditions' map, which uses the latest NowCast formula to provide a site's Maximum NowCast value for either PM_{10}, $PM_{2.5}$ or O_3, as well as the latest formulas for each of the three pollutants' NowCast values. The second tab shows the AQI developed by an unofficial, rolling formula. The map also serves as a way to gather Raw Data from the air quality monitors, which provides hourly CO, NO_2, O_3, $PM_{2.5}$, SO_2, and 5-minute concentrations for PM_{10} and meteorological data from each site.

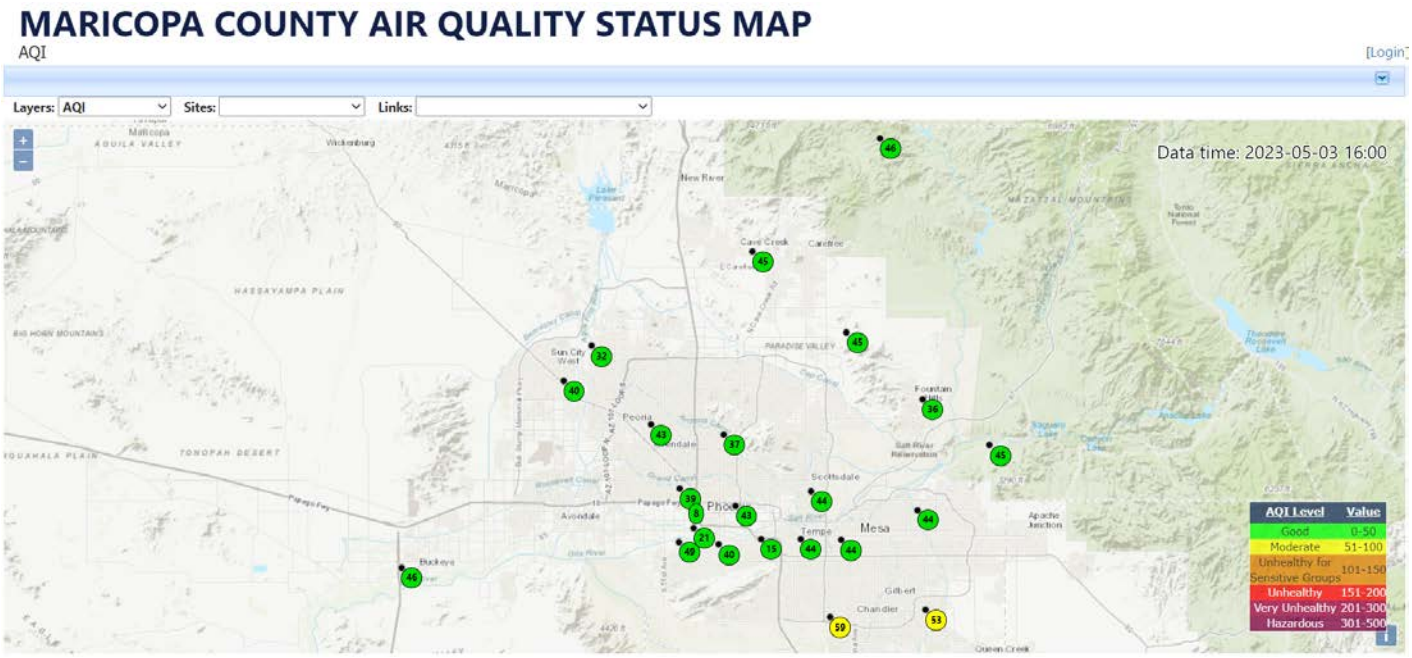


Figure 4 MCAQD Air Quality Status Map

Information Regarding Compliance of Criteria Pollutants

Unless otherwise noted, the information regarding air pollutants in this section was compiled from various pages at the U.S. EPA's **Air and Radiation website**.

Carbon Monoxide (CO)

In 2022, there were no exceedances or violations of the CO NAAQS.

Nitrogen Oxides (NO_X) with Nitrogen Dioxide (NO_2) as the Indicator Compound

In 2022, there were no exceedances or violations of the 1-hour or annual NO_2 NAAQS.

Ozone (O_3)

In 2022, there were forty-eight (48) days when at least one O_3 monitor exceeded the 2015 8-hour NAAQS, and fifteen (15) sites violated the standard. For the 2008 8-hour NAAQS, there were twenty-five (25) days and fifteen (15) sites that violated the standard. For more information regarding the O_3 exceedance days and NAAQS violations, refer to Table 13 2022 O_3 Eight-hour Average Summary.

Particulate Matter (PM)

In 2022, there were seven (7) days when at least one PM_{10} monitor exceeded the 2012 24-hour PM_{10} NAAQS level. For $PM_{2.5}$, there were seven (7) days when at least one monitor exceeded the 2012 24-hour NAAQS level. For more information regarding the PM exceedance days and NAAQS violations, refer to Table 15 2022 PM_{10} 24-Hour Data Summary Including EE Data and Table 17 2022 $PM_{2.5}$ 24-Hour and Annual Averages.

Sulfur Dioxide (SO_2)

In 2022, there were no exceedances or violations of the primary or secondary SO_2 NAAQS.

Lead (Pb)

As of December 2019, MCAQD no longer monitors for Pb. Ambient air monitoring for Pb occurs at the Arizona Department of Environmental Quality JLG Supersite's NCore monitoring station (04-013-9997).

Air Monitoring Strategies and Surveillance System Design

Overview of Air Monitoring Requirements and System Design

The MCAQD operated and maintained 23 ambient air monitoring sites throughout Maricopa County. The sites' start-up dates range from 1961 for Central Phoenix to 2021 for the Eastwood site. Land use patterns around the sites vary from densely populated urban areas to sparsely populated rural settings. The sites' elevations range from 845 feet above sea level at Buckeye to 5190 feet above sea level at the top of Humboldt Mountain. The MCAQD chose each site and its pollutant monitors based on specific EPA requirements, special requests from EPA, and/or specific needs of the County.

Requirements for operating an ambient air monitoring program are found in 40 CFR Parts 50 and 58. The MCAQD holds the Primary Quality Assurance Organization (PQAO) designation for the County's ambient air monitoring network and is fully responsible for designing and operating the total air monitoring surveillance system and managing the pollutant data generated. The MCAQD operates air monitors at EPA-approved State and Local Air Monitoring Stations (SLAMS), which includes the near-road stations. On occasion, special air monitoring initiatives involve temporarily operating monitors designated as Special Purpose Monitors (SPM), as well as special studies.

This section details how each Ambient Air Quality network is designed to obtain "representative" data as per 40 CFR Part 58 Appendix D. To determine compliance with the NAAQS, EPA-approved air monitors must collect the pollutant data. The EPA classifies approved monitor methods into one of three categories: a federal reference method (FRM), a federal equivalent method (FEM), or an approved regional method (ARM). The MCAQD uses FRM and FEM instruments. This practice ensures high-quality data of like kind are used for compliance-driven decisions.

However, data from research monitors, e.g., non compliance-related monitors, can be used to develop state and/or federal attainment and maintenance plans, further evaluate regional air quality models used in developing emissions control strategies, tracking trends in air pollution, and evaluating the impact control measures are having on improving air quality. Any short-term research data collected by the MCAQD can be made available to decision makers, but the data are not reported to AQS.

Within Maricopa County, the ADEQ collects compliance data as well as research data at the JLG Supersite via the following EPA monitoring networks: National Core multi-pollutant site (NCore), Photochemical Ambient Monitoring Stations (PAMS), Chemical Speciation Network (CSN), and National Air Toxics Trends Stations (NATTS). ADEQ also collects air toxics samples for the Urban Air Toxics Monitoring Program (UATMP) at MCAQD's South Phoenix

site. The data from these networks are reported to EPA and should be available in AQS and/or another EPA database.

In addition to producing an annual network plan, the EPA requires a five-year network assessment as per 40 CFR Part 58.10. The 5-year assessment is best served by collaborating with EPA, ADEQ, and other local and/or tribal Monitoring Organizations. MCAQD last completed the assessment in 2020. The assessment process continues to improve, and MCAQD works with other Monitoring Organizations regarding network design issues as needed. Monitoring Organizations within Arizona may provide support to each other by exchanging technical services and/or knowledge when problems arise with instrumentation or when conducting special studies.

Basic Air Monitoring Objectives

Each ambient air monitor must have a designated basic monitoring objective. The objectives in Table 5 apply to establishing required SLAMS monitoring stations and choosing the general locations for additional monitoring sites. The objectives are not listed based on importance or priority; however, each objective is important and must be considered individually.

Table 5 Basic SLAMS Air Monitoring Objectives

Objective	Description
Provide air pollution data to the general public in a timely manner	Data can be presented to the public in a number of ways including air quality maps, newspapers, MOs, and EPA websites, and as part of weather forecasts and public advisories.
Support compliance with ambient air quality standards and emissions strategy development	Data from EPA-approved monitors for NAAQS pollutants will be used for comparing an area's air pollution levels.
Support for air pollution research studies	Supplemental data useful with health effect assessments, atmospheric processes, or monitoring methods development work.

Source: 40 CFR Part 58 Appendix D, 1.1(a – c)

Monitor Types

Pollutant monitor types must be designated as shown in Table 6 and are based upon how the data will be used and how long the monitor will remain in operation. The MCAQD's air monitoring network is comprised of SLAMS, which gather data for comparison to the NAAQS. The MCAQD may operate SPMs temporarily; however, no SPMs or PSD monitors were operated in 2022.

Table 6 Monitor Types*

Name	Description
SLAMS (State and Local Air Monitoring Stations)	EPA-approved, compliance monitor typically operated on a long-term basis. Measure criteria pollutants for comparison to the NAAQS.
SPM (Special Purpose Monitors)	A monitor typically operated on a short-term basis and not necessarily EPA-approved. These monitors are useful for gathering and reporting preliminary information regarding air quality in a local area quickly and over a short-term period, which is less than two years. In the event of a geographical area's population increasing or data indicating that a SLAMS is more appropriate; an SPM may be reclassified to SLAMS and potentially outfitted with a different method. 40 CFR Part 58.20 Subpart C
PSD (Prevention of Significant Deterioration)	A monitor typically operated for less than two years prior to a source opening in a protected Class A area and usually required by the permitting authority. PSDs are operated for the purpose of establishing the effect on air quality of the emissions from a proposed source for purposes of preventing significant deterioration to a "protected" area, e.g., a Class 1 area. Class 1 areas include national parks and wilderness areas where a major effort is underway to improve visibility and air quality.

* Reference 40 CFR Part 58

Site Types

To support the three basic monitoring objectives, each site must be identified as one of the six "site types" shown below and may vary within each pollutant's network. The site type is key to informing air quality professionals and the public about a pollutant's peak concentration levels. The six general site types as defined in 40 CFR Part 58, Appendix D.1 are:

- Sites for determining the **highest concentrations** expected to occur in the area covered by the network.
- Sites for measuring typical concentrations in areas of **high population density (population exposure)**.
- Sites for determining the impact of significant **sources** or source categories on air quality.
- Sites for determining general **background concentration** levels.
- Sites for determining the extent of **regional pollutant transport** among populated areas and in support of secondary standards.

- Sites for measuring air pollution impacts to visibility, vegetation damage, or other welfare-based impacts.

Monitoring Scales (Spatial Scales of Representativeness)

To help link the site type with a monitor's basic monitoring objective and physical location, EPA uses the spatial scale of representativeness concept as described in 40 CFR Part 58, Appendix D 1.2 (a) and (b). The goal is to correctly match the spatial scale represented by an air sample with the spatial scale most appropriate for the site type, air pollutant to be measured, and the monitoring objective. Table 7 shows the scales of representativeness that are of most interest for the air monitoring site types described above.

Table 7 Spatial Scales of Representativeness

Name	Distance
Micro Scale	0 to 100 meters
Middle Scale	100 to 500 meters
Neighborhood Scale	0.5 to 4 kilometers
Urban Scale	4 to 50 kilometers
Regional Scale	10s to 100s of kilometers
National and Global Scales	Characterize the nation and the globe as a whole

Source: Adapted from 40 CFR Part 58, Appendix D 1.2

Overview of the Air Monitoring Sites

According to the U.S. Census Bureau, Maricopa County's most recent population estimate is 4,551,524 people **(U.S. Census Bureau: Quick Facts Population Estimate for Maricopa County**). As per 40 CFR Part 58, the EPA mandates the minimum quantity of monitors required by a pollutant's network to properly represent the County's population. The MCAQD pollutant networks are designed using the concept of spatial scale representativeness and monitoring objectives. This results in Amibient Air Monitoring networks that meet, and in most cases exceed, the minimum quantity of monitors required by EPA. Additional information on the siting of air monitors can be found in Appendix I of this network plan.

SUMMARY OF NETWORK RESULTS AND REQUIRED INFORMATION

Determining Data Quality and Acceptability

This section details the results obtained from our 2022 monitoring year. The EPA has established data quality and measurement quality objectives for pollutant data. In addition to 40 CFR Part 58, the EPA **QA Handbook for Air Pollution Measurement Systems: "Volume II: Ambient Air Quality Monitoring Program** provides extensive information regarding the quality system and its components. There are seven data quality indicators (DQI) established by the EPA to determine the quality of ambient air data. Data must meet each indicator's requirement to be certified and acceptable for use by decision makers for NAAQS compliance determinations, researchers, and the public.

These indicators are precision, bias, completeness, comparability, detectability, representativeness, and sensitivity. "Timeliness" of data collection, validation, and upload to AQS are important as well. "Accuracy" is now defined as a measure of the overall agreement of a measurement to a known value and includes a combination of random error (precision) and systematic error (bias) components of both sampling and analytical operations. The MCAQD's personnel evaluate data using these indicators, with precision, bias, and completeness being the most crucial to evaluate on an ongoing basis.

Data Completeness

Before considering any data set valid, it must first pass a data recovery, or completeness, test. The test requirements begin with checking completeness at hourly and 24-hour concentration values, or 'samples. The pollutant data measurements from continuous analyzers are based on a valid hour, while filter samples from manual samplers are based on a 24-hour sampling period from midnight to midnight. Equation 1 shows the calculation for the data completeness percentage, which is the quantity of valid measurements divided by the quantity of scheduled measurements, multiplied by one hundred. For data, completeness must be greater than 75% for a data set to pass the first validity test. Furthermore, data completeness requirements may vary and use multiple levels of data aggregation, e.g., 1-hour, 3-hour, 8-hour, 24-hour, quarterly, annual, and multiple years.

Equation 1

$$Data\ Completeness\ (\%) = \frac{Quantity\ of\ Valid\ Measurements}{Quantity\ of\ Scheduled\ Measurements} \times 100\%$$

Table 8 2022 Criteria Pollutant Data Completeness for SLAMS

Pollutant	CO	O_3	NO_2	SO_2	$PM_{2.5}$	PM_{10}	Total
Percent Complete	97.3	98.5	97.4	97.5	97.0	97.1	97.6

Source: AQS database – 2022 Data Completeness Report (AMP430)

Summary of 2022 Criteria Pollutant Data

This section covers the 2022 data generated by each network.

Carbon Monoxide (CO)

Figure 5 shows the CO monitoring sites operating in 2022. A CO monitor is required at one MCAQD near-road site. The CO data were reported to AQS, and the data are suitable for comparison to the NAAQS.

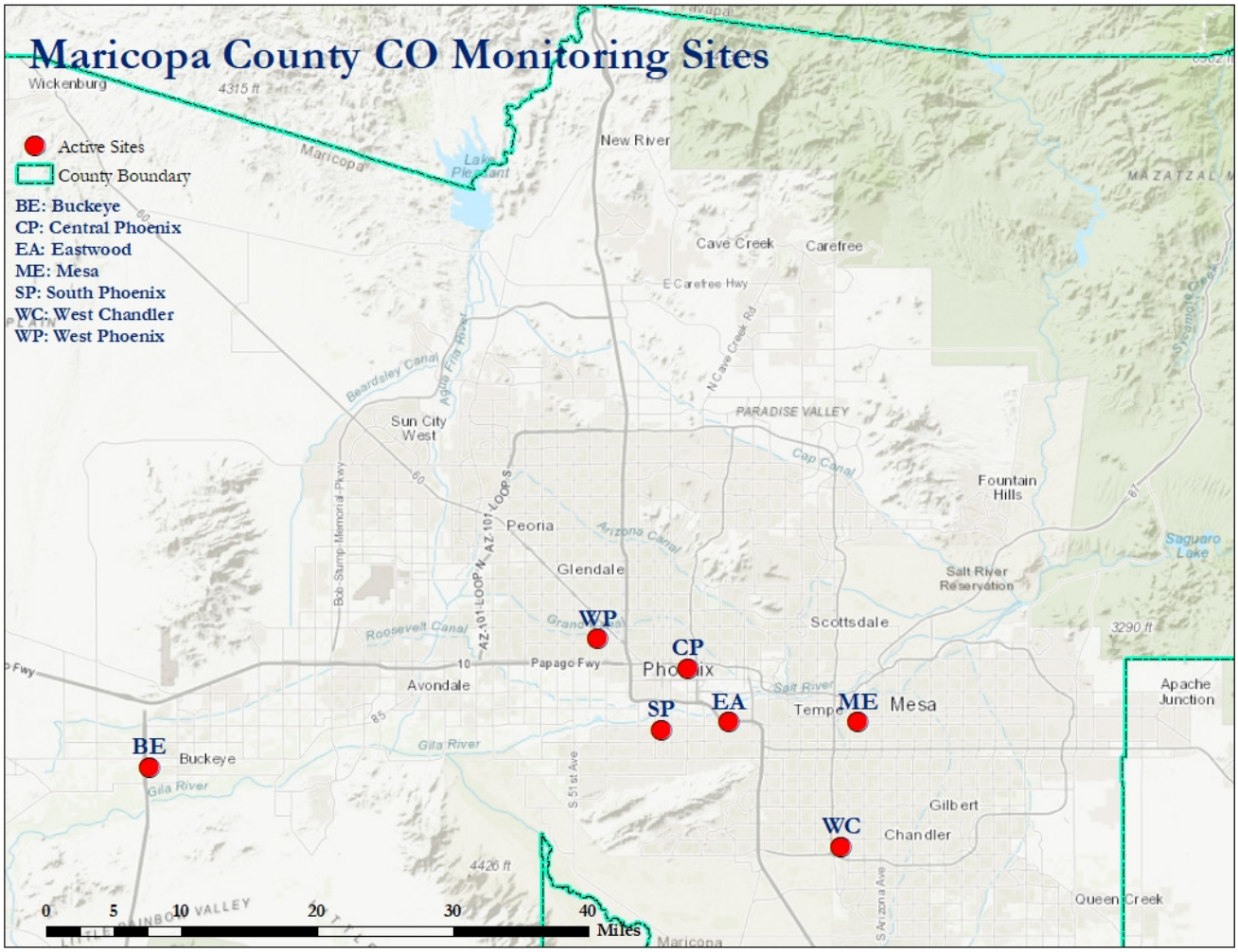


Figure 5 2022 CO Monitoring Sites

In 2022, no exceedances or violations of the 1-hour or 8-hour CO NAAQS occurred at any MCAQD sites, and concentrations remained well below NAAQS levels. Table 9 shows the maximum and second maximum 1-hour and 8-hour CO averages measured.

Table 9 2022 CO Average Data Summary

Site	CO 1-hour Average Maximum (ppm)	CO 1-hour Average 2nd Maximum (ppm)	CO 8-hour Average Maximum (ppm)	CO 8-hour Average 2nd Maximum (ppm)
Buckeye	1.0	1.0	0.7	0.7
Central Phoenix	2.7	2.6	1.8	1.7
Eastwood	1.6	1.5	.9	.9
Mesa	2.1	2.0	1.3	1.3
South Phoenix	2.9	2.8	2.4	1.8
West Chandler	1.3	1.3	1.1	1.1
West Phoenix	2.7	2.6	2.2	2.1

Source: AMP450 Quicklook Criteria Report

Table 10 2022 CO Monitor Requirements

CBSA	Population Estimate (2022)	Required Near-Road Monitors	Active Near-Road Monitors	Additional Near-Road Monitors Needed
38060	4,551,524	1	1	0

Source: **U.S. Census Bureau: Quick Facts Population Estimate for Maricopa County**

Nitrogen Dioxide (NO_2)

Figure 6 shows the five NO_2 monitoring sites which operated in 2022. The NO_2 monitors at the Buckeye, Central Phoenix, and West Phoenix sites are designated as SLAMS, which represent the NO_2 concentrations within Maricopa County. The near-road network requires two NO_2 monitors in the metropolitan area. The Thirty-Third and Eastwood site monitors are the designated near-road monitors representing the microscale by collecting source-oriented emissions from vehicular traffic on heavily travelled highways within Maricopa County.

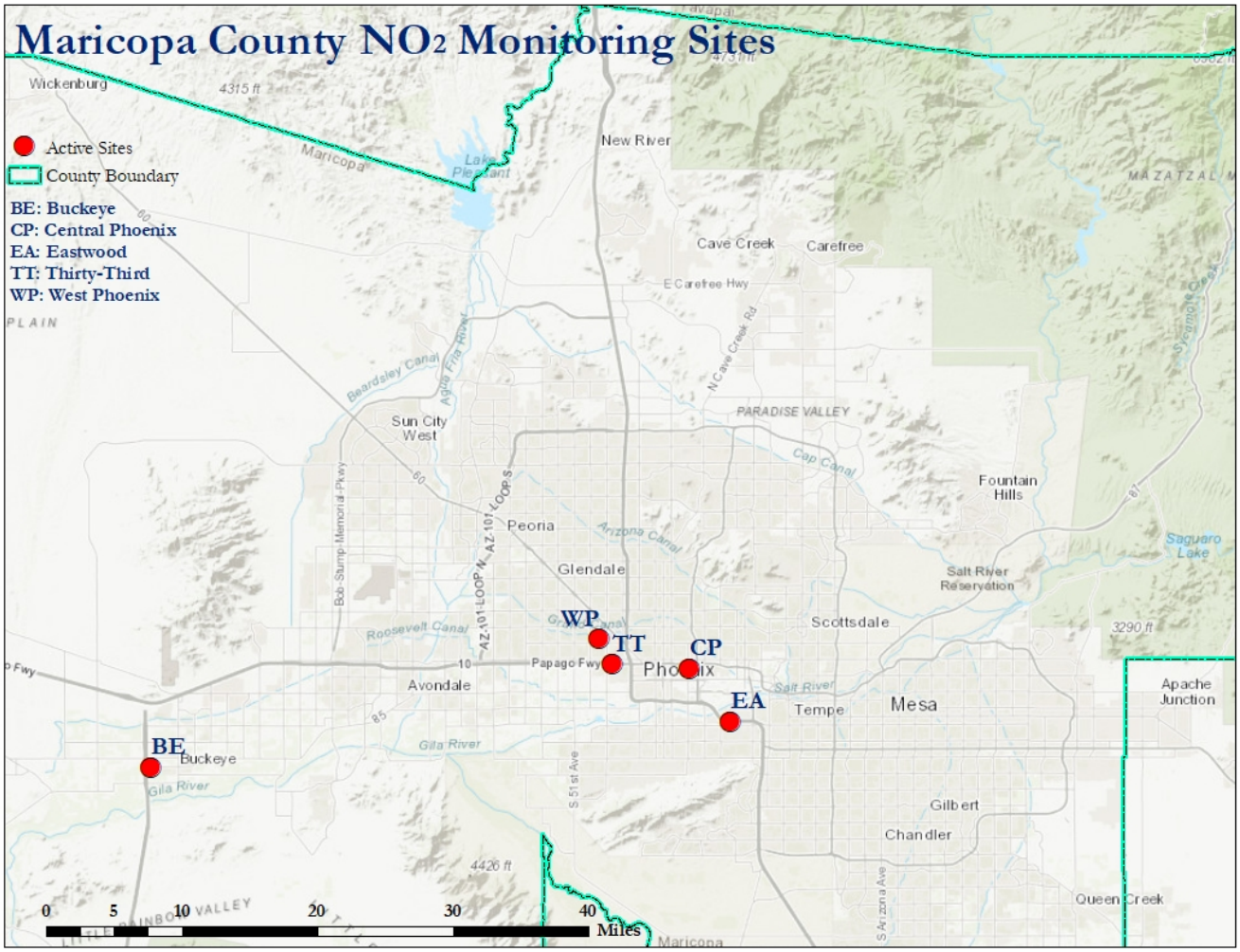


Figure 6 2022 NO_2 Monitoring Sites

Data from both the area-wide and near-road monitors were reported to AQS, and the data are suitable for comparison to the NAAQS. Table 11 shows that no exceedances or violations of the NO_2 annual or 1-hour NAAQS were recorded at Maricopa County monitoring sites in 2022.

Table 11 2022 NO_2 1-hour Data Summary

Site Name	NO_2 Maximum (ppb)	NO_2 Annual Average (ppb)	NO_2 98th Percentile (ppb)	NO_2 3-Year 98th Percentiles Average (ppb)
Buckeye	43.0	8.02	33.0	34.0
Central Phoenix	57.0	14.91	51.0	53.0
Eastwood	86.0	15.23	47.0	49.5*
Thirty-Third	82.0	25.64	61.0	59.0
West Phoenix	51.0	13.99	47.0	47.3

*- Site established in 2021, 2-year average provided.

Source: EPA AQS database - 2020 – 2022 Quicklook Criteria Report (AMP450)

Additional information required by EPA for the near-road NO_2 monitors is shown in Table 12.

Table 12 2022 NO_2 Monitor Requirements

CBSA	Population Estimate (2022)	Max AADT Count (2021)	Required Near-Road Monitors	Active Near-Road Monitors	Needed Near-Road Monitors	Required Area-Wide Monitors	Active Area-Wide Monitors	Needed Area-Wide Monitors
38060	4,551,524	295,833	2	2	0	1	3	0

Sources: **U.S. Census Bureau: Quick Facts Population Estimate for Maricopa County; Traffic Monitoring** – ADOT Annual Average Daily Traffic Count

Ozone (O_3)

Figure 7 shows the seventeen SLAMS O_3 monitors which operated in 2022. The data were reported to AQS, and data are suitable for comparison to the NAAQS.

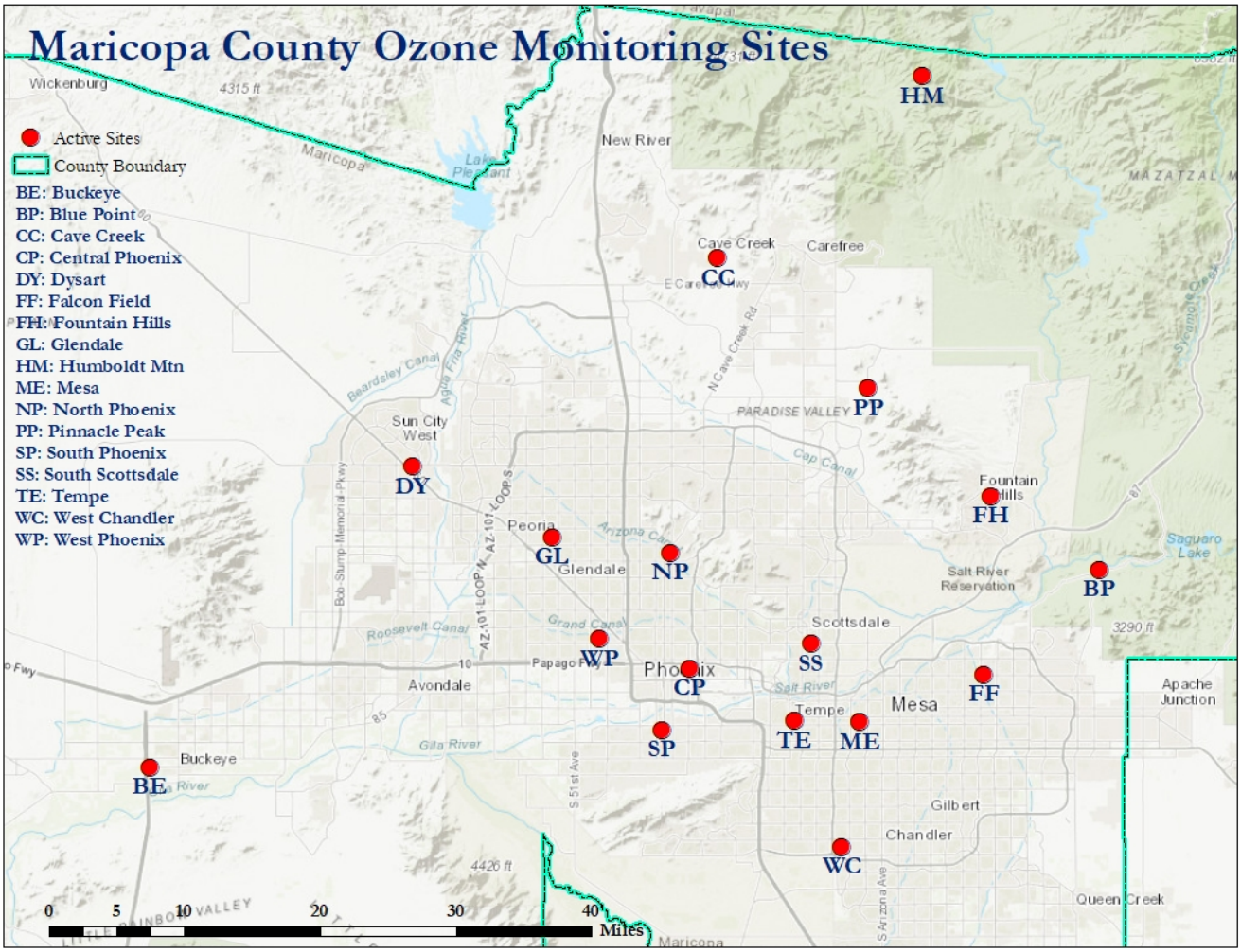


Figure 7 2022 O_3 Monitoring Sites

Table 13 2022 O_3 Eight-hour Average Summary

Site	1st 8-hr Maximum (ppm)	2nd 8-hr Maximum (ppm)	3rd 8-hr Maximum (ppm)	4th 8-hr Maximum (ppm)	Qty. of Days > 0.070 ppm
Blue Point	0.078†	0.077†	0.077†	0.077†	17
Buckeye	0.072†	0.071†	0.071†	0.071†	4
Cave Creek	0.072†	0.071†	0.071†	0.071†	4
Central Phoenix	0.075†	0.074†	0.072†	0.072†	6
Dysart	0.082†	0.080†	0.077†	0.075†	11
Falcon Field	0.085†	0.080†	0.079†	0.078†	18
Fountain Hills	0.078†	0.077†	0.076†	0.076†	18
Glendale	0.087†	0.085†	0.082†	0.081†	19
Humboldt Mt.	0.087†	0.074†	0.072†	0.072†	5
Mesa	0.084†	0.081†	0.078†	0.078†	22
North Phoenix	0.088†	0.085†	0.078†	0.077†	28
Pinnacle Peak	0.077†	0.077†	0.077†	0.077†	17
South Phoenix	0.076†	0.076†	0.073†	0.069	3
South Scottsdale	0.072†	0.071†	0.068	0.068	2
Tempe	0.080†	0.079†	0.073†	0.073†	8
West Chandler	0.083†	0.075†	0.071†	0.071†	4
West Phoenix	0.081†	0.080†	0.079†	0.076†	17

† - Indicates an exceedance of the 2015 8-hr NAAQS**Source:** AMP450 Quicklook Criteria Report; MCAQD 2022 O_3 Exceedance Day Report

Table 13 2022 O_3 Monitor Requirements

CBSA		38060
County		Maricopa
Population Estimate (2022)		4,551,524
3-Year Design Value		81 ppb
3-Year Design Value Site(s)	AQS ID	04-013-1004
	Site Name	North Phoenix
	Monitoring Organization	MCAQD
MCAQD 8-Hour Maximum Concentration		88 ppb
MCAQD 8-Hour Maximum Concentration Site(s)	AQS ID	04-013-1004
	Site Name	North Phoenix
MSA Maximum 8-Hour Concentration		88 ppb
MSA Maximum Concentration Site(s)	AQS ID	04-013-1004
	Site Name	North Phoenix
	Monitoring Organization	MCAQD
Required Monitors		3
Active Monitors		17
Additional Monitors Needed		0

Source: AMP480 Preliminary Design Value Report; AMP450 2022 Criteria Report; **U.S. Census Bureau: Quick Facts Population Estimate for Maricopa County**

Particulate Matter ≤10 Micrometers (PM_{10})

Figure 8 shows the fifteen PM_{10} SLAMS monitors which operated in 2022. All PM_{10} monitoring stations operate continuous PM_{10} analyzers that collect 5-minute and hourly averaged data. All data were submitted to AQS and are suitable for comparison to the NAAQS. The EPA does not require PM_{10} analyzers to be collocated at the PQAO level or the national level.

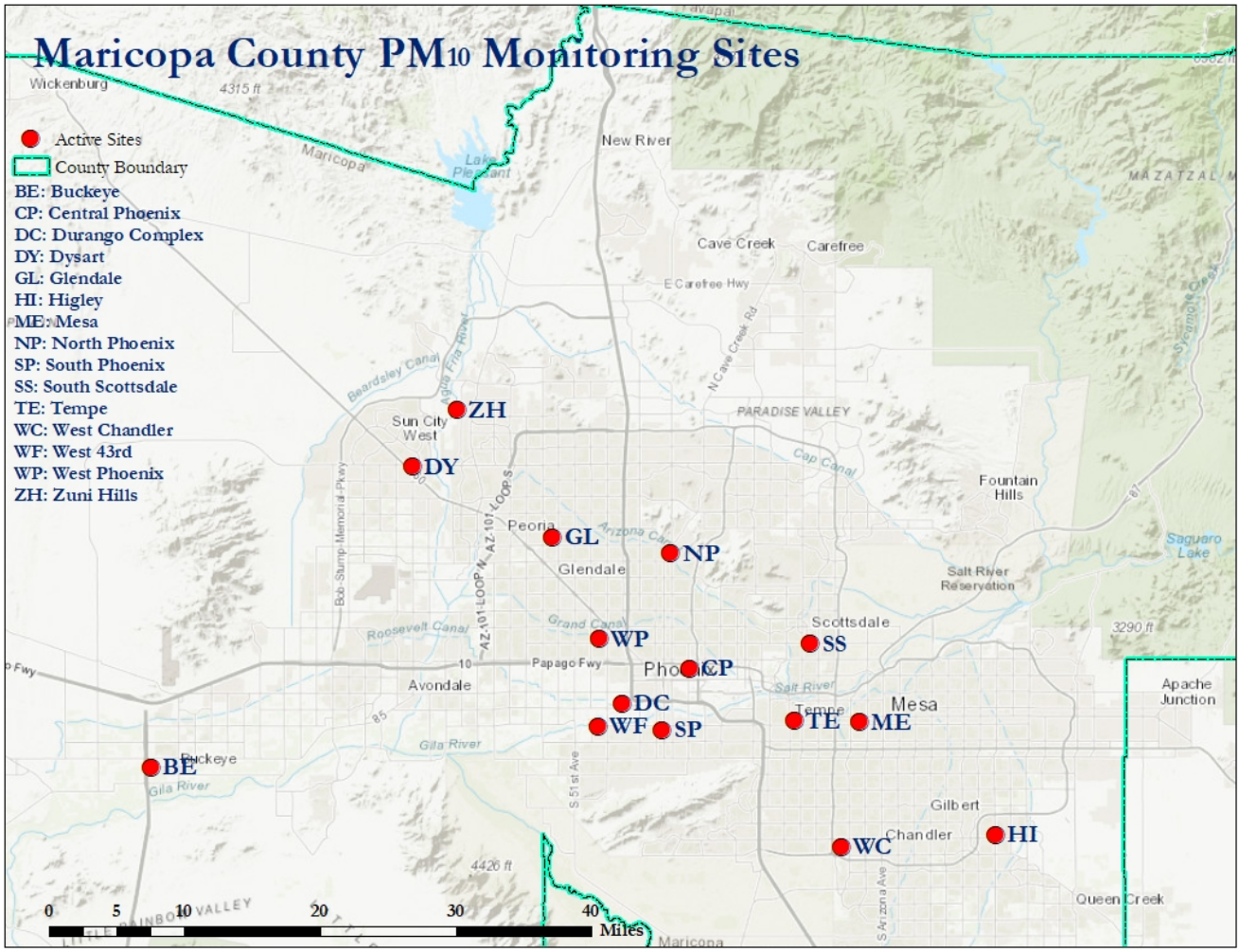


Figure 8 2022 PM_{10} Monitoring Sites

The PM_{10} NAAQS are violated when the expected number of exceedances at a monitor is more than one per year on average over three years. The expected number of exceedances for a site is estimated using a formula provided in 40 CFR Part 50 Appendix K. The formula uses the number of days sampling occurs and the number of valid samples that can be collected. A 3-year average of these estimated days is then used to determine compliance. Effective December 18, 2006, EPA revoked the PM_{10} annual primary standard; however, the annual weighted average is displayed on Table 16 for informational purposes.

In recent years, some PM_{10} exceedances occurring in the Maricopa County CBSA have been successfully attributed to an Exceptional Event (EE). Per the EPA's Exceptional Event Rule, an EE is an uncontrollable event that was caused by natural sources of pollution or an event that is not expected to recur at a given location. ADEQ makes the determination of which events to classify as exceptional, then they submit documentation to EPA supporting the contention that the exceedance(s) was due to an EE. If EPA Region 9 concurs, the PM_{10} concentrations measured during the EE are not used to determine compliance with the NAAQS. The EE counts shown below on Table 15 are current as of this review's publishing.

In 2022, there were seven days that exceeded the 24-hour PM_{10} NAAQS at MCAQD's sites, and three sites Dysart, West 43rd, and West Chandler violated the NAAQS. Table 15 shows the PM_{10} 24-hour NAAQS status and data summary, including EE data values.

Table 14 2022 PM_{10} 24-Hour Data Summary Including EE Data

Site Name	Maximum 24-Hour Average (mg/m^3)	2nd Maximum24-Hour Average (mg/m^3)	Number of 24-hour NAAQS Exceedances	Three-year Average Annual Expected Exceedance Rate	Annual Weighted Average (mg/m^3)	Quantity of EEs
Buckeye	153	140	0	1	38.7	0
Central Phoenix	101	99	0	0.7	31.5	0
Durango Complex	98	97	0	0.3	37.6	0
Dysart	206†‡	195†‡	2	1.3†	28.2	2
Glendale	89	57	0	0.3	19.4	0
Higley	160†‡	99	1	1	28.8	1
Mesa	74	65	0	0.7	19.2	0
North Phoenix	68	97	0	0	19.2	0
South Phoenix	97	84	0	0	32.4	0
South Scottsdale	100	99	0	1	26.2	0
Tempe	73	70	0	0.7	22.4	0
West Chandler	191†‡	168†‡	2	2.1†	31.5	2
West 43rd Avenue	316†‡	223†‡	5	3.8†	62.6	5
West Phoenix	127	81	0	0.7	29.4	0
Zuni Hills	167†‡	126	1	0.7	25.4	1

† - Indicates an exceedance of the standard
‡ - Data are associated with exceptional event flag
Source: AMP480 Preliminary Design Value Report; AMP450 Quicklook Criteria Report

Table 15 2022 PM_{10} Monitor Requirements

CBSA		38060
County		Maricopa
Population Estimate (2022)		4,551,524
MCAQD Maximum 24-Hour Concentration		316 µg/m^3
MCAQD Maximum Concentration for Site	AQS ID	04-013-4009
	Site Name	West 43rd Avenue
MSA Maximum 24-Hour Concentration		316 µg/m^3
MSA Maximum Concentration Site	AQS ID	04-013-4009
	Site Name	West 43rd Avenue
	Monitoring Organization	MCAQD
Required Monitors		6-10
Active Monitors		15
Additional Monitors Needed		0

Source: AMP450 Quicklook Criteria Report; **U.S. Census Bureau: Quick Facts Population Estimate for Maricopa County**

Particulate Matter ≤2.5 Micrometers ($PM_{2.5}$)

Figure 9 shows the eight $PM_{2.5}$ sites which operated in 2022. All $PM_{2.5}$ monitors are designated as SLAMS. Data were reported to AQS, and data are suitable for comparison to the NAAQS.

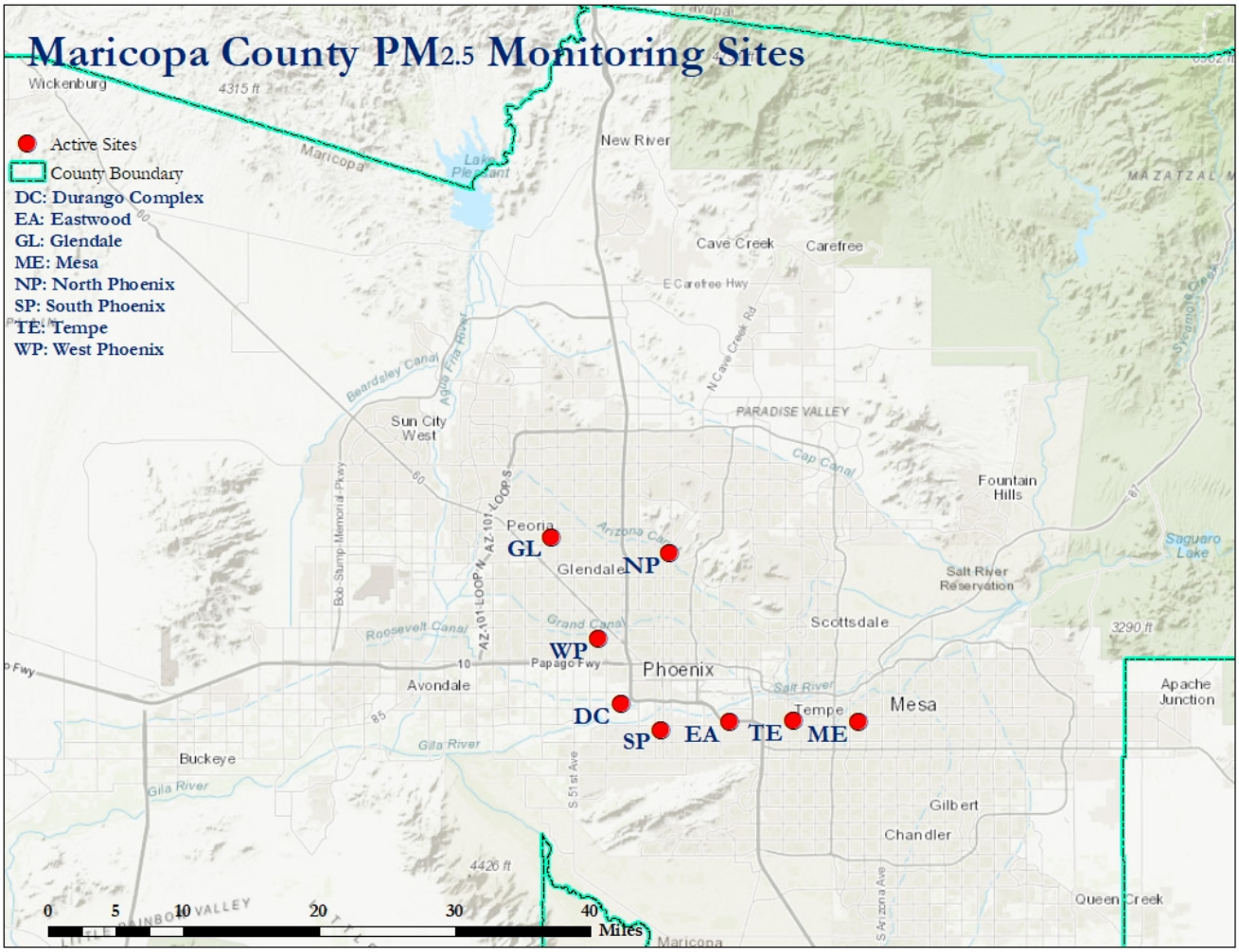


Figure 9 2022 $PM_{2.5}$ Monitoring Sites

Each $PM_{2.5}$ site operates a continuous FEM monitor that provides hourly concentration data used for NAAQS comparison. To meet the EPA's QA collocation requirements for the $PM_{2.5}$ network, a secondary monitor is operated at the West Phoenix site. This site operates one FEM continuous analyzer designated as the primary monitor and one FRM filter-based $PM_{2.5}$ sampler designated as the secondary monitor. The FRM filter-based secondary sampler collects a 24-hour filter sample for QA purposes every 12 days. The U.S. EPA OAQPS produces the **annual sampling calendar** each year and posts it on the AMTIC website.

In addition to the secondary monitor's data being used for QA purposes, if necessary, the data can be substituted for the primary monitor's data as per 40 CFR Part 50 Appendix N. The EPA may reference data from the secondary monitor to better evaluate air quality in the area.

Maricopa County is currently in attainment for $PM_{2.5}$. The MCAQD continually assesses the existing $PM_{2.5}$ network to ensure it adequately represents air quality in Maricopa County. To determine compliance with the annual $PM_{2.5}$ NAAQS requires that three years of the annual average of 24-hour data be used from each monitor. To determine compliance with the 24-

hour NAAQS requires that three years of the 98th percentile data be used from each $PM_{2.5}$ monitor. For data to be acceptable for comparison to the annual and the 24-hour NAAQS, a site's $PM_{2.5}$ monitor must meet all EPA-required operating and QA criteria.

In the event MCAQD needed to move or change a violating $PM_{2.5}$ monitor, this procedure would be followed. MCAQD would hold a public hearing regarding the requested change. Details and documentation of the requested change, as well as all public comments, would then be forwarded to the EPA Region 9 for approval. Any action on MCAQD's part will be dependent on EPA Region 9 approval. Please note that this statement is general in nature and required in this AMNP by 40 CFR Part 58. MCAQD does not currently have any violating $PM_{2.5}$ monitors, nor does it have any proposals to move any $PM_{2.5}$ monitors.

In 2022, there were seven days that exceeded the 24-hour $PM_{2.5}$ NAAQS at one or more MCAQD sites. Table 17 summarizes the 24-hour and annual data from the primary monitors only, including EE data values if any.

Table 16 2022 $PM_{2.5}$ 24-Hour and Annual Averages

Site Name	Maximum 24-Hour Average Concentration (mg/m^3)	2nd Maximum 24-Hour Average Concentration (mg/m^3)	98th Percentile 24-Hour Average Concentration (mg/m^3)	Annual Average Concentration (mg/m^3)
Durango Complex	84.4†	44.2†	28.0	9.75
Eastwood	32.2	26.2	17.7	7.88
Glendale	51.8†‡	28.7	19.1	6.17
Mesa	24.9	22.9	16.7	6.30
North Phoenix	29.3	25.9	21.5	6.95
South Phoenix	84.5†	64.2†‡	29.5	11.09
Tempe	24.9	21.9	17.1	7.81
West Phoenix	110.3†	59.7†	33.0	10.2

† - Indicates an exceedance of the standard.
‡ - Data are associated with exceptional event flag
* - Indicates that the mean does not satisfy summary criteria

Source: AMP450 Quicklook Criteria Report

Compliance with the primary and secondary annual NAAQS is determined by averaging three consecutive years of a site's annual mean value using the 24-hour, or daily, concentrations. The annual $PM_{2.5}$ NAAQS is met when the 3-year annual average concentration is less than or equal to 12.0 µg/m^3 at each eligible monitoring site. All 3-year averages were below the $PM_{2.5}$ annual NAAQS. Table 18 summarizes the 3-year annual average data.

Table 17 $PM_{2.5}$ 3-Year Annual Averages

Site Name	2020 Annual Average Concentration (µg/m^3)	2021 Annual Average Concentration (µg/m^3)	2022 Annual Average Concentration (µg/m^3)	3-Year Annual Average Concentration (µg/m^3)
Durango Complex	10.52	10.23	9.75	10.16
Eastwood	not operating	7.48*	7.88	not available
Glendale	7.63	6.99	6.17	6.93
Mesa	7.30	6.79	6.30	6.79
North Phoenix	7.88	7.29	6.95	7.37
South Phoenix	10.45	9.62	11.09	10.38
Tempe	6.78	7.59	7.81	7.39
West Phoenix	10.47	10.72	10.20	10.46

* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness
Source: AMP450 Quicklook Criteria Report

Compliance with the primary and secondary 24-hour $PM_{2.5}$ NAAQS is determined by averaging 3 consecutive years of the 24-hour 98th percentile concentration values from all eligible sites. The 24-hour NAAQS is met when the 3-year average concentration value is less than or equal to 35 µg/m^3. In 2022, there were seven exceedance days, but no violations of the primary or secondary 24-hour NAAQS occurred. Table 19 summarizes the 3-year 24-hour 98th percentile data from the FEM analyzers.

Table 18 $PM_{2.5}$ 3-Year 24-Hour Averages of the 98th Percentile

Site Name	2020 98th Percentile 24-Hour Average Concentration ($\mu g/m^3$)	2021 98th Percentile 24-Hour Average Concentration ($\mu g/m^3$)	2022 98th Percentile 24-Hour Average Concentration ($\mu g/m^3$)	3-Year 98th Percentile 24-Hour Average Concentration ($\mu g/m^3$)
Durango Complex	28.8	27.2	28.0	28.0
Eastwood	not operating	16.2	17.7	not available
Glendale	19.0	17.8	19.1	18.6
Mesa	17.4	18.1	16.7	17.4
North Phoenix	18.4	16.2	21.5	18.7
South Phoenix	34.1	30.5	29.5	31.3
Tempe	15.6	21.9	17.1	18.2
West Phoenix	33.9	26.0	33.0	30.9

* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness

Source: AMP450 Quicklook Criteria Report

Table 20 shows additional information required by EPA. The $PM_{2.5}$ annual and daily design values include any measurements submitted as an EE for EPA's concurrence. In 2022 one exceptional event was submitted for readings taken on December 31, 2022. Maricopa County exceeds the minimum requirement for $PM_{2.5}$ monitors for the CBSA.

Table 19 2022 $PM_{2.5}$ Data Required by EPA

CBSA		38060
County		Maricopa
Population Estimate (2022)		4,551,524
MCAQD Annual Design Value		10.5 µg/m^3
MCAQD Annual Design Value Site	AQS ID	04-013-0019
	Site Name	West Phoenix
MCAQD 24-Hour Design Value		31 µg/m^3
MCAQD 24-Hour Design Value Sites	AQS ID	04-013-0019
	Site Name	West Phoenix
MCAQD Max 24-Hour Concentration		110.3 µg/m^3
MCAQD Max 24-Hour Concentration Site	AQS ID	04-013-0019
	Site Name	West Phoenix
MSA Max 24-Hour Concentration		110.3 µg/m^3
MSA Max 24-Hour Concentration Site	AQS ID	04-013-0019
	Site Name	West Phoenix
	Monitoring Organization	MCAQD
Required Monitors		3
Active Monitors		8
Additional Monitors Needed		0

Source: AMP480 Preliminary Design Value Report; AMP450 Quicklook Criteria Parameter Report; **U.S. Census Bureau: Quick Facts Population Estimate for Maricopa County**

Sulfur Dioxide (SO_2)

Figure 10 shows the two SO_2 SLAMS monitors which operated in 2022. The data were reported to AQS, and the data are suitable for NAAQS comparison.

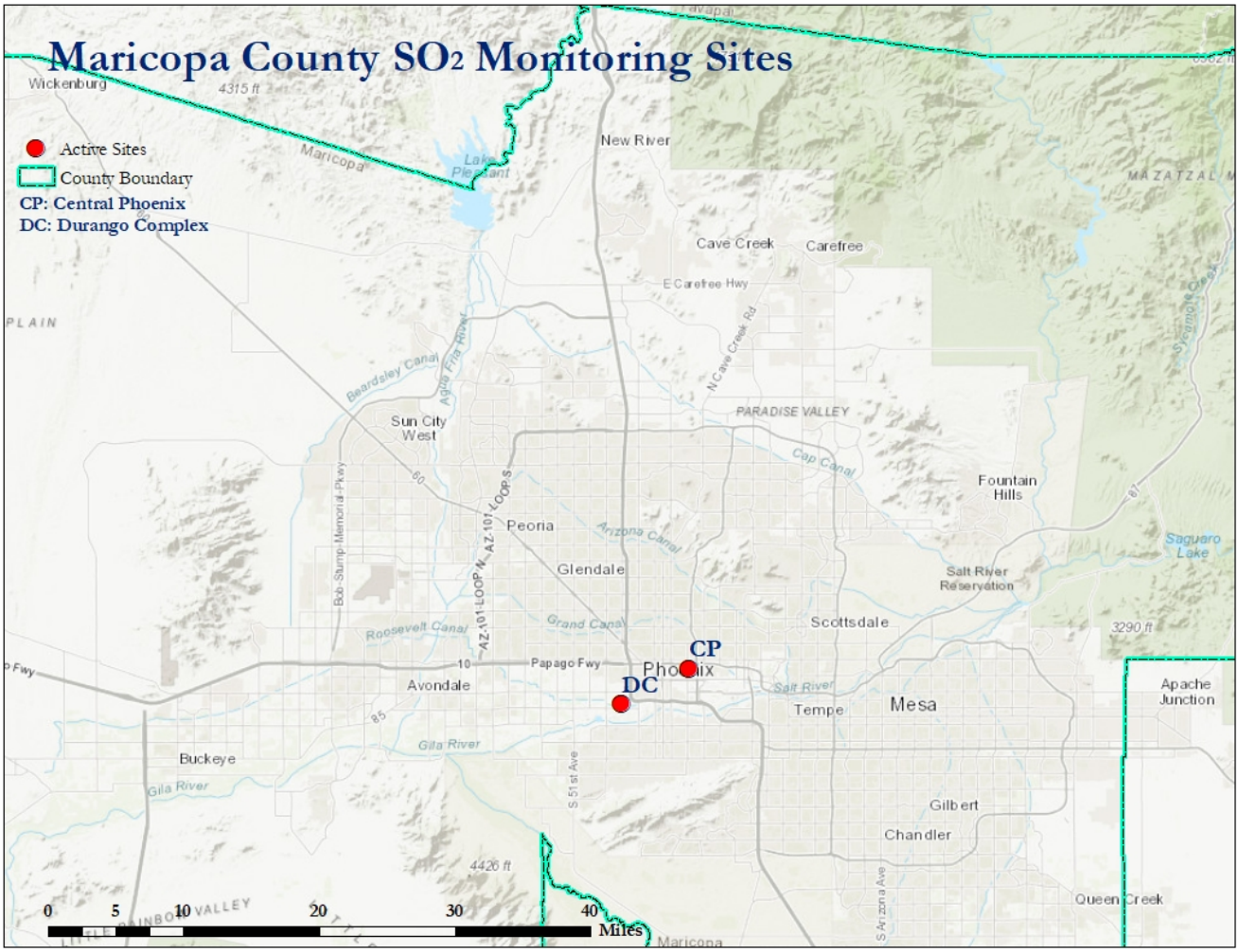


Figure 10 2022 SO_2 Monitoring Sites

Sulfur dioxide has a 1-hour primary standard and a 3-hour secondary standard. In 2022, no exceedances of the SO_2 primary 1-hour or secondary 3-hour standard were recorded at Maricopa County monitoring sites; and no site violated the SO_2 NAAQS. The EPA requires that the highest 5-minute average per hour per day be reported to AQS; however, there is no 5-minute SO_2 NAAQS standard.

Table 20 2022 SO_2 Data Summary

Site	1-hour Maximum Concentration (ppb)	1-hour 2nd Maximum Concentration (ppb)	1-hour 99th Percentile (ppb)
Central Phoenix	10.0	5.0	5
Durango Complex	4.0	4.0	4.0

Source: EPA AQS database – 2022 Quicklook Criteria Parameters Report (AMP450)

The minimum required quantity of SO_2 monitors operating within the MCAQD's network is based on either the Population Weighted Emissions Index (PWEI) and/or the EPA R9 Administrator's input (see 40 CFR Part 58 - Appendix D 4.4.3).

Table 21 2022 SO_2 Monitor Requirements

CBSA	County	Population Estimate (2022)	Total SO_2 Emitted (2020) (tpy)	Population Weighted Emission Index (million persons-tons/yr)	Required Monitors	Active Monitors	Additional Monitors Needed
38060	Maricopa	4,551,524	1167	5311	1	2	0

Source: **The EPA's National Emissions Inventories (NEI) database – 2022 NEI Data**
U.S. Census Bureau: Quick Facts Population Estimate for Maricopa County

Summary of 2022 Criteria Pollutant NAAQS Status

This section summarizes information regarding the status of each pollutant relative to its NAAQS level. It also provides detailed information regarding pollutants that are in NAAQS violation. Table 23 summarizes the 2022 NAAQS exceedances and violations by pollutant.

Table 22 2022 NAAQS Exceedances and Violation Summary

Pollutant	NAAQS Status
O_3	• On forty-eight (48) unique days, at least one monitor exceeded the 2015 8-hour primary/secondary NAAQS unless EPA Region 9 concurs with the EE demonstration submittals. • On twenty-five (25) days, at least one monitor exceeded the 2008 8-hour primary/secondary NAAQS. • Fifteen (15) sites will violate the 2015 8-hour primary/secondary NAAQS unless EPA Region 9 concurs with the EE demonstration submittals.
PM_{10}	• On seven (7) unique days, at least one monitor exceeded the 24-hour primary/secondary 1987 NAAQS. • Three (3) sites will violate the primary/secondary 1987 NAAQS unless EPA Region 9 concurs with the EE demonstration submittals. If submittals are approved, then no site will violate the NAAQS.
$PM_{2.5}$	• On seven (7) unique days, at least one monitor exceeded the 2012 24-hour primary/secondary NAAQS. • No sites violated the 24-hour or annual primary/secondary 2012 NAAQS.
SO_2	• No exceedances or violations of the primary annual or 1-hour 2010 NAAQS or the annual secondary 2010 NAAQS occurred.
NO_2	• No exceedances or violations of the 1-hour or annual primary 2010 NAAQS or annual secondary 2012 NAAQS occurred.
CO	• No exceedances or violations of the 1-hour or 8-hour primary 2011 NAAQS occurred.

2022 O_3 Exceedance, Violation, and Exceptional Event Information

This section discusses the monitoring results of the O_3 network, and the 2015 NAAQS violation status based upon years 2020 through 2022.

O_3 NAAQS Exceedances

The 2015 O_3 NAAQS level of 0.070 ppm is exceeded when a rolling 8-hour average is 0.071 ppm or higher. Fourty-eight exceedance days occurred in 2022. Figure 11 shows the 2022 O_3 exceedance dates and concentrations by site. Exceedance day values associated with an EE are shown in red in the table below.

The 2008 O3 NAAQS level of 0.075 ppm is exceeded when a rolling 8-hour average is 0.076 ppm or higher. Twenty-five exceedances occurred in 2022. Figure 11 shows the 2022 O_3 exceedance dates and concentrations by site. Exceedance day values associated with an EE are shown in red in the table below.

O_3 Exceptional Events and Status of EPA Concurrence

Twenty-two (22) exceedance days appear to be influenced by smoke from wildfires for which EE packages are being developed for submittal to EPA. The EPA must concur with the EE demonstration package before O_3 data can be omitted from NAAQS comparisons.

O_3 NAAQS Violation Status - Including Exceptional Event Data

A site violates the 2015 O_3 NAAQS when its 3-year average of the 4th highest rolling 8-hour average concentration measured during a year exceeds 0.070 ppm. Figure 12 shows the sites that violated the 2015 O_3 NAAQS and includes 2020 through 2022 average data associated with EE submittals.

O_3 NAAQS Violation Status - Excluding Exceptional Event Data

Figure 13 shows the sites that would violate the 2015 O_3 NAAQS in 2022, if the EPA concurs with the EE demonstration packages submitted for 2020 through 2022. The graph also shows that only the Falcon Field site would violate the 2008 O_3 NAAQS if exceptional events are approved.

2022 Ozone Exceedance Days

2015 Ozone 8-Hr Avg. NAAQS > 0.070 ppm
2008 Ozone 8-Hr Avg. NAAQS > 0.075 ppm

Date	Buckeye	Blue Point	Cave Creek	Central Phoenix	Dysart	Falcon Field	Fountain Hills	Glendale	Humboldt Mt.	Mesa	North Phoenix	Pinnacle Peak	South Phoenix	South Scottsdale	Tempe	West Chandler	West Phoenix
04/25/22								0.071	0.074								
04/26/22					0.072			0.071	0.071		0.076						0.072
04/29/22		0.077				0.075	0.074				0.072	0.074					
04/30/22						0.072						0.072					
05/06/22		0.075	0.072			0.076	0.076	0.072	0.072		0.074	0.077					
05/12/22		0.077				0.078	0.077	0.075			0.073	0.075				0.075	0.072
05/13/22		0.073				0.075	0.076				0.074	0.076					
05/15/22						0.071											
05/25/22										0.071							
05/26/22										0.071							
06/01/22		0.074					0.076		0.072	0.072	0.071	0.073					
06/02/22		0.078					0.075			0.075	0.073	0.073					
06/15/22		0.072	**		0.082		0.075	0.087	0.087	0.075	0.085	0.077					0.075
06/16/22		0.071			0.072		0.072	0.085	0.078	0.074	0.088	0.075	0.073				0.080
06/21/22											0.071						
06/22/22	0.071							0.073			0.072						0.074
06/27/22	0.071				0.075			0.073									0.071
06/28/22								0.073			0.071						
06/29/22			0.071														
06/30/22										0.073						0.071	
07/10/22																	0.074
07/13/22		0.071						0.071			0.074						
07/14/22										0.075					0.073	0.071	
07/15/22	0.072	0.073		0.074		0.074	0.076	0.072		0.084	0.075		0.076	0.071	0.080	0.083	0.076
07/16/22						0.071	0.073			0.074							
07/17/22		0.077	0.071			0.074	0.078			0.078	0.074	0.074			0.072		0.071
07/18/22		0.072				0.073	0.072										
07/22/22		0.071					0.073										
08/04/22				0.072			0.074			0.071	0.072	0.077					
08/05/22						0.072				0.072	0.072	0.072					
08/06/22										0.073							
08/08/22						0.076	0.071			0.076							
08/10/22						0.071					0.077	0.077					
08/11/22					0.075			0.080			0.075						0.071
08/13/22								0.073		0.071	0.072				0.071		0.072
08/15/22		0.071		0.071		0.079				0.078		0.071					
08/16/22		0.076	0.071			0.08	0.076	0.073		0.078	0.077	0.077			0.073		
08/18/22				0.072									0.076		0.071		0.075
08/22/22		0.077				0.085	0.074			0.074	0.073	0.071					
08/23/22				0.075	0.073	0.075		0.078		0.081	0.075				0.079		0.081
08/24/22					0.074												
08/25/22					0.077			0.081			0.078						0.076
08/26/22		0.074				0.076											
08/30/22	0.071				0.071												
08/31/22					0.074			0.078		0.075	0.077				0.071		0.079
09/01/22				0.072			0.071	0.073		0.071	0.075			0.072			0.076
09/02/22					0.080			0.082			0.076						0.076
09/08/22											0.071	0.071					
Exceedance Days	4	17	4	6	11	18	18	19	6	22	28	17	3	2	8	4	17
Maximum Value	0.072	0.078	0.072	0.075	0.082	0.085	0.078	0.087	0.087	0.084	0.088	0.077	0.076	0.072	0.080	0.083	0.081
4th Highest Value >0.070	0.071	0.077	0.071	0.072	0.075	0.078	0.076	0.081	0.072	0.078	0.077	0.077	N/A	N/A	0.073	0.071	0.076

NOTES:
* – no data – monitor down
** – value corrected since original report issued

Total Number of Days where at least one monitor exceeded the NAAQS: 48

Exceptional Event Designation
Please see ADEQ for information on additional statewide ozone sites

Figure 11 Ozone Exceedance Days

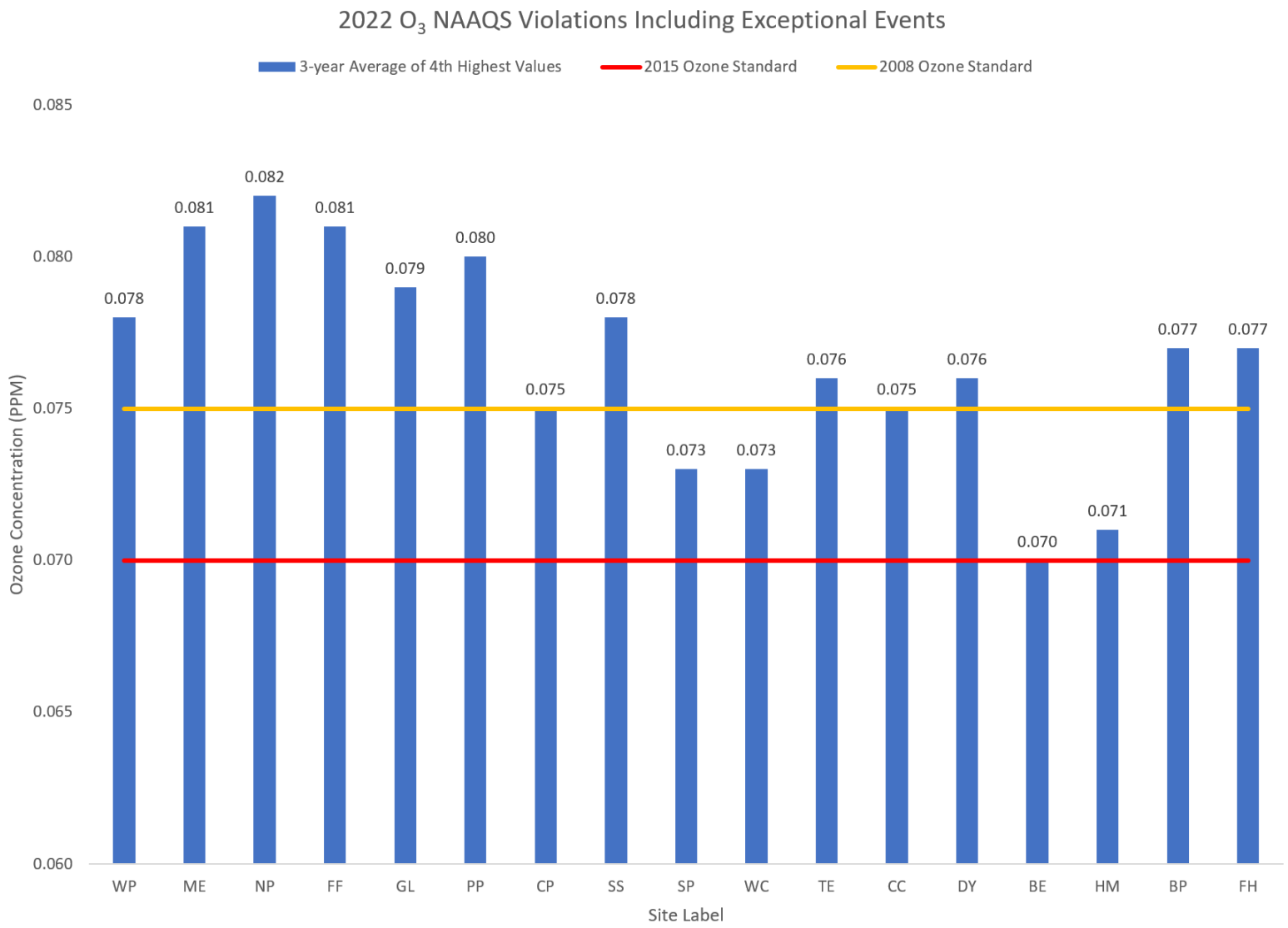


Figure 12 2022 O_3 NAAQS Violations by Site Including Exceptional Event

Source: AMP440 O_3 8-Hour Maximum Values Report

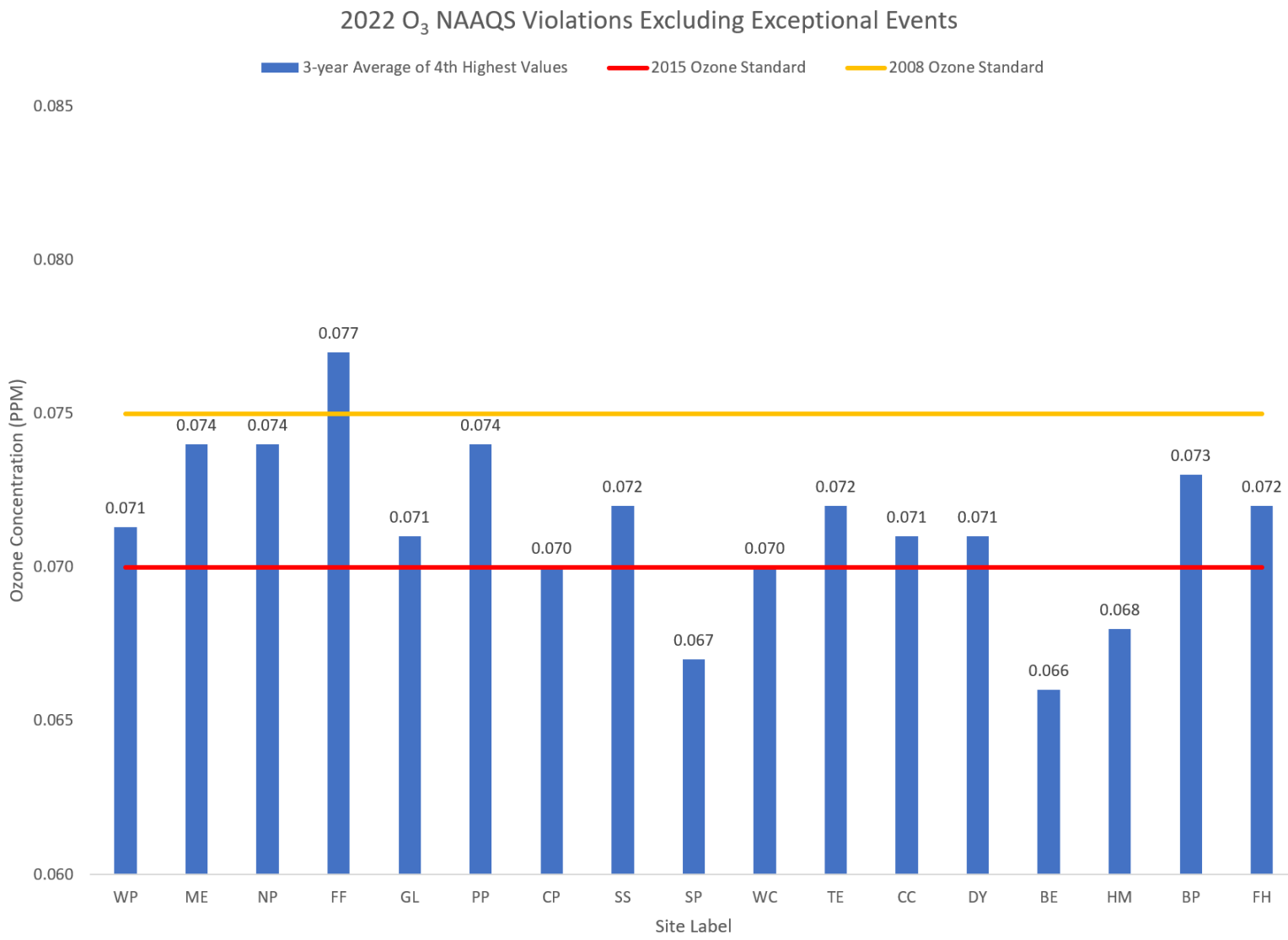


Figure 13 2022 O_3 NAAQS Violations by Site Excluding Exceptional Events

Source: AQS 2022 O_3 8-Hour Maximum Values Report (AMP440)

2022 PM_{10} Exceedance, Violation, and Exceptional Event Information

This section discusses the monitoring results of the PM_{10} network and NAAQS violation status based upon years 2020 - 2022.

PM_{10} NAAQS Exceedances

A PM_{10} exceedance occurs when a monitor's 24-hour average concentration from midnight-to-midnight is 155.5 µg/m^3 or higher. Figure 14 shows the site and date of PM_{10} exceedances that occurred in 2022. All 2022 exceedances of the PM_{10} NAAQS qualify for Exceptional Events consideration and demonstration packages will be developed for EPA's review. The 24-hour concentrations shown below include hourly PM_{10} data flagged as an Exceptional Event in red.

2022 Exceedance Days of the 24-Hr PM_{10} NAAQS

PM_{10} 24-Hr Avg. NAAQS ≥ 155 µg/m^3

	Buckeye	Central Phoenix	Durango Complex	Dysart	Glendale	Higley	Mesa	North Phoenix	South Phoenix	South Scottsdale	Tempe	West Chandler	West 43rd	West Phoenix	Zuni Hills
03/16/22													167.5		
04/12/22													223.9		
04/22/22													215.7		
07/23/22				195.5									164.1		
08/17/22												191.9			
09/02/22				206.7		160.7						169.1			167.6
10/03/22													316.8		
Exceedance Days	0	0	0	2	0	1	0	0	0	0	0	2	5	0	1

NOTE: Exceedances qualifying for an EE sumbittal to EPA are shown in RED

Number of Days in 2022 when at least one monitor exceeded the 24-Hr PM_{10} NAAQS: 7

Figure 14 2022 PM_{10} Exceedance Days

PM_{10} 24-Hour NAAQS Violation Status - Including Exceptional Event Data

As per 40 CFR Part 50.6 (a), a site violates the primary and/or secondary 24-hour PM_{10} NAAQS when the calculated "rate of expected exceedances" is greater than one (> 1) when averaged over three consecutive years. Table 24 includes EE data and shows the maximum three-year 24-hour PM_{10} averages, the calculation of expected exceedances for each year, and the calculation of three-year average for the rate of expected exceedances. If the EPA does not concur with the EE demonstration packages submitted for years 2020 through 2022; then, three sites within the MCAQD network will violate the PM_{10} NAAQS as shown in the 3-Year Average Rate of Expected Exceedances column.

Table 23 2022 Violations of the PM_{10} 24-Hour NAAQS Including EE Data

Site	2020		2021		2022		3-Year Average Rate of Expected Exceedances
	24-Hour Maximum (µg/m³)	Expected Exceedances	24-Hour Maximum (µg/m³)	Expected Exceedances	24-Hour Maximum (µg/m³)	Expected Exceedances	
Buckeye	165‡	1	258‡	2	153	0	1
Central Phoenix	214‡	1	170‡	1	101	0	0.7
Durango Complex	141	0	163‡	1	98	0	0.3
Dysart	136	0	170‡	2	206‡	2	1.3†
Glendale	92	0	173‡	1	89	0	0.3
Higley	131	0	219‡	2.1	160‡	1	1
Mesa	129	0	199‡	2.1	74	0	0.7
North Phoenix	116	0	143	0	68	0	0
South Phoenix	98	0	144	0	97	0	0
South Scottsdale	192‡	1	188‡	2	100	0	1
Tempe	134	0	208‡	2.1	73	0	0.7
West Chandler	263‡	1.1	181‡	3	191‡	2.1	2.1†
West 43rd	226‡	3.1	177‡	3	316‡	5.2	3.8†
West Phoenix	159‡	1	250†	1.1	127	0	0.7
Zuni Hills	111	0	248‡	1	167‡	1	0.7

‡ - MCAQD flagged this exceedance as an EE in AQS

†- indicates a violation of the NAAQS

Source: EPA AQS database - 2020 - 2022 – Quicklook Criteria Parameters Report (AMP450)

PM_{10} 24-Hour NAAQS Violation Status - Excluding Exceptional Event Data

The ADEQ submits EE packages to EPA Region 9 for the 2022 PM_{10} exceedance days. If EPA concurs with the EE demonstration packages submitted for 2020 through 2022, then no sites will violate the PM_{10} NAAQS in 2022. Table 25 excludes PM_{10} data considered the result of an EE, regardless of the EPA's concurrence status. The NAAQS violation status is shown in the 3-Year Average Rate of Expected Exceedances column.

Table 24 2022 Violations of the PM_{10} NAAQS Excluding Data Flagged as an EE

Site	2020		2021		2022		3-Year Average Rate of Expected Exceedances
	24-hour Maximum (µg/m³)	Expected Exceedances	24-hour Maximum (µg/m³)	Expected Exceedances	24-hour Maximum (µg/m³)	Expected Exceedances	
Buckeye	138	0	149	0	153	0	0
Central Phoenix	100	0	125	0	101	0	0
Durango Complex	141	0	131	0	98	0	0
Dysart	136	0	137	0	136	0	0
Glendale	76	0	107	0	89	0	0
Higley	131	0	134	0	99	0	0
Mesa	129	0	170	0	74	0	0
North Phoenix	116	0	98	0	68	0	0
South Phoenix	98	0	92	0	97	0	0
South Scottsdale	107	0	103	0	100	0	0
Tempe	134	0	83	0	73	0	0
West Chandler	89	0	89	0	115	0	0
West 43rd Avenue	130	0	155	1	148	0	0.33
West Phoenix	120	0	141	0	127	0	0
Zuni Hills	111	0	122	0	126	0	0

Source: EPA AQS database – 2020 - 2022 Maximum Values Report (AMP440)

2022 $PM_{2.5}$ Exceedance, Violation, and Exceptional Event Information

This section discusses the monitoring results of the $PM_{2.5}$ network in 2022. It includes NAAQS exceedance information and violation status for 2022.

$PM_{2.5}$ Annual NAAQS Exceedance and Violation Status

The annual primary NAAQS for $PM_{2.5}$ is 12.0 µg/m^3 and the secondary NAAQS for $PM_{2.5}$ is 15.0 µg/m^3. In 2022, there were no exceedances or violations of either annual NAAQS levels. Each site's annual $PM_{2.5}$ average was shown previously on Table 18.

$PM_{2.5}$ 24-Hour NAAQS Exceedance and Violation Status

The 24-hour primary and secondary NAAQS levels for $PM_{2.5}$ are 35 µg/m^3. If the 24-hour block-average concentration from midnight-to-midnight at a site is 35.5 µg/m^3 or higher, then it is counted as an exceedance. A summary of the 24-hour average data can be found in Table 17 and Figure 15 below. If the 24-hour 3-year average of the 98th percentile exceeds 35 µg/m^3, then the 24-hour NAAQS is violated. The data presented in Table 19 shows no exceedances or violations of the 98th percentile average data.

2022 Exceedance Days of the 24-Hr $PM_{2.5}$ NAAQS

$PM_{2.5}$ 24-Hr Avg. NAAQS ≥ 35.5 µg/m^3

	Durango Complex	Eastwood	Glendale	Mesa	North Phoenix	South Phoenix	Tempe	West Phoenix
01/06/2022						36.1		
12/11/2022	39.8							
12/18/2022								41.1
12/19/2022								37.6
12/24/2022	44.2					62.7		59.7
12/25/2022	84.4					84.5		110.3
12/31/2022			51.8			64.2		50.1
Exceedance Days	3	0	1	0	0	4	0	5
* - monitor down								
		Number of Days in 2022 where at least one monitor exceeded the 24-Hr $PM_{2.5}$ NAAQS						7
NOTES:								
Exceedances qualifying for an EE sumbittal to EPA are shown in RED								

Figure 15 2022 $PM_{2.5}$ Exceedance Days

$PM_{2.5}$ Exceptional Events and Status of EPA Concurrence

There was one $PM_{2.5}$ exceptional event in 2022, and an EE submittal package was submitted for the 24-hour standard exceedance on December 31, 2022.

Shared Air Monitoring Responsibilities

For the MCAQD monitoring network, EPA requested that we work with the other State/Local/Tribal MOs within the MSA/CBSA to develop a shared monitoring agreement as specified by EPA Region 9. This is to ensure that each pollutant's network is adequately represented throughout Maricopa and Pinal Counties, which is the MSA/CBSA geographical area. In 2019, we checked in with EPA Region 9 representatives regarding their direction on how to proceed with this requirement. We are dependent upon representatives at EPA Region 9 to provide the specifics needed in such an agreement before we can satisfy this requirement. As of May 2023, no agreement has been developed.

Information Regarding Additional Air Monitoring within Maricopa County

ADEQ operates its own air monitoring surveillance system within the State of Arizona, which includes the JLG Supersite in central Phoenix. JLG Supersite is part of the national air monitoring surveillance system and numerous SLAMS monitors operate there. In addition, ADEQ collects research data for other air monitoring programs at both the JLG Supersite and MCAQD's South Phoenix site. The research data support EPA's air monitoring programs that include, but are not limited to, identifying airborne air toxics and ozone precursors, identifying the chemical composition of $PM_{2.5}$, and measuring visual haze.

Specifically, ADEQ performs air monitoring in Maricopa County for the Chemical Speciation Network (CSN), the Interagency Monitoring of Protected Visual Environments (IMPROVE), the National Air Toxics Trends Stations (NATTS), the National Core multi-pollutant monitoring stations (NCore), the Photochemical Assessment Monitoring Stations (PAMS), and the Urban Air Toxics Monitoring Program (UATMP). They also operate visibility cameras and meteorological monitors within the County. Occasionally, ADEQ may temporarily use other sites for special projects.

For more information about ADEQ's network, consult the **ADEQ Air Quality Division's website**.

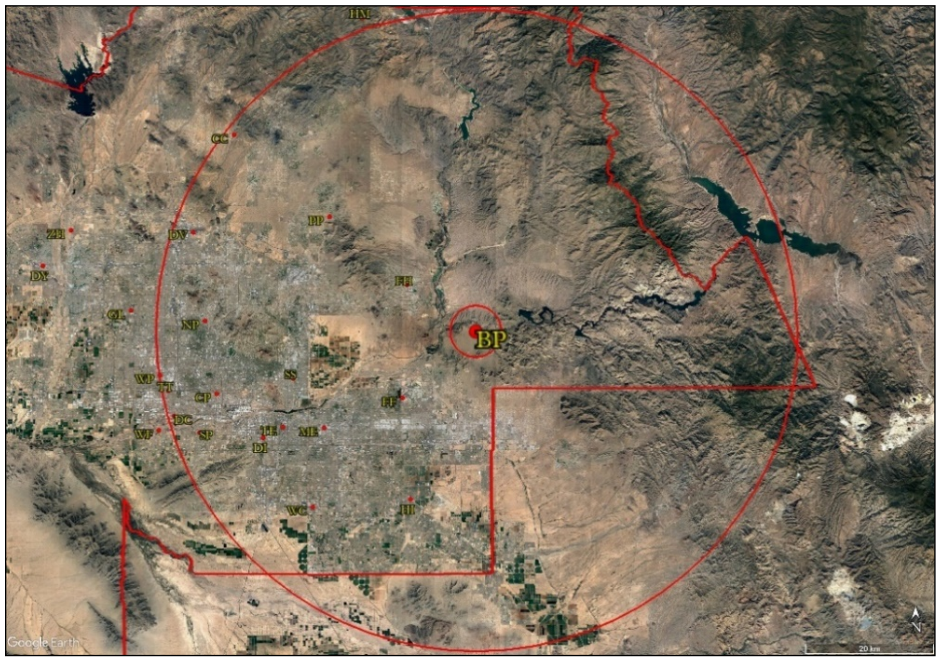
REFERENCES

- The **eCFR Title 40, Parts 50, 53, and 58**
- U.S. EPA Office of Air and Radiation: **https://www.epa.gov/aboutepa/about-office-air-and-radiation-oar**
- U.S. EPA Criteria Pollutant Information: **https://www.epa.gov/criteria-air-pollutants**
- U.S. EPA NAAQS Information: **https://www.epa.gov/criteria-air-pollutants/naaqs-table**
- U.S. EPA Network Assessments/Plans webpage: **https://www.epa.gov/amtic/state-monitoring-agency-annual-air-monitoring-plans-and-network-assessments**
- U.S. EPA NowCast Presentation: https://www3.epa.gov/airnow/ani/pm25_aqi_reporting_nowcast_overview.pdf
- U.S. EPA AIRNow webpage: **https://gispub.epa.gov/airnow/**
- U.S. EPA AQS AirData website: **https://www.epa.gov/outdoor-air-quality-data**
- U.S. EPA NowCast Calculator webpage: **https://www3.epa.gov/airnow/aqicalctest/nowcast.htm**
- U.S. EPA OAQPS QA Webpage: **Ambient Air Monitoring Quality Assurance | US EPA**
- U.S. EPA Exceptional Events webpage: **https://www.epa.gov/air-quality-analysis/treatment-data-influenced-exceptional-events**
- U.S. EPA List of Areas Protected by the Regional Haze Program: **https://www.epa.gov/visibility/list-areas-protected-regional-haze-program**
- U.S. EPA National Emissions Inventory database: **https://www.epa.gov/air-emissions-inventories/2014-national-emissions-inventory-nei-data**
- EPA Metadata Specifications: **https://www.epa.gov/geospatial/epa-metadata-technical-specification**
- EPA Region 9 Air Program Information: **http://www.epa.gov/region9/air/index.html**
- Arizona SIP Information: **https://azdeq.gov/SIP**
- ADEQ Natural and Exceptional Events Information: **https://azdeq.gov/naturalandexceptional_events**
- MCAQD Online Interactive Air Quality Map: **http://alert.fcd.maricopa.gov/alert/Google/v3/airnow.html**
- MCAQD Annual Monitoring Plans and Network Assessments: **http://www.maricopa.gov/1669/Air-Monitoring-Network-Plans-Assessments**
- MCAQD Clean Air Make More Restrictions Web page: **https://cleanairmakemore.com/our-air/restrictions/**
- MCAQD Dusts Sources, Control and Training: **https://www.maricopa.gov/1913/Dust-Sources-Control-and-Training**

APPENDIX I – Air Monitoring Data by Site

Site information includes site location, spatial scale, site type, and site description.

Blue Point (BP) (04-013-9702)



Site Location	Bush Hwy. & Usery Pass Rd., Maricopa County
Spatial Scale	Urban
Site Type	Maximum O_3 Concentration

Site Description: This site began operating in July 1995. This SLAMS location monitors for O_3. Meteorological monitoring includes ambient temperature and wind speed/direction.

This site is located approximately 40 miles east of the Phoenix metropolitan area and represents maximum O_3 concentrations downwind from an urban area.

BLUE POINT	
County Abbreviation: BP AQS ID: 04-013-9702 Address: Bush Highway & Usery Pass Rd., Maricopa County Lat/Long Coordinates: 33.54558 N, -111.60972 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**O_3**
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed (Gases)	25
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed (PM)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed	2
Dates of PE Audits	05/10/2022 11/08/2022
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/28/23
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	01/01/1993
Monitor Type	SLAMS
Monitor Make - Model	Teledyne API – Model 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Max Ozone Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Urban
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable

BLUE POINT		
Probe Height (distance above ground level to inlet)	2.9 meters	
Airflow Arc	360º	
Probe Sample Line Material	FEP	
Pollutant Sample Residence Time (seconds)	8.51	
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	1.9 meters
	Vertical	0 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	15.8 meters
	Vertical	0 meters
Distance from Dripline of Closest Tree(s)	8.2 meters*	
Distance to Furnace or Flue	No Furnace or Flue	
Nearest Major Roadway	Bush Highway	
Distance and Direction to Road	160 meters, S	
Average Daily Traffic Count	6,110	
Groundcover	Pavement	

Source: AMP256 DQI Report; *AMP 251 QA Raw Assessment Report*

* MCAQD is aware that these measurmenets do not meet siting requirements. The trees closest to the monitor inlets are not on MCAQD property. MCAQD is working with property owners to change the situation to move make adjustments to achieve compliance.

Buckeye (BE) (04-013-4011)

Site Location	AZ Hwy. 85 & MC Hwy. 85, Buckeye
Spatial Scale	Neighborhood for CO, and PM_{10} Urban for NO_2 and O_3
Site Type	Population Exposure and Upwind Background for O_3

Site Description: The Buckeye site began operating in August 2004. This SLAMS location monitors for CO, NO_2, O_3, and PM_{10}. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

The site is located at the Maricopa County Department of Transportation - Southwest Facility. The immediate area is agriculture and encroaching residential development.

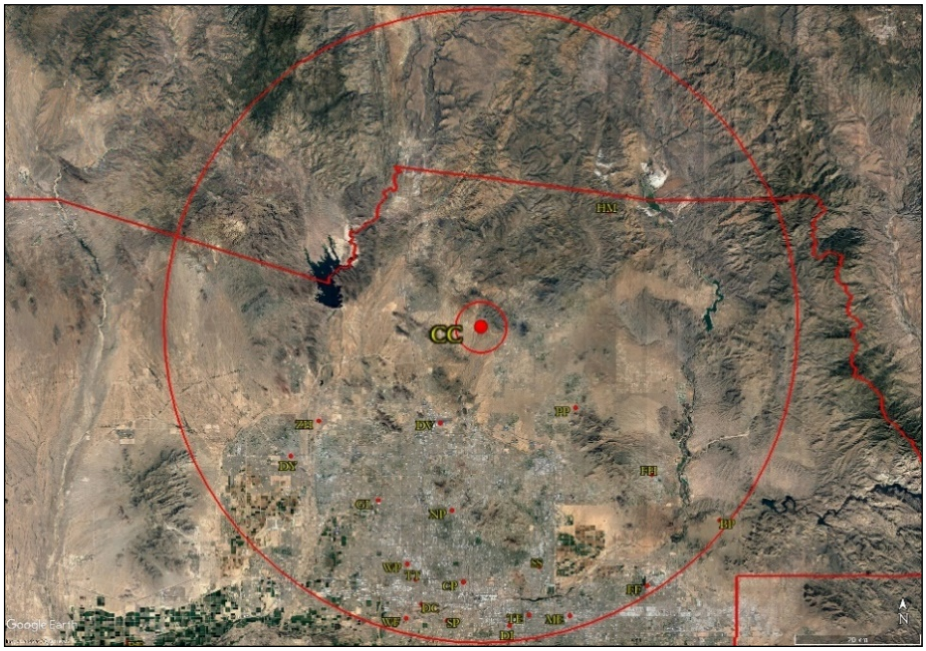
BUCKEYE				
County ID: BE AQS ID: 04-013-4011 Address 26453 W MC85 Coordinates: 33.36985 N, -112.62068 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa				
General Information				
Pollutant	**CO**	**NO_2**	**O_3**	**PM_{10}**
Parameter Code	42101	42602	44201	81102
Parameter Occurrence Code	1	1	1	1
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs				
Number of 1-Point QC (Precision) Checks Performed (Gases)	26	26	26	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly	Bi-Weekly	
Number of Flow Rate Verifications Performed (PM)	Not Applicable	Not Applicable	Not Applicable	26
Frequency of Flow Rate Verifications				Bi-Weekly
Number of PE Audits Performed	2	2	2	4
Dates of PE Audits	01/10/22 07/11/22	01/10/22 07/11/22	06/13/22 12/29/22	01/10/22 04/05/22 07/11/22 10/04/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	4/28/23			
Appendix B Requirements - PSD Monitoring - Not Applicable				
Appendix C Requirements - Monitoring Methodology				
Date Sampling Started	08/01/2004	08/01/2004	08/01/2004	08/01/2004
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS

BUCKEYE					
Monitor Make - Model		Teledyne API – Model 300T	Teledyne API – Model 200T	Teledyne API – Model 400T	Thermo – TEOM 1405-S
Method Code		093	099	087	079
PM Monitor Flow Type		Not Applicable	Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type		Not Applicable	Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)		FRM	FRM	FEM	FEM
Appendix D Requirements - Network Design Criteria					
Site Type		Population Exposure	Population Exposure	Upwind Background	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Urban	Urban	Neighborhood
Monitoring Season		Sep-Mar	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria					
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable	Not Applicable
Probe Height (distance above ground level to inlet)		4.1 meters	4.1 meters	4.2 meters	4.3 meters
Airflow Arc		360º	360º	360º	360º
Probe Sample Line Material		FEP	FEP	FEP	Not Applicable
Pollutant Sample Residence Time (seconds)		6.18	7.75	9.87	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters	0 meters
	Vertical	1.5 meters	1.5 meters	1.5 meters	1.6 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction

BUCKEYE					
(horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Vertical	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		17.3 meters	17.3 meters	17.3 meters	21.9 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		U.S. Hwy 85	U.S. Hwy 85	U.S. Hwy 85	U.S. Hwy 85
Distance and Direction to Road		31 meters, N	31 meters, N	31 meters, N	31 meters, N
Average Daily Traffic Count		2,895	2,895	2,895	2,895
Groundcover		Pavement	Pavement	Pavement	Pavement

Source: AMP256 DQI Report; *AMP 251 QA Raw Assessment Report*

Cave Creek (CC) (04-013-4008)



Site Location	32nd St. & Carefree Hwy., Cave Creek
Spatial Scale	Urban
Site Type	Maximum O_3 Concentration

Site Description: The Cave Creek site began operating in July 2001. This SLAMS location monitors for O_3. Meteorological monitoring includes ambient temperature, barometric pressure, rain, relative humidity, and wind speed/direction.

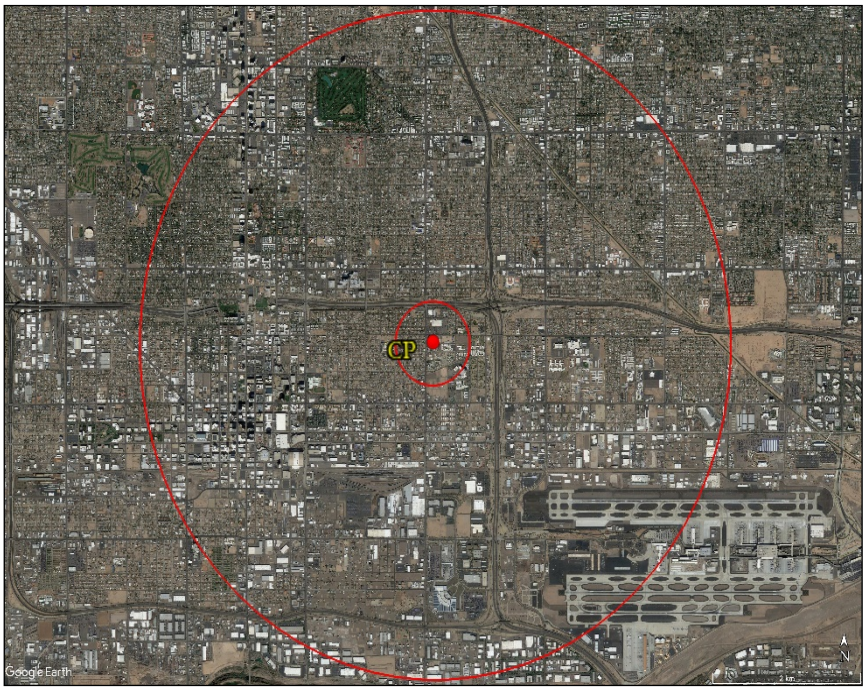
The site is located at the Maricopa County Cave Creek Recreation Area.

CAVE CREEK	
County ID: CC AQS ID: 04-013-4008 Address: 37019 N Lava Lane, Phoenix Coordinates: 33.82169 N, -112.01726 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**O_3**
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed (Gases)	26
Frequency of 1-Point QC (Precision) Checks	Bi-weekly
2Number of Flow Rate Verifications Performed (PM)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed	2
Dates of PE Audits	04/20/22 11/02/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	4/28/23
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	07/20/2001
Monitor Type	SLAMS
Monitor Make - Model	Teledyne - API Model 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Max Ozone Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Urban
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable

CAVE CREEK		
Probe Height (distance above ground level to inlet)		4.7 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time (seconds)		9.95
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	0.9 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	5.1 meters
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	10 meters
Distance from Dripline of Closest Tree(s)		10.0 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		32nd Street
Distance and Direction to Road		240 meters, NE
Average Daily Traffic Count		2,333
Groundcover		Pavement

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Central Phoenix (CP) (04-013-3002)



Site Location	19th St. & Roosevelt St., Phoenix
Spatial Scale	Neighborhood
Site Type	Population
	Exposure for CO, O_3, and PM_{10}
	Highest Concentration for NO_2 and SO_2

Site Description: The Central Phoenix site began operating in June 1962. This SLAMS location monitors for CO, PM_{10}, NO_2, O_3, and SO_2. Meteorological monitoring includes ambient temperature, barometric pressure, and wind speed/direction.

This site is located within the Maricopa County Public Health building.

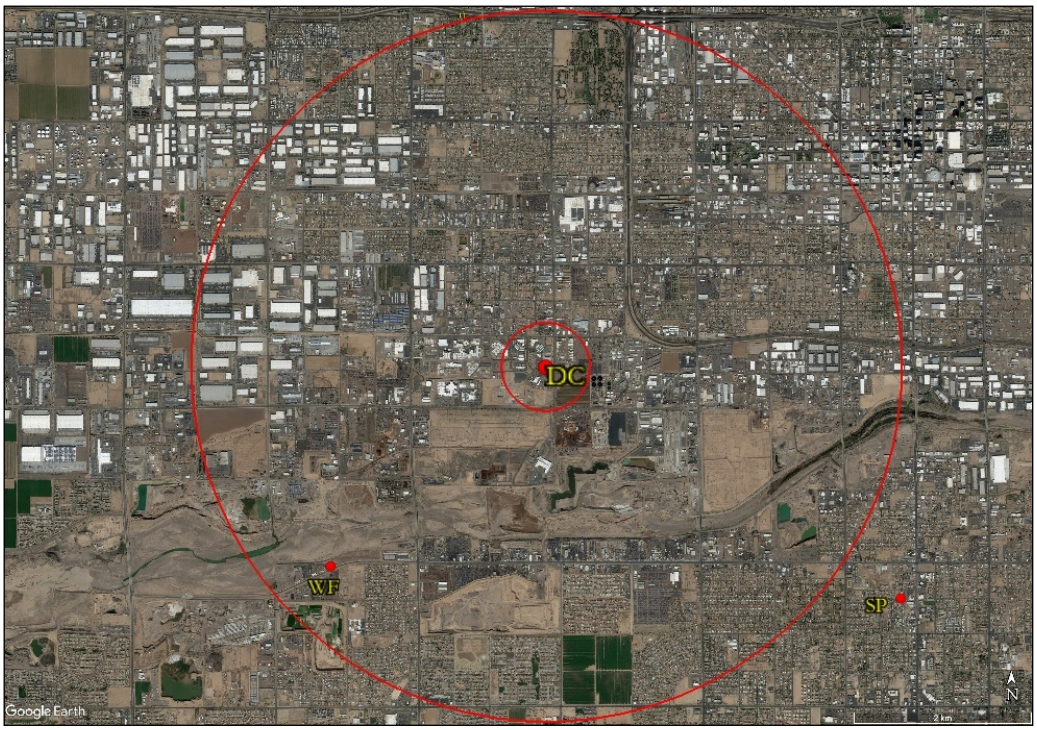
CENTRAL PHOENIX					
County ID: CP AQS ID: 04-013-3002 Address: 1645 E Roosevelt St., Phoenix Coordinates: 33.45797 N, -112.04659 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa					
General Information					
Pollutant	**CO**	**NO_2**	**O_3**	**SO_2**	**PM_{10}**
Parameter Code	42101	42602	44201	42401	81102
Parameter Occurrence Code	1	6	1	4	4
Collection Frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs					
Number of 1-Point QC (Precision) Checks Performed (Gases)	26	26	26	27	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-weekly	Bi-weekly	Bi-weekly	Bi-weekly	
Number of Flow Rate Verifications Performed (PM)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	25
Frequency of Flow Rate Verifications					Bi-weekly
Number of PE Audits Performed	3	2	2	3	4
Dates of PE Audits	05/23/22 07/05/22 11/10/22	04/11/22 10/12/22	06/07/22 12/05/22	02/14/22 05/23/22 09/14/22	01/06/22 04/13/22 07/05/22 10/12/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	4/28/23				
Appendix B Requirements - PSD Monitoring - Not Applicable					
Appendix C Requirements - Monitoring Methodology					
Date Sampling Started	10/01/1966	01/01/1967	06/01/1967	01/01/1965	04/01/1985
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API - Model 300T	Teledyne API - Model 200T	Teledyne API - Model 400T	Teledyne API - Model 100T	Thermo - TEOM 1405-S

CENTRAL PHOENIX						
Method Code		093	099	087	100	079
PM Monitor Flow Type		Not Applicable	Not Applicable	Not Applicable	Not Applicable	Low Volume
PM Monitor Collection Type		Not Applicable	Not Applicable	Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)		FRM	FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria						
Site Type		Population Exposure	Highest Concentration	Population Exposure	Highest Concentration	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria						
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Probe Height (distance above ground level to inlet)		11.8 meters	11.8 meters	11.8 meters	11.8 meters	12.8 meters
Airflow Arc		360º	360º	360º	360º	360º
Probe Sample Line Material		FEP	FEP	FEP	FEP	Not Applicable
Pollutant Sample Residence Time (seconds)		9.16	14.5	9.69	9.93	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters	0 meters	0 meters
	Vertical	1.9 meters	1.9 meters	1.9 meters	1.9 meters	2.6 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction

CENTRAL PHOENIX						
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		23.7 meters	23.7 meters	23.7 meters	23.7 meters	26.5 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		16th Street	16th Street	16th Street	16th Street	16th Street
Distance and Direction to Road		88 meters, W	88 meters, W	88 meters, W	88 meters, W	91 meters, W
Average Daily Traffic Count		31,475	31,475	31,475	31,475	31,475
Nearest Major Roadway B		Roosevelt St.	Roosevelt St.	Roosevelt St.	Roosevelt St.	Roosevelt St.
Distance and Direction to Road		75 meters, N	75 meters, N	75 meters, N	75 meters, N	75 meters, N
Average Daily Traffic Count		21,637	21,637	21,637	21,637	21,637
Groundcover		Pavement	Pavement	Pavement	Pavement	Pavement

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Durango Complex (DC) (04-013-9812)



Site Location	27th Ave & Durango St., Phoenix
Spatial Scale	Neighborhood
Site Type	Highest Concentration

Site Description: This site began operating in January 1999. This SLAMS location monitors for PM_{10}, $PM_{2.5}$, and SO_2. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

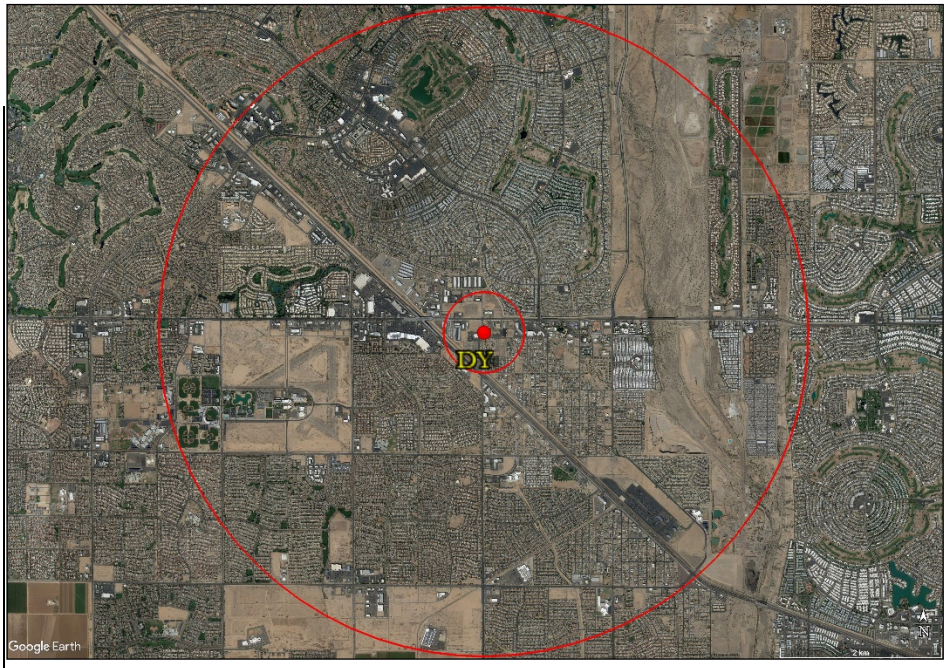
The site is located inside the Maricopa County Department of Transportation storage yard.

DURANGO COMPLEX			
County ID: DC AQS ID: 04-013-9812 Address: 2702 RC Esterbrooks Blvd., Phoenix Coordinates: 33.42650 N, -112.11812 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**PM_{10}**	**$PM_{2.5}$**	**SO_2**
Parameter Code	81102	88101	42401
Parameter Occurrence Code	1	3	1
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Yes	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point QC (Precision) Checks Performed (Gases)	Not Applicable	Not Applicable	27
Frequency of 1-Point QC (Precision) Checks			Bi-Weekly
Number of Flow Rate Checks Performed (PM)	28	28	Not Applicable
Frequency of Flow Rate Verifications	Bi-Weekly	Bi-Weekly	
Number of PE Audits Performed	3	3	2
Dates of PE Audits	01/04/22 07/12/22 10/06/22	01/04/22 07/12/22 10/06/22	05/06/22 11/02/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	4/28/23		
Appendix B Requirements - PSD Monitoring - Not Applicable			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started	07/01/1999	07/01/2005	01/01/2011
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF	Teledyne API – 100T
Method Code	208	182	100
PM Monitor Flow Type	Low Volume	Low Volume	Not Applicable
PM Monitor Collection Type	Dichotomous	Dichotomous	Not Applicable
Method Type (FRM, FEM, ARM)	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria			

DURANGO COMPLEX				
Site Type		Population Exposure	Highest Concentration	Highest Concentration
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Middle
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable
Distance between PM monitor inlets?		0 meters	0 meters	Not Applicable
Probe Height (distance above ground level to inlet)		4.4 meters	4.4 meters	4.4 meters
Airflow Arc		360°	360°	360°
Probe Sample Line Material		Not Applicable	Not Applicable	FEP
Pollutant Sample Residence Time (seconds)		Not Applicable	Not Applicable	6.51
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0.13 meters
	Vertical	1.7 meters	1.7 meters	1.8 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions	no obstructions	no obstructions
	Vertical	no obstructions	no obstructions	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	53.9 meters	53.9 meters	53.9 meters
	Vertical	0 meters	0 meters	0 meters
Distance from Dripline of Closest Tree(s)		13.7 meters	13.7 meters	15.5 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		27th Ave	27th Ave	27th Ave
Distance and Direction to Road		78 meters, E	76 meters, E	76 meters, E
Average Daily Traffic Count		19,349	19,349	19,349
Groundcover		Pavement	Pavement	Pavement

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Dysart (DY) (04-013-4010)



Site Location	Bell Rd. & Dysart Rd., Surprise
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: The Dysart site began operating in July 2003. This SLAMS location monitors for O_3 and PM_{10}. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

The site is located at the Maricopa County Facility Maintenance Yard on the corner of Bell Rd. and Dysart Rd. The site is in a growing population area in the northwest valley and is surrounded by a variety of land use.

DYSART		
County ID: DY AQS ID: 04-013-4010 Address: 16825 N Dysart Rd., Surprise Coordinates: 33.63718 N, -112.34185 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**O_3**	**PM_{10}**
Parameter Code	44201	81102
Parameter Occurrence Code	1	1
Collection Frequency	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point QC (Precision) Checks Performed (Gases)	25	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	
Number of Flow Rate Verifications Performed (PM)	Not Applicable	25
Frequency of Flow Rate Verifications		Bi-Weekly
Number of PE Audits Performed	2	4
Dates of PE Audits	04/13/22 10/12/22	01/03/22 04/13/22 07/06/22 10/12/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes
Date of Annual Data Certification Submission	4/28/23	
Appendix B Requirements - PSD Monitoring - Not Applicable		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started	7/21/2003	07/14/2003
Monitor Type	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 400T	Thermo - TEOM 1405-S
Method Code	087	079
PM Monitor Flow Type	Not Applicable	Low Volume
PM Monitor Collection Type	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)	FEM	FEM

DYSART			
Appendix D Requirements - Network Design Criteria			
Site Type		Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers		Not Applicable	Not Applicable
Probe Height (distance above ground level to inlet)		4.2 meters	4.4 meters
Airflow Arc		360º	360º
Probe Sample Line Material		FEP	Not Applicable
Pollutant Sample Residence Time (seconds)		4.79	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters
	Vertical	1.7 meters	1.5 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions	no obstructions
	Vertical	no obstructions	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	36.5 meters	36.5 meters
	Vertical	0 meters	0 meters
Distance from Dripline of Closest Tree(s)		49.3 meters	51.2 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		Dysart	Dysart
Distance and Direction to Road		17 meters, W	12 meters, W
Average Daily Traffic Count		12,000	12,000
Nearest Major Roadway B		Bell Rd	Bell Rd
Distance and Direction to Road		495 meters, N	460 meters, N
Average Daily Traffic Count		35,957	35,957

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Eastwood (EA) (04-013-4021)

Site Location	36th Street & Interstate 10
Spatial Scale	Micro
Site Type	Source-Oriented

Site Description: The Eastwood site began operating in March 2021. This SLAMS location monitors for CO, NO_2, and $PM_{2.5}$. Meteorological monitoring includes ambient temperature, relative humidity, and wind speed/direction.

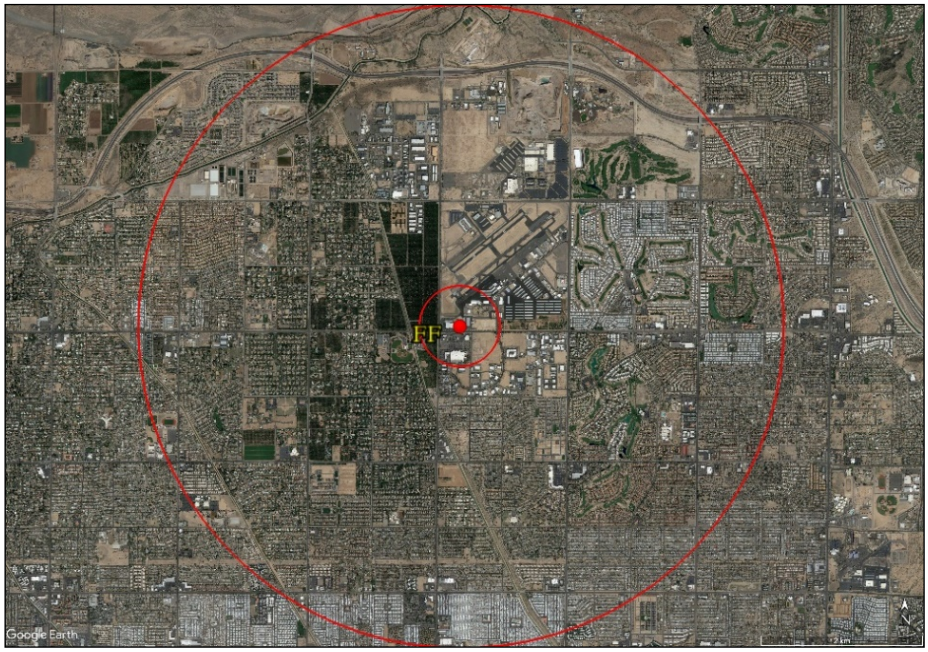
The site is one of two near-road air monitoring sites and is located on the south side of the I-10 East.

EASTWOOD			
County ID: EA AQS ID: 04-013-4021 Address: 4135 S. 36th Street, Phoenix Coordinates: 33.41046 N, -112.00264 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**CO**	**NO_2**	**$PM_{2.5}$**
Parameter Code	42101	42602	88101
Parameter Occurrence Code	1	1	3
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (Filter samples only	Not Applicable	Not Applicable	Not Applicable
Analytical Laboratory (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* PM2.5 NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point QC (Precision) Checks Performed (Gases)	26	26	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly	
Number of Flow Rate Verifications Performed (PM)	Not Applicable	Not Applicable	26
Frequency of Flow Rate Verifications			Bi-Weekly
Number of PE Audits Performed	2	2	4
Dates of PE Audits	03/11/22 09/22/22	02/11/22 08/11/22	03/10/22 06/16/22 09/09/22 12/16/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	4/28/23		
Appendix B Requirements - PSD Monitoring - Not Applicable			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started	03/05/2021	03/05/2021	03/05/2021
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne - API 300T	Teledyne - API 200T	Thermo - TEOM 1405-DF

Method Code	93		99	182
PM Monitor Flow Type	Not Applicable		Not Applicable	Low Volume
PM Monitor Collection Type	Not Applicable		Not Applicable	Dichotomous
Method Type (FRM, FEM, ARM)	FRM		FRM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type	Source-Oriented		Source-Oriented	Source-Oriented
Basic Monitoring Objective	NAAQS Comparison		NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Micro		Micro	Micro
Monitoring Season	Jan-Dec		Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes		Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers	Not Applicable		Not Applicable	Not Applicable
Probe Height (distance above ground level to inlet)	4.2 meters		4.2 meters	4.4 meters
Airflow Arc	360º		360º	360º
Probe Sample Line Material	FEP		FEP	Not Applicable
Pollutant Sample Residence Time (seconds)	5.29		7.33	Not Applicable
Filter Sample Material	Not Applicable		Not Applicable	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.3 meters	0.3 meters	0 meters
	Vertical	1.6 meters	1.6 meters	1.7 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	44.8 meters	44.8 meters	44.8 meters
	Vertical	0 meters	0 meters	0 meters
Distance from Dripline of Closest Tree(s)	21.9 meters		21.9 meters	22.8 meters
Distance to Furnace or Flue	No Furnace or Flue		No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway	I-10		I-10	I-10
Distance and Direction to Road	24 meters, N		24 meters, N	24 meters, N
Average Daily Traffic Count	121,222		121,222	121,222
Groundcover	Gravel		Gravel	Gravel

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Falcon Field (FF) (04-013-1010)



Site Location	Greenfield Rd. & McKellips Rd., Mesa
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: This site began operating in June 1989. This SLAMS location monitors for O_3. Meteorological monitoring includes ambient temperature and relative humidity.

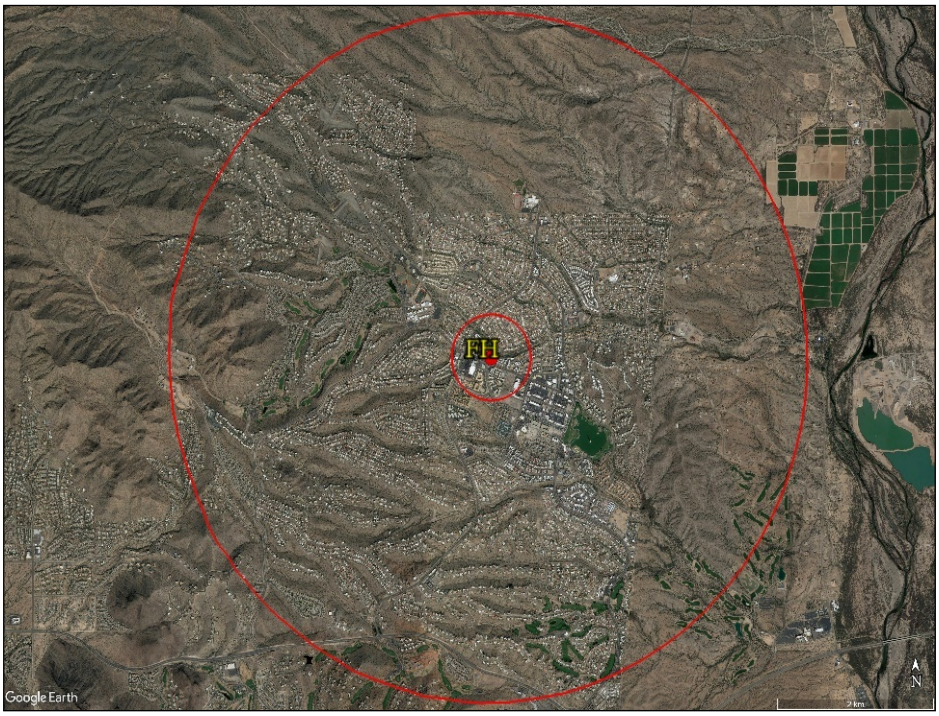
The site is located at a fire station near an airfield within a growing residential area. In 2020, wind speed and wind direction monitoring ceased at this location due to no longer being able to secure a wind tower to the roof of the fire station. The search for a new location in the same general area where an air monitoring shelter can be installed is underway.

FALCON FIELD	
County ID: FF AQS ID: 04-013-1010 Address: 4530 E McKellips Rd, Mesa Coordinates: 33.45244 N, -111.73327 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**O_3**
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed (Gases)	26
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed (PM)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed	2
Dates of PE Audits	01/13/22 07/06/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	4/28/23
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	06/01/1989
Monitor Type	SLAMS
Monitor Make - Model	Teledyne API – 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Population Exposure
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	

FALCON FIELD		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		8.9 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time (seconds)		19.11
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	3.3 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	5.7 meters
	Vertical	0 meters
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	40.2 meters
	Vertical	0 meters
Distance from Dripline of Closest Tree(s)		21.9 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		McKellips
Distance and Direction to Road		58 meters, S
Average Daily Traffic Count		18,337
Groundcover		Pavement

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Fountain Hills (FH) (04-013-9704)



Site Location	Fountain Hills Blvd. & Palisades Blvd., Fountain Hills
Spatial Scale	Neighborhood
Site Type	Maximum O_3 Concentration

Site Description: The site began operating in April 1996 at a Fountain Hills fire station. This SLAMS location monitors for O_3 only. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

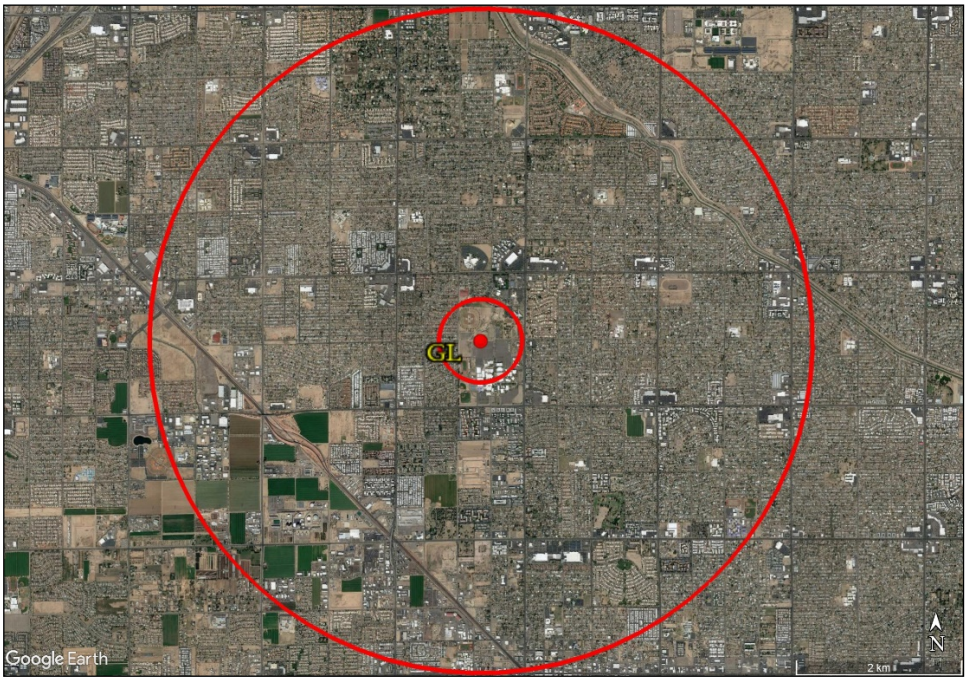
The site is located approximately 15 miles northeast of the Phoenix metropolitan area and represents maximum O_3 concentrations downwind from an urban area. Furthermore, the site sits on the fringes of the central basin district along the predominant summer/fall daytime wind direction.

FOUNTAIN HILLS	
County ID: FH AQS ID: 04-013-9704 Address: 16426 E. Palisades Blvd., Fountain Hills Coordinates: 33.61092 N, -111.72534 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**O_3**
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed (Gases)	25
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed (PM)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed	2
Dates of PE Audits	02/24/22 10/18/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	4/28/23
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	04/01/1996
Monitor Type	SLAMS
Monitor Make – Model	Teledyne API – 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Population Exposure
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable

FOUNTAIN HILLS		
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time (seconds)		9.01
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.1 meters
	Vertical	1.8 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions
	Vertical	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	3.7 meters
	Vertical	0 meters
Distance from Dripline of Closest Tree(s)		15 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		Palisades Blvd
Distance and Direction to Road		70 meters, SW
Average Daily Traffic Count		17,837
Groundcover		Pavement

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Glendale (GL) (04-013-2001)



Site Location	59th Ave. & Olive Ave., Glendale
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: The site began operating in January 1974. This SLAMS location monitors for O_3, PM_{10}, and $PM_{2.5}$. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

The site is located on the grounds of Glendale Community College near homes, various strip malls, food establishments, and parks.

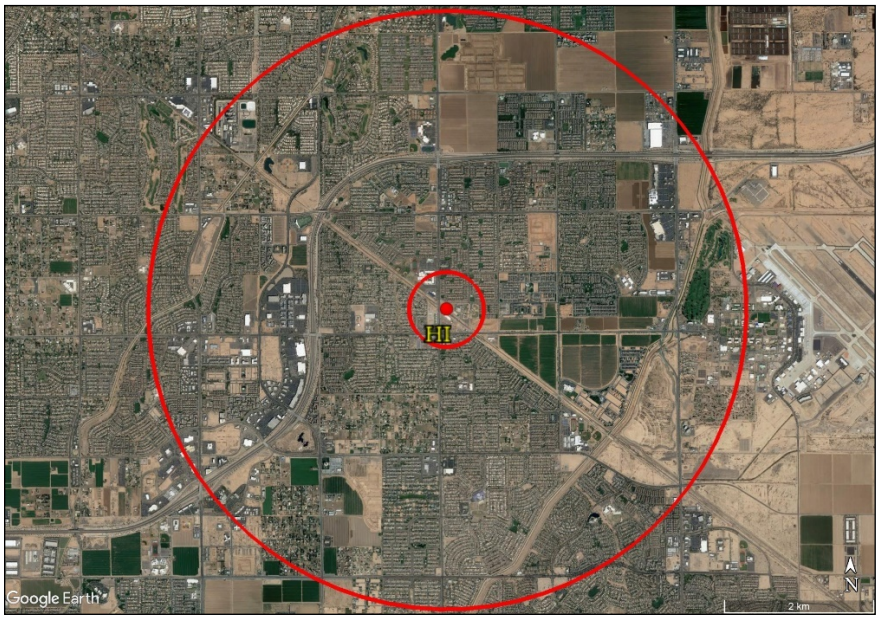
GLENDALE			
County ID: GL AQS ID: 04-013-2001 Address: 6001 W Olive, Glendale Coordinates: 33.57453 N, -112.19193 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**O_3**	**PM_{10}**	**$PM_{2.5}$**
Parameter Code	44201	81102	88101
Parameter Occurrence Code	1	1	3
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point QC (Precision) Checks Performed (Gases)	26	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly		
Number of Flow Rate Verifications Performed (PM)	Not Applicable	26	26
Frequency of Flow Rate Verifications		Bi-Weekly	Bi-Weekly
Number of PE Audits Performed	2	4	4
Dates of PE Audits	05/03/22 10/06/22	02/10/22 05/03/22 08/10/22 11/02/22	02/10/22 05/03/22 08/10/22 11/02/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	4/28/23		
Appendix B Requirements - PSD Monitoring - Not Applicable			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started	01/01/1974	07/01/1987	6/1/2011
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF

GLENDALE				
Method Code		087	208	182
PM Monitor Flow Type		Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type		Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)		FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type		Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable
Distance between PM_{10} and $PM_{2.5}$ monitors		Not Applicable	0 meters	0 meters
Probe Height (distance above ground level to inlet)		4.5 meters	4.9 meters	4.9 meters
Airflow Arc		360º	360º	360º
Probe Sample Line Material		FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time (seconds)		9.16	Not Applicable	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters
	Vertical	1.6 meters	2.0 meters	2.0 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions	no obstructions	no obstructions
	Vertical	no obstructions	no obstructions	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions	no obstructions	no obstructions
	Vertical	no obstructions	no obstructions	no obstructions
Distance from Dripline of Closest Tree(s)		12.8 meters	15.5 meters	15.5 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue

GLENDALE			
Nearest Major Roadway A	Olive Ave	Olive Ave	Olive Ave
Distance and Direction to Road	225 meters, S	227 meters, S	227 meters, S
Average Daily Traffic Count	25,000	25,000	25,000
Nearest Major Roadway B	59th Ave	59th Ave	59th Ave
Distance and Direction to Road	475 meters, E	430 meters, E	430 meters, E
Average Daily Traffic Count	25,394	25,394	25,394
Groundcover	Pavement	Pavement	Pavement

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Higley (HI) (04-013-4006)



Site Location	Higley Rd. & Williams Field Rd., Gilbert
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: Originally, ADEQ began monitoring at this site in 1994 to measure background particulate concentrations near the urban limits of Maricopa County. The MCAQD assumed operating this site in July 2000. This SLAMS location monitors for PM_{10}. Meteorological monitoring includes ambient temperature, barometric pressure, and wind speed/direction.

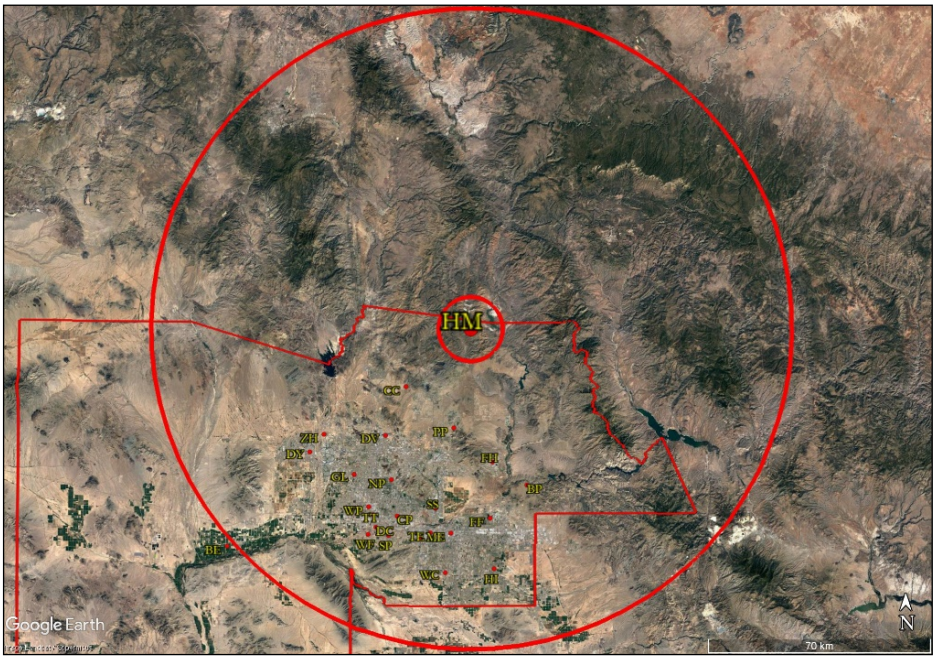
The site is in a suburban area near homes, strip malls, and schools with limited agricultural operations nearby.

HIGLEY	
County ID: HI AQS ID: 04-013-4006 Address: 2207 S Higley Rd., Gilbert Coordinates: 33.30995 N, -111.72003 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**PM_{10}**
Parameter Code	81102
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed (Gases)	Not Applicable
Frequency of 1-Point QC (Precision) Checks	
Number of Flow Rate Verifications Performed (PM)	26
Frequency of Flow Rate Verifications	Bi-Weekly
Number of PE Audits Performed	4
Dates of PE Audits	02/03/22 05/12/22 08/02/22 11/08/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	4/28/23
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	07/01/2000
Monitor Type	SLAMS
Monitor Make - Model	Thermo – TEOM 1405-S
Method Code	079
PM Monitor Flow Type	Low Volume
PM Monitor Collection Type	Size Specific
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Population Exposure

HIGLEY		
Basic Monitoring Objective		NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4.7 meters
Airflow Arc		360º
Probe Sample Line Material		Not Applicable
Pollutant Sample Residence Time (seconds)		Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2.0 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions
	Vertical	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions
	Vertical	no obstructions
Distance from Dripline of Closest Tree(s)		34.7 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway A		Higley Rd
Distance and Direction to Road		117 meters, E
Average Daily Traffic Count		18,298
Nearest Major Roadway B		Williams Field Rd
Distance and Direction to Road		410 meters, S
Average Daily Traffic Count		11,500
Groundcover		Pavement

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Humboldt Mountain (HM) (04-013-9508)



Site Location	Humboldt Mtn. Summit
Spatial Scale	Regional
Site Type	Maximum O_3 Concentration

Site Description: This site began operating in August 1995. This SLAMS location monitors for O_3. Meteorological monitoring includes ambient temperature and relative humidity.

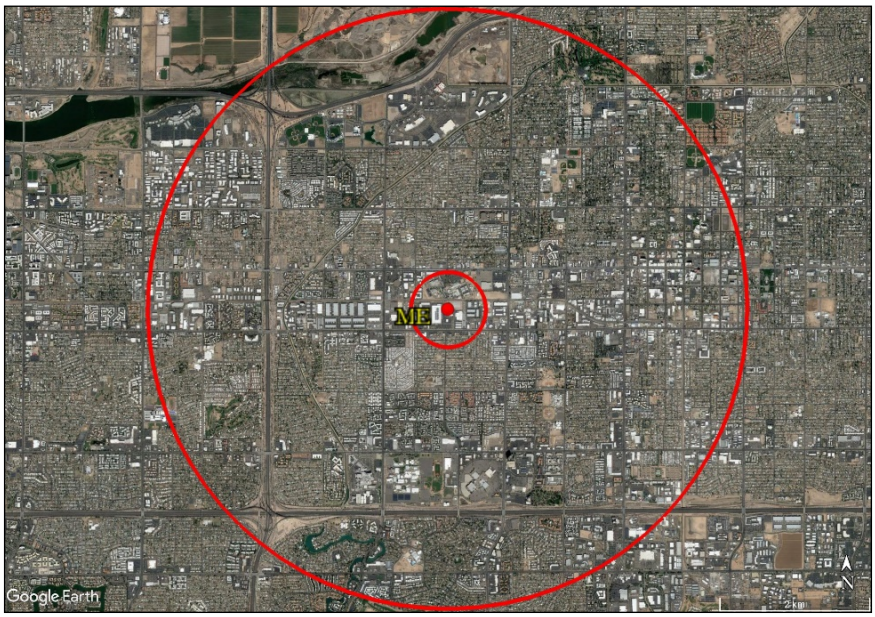
The site is located on Federal Aviation Agency (FAA) property within the Tonto National Forest. In 2019, the long-anticipated move of the station into a new facility occurred. The new station is about 15 meters away from the National Forest Service building that once housed it. This site is located approximately 40 miles NE of the Phoenix metropolitan area at an elevation of 5190 feet and represents extreme downwind O_3 concentrations.

HUMBOLDT MOUNTAIN	
County ID: HM AQS ID: 04-013-9508 Address: E State Hwy 562- FAA Radar Station, Tonto National Forest Coordinates: 33.98280 N, -111.79871 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**O_3**
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed (Gases)	26
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed (PM or Pb)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed	2
Dates of PE Audits	04/15/22 10/13/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	4/28/23
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	08/01/1995
Monitor Type	SLAMS
Monitor Make – Model	Teledyne API – 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Maximum O_3 Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Regional
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	

HUMBOLDT MOUNTAIN		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time (seconds)		8.96
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.7 meters
	Vertical	2.0 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Dripline of Closest Tree(s)		no tree
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway - Remote Mountaintop - Access using E. State Hwy 562		Cave Creek Road
Distance and Direction to Road		15 miles south
Average Daily Traffic Count		792
Groundcover		Soil / Vegetation

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Mesa (ME) (04-013-1003)



Site Location	Broadway Rd. & Brooks Ave., Mesa
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: This site began operating in January 1978. This SLAMS location monitors for CO, O_3, PM_{10}, and $PM_{2.5}$. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

The site is located at Mesa Brooks Reservoir, which is an area that contains residential, commercial, and industrial properties.

MESA				
County ID: ME AQS ID: 04-013-1003 Address: 310 S Brooks, Mesa Coordinates: 33.41018 N, -111.86536 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa				
General Information				
Pollutant	**CO**	**O_3**	**PM_{10}**	**$PM_{2.5}$**
Parameter Code	42101	44201	81102	88101
Parameter Occurrence Code	1	1	1	3
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs				
Number of 1-Point QC (Precision) Checks Performed (Gases)	27	26	Not Applicable	
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly		
Number of Flow Rate Verifications Performed (PM)	Not Applicable	Not Applicable	25	25
Frequency of Flow Rate Verifications			Bi-Weekly	Bi-Weekly
Number of PE Audits Performed	2	2	4	4
Dates of PE Audits	01/14/22 07/08/22	04/18/22 10/13/22	02/04/22 05/13/22 08/04/22 11/09/22	02/04/22 05/13/22 08/04/22 11/09/22

MESA					
Annual Precision & PE Audit Reports Submitted to AQS?		Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission		4/28/23			
Appendix B Requirements - PSD Monitoring - Not Applicable					
Appendix C Requirements - Monitoring Methodology					
Date Sampling Started		01/01/1978	11/1/2012	11/1/2012	11/1/2012
Monitor Type		SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model		Teledyne API – 300T	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
Method Code		093	087	208	182
PM Monitor Flow Type		Not Applicable	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type		Not Applicable	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)		FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria					
Site Type		Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season		Sep-Mar	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria					
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable	Not Applicable
Distance between PM_{10} and $PM_{2.5}$ monitors		Not Applicable	Not Applicable	0 meters	0 meters
Probe Height (distance above ground level to inlet)		4.1 meters	4.1 meters	4.7 meters	4.7 meters
Airflow Arc		360º	360º	360º	360º
Probe Sample Line Material		FEP	FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time (seconds)		5.47	8.12	Not Applicable	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and	Horizontal	0 meters	0 meters	0 meters	0 meters
	Vertical	1.5 meters	1.5 meters	2.0 meters	2.0 meters

MESA					
vertical distance to probe/inlet)					
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		no tree	no tree	no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		Broadway Rd.	Broadway Rd.	Broadway Rd.	Broadway Rd.
Distance and Direction to Road		305 meters, S	305 meters, S	305 meters, S	305 meters, S
Average Daily Traffic Count		23,465	23,465	23,465	23,465
Groundcover		Pavement/Gravel	Pavement/Gravel	Pavement/Gravel	Pavement/Gravel

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

North Phoenix (NP) (04-013-1004)

Site Location	7th St. & Butler Ave., Phoenix
Spatial Scale	Neighborhood
Site Type	Population Exposure for PM_{10} & $PM_{2.5}$; Max Concentration for O_3

Site Description: This site began operating in January 1975. This SLAMS location monitors for O_3, and PM_{10}, $PM_{2.5}$. Meteorological monitoring includes ambient temperature, barometric pressure, and wind speed/direction.

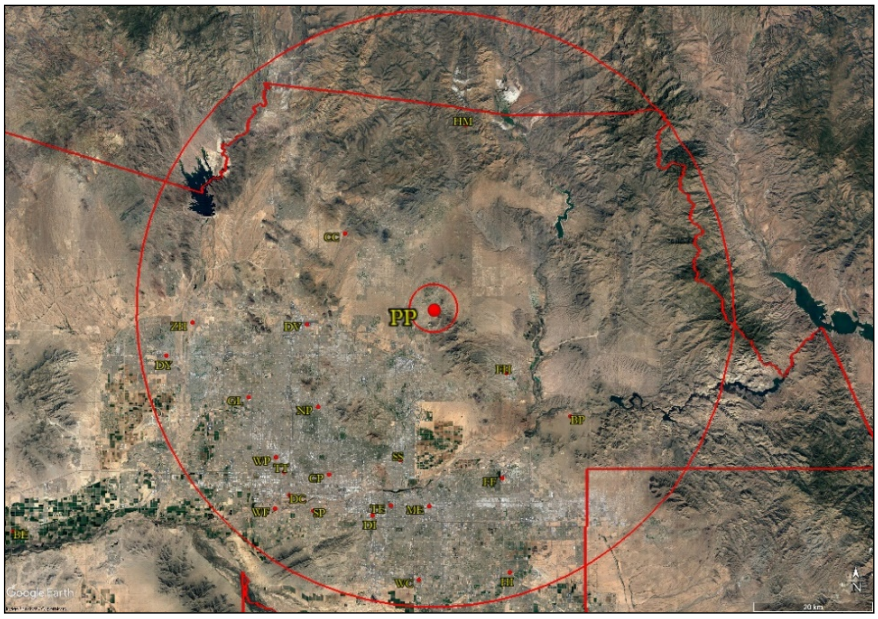
NORTH PHOENIX			
County ID: NP AQS ID: 04-013-1004 Address: 601 E Butler Dr., Phoenix Coordinates: 33.56034 N, -112.06627 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**O_3**	**PM_{10}**	**$PM_{2.5}$**
Parameter Code	44201	81102	88101
Parameter Occurrence Code	1	1	3
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point QC (Precision) Checks Performed (Gases)	26	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly		
Number of Flow Rate Verifications Performed (PM)	Not Applicable	26	26
Frequency of Flow Rate Verifications		Bi-Weekly	Bi-Weekly
Number of PE Audits Performed	2	4	4
Dates of PE Audits	06/07/22 12/06/22	02/03/22 05/10/22 08/15/22 12/06/22	02/03/22 05/10/22 08/15/22 12/06/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	4/28/23		
Appendix B Requirements - PSD Monitoring - Not Applicable			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started	01/01/1975	9/1/2011	9/1/2011
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF

NORTH PHOENIX				
Method Code		087	208	182
PM Monitor Flow Type		Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type		Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)		FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type		Max Ozone Concentration	Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable
Distance between PM_{10} and $PM_{2.5}$ monitors		Not Applicable	0 meters	0 meters
Probe Height (distance above ground level to inlet)		4.4 meters	4.7 meters	4.7 meters
Airflow Arc		360°	360°	360°
Probe Sample Line Material		FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time (seconds)		10.37	Not Applicable	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	1.21 meters	0 meters	0 meters
	Vertical	1.8 meters	2.1 meters	2.1 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	6.4 meters	4.5 meters	4.5 meters
	Vertical	2.6 meters	2.6 meters	2.6 meters
Distance from Dripline of Closest Tree(s)		13.7 meters	18.2 meters	18.2 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue

NORTH PHOENIX			
Nearest Major Roadway	7th Street	7th Street	7th Street
Distance and Direction to Road	75 meters, E	75 meters, E	75 meters, E
Average Daily Traffic Count (ADT)	18,298	18,298	18,298
Groundcover	Gravel	Gravel	Gravel

Source: AMP256 DQI Report; AMP251 *QA Raw Assessment Report*

Pinnacle Peak (PP) (04-013-2005)



Site Location	Alma School & Happy Valley Rd., Scottsdale
Spatial Scale	Urban
Site Type	Maximum O_3 Concentration

Site Description: This site began operating in February 1988. This SLAMS location monitors for O_3 only. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

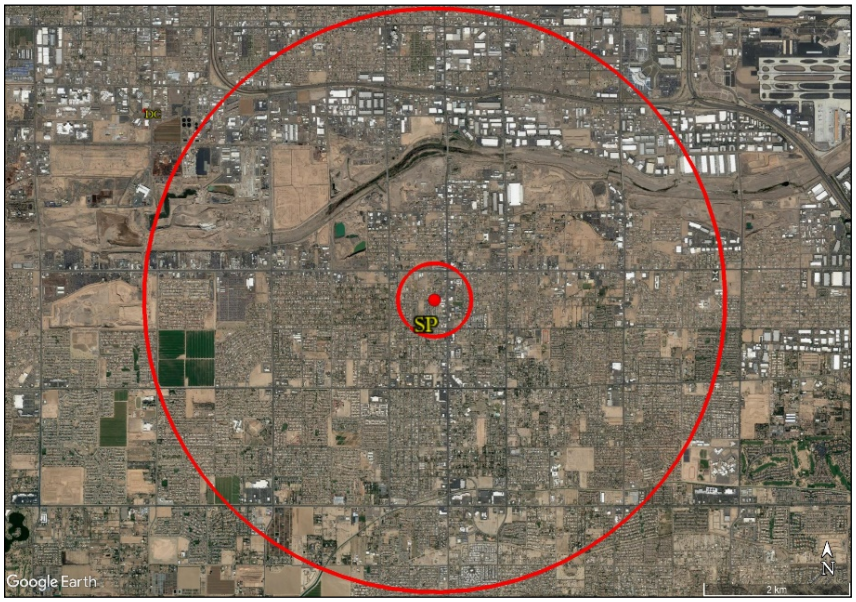
The site is located approximately 25 miles NE of the Phoenix metropolitan area and represents maximum O_3 concentrations downwind from an urban area. This site measures O_3 concentrations related to the transport of O_3 from central metropolitan Phoenix.

PINNACLE PEAK	
County ID: PP AQS ID: 04-013-2005 Address: 24301 N Alma School Rd., Scottsdale Coordinates: 33.706315 N, -111.856151 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**O_3**
Parameter Code	44201
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed (Gases)	27
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed (PM or Pb)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed	2
Dates of PE Audits	01/04/22 07/14/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	4/28/23
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	02/01/1988
Monitor Type	SLAMS
Monitor Make - Model	Teledyne API – 400T
Method Code	087
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Max Ozone Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Urban
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable

PINNACLE PEAK		
Probe Height (distance above ground level to inlet)		4.2 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time (seconds)		5.34
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.1 meters
	Vertical	1.6 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	3.3 meters
	Vertical	0.9 meters
Distance from Dripline of Closest Tree(s)		10 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		Happy Valley Rd.
Distance and Direction to Road		61 meters, S
Average Daily Traffic Count		16,678
Groundcover		Pavement / Grass

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

South Phoenix (SP) (04-013-4003)



Site Location	Central Ave. & Broadway Rd., Phoenix
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: The site began operating in October 1999. This SLAMS location monitors for CO, O_3, PM_{10}, and $PM_{2.5}$. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

The site borders a mixture of high population density residential and commercial properties.

SOUTH PHOENIX				
County ID: SP AQS ID: 04-013-4003 Address: 33 W Tamarisk St., Phoenix Coordinates: 33.40314 N, -112.07526 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa				
General Information				
Pollutant	**CO**	**O_3**	**PM_{10}**	**$PM_{2.5}$**
Parameter Code	42101	44201	81102	88101
Parameter Occurrence Code	1	1	1	3
Collection Frequency	Continuous	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs				
Number of 1-Point QC (Precision) Checks Performed (Gases)	27	27	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly		
Number of Flow Rate Verifications Performed (PM)	Not Applicable	Not Applicable	27	27
Frequency of Flow Rate Verifications			Bi-Weekly	Bi-Weekly
Number of PE Audits Performed	2	2	4	4
Dates of PE Audits	04/05/22 11/14/22	04/05/22 11/14/22	02/08/22 05/04/22 08/08/22 11/14/22	02/08/22 05/04/22 08/08/22 11/14/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	4/28/23			
Appendix B Requirements - PSD Monitoring - Not Applicable				

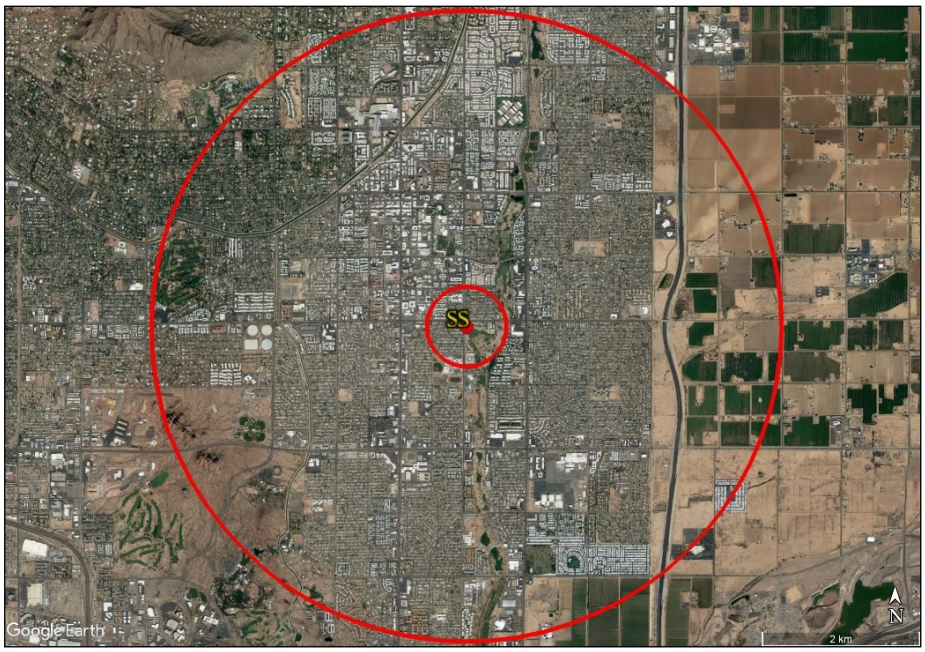
SOUTH PHOENIX					
Appendix C Requirements - Monitoring Methodology					
Date Sampling Started		10/01/1999	10/01/1999	7/1/2007	05/01/2010
Monitor Type		SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model		Teledyne API – 300T	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
Method Code		093	087	208	182
PM Monitor Flow Type		Not Applicable	Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type		Not Applicable	Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)		FRM	FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria					
Site Type		Population Exposure	Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria					
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable	Not Applicable
Distance between PM_{10} and $PM_{2.5}$ monitors		Not Applicable	Not Applicable	0 meters	0 meters
Probe Height (distance above ground level to inlet)		5.2 meters	5.2 meters	4.2 meters	4.2 meters
Airflow Arc		360º	360º	360º	360º
Probe Sample Line Material		FEP	FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time (seconds)		4.37	5.29	Not Applicable	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.3 meters	0.3 meters	0 meters	0 meters
	Vertical	2.0 meters	2.0 meters	3.0 meters	3.0 meters

SOUTH PHOENIX					
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	21.0 meters	21.0 meters	2.4 meters	2.4 meters
	Vertical	0 meters	0 meters	0.6 meters	0.6 meters
Distance from Dripline of Closest Tree(s)		10.9 meters	10.9 meters	7.3 meters*	7.3 meters*
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		Central Ave.	Central Ave.	Central Ave.	Central Ave.
Distance and Direction to Road		168 meters, E	168 meters, E	165 meters, E	165 meters, E
Average Daily Traffic Count		23,399	23,399	23,399	23,399
Nearest Major Roadway B		Broadway Rd.	Broadway Rd.	Broadway Rd.	Broadway Rd.
Distance and Direction to Road		385 meters, N	385 meters, N	385 meters, N	385 meters, N
Average Daily Traffic Count		20,051	20,051	20,051	20,051
Groundcover		Pavement	Pavement	Pavement	Pavement

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

* MCAQD is aware that these measurmenets do not meet siting requirements. The trees closest to the monitor inlets are not on MCAQD property. MCAQD is working with property owners to change the situation to move make adjustments to achieve compliance.

South Scottsdale (SS) (04-013-3003)



Site Location	Thomas Rd. & Miller Rd., Scottsdale
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: This site began operating in January 1974. This SLAMS location monitors for O_3 and PM_{10}. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

The station is in a residential area.

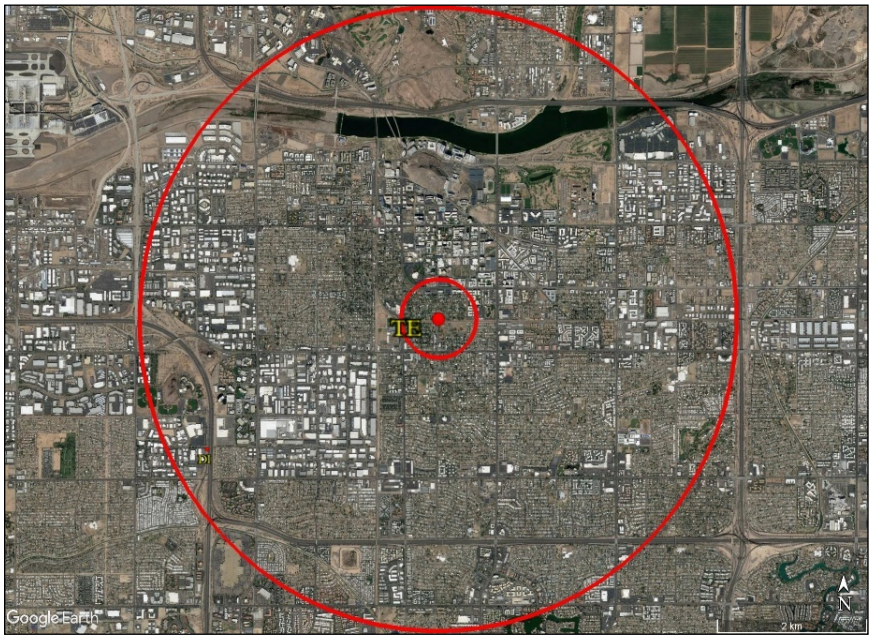
SOUTH SCOTTSDALE		
County ID: SS AQS ID: 04-013-3003 Address: 2857 N Miller Rd., Scottsdale Coordinates: 33.47968 N, -111.91711 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa		
General Information		
Pollutant	**O_3**	**PM_{10}**
Parameter Code	44201	81102
Parameter Occurrence Code	1	1
Collection Frequency	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	Yes	Yes
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs		
Number of 1-Point QC (Precision) Checks Performed (Gases)	26	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	
Number of Flow Rate Verifications Performed (PM)	Not Applicable	26
Frequency of Flow Rate Verifications		Bi-Weekly
Number of PE Audits Performed	2	4
Dates of PE Audits	01/05/22 07/07/22	02/01/22 05/10/22 08/02/22 11/08/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes
Date of Annual Data Certification Submission	4/28/23	
Appendix B Requirements - PSD Monitoring - Not Applicable		
Appendix C Requirements - Monitoring Methodology		
Date Sampling Started	01/01/1974	09/01/2012
Monitor Type	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 400T	Thermo - TEOM 1405-S
Method Code	087	079
PM Monitor Flow Type	Not Applicable	Low Volume
PM Monitor Collection Type	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)	FEM	FEM
Appendix D Requirements - Network Design Criteria		

SOUTH SCOTTSDALE			
Site Type		Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria			
Distance between collocated samplers		Not Applicable	Not Applicable
Probe Height (distance above ground level to inlet)		5.1 meters	6.1 meters
Airflow Arc		360º	360º
Probe Sample Line Material		FEP	Not Applicable
Pollutant Sample Residence Time (seconds)		8.43	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.46 meters	0 meters
	Vertical	1.9 meters	6.1 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	16.4 meters	24.6 meters
	Vertical	0 meters	0 meters
Distance from Dripline of Closest Tree(s)		4.0 meters*	8.2 meters*
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		Thomas Rd.	Thomas Rd.
Distance and Direction to Road		66 meters, N	62 meters, N
Average Daily Traffic Count		34,583	34,583
Nearest Major Roadway B		Miller Rd.	Miller Rd.
Distance and Direction to Road		32 meters, W	35 meters, W
Average Daily Traffic Count		19,590	19,590
Groundcover		Pavement	Pavement

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

* MCAQD is aware that these measurmenets do not meet siting requirements. The proposed change to this monitoring location will address the dripline measurement.

Tempe (TE) (04-013-4005)



Site Location	Apache Blvd. & College Ave., Tempe
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: This site began operating in 2000. This SLAMS location monitors for O_3, PM_{10}, and $PM_{2.5}$. Meteorological monitoring includes ambient temperature, rain, and wind speed/direction.

The station is near the ASU Tempe Campus and surrounded by residential homes, high-density residential properties, and a railroad track.

TEMPE			
County ID: TE AQS ID: 04-013-4005 Address: 1525 S College Ave., Tempe Coordinates: 33.4123 N, -111.93471 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**O_3**	**PM_{10}**	**$PM_{2.5}$**
Parameter Code	44201	81102	88101
Parameter Occurrence Code	1	1	3
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point QC (Precision) Checks Performed (Gases)	26	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly		
Number of Flow Rate Verifications Performed (PM)	Not Applicable	26	26
Frequency of Flow Rate Verifications		Bi-Weekly	Bi-Weekly
Number of PE Audits Performed	2	4	4
Dates of PE Audits	05/19/22 11/03/22	02/08/22 05/16/22 08/09/22 11/03/22	02/08/22 05/16/22 08/09/22 11/03/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	4/28/23		
Appendix B Requirements - PSD Monitoring - Not Applicable			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started	07/01/2000	03/01/2012	03/01/2012
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 400T	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF
Method Code	087	208	182

TEMPE				
PM Monitor Flow Type		Not Applicable	Low Volume	Low Volume
PM Monitor Collection Type		Not Applicable	Dichotomous	Dichotomous
Method Type (FRM, FEM, ARM)		FEM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type		Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable
Distance between PM_{10} and $PM_{2.5}$ monitors		Not Applicable	0 meters	0 meters
Probe Height (distance above ground level to inlet)		4.2 meters	4.7 meters	4.7 meters
Airflow Arc		360°	360°	360°
Probe Sample Line Material		FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time (seconds)		5.89	Not Applicable	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.1 meters	0 meters	0 meters
	Vertical	1.5 meters	2.1 meters	2.1 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	5.4 meters	8.2 meters	8.2 meters
	Vertical	0 meters	0 meters	0 meters
Distance from Dripline of Closest Tree(s)		12.8 meters	10.0 meters	10.0 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue

TEMPE			
Nearest Major Roadway	Broadway Rd.	Broadway Rd.	Broadway Rd.
Distance and Direction to Road	370 meters, S	370 meters, S	370 meters, S
Average Daily Traffic Count	24,184	24,184	24,184
Groundcover	Gravel	Gravel	Gravel

Source: AMP256 DQI Report, AMP251 QA Raw Assessment report

Thirty-Third (TT) (04-013-4020)

Site Location	Interstate-10 & 33rd Ave., Phoenix
Spatial Scale	Micro
Site Type	Source-Oriented

Site Description: This site began operating in September 2015. This SLAMS location monitors for NO_2; and temporarily monitored for CO and $PM_{2.5}$ from January 2020 through February 2021. CO and $PM_{2.5}$ were removed from the Thirty-Third site and relocated to the new Eastwood site in March 2021. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

The site is one of two near-road air monitoring sites and is located on the south side embankment adjacent to the I-10 and oriented on an east-west section of the highway, midway downslope from 33rd Avenue toward the I-10.

THIRTY-THIRD	
County ID: TT AQS ID: 04-013-4020 Address: 3248 W Moreland Ave., Phoenix Coordinates: 33.46173 N, -112.12796 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**NO_2**
Parameter Code	42602
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed (Gases)	26
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications (PM)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed	2
Dates of PE Audits	05/04/22 11/03/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	4/28/23
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	09/01/2015
Monitor Type	SLAMS
Monitor Make – Model	Thermo 42iQ
Method Code	074
Method Type (FRM, FEM, ARM)	FRM
Appendix D Requirements - Network Design Criteria	
Site Type	Source-Oriented
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Micro
Monitoring Season	Jan-Dec
Network Meets Minimum Number of Monitors Required?	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria	
Distance between collocated samplers	Not Applicable
Probe Height (distance above ground level to inlet)	11.8 meters
Airflow Arc	360º

THIRTY-THIRD		
Probe Sample Line Material		FEP
Pollutant Sample Residence Time (seconds)		15.08
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizonal	4.5 meters
	Vertical	0 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizonal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizonal	no obstruction
	Vertical	no obstruction
Distance from Dripline of Closest Tree(s)		18.2 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		I-10
Distance and Direction to Road		13.5 meters, N
Average Daily Traffic Count		249,514
Groundcover		Gravel

Source: AMP256 DQI Report, AMP251 QA Raw Assessment report

West 43rd Avenue (WF) (04-013-4009)

Site Location	43rd Ave. & Broadway Rd., Phoenix
Spatial Scale	Middle
Site Type	Highest Concentration

Site Description: This site began operating in April 2002. This SLAMS location monitors for PM_{10}. Meteorological monitoring includes ambient temperature, barometric pressure, and wind speed/direction.

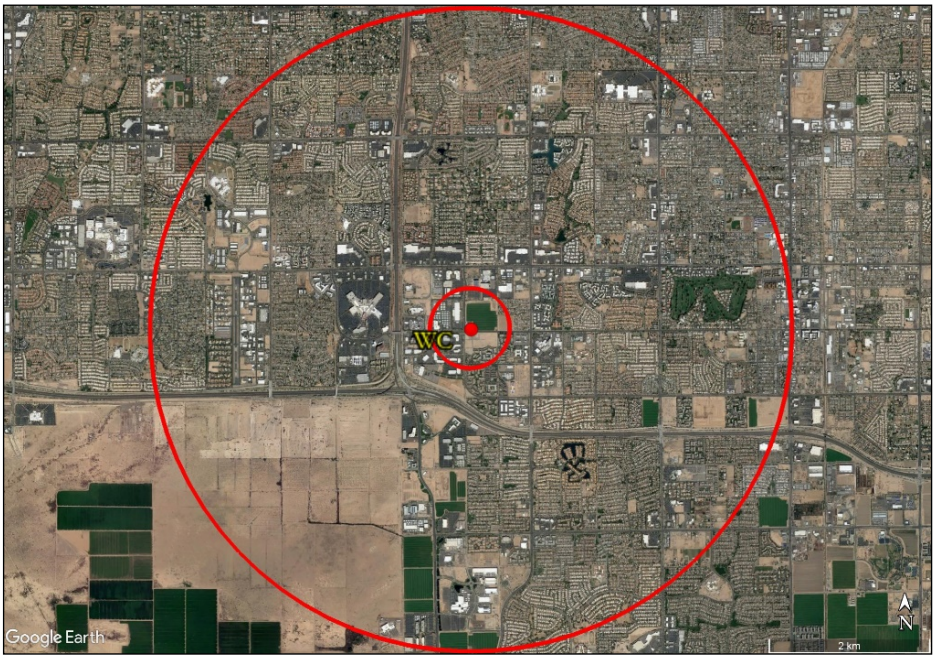
The site is located near a combination of heavy industrial operations and residential homes to measure maximum PM_{10} concentrations. The sources around the site include sand and gravel operations, automobile and metal recycling facilities, landfills, paved and unpaved haul roads, and cement casting.

WEST 43RD AVENUE	
County ID: WF AQS ID: 04-013-4009 Address: 3940 W Broadway Rd., Phoenix Coordinates: 33.40635 N, -112.14426 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**PM_{10}**
Parameter Code	81102
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* $PM_{2.5}$ NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed (Gases)	Not Applicable
Frequency of 1-Point QC (Precision) Checks	
Number of Flow Rate Verifications Performed (PM)	25
Frequency of Flow Rate Verifications	Bi-Weekly
Number of PE Audits Performed	4
Dates of PE Audits	03/03/22 06/06/22 09/13/22 12/07/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	4/28/23
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	04/01/2002
Monitor Type	SLAMS
Monitor Make – Model	Thermo - TEOM 1405-S
Method Code	079
PM Monitor Flow Type	Low Volume
PM Monitor Collection Type	Size Specific
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Highest Concentration
Basic Monitoring Objective	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Middle

WEST 43RD AVENUE		
Monitoring Season		Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4.6 meters
Airflow Arc		360º
Probe Sample Line Material		Not Applicable
Pollutant Sample Residence Time (seconds)		Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	1.9 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction
	Vertical	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	13.7 meters
	Vertical	0 meters
Distance from Dripline of Closest Tree(s)		20.1 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway A		Broadway Rd. (E of 35th Ave.)
Distance and Direction to Road		37 meters, S
Average Daily Traffic Count		12,501
Nearest Major Roadway B		35th Ave. (N. of Broadway Rd.)
Distance and Direction to Road		1 kilometer, E
Average Daily Traffic Count		28,398
Groundcover		Gravel

Source: AMP256 DQI Report, AMP251 QA Raw Assessment report

West Chandler (WC) (04-013-4004)



Site Location	Frye Rd. & Ellis St., Chandler
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: This site began operating in January 1995, This SLAMS location monitors for CO, O_3, and PM_{10}. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

The site is surrounded by residential, agricultural, and heavy industrial operations, such as semiconductor manufacturing plants and liquid air storage. The PM_{10} monitor's scale of representativeness was first established as middle scale, but it was changed to neighborhood in June 2019 to better reflect land use currently surrounding the site.

WEST CHANDLER			
County ID: WC AQS ID: 04-013-4004 Address: 275 S Ellis, Chandler Coordinates: 33.29896 N, -111.88426 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa			
General Information			
Pollutant	**CO**	**O_3**	**PM_{10}**
Parameter Code	42101	44201	81102
Parameter Occurrence Code	1	1	1
Collection Frequency	Continuous	Continuous	Continuous
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable
Any Proposal to Remove or Move Monitor?	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes
Is site suitable for comparison to the *annual* PM2.5 NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs			
Number of 1-Point QC (Precision) Checks Performed (Gases)	26	26	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly	
Number of Flow Rate Verifications Performed (PM)	Not Applicable	Not Applicable	26
Frequency of Flow Rate Verifications			Bi-Weekly
Number of PE Audits Performed	2	2	4
Dates of PE Audits	03/22/22 09/21/22	04/20/22 10/05/22	03/22/22 06/02/22 09/08/22 12/29/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	4/28/23		
Appendix B Requirements - PSD Monitoring - Not Applicable			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started	07/01/2000	07/01/2000	07/01/2000
Monitor Type	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne API – 300T	Teledyne API – 400T	Thermo – TEOM 1405-S
Method Code	093	087	079
PM Monitor Flow Type	Not Applicable	Not Applicable	Low Volume

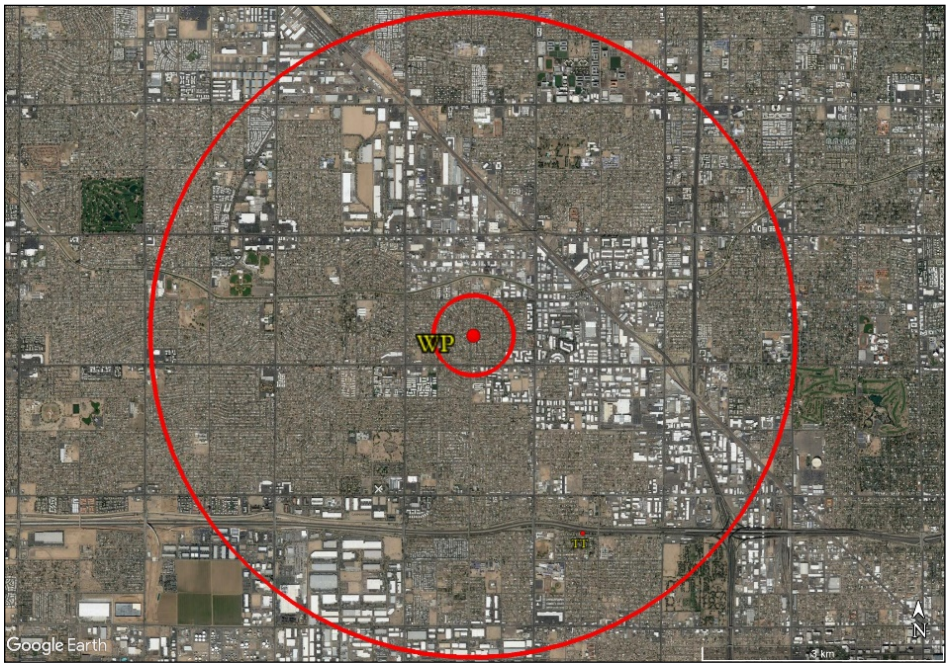
WEST CHANDLER				
PM Monitor Collection Type		Not Applicable	Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)		FRM	FEM	FEM
Appendix D Requirements - Network Design Criteria				
Site Type		Population Exposure	Population Exposure	Population Exposure
Basic Monitoring Objective		NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)		Neighborhood	Neighborhood	Neighborhood
Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria				
Distance between collocated samplers		Not Applicable	Not Applicable	Not Applicable
Probe Height (distance above ground level to inlet)		4.5 meters	4.5 meters	5.2 meters
Airflow Arc		360º	360º	360º
Probe Sample Line Material		FEP	FEP	Not Applicable
Pollutant Sample Residence Time (seconds)		4.14	4.24	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters
	Vertical	1.4 meters	1.4 meters	2.2 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	14 meters	14 meters	14 meters
	Vertical	3 meters	3 meters	3 meters
Distance from Dripline of Closest Tree(s)		7.3 meters*	7.3 meters*	8.2 meters*
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway A		Frye Rd.	Frye Rd.	Frye Rd.
Distance and Direction to Road		30 meters, S	30 meters, S	30 meters, S
Average Daily Traffic Count		20,494	20,494	20,494

WEST CHANDLER			
Groundcover	Pavement / Gravel	Pavement / Gravel	Pavement / Gravel

Source: AMP256 DQI Report, AMP251 QA Raw Assessment report

* MCAQD is aware that these measurmenets do not meet siting requirements. The trees closest to the monitor inlets are not on MCAQD property. MCAQD is working with property owners to change the situation to move make adjustments to achieve compliance.

West Phoenix (WP) (04-013-0019)



Site Location	39th Ave. & Earll Dr., Phoenix
Spatial Scale	Neighborhood
Site Type	Population Exposure for CO, NO_2, O_3, PM_{10}, and Highest Concentration for $PM_{2.5}$

Site Description: This site began operating in January 1984. This SLAMS location monitors for CO, NO_2, O_3, PM_{10}, and $PM_{2.5}$. Meteorological monitoring includes ambient temperature, barometric pressure, and wind speed/direction. The site is in an area of stable, high-density, residential properties. This is the QA collocation site for $PM_{2.5}$ where one filter based $PM_{2.5}$ FRM sampler operates alongside a continuous $PM_{2.5}$ FEM analyzer as per *40 CFR Part 58 Appendix A*.

WEST PHOENIX									
County ID: WP AQS ID: 04-013-0019 Address: 3847 W Earll, Phoenix Coordinates: 33.48378 N, -112.14256 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa									
General Information									
Pollutant	**CO**	**CO**	**NO_2**	**NO_2**	**O_3**	**O_3**	**PM_{10}**	**$PM_{2.5}$ Primary**	**$PM_{2.5}$ Secondary**
Parameter Code	42101	42101	42602	42602	44201	44201	81102	88101	88101
Parameter Occurrence Code	1	1	1	1	1	1	1	3	2
Collection Frequency	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	1 in 12 days
Analysis Method (filter samples only)	Not Applicable								*As per 40 CFR Part 50, Appendix L*
Analytical Laboratory (filter samples only)	Not Applicable								Pace Analytical® Laboratory
Any Proposal to Remove or Move Monitor?	No	No	No	No	No	No	No	No	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Is site suitable for comparison to the *annual* PM2.5 NAAQS as per *§58.30*?	Not Applicable							Yes	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs									
Number of 1-Point QC (Precision) Checks Performed (Gases)	15	11	15	11	15	11	Not Applicable	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly	Bi-Weekly	Bi-Weekly	Bi-Weekly	Bi-Weekly			
Number of Flow Rate Verifications Performed (PM)	Not Applicable						26	26	12
Frequency of Flow Rate Verifications							Bi-Weekly	Bi-Weekly	Monthly
Number of Required Collocated Assessments ($PM_{2.5}$ Only)	Not Applicable								31

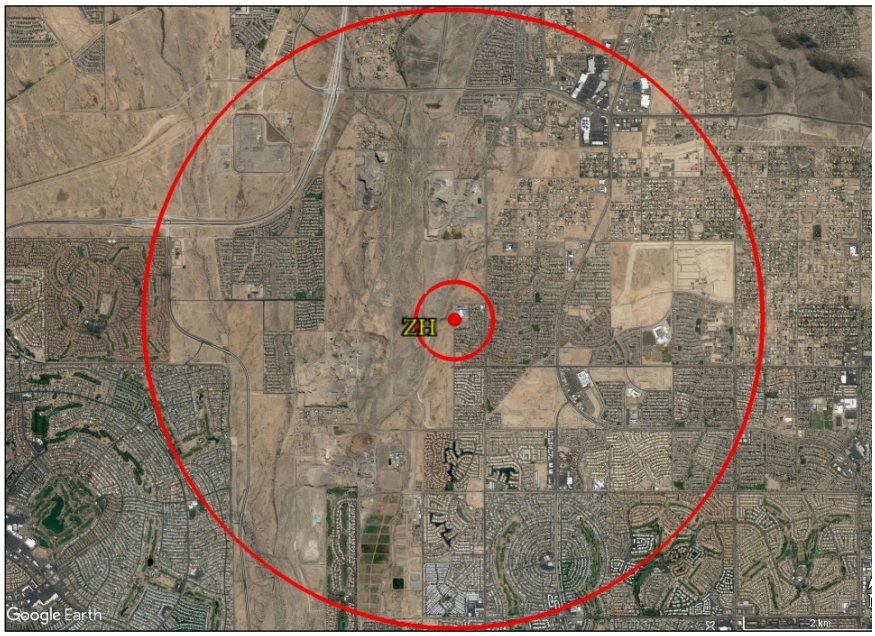
Number of Valid Collocation Assessments ($PM_{2.5}$ Only)	Not Applicable								31
Number of Collocation Assessments ($PM_{2.5}$ Only)	Not Applicable								31
Number of PE Audits Performed	1	1	1	1	1	1	3	3	4
Dates of PE Audits	06/20/2022	12/05/2022	03/10/2022	08/17/2022	01/07/2022	06/01/2022	06/08/2022 09/14/2022 12/05/2022	06/08/2022 09/14/2022 12/05/2022	03/02/2022 06/09/2022 09/15/2022 12/08/2022
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/28/2023								
Appendix B Requirements - PSD Monitoring - Not Applicable									
Appendix C Requirements - Monitoring Methodology									
Date Sampling Started	01/01/1984	01/01/1984	05/24/1990	05/24/1990	01/01/1984	01/01/1984	02/01/1988	09/01/2005	06/13/2000
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne - API 300T	Thermo 48iq	Teledyne – API 200T	Thermo 42iq	Teledyne - API 400T	Thermo 49iq	Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF	Thermo - Partisol 2025
Notes: The same monitor collects PM_{10} and $PM_{2.5}$ hourly (continuous) measurements. The collocated Partisol 2025i sampler collects a QA filter sample once every 12 days.									
7/26/2023 – The Teledyne API 200T, API 300T, and 400T were sampling was discontinued and the Thermo 42iq, 48iq, and 49iq were installed at the site.									
Method Code	93	54	99	74	87	47	208	182	145
PM Monitor Flow Type	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Low Volume	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Dichotomous	Dichotomous	Size Specific & Sequential
Method Type (FRM, FEM, ARM)	FRM	FRM	FRM	FRM	FEM	FEM	FEM	FEM	FRM
Appendix D Requirements - Network Design Criteria									
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Highest Concentration	Highest Concentration
Basic Monitoring Objective	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison	NAAQS Comparison
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood

Monitoring Season		Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec	Jan-Dec
Network Meets Minimum Number of Monitors Required?		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Appendix E Requirements - Probe and Monitoring Path Siting Criteria										
Distance between collocated $PM_{2.5}$ monitors		Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	2 meters	2 meters	2 meters
Distance between PM_{10} and $PM_{2.5}$ monitors		Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	0 meters	0 meters	2 meters
Probe Height (distance above ground level to inlet)		4.3 meters	4.3 meters	4.3 meters	4.3 meters	4.3 meters	4.3 meters	4.1 meters	4.1 meters	4 meters
Airflow Arc		360º	360º	360º	360º	360º	360º	360º	360º	360º
Probe Sample Line Material		FEP	FEP	FEP	FEP	FEP	FEP	Not Applicable	Not Applicable	FEP
Pollutant Sample Residence Time (seconds)		8.67	6.21	8.67	8.67	8.67	4.19	Not Applicable	Not Applicable	Not Applicable
Filter Sample Material		Not Applicable								FEP
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.2 meters	0.2 meters	0.2 meters	0.2 meters	0.2 meters	0.2 meters	0 meters	0 meters	0 meters
	Vertical	1.5 meters	1.5 meters	1.5 meters	1.5 meters	1.5 meters	1.5 meters	01.2 meters	1.2 meters	0.5 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		no tree	no tree	no tree	no tree	no tree	no tree	no tree	no tree	no tree

Distance to Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.	Thomas Rd.
Distance and Direction to Road	360 meters, S	360 meters, S	360 meters, S	360 meters, S	360 meters, S	360 meters, S	360 meters, S	360 meters, S	360 meters, S
Average Daily Traffic Count	30,907	30,907	30,907	30,907	30,907	30,907	30,907	30,907	30,907
Groundcover	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel

Source: AMP256 DQI Report, AMP251 QA Raw Assessment report

Zuni Hills (ZH) (04-013-4016)



Site Location	109th Ave. & Deer Valley Rd., Phoenix
Spatial Scale	Neighborhood
Site Type	Population Exposure

Site Description: This site began operating in December 2009. This SLAMS location monitors for PM_{10}. Meteorological monitoring includes ambient temperature and wind speed/direction.

The station is located on the campus of the Zuni Hills Elementary School.

ZUNI HILLS	
County ID: ZH AQS ID: 04-013-4016 Address: 10851 W Williams Rd., Sun City Coordinates: 33.68719 N, -112.29416 W Metropolitan Statistical Area (MSA): 6200 Phoenix-Mesa	
General Information	
Pollutant	**PM_{10}**
Parameter Code	81102
Parameter Occurrence Code	1
Collection Frequency	Continuous
Analysis Method (filter samples only)	Not Applicable
Any Proposal to Remove or Move Monitor?	No
Does monitor operation meet *40 CFR Part 58, Subpart G – Appendices A, C, D, and E*?	Yes
Is site suitable for comparison to the *annual* PM2.5 NAAQS as per *§58.30*?	Not Applicable
Are Data Comparable to Respective NAAQS?	Yes
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed (Gases)	Not Applicable
Frequency of 1-Point QC (Precision) Checks	
Number of Flow Rate Verifications Performed (PM)	26
Frequency of Flow Rate Verifications	Bi-Weekly
Number of PE Audits Performed	4
Dates of PE Audits	03/09/22 06/01/22 09/08/22 12/15/22
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	4/28/23
Appendix B Requirements - PSD Monitoring - Not Applicable	
Appendix C Requirements - Monitoring Methodology	
Date Sampling Started	12/01/2009
Monitor Type	SLAMS
Monitor Make – Model	Thermo - TEOM 1405-S
Method Code	079
PM Monitor Flow Type	Low Volume
PM Monitor Collection Type	Size Specific
Method Type (FRM, FEM, ARM)	FEM
Appendix D Requirements - Network Design Criteria	
Site Type	Population Exposure

ZUNI HILLS		
Basic Monitoring Objective	NAAQS Comparison	
Monitoring Scale (Spatial Scale Represented)	Neighborhood	
Monitoring Season	Jan-Dec	
Network Meets Minimum Number of Monitors Required?	Yes	
Appendix E Requirements - Probe and Monitoring Path Siting Criteria		
Distance between collocated samplers	Not Applicable	
Probe Height (distance above ground level to inlet)	2.9 meters	
Airflow Arc	360°	
Probe Sample Line Material	Not Applicable	
Pollutant Sample Residence Time (seconds)	Not Applicable	
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	0.6 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	Horizontal	no obstructions
	Vertical	no obstructions
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Horizontal	14 meters
	Vertical	17 meters
Distance from Dripline of Closest Tree(s)	30.1 meters	
Distance to Furnace or Flue	No Furnace or Flue	
Nearest Major Roadway	107th Ave.	
Distance and Direction to Road	200 meters, E	
Average Daily Traffic Count	12,676	
Groundcover	Lawn / Soil	

Source: AMP256 DQI Report; AMP251 QA Raw Assessment report

Appendix II - Discontinuation of the Thirty- Third Site $PM_{2.5}$ Monitor

Contents

Executive Summary

The Thirty-Third air monitoring site was opened by the Maricopa County Air Quality Department (MCAQD) in 2015 as the second near-road site; the first was Diablo, which was opened in 2014. Thirty-Third was originally planned and sited only for a near-road nitrogen dioxide (NO_2) monitor, but carbon dioxide (CO) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) near-road monitors were also briefly operated there. After operations commenced, concentrations of $PM_{2.5}$ were noted to be unusually high. An investigation noted that the monitor was being influenced by nearby unregulated residential and commercial wood burning and cooking smoke. Consequently, the monitor was shut down in 2016 because it was found to be inappropriately sited for either near-road or area-wide $PM_{2.5}$ monitoring. $PM_{2.5}$ and CO near-road monitoring continued at the Diablo site, and this was sufficient to meet the requirements of 40 CFR 58, Appendix D.

In 2019, MCAQD was notified by the Arizona Department of Transportation (ADOT) that the Diablo site would need to be shut down because of freeway construction. A new site location was identified, but construction of the new site took 15 months. Following notification to U.S. Environmental Protection Agency (EPA) Region 9, MCAQD temporarily moved the CO and $PM_{2.5}$ monitors that were at Diablo to the Thirty-Third site to ensure that at least one near-road NO_2, CO, and $PM_{2.5}$ monitor was operating in the Phoenix area. During discussions with EPA Region 9, MCAQD explained that these temporary monitors would be moved to the new site when it was opened. The $PM_{2.5}$ and CO monitors from Diablo began operating at Thirty-Third in January 2020; in March 2021 they were moved to the new site, which was named Eastwood. In May 2022, EPA Region 9 informed MCAQD that a formal request to move these monitors from Thirty-Third to Eastwood was still needed; this document serves as that request and explains why Thirty-Third is an inappropriate location for a near-road or area-wide $PM_{2.5}$ monitoring site.

While the monitor was operating at Thirty-Third during 2020 and 2021, MCAQD again noted that $PM_{2.5}$ concentrations were unusually high. On average, concentrations at Thirty-Third were 18% higher than the next highest site, West Phoenix. Correlation analyses showed that Thirty-Third was very similar to West Phoenix, especially in the winter, and also to Durango Complex. This demonstrates that Thirty-Third was monitoring the same or similar sources as West Phoenix and Durango Complex, with the added contribution of freeway emissions.

To verify that no new sources were operating near the monitor, another investigation was conducted in November 2022 to survey sources in the area of the Thirty-Third site. This investigation again found many residential and commercial sources in the area.

Especially on weekends, most of the emissions noted were unregulated wood burning or cooking smoke coming from residential, restaurant, and food truck sources.

This source survey and other site characteristics, including topography—as the site is below the grade of the surrounding area, and roadside structures—as sound walls line the freeway in this area, demonstrate that Thirty-Third is still an inappropriate location for a near-road or area wide $PM_{2.5}$ monitoring site. The guidance in the Near-Road NO_2 Technical Assistant Document clarifies why the site does not meet the objective of a near-road $PM_{2.5}$ monitoring site, while 40 CFR 58, Appendices D and E make it evident that this microscale site is not suitable as an area wide $PM_{2.5}$ monitoring site either.

The EPA expressed concern that the Thirty-Third $PM_{2.5}$ monitor might have eventually violated the National Ambient Air Quality Standards (NAAQS) for 24-hour $PM_{2.5}$, though evidence suggests that emissions from nearby unregulated sources are pooling near the site due to topographical features and roadside structures thus making this an inappropriate $PM_{2.5}$ monitoring site for comparing to the NAAQS. In addition, 2020 was an exceptionally bad year for particulate concentrations throughout Maricopa County due to impacts from wildfires and holiday fireworks usage. Nevertheless, MCAQD created a model to estimate concentrations in years when the monitor was not in operation. This model was used to estimate what the design value would have been with three years of monitoring data; MCAQD also ran the test outlined in 40 CFR 58.14 (c)(1), to determine if five years of modeled design values have less than a 10% chance of exceeding 80% of the 24-hour NAAQS. Modeled values suggest the site would not have violated the 24-hour NAAQS if three years of data were available, though it did not pass the 40 CFR 58.14 (c)(1) test when using five years of modeled data.

Based on this information, MCAQD requests to permanently discontinue the $PM_{2.5}$ monitor at the Thirty-Third site in accordance with 40 CFR 58.14; specifically, sections 58.14 (c), which allows for case-by-case consideration, and 58.14 (c)(4), due to the monitor being inapplicable for comparison to the NAAQS. This document provides a summary of the case-by-case considerations for the monitor being inapplicable for comparison to the NAAQS.:

The closure of the Diablo site and the temporary move of the CO and $PM_{2.5}$ monitors to the Thirty-Third site and then to the Eastwood site will be discussed in the MCAQD 2023 Air Monitoring Network Plan. The public will have the opportunity to comment on this during the standard Network Plan comment period.

Background of Thirty-Third

Site Selection

The Thirty-Third site, AQS# 04-013-4020, was opened by MCAQD on September 1, 2015, as the second NO_2 near-road site in the Phoenix metropolitan area. The first NO_2 near-road site was Diablo, AQS# 04-013-4019, which was opened on February 13, 2014. The

2012 analysis[1] completed by MCAQD to choose these two sites was focused exclusively on NO_2, because the impetus to open the near-road sites was the 2010 revisions to the NAAQS for NO_2. $PM_{2.5}$ was not considered, because the regulation requiring near-road $PM_{2.5}$ monitoring was not finalized until 2013 (78 FR 3286). The decision to add CO and $PM_{2.5}$ monitors at these near-road sites came later, in an effort to comply with the 2013 amendments to 40 CFR Part 58, Appendix D.

Diablo was chosen as the first near-road site in Maricopa County due to many favorable features for near-road NO_2 monitoring. These features included heavy traffic volume and extreme congestion near the site. In Maricopa County, the I-10 freeway next to Diablo ranked number 1 in average weekday traffic (AWT) volume, number 3 in heavy-duty diesel (HDD) truck traffic volume, and the traffic congestion was given a Level of Service (LOS) grade of 'F', which is considered extreme. Other favorable features for a near-road monitoring site included: roadway design (the I-10 freeway was at grade with the surrounding areas); roadside structures (there were no sound walls on this portion of the I-10 freeway); meteorology (the I-10 freeway ran perpendicular to the average wind direction in this area); and the minimal influence of background non-road sources (there were no significant NO_2 stationary sources within a one-mile radius of the site, though there is a natural gas-fired power plant approximately three miles to the southeast). A few other features were less desirable, such as terrain (due to the location of nearby buttes); surrounding land use (the site had limited residential areas nearby); and population exposure (the population density in the area is moderate); but the overall score made this the best choice for a new site.

For the second near-road site, MCAQD decided to find a location away from Diablo so as to represent a different area. MCAQD also wanted to locate the second near-road monitor in an area with high population density, as the Diablo area had a high proportion of commercial and industrial parcels and fewer residential parcels nearby. In our ranking of possible site location candidates, number 13 was the next best choice. Of the 12 higher ranked candidates, eleven were located on the same freeway stretch as Diablo and one (number 11) was located 30 feet below surrounding grade near the I-10 Deck Park tunnel. The number 13 location was at 34th Avenue and the I-10 freeway in a sound wall gap; however, this area was not available due to complications with the nearby freeway on-ramp, and instead ADOT gave us the spot at 33rd Avenue and the I-10 which became the Thirty-Third site. This site had favorable features including being number 17 overall in AWT volume, number 12 in HDD traffic volume, and a traffic congestion LOS grade of 'F' (extreme). Additionally, there are mostly residential parcels nearby with some commercial parcels mixed in; there is a high population density in the surrounding area; and there are few stationary NO_2 sources nearby, with the main source being a natural gas-fired power plant located approximately 2.5 miles to the southwest. However, there were some drawbacks to this location, including the freeway

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[1] Pope, R. (2012). *Near-Road NO_2 Monitor Site Selection.* Phoenix: Maricopa County Air Quality Department.

running in an east-west orientation (which is parallel to the average wind direction); the freeway being located approximately 20 feet below grade at this location; and the presence of sound walls on this stretch of freeway near all the residential areas. We hoped that the positive aspects would outweigh the negative and, as earlier noted, the effects of these features were only considered in regard to NO_2 and not particulate pollution.

Initial Operation and Shutdown of the $PM_{2.5}$ Monitor

After the Thirty-Third site opened in September 2015, it was noted that the $PM_{2.5}$ monitor measured average concentrations that were higher than other sites in the network. Thirty-Third correlated well with the nearby West Phoenix $PM_{2.5}$ monitor, located approximately 1.7 miles away, with an R^2 value of 0.93, though average 1-hour concentrations were 10% higher for the period of September 1, 2015, through January 31, 2016 (Table 1). For the same period, NO_2 and CO concentrations at Thirty-Third were 39% and 28% higher, respectively, than at West Phoenix, demonstrating the larger effect that freeway traffic emissions have on these pollutants compared to the effect they have on $PM_{2.5}$.

Table 25: Monthly $PM_{2.5}$ averages for the period of September 1, 2015, through January 31, 2016.

Site	Overall	September	October	November	December	January
Diablo	9.4	6.1	7.1	9.0	11.8	12.6
Durango Complex	12.2	5.9	7.4	13.6	18.2	15.8
Glendale	9.1	4.7	5.0	8.6	13.7	13.2
Mesa	8.4	5.1	5.8	9.0	11.2	11.1
North Phoenix	8.2	4.9	4.9	8.0	12.4	10.6
South Phoenix	12.2	5.8	6.8	12.5	18.6	16.9
Tempe	9.7	-	6.2	9.1	11.4	11.1
Thirty-Third	13.7	6.5	7.9	13.9	21.4	18.3
West Phoenix	12.3	5.7	6.7	11.4	19.4	18.0

Due to the elevated concentrations, surveys were conducted around the Thirty-Third site in the fall of 2015 to verify that there weren't any unpermitted sources operating illegally in the area. Air Quality Inspectors from the Compliance Division of MCAQD performed multiple surveys of the area, at differing times of day, with a goal of identifying any

sources of particulate pollution, especially smoke. The only sources noted were cooking smoke, residential wood burning smoke, and area haze. The cooking smoke was noted to especially come from restaurants and outdoor grills located on McDowell Road, a half-mile north of the site. Residential wood burning smoke was noted throughout the area and came from both indoor fireplaces and outdoor firepits and grills. It was not possible to attribute the area haze to a source, but it was presumed to be coming from residential wood burning, both local to the area around the Thirty-Third site as well as being channeled from other urban areas due to the regional topography and then pooling in the subgrade freeway and landscape depressions.

Because the Thirty-Third $PM_{2.5}$ monitor was being unduly influenced by smoke from cooking and residential wood burning, and wasn't uniquely representative of freeway traffic emissions alone, MCAQD decided to shut the near-road $PM_{2.5}$ monitor down. Since the $PM_{2.5}$ monitor was classified as a special purpose monitor which had been operating for less than 24 months, it was closed in March 2016 in accordance with the requirements of 40 CFR Part 58.20. Table 2 summarizes the dates when CO, NO_2, and $PM_{2.5}$ monitors were operating at the three near-road sites. Monitoring regulations only require one $PM_{2.5}$ and CO near-road monitor in operation in the Phoenix metropolitan area, so MCAQD also shut down the CO monitor at the Thirty-Third site, since the Diablo site operated NO_2, CO, and $PM_{2.5}$ near-road monitors.

Table 26. Open and close dates for the near-road monitoring sites in the Phoenix metropolitan area.

Site	Monitor	Open	Close	Open	Close
Diablo	CO	February 21, 2014	December 31, 2019		
	NO_2	February 21, 2014	December 31, 2019		
	$PM_{2.5}$	May 1, 2014	December 31, 2019		
Thirty-Third	CO	September 1, 2015	March 31, 2016	January 1, 2020	February 28, 2021
	NO_2	September 1, 2015			
	$PM_{2.5}$	September 1, 2015	March 31, 2016	January 1, 2020	February 28, 2021
Eastwood	CO	March 5, 2021			
	NO_2	March 5, 2021			
	$PM_{2.5}$	March 5, 2021			

Shutdown of Diablo

ADOT notified MCAQD that the Diablo site must be removed from its location by the end of 2019, as ADOT was beginning a project to widen the I-10 freeway in that area. This project would eliminate the right-of-way that the monitoring site was located in. MCAQD began to look for a location for a new site and relied heavily on the initial near-road

monitor siting analysis that was conducted in 2012. Comparisons were made between the 2012 and 2019 traffic estimates, but differences were minor and it was decided that the conclusions of the 2012 analysis were still valid. The location chosen for the new monitor is 4135 S. 36th St., which is located on the southern right-of-way of the I-10 freeway. The new site is approximately two miles to the west of the previous Diablo site and had ranked as number 5 on the 2012 analysis; as such, conditions are very similar to those at Diablo and this is still a high-priority area for near-road monitoring.

MCAQD began constructing the new site, named Eastwood (AQS# 04-013-4021), but it would not be ready until March 2021. Following notification to EPA Region 9, MCAQD temporarily moved the CO and $PM_{2.5}$ monitors that were at Diablo to the Thirty-Third site, to ensure at least one near-road NO_2, CO, and $PM_{2.5}$ monitor was operating in the Phoenix area[2]. During discussions with EPA Region 9, MCAQD explained that the temporary CO and $PM_{2.5}$ monitors from Thirty-Third would be moved to Eastwood when the new site was opened (see Appendix A). Following this plan, after Diablo was closed at the end of December 2019, the CO and $PM_{2.5}$ monitors were moved to the Thirty-Third site where they operated for 14 months. When Eastwood was ready in March 2021, the monitors were again moved from Thirty-Third to the Eastwood site (Table 2).

In May of 2022, EPA Region 9 performed a Technical System Audit (TSA) of MCAQD's monitoring program. In the exit meeting for the TSA, the EPA mentioned that they had expected to receive a formal request from MCAQD for moving the CO and $PM_{2.5}$ monitors from Thirty-Third to Eastwood, once that site had opened. This document serves as that formal request to move the near-road CO and $PM_{2.5}$ monitors from Thirty-Third to Eastwood. Conditions around the site are documented and the reasons why the Thirty-Third site is inappropriate for near-road and area-wide $PM_{2.5}$ monitoring of the surrounding neighborhoods are included. This report will also note that the Thirty-Third site does not meet $PM_{2.5}$ monitor siting requirements and that it most likely would not have violated the 24-hour $PM_{2.5}$ NAAQS. As such, it qualifies for discontinuation in accordance with 40 CFR 58.14.

Environmental Conditions

In the 14 months that the $PM_{2.5}$ monitor operated at the Thirty-Third site in 2020 and 2021, it usually had the highest average concentrations in the MCAQD $PM_{2.5}$ network (Table 3). The $PM_{2.5}$ concentrations during the period of January 2020 to February 2021 were on average 18% higher than the next highest monitor, West Phoenix. These differences varied depending on the season. During the winter burn season (November 2020 thru February 2021) there was only a 12% difference between Thirty-Third and West Phoenix. Outside of the winter burn season, Durango Complex had the second highest average $PM_{2.5}$ concentrations with Thirty-Third being 16% higher (Table 4).

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[2] See Appendix 1 for the EPA's Review and Approval letter for moving the Diablo monitors to the Thirty-Third site.

Though it had the highest concentrations, Thirty-Third $PM_{2.5}$ correlated well with the West Phoenix and Durango Complex monitors (Table 5). These correlations were also sensitive to the seasons, with the correlation being higher during the winter burn season than outside of it. These patterns suggest that Thirty-Third was influenced by the same sources surrounding the West Phoenix and Durango Complex monitors, though it also measured the local traffic emissions from the freeway.

November 2022 Area Survey

In order to verify that no new unpermitted sources of particulate matter had begun operation in the area of the Thirty-Third monitor since the surveys done in Fall 2015, MCAQD decided to conduct a new survey. The new survey also attempted to quantify unregulated sources and activities, such as restaurants, mobile food operations, and residential wood burning, that are occurring in the area of the monitor.

The patterns of past $PM_{2.5}$ concentrations from the Thirty-Third and nearby monitors were analyzed in order to determine the best times to conduct the survey. The preliminary analysis showed that 24-hour average $PM_{2.5}$ concentrations at Thirty-Third were highest on Saturdays and Sundays, followed by Thursdays and Wednesdays. On Saturdays and Sundays, concentrations were higher at West Phoenix than at Durango Complex. On Wednesdays and Thursdays, concentrations were higher at Durango Complex than at West Phoenix.

The preliminary analyses also showed that, at Durango Complex, weekday $PM_{2.5}$ concentrations were highest between 6:00 a.m. and 10:00 a.m., likely due to the startup of industrial facilities in that area. At West Phoenix, weekend $PM_{2.5}$ concentrations were highest between 12:00 a.m. and 3:00 a.m., likely due to residential wood burning occurring on Friday and Saturday evenings.

Based on this preliminary analysis, a plan was made to survey the areas around Durango and Thirty-Third from 7:00 a.m. to 10:00 a.m. on Wednesdays and Thursdays, and the areas around West Phoenix and Thirty-Third from 6:00 p.m. to 9:00 p.m. on Fridays and Saturdays. The surveys took place between November 2, 2022, and November 12, 2022.

Four inspectors from the Compliance Division conducted the surveys. Two inspectors were assigned to each monitoring site and were instructed to continually drive through the area within two miles of that site. Inspectors were asked to record any observations of PM sources, including area haze or visible emissions.

Table 27: Monthly $PM_{2.5}$ averages for January 2020 through February 2021.

Month	Durango Complex	Glendale	Mesa	North Phoenix	South Phoenix	Tempe	Thirty-Third	West Phoenix
January 2020	16.6	10.9	7.6	11.9	15.7	7.8	22.3	20.2
February 2020	9.9	7.9	6.2	8.2	9.7	5.9	13.4	11.2
March 2020	5.9	*	3.7	4.9	5.0	3.9	7.3	5.4
April 2020	6.1	4.6	4.9	5.3	5.4	4.8	6.9	5.3
May 2020	6.4	5.7	5.9	5.9	6.4	5.5	8.0	5.6
June 2020	6.3	5.1	5.4	5.4	5.2	4.9	7.4	5.3
July 2020	5.8	5.6	6.4	6.4	6.4	5.8	7.5	5.8
August 2020	9.5	8.6	9.2	9.1	8.7	8.5	11.4	9.2
September 2020	10.6	8.6	9.1	8.0	9.9	8.2	12.5	9.7
October 2020	12.8	*	9.1	8.5	12.4	7.8	*	11.8
November 2020	*	8.5	*	9.3	17.1	8.2	19.3	13.3
December 2020	20.5	10.8	10.3	11.7	24.4	9.4	27.1	22.4
January 2021	18.7	11.5	11.7	11.3	17.6	9.6	22.9	24.0
February 2021	10.5	5.8	6.9	6.9	10.2	6.2	11.7	9.6

*Data completeness criteria not met

Table 28: Average $PM_{2.5}$ concentrations for the network during the period that the Thirty-Third monitor was in operation.

Site	January 2020 – February 2021	Percent Difference	November 2020 – February 2021	Percent Difference	March 2020 – October 2020	Percent Difference
Durango Complex	11	22%	16.6	20%	8.0	16%
Glendale	7.8	72%	9.4	113%	6.5	43%
Mesa	7.6	76%	9.7	106%	6.8	37%
North Phoenix	8.1	65%	9.9	102%	6.7	39%
South Phoenix	10.9	23%	17.3	16%	7.5	24%
Tempe	7	91%	8.8	127%	6.2	50%
West Phoenix	11.4	18%	17.8	12%	7.3	27%

Table 29: Pearson's correlation coefficients between the Thirty-Third, Durango Complex, and West Phoenix $PM_{2.5}$ monitors.

Time Period	Thirty Third and Durango Complex	Thirty-Third and West Phoenix
January 2020 – February 2021	0.82	0.90
November 2020 – February 2021	0.85	0.89
March 2020 – October 2020	0.75	0.79

Following the field survey, inspector observations were categorized and plotted on maps (Appendix B). Field work was done over a course of eight days, or 24 hours total. As there were usually four individual inspectors surveying for each hour, the final total was 93 collective hours of field surveys completed. The 477 observations made during this time period were plotted on the map. Table 6 shows the number of observations in each category.

Table 30: Number of inspector observations recorded during the 2022 survey, by category.

Category	Wednesday and Thursday	Friday and Saturday	Total
Burning Smell	30	39	69
Commercial Restaurant or Food Truck	31	89	120
Cooking or Grilling: Residential or Unspecified	25	80	105
Vehicle or Structure Fire	19	0	19
Residential Woodburning or Fireworks	13	45	58
Dust from a Non-Residential Source	10	0	10
Windblown Dust	4	0	4
Visible Emissions, Haze, or Odor from a Commercial Source	18	1	19
Visible Vehicle Emissions	22	10	32
Total	197	280	477

The spatial pattern of inspector observations tended to align with the known and suspected sources of PM. Thus, on weekday mornings, there were many more observations of haze and burning odor near the Durango Complex site than in other areas of the survey. This area has many industrial sources, such as concrete batch plants, sand and gravel mining, landfills, and mulching/green waste recycling operations, which are more active on weekdays. The majority of visible emissions from diesel trucks and locomotives were also noted in this area.

The observations on Friday and Saturday evenings, on the other hand, noted far more residential sources, such as smoke from grilling, cooking, fireplaces, and outdoor firepits. Visible emissions from restaurants and food trucks were also far more prevalent on weekend evenings. Hazy conditions and burning odor from unspecified sources were noted at a lesser extent than on weekday mornings, but the locations tended to be much closer to the Thirty-Third site. Of particular note were the number of observations in the evenings that were within one mile of the Thirty-Third site. Friday and Saturday evenings had 36% more observations in the area than Wednesday and Thursday mornings.

Evidence of Inappropriate Siting

Influence from Nearby Unregulated Sources

The area surveys that were completed in Fall 2015, as well as the surveys that were completed in November 2022, confirm that there are many unregulated sources of $PM_{2.5}$ in the area of the Thirty-Third site. These include restaurants, mobile food truck cooking operations, residential outdoor cooking and grilling, and residential wood burning in fireplaces and fire pits.

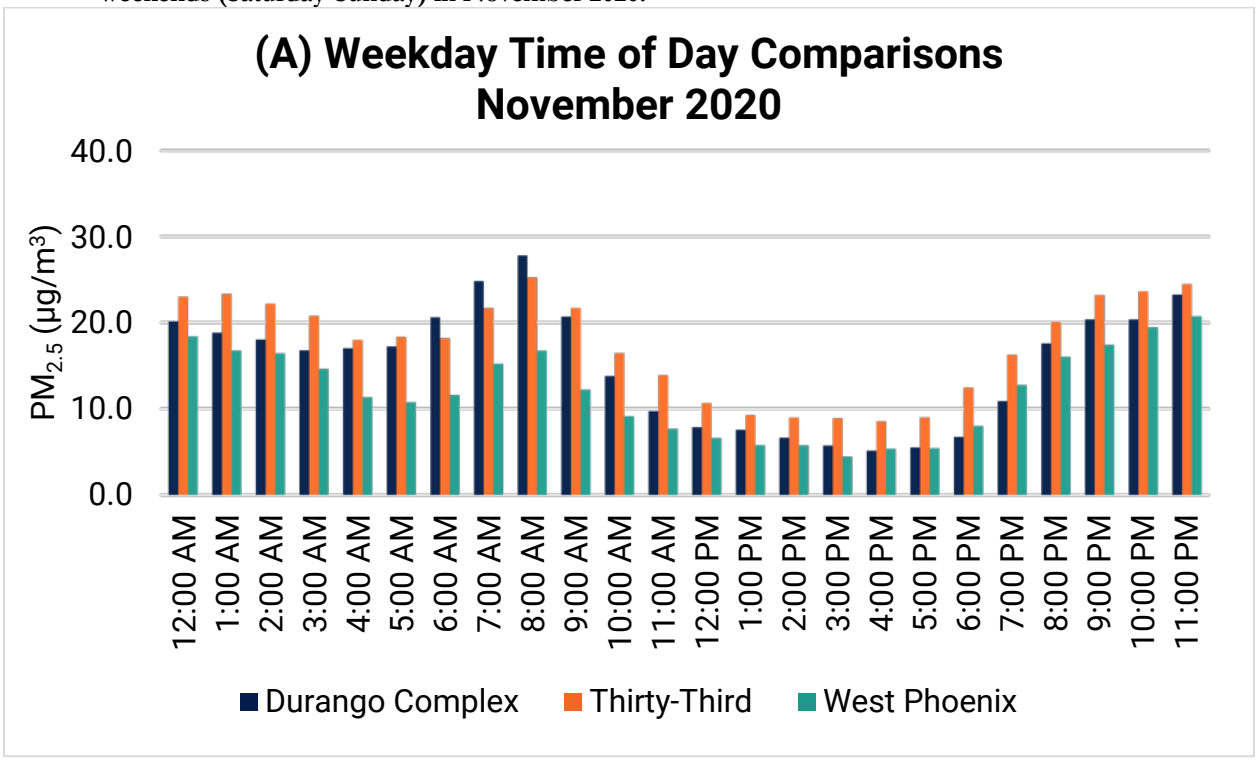
Considering the other characteristics of the area, e.g., topographic slope and depression as well as sound walls in this vicinity of the freeway, fine particulate matter from unregulated sources and traffic emissions are likely collecting and pooling near the Thirty-Third site. Thus, the Thirty-Third $PM_{2.5}$ monitor was not representative of microscale near-road traffic emissions, as it was being unduly influenced by nearby unregulated sources. Nor was this monitor representative of the surrounding residential areas at middle or neighborhood monitoring scales due to its microscale area of representation.

Topography

The Thirty-Third site is located along a stretch of the I-10 freeway that is, on average, 20 feet below the grade of the surrounding neighborhoods. This below grade elevation continues to the east for approximately one-half mile and to the west for approximately 7 miles (Figure 2). MCAQD originally planned to place the second near-road site at 34th Avenue and I-10, where the freeway averages 10 to 15 feet below grade, but that location did not work due to the location of the freeway on-ramp and ADOT gave MCAQD the space at 33rd Avenue instead. MCAQD discussed the possibility of NO_2 pooling and accumulating in the area, but believed that the physical properties of the gas and the typical time scale of maximum emissions during daytime traffic rush hours (when atmospheric mixing is greater) would maximize dispersion and minimize the negative effects of pooling. Since the site was not analyzed as a $PM_{2.5}$ monitoring location, the physical properties of aerosols and the time patterns of their emissions in this area were not considered. As noted in Figure 1, average $PM_{2.5}$ concentrations tend to increase in the evening, especially on weekends, after the sun has set; this is likely the result of wood burning and cooking activities by the aforementioned residential and commercial sources. These activities, on average, probably cease by the late night, but atmospheric subsidence and the terrain features likely concentrate locally emitted aerosols near the monitor.

At a larger urban landscape scale, topographic features and late-night atmospheric subsidence serve to funnel aerosol emissions from across the mid-town Phoenix urban area toward the Salt River (Figure 2). This intra-urban transport of aerosols within the Phoenix metropolitan area has been demonstrated by MCAQD in multiple (annually between 2013 and 2020) internal studies of the wintertime burn season. In light of this evidence, it is likely that transported aerosol emissions from other parts of the metropolitan area impacted the Thirty-Third $PM_{2.5}$ monitor, especially during the winter burn season.

Figure 16: $PM_{2.5}$ concentrations for three $PM_{2.5}$ sites by time of day on (A) weekdays (Monday-Friday) and (B) weekends (Saturday-Sunday) in November 2020.



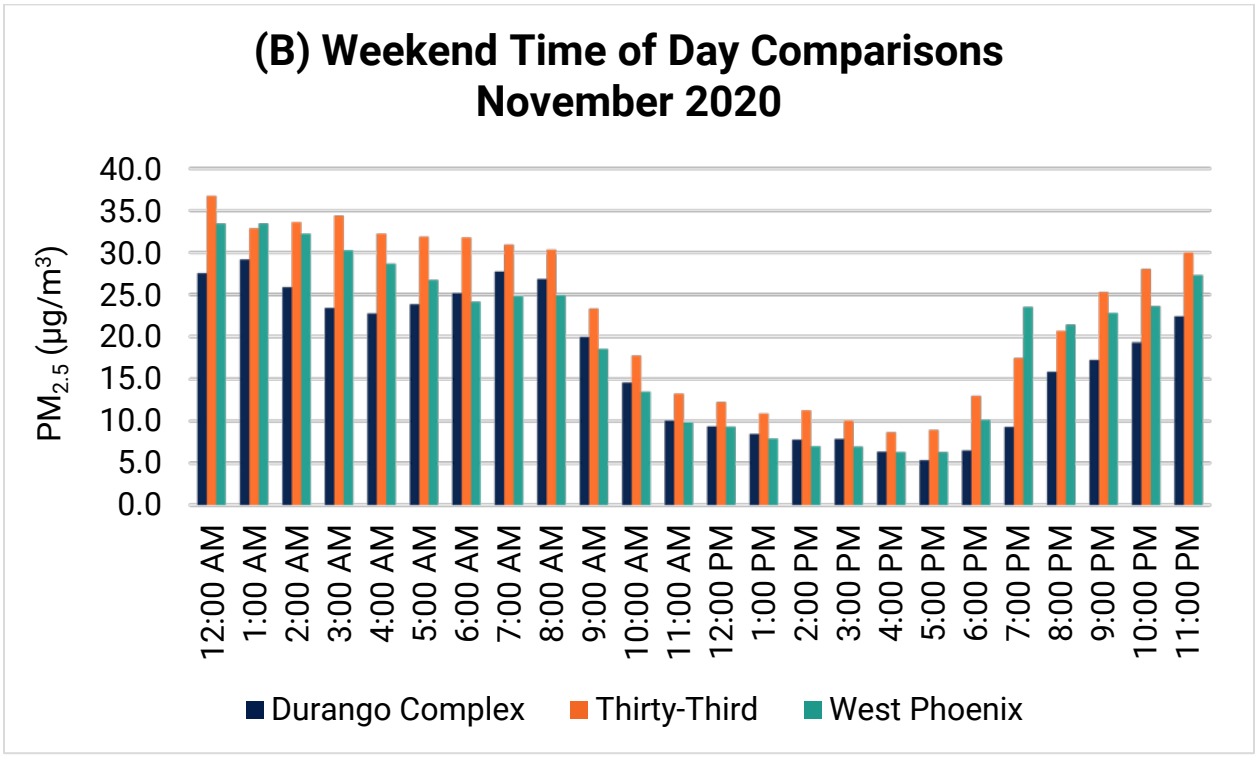
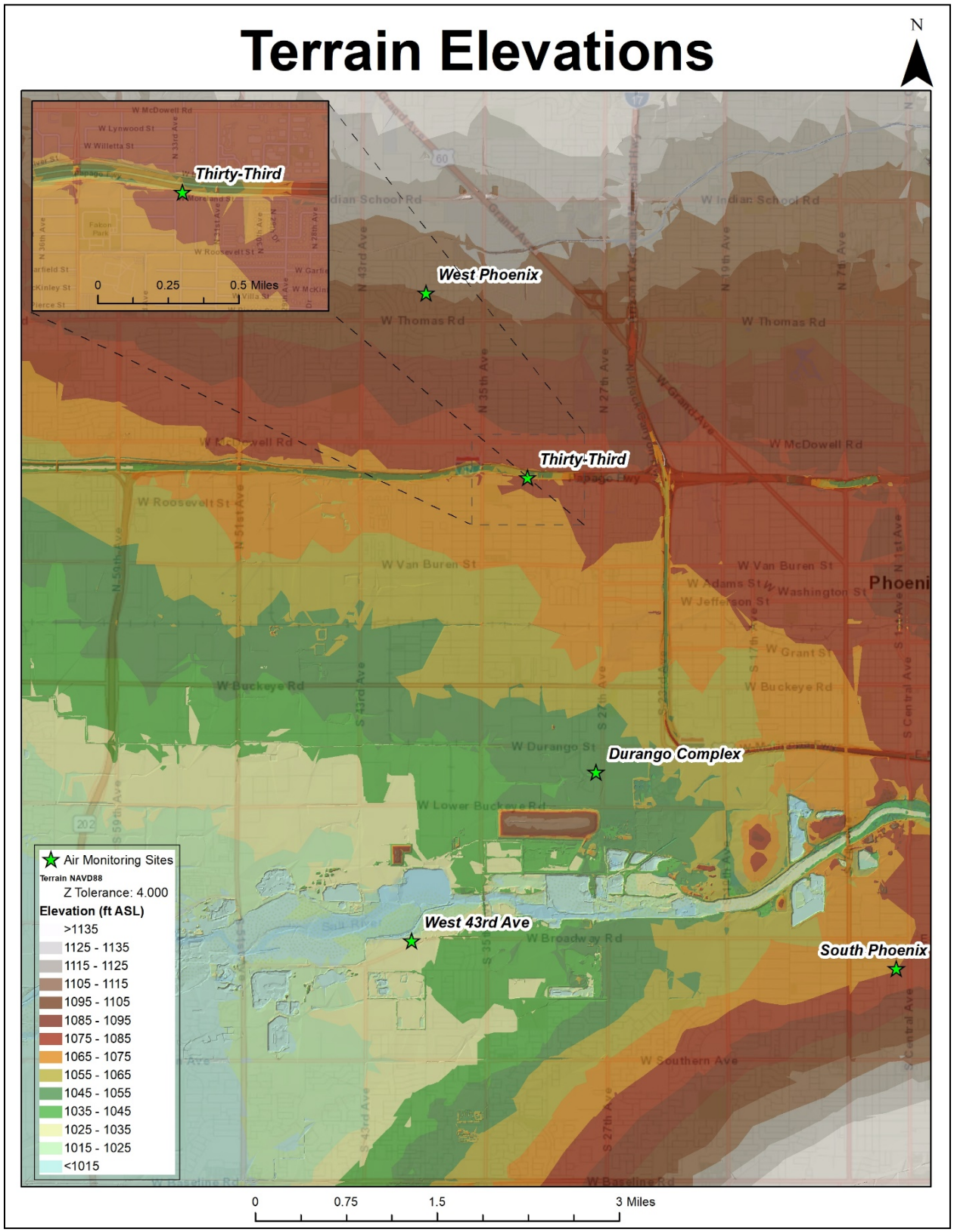


Figure 17: Elevations, in feet above sea level (ASL), in the area of southwest Phoenix and the Thirty-Third monitoring site.

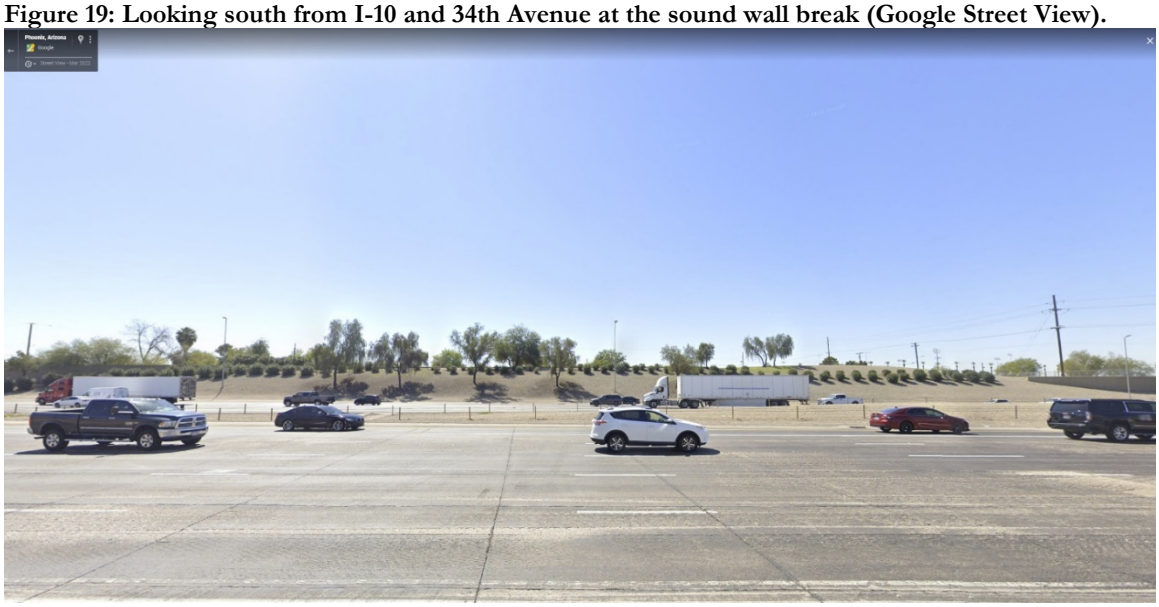


Roadside Structures

The existence of sound walls in the area of the Thirty-Third monitor likely exacerbated the issues with terrain. On this section of the I-10 freeway, sound walls start at 29th and 30th Avenues on the south and north sides, respectively, and continue west to 43rd Avenue. Besides the breaks for arterial road intersections and crossovers, there are also breaks in the south sound walls at 33rd and 34th Avenues, though the earthen berm foundations rise up to the same elevation as adjoining walls (Figure 3 and Figure 4).

Figure 18: Looking south from I-10 and 33rd Avenue at the Thirty-Third site (Google Street View).

Figure 19: Looking south from I-10 and 34th Avenue at the sound wall break (Google Street View).



The location at 34th Avenue was the first choice for a site because the gap in the sound wall was larger, but the location of the on-ramp disqualified this area (Figure 4). After being offered

the space at 33rd Avenue, MCAQD decided that the differences between the two locations were minimal, with respect to near-road NO_2 monitoring.

The sound walls were of concern in the 2012 analysis and were considered the major detractor for siting a near-road monitor in this area; but MCAQD concluded the positives of the area outweighed the negatives and this would still be the best available stretch of freeway to site the second near-road NO_2 monitor. As with the topographic features that were previously mentioned, there was concern about NO_2 being trapped in this area, but it was felt that the physical properties of the gas and the temporal pattern of emissions would minimize this issue. The effects of the sound walls on trapping aerosols in the area was not considered.

Inappropriate Siting Characteristics

The Thirty-Third location was chosen as a near-road NO_2 monitoring site. The analysis parameters used to pick this site included:

- Traffic fleet mix counts and traffic congestion
- Roadway design
- Roadside structures
- Terrain
- Meteorology
- Population exposure
- Safety features for service personnel
- Interchanges/crossovers
- Surrounding land use
- Nearby permitted NO_X sources
- Frontage roads
- Availability of support infrastructure

Each candidate site was scored by these parameters in accordance with 40 CFR 58, Appendix D.4.3.2(a)(1). More weight was given to the traffic parameters, and so even though there were drawbacks to this location, the high nearby traffic volume ultimately resulted in it achieving a high score in the site selection matrix that was developed.

However, these analyses pertained only to siting an NO_2 monitor and not a PM or CO monitor. It was quickly realized when the monitor was first operated in 2015 that, due to these drawbacks, Thirty-Third was an inappropriate location for a near-road $PM_{2.5}$ site. Thus, the $PM_{2.5}$ monitor was discontinued in 2016 in accordance with 40 CFR 58.20. When the $PM_{2.5}$ monitor was operated in 2020 and 2021, these problems came up again. In addition to the points identified in this report, the following sources provide further evidence that the site is inappropriately sited:

- **Near-Road NO_2 Monitoring Technical Assistance Document[3] -** Section 13.2 of the document states that it is desirable to have a near-road site that is mostly influenced by typical roadway activity instead of those that are heavily influenced by background stationary sources or features such as terrain or roadway design. As pointed out in this report, there is a great deal of evidence that the Thirty-Third $PM_{2.5}$ monitor is being heavily influenced by nearby unregulated background sources, the terrain in the area, and roadway design features such as sound walls. Thus, it is evident that the Thirty-

[3] Watkins, N., & Baldauf, R. (2012). *Near-road NO2 monitoring technical assistance document* (No. EPA-454/B-12-002).

Third site is inappropriate for the objective as a near-road $PM_{2.5}$ monitoring site. (Note: as a near-road technical assistance document (TAD) doesn't exist for $PM_{2.5}$ monitoring, the Near-Road NO_2 TAD was consulted instead; Sections 13.4 and 16 in the document support using it in this manner).

- **40 CFR 58, Appendices D and E -** The Thirty-Third $PM_{2.5}$ monitor was appropriately designated to be spatially representative at the microscale, as defined by Appendix D.1.2, Appendix E.6.3, and Table E-1, due to these features:
    - The average daily traffic of affecting roads is 490,838. This was measured in the 2012 analysis as the fleet equivalency average weekday traffic count (FE-AWT). Even if fleet equivalency isn't used, the AWT is 260,136.
    - The distance of the $PM_{2.5}$ monitor probe to the nearest traffic lane was 13.5 meters.
    - The height of the $PM_{2.5}$ monitor probe was 7 meters.

Since the Thirty-Third $PM_{2.5}$ monitor is inappropriate as a near-road monitor, this would make it a microscale monitor with an objective of measuring area-wide concentrations comparable to the NAAQS, i.e., a traffic corridor where the general public is exposed to maximum concentrations from mobile sources. However, 40 CFR 58, Appendix D.4.7(c)(1) notes that $PM_{2.5}$ SLAMS sites measured at the microscale should be limited to urban sites that are representative of long-term human exposure and of many such microenvironments in the area. Thirty-Third, as a microscale near-road site located on an extremely busy freeway 20 feet below the grade of surrounding areas and sound walls, does not meet this criterion and therefore does not meet the objective and type requirements of 40 CFR 58, Appendix D.1. Thus, Thirty-Third is not an appropriate monitoring site for comparing area-wide $PM_{2.5}$ to the 24-hour NAAQS.

Comparing Thirty-Third $PM_{2.5}$ to the NAAQS

As previously mentioned, the Thirty-Third $PM_{2.5}$ monitor generally had the highest concentrations within the Maricopa County monitoring network, though this document provides evidence that this is due to influence from unregulated sources which are being pooled near the site due to topographical features and roadside structures, making this an inappropriate $PM_{2.5}$ monitoring site. Nevertheless, for 2020, this equated to an exceedance of the 24-hour $PM_{2.5}$ NAAQS with a 98^{th} percentile of 36.7 $\mu g/m^3$ (note that as a microscale monitor, Thirty-Third cannot be compared to the annual $PM_{2.5}$ NAAQS as per 40 CFR 58.30). This implies that Thirty-Third would have violated the 24-hour NAAQS if it had operated for three years to generate a design value. While this is a possibility, 2020 was exceptionally bad for particulate concentrations, due mainly to holiday firework usage and wildfire smoke intrusions which impacted all of Maricopa County. To get a picture of what the design value would have been if years outside of 2020 were monitored, an extrapolation model was created to see if Thirty-Third would have violated the NAAQS between 2018 and 2022, and if the site would pass the test in 40 CFR 58.14 (c)(1), if five years of modeled design values have less than a 10% chance of exceeding 80% of the 24-hour NAAQS.

As noted in the Background section, temporal trends at Thirty-Third correlated well with West Phoenix and Durango Complex. There is ample evidence that the $PM_{2.5}$ sources which are

influencing West Phoenix and Durango Complex are also influencing Thirty-Third, in addition to the near-road influence of traffic emissions. Therefore, the model looked at the ratio of Thirty-Third 2020 annual concentrations to an average of the Durango Complex-West Phoenix concentrations. After the average increase of Thirty-Third was calculated, this ratio was applied to extrapolate the 98th percentile at Thirty-Third between 2016 and 2022. These values were then used to create a factored three-year design value (Table 7). Due to the previously mentioned effect of fireworks during New Year's holidays, this model was also repeated after 24-hour values from December 31 and January 1 were removed as exceptional events and new 98th percentiles calculated.

Results show that during the period of 2016 through 2022, 98th percentiles were the highest in 2020, though 2022 values were a close second. Because of this, the three-year design value from 2022 was the highest, though it still didn't result in a violation of the 24-hour NAAQS (Table 7). Removing fireworks exceptional events decreased the 98th percentile in every year modeled, demonstrating how much effect holiday fireworks have on these statistics, especially at the West Phoenix and Thirty-Third sites. Though 2022 modeled design values at Thirty-Third were again the highest in the modeled period, it was still below the violation threshold (Table 8).

Based on these extrapolation models, it is unlikely that Thirty-Third would have violated the 24-hour NAAQS, especially when fireworks exceptional events are removed. However, the modeled concentrations, either with or without exceptional events, did not pass the 40 CFR 58.14(c)(1) test of having less than a 10% chance of exceeding 80% of the NAAQS (i.e., 28 μg/m^3). The 90% confidence interval for the modeled values with and without exceptional events was 33.7 and 32.8 μg/m^3, respectively.

Table 31. Extrapolated three-year $PM_{2.5}$ design values from the Thirty-Third site based upon a ratio from the 2020 98th percentile of monitored 24-hour concentrations.

	2016	2017	2018	2019	2020	2021	2022
98th Percentile of Monitored 24-Hour Average Concentrations (µg/m³)							
Durango Complex	22.7	30.6	25.7	21.7	28.8	27.2	28.0
West Phoenix	23.8	30.2	30.6	23.4	33.9	26.0	33.0
Average Durango Complex and West Phoenix	23.3	30.4	28.2	22.6	31.4	26.6	30.5
Thirty-Third					36.7		
Percent Difference					17.9%		
Modeled 24-Hour Average Concentrations (µg/m³)							
Thirty-Third (98th Percentile)	27.4	35.8	33.2	26.6	36.9	31.3	35.9
Thirty-Third (Design Value)			32.1	31.9	32.2	31.6	34.7

Table 32. Extrapolated three-year $PM_{2.5}$ design values from the Thirty-Third site. In this model 24-hour values from December 31 and January 1 were removed as firework exceptional events.

	2016	2017	2018	2019	2020	2021	2022
98th Percentile of Monitored 24-Hour Average Concentrations (µg/m³)							
Durango Complex	21.9	28.2	25.7	21.7	28.4	26.8	28.0
West Phoenix	23.5	27.4	28.7	23.3	33.8	25.2	29.0
Average Durango Complex and West Phoenix	22.7	27.8	27.2	22.5	31.1	26.0	28.5
Thirty-Third					36.4		
Percent Difference					17.9%		
Modeled 24-Hour Average Concentrations (µg/m³)							
Thirty-Third (98th Percentile)	26.8	32.8	32.1	26.5	36.7	30.7	33.6
Thirty-Third (Design Value)			30.5	30.5	31.8	31.3	33.6

Request to Discontinue the Thirty-Third $PM_{2.5}$ Monitor

MCAQD requests to be allowed to permanently discontinue the $PM_{2.5}$ monitor at the Thirty-Third site in accordance with 40 CFR 58.14. Because the monitor was only meant to be operated temporarily until the Eastwood near-road site was ready, there were only 14 months of data collected from the monitor in 2020 and 2021. As such, many of the criteria listed in 40 CFR 58.14 are not applicable, except for 58.14(c) and 58.14(c)(4), i.e., the case-by-case consideration and the monitor being inapplicable for comparison to the NAAQS.

The following is a summary of the case-by-case considerations for the monitor being inapplicable for comparison to the NAAQS.:

- The Thirty-Third site was originally sited as a near-road NO_2 site. The positives of the site were thought to outweigh the disadvantages, but this was only considered with respect to NO_2; MCAQD believed that the physical properties of NO_2 gas would be sufficient for dispersion. The properties of aerosols, including the increase in late evening emissions and the tendency to pool near the site, were not considered and the site is inappropriate as a near-road $PM_{2.5}$ site.
- The Thirty-Third site is being impacted by nearby aerosol emissions from unregulated sources. Extensive surveys of the area have demonstrated that this is largely due to cooking smoke from both commercial and residential sources, residential wood burning in fireplaces, and outdoor fire pits.
- The terrain of the immediate area around the Thirty-Third site includes the I-10 freeway being located in a channel that is 20 feet below the grade of the surrounding area and is believed to cause aerosols to be trapped and pool near the site when atmospheric mixing isn't taking place. In addition, the larger landscape-scale topography of the airshed basin shows that this entire area slopes down toward the Salt River. Late night atmospheric subsidence is known to drain and funnel aerosol emissions from the higher elevations in the metropolitan urban area down toward the river, potentially impacting and pooling near the Thirty-Third site.
- Roadside structures, i.e., sound walls, surround the Thirty-Third site in between residential areas and the I-10 freeway subgrade channel. These sound walls likely exacerbate the terrain problems previously mentioned.
- The Thirty-Third site is inappropriate for siting a $PM_{2.5}$ monitor, for either near-road or area-wide NAAQS comparison objectives. The influence of background unregulated aerosol sources and the physical conditions which tend to aggregate those aerosols in the area surrounding the site preclude it from properly characterizing traffic emissions as a near-road $PM_{2.5}$ monitor. The location of the sample port and the volume of traffic on the I-10 freeway necessitates that a $PM_{2.5}$ site operates at the microscale spatial scale of representativeness. The physical conditions surrounding this site preclude a microscale monitor from being used to compare to the NAAQS as noted in 40 CFR 58, Appendix D.4.7(c)(1).
- Although the $PM_{2.5}$ monitor did not operate long enough to determine if it would be a NAAQS violating site, extrapolation modeling suggests that it would not have violated the NAAQS. Note that this same modeling does not suggest that it passes the test in 40 CFR 58.14(c)(1), i.e., having less than a 10% chance of exceeding 80% of the 24-hour NAAQS. However, the high 98^{th} percentile values influencing this modeling are associated with the exceptionally bad years of 2020 and 2022 when the entire Maricopa

County $PM_{2.5}$ network was impacted by holiday fireworks usage and transported wildfire smoke.

Public Notification

The closure of the Diablo site and the temporary move of the CO and $PM_{2.5}$ monitors to the Thirty-Third site and then to the Eastwood site will be discussed in MCAQD's 2023 Air Monitoring Network Plan. Thus, the public will be notified of the reason the monitors were moved from Diablo, why Thirty-Third was an inappropriate site for a near-road or area-wide NAAQS compliance $PM_{2.5}$ monitor, and that they are now operating at Eastwood in their intended near-road monitoring objective. The public will have the opportunity to comment on this during the standard Network Plan comment period.

Appendix A

Letter of Approval for the Removal and Relocation of the Diablo Monitoring Site

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IX
75 Hawthorne Street
San Francisco, CA 94105-3901

June 1, 2020

Mr. Ben Davis
Air Monitoring Division Manager
Maricopa County Air Quality Department
2145 South 11th Avenue, Suite 170
Phoenix, Arizona 85012

Dear Mr. Davis:

This letter provides the U.S. Environmental Protection Agency's (EPA) review and approval for Maricopa County Air Quality Department's (MCAQD) relocation of the NO_2 State or Local Air Monitoring Station (SLAMS) monitor from the Diablo near-road site (AQS ID: 04-013-4019) to a new near-road site (east of 36th Street, south of I-10, latitude: 33.41048, longitude: -112.00289, 3.7 kilometers west of the existing site, Air Quality System (AQS) ID to be determined), discontinuation of CO and $PM_{2.5}$ near-road SLAMS monitors at Diablo and approval of CO and $PM_{2.5}$ near-road SLAMS monitors at the Thirty-Third near-road site (AQS ID: 04-013-4020). On December 18, 2019, MCAQD sent an email to the EPA describing the proposal to discontinue all monitoring at the Diablo site, and to relocate the NO_2 monitor to the new site referenced above. On December 31, 2019, MCAQD sent an email to the EPA informing the EPA of the shutdown of the CO and $PM_{2.5}$ monitors at Diablo and start-up of CO and $PM_{2.5}$ monitoring at the Thirty-Third site. Per 40 CFR 58.14, monitoring agencies are required to obtain EPA approval for the relocation or discontinuation of SLAMS monitors, and modifications to the SLAMS including new SLAMS monitors.

The Phoenix-Mesa-Scottdale Core-Based Statistical Area (Phoenix CBSA) is required to have two near-road NO_2 monitors,[1] with a CO monitor collocated with one of the near-road NO_2 monitors,[2] and a $PM_{2.5}$ collocated with one of the near-road NO_2 monitors.[3] MCAQD had been meeting these requirements with their NO_2, CO, and $PM_{2.5}$ monitors located at the Diablo near-road site, and the NO_2 monitor at the Thirty-Third near-road site.

Relocation of the Diablo NO_2 monitor to the proposed new near-road site was reviewed by the EPA against criteria contained in 40 CFR 58.14(c)(6), which describes the relocation requirements if a SLAMS monitor is not eligible for removal under the criteria in 40 CFR 58.14(c)(1) through (c)(5) and states that, "[a] SLAMS monitor … may be moved to a nearby location with the same scale of representation if logistical problems beyond the State's control make it impossible to continue operation at its current site." The NO_2 monitor is not eligible for removal under 40 CFR 58.14(c)(1) - (c)(5). The current Diablo site is located on the west side of the I-10 freeway just south of the Fairmont /Diablo Way intersection. The Arizona Department of Transportation (ADOT) notified MCAQD that the current

[1] 40 CFR 58 Appendix D, §4.3.2(a)
[2] 40 CFR 58 Appendix D, §4.2.1(a)
[3] 40 CFR 58 Appendix D, §4.7.1(b)(2)

Diablo site must be vacated to make way for an I-10 freeway expansion, including additional traffic lanes and a feeder-type lane which would be constructed over the current Diablo site location. Logistical problems beyond MCAQD's control therefore make it impossible to continue operation at the current site.

In order to relocate the near-road NO_2 monitor, MCAQD explored alternate near-road monitoring locations in the area near the existing site. The proposed new site is located approximately two miles west of the current Diablo site and is along the same I-10 corridor. The proposed site was evaluated by MCAQD in the original near-road analysis used to select the current site. MCAQD evaluated updated traffic data and concluded that the original near-road analysis is still valid. The section of the I-10 freeway near the Broadway Curve (where the existing and proposed sites are located) is still one of the busiest sections in the Phoenix CBSA. Both sites are in an area characterized by residential, commercial, and industrial land use. The effects of local meteorology and transport from outside MCAQD boundaries are also expected to be similar between the two sites. The EPA reviewed the proposed new site against the EPA *Region 9 Near-road Plan Review Checklist* (enclosure A of this letter) and concludes that it meets the EPA's criteria for a near-road monitoring site. The relocation site is expected to measure similar NO_2 concentrations from similar sources due to the consistency in land uses and proximity to sources. Based on the previous five design values (2014-2018), the Diablo NO_2 monitor does not have the highest design value within the Phoenix CBSA, and has a lower design value than MCAQD's Thirty-Third near-road monitor for design values 2016, 2017, and 2018.

Based on the assessment of scale of representation at both locations, the EPA has determined that MCAQD's request meets the requirement that the replacement site is at a nearby location with the same scale of representation and approves relocation of the NO_2 monitor from the Diablo site to the proposed new near-road site. This approval assumes that the new site will meet all 40 CFR 58 requirements, including the siting requirements specified in Appendix E. Please work with the EPA to ensure that the new site meets all relevant requirements. As this is a relocation, the data from the old and new sites will be linked in the EPA's Air Quality System (AQS) to form one continuous data record for NO_2 design value calculations. Please note this in the AQS comment field for both the old and the new AQS site.

The EPA also reviewed MCAQD's proposal to discontinue the CO and $PM_{2.5}$ SLAMS monitoring at the Diablo near-road site and install CO and $PM_{2.5}$ SLAMS monitors at the Thirty-Third near-road site. Discontinuation of the Diablo CO monitor was reviewed by the EPA against criteria contained in 40 CFR 58.14(c)(1). According to certified data submitted to the EPA's AQS, the Diablo site was in attainment of the 1971 1-hour CO and 8-hour CO NAAQS for design value years 2014-2018. The EPA has determined that, based on design values from 2014-2018, there is a less than 10 percent probability of exceeding 80 percent of the NAAQS during the next three years at the Diablo site. Preliminary concentrations available for 2019 are consistent with the historical trends and continue to show low concentrations. For design value years 2014-2018, the Diablo CO monitor is not the design value site in the Phoenix CBSA. This CO monitor is not specifically required by an attainment or maintenance plan, and there will continue to be seven SLAMS CO monitors in the Phoenix CBSA, as well as the new SLAMS CO monitor at Thirty-Third discussed below.

Discontinuation of the Diablo $PM_{2.5}$ monitor was specifically reviewed against criteria contained in 40 CFR 58.14(c). Under 40 CFR 58.14(c), requests for site closures may be approved on a case-by-case basis as long as the discontinuance does not compromise data collection necessary for implementation of

the NAAQS and the requirements of 40 CFR 58 Appendix D continue to be met. Based on certified data submitted to AQS, the Diablo site was in attainment of the 2006 24-hour $PM_{2.5}$ and 2012 annual $PM_{2.5}$ NAAQS for design value years 2017 and 2018, and had lower 2017 and 2018 24-hour and annual design values than the highest monitoring site in the Phoenix CBSA. Design values at the Diablo site for 2014-2016 were invalid due to incomplete data in 2014 when the monitor began operating. This $PM_{2.5}$ monitor is not specifically required by an attainment or maintenance plan, and eleven SLAMS $PM_{2.5}$ monitors will continue to operate in the Phoenix CBSA, as well as the new SLAMS $PM_{2.5}$ monitor at Thirty-Third discussed below.

The Thirty-Third site was approved as a near-road site by the EPA on October 31, 2016, as part of the 2015 Annual Network Plan approval. Special Purpose Monitoring (SPM) for CO and $PM_{2.5}$ occurred from September 2015 to March 2016 at the Thirty-Third site. Data from the Thirty-Third site and the Diablo site during this period show similar 1-hour CO and 24-hour $PM_{2.5}$ trends, with the Thirty-Third site having higher peak CO and $PM_{2.5}$ values. By installing CO and $PM_{2.5}$ SLAMS monitors at the Thirty-Third near-road site, MCAQD will continue to meet the 40 CFR 58 Appendix D near-road requirements for CO and $PM_{2.5}$, and data collection for implementation of the National Ambient Air Quality Standards (NAAQS) will not be compromised. This approval assumes that the CO and $PM_{2.5}$ SLAMS monitors at the Thirty-Third near-road site will meet all 40 CFR 58 requirements, including the siting requirements specified in Appendix E. Please work with the EPA to ensure that the monitors meet all relevant requirements. The EPA's approval of discontinuation of CO and $PM_{2.5}$ monitoring at Diablo is contingent upon installation and operation of the new CO and $PM_{2.5}$ SLAMS monitors at the Thirty-Third site.

Based on these analyses, the EPA approves the relocation of the NO_2 near-road SLAMS monitor at Diablo to the proposed new near-road site, and approves discontinuation of the CO and $PM_{2.5}$ near-road SLAMS monitors at the Diablo site contingent upon installation and operation of new CO and $PM_{2.5}$ near-road SLAMS monitors at the Thirty-Third site. Please include these network modifications and the EPA's approval in your next ANP. If you have any questions, please feel free to contact me at (415) 947-4134 or Randy Chang at (415) 947-4180 or Anna Mebust at (415) 972-3265.

Sincerely,

Gwen M. Yoshimura

Digitally signed by Gwen M. Yoshimura
Date: 2020.06.01 09:51:08 -07'00'

Gwen Yoshimura,
Manager, Air Quality Analysis Office
Air and Radiation Division

Enclosure: Region 9 Near-road Plan Review Checklist

Region 9 Near-road Plan review checklist
Checklist Version date: February 9, 2017

Agency: Maricopa County Air Quality Department (MCAQD)
CBSA: Phoenix-Mesa-Scottsdale
Proposed New Site*: East of 36th Street, south of I-10, latitude: 33.41048, longitude: -112.00289
Review date: March 20, 2020
**Diablo (AQS ID: 04-013-4019) NO_2 relocation*

This checklist is intended to clarify those elements that EPA will be looking for during the review of proposed near-road monitoring sites. Please note that this checklist is based on near-road site selection criteria specified in 40 CFR Part 58 Appendix D section 4.3.2, but does not substitute for those requirements, nor do its contents provide a binding determination of compliance with those requirements. The checklist is subject to revision in the future and we welcome comments on its contents and structure.

COMPLETENESS CHECK:

No.	Near-road plan requirement	Citation	Info submitted?[1] If yes, page #s.	Requirement met?[2]	Notes
1	Evidence of public comment on proposed site(s), no changes subsequent to proposal, and submittal of any received comments	40 CFR 58.10(a)(2)	Yes, 2015 Annual Network Plan (ANP)	Yes	With their December 2019 request, MCAQD submitted analysis of updated traffic counts to confirm that the original 2012 near-road analysis was still pertinent and relevant.
2	Anticipated operation start date	40 CFR 58.10(a)(5)	TBD	Yes	Site is being relocated to new site
3	AQS site identification number	40 CFR 58.10(b)(1)	04-013-4019 (existing)	Yes	AQS ID is for present site. New site will likely need new AQS site ID to be assigned.
4	Location (street address & geographical coordinates)	40 CFR 58.10(b)(2)	Relocation request	Yes	
5	Sampling and analysis method (method code)	40 CFR 58.10(b)(3)	2019 ANP	Yes	Relocation of monitor from existing site to new site
6	Operation Schedule (Season & sampling frequency)	40 CFR 58.10(b)(4)	2019 ANP	Yes	Relocation of monitor from existing site to new site
7	Any proposal to remove or move the monitor within a period of 18 months following plan submittal	40 CFR 58.10(b)(5)	2019 ANP	Yes	Relocation of monitor from existing site to new site
8	Monitoring objective & spatial scale of representativeness	40 CFR 58.10(b)(6)	2019 ANP	Yes	Same as for existing site
9	CBSA represented by the monitor	40 CFR 58.10(b)(8)	Phoenix-Mesa-Scottsdale	Yes	

[1] Response options: N/A (Not Applicable), Yes, No, Incomplete, Incorrect. The responses "Incomplete" and "Incorrect" assume that some information has been provided.

[2] Response options: N/A (Not Applicable) – [reason], Yes, No, Insufficient to Judge. Assumes information submitted is correct.

	Network Design requirements (40 CFR 58, Appendix D, Section 4.3.2)				
10	CBSA population & year	40 CFR 58, App. D 4.3.2(a)	2019 ANP	Yes	
11	Maximum AADT counts & year for the CBSA(s)	40 CFR 58, App. D 4.3.2(a)	2019 ANP	Yes	
12	Correct # of required near-road NO_2 monitors for the CBSA(s)	40 CFR 58, App. D 4.3.2(a)	2019 ANP	Yes	
13	Were all road segments within the CBSA ranked by AADT?	40 CFR 58, App. D 4.3.2(a)(1)	Near Road Assessment (NRA) in 2015 ANP	Yes	
14	Discussion of how fleet mix is considered	40 CFR 58, App. D 4.3.2(a)(1)	NRA in 2015 ANP	Yes	
15	Discussion of how roadway design is considered	40 CFR 58, App. D 4.3.2(a)(1)	NRA in 2015 ANP	Yes	
16	Discussion of how congestion is considered	40 CFR 58, App. D 4.3.2(a)(1)	NRA in 2015 ANP	Yes	
17	Discussion of how terrain is considered	40 CFR 58, App. D 4.3.2(a)(1)	NRA in 2015 ANP	Yes	
18	Discussion of how meteorology is considered	40 CFR 58, App. D 4.3.2(a)(1)	NRA in 2015 ANP	Yes	
19	After above factors considered, if multiple candidate sites where max concentrations expected: Discussion of how population exposure is considered?	40 CFR 58, App. D 4.3.2(a)(1)	NRA in 2015 ANP	Yes	

20	Where the site proposed is the 2nd in the CBSA: Discussion of differing factors compared to first site (i.e. fleet mix; congestion; terrain; geographic area within CBSA; or different route, interstate, or freeway designation).	40 CFR 58, App. D 4.3.2(a)(1)	NRA in 2015 ANP	Yes	Site proposed is relocation of the 1st site in the CBSA.
	Siting criteria requirements (40 CFR 58, Appendix E)-				
21	Distance from target road segment as near as practicable (TAD recommendation is within 20 meters) & no more than 50 meters?	40 CFR 58, App. E 6.4(a)	2019 ANP	Yes	
22	Vertical inlet placement between 2-7 meters?	40 CFR 58, App. E 2	2019 ANP	Yes	
23	Probe distance from supporting structures is at least 1 meter away vertically or horizontally?	40 CFR 58, App. E 2	2019 ANP	Yes	
24	Is air flow unobstructed between the probe and the outside nearest edge of the targeted road segment?	40 CFR 58, App. E 4(d)	2019 ANP	Yes	

SUPPORTING/ADDITIONAL INFORMATION: Based on Near-road NO_2 monitoring TAD and experience.

Check	**(Yes, No, N/A) If yes, page #s.**	**Comments**
If top FE-AADT segment not selected, is adequate justification provided for higher ranks not selected?	Yes, Relocation request	Original site was the highest FE-AADT segment. The proposed is the fifth highest ranked.
If similar top FE-AADT candidate sites available, was most congested segment selected?	Yes, NRA in 2015 ANP	Proposed site is along the same most congested segment.
Is candidate site selected downwind of target road segment?	Yes, NRA in 2015 ANP	
Are wind roses included to show predominant wind patterns?	Yes, NRA in 2015 ANP	
Are physical attributes (roadway design, roadside structures, or terrain) desirable according to Table 4-2 of the Near-road NO_2 TAD (see below)?	Yes, NRA in 2015 ANP	
If physical attributes (roadway design, roadside structures, or terrain) NOT desirable according to Table 4-2 of the Near-road NO_2 TAD, are they TYPICAL for the area?	Yes, NRA in 2015 ANP	
Was population exposure correctly considered as an additional factor AFTER consideration of primary factors (FE-AADT, congestion, roadway design, terrain, meteorology) and IF multiple max concentration candidate sites identified?	Yes, NRA in 2015 ANP	
Will this be a multi-pollutant site? If so, list additional parameters planned in Comments.	No	CO and PM2.5 moved to Thirty-Third site
Does agency ensure candidate selection is NOT in a "unique" location? (See Near-road NO_2 TAD section 13.2 included below)	Not in a "unique" location. See NRA in 2015 ANP	

Table 4-2. Summary of Physical Considerations for Candidate Near-Road Sites.

Physical Site Component	Impact on Site Selection	Desirable Attributes	Least Desirable Attributes	Potential Information Sources
Roadway design or configuration	Feasibility of monitor placements; affects pollutant transport and dispersion.	At-grade or nearly at-grade with immediate surrounding terrain.	Deep cut-sections/significantly below grade; significantly above grade (fill or bridge); above grade (bridge).	Field reconnaissance; satellite imagery
Roadside Structures	Feasibility of monitor placements; affects pollutant transport and dispersion.	Present other than low (<2 m in height) vegetation or safety features such as guardrails.	Presence of sound walls, mature (high and thick) vegetation, obstructive buildings.	Field reconnaissance; satellite imagery
Terrain	Affects pollutant dispersion, local atmospheric stability.	Flat or gentle terrain, within a valley, or along a road grade.	Along mountain ridges or peaks, hillsides, or other naturally windswept areas.	Field reconnaissance; digital elevation models and vegetation files; satellite imagery.
Meteorology	Affects pollutant transport and dispersion.	Relative downwind locations; winds from road to monitor.	Strongly predominant upwind positions.	Local data; National Oceanic and Atmospheric Administration's (NOAA's) National Weather Service (NWS); EPA's Air Quality System (AQS).

13.2 Unique Locations and Background Source Influences

In the evaluation process, state and local air agencies may encounter situations where certain road segments of interest have characteristics that make the location a unique near-road location that has elevated pollutant concentrations. In such cases, the pollutant concentrations are not representative of other near-road locations across the CBSA. The unique characteristics of these locations could be due to the close proximity of a substantial stationary source, non-road mobile sources, or roadway design features (such as tunnel entrances and exits or toll plazas). In situations where a state or local air agency has a choice between road segments that otherwise have similar potential for peak NO2 concentrations, the air agencies should place a higher weight on sites that are most influenced by typical roadway activity rather than those that are heavily influenced by unique sources or features. This approach increases the probability that the chosen site can represent a larger population exposure within and across CBSAs.

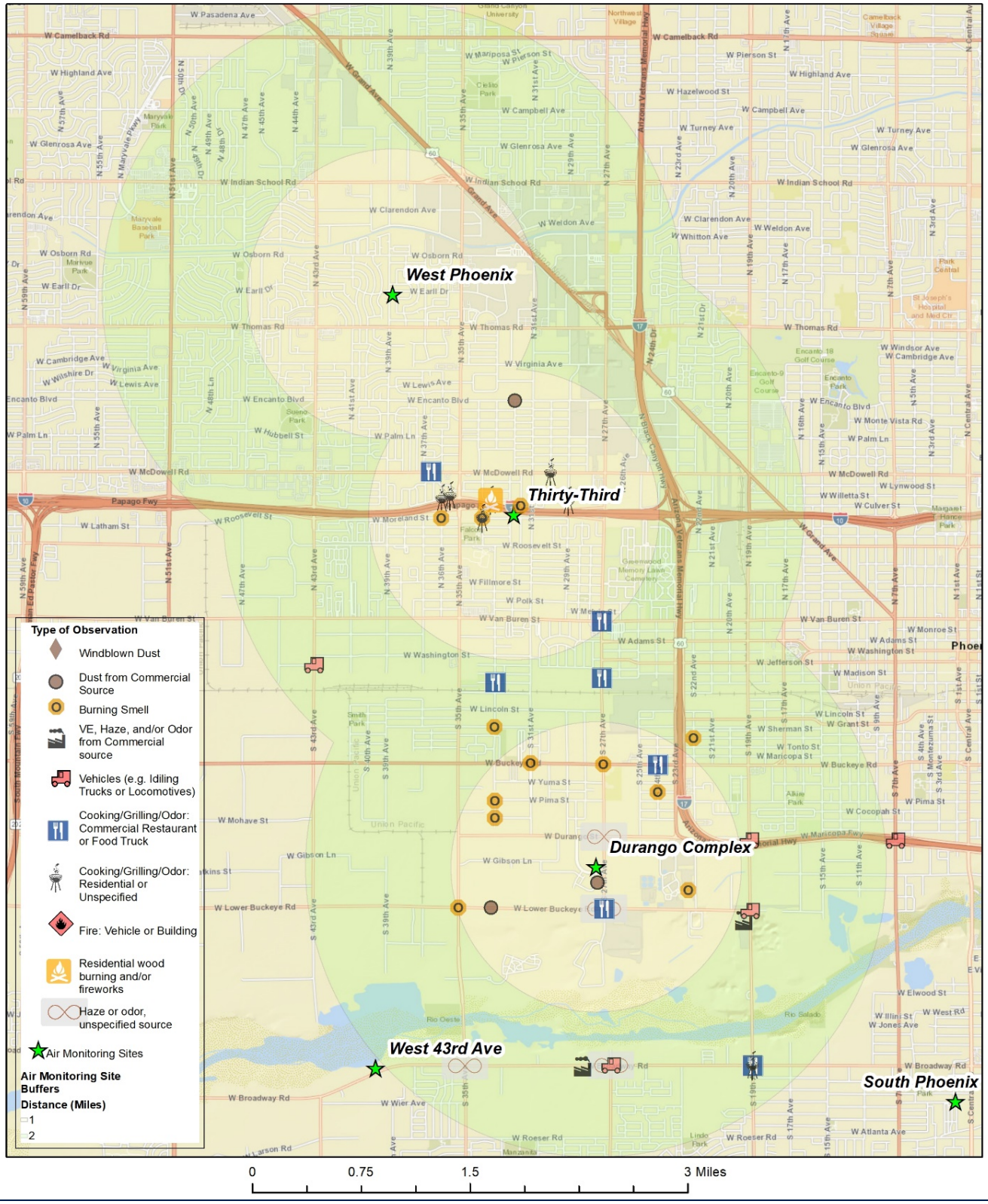
The EPA recognizes that state and local air agencies will likely have a good understanding of whether candidate near-road NO2 monitoring sites have unique characteristics that do or do not represent the CBSA that those sites are within. The EPA encourages state and local air agencies to use their local knowledge in site selection and to engage the EPA Regional staff for assistance in evaluating such a situation as necessary.

Appendix B

Maps of Inspector Observations During the November 2022 Surveys

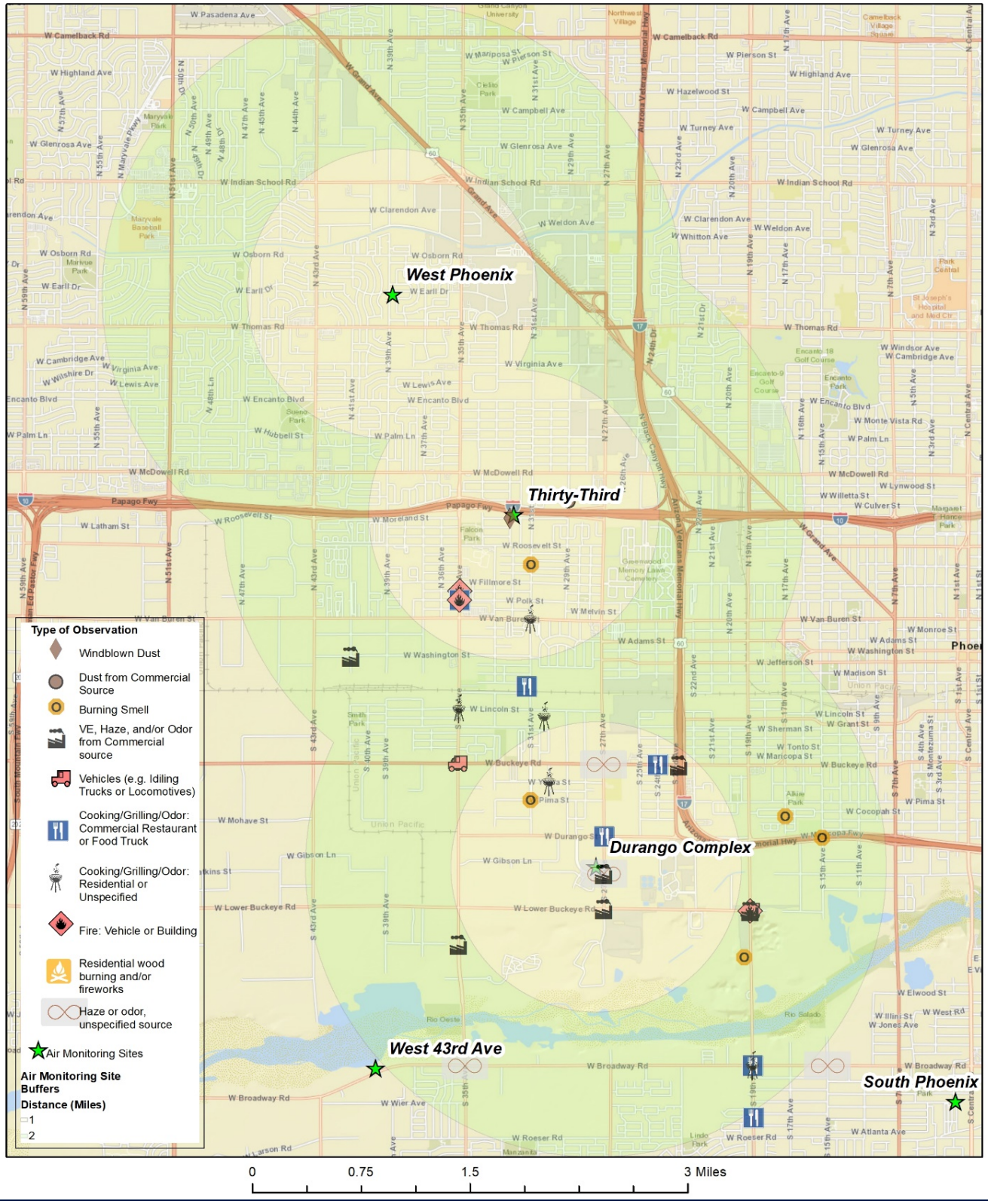
Inspector Observations 11/02/2022

7:00 AM - 10:00 AM



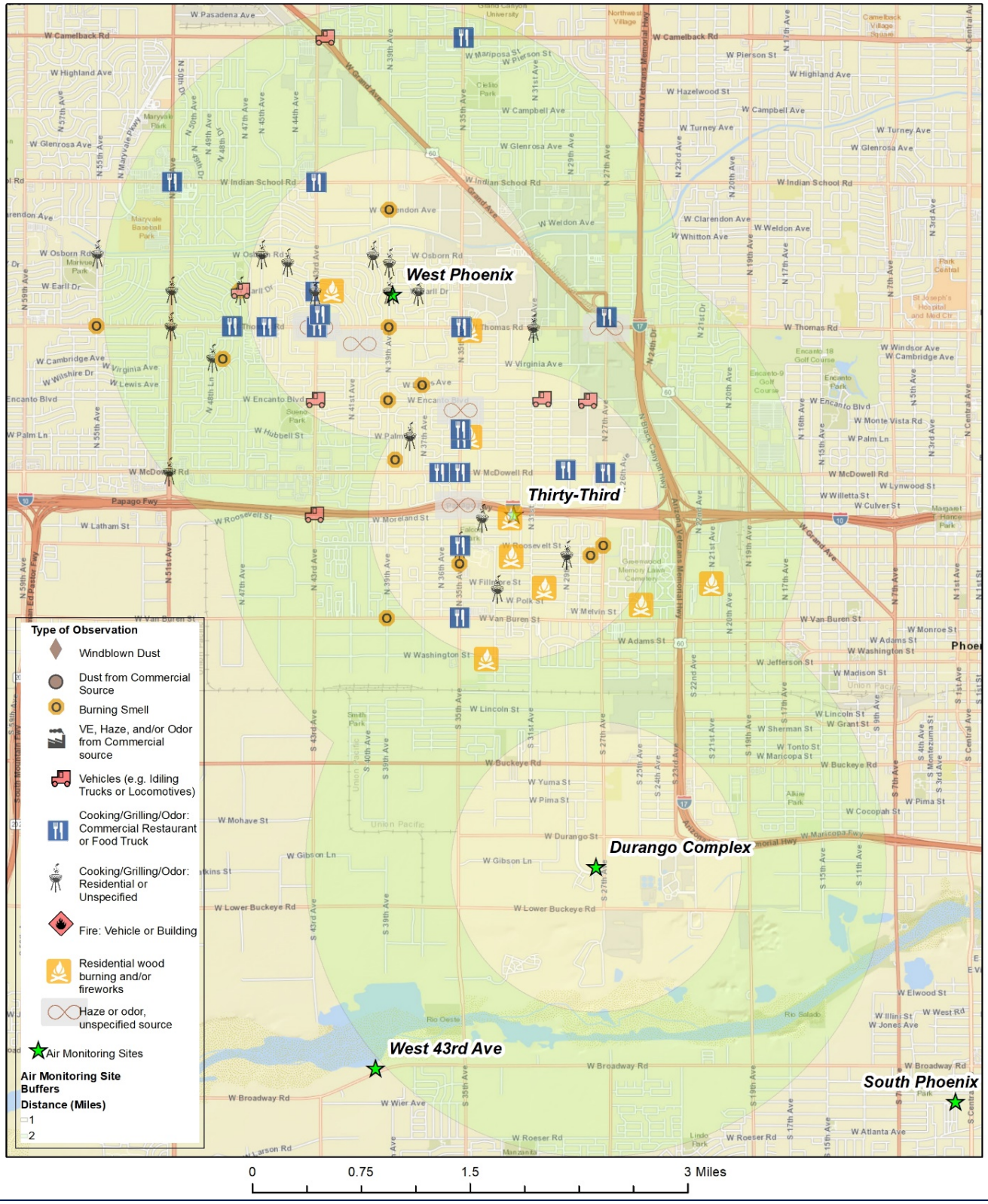
Inspector Observations 11/03/2022

7:00 AM - 10:00 AM



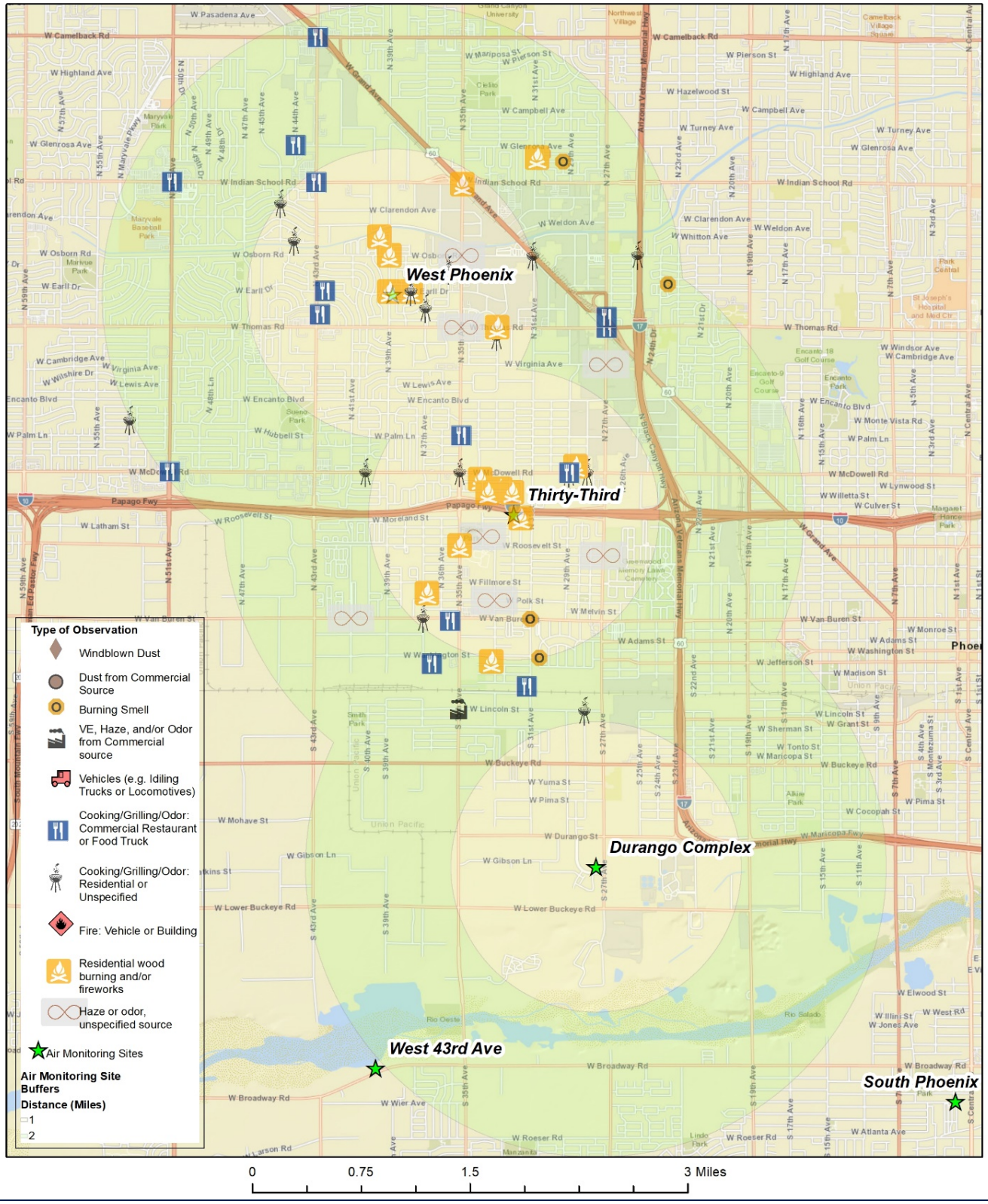
Inspector Observations 11/04/2022

6:00 PM - 9:00 PM



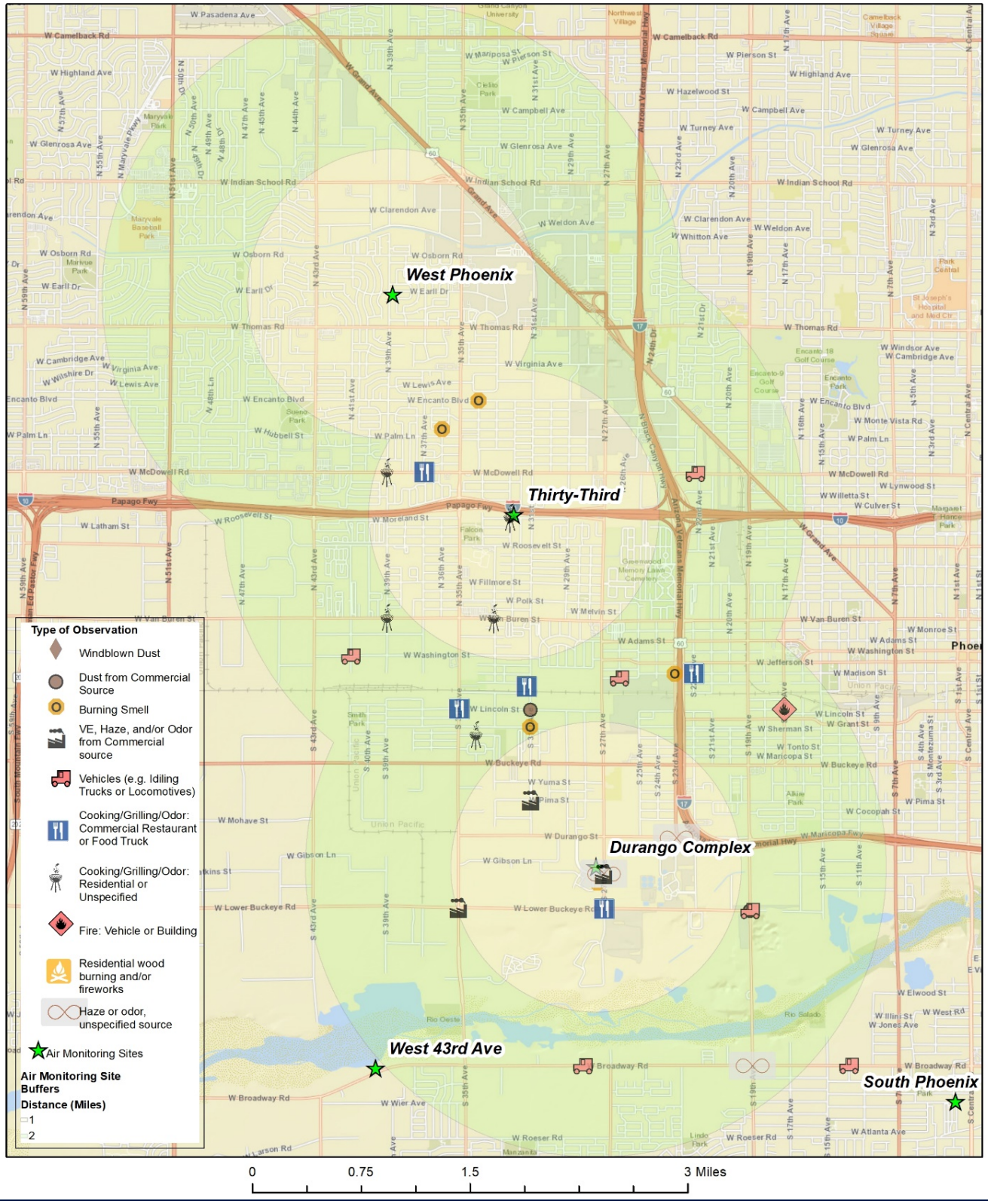
Inspector Observations 11/05/2022

6:00 PM - 9:00 PM



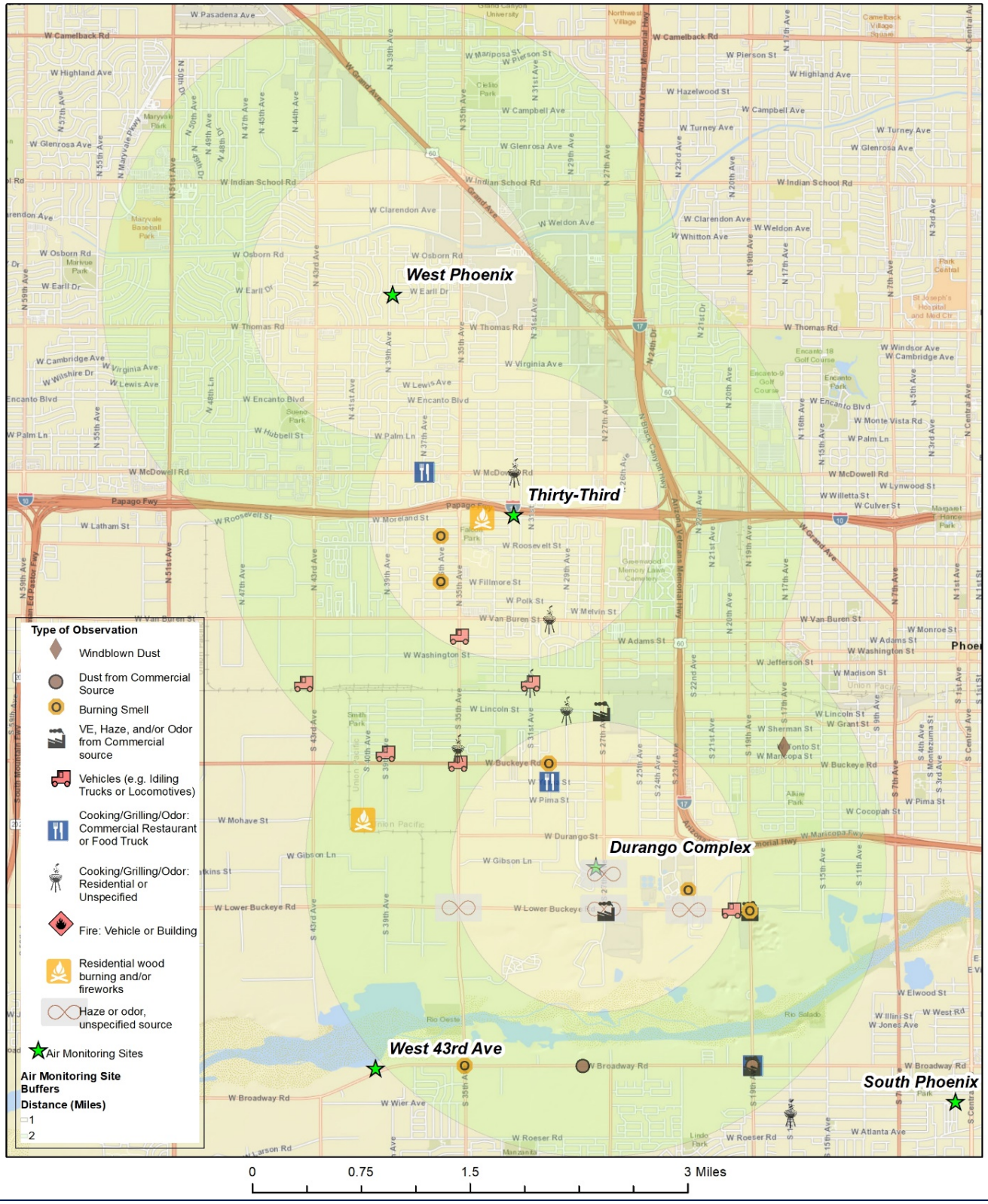
Inspector Observations 11/09/2022

7:00 AM - 10:00 AM



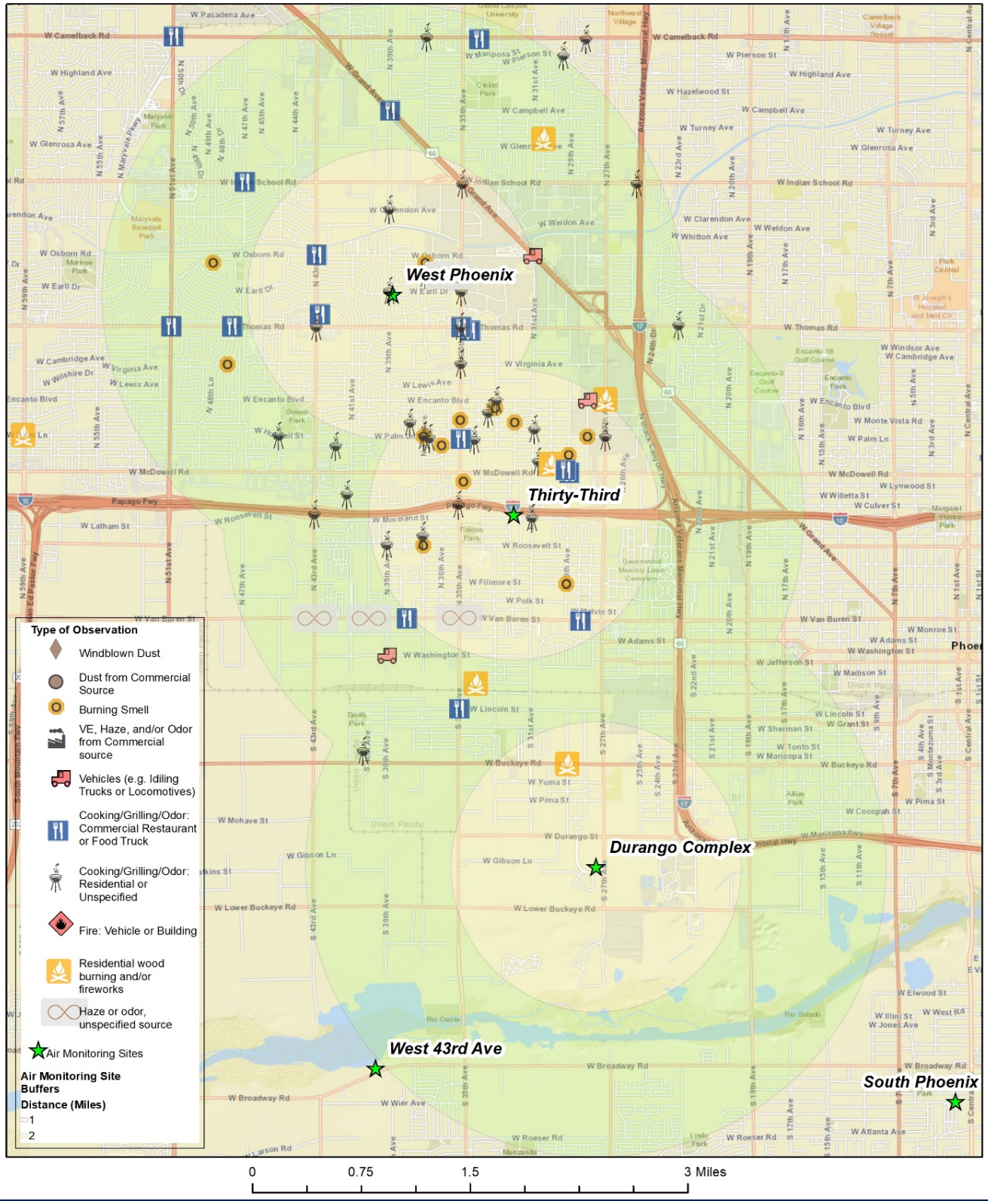
Inspector Observations 11/10/2022

7:00 AM - 10:00 AM



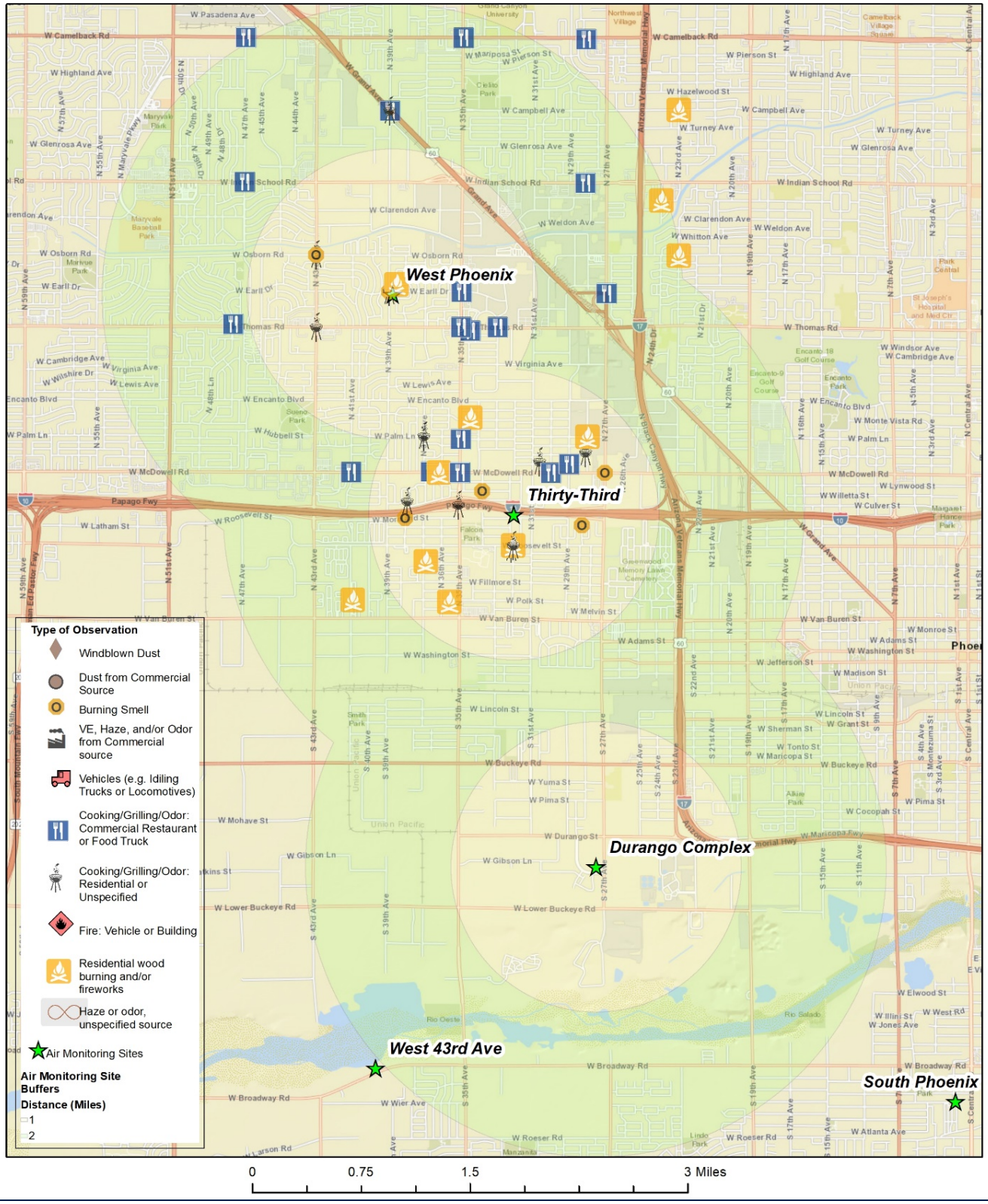
Inspector Observations 11/11/2022

6:00 PM - 9:00 PM



Inspector Observations 11/12/2022

6:00 PM - 9:00 PM



Appendix III - Public Notice and Comment Information

Figure 16 shows the public comment period announcement, which appeared in The Record Reporter on May 19th and May 26th, 2023. The public comment period was from May 22nd, 2023, to June 21st, 2023.

Additionally, the public notice was posted on the Maricopa County Air Quality Department website at **Maricopa.Gov/1624**.

2023 Public Comment Period Announcement

MARICOPA COUNTY AIR QUALITY

MARICOPA COUNTY AIR QUALITY DEPARTMENT
PUBLIC NOTICE AND MEETING ANNOUNCEMENT

Start of 30-day Public Comment Period: May 22, 2023
End of 30-day Public Comment Period: June 21, 2023

The Maricopa County Air Quality Department will hold a public meeting to discuss the 2023 Air Monitoring Network Plan. The Network Plan reports the ambient air monitoring activity captured by the Department's 23 air monitoring sites throughout Maricopa County during 2022. The 2023 Network Plan provides a summary of the airborne pollutants measured, the air monitoring network design, air monitoring site details, and statistical analyses of pollutant data. The 2023 Network Plan also covers proposed changes to the County's air monitoring network in 2023.

A virtual public comment meeting hosted by the Air Monitoring Division will be held on Wednesday, June 7th, from 10 a.m. – 12 p.m. via Microsoft Teams.

Join on your computer, mobile app or room device
Click here to join the meeting
Meeting ID: 241 520 323 76
Passcode: cHahZe
Download Teams | Join on the web

Join with a video conferencing device
708137873@t.plcm.vc
Video Conference ID: 117 771 552 9
Alternate VTC instructions

Or call in (audio only)
+1 480-702-3496,,56936998# United States, Phoenix
Phone Conference ID: 569 369 98#
Find a local number | Reset PIN

New to Microsoft Teams? Get the app now and be ready when your first meeting starts: https://www.microsoft.com/en-us/microsoft-teams/group-chat-software

Figure 20 Network Plan Public Notice

The purpose of the meeting is to receive and discuss comments from the public regarding the 2023 Network Plan. Members of the public may comment in person during the meeting or through written statements to the department.

Additional information regarding the 2023 Network Plan may be obtained by contacting AJ Mesko at (602) 506-2601, or by email at AirMonitoring@Maricopa.gov. An electronic copy of the 2023 Network Plan is currently available on the department's website at: https://www.maricopa.gov/1669/Air-Monitoring-Network-Plans-Assessments.

In accordance with §49-426 and §49-480.02 of the Arizona Revised Statutes (ARS), any person may submit to the Air Quality Monitoring Division Manager, written comments before the end of the public comment period. Any written comment shall state the name and mailing address of the person, shall be signed by the person, his agent, or his attorney. Written comments may be mailed to the Air Monitoring Division's address at: 2145 S. 11th Ave, Phoenix, AZ 85007 or emailed to: AirMonitoring@Maricopa.gov. All comments are due to the department on Wednesday, June 21st, 2023, by 5 p.m.

Copies of the document and other records may be obtained by contacting the department's Records Division at 602-506-6201 or submitting a public record request online at: https://www.maricopa.gov/5073/Public-Records-Request.

MCAQD will take reasonable measures to provide access to department services to individuals with limited ability to speak, write, or understand English and/or to those with disabilities. Requests for language interpretation services or for disability accommodations must be made at least 48 hours in advance by contacting: (602) 506-6443.

MCAQD tomará las medidas necesarias para brindar acceso a los servicios del departamento a personas que no dominan el idioma inglés y/o personas con discapacidades. Las solicitudes de servicios de interpretación de otro idioma o adaptaciones para discapacitados deben realizarse con al menos 48 horas de anticipación comunicándose con: (602) 506-6443.

Public Meeting Attendance – June 7th

Attendance to the virtual open forum meeting was taken by AJ Mesko in lieu of a sign-in sheet, and a list of attendees is shown on Table 26.

Table 33 2022 Open Forum Meeting Attendees

Name	Agency

AJ Mesko	Maricopa County Air Quality Department
Karla Copeland	Maricopa County Air Quality Department
	Maricopa County Air Quality Department

Public Comments Received and MCAQD Responses

As stated in the announcement, the open forum meeting provides an opportunity for members of the public and air monitoring community to discuss the County's air monitoring network. No comments were received during the 30-day comment period.

Appendix IV - Glossary

Glossary of Acronyms and Terms

ADEQ:	Arizona Department of Environmental Quality
AADT:	annual average daily traffic count
aka:	Also known as
AMD:	Air Monitoring Division
AMNP:	Air Monitoring Network Plan - an annual report produced for U.S. EPA each calendar year that provides comprehensive information regarding the performance of the County's air quality surveillance system, e.g., network of SLAMS and SPM monitoring stations and / or sites, and the data collected and reported to EPA. The plan includes proposed future changes to the system as well.
Analysis Method	Refers to the laboratory method used to process and analyze PM and Pb filter samples.
Analyzer:	A monitor that samples the air and produces real-time data without collecting a sample that must be laboratory analyzed.
ANSI:	American National Standards Institute
AQI:	Air Quality Index - the index that applies to each criteria pollutant and shows the concentration of each pollutant relative to its respective standard. When the AQI reaches 101, the pollutant's concentration has exceeded the NAAQS.
AQS:	Air Quality System, sometimes defined as the Air Quality Subsystem. The AQS is the U.S. EPA's ambient air database.
ASQ:	American Society for Quality
Attainment:	Attainment refers to a geographical area as being "in compliance" with a NAAQS and the U.S. Clean Air Act. After several years of no violations of a NAAQS, the U.S. EPA can

	classify a geographic area as in attainment for a particular Criteria Pollutant.
AWT:	Average Weekday Traffic count
BAM:	Beta Attenuation Monitor. A continuous particulate measuring instrument used previously by MCAQD to measure PM_{10}.
CAA:	Clean Air Act
CASAC:	Clean Air Scientific Advisory Committee
CBSA:	Core-Based Statistical Area – is defined by the U.S. Office of Management and Budget as a statistical geographic entity consisting of the county or counties associated with at least one urbanized area/urban cluster of at least 10,000 in population, plus adjacent counties having a high degree of social and economic integration.
CFR:	The Code of Federal Regulations is published annually and contains the codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government. An eCFR is a free electronic version; however, it is not the legal version.
Class I Area:	Federally designated areas of special national or regional scenic, recreational, or historic value where maximum protection of environmental quality is highest. Class 1 areas are subject to special protection including mandated visibility requirements to prevent significant deterioration.
CO:	Carbon monoxide, a criteria pollutant
Collocated:	The practice of establishing a second pollutant monitor within a specified distance and of a specified type at a monitoring site for quality assurance purposes.
Continuous Monitor:	A method of monitoring air pollutants that is continually measuring the quantity of the pollutant, either gaseous or particulate. Continuous monitors are analyzers that can obtain real-time or short-term averages of pollutants. Continuous monitors may also be referred to as “automated” monitors.
Criteria Pollutants:	Six pollutants (CO, O_3, NO_2, Pb, PM, and SO_2) that have NAAQS established by the U.S. EPA.

CSA:	Combined Statistical Area - is defined by the U.S. Office of Management and Budget as when very large cities combine two or more CBSAs, these larger areas are referred to as combined statistical areas
CSN:	The chemical speciation network - a nationwide, research air monitoring network designed to ferret-out the chemical constitutes of and to discern trends in $PM_{2.5}$ pollution. This program is managed by the U.S. EPA OAQPS.
Delta T:	The difference between two levels of temperature measurements - Delta T is measured in the MCAQD network at heights of 2 and 10 meters. A higher temperature at the upper level indicates a temperature inversion.
Design Value:	A design value is a statistic that describes the air quality status of a given area relative to the level of the NAAQS. For a concentration-based standard, the air quality design value is simply the standard-related test statistic. The design value of a pollutant monitoring network is the highest sample value in the network used to compare to the NAAQS; i.e., the 24-hour $PM_{2.5}$ design value for the network is the monitor with the highest 3-year average of the 98^{th} percentile.
Distance from Obstructions Not on Roof:	Means the horizontal distance and vertical height in meters from obstructions such as trees, walls, etc. that are higher than the sample probe/inlet.
Distance from Obstructions on Roof:	Means the horizontal distance and vertical height in meters from obstructions on a roof such as a parapets, penthouses, and firewalls to the sample probe/inlet.
Distance from Supporting Structure:	Means the horizontal distance and vertical height in meters from a building or shelter roof to the sample probe/inlet. A roof supports all monitors; whether it be the roof of a building, trailer (room/shelter), or monitor housing cabinet.
EBAM:	E-Beta Attenuation Monitor - is a rugged, portable, battery or solar-operated analyzer that is suitable for obtaining and reporting continuous measurements of particulate matter in remote locations. EBAMs are often equipped with wind speed and direction instrumentation as well. EBAMs are particularly useful for temporary measurements of PM related to an event.
EPA R9:	Environmental Protection Agency Region 9

EE:	Exceptional Event – a high pollution event that is considered to be uncontrollable and caused by natural sources of pollution or an event that is not expected to recur at a given location. An EE can apply to any Criteria Pollutant.
Event:	Generally, refers to a high pollution day where a NAAQS was exceeded.
Exceedance:	Generally, refers to a high pollution day where a NAAQS was exceeded.
FDMS-TEOM:	Filter Dynamics Measurement System-Tapered Element Oscillating Microbalance - a continuous particulate analyzer used by MCAQD to measure $PM_{2.5}$.
FEM:	Federal Equivalent Method - an EPA-approved method of sampling and analyzing the ambient air for an air pollutant, i.e., includes the monitor and its operating firmware and procedure(s). An FEM must pass required testing found in 40 CFR Part 53 and show pollutant data produced are similar to the Federal Reference Method (FRM). Continuous particulate matter and some gaseous analyzers are FEMs.
Filter-based sampler:	A method of monitoring particulate pollution that involves exposing a pre-weighed filter to a specific flow rate for a prescribed period of time, usually midnight to midnight, or 1440 minutes. The filters are then post-weighed to determine the mass of particulates per volume, e.g., $\mu g/m^3$. Filter samples are stored for a period and can be referenced later if needed.
FRM:	Federal Reference Method - an EPA-approved method of sampling and/or analyzing the ambient air for an air pollutant, i.e., includes the monitor and its operating firmware and procedure(s). An FRM must pass required testing found in 40 CFR Part 53 and show data produced are accurate based on acceptable precision and bias limits. These methods are the baseline that all other methods reference, e.g., Federal Equivalency Methods (FEM).
HAPs:	Hazardous Air Pollutants - airborne chemicals that are been listed in the federal Clean Air Act and have an associated standard or process requirement determined for it.
Sample Probe/Inlet Height:	Means the vertical height in meters above the roof, or additional supporting structure on top of the roof if present, to the air sample intake. In general, gas samples enter through a probe at the end of the sample line and PM and Pb samples enter through

	an inlet that helps control the aerodynamic size of particles sampled.
MAG:	Maricopa Association of Governments
MCAQCED:	Maricopa County Air Quality Compliance and Enforcement Division
MCAQD:	Maricopa County Air Quality Department
Metadata:	refers to data that provide information about other data; and typically includes geospatial and non-geospatial information. See **EPA Metadata Specifications**
MO:	Monitoring organization
Monitor:	Monitor is a term that refers to an instrument, sampler, analyzer, or other device that measures or assists in the measurement of atmospheric air pollutants and which is acceptable for use in ambient air surveillance under the applicable provisions of 40 CFR Part 58 Appendix C.
µg/m^3:	micrograms per cubic meter
µm:	micrometers
MSA:	Metropolitan Statistical Area is designated by the U.S. Office of Management and Budget as a geographical area based on the concept of a core area with a large population nucleus, plus adjacent communities having a high degree of economic and social integration within that core. Metropolitan and micropolitan statistical areas are the two categories of CBSAs. Metropolitan areas have populations greater than 50,000, and micropolitan areas have populations between 10,000 and 50,000. The MCAQD operates air monitoring stations within the Phoenix-Mesa MSA, which includes portions of Maricopa and Pinal County.
NAAQS:	National Ambient Air Quality Standards - health and welfare-based standards established by the U.S. EPA that set permissible airborne concentration levels for the Criteria Pollutants.
NATTS:	National Air Toxics Trend Stations - a nationwide, research air monitoring program designed to measure toxic air pollutant trends. This program is managed by the U.S. EPA OAQPS.

NCore:	National Core multi-pollutant is a national network of multi-pollutant monitoring sites used to represent the nation as a whole. There are currently ~75 NCore sites, 1 to 3 per state plus Washington D.C., Virgin Islands, and Puerto Rico located in both urban and rural areas. This program is managed by the U.S. EPA OAQPS.
Network:	All stations of a given type or types
NO_2:	Nitrogen dioxide. The indicator compound used to gauge the ambient concentration of NO_x.
NO_X:	Nitrogen oxide(s), a criteria pollutant. NO_x is the sum of nitric oxide (NO), NO_2, and other nitrogen-containing compounds.
Nonattainment:	Means a geographical area is "not in compliance" with the NAAQS and the U.S. Clean Air Act. After several years of violating a NAAQS, the EPA can classify a geographic area as being in nonattainment for a particular criteria pollutant.
O_3:	Ozone, a criteria pollutant
OAQPS:	The U.S. EPA Office of Air Quality Planning and Standards, located in Research Triangle Park, N.C., which serves as EPA "Headquarters" for ambient air monitoring guidance and the NAAQS reviews.
PAMS:	Photochemical Ambient Monitoring Stations - a nationwide, research air monitoring program designed to measure specific airborne chemicals that are known to be "precursor pollutants" that form ozone when combined with ultraviolet light and heat. This program is managed by the U.S. EPA OAQPS.
PCAQCD:	Pinal County Air Quality Control District
Pb:	Lead, a criteria pollutant
Performance Evaluation (PE) Audit:	Quality Assurance audits performed on pollutant monitors.
PM:	Particulate matter, also known as "particulates", project manager, or preventative maintenance depending on context
$PM_{2.5}$:	Particulate matter 2.5 micrometers in aerometric diameter or smaller, a criteria pollutant. $PM_{2.5}$ is also referred to as "fine" particulate matter.

PM_{10}:	Particulate matter 10 micrometers in aerometric diameter or smaller, a criteria pollutant
$PM_{10-2.5}$ and / or PM_c:	“Coarse” particulate matter is less than 10 micrometers, but recently, has come to mean PM_{10} minus $PM_{2.5}$, not currently regulated as a lone criteria pollutant.
ppb:	parts per billion
ppm:	parts per million
PQAO:	Primary quality assurance organization - a monitoring organization (MO) or other organization that is responsible for a set of air monitoring stations that monitor the same pollutant and for which data quality assessments can be pooled. Each criteria pollutant sampler/monitor at a monitoring station in the SLAMS and SPM networks must be associated with one, and only one, primary quality assurance organization.
Primary Standard:	The portion of the NAAQS designed to protect public health.
Probe:	The end of a sample line where a gas sample is extracted from the atmosphere for delivery to a point analyzer for pollutant analysis
Probe/Inlet Height:	The vertical height in meters above ground level to the air sample intake location for an analyzer or sampler
Probe (Sample) Line Material:	Refers to the chemical composition of the sample line tubbing.
QA:	Quality Assurance – generally refers to the administrative or managerial processes in place to verify that quality control activities are successfully carried out by personnel and that data produced meet specified quality requirements prior to use, i.e., written guidance documents, program oversight activities, etc.
QC:	Quality Control – generally refers to the technical activities in place to produce high quality data, i.e., air monitoring instruments operate within specified criteria, data collection from sites, etc.
Quality System:	The overall system of technical activities that measure the attributes and performance of a process, item, or service against defined standards to verify that they meet the stated

	requirements established by the customer. (see ANSI/ASQ E4-2004)
Rapid Response:	Rapid Response Notification System - a communication tool used by MCAQD to manage high pollution events by alerting residents, intergovernmental personnel, and stakeholders of increasing PM concentrations.
Sampler:	A type of air monitor that collects a physical sample for analysis. Air samples may be collected onto a filter, cartridge, or other medium, or into a device such as a canister.
Sample Residence Time:	This measurement applies to CO, NO_2, O_3, and SO_2 sample lines and it mean the amount of time in seconds that it takes for a sample of air to travel from the probe intake to the bulkhead of the point analyzer. EPA recommends a residence time of 10 seconds, but 20 second is the maximum allowable.
Secondary Standard:	The portion of the NAAQS designed to protect public welfare and the environment.
SIP:	State Implementation Plan - a SIP is a plan produced by state and/or local regulatory agencies that specifies obligations that will be taken for a geographic area in nonattainment to meet the NAAQS for a criteria pollutant. SIPs are also developed for maintaining compliance with the NAAQS.
Site:	A site is a geographic location. One or more air monitoring stations can be located at a site.
SLAMS:	State and Local Air Monitoring Station - the SLAMS network consists of approximately 5,000 monitoring stations nationwide whose size and distribution is largely determined by the needs of State and local air pollution control agencies to meet their respective SIP requirements. Other types of monitoring stations include: NCore (national core) and SPM (special purpose). Currently, the MCAQD operates SLAMS only.
SO_2:	Sulfur dioxide, a criteria pollutant
SPM:	Special Purpose Monitor - a special purpose monitor provides data for special studies needed by the State and local agencies to support SIPs and other air program activities. The SPMs are

	not permanently established as part of a particular pollutant's monitoring station(s); their location can be adjusted easily to accommodate changing needs and priorities.
SSI:	Size Selective Inlet - the inlet used on high- and low-volume particulate samplers and analyzers to determine the size of particles sampled or measured by the monitor. The particle size separation process usually employs impaction, filtration, or cyclonic flow.
Station:	A station may comprise a single pollutant monitor, or a group of monitors with a shared objective, located at a particular site.
TEOM:	Tapered Element Oscillating Microbalance - an automated, continuous FEM PM analyzer used by MCAQD to measure PM_{10} and/or $PM_{2.5}$ concentrations, depending upon the instrument model and air sample inlet configuration(s).
tpy:	tons per year
UATMP:	Urban Air Toxics Monitoring Program - a nationwide research air monitoring program designed to measure toxic air pollutants within urban areas. This program is managed by the U.S. EPA OAQPS.
U.S. EPA:	United States Environmental Protection Agency
VOC:	Volatile Organic Compound - VOCs are chemical compounds that can easily vaporize and enter the atmosphere. There are many natural and artificial sources of VOCs; solvents and gasoline make up some of the largest artificial sources. VOCs will react with NO_x in the presence of sunlight to create ground-level O_3 pollution.
Volume:	The amount of air sampled for analysis. Volume is calculated by multiplying a monitor's flowrate by the collection time, usually in minutes. Volume = flowrate X minutes The amount of data in a file or database.