2020 AIR MONITORING NETWORK REVIEW and 2021 PLAN

Final

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ACKNOWLEDGEMENTS

In 2020, the Maricopa County Air Quality Department's Air Monitoring Division maintained 22 ambient air monitoring sites throughout Maricopa County. Air Monitoring Division team members include: one manager, one quality assurance officer, two technician supervisors, two air quality planners, one management analyst, and thirteen technicians.

Maricopa County Air Quality Department would especially like to thank air monitoring personnel and atmospheric scientist for their excellent job in helping to maintain the County's air monitoring program. Respectively, they are: Ben Davis, Gary Ensminger, Reynaldo Santillano, Robert Dyer, Ceresa Stewart, Hirna Patel, Nikki Peterson, Alex Herrera, Andy Clifton, Carlos Ramos, Chris Pestka, Chris Holderead, Daniel Daniels, David Dubiel, Freddie Alejandro, John Neff, Jose Bravo, Miguel Reyes, Ralph Lucero, Rene Rodriguez, and Ron Pope.

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The Maricopa County Air Quality Department gratefully acknowledges the assistance of other agencies, which provided data and helpful comments to this review. These may include the Arizona Department of Environmental Quality, Pinal County Air Quality Control District, the Maricopa Association of Governments, and the Tribal air monitoring organizations adjacent to Maricopa County.

Last, we would like to thank the United States Environmental Protection Agency's Region 9 personnel for their guidance and support regarding our air monitoring program. Maricopa County Air Quality Department respectfully submits this 2020 Air Monitoring Network Review and 2021 Plan to Region 9 for review.

Cover photos: From the left: West 43rd site - new shelter
North Phoenix site - new shelter
West Phoenix site - small sensor for Phase III U.S. EPA Project

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ABSTRACT

In 2020, the Maricopa County Air Quality Department (MCAQD) Air Monitoring Division (AMD) successfully operated a robust air quality surveillance system that monitored for regulated ambient air pollutants as per *40 CFR Parts 50 and 58*. This 2020 Air Monitoring Network Review and 2021 Plan (AMNRP), or "Plan", documents how the system performed during 2020. The air monitoring data produced are intended for regulatory compliance determinations regarding six regulated ambient air pollutants, known as the "criteria pollutants". Except where otherwise noted, each monitor meets the requirements of *40 CFR Part 58 - Appendices A, B, C, D, and E,* where applicable.

The Plan covers changes made to the air monitoring network in 2020, and it provides supporting information for those changes. It also covers changes planned for 2021. MCAQD informs personnel at Environmental Protection Agency Region 9 (EPA R9) office of any significant data collection interruptions immediately.

During 2020, some notable accomplishments were:

- Receiving approval from the EPA R9 to temporarily relocate near-road pollutant monitors at the Diablo site to the Thirty-Third site to remain compliant with federal regulatory monitoring requirements;
- Removing the shelter and vacating the ADOT property that housed the Diablo near-road monitoring site, which closed in December 2020;
- Identifying a suitable replacement location for the Diablo site and receiving EPA R9 approval for the location; and securing a property use agreement with ADOT for the new site location and beginning construction;
- Submitting a request to EPA R9 for discontinuing delta T (temperature inversion) monitoring, and receiving approval to do so because the measurement system could not be easily replaced, and the data were no longer being used by customers;
- Completing the upgrades begun in 2019 at the West 43rd site by installing a new shelter and power supply;
- Replacing the ESC-8832 data loggers with the new Agiliare$_{LLC}$/ESC-8864 data loggers at four sites;
- Implementing the use of TELEDYNE API T-series gaseous analyzers with the proprietary NumaView™ Software, which provided better data acquisition, logging, and graphing capabilities; and thereby, improved the QC and QA Units' ability to analyze precision and multi-point verification/calibration data;
- Partnering with EPA's Office of Air Quality Planning and Standards (OAQPS) on a three-phase low-cost small air sensor research study designed to help determine each model's data accuracy, plus how well and long each model functions in a hot, arid environment; and
- Improving the AIRNow and MCAQD's online air quality maps for the public's use and benefit.

INTRODUCTION TO THE AIR MONITORING NETWORK PLAN

Each year, MCAQD produces a comprehensive AMNRP, or Plan, that provides vital information regarding the air monitoring surveillance system operating within Maricopa County. The Plan 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.

The Plan is complementary to the annual data certification process. It helps us continuously review, assess, and improve how well the County's air monitoring surveillance system, or "network", is performing. The design and performance of an ambient air monitoring network and data certification process are covered by the regulatory requirements found in *40 CFR Part 58 - 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 Plan addresses other regulatory requirements found in *40 CFR Part 58 Appendix A (quality assurance requirements for state and local air monitoring stations (SLAMS), Appendix C (ambient air quality monitoring methodology), Appendix D (network design criteria for ambient air quality monitoring), and Appendix E (probe and monitoring path siting criteria for ambient air quality monitoring), and Appendix G (AQI and daily reporting).* The Plan's information includes, but is not limited to:

- The purpose for monitoring and the type of monitoring conducted at each site;
- Detailed descriptions and metadata about each monitoring site;
- Metadata for each pollutant monitor that operated in 2020;
- Three years of criteria pollutant (CP) 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 CP network;
- Summaries of pollutant data by network and required statistical analyses;
- The quality and suitability of pollutant data for comparison to the NAAQS;
- The compliance status of MCAQD monitors with the six CP NAAQS, including exceedance days and violations;
- Proposed changes to the pollutant networks, sites, monitoring and analytical laboratory methods within the next 18 months;
- 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 our web map and AIRNow;
- Any requests for waivers from specific air monitoring requirements;
- Interagency correspondence regarding the air monitoring program; and
- Public comments received regarding the final draft AMNRP and MCAQD's response to the comments.

Regarding public comments, each year MCAQD solicits comments from the public on the final draft AMNRP during a 30-day public comment period. We also hold an open forum meeting, which is

open to the public. As needed, MCAQD amends the final draft based on the comments received and submits the Final AMNRP to EPA R9 for review and approval. EPA R9 completes the review process within 120 days of receiving the Plan, and EPA R9 Administrator, or their representative, must approve the requests for network changes and waivers. If EPA does not approve the Plan, then MCAQD addresses the concerns presented by EPA R9 personnel and submits a revised Plan. Following EPA's approval of the Plan, MCAQD posts it on our website.

In 2020, MCAQD's monitoring network was comprised of 22 monitoring sites. Figure 1 shows the location of MCAQD's air monitoring sites discussed in this year's Plan.

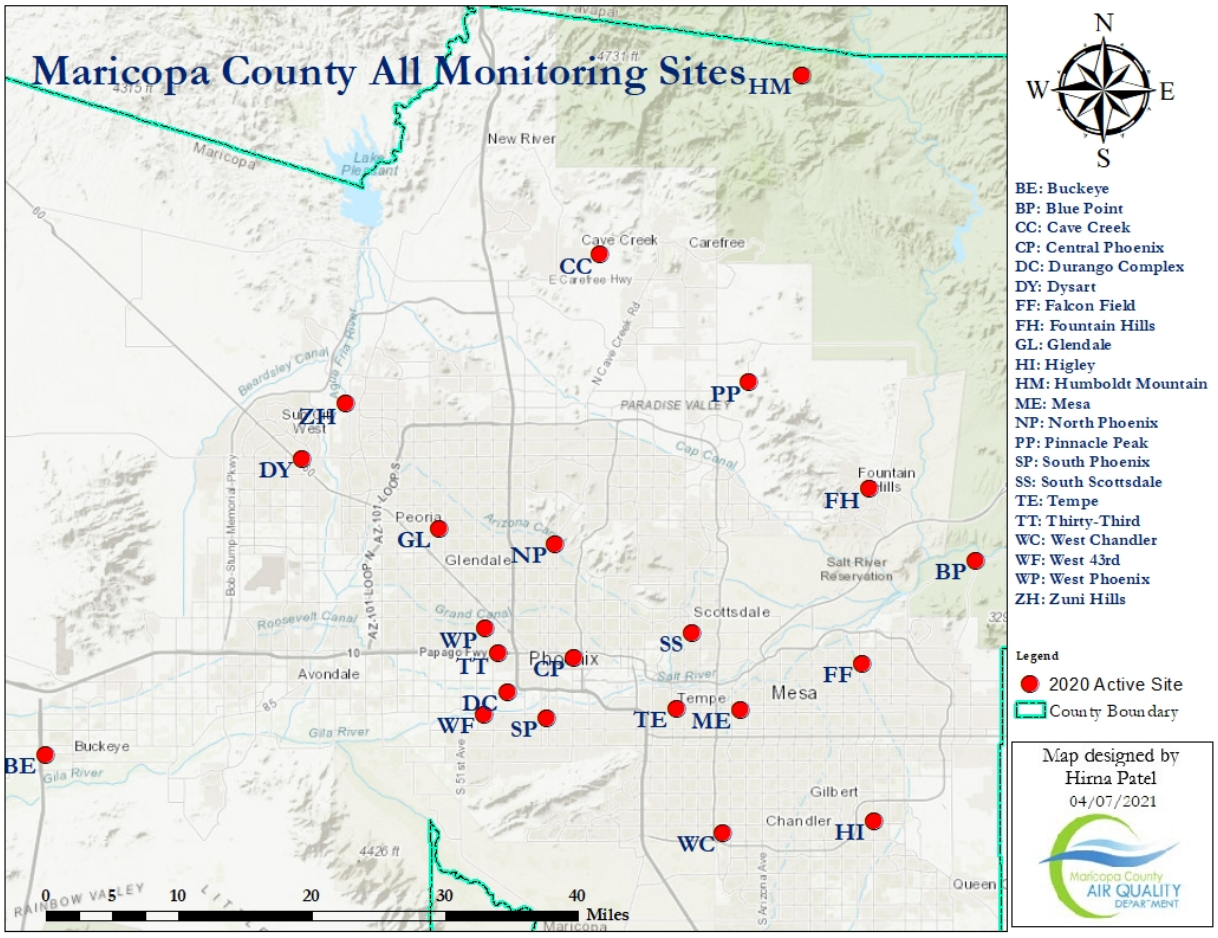


Figure 1. 2020 Air Monitoring Site Map

Overview of the Clean Air Act and Criteria Pollutants

Between the years 1900 and 1970, the emission of the six CPs increased significantly. These pollutants occur throughout the U.S., and are known to cause health problems, property damage, and harm to the environment. The first federal legislation involving air pollution control was the Air Pollution Control Act of 1955, which provided funds for federal air pollution research. Later, the Clean Air Act (CAA) of 1963 was passed, which was the first federal legislation to actually control air pollution. It authorized research into techniques for air monitoring and controlling air pollution. This led to the Air Quality Act of 1967 being passed, which expanded federal studies of air pollutant emission inventories, ambient air monitoring techniques, pollution control techniques, and initiated review of air pollution transport.

The enactment of the 1970 CAA produced a major shift in the federal government's role in air pollution. It authorized the development of comprehensive federal and state regulations to limit pollutant emissions from stationary and mobile sources. It also set forth four major regulatory programs affecting stationary pollution sources:

- NAAQS,
- State Implementation Plans (SIP),
- New Source Performance Standards (NSPS), and
- National Emission Standards for Hazardous Air Pollutants (NESHAPs).

The 1977 CAA Amendments (CAAA) furthered air monitoring efforts related to the "Prevention of Significant Deterioration" (PSD). In short, PSD air monitoring data are used for permitting a new source wishing to start-up in an attainment area. Then, the 1990 CAAA increased the authority and responsibility of the federal government, and it established new regulatory programs for acid rain deposition, stationary source permitting, and expanding the NESHAPs program to control toxic air pollutants. It also included provisions for protecting stratospheric O_3 and expanding air quality research programs.

The CAA, and its amendments, provide the framework for pertinent State/Local/Tribal (S/L/T) 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 *Appendix B* applies to PSD monitoring only and that no PSD monitoring was conducted within Maricopa County.

MCAQD monitors for five CPs, 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 U.S. EPA regulates CPs using the NAAQS, which establish ambient levels for each CP 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 CP in the ambient air. The primary standards protect public health and secondary standards protect public welfare by preventing damage to property such as farm crops and buildings, visibility impairment in national parks and wilderness areas, and the protection of ecosystems.

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. Lowering a NAAQS level occurs when medical, epidemiological and other scientific research such as ecosystem and visibility effects demonstrate that NAAQS are not adequately protecting public health and welfare. Detailed information regarding the NAAQS development can be found in this section under each pollutant's overview.

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 R9. 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.

The National Ambient Air Quality Standards

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 CP 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. Table 1 shows a summary of the current primary and secondary NAAQS levels for each CP.

Table 1. 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	8 hours	0.070 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

Source: Adapted from the table shown: https://www.epa.gov/criteria-air-pollutants/naaqs-table

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. The model generates information needed for meteorologists to make forecasts. For a decade or so, continuous analyzers and meteorological instruments have measured and reported hourly data to their monitoring organization (MO) for distribution and/or to AirNow. The readily available data are invaluable to air quality forecasters, because they can better predict what the air quality index (AQI) will be tomorrow.

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; plus, loads of helpful information on improving air quality. Figure 2 shows an overview of the content available.

Figure 2. MCAQD Clean Air Make More Website

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 CP health risks based upon data from their network. EPA requires that a MO within a metropolitan statistical area with a population greater than 350,000 report the AQI; otherwise, it is voluntary. To do so, EPA developed the AQI, which is a health risk communication tool that converts CP concentrations into six health-impact related color-coded indices based upon the NAAQS. Members of the public used 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 on Figure 3.

AQI colors

EPA has assigned a specific color to each AQI category to make it easier for people to understand quickly whether air pollution is reaching unhealthy levels in their communities. For example, the color orange means that conditions are "unhealthy for sensitive groups," while red means that conditions may be "unhealthy for everyone," and so on.

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 3. 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 well 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. Also, U.S. EPA provides an online NowCast calculator.

AirNow Web Maps

In 2015, EPA began transitioning to the new formulas on the AirNow website. Figure 4 shows the newly updated AIRNow website that includes multiple maps, which communicate air quality throughout the country. The Current default map shown below provides the NowCast for O_3 and PM pollutants. Again, the different AQI colors on the map indicate health risks using pollutant concentrations. Below, the combination of O_3, PM_{10}, and $PM_{2.5}$ is showing moderate health risks in the yellow areas and an increased risk for unhealthy or sensitive groups within the orange area.

The MCAQD has participated in the AirNow program since 2001. The MCAQD distributes 1-hour continuous CP 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 ADEQ, Local, Tribal, and National Park Service air monitoring operations within Arizona populate the map as well.

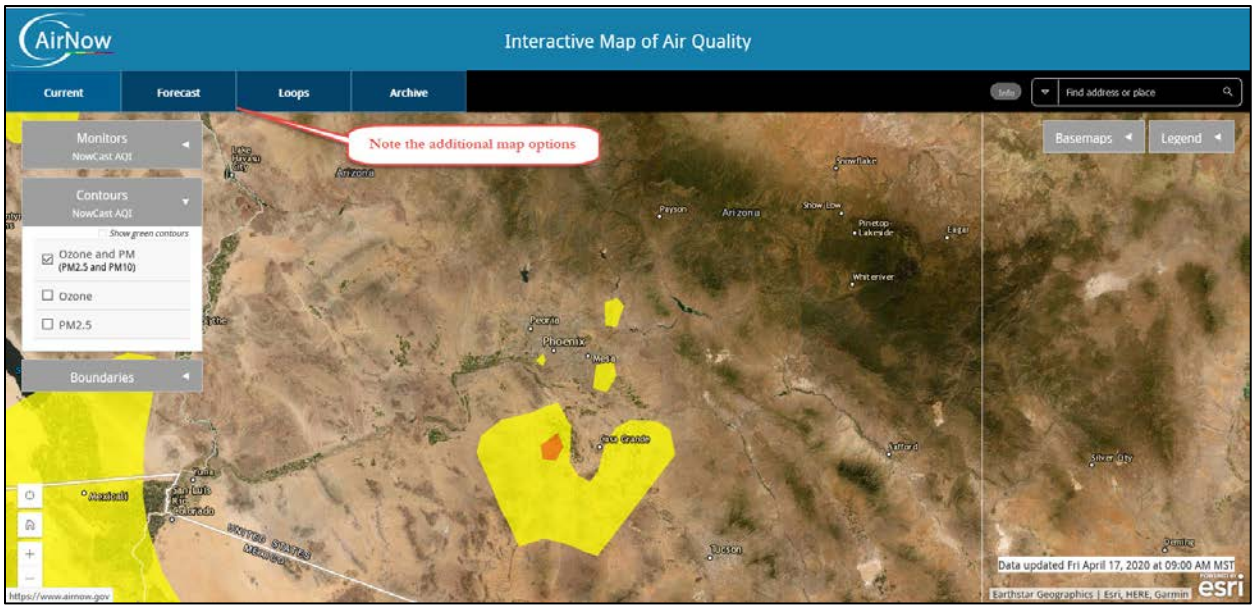


Figure 4. AirNow Air Quality Maps

Source: EPA AirNow

The Maricopa County Interactive Air Quality Map

The MCAQD also provides real-time data on our website using an interactive air quality map with three layers of information. Figure 5 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 third tab shows the Raw Data map, 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.

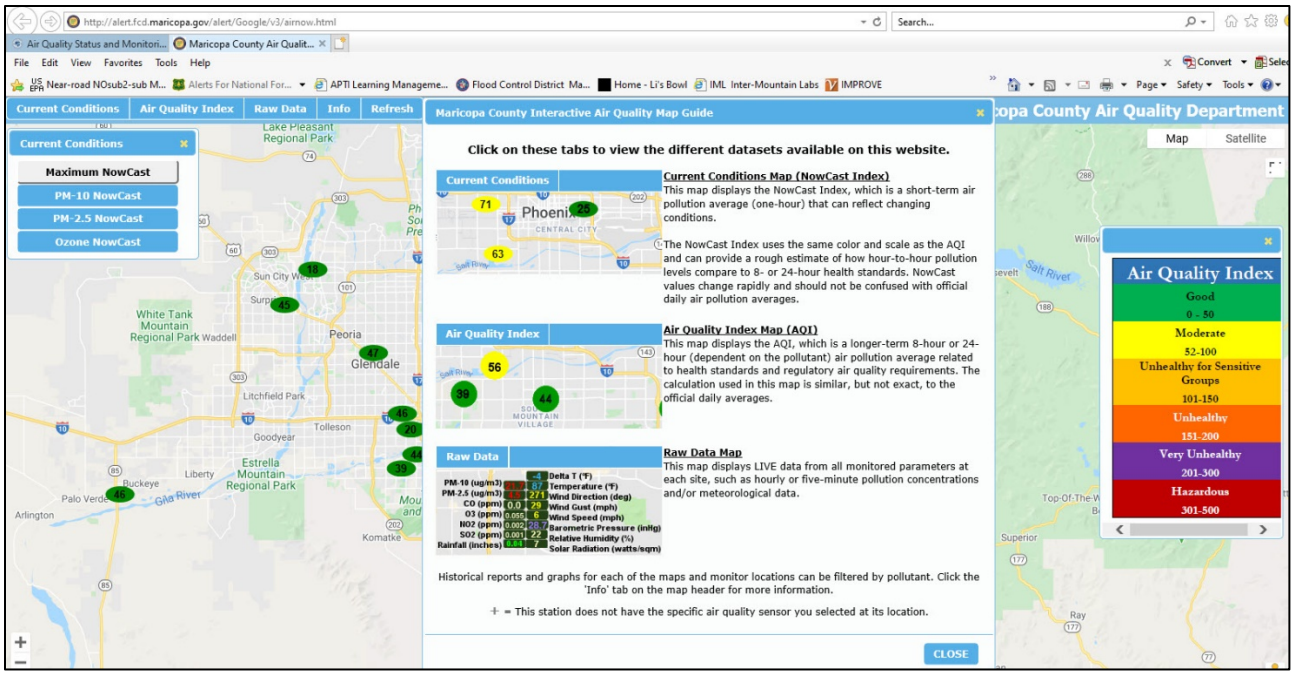


Figure 5. MCAQD Interactive NowCast Map

Source: MCAQD's Air Quality Website

Figure 6 shows the Raw Data map for O_3 concentrations. If a site does not have an O_3 monitor, a gray cross "+" appears, indicating that no O_3 monitor is operating at a site or it has not reported data for several hours. A gray cross on the PM_{10} and $PM_{2.5}$ layers has the same meaning.

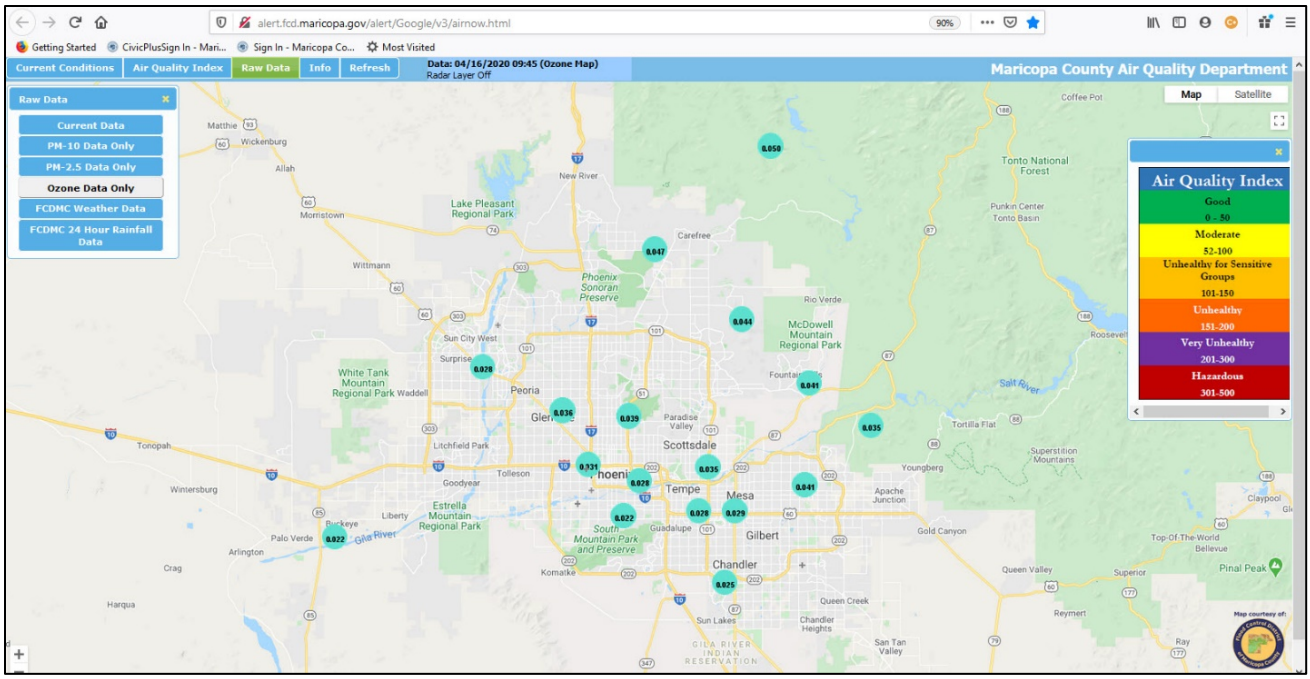


Figure 6. MCAQD Interactive Pollutant Map

Source: MCAQD Air Quality Website

Information Regarding the Causes, Characteristics, and 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)

Carbon monoxide is a colorless, odorless gas found in both outdoor and indoor air. Carbon monoxide is primarily formed by the incomplete combustion of fossil fuels, e.g., carbon-containing fuels, and the photochemical reactions of gases in the atmosphere. Concentrations of CO tend to peak in the colder, winter months. Carbon monoxide is produced by both natural and anthropogenic sources, aka, human activities. One of the more significant anthropogenic sources of CO is automobile exhaust. Concentrations of CO from motorized vehicles lowered considerably over the last three with cleaner fuels and substantial changes to automobile engines and exhaust emissions controls, all of which results in a more efficient use and combustion of fuel. Natural, or biogenic, sources of CO emissions include volcanic emissions and smoke from wildfires. Smoke from tobacco, cooking, fireplaces, and woodstoves contribute to indoor exposure to CO. In Arizona, the primary sources of CO are exhaust from motor vehicles, electricity generation, industrial and commercial boilers, and household natural gas burning. Carbon monoxide can be a minor contributor to the formation of ground-level O_3.

Carbon monoxide enters the body through inhalation, and the body eliminates CO primarily through exhalation and to a lesser extent through metabolic activity. After being inhaled, CO enters the bloodstream and binds to the blood's hemoglobin; thereby forming carboxy-hemoglobin that displaces oxygen (O_2) in the blood. This reduces the blood's capacity to carry O_2 to organs and tissues and causes the body to become O_2 deprived. This deprivation of O_2 is called hypoxia. This can adversely affect those with anemia, because anemia already reduces the blood's ability to carry O_2. Exposure to CO can result in a type of cardiovascular disease called ischemic heart disease, especially for those with existing heart problems. The central nervous system is adversely affected by CO as well. Acute exposure to severely high levels of CO is toxic and potentially fatal, and its effects on the body are well-known and widely studied. According to the Agency for Toxic Substances and Disease Registry, severe acute poisoning can cause cardiac arrest, heart attack, seizers, hypotension, respiratory arrest, noncardiogenic pulmonary edema, and coma. Moderate exposure may include many symptoms, such as confusion, chest pain, and weakness. Mild exposure may lead to symptoms that include headache, nausea, vomiting, dizziness, and blurred vision.

In 1971 U.S. EPA established identical primary and secondary standards for CO: an 8-hour primary standard at 9 parts per million (ppm) and 1-hour primary standard at 35 ppm. EPA has reviewed the CO NAAQS several times since 1971, which led to the secondary standard being revoked in 1985. The primary standard levels have not changed to date, and currently, CO concentrations nationwide are substantially lower than the CO NAAQS. No exceedances or violations of the CO NAAQS occurred at any site in 2020.

Lead (Pb)

Lead is a heavy metal that occurs naturally in the environment and it is used in manufactured products. The major sources of Pb emissions have historically been motor vehicles and industrial sources. In the early 1970s, EPA established national regulations to reduce the Pb content in gasoline, gradually. In 1975, unleaded gasoline was introduced for motor vehicles equipped with catalytic converters. The EPA banned the use of leaded gasoline in "highway motor vehicles" in December 1995. A highway vehicle includes, but is not necessarily limited to, passenger vehicles propelled by their own motor, whether such motor is powered by gasoline, diesel fuel, special motor fuels, electricity, or otherwise.

Due to the phase-out of leaded gasoline, metals processing is the major source of lead emissions to the air today. The highest levels of Pb in air are generally found near lead smelters. General aviation airports are also a significant source of Pb, as general aviation fuel still contains Pb additives. Other stationary sources include waste incinerators, utilities, and Pb-acid battery manufacturers.

Exposure to Pb has an array of adverse health effects. Once taken into the body, Pb distributes throughout the body in the blood and accumulates in the bones. Depending on the level of exposure, Pb can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems, and the cardiovascular system. Lead exposure also affects the O_2 carrying capacity of the blood. Currently, the foremost health effects associated with Pb exposure to children are neurological and for adults cardiovascular, e.g., high blood pressure and heart disease. Infants and young children are especially sensitive to even low levels of Pb, which may contribute to behavioral problems, learning deficits, and lowered IQ.

Lead is persistent in the environment and accumulates in soils and sediments through deposition from air sources, direct discharge of waste streams to water bodies, mining, and erosion. Ecosystems near Pb point-sources demonstrate a wide range of adverse effects including losses in biodiversity, changes in community composition, decreased growth and reproductive rates in plants and animals, and neurological effects in vertebrates.

Following the removal of Pb in gasoline, Pb emissions decreased by 94 percent between 1980 and 1999. Air monitoring showed that Pb concentrations in Maricopa County were well below the NAAQS; thus, air monitoring discontinued in 1997. In 2008, the Pb primary standard was revised to better protect public health, especially for "sensitive" populations, which include asthmatics, children, and the elderly. The lowered NAAQS Level required Pb monitoring near sources that emitted more than one ton of Pb per year. The MCADQ conducted source-oriented Pb monitoring at Deer Valley Airport for more than ten years. The results showed that the ambient levels of Pb at Deer Valley Airport are well below the Pb NAAQS. In addition, Pb emissions from the airport have decreased since monitoring began. In lieu of this information, EPA R9 approved MCAQD discontinuing Pb monitoring at the airport. The last Pb air sample was collected on December 29, 2019.

The revised Pb NAAQS requires Pb monitoring at NCore stations around the U.S.; and ADEQ continues to monitor for ambient Pb at the local NCore station at JLG Supersite (04-013-9997) in Phoenix.

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

Nitrogen dioxide belongs to a family of reactive gases called NO_x. These gases are formed when fuel is burned at high temperatures, and they are primarily emitted from motor vehicle exhaust and power plants. Nitrogen oxides are key compounds in the production of ground-level ozone (O_3).

Nitrogen dioxide has been selected by EPA as the "indicator" compound for NO_x. Unlike the other gaseous CPs, we measure the ambient levels of NO_x indirectly. The analytical process involves determining the concentration of NO_2, then nitric oxide (NO). NO_2 and NO concentrations are summed to determine the NO_X concentration.

For most of the population, the primary route of NO_2 entry into the body is inhalation. Current scientific evidence links short-term NO_2 exposures, ranging from 30 minutes to 24 hours, with adverse respiratory effects including airway inflammation in healthy people and increased respiratory symptoms in people with asthma. Studies show a connection between breathing elevated short-term NO_x concentrations and increased visits to emergency rooms and hospital admissions for respiratory issues, especially asthma. Additionally, NO_2 reacts with ammonia, moisture, and other compounds to form small nitrate particles. These small particles penetrate deeply into sensitive parts of the lungs and can cause or worsen respiratory disease, such as emphysema and bronchitis. They can aggravate existing heart disease, leading to increased hospital admissions and premature death, too.

In 1971, EPA established the first primary and secondary standards for NO_2 at 53 ppb, averaged annually. EPA reviewed the standards in 1985 and 1996 and chose not to revise either standard. In January 2010, EPA retained the 1971 standards and added a 1-hour average limit of 100 ppb to the primary standard, determined as a three-year average of the annual 98th percentile value.

Research indicates that individuals who spend time on or near major roadways can experience acute exposures to NO_2 concentrations that are considerably higher than those measured by the NO_2 network. "Near-roadway" means within about 50 meters of a major roadway. Research by the EPA shows that NO_2 concentrations inside vehicles can be 2-3 times higher than those measured at nearby area-wide monitors; and, MCAQD has found NO_2 concentrations to be approximately 30 to 100% higher than ambient concentrations away from roadways.

For this reason, in February 2010 the EPA revised the 1-hour NO_2 NAAQS and promulgated requirements for monitoring NO_2 near roadways in large urban areas. In response, AMD established two NO_2 monitor sites: Diablo, which was located near I-10 and U.S. Hwy 60 - east of downtown Phoenix, and Thirty-Third, which is located off I-10 and 33rd Avenue - west of downtown Phoenix.

In 2020, Thirty-Third was the only near-road site operating due to Diablo site closing for I-10 improvements. The AMD worked with ADOT to identify and secure a location in the same general area as the Diablo site based upon population and traffic counts. The location near I-10 and 36th Street was approved by EPA R9 in June 2020. Site build-out began following approval, was completed in early 2021, and is currently operational.

In 2020, there were no exceedances of the 1-hour or annual NO_2 NAAQS. Maricopa County is currently in attainment for the NO_2 1971 and 2010 NAAQS. In fact, no area within the U.S. is in nonattainment with the NO_2 NAAQS.

Ozone (O_3)

Ozone is a colorless, slightly odorous, reactive gas molecule containing three oxygen atoms. Ozone occurs naturally in the Earth's upper atmosphere, or the stratosphere, where it has a beneficial effect of protecting us from the Sun's harmful ultraviolet rays. However, at ground-level, it is the main component of smog, and adversely affects public heath, vegetation and ecosystems, and can cause damage to man-made materials.

Ozone is not directly emitted into the air but is formed by a complex photochemical reaction that involves sunlight, primarily ultra-violet light, or (UV), heat, and a "soup" of pollutants, especially volatile organic compounds (VOC) and NO_x. Ozone is continually going through a rapid, natural cycle of being formed, then converted back to the more stable, "diatomic" oxygen molecule (O_2). Anthropogenic activities have been a leading cause of ground-level O_3 due to VOC and NO_x emissions from industrial facilities, electric utilities, motor vehicles, and chemical solvent vapors. Ozone is likely to reach unhealthy levels on hot, sunny days in urban environments, but it can affect rural areas by being transported long distances by wind. Although the Phoenix metropolitan area has sunshine most of the year, shorter days and weak UV during the late fall and winter months keeps O_3 from reaching unhealthful concentrations.

Ozone causes significant physiological and pathological changes in both animals and humans at concentrations present in many urban environments. Ozone affects the respiratory system in people and animals, and it affects the growth of plants. The primary route of entry into the body is inhalation, and symptoms of O_3 exposure generally involve the lungs. Symptoms can include coughing, a sore or scratchy throat, shortness of breath, chest pain on deep inhalations, increases in asthma attacks, and damage to the lungs. Children are the population at greatest risk due to several factors: their lungs are still developing; they are more likely to be active outdoors when O_3 levels are high; and they are more likely to have asthma than adults are. It has been widely documented that O_3 even at low concentrations causes damage to plants and reduces crop yields, resulting in it being considered by plant scientists as the most important phytotoxic air pollutant.

The first NAAQS regulating O_3 levels was implemented in 1971. The 1971 NAAQS included a primary and secondary 1-hour level of 0.08 ppm (80 ppb) for "total photochemical oxidants" (TPO). This level could not be exceeded more than 1-hour per year. TPOs are "precursors" to O_3 development and were used as the "indicator compound(s)" to ascertain O_3 concentrations. These compounds are used widely in industry and include reactive VOCs.

After scientific review, U.S. EPA revised the NAAQS in 1979, establishing O_3 as the indicator compound, or chemical. Both primary and secondary NAAQS changed to an annual 1-hour level of 0.12 ppm (120 ppb) for O_3 only. From 1979 to date, the O_3 NAAQS levels have been established using O_3 concentrations only. In 1997, EPA revised both O_3 NAAQS by establishing an 8-hour level of 0.08 ppm (80 ppb). The 1997 NAAQS introduced a new averaging time for determining compliance. Compliance with the revised NAAQS was determined when the 4th highest daily O_3 maximum 8-hour average over a 3-year period was less than or equal to 0.08 ppm (80 ppb). Note that the 8-hour average rounded to the nearest hundredth of a ppm, meaning an 8-hour average concentration had to be greater than or equal to 0.085 ppm for an exceedance of the 1997 NAAQS to occur.

In March 2008, the EPA, again, further reduced the primary and secondary 8-hour O_3 NAAQS from 0.080 to 0.075 ppm (75 ppb). Compliance with the NAAQS is determined by averaging the 4th highest 8-hour average over a 3-year period, which must be less than or equal to 0.075 ppm.

In December 2015, the EPA lowered both the primary and secondary 8-hour O_3 NAAQS levels to 0.070 ppm (70 ppb). Compliance with the NAAQS is determined by averaging the 4th highest 8-hour average over a 3-year period, which must be less than or equal to 0.070 ppm.

Regarding Maricopa County's status with the NAAQS, we have attained the 1979 1-hour standard. The EPA revoked the 1979 1-hour NAAQS for the Phoenix-Mesa nonattainment area in 2005. In addition, the Phoenix-Mesa nonattainment area for the 1997 8-hour O_3 NAAQS is now in attainment. When the 2008 NAAQS became effective in May 2008, O_3 concentrations in the County had improved, but exceeded the new level. This led to EPA designating portions of Maricopa and Pinal Counties as nonattainment for the 2008 O_3 NAAQS in 2012. Otherwise, the EPA has redesignated the state of Arizona as in attainment for the 2008 O_3 NAAQS effective October 17, 2014.

In 2020, there were 34 days when at least one O_3 monitor exceeded the 2015 8-hour NAAQS, and fifteen monitors violated the standard. If EPA R9 concurs with EE submittals for 2018 – 2020, then eight sites will violate. Information regarding EEs, and their effects on O_3 exceedance days and NAAQS violation statuses, see the 2020 O_3 Exceedance, Violation, and Exceptional Event Information Summary of 2020 Criteria Pollutant NAAQS Status section.

Particulate Matter (PM)

Particulate matter is a collective term describing very small solid or liquid particles that vary considerably in size, geometry, chemical composition, and physical properties. Numerous chemical components may be present in particle pollution including acids, nitrates, sulfates, organic chemicals, metals, soils, and finer dust particles. Particulates can be formed by natural processes, such as pollen production and wind erosion, and anthropogenic activities, such as commercial/industrial/agricultural operations and motor vehicle use. Particulates contribute to visibility reduction, pose a threat to public health, and cause economic damage.

The EPA currently regulates PM pollution using two size categories:

- "PM_{10}", particles with size range ≤10 micrometers (μm) in aerodynamic diameter; and
- "$PM_{2.5}$", aka "fine particles", particles with a size range of ≤2.5 μm in aerodynamic diameter.

The larger particles that make up PM_{10} form through mechanical processes such as the grinding of matter and the atomization of liquids, natural weathering processes, and anthropogenic activities that disturb soil. In Arizona, elevated concentrations of PM_{10} are associated with people driving on unpaved roads, dusty industries, and dust storms related to high wind events.

Fine particulates are formed by the incomplete combustion of fossil fuels, the condensation of vapors, and photochemical processes. Fine particulates are further classified as "primary", meaning they are produced within and emitted directly from a source such as exhaust from a diesel engine or smoke from a fire. "Secondary" particulates form in the atmosphere from gaseous pollutants. Nitrates and sulfates are formed by the photochemical oxidation of gaseous NO_2 and SO_2, respectively. In addition, secondary organic carbon particles form through a photochemical transformation of gaseous organic compounds.

The primary route of entry for PM_{10} into the body is through inhalation. The size, shape, and chemical composition of particulates determine the health effects that may result from PM exposures. The potential for causing health problems is directly linked to particle size. Smaller particles are more toxic than larger particles because of the higher relative content of toxic metals and ions combined with the increase of particle surface area. The EPA is concerned about particles ≤10 μm in diameter, because those are the particles that generally pass through the throat and nose and enter the lungs. Coarser particles are deposited in the upper parts of the respiratory system, but finer particles are deposited deeper into the respiratory system. Fine particles are small enough to be deposited in the lung's alveoli, which are tiny air sacks deep inside the lungs. Some research shows that the smallest of particles may enter the bloodstream as well. Currently, research is underway to better understand the health effects of ultrafine particles.

The populations most at risk from particulate exposure are older adults, diabetics, and children; because children tend to be more physically active and that causes them to breath faster and deeper. Once inhaled, these particles can cause serious heart and lung health effects that affect both humans and animals. Epidemiological studies show that long-term, chronic exposures, i.e., years of exposure to high levels of particulates, are associated with reduced lung function, the development of chronic bronchitis, and premature death. Studies show that short-term, acute exposures, i.e., hours to days of exposure to high levels of particulates, can aggravate lung disease, asthma attacks, acute bronchitis,

and may increase susceptibility of respiratory infections. For those with heart disease, it can induce heart attacks. Exposure to acidic aerosols, i.e., acidic particles with an aerometric diameter of about 0.01 – 100 μm, have been linked to the upper respiratory tract and pulmonary system's inability to remove harmful particles.

In 1987, U.S. EPA replaced the 1971 Total Suspended Particulates (TSP), i.e., particles around 40 μm and less in aerometric diameter, with the primary and secondary NAAQS for PM_{10}. The EPA revoked the annual PM_{10} NAAQS in 2006. Currently, the 24-hour primary and secondary levels for PM_{10} are both 150 $\mu g/m^3$ as per the 1987 NAAQS. In 2012, the PM_{10} NAAQS underwent review with exposure to $PM_{10-2.5}$ also being considered. This review resulted in EPA retaining the existing primary and secondary 24-hour PM_{10} NAAQS, which is considered to provide for protection against effects associated with acute exposure to $PM_{10-2.5}$.

In 1997, the U.S. EPA implemented a primary and secondary NAAQS for $PM_{2.5}$ with an annual level of 15 $\mu g/m^3$ and a 24-hour level of 65 $\mu g/m^3$. In 2006, the annual NAAQS levels were not changed, but the 24-hour NAAQS level was lowered to 35.0 $\mu g/m^3$. In 2012, the primary annual NAAQS was lowered to 12.0 $\mu g/m^3$, but the secondary annual NAAQS and the 24-hour NAAQS levels were not changed. While Maricopa County is currently in attainment for $PM_{2.5}$, we tend to experience 24-hour exceedances during the colder, winter months, especially from Thanksgiving into January. In colder months, smoke from residential fireplaces coupled with the temperature inversions tends to drive up $PM_{2.5}$ concentrations throughout the metropolitan area.

To address this problem, ADEQ and Maricopa County worked together on a public outreach campaign to reduce wood burning within the County around the fall/winter holidays. Maricopa County's umbrella dust abatement rule, *Rule 310 – Fugitive Dust From Dust-Generating Operations*, has been revised many times through the years. *Rule 310* regulates construction dust, trackout dust, and dust from unpaved parking and vacant lots. The recent PM_{10} SIP includes seventy-seven new measures to enhance enforcement of the rule, implementation of agricultural best management practices, diesel engine replacement and retirement programs, and requirements for cleaner burning fireplaces to further reduce $PM_{2.5}$ emissions.

The western U.S. has a unique problem with exceeding the PM NAAQS. It has been acknowledged for decades that exceedances of the PM NAAQS due to blowing dust and smoke from massive wildfires may be "exceptional" in nature, i.e., not expected to recur or caused by acts of nature that overwhelm emission controls. Initially by policy, and later by rule, EPA established procedures and standards for documenting whether an exceedance of the NAAQS is the result of an "exceptional event" (EE) and if the pollutant data should be excluded from NAAQS compliance determinations. In 2007, EPA adopted the *Treatment of Data Influenced by Exceptional Events (EER)* rule that covers how to prepare an EE package for EPA's review and how to manage event-related data. In the past few years, most exceedances of the PM_{10} NAAQS within Maricopa County have been successfully shown to meet the EE requirements. Information regarding EEs, and their effects on exceedance days and NAAQS violation statuses, is provided in the Summary of 2020 Criteria Pollutant NAAQS Status section.

In 2020, there were four unique days when at least one PM_{10} monitor exceeded the 1987 24-hour PM_{10} NAAQS level, but no monitors will violate the PM_{10} NAAQS if EPA R9 concurs with EE submittals. For $PM_{2.5}$, there were eleven unique days when at least one monitor exceeded the 2012 24-hour NAAQS level, but no monitors violated the $PM_{2.5}$ NAAQS.

Sulfur Dioxide (SO_2)

Sulfur dioxide is a colorless gas with a pungent irritating odor at elevated concentrations. It is emitted primarily from the burning of high-sulfur coal, oil, and diesel fuel, and the smelting of metals like copper. Most fuels contain trace quantities of sulfur. When fuels burn, both gaseous SO_2 and sulfate particles are released into the air. Consequently, separating the health effects of these two chemicals is difficult. Together, SO_2 and $PM_{2.5}$ act separately and together to threaten public health and can make up a major portion of pollution in many cities. Sulfur dioxide is removed from the atmosphere through dry deposition, and it is converted to sulfuric acid, and eventually sulfate particles. Both contribute to public health problems and negatively affect the environment. The SO_2 and sulfate from vehicular emissions have been significantly reduced over the years through lowering the sulfur content in diesel fuel and gasoline.

Sulfur dioxide's primary route of entry into the body is by inhalation. It contributes to respiratory illness, particularly in children and the elderly, and aggravates existing heart and lung diseases. Sulfur dioxide contributes to the formation of acid rain, and it contributes to the formation of atmospheric particles that cause visibility impairment, most notably in national parks. Sulfur dioxide and the pollutants formed from SO_2, such as sulfate particles, can be transported over long distances and deposited far from the point of origin. This means that problems associated with SO_2 are not confined to areas where it is emitted.

In Maricopa County, mobile and industrial sources emit the majority of SO_2. The majority of statewide SO_2 emissions occurs in eastern Arizona and is produced by coal-based electricity generation, the smelting of non-ferrous sulfide copper ore, and smoke from wildfires. Major controls were installed in Arizona's copper smelters in the 1980s, which reduced SO_2 emissions substantially. In addition, most of the copper ore smelters that previously operated have been shutdown, which reduced SO_2 emissions in localized areas around the state. In addition, all of the coal-fired power plants in the State have installed scrubbers, which remove over 90% of the SO_2 emissions.

The U.S. EPA first established primary and secondary NAAQS for SO_2 in 1971. The NAAQS levels changed in 1973 and 2010. In 2010, EPA revised the primary SO_2 NAAQS by revoking an annual level of 0.03 ppm (3 ppb) and the 24-hour level of 0.14 ppm (14 ppb). In February 2019, EPA retained the 2010 NAAQS levels following CASAC's most recent review. Currently, the primary SO_2 NAAQS is a 1-hour level of 75 ppb, and the secondary NAAQS is 0.5 ppm (500 ppb). Compliance with the primary NAAQS is determined by averaging the 99th percentile of 1-hour daily maximum concentration average over a 3-year period, which cannot be greater than 75 ppb. For compliance with the secondary NAAQS, a 3-hour average cannot exceed a concentration of 0.5 ppm more than once per year.

In 2020, there were no exceedances or violations of the primary or secondary SO_2 NAAQS. Currently, Maricopa County is in attainment for SO_2. The AMD operates two year-round SO_2 monitoring stations, and the siting of SO_2 monitors meets EPA requirements.

AIR MONITORING STRATEGIES AND SURVEILLANCE SYSTEM DESIGN

Overview of Air Monitoring Requirements and System Design

In 2020, the AMD monitored for five CPs by operating and maintaining 22 ambient air monitoring sites located throughout Maricopa County. The sites' start-up dates range from 1961 for Central Phoenix to 2021 for new 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. Some sites measure many pollutants, while others may only measure one or two. The MCAQD chose each site and its pollutant monitors based on specific EPA requirements as described below, special requests from EPA, and/or specific needs of the County.

The *40 CFR Parts 50 and 58* provides the requirements for operating an ambient air monitoring program. The MCAQD is fully responsible for designing and operating the total air monitoring surveillance system and managing the pollutant data generated. The MCAQD holds the Primary Quality Assurance Organization (PQAO) designation for the County's ambient air monitoring network, which basically means that we do not share QA roles and/or responsibilities with another MO. 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 CP monitors designated as Special Purpose Monitors (SPM), as well as PM speciation and air toxics monitors.

This section details how each CP network is designed to obtain "representative" data. The *40 CFR Part 58 Appendix D* covers the requirements for designing the air monitoring network and is summarized in this section. To determine compliance with the NAAQS, EPA-approved air monitors must collect the CP 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 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). The ADEQ also collects air toxics samples for the Urban Air Toxics Monitoring Program (UATMP) at MCAQD's South Phoenix site. In addition, ADEQ collects PAMS data east of Maricopa County, near Queen Valley, which is in Pinal County. 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 now 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 MOs. The first assessment was produced in 2010 and the second was produced in 2015. The assessment process continues to improve, and MCAQD works with other MOs regarding CP network design issues as needed. The MOs 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 three objectives below apply to establishing required SLAMS monitoring stations and choosing the general locations for additional monitoring sites. This appendix further describes specific requirements for specific pollutants as well as other air monitoring networks not operated by the MCAQD such as NCore, PAMS, PM speciation and O_3 precursors. The objectives are not listed based on importance or priority. Each objective is important and must be considered individually. Table 2 shows the three basic objectives.

Table 2. 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 attractive 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

Each pollutant monitor must be designated one of three types. The monitor type is based upon how the data will be used and how long the monitor will remain in operation. Table 3 shows the three monitor types defined by EPA in *40 CFR Part 58*.

- The first type of monitor is a "State/Local Air Monitoring Station", or SLAMS. The MCAQD's air monitoring network is comprised of SLAMS, which gather data for comparison to the NAAQS. The monitors operating within the near-road, NCore, PAMS, NATTS, and UATMP networks are a subset of SLAMS.

- The second type of monitor is a "Special Purpose Monitor", or SPM. The MCAQD may operate SPMs temporarily; however, we did not in 2020. 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. The *40 CFR Part 58.20 Subpart C* states that:

  > *"An SPM is defined as any monitor included in an agency's monitoring network that the agency has designated as a special purpose monitor in its annual monitoring network plan and in AQS, and which the agency does not count when showing compliance with the minimum requirements of this subpart for the number and siting of monitor of various types. Any SPM operated by an air monitoring agency must be included in the period assessments and the annual monitoring network plan".*

- The third type of monitor is a "Prevention of Significant Deterioration", or PSD, monitor and it is 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. There are no Class 1 areas within Maricopa County; however, Arizona does have twelve Class 1 areas under the protection of the Visibility and Regional Haze program.

Table 3. Monitor Types

Name	Description of Use
SLAMS	EPA-approved, compliance monitor typically operated on a long-term basis.
SPM*	A monitor typically operated on a short-term basis and not necessarily EPA-approved.
PSD	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.

* Reference *40 CFR Part 58* for important EPA's requirements regarding SPM monitor operation. Usually, if the SPM operates for more than two years and meets *40 CFR Part 58 Appendix D* siting requirements, removing it will need prior approval by EPA.

Site Types

To support the three basic monitoring objectives, each site must be identified as one of the six "site types" shown below. Site types 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. Table 4 shows the site types as defined by EPA.

Table 4. Site Types

Determine the ***highest concentrations*** expected to occur in the area covered by the network.
Measure typical concentrations in areas of ***high population density (population exposure)***.
Determine the impact of significant ***sources*** or source categories on air quality.
Determine general ***background concentration*** levels.
Determine the extent of ***regional pollutant transport*** among populated areas and in support of secondary standards.
Measure air pollution ***impacts to visibility, vegetation damage, or other welfare-based impacts***.

Source: Adapted from *40 CFR Part 58, Appendix D.1*

Monitoring Scales (Spatial Scales of Representativeness)

To help link the site type with a monitor's basic monitoring objective and physical location, EPA developed the "spatial scale of representativeness" concept. As per *40 CFR Part 58, Appendix D 1.2 (a) and (b):*

> "*The goal in locating air monitors is to correctly match the spatial scale represented by the sample of monitored air with the spatial scale most appropriate for the monitoring site type, air pollutant to be measured and the monitoring objective. Thus, spatial Scale of representativeness is described in terms of physical dimension of the air parcel nearest to a monitoring site throughout which actual pollutant concentrations are reasonably similar".*

Table 5 shows six scales of representativeness that are of most interest for the air monitoring site types described above.

Table 5. 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*

Locating Air Monitoring Sites

The air monitoring network is designed to provide pollutant data that represents County-wide "ambient" air quality. EPA defines ambient air as "the air to which the public has access". Since it is physically and fiscally impossible to monitor the air in every location, each monitor's objective, the associated site type, and corresponding spatial scale of representativeness most appropriate for the CP to be measured are foremost in determining each site's location. In addition to correctly integrating the above considerations, a site's location must also have reasonable accessibility, security, and operating feasibility, such as a property owner's agreeability to have monitoring conducted on their land and a clean power supply.

For example, consider the case where the objective is to determine NAAQS compliance by understanding the maximum O_3 concentrations for an area. Such areas would most likely be located downwind of a metropolitan area in a suburban residential area where children and other susceptible individuals are likely to be outdoors. Sites located in these areas are most likely to represent an urban scale of measurement. In this example, O_3 precursor emission patterns, public activity, and meteorological characteristics that affect O_3 formation and dispersion were considered when selecting an O_3 monitoring site's physical/geographical location; and, the spatial scale of representativeness was a result of the selection process.

When applying these principles, the total quantity of monitoring sites that will serve the variety of data needs is often substantially higher than federal minimum requirements. The optimal size of each pollutant's network involves compromises among data needs and available resources; and, a network's size can change over time. Each pollutant's network must be dynamic enough to maintain a current representative sampling of the air quality.

Overview of the Air Monitoring Sites

According to the U.S. Census Bureau, Maricopa County's most recent population estimate is 4,485,414 people (U.S. Census Bureau: Quick Facts 2019 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. As previously mentioned, the MCAQD pollutant networks are designed using the concept of spatial scale representativeness and monitoring objectives. This results in CP 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 the Appendix II.

Table 6 shows details regarding the MCAQD's site names and abbreviations (code), their AQS identification numbers, and geographic location information for site operating in 2020.

Table 6. 2020 Air Monitoring Site Information

Name	Code	AQS ID#	Latitude	Longitude	Location
Blue Point	BP	04-013-9702	33.54558	-111.60972	Usery Pass & Bush Hwy.
Buckeye	BE	04-013-4011	33.36985	-112.62068	MC Hwy. 85 & AZ Hwy. 85
Cave Creek	CC	04-013-4008	33.82169	-112.01726	32nd St. & Carefree Hwy.
Central Phoenix	CP	04-013-3002	33.45797	-112.04659	19th St. & Roosevelt St.
Durango Complex	DC	04-013-9812	33.42650	-112.11821	27th Ave. & Durango St.
Dysart	DY	04-013-4010	33.63718	-112.34185	Bell Rd. & Dysart Rd.
Falcon Field	FF	04-013-1010	33.45224	-111.73327	McKellips Rd. & Greenfield Rd.
Fountain Hills	FH	04-013-9704	33.61092	-111.72534	E. Palisades Blvd. & Fountain Hills Blvd.
Glendale	GL	04-013-2001	33.30995	-111.72003	59th Ave. & W. Olive Ave.
Higley	HI	04-013-4006	33.30995	-111.72003	Higley Rd. & Williams Field Rd.
Humboldt Mountain	HM	04-013-9508	33.98280	-111.79871	Top of Humboldt Mountain
Mesa	ME	04-013-1003	33.41018	-111.86536	Broadway Rd. & Alma School Rd.
North Phoenix	NP	04-013-1004	33.56034	-112.06627	7th St. & Dunlap Ave.
Pinnacle Peak	PP	04-013-2005	33.70639	-111.85575	Alma School Rd. & Happy Valley Rd.
South Phoenix	SP	04-013-4003	33.40314	-112.07526	Central Ave. & Broadway Rd.
South Scottsdale	SS	04-013-3003	33.47968	-111.91711	Scottsdale Rd. & Miller Rd.
Tempe	TE	04-013-4005	33.41123	-111.93471	College Ave. & Apache Blvd.
Thirty-Third	TT	04-013-4020	33.46173	-112.12796	Interstate 10 & 33rd Ave.
West Chandler	WC	04-013-4004	33.40635	-112.14426	Ellis St. & Frye Rd.
West 43rd Avenue	WF	04-013-4009	33.29896	-111.88426	43rd Ave. & Broadway Rd.
West Phoenix	WP	04-013-0019	33.48378	-112.14256	39th Ave. & Earll Dr.
Zuni Hills	ZH	04-013-4016	33.68719	-112.29416	109th Ave. & Deer Valley Rd.

Source: EPA AQS database – *Site Description Report (AMP380)*

Figure 7 provides the complement of air monitoring instruments operating at each site in 2020.

Maricopa County - 2020 Air Monitoring Site Instrumentation

Site	AQS Code	CO	NO_2	O_3	SO_2	PM_{10}	$PM_{2.5}$	$PM_{2.5}$ Filter	WS / WD	Baro Press	Delta T	Amb Temp	Rel Hum	Rain	Solar Rad	Room	Multi-Gas Cal	Active Instruments
BE	04-013-4011	1	1	1		1			1	1		1	1			1	2	11
BP	04-013-9702			1					1			1	1			1		5
CC	04-013-4008			1					1			1	1	1		1		6
CP	04-013-3002	1	1	1	1	1			1	1		1				1	2	11
DC	04-013-9812				1	1	1		1	1		1	1			1	1	9
DY	04-013-4010			1		1			1	1		1	1			1		7
FF	04-013-1010			1					1			1	1			1		5
FH	04-013-9704			1					1	1		1	1			1		6
GL	04-013-2001			1		1	1		1	1		1	1			1		8
HI	04-013-4006					1			1	1	1	1				1		6
HM	04-013-9508			1								1	1			1		4
ME	04-013-1003	1		1		1	1		1	1		1	1			1	1	10
NP	04-013-1004			1		1	1		1	1	1	1				1		8
PP	04-013-2005			1					1	1		1	1			1		6
SP	04-013-4003	1		1		1	1		1	1		1	1		1	1	1	11
SS	04-013-3003			1		1			1	1		1	1			1		7
TE	04-013-4005			1		1	1		1	1	1	1		1		1		9
TT	04-013-4020	1	1				1		1	1		1	1			1	2	10
WC	04-013-4004	1		1		1			1	1		1	1			1	1	9
WF	04-013-4009					1			1	1	1	1				1		6
WP	04-013-0019	1	1	1		1	1	1	1	1	1	1				1	1	12
ZH	04-013-4016					1			1	1								3
Active Instruments		**7**	**4**	**17**	**2**	**15**	**8**	**1**	**21**	**18**	**5**	**21**	**15**	**2**	**1**	**21**	**11**	

Total # of Criteria Pollutant Monitors **54**
Total # of Active Instruments **169**
Total # of Active Sites **22**

NOTES:
TT - CO and $PM_{2.5}$ sampling ends 02/28/21
Delta Temperature sampling ends 08/31/20
NO_2 stations house both a QC and a QA muti-gas calibrator

Last updated: CLS 04282021

Figure 7. 2020 Air Monitoring Instruments by Site

2020 SUMMARY OF NETWORK RESULTS AND REQUIRED INFORMATION

Determining Data Quality and Acceptability

This section details the results obtained from our 2020 monitoring year. The EPA has established data quality and measurement quality objectives for CP 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 AMD'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. These values may be referred to as "samples". The CP 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 100. For CP data, completeness must be greater than 75% for a data set to pass the first validity test. Furthermore, CP 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:

$$\text{Data Completeness Percentage} = \frac{\text{Qty. of Valid Measurements}}{\text{Qty. of Measurements Scheduled}} (100)$$

Table 7 shows the pollutant data completeness percentages for 2020.

Table 7. 2020 Criteria Pollutant Data Completeness for SLAMS

Pollutant	CO	O_3	NO_2	SO_2	$PM_{2.5}$	PM_{10}	TOTAL
Percent Complete	96.7	97.5	97.0	96.5	95.8	97.2	96.9

Source: EPA AQS database – *2020 Data Completeness Report (AMP430)*

Increasing Data Volumes

Due to increasing data requirements and the availability of FEM analyzers, the amount of data the AMD produces increased considerably over the past few years. Operating and maintaining the various components of each air monitoring network is an ongoing challenge. To remain current with EPA's requirements and to meet decision makers and researchers' data needs, AMD personnel adjust standard operating procedures according to EPA's latest requirements and/or guidance to ensure only high-quality data are being produced. In addition to the increased amount of CP data generated and managed, supporting components of the surveillance system such as the communications system to the sites and the database used for data management also need continuing upgrades. So far, AMD has managed to make significant program changes to keep up with the increasing demand for data. By automating some processes, we have been able to successfully respond to data needs without increases to personnel. The following information summarizes a few notable changes that have been implemented to date.

- The commercial database, AirVision™, has enhanced our ability to manage the increase in data volume. It has helped to advance data validation and dissemination, as well as data retrieval/storage/security. The database must be maintained and updated regularly to keep up with software changes involving data collection, validation, and reporting to AQS.

- AirVision™ also allows AMD personnel to perform multiple data checks throughout the workday to help prevent bad data from being released to the public via the County and EPA's websites. In addition, it is used to upload preliminary data to the MC website as close as possible to real-time.

- A Rapid Response Notification System (RRNS) was implemented to better manage quickly developing pollution events. The RRNS uses automated alarms to monitor instrument performance and incoming pollutant concentrations. The triggering instrument warning and pollutant concentration levels can be adjusted as needed for each alarm. The AirVision™ database is programmed to automatically generate these alerts.

Table 8 shows the approximate amount of hourly and 5-minute data produced in 2020. In addition, AMD is now producing 1-minute pollutant and meteorological data.

Table 8. Approximate Amount of 2020 Data Produced

Type	1-Hour CP Data	1-Hour CP and Met Data	1-Hour, 5-Minute and 24-Hour CP and Met Data
Amount	~568,679	~1,010,000	~10,000,000

Source: MCAQD AirVision™ database

Summary of 2020 Criteria Pollutant Data

This section covers the 2020 data generated by each CP's network.

Carbon Monoxide (CO)

Figure 8 shows the seven CO monitoring sites operating in 2020. The network is comprised of seven year-round CO monitors. A CO monitor is required at one MCAQD near-road site. Therefore, the Thirty-Third site began temporarily monitoring for CO while the new near-road site replacing Diablo is under construction.

The CO data were reported to AQS, and the data are suitable for comparison to the NAAQS. There are two primary NAAQS levels for CO: an 8-hour average of 9 ppm and a 1-hour average of 35 ppm. A violation of either standard is based on two exceedances in a calendar year.

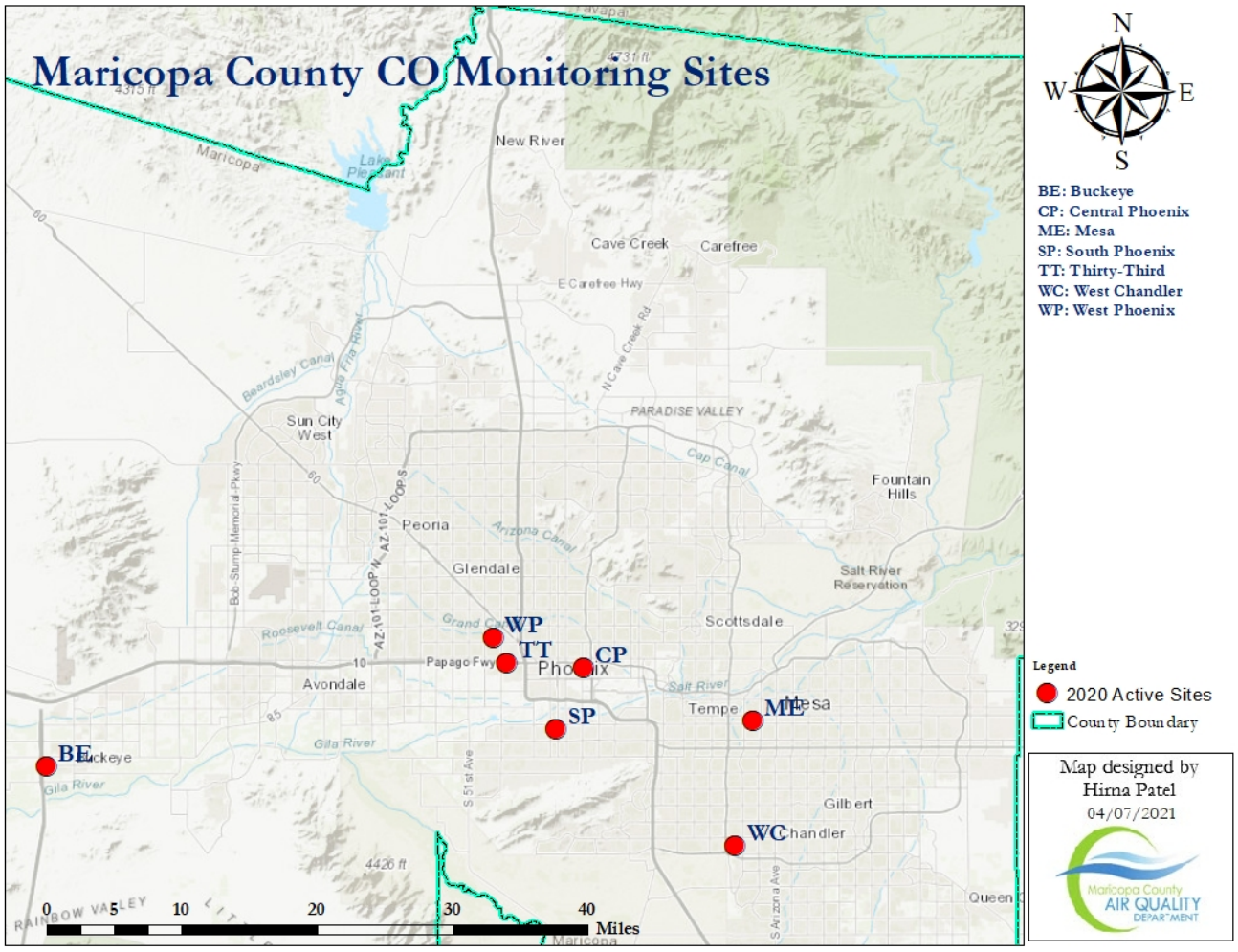


Figure 8. 2020 CO Monitoring Site Map

The Phoenix metropolitan area was once designated as being in moderate nonattainment for CO for the 1971 primary NAAQS. A nonattainment SIP was developed by ADEQ that covered how to reduce and maintain CO concentrations. The area failed to reach attainment by the end of 1995, which caused EPA to reclassify the area to serious nonattainment in 1996, with a new attainment date of December 31, 2000. In response, the Governor's Office, Legislature, Maricopa County, and other entities worked cooperatively to find ways to reduce CO that included implementing innovative programs such as a nationally recognized, enhanced vehicle emissions inspection program, a cleaner burning gasoline program, pollution reduction measures for commercial and industrial sources, and woodburning restrictions. As a result, CO concentrations declined, and data showed that the area had reached attainment with the 8-hour primary NAAQS.

In April 2005, the EPA redesignated the Phoenix metropolitan area to attainment for CO and approved the attainment demonstration and maintenance plan, which shows how the area will maintain compliance with the CO NAAQS through 2015. However, Maricopa County must continue to show that the air quality is maintaining compliance with the NAAQS for a period of 20 years from the attainment determination. The area is now covered by a 10-year maintenance SIP.

In 2020, no exceedances of the 1-hour or 8-hour CO NAAQS occurred at any MCAQD sites, and concentrations remained well below NAAQS levels. Since 1-hour CO concentrations have been significantly lower than the NAAQS level for many years, we have not included this metric on a table. Table 9 shows the maximum and second maximum 8-hour CO averages measured.

Table 9. 2020 8-hour CO Average Data Summary

Site	CO 8-hour Average Maximum (ppm)	CO 8-hour Average 2nd Maximum (ppm)
Buckeye	0.7	0.6
Central Phoenix	1.9	1.9
Mesa	1.6	1.2
South Phoenix	2.2	1.8
*Thirty-Third	2.9	2.6
West Chandler	1.3	1.3
West Phoenix	3.0	2.5

* - Site temporarily monitoring for CO in 2020

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

Table 10 shows additional CO information required by EPA for the Phoenix core-based statistical area (CBSA), which includes Maricopa and Pinal Counties.

Table 10. 2020 CO Data Required by EPA

CBSA	Population & Census Year (2019)	Required Near-Road Monitors	Active Near-Road Monitors	Additional Near-Road Monitors Needed
38060	4,485,414	1	1	0

Source: U.S. Census Bureau: Quick Facts 2019 Population Estimate for Maricopa County

Nitrogen Dioxide (NO_2)

Figure 9 shows the four NO_2 monitoring sites operating at the beginning and end of 2020. The NO_2 monitors are designated as SLAMS; however, two are further sub-designated as being "near-road" monitors. At the Buckeye, Central Phoenix, and West Phoenix sites, the monitors are area-wide monitors and represent the NO_2 concentrations within Maricopa County. The Thirty-Third monitor is a near-road monitor representing the microscale by collecting source-oriented emissions from vehicular traffic on heavily travelled highways within Maricopa County. The near-road network requires two NO_2 monitors in the metropolitan area. The Diablo site replacement location was approved in 2020 by EPA R9. The new near-road site will open in 2021 and will house the second near-road NO_2 monitor.

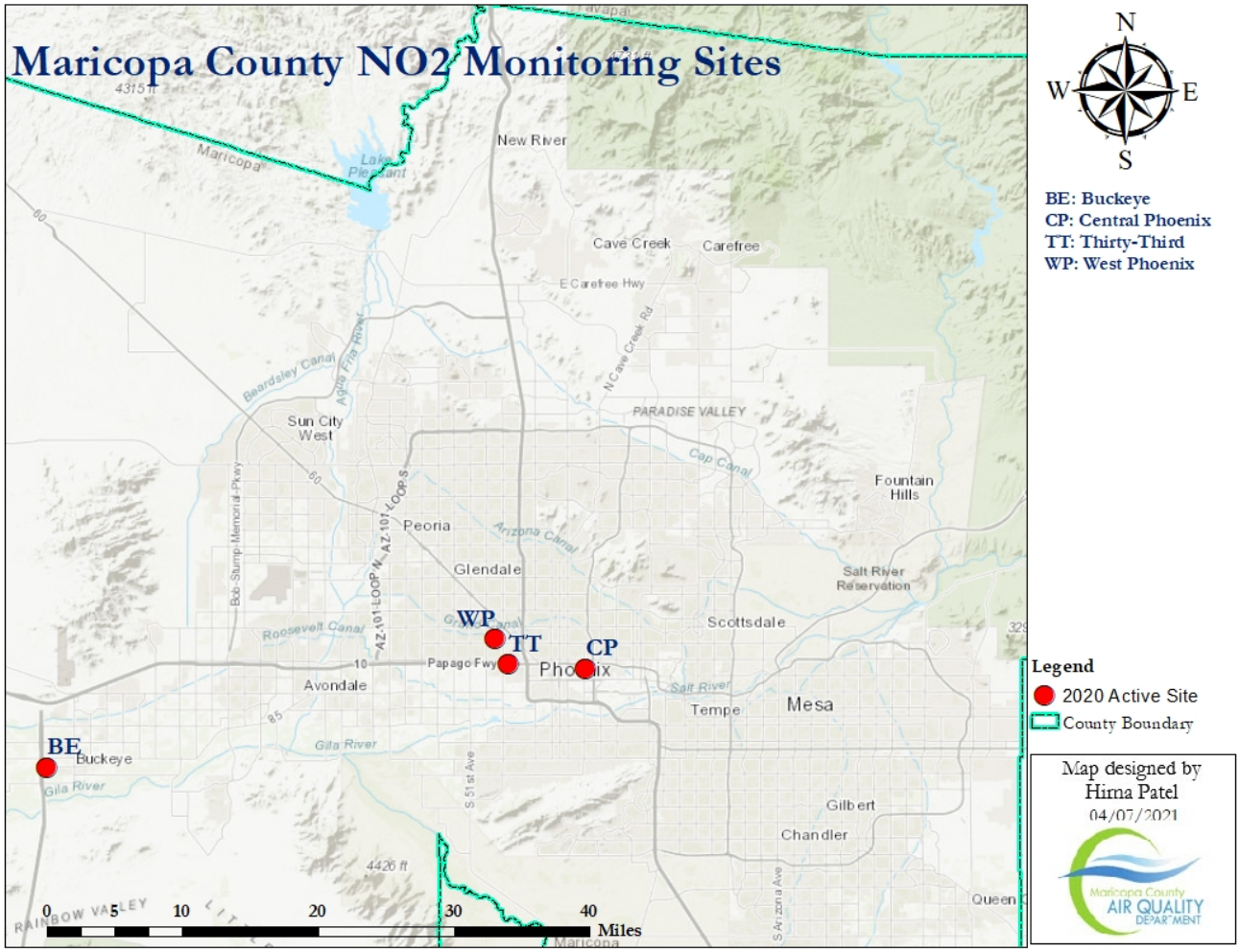


Figure 9. 2020 NO_2 Monitoring Site Map

Data from both the area-wide and near-road monitors were reported to AQS, and the data are suitable for comparison to the NAAQS. Maricopa County is in attainment for NO_2. Compliance with the NO_2 standard is achieved when the annual arithmetic mean concentration in a calendar year is less than or equal to 53 ppb. A new hourly standard for NO_2 began in 2010; this regulation states that the 3-year average of the 98th

percentile cannot exceed 100 ppb. 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 2020.

Table 11. 2020 NO_2 1-hour Data Summary

Site Name	NO_2 Maximum (ppb)	NO_2. 98th Percentile (ppb)	NO_2 3-Year Average of the 98th Percentiles (ppb)	NO_2 Annual Average (ppb)
Buckeye	45.0	36.0	34.3	8.12
Central Phoenix	61.0	54.0	54.0	15.93
Thirty-Third	65.0	57.0	59.0	25.11
West Phoenix	54.0	48.0	49.0	13.36

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*

Additional information required by EPA for the near-road NO_2 monitors is shown in Table 12. The annual average daily traffic (AADT) count is provided by MAG.

This year, as per MAG's data, the highest AADT was 204,528 at the Loop 202/I-10 interchange. The Broadway Curve had the highest count in 2018, and if modelled may show the highest count in 2020.

Table 12. 2020 NO_2 Data Required by EPA

CBSA	Population & Census Year (2019)	Max AADT Counts (2019)	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	4,485,414	204,528	2	2	0	1	4	0

Sources: U.S. Census Bureau: Quick Facts 2019 Population Estimate for Maricopa County
MAG - Transportation Data Management System for AADT Counts

Ozone (O_3)

Figure 10 shows the seventeen O_3 monitors operating at the beginning and end of 2020. The O_3 monitors are designated as SLAMS. The data were reported to AQS, and data are suitable for use with NAAQS comparisons.

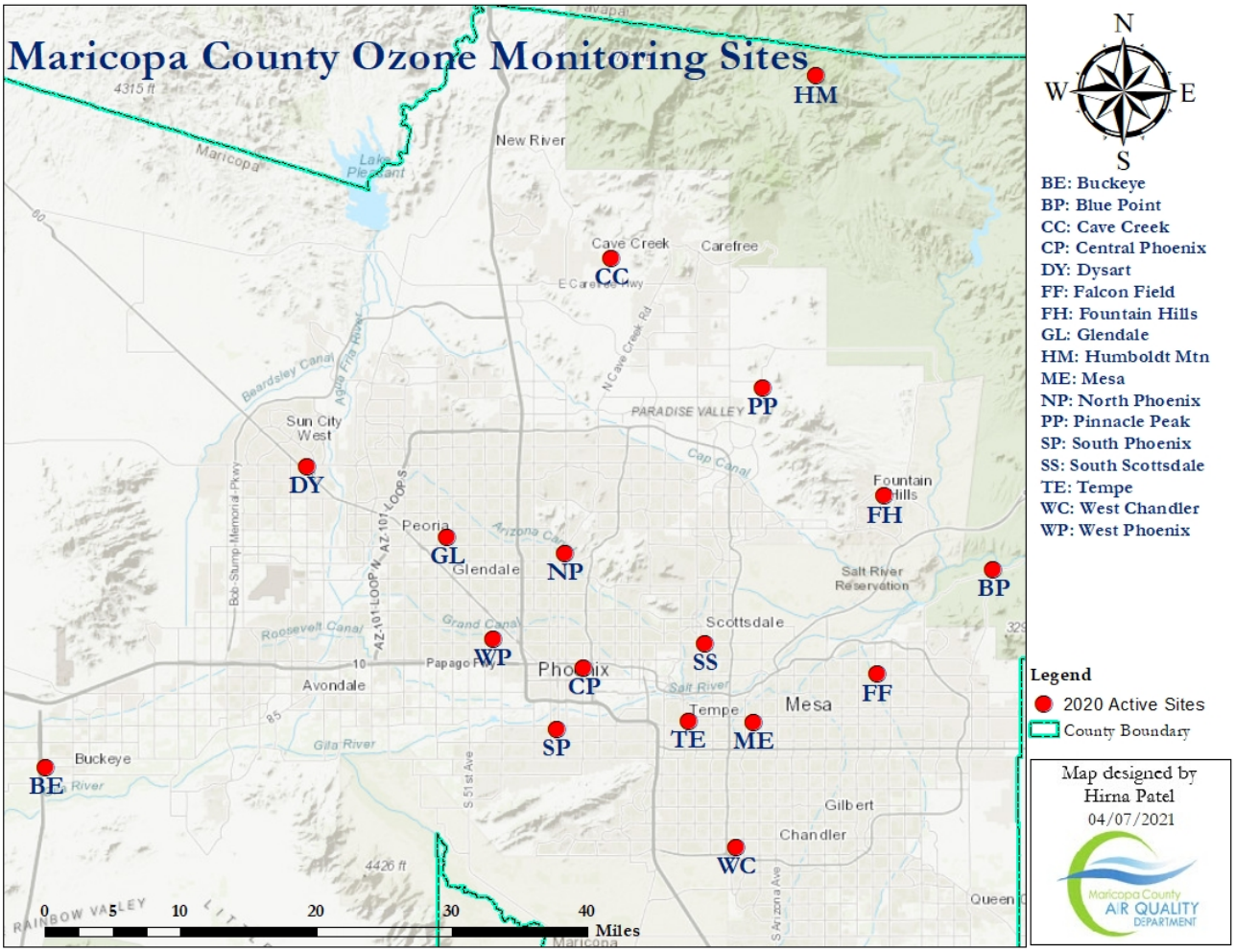


Figure 10. 2020 O_3 Monitoring Site Map

As stated in the O_3 summary, compliance with the NAAQS is determined by averaging the fourth highest 8-hour average over a 3-year period. Currently, this 3-year average must be less than or equal to 0.070 ppm. The 8-hour NAAQS is violated when a 3-year average using the fourth highest concentration measured in each year exceeds 0.070 ppm. In 2020, thirty-four days exceeded the 2015 8-hour primary standard for O_3, and fifteen sites violated the 2015 NAAQS.

In 2020, sixteen exceedance days appear to have been influenced by wildfire smoke. If EPA R9 concurs, the O_3 concentrations affected by EEs will not be used to determine compliance with the NAAQS. To view EE information related to O_3, see the 2020 O3 Exceedance, Violation, and Exceptional Event Information section.

Table 13 presents the 2020 8-hour O_3 data summary, including EE data.

Table 13. 2020 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	0.094†	0.087†	0.087†	0.082†	16
Buckeye	0.084†	0.077†	0.070	0.069	2
Cave Creek	0.086†	0.084†	0.083†	0.079†	14
Central Phoenix	0.073†	00.073†	0.072†	0.072†	7
Dysart	0.091†	0.088†	0..085†	0.077†	15
Falcon Field	0.089†	0.088†	0.085†	0.084†	20
Fountain Hills	0.092†	0.088†	0.084†	0.080†	8
Glendale	0.086†	0.083†	0.077†	0.076†	5
Humboldt Mt.	0.078†	0.077†	0.074†	0.074†	6
Mesa	0.093†	0.089†	0.086†	0.081†	15
North Phoenix	0.094†	0.093†	0.090†	0.087†	15
Pinnacle Peak	0.094†	0.086†	0.083†	0.083†	13
South Phoenix	0.086†	0.085†	0.077†	0.075†	5
South Scottsdale	0.102†	0.093†	0.091†	0.084†	18
Tempe	0.080†	0.077†	0.077†	0.075†	11
West Chandler	0.081†	0.081†	0.077†	0.075†	5
West Phoenix	0.091†	0.089†	0.081†	0.079†	10

† - Indicates an exceedance of the 2015 8-hr NAAQS

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

Table 14 shows additional information required by EPA.

Table 14. 2020 O_3 Data Required by EPA

CBSA		38060
County		Maricopa
Population & Census Year (2019)		4,485,141
3-Year Design Value		0.079
3-Year Design Value Site(s)	AQS ID	04-013-2005
	Site Name	Pinnacle Peak
	Monitoring Organization	MCAQD
MCAQD 8-Hour Maximum Concentration		0.102
MCAQD 8-Hour Maximum Concentration Site(s)	AQS ID	04-013-3003
	Site Name	South Scottsdale
MSA Maximum 8-Hour Concentration		0.102
MSA Maximum Concentration Site(s)	AQS ID	04-013-3003
	Site Name	South Scottsdale
	Monitoring Organization	MCAQD
Required Monitors		3
Active Monitors		18
Additional Monitors Needed		0

Sources: EPA AQS database – *2020 Quicklook Criteria Report (AMP450)*
U.S. Census Bureau: Quick Facts 2019 Population Estimate for Maricopa County

Lead (Pb)

The primary and secondary Pb NAAQS levels are identical. Either is violated if a rolling 3-month average exceeds 0.15 $\mu g/m^3$. The Phoenix metropolitan area is in attainment with the Pb NAAQS. The MCADQ conducted Pb monitoring at the Deer Valley Airport for more than ten years. The results showed that airborne Pb concentrations are well below the Pb NAAQS. In addition, Pb emissions from the airport have decreased since monitoring began. In lieu of this information, EPA R9 approved MCAQD discontinuing Pb monitoring at the airport. The last Pb air sample was collected on December 29, 2019.

The 2008 Pb NAAQS requires ambient Pb monitoring at NCore stations around the U.S.; and ADEQ monitors for Pb at the local NCore station at JLG Supersite (04-013-9997) in Phoenix.

Particulate Matter ≤10 Micrometers (PM_{10})

Figure 11 shows the fifteen PM_{10} monitors operating at the beginning and end of 2020. The PM_{10} monitors are designated as SLAMS and data are suitable for comparison to the NAAQS. All PM_{10} monitoring stations operate continuous PM_{10} analyzers that collect 5-minute and hourly averaged data. It is worth noting that EPA does not require PM_{10} analyzers to be collocated at the PQAO level or the national level.

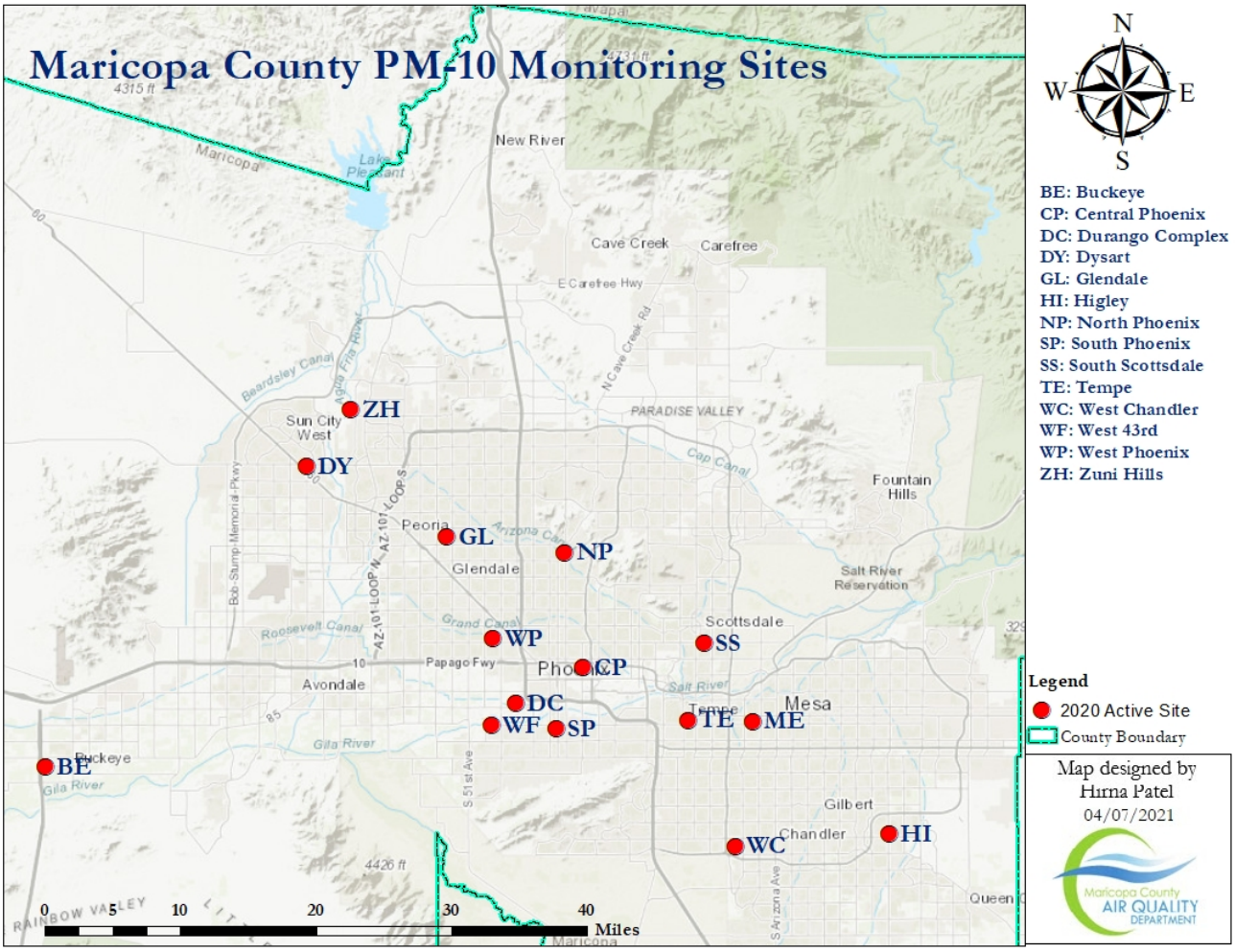


Figure 11. 2020 PM_{10} Monitoring Site Map

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 takes into account 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 15 for informational purposes.

In recent years, some PM_{10} exceedances occurring in the Maricopa County CBSA have been successfully attributed to an EE. Again, as 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 R9 concurs, the PM_{10}

concentrations affected by EEs will not be used to determine compliance with the NAAQS. To view EE information related to PM_{10}, see the 2020 PM10 Exceedance, Violation, and Exceptional Event Information section.

In 2020, there were four exceedance days of the 24-hour PM_{10} NAAQS, and six sites had at least one exceedance day. The sites are: Buckeye, Central Phoenix, South Scottdale, West Chandler, West 43rd, and West Phoenix. Table 15 shows the 2020 PM_{10} 24-hour maximum and second maximum daily averages and the expected exceedance rates by site, including EE data.

Table 15. 2020 PM_{10} 24-Hour Data Summary Including EE Data

Site Name	Maximum 24-Hour Average ($\mu g/m^3$)	2nd Maximum 24-Hour Average ($\mu g/m^3$)	Number of 24-hour NAAQS Exceedances	Expected Exceedance Rate	Annual Weighted Average ($\mu g/m^3$)
Buckeye	165†‡	138	1	1	45.8
Central Phoenix	214†‡	100	1	1	37.4
Durango Complex	141	100	0	0	39.3
Dysart	136	94	0	0	28.0
Glendale	76	68	0	0	20.1
Higley	131	107	0	0	39.2
Mesa	129	76	0	0	21.5
North Phoenix	116	54	0	0	20.5
South Phoenix	98	94	0	0	34.2
South Scottsdale	192†‡	107	1	1	28.3
Tempe	134	87	0	0	22.4
West Chandler	263†‡	89	1	1.1	30.7
West 43rd Avenue	226†‡	199†‡	3	3.1	58.2
West Phoenix	159†	120	1	1	30.8
Zuni Hills	111	88	0	0	25.4

† - Indicates an exceedance of the standard

‡ - Data are associated with exceptional event flag

Sources: EPA AQS database - *2020 Quicklook Criteria Report (AMP450)*

Table 16 shows additional information required by EPA. Data include measurements submitted as EEs.

Table 16. 2020 PM_{10} Data Required by EPA

CBSA		38060
County		Maricopa
Population & Census Year (2019)		4,485,414
MCAQD Maximum 24-Hour Concentration		263
MCAQD Maximum Concentration for Site	AQS ID	04-013-4004
	Site Name	West Chandler
MSA Maximum 24-Hour Concentration		1228
MSA Maximum Concentration Site	AQS ID	04-021-3014
	Site Name	Eloy
	Monitoring Organization	PCAQCD
Required Monitors		6-10
Active Monitors		16
Additional Monitors Needed		0

Sources: EPA AQS database – *2020 Quicklook Criteria Report (AMP450)*
U.S. Census Bureau: Quick Facts 2019 Population Estimate for Maricopa County

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

Figure 12 shows the eight $PM_{2.5}$ sites operating at the beginning and end of 2020. All $PM_{2.5}$ monitors are designated as SLAMS. Data were reported to AQS, and data are suitable for comparison to the NAAQS.

The $PM_{2.5}$ monitoring network is representative of area-wide air quality in respect to fine particulate with the exception of the monitor at Thirty-Third, which is a near-road monitoring site.

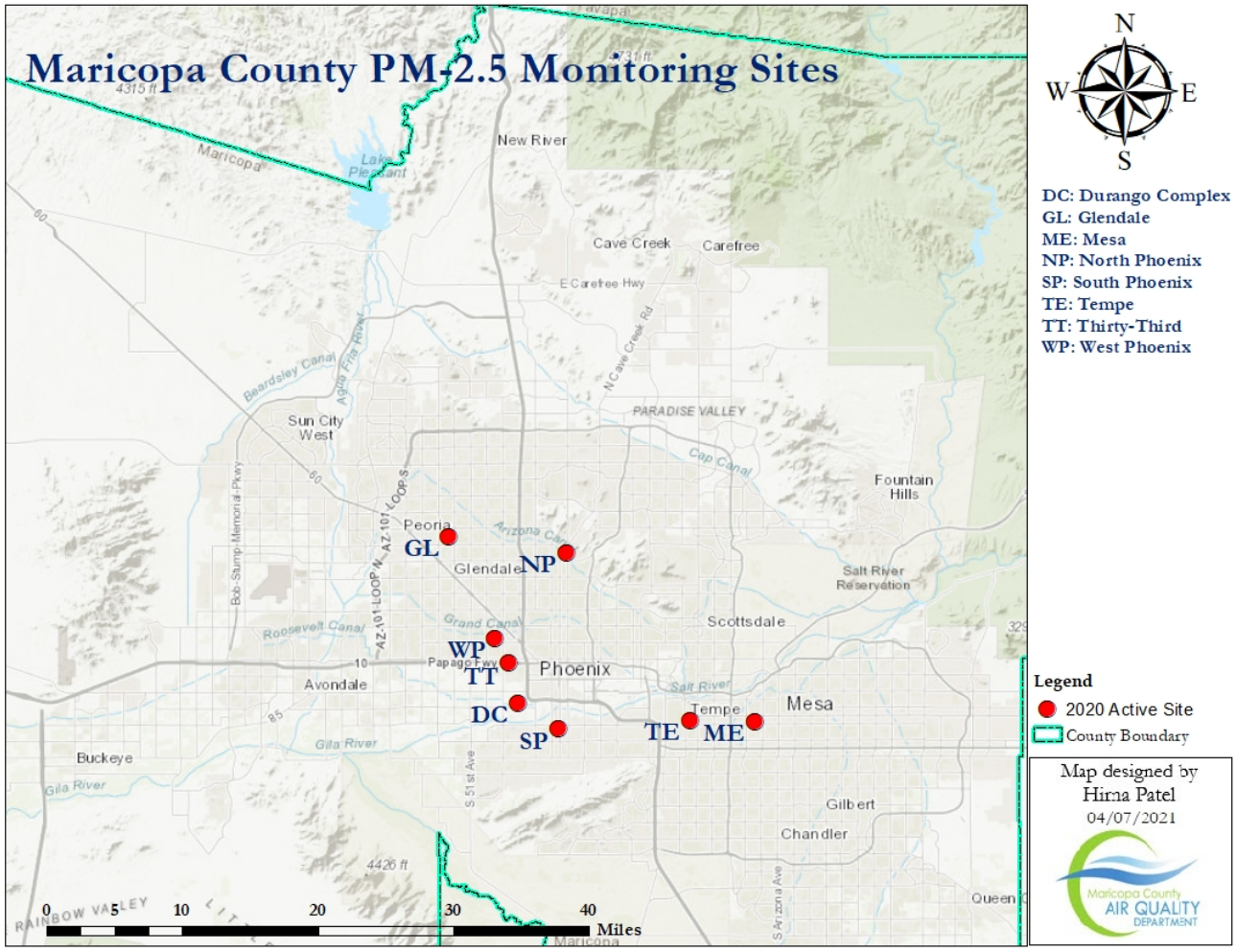


Figure 12. 2020 $PM_{2.5}$ Monitoring Site Map

Each $PM_{2.5}$ site operates a continuous FEM monitor that provides hourly concentration data used for NAAQS comparison. The West Phoenix site remains our "collocated" site for $PM_{2.5}$, which means that we operate 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 sampler collects a filter sample every 12 days for QA purposes. The secondary monitor is required to meet the EPA's QA collocation requirements for the $PM_{2.5}$ network.

The EPA may reference data from the secondary monitor to better evaluate air quality in the area. 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*. This secondary monitor collects a 24-hour filter sample from midnight-to-midnight on the designated 1:12 day schedule as required

for collocated QA samples. The U.S. EPA OAQPS produces the annual sampling calendar each year and posts it on the AMTIC website.

Maricopa County is currently in attainment for $PM_{2.5}$. The MCAQD continually assesses the existing network to ensure it adequately represents air quality in Maricopa County regarding $PM_{2.5}$. 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.

Required General Statement Regarding Changes to the $PM_{2.5}$ Network

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 R9 for approval. Any action on MCAQD's part will be dependent on EPA R9 approval. Please note that this statement is general in nature and required in this AMNRP 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.

2020 $PM_{2.5}$ Data Summary

Table 17 summarizes the 24-hour and annual data from the primary monitors only, including EE data values if any.

Table 17. 2020 $PM_{2.5}$ 24-Hour and Annual Averages Including EE Data

Site Name	Maximum 24-Hour Average Concentration (µg/m³)	2nd Maximum 24-Hour Average Concentration (µg/m³)	98th Percentile 24-Hour Average Concentration (µg/m³)	Annual Average Concentration (µg/m³)
Durango Complex	76.3†	54.7†	28.8	10.52
Glendale	64.9†	21.0	19.0	7.63
Mesa	20.6	19.7	17.4	7.30
North Phoenix	51.4†	25.5	18.4	7.88
South Phoenix	64.7†	63.0†	34.1	10.45
Tempe	19.4	18.3	15.6	6.78
Thirty-Third	141.4†	69.4†	36.7†	13.18†*
West Phoenix	149.1†	63.0†	33.9	10.47

† - Indicates an exceedance of the standard.
* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness

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

The Annual $PM_{2.5}$ NAAQS Status

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 $\mu g/m^3$ 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 18. $PM_{2.5}$ 3-Year Annual Averages

Site Name	2018 Annual Average Concentration ($\mu g/m^3$)	2019 Annual Average Concentration ($\mu g/m^3$)	2020 Annual Average Concentration ($\mu g/m^3$)	3-Year Annual Average Concentration ($\mu g/m^3$)
Durango Complex	10.10	8.38	10.52	9.66
Glendale	7.33	6.34	7.63	7.10
Mesa	7.42	5.20	7.30	6.64
North Phoenix	7.35*	6.31	7.88	7.18*
South Phoenix	9.37	7.48	10.45	9.10
Tempe	7.11	5.79	6.78	6.56
Thirty-Third	not operating	not operating	13.18†*	not available
West Phoenix	9.92	8.17	10.47	9.52

† - Indicates an exceedance of the standard

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

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*

2020 24-Hour $PM_{2.5}$ NAAQS Status

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 3-year average concentration values is less than or equal to 35 µg/m^3. In 2020, there were eleven exceedance days, but no violations of the primary or secondary 24-hour NAAQS occurred. Table 19 summaries the 3-year 24-hour 98th percentile data from the FEM analyzers.

Table 19. $PM_{2.5}$ 3-Year 24-Hour Averages of the 98th Percentile

Site Name	2018 98th Percentile 24-Hour Average Concentration (µg/m^3)	2019 98th Percentile 24-Hour Average Concentration (µg/m^3)	2020 98th Percentile 24-Hour Average Concentration (µg/m^3)	3-Year 98th Percentile 24-Hour Average Concentration (µg/m^3)
Durango Complex	25.7	21.7	28.8	25.4
Glendale	19.5	15.1	19.0	17.8
Mesa	19.1	11.1	17.4	15.8
North Phoenix	18.7	14.5	18.4	17.2
South Phoenix	27.8	21.4	34.1	27.7
Tempe	16.3	11.9	15.6	14.6
Thirty-Third	not operating	not operating	36.7	not available
West Phoenix	30.6	23.4	33.9	29.3

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

Source: EPA AQS database – *2018 - 2020 Quicklook Criteria Report (AMP450)*

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 2020, there were no EEs submitted for $PM_{2.5}$ exceedances. Maricopa County operates more than the required minimum number of $PM_{2.5}$ monitors for the CBSA.

Table 20. 2020 $PM_{2.5}$ Data Required by EPA

CBSA		38060
County		Maricopa
Population & Census Year (2019)		4,485,414
MCAQD Annual Design Value		9.7 µg/m^3
MCAQD Annual Design Value Site	AQS ID	04-013-9812
	Site Name	Durango Complex
MCAQD 24-Hour Design Value		28 µg/m^3
MCAQD 24-Hour Design Value Sites	AQS ID	04-013-4003
	Site Name	South Phoenix
MCAQD Max 24-Hour Concentration		149.1 µg/m^3
MCAQD Max 24-Hour Concentration Site	AQS ID	04-013-0019
	Site Name	West Phoenix
MSA Max 24-Hour Concentration		149.1 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

Sources: EPA AQS database - *2020 Preliminary Design Value Report (AMP480) and 2020 Quicklook Criteria Parameter Report (AMP450)*
U.S. Census Bureau: Quick Facts 2019 Population Estimate for Maricopa County

Sulfur Dioxide (SO_2)

Figure 13 shows the two SO_2 SLAMS monitors operating at the beginning and end of 2020. The data were reported to AQS, and the data are suitable for NAAQS comparison.

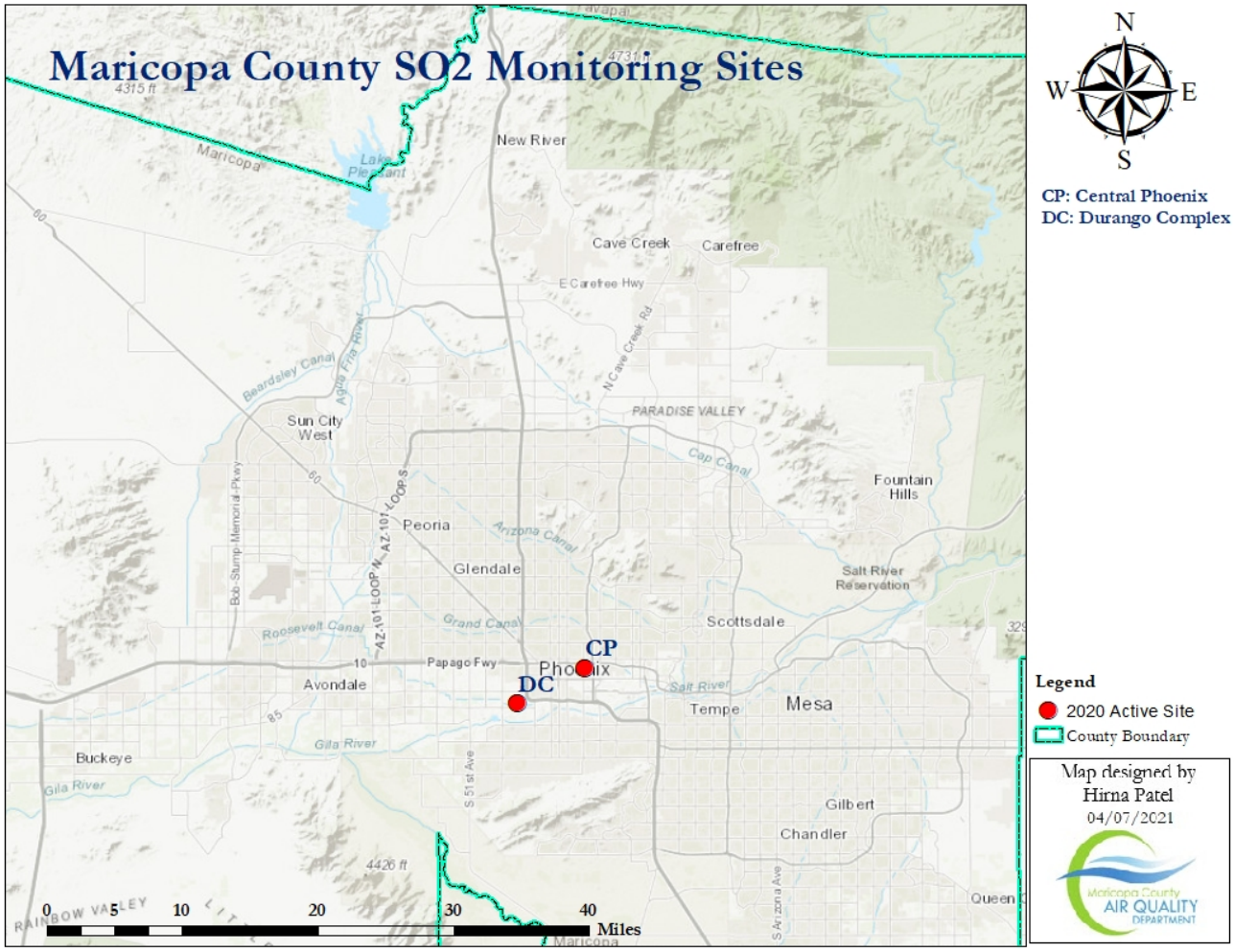


Figure 13. 2020 SO_2 Monitoring Site Map

Sulfur dioxide has a 1-hour primary standard and a 3-hour secondary standard. The 24-hour and annual average standards were revoked in a June 2010 rulemaking. A violation of the primary standard occurs when the 3-year average of the 99th percentile of the daily maximum 1-hour average exceeds 75 ppb. A violation of the secondary standard occurs when a 3-hour average of 500 ppb is exceeded more than once per year. Maricopa County is in attainment for SO_2.

In 2020, 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 now requires that the highest 5-minute average per hour per day be reported to AQS; however, there is not a 5-minute SO_2 NAAQS level. The EPA no longer requires the reporting of 3-hour values for the SO_2 secondary NAAQS.

Table 21 shows the SO_2 data summary.

Table 21. 2020 SO_2 Data Summary

Site	1-hour Maximum Concentration (ppb)	1-hour 2nd Maximum Concentration (ppb)	1-hour 99th Percentile (ppb)
Central Phoenix	6.0	5.0	5.0
Durango Complex	8.0	8.0	7.0

Source: EPA AQS database – *2020 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)*. The below was the most current information found online for SO_2 emissions, we will continue to update as newer data is available.

Table 22 shows additional information required by EPA.

Table 22. 2020 SO_2 Data Required by EPA

CBSA	County	Population & Census Year (2019)	Total SO_2 Emitted (2014) (tpy)	Population Weighted Emission Index	Required Monitors	Active Monitors	Additional Monitors Needed
38060	Maricopa	4,485,414	1177	3810	0	2	0

Sources: The EPA's National Emissions Inventories (NEI) database – 2014 NEI Data
U.S. Census Bureau: Quick Facts 2019 Population Estimate for Maricopa County

Summary of 2020 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 2020 NAAQS exceedances and violations by pollutant.

Table 23. 2020 NAAQS Exceedances and Violation Summary

Pollutant	NAAQS Status
CO	No exceedances or violations of the 1-hour or 8-hour primary 2011 NAAQS occurred.
NO_2	No exceedances or violations of the 1-hour or annual primary 2010 NAAQS or annual secondary 2012 NAAQS occurred.
O_3	On thirty-four unique days, at least one monitor exceeded the 2015 8-hour primary / secondary NAAQS. Fifteen sites will violate the 2015 8-hour primary / secondary NAAQS unless EPA R9 concurs with the EE demonstration submittals. If approved, then eight sites will violate the NAAQS.
PM_{10}	On four unique days, at least one monitor exceeded the 24-hour primary / secondary 1987 NAAQS. Seven sites will violate the primary / secondary 1987 NAAQS unless EPA R9 concurs with the EE demonstration submittals. If submittals are approved, then no site will violate the NAAQS.
$PM_{2.5}$	On eleven unique days, at least one monitor exceeded the 2012 24-hour primary / secondary NAAQS, but 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.

2020 O_3 Exceedance, Violation, and Exceptional Event Information

This section discusses the monitoring results of the O_3 network in 2020 and the 2015 NAAQS violation status based upon years 2018 through 2020.

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. Thirty-four exceedance days occurred in 2020. On the next page, Figure 14 shows the O_3 2020 exceedance dates and concentrations by site for the 2015 NAAQS. Exceedance day values associated with an EE are shown in red.

O_3 Exceptional Events and Status of EPA Concurrence

Sixteen exceedance days appear to be influenced by smoke from wildfires, and EE packages are being developed for submittal to EPA. The EPA has yet to concur or not with the EE demonstration packages before O_3 data can be omitted from NAAQS comparisons. The concentrations include hourly O_3 data that are flagged as an EE with the qualifier code indicated.

2020 Ozone Exceedance Days

as of 5/13/2021

Ozone 8-Hr Avg. NAAQS > 0.070 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
04/28/20		0.074				0.078											
04/29/20		0.074			0.073	0.080				0.074	0.072			0.073	0.074		
04/30/20						0.071											
05/04/20						0.076				0.074				0.071	0.072		
05/05/20		0.072	0.072	0.071	0.071	0.083				0.076	0.072			0.078	0.074		*
05/06/20		0.082	0.077		0.075	0.084			0.077	0.079	0.076	0.074		0.079	0.077		0.071
05/07/20		0.081	0.079	0.072	0.077	0.078			0.071	0.077	0.078	0.078		0.078	0.075	0.074	0.073
05/08/20		0.074				0.073											
05/21/20		0.071	0.071														
05/26/20		0.071	0.071														
05/28/20		0.073				0.071											
05/29/20			0.071	0.073		0.075	0.073	0.076		0.072	0.082	0.072		0.078	0.074		0.076
06/01/20		0.071				0.075				0.074					0.074		
06/03/20						0.075											
06/04/20		0.071	0.075	0.072		0.072					0.079	0.071		0.073	0.071		
06/11/20		0.071				0.072						0.071		0.072			
06/24/20						0.073											
07/27/20					0.071						0.071						
07/28/20										0.072							
07/29/20						0.072											
07/31/20												0.071		0.077			
08/17/20					0.074						0.072			0.072			
08/18/20			0.073		0.073		0.072				0.077	0.071		0.073			
08/19/20		0.094	0.086		0.071	0.089	0.092	0.072	0.078	0.093	0.094	0.094	0.075	0.102	0.080	0.081	0.079
08/23/20										0.075							
08/24/20	0.077	0.087	0.083	0.073	0.088	0.085	0.087	0.083	0.074	0.086	0.093	0.086	0.086	0.093	0.075	0.075	0.089
08/25/20		0.087	0.084	0.072	0.085	0.088	0.084	0.086	0.073	0.089	0.090	0.083	0.085	0.091	0.077	0.081	0.091
08/26/20	0.084	0.082	0.079		0.091	0.074	0.08	0.077	0.074	0.081	0.087	0.083	0.077	0.084		0.077	0.081
08/27/20			0.074		0.074		0.072			0.079	0.075	0.071	0.071	0.076			0.072
08/28/20			0.072				0.074			0.072	0.073	0.076		0.072			0.071
09/05/20					0.071												
09/15/20				0.071	0.072												0.073
09/16/20														0.072			
09/18/20					0.073												
Exceedance Days	2	16	14	7	15	20	8	5	6	15	15	13	5	18	11	5	10
Maximum Value	0.084	0.094	0.086	0.073	0.091	0.089	0.092	0.086	0.078	0.093	0.094	0.094	0.086	0.102	0.080	0.081	0.091
4th Highest Value >0.070		0.082	0.079	0.072	0.077	0.084	0.08	0.076	0.074	0.081	0.087	0.083	0.075	0.084	0.075	0.075	0.079

* - no data - monitor down

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

Total Number of Days where at least one monitor: 34

Figure 14. 2020 O_3 Exceedance Days

Source: MCAQD AirVision™ database

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. This section shows the sites that violate the 2015 O_3 NAAQS, and it includes 2018 and 2020 data associated with EE submittals.

Figure 15 shows a graph of the sites that violated the 2015 O_3 NAAQS in 2020. If the EPA does not concur with the EE demonstration packages submitted for 2018 through 2020, then, 15 sites within the MCAQD network will violate the O_3 NAAQS. The sites that violated the 2015 NAAQS in 2020 are: Blue Point, Cave Creek, Central Phoenix, Dysart, Falcon Field, Fountain Hills, Glendale, Humboldt Mountain, Mesa, North Phoenix, Pinnacle Peak, South Phoenix, South Scottsdale, West Chandler, and West Phoenix.

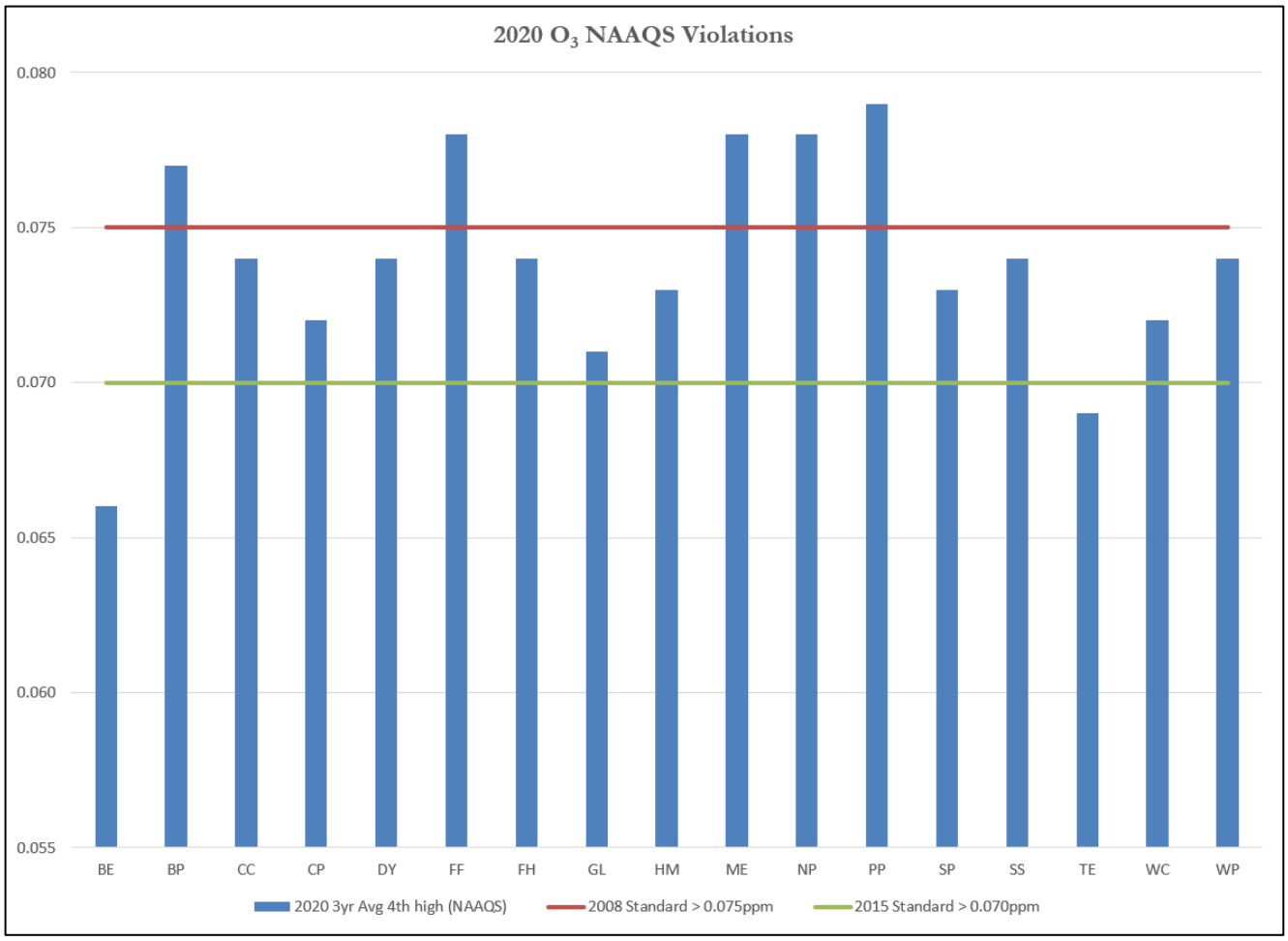


Figure 15. 2020 O_3 2015 NAAQS Violations Including EE Data

Source: *AQS 2018- 2020 O3 8-Hour Maximum Values Report (AMP440)*

If EPA concurs with EE submittal packages, then eight sites will violate the NAAQS. The sites are: Blue Point, Cave Creek, Central Phoenix, Falcon Field, Mesa, North Phoenix, Pinnacle Peak, and South Scottsdale. Figure 16 shows the sites that will violate the 2015 O3 NAAQS when EE data is removed.

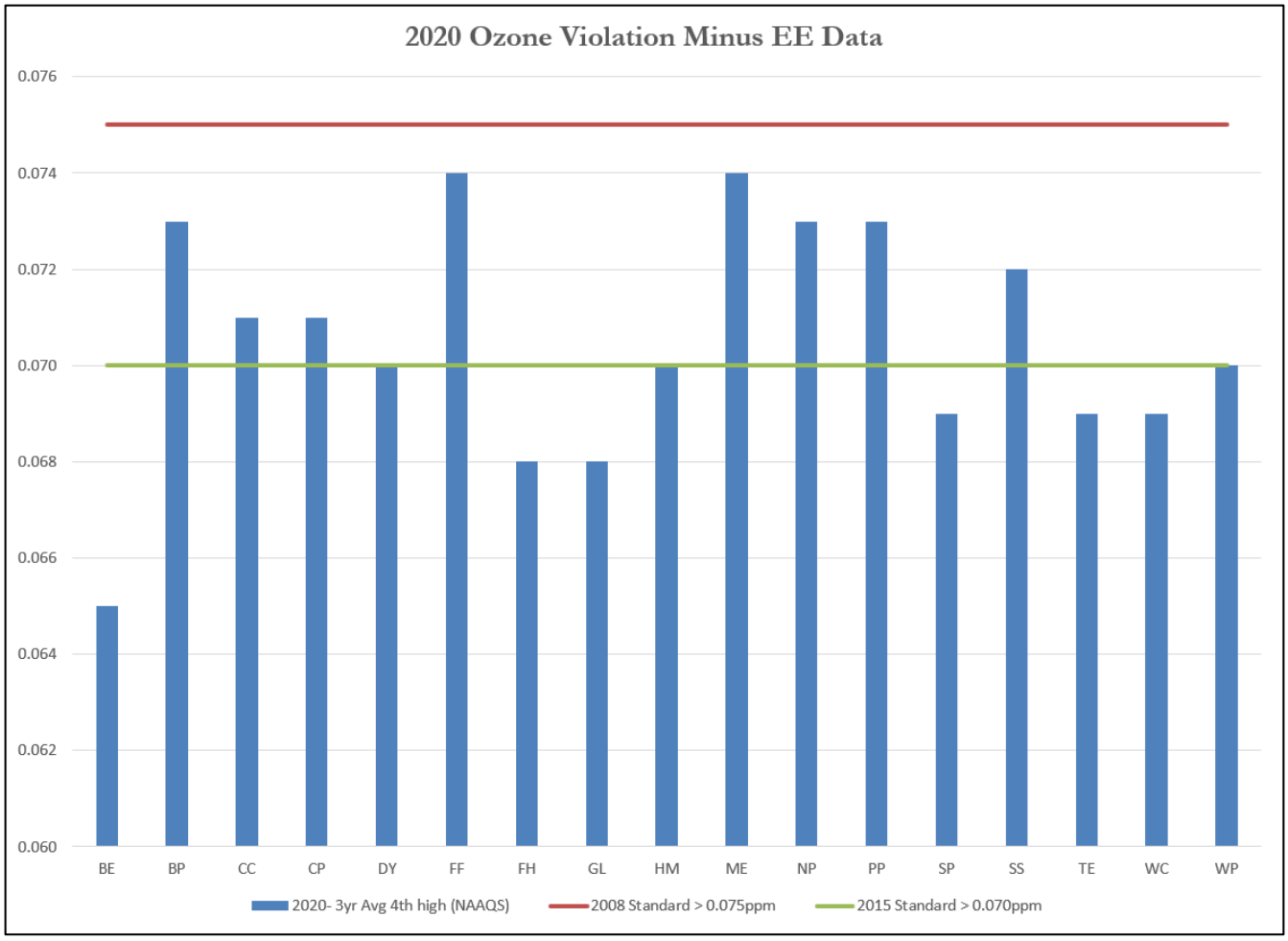


Figure 16. 2020 Ozone 2015 NAAQS Violations Excluding EE Data

Source: *AQS 2018- 2020 O3 8-Hour Maximum Values Report (AMP440)*

2020 PM_{10} Exceedance, Violation, and Exceptional Event Information

This section discusses the monitoring results of the PM_{10} network in 2020 and NAAQS violation status based upon years 2018 - 2020.

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 17 shows the site and date of PM_{10} exceedances that occurred in 2020. All 2020 exceedances of the PM_{10} NAAQS qualify for EE 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 EE.

2020 Exceedance Days of the 24-Hr PM_{10} NAAQS

as of 11/17/2020

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
01/01/20														159.6	
08/16/20		215.2								192.5		263.9	199.5		
08/17/20													186.7		
10/26/20	166.1												226.8		
Exceedance Days	1	1	0	0	0	0	0	0	0	1	0	1	3	1	0

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

Number of Days in 2020 when at least one monitor exceeded the 24-Hr PM_{10} NAAQS: 4

Figure 17. 2020 PM_{10} Exceedance Days

Source: MCAQS AirVision™ database

PM_{10} Exceptional Events and Status of EPA Concurrence

Table 24 shows the EE qualifier associated with each exceedance. Please note that data holding EE concurrence from EPA are not included when determining compliance with the NAAQS.

Table 24. 2020 PM_{10} Exceptional Event Information

PM_{10} Exceedance Date	Site	24-Hour Average Concentration (µg/m^3)	EE Qualifier Code	Qualifier Code Description
01/01/20	West Phoenix	159	rh	fireworks
08/16/20	Central Phoenix	214	rj	high winds
	South Scottsdale	192		
	West Chandler	263		
	West 43rd	199		
08/17/20	West 43rd	186		
10/26/20	Buckeye	165		
	West 43rd	226		

Source: EPA AQS database – *2020 PM_{10} Maximum Values Report (AMP440)*

This following information contrasts the PM_{10} NAAQS violation status with and without EE data. The EPA has yet to concur or not with EE demonstration package submittals for 2018 through 2020.

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 25 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 2018 through 2020; then, seven sites within the MCAQD network will violate the PM_{10} NAAQS as shown in the 3-Year Average Rate of Expected Exceedance column.

Table 25. 2020 Violations of the PM_{10} 24-Hour NAAQS Including EE Data

Site	2018		2019		2020		3-Year Average Rate of Expected Exceedances
	24-Hour Maximum ($\mu g/m^3$)	Expected Exceedances	24-Hour Maximum ($\mu g/m^3$)	Expected Exceedances	24-Hour Maximum ($\mu g/m^3$)	Expected Exceedances	
Buckeye	285‡	3	237‡	1	165‡	1	1.7†
Central Phoenix	337‡	4	84	0	214‡	1	1.7†
Durango Complex	282‡	3.1	123	0	141	0	1.0
Dysart	244‡	3	73	0	136	0	1.0
Glendale	235‡	2	44	0	92	0	0.7
Higley	215‡	5.1	114	0	131	0	1.7†
Mesa	257‡	2	48	0	129	0	0.7
North Phoenix	216‡	2*	50	0	116	0	0.7*
South Phoenix	171‡	2	72	0	98	0	0.7
South Scottsdale	341‡	4	74	0	192‡	1	1.7†
Tempe	235‡	2	67	0	134	0	0.7
West Chandler	382‡	7	76	0	263‡	1.1	2.7†
West 43rd	385‡	8	235‡	3	226‡	3.1	4.7†
West Phoenix	259‡	4	58	0	159‡	1	1.7†
Zuni Hills	231‡	2.2	113	0	111	0	0.7

‡ - MCAQD flagged this exceedance as an EE in AQS

†- indicates a violation of the NAAQS

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

Source: EPA AQS database - *2018 - 2020 – Quicklook Criteria Parameters Report (AMP450) and AQS Preliminary Design Value Report (AMP480)*

Figure 18 shows each site's three-year average rate of expected exceedances for PM_{10}. The data shown below assume that EPA R9 does not concur with any EE submission packages. Again, a site violates the NAAQS when the average is >1.0.

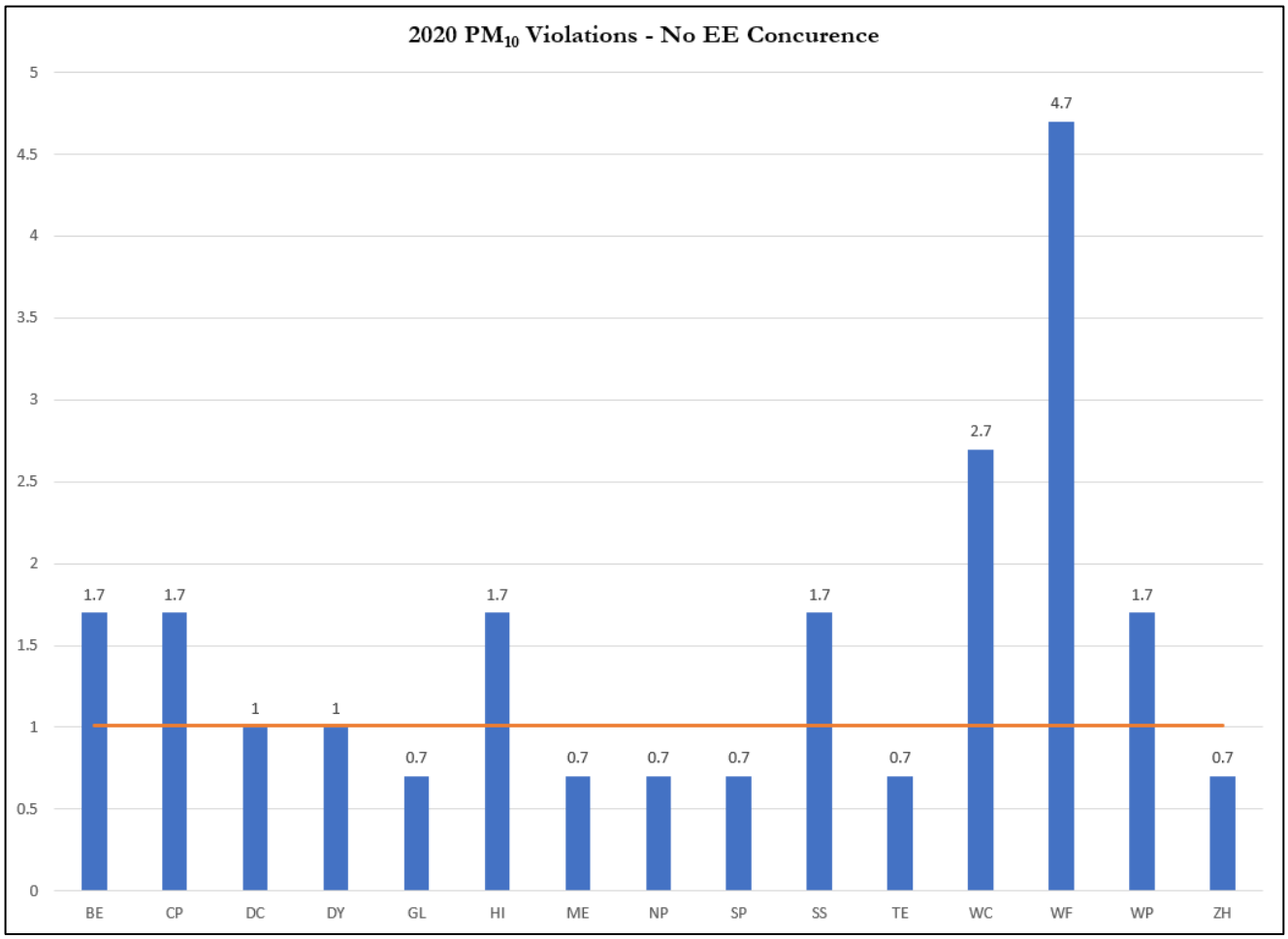


Figure 18. 2020 PM_{10} 24-Hour NAAQS Violations - No EE Concurrence

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

The ADEQ submits the EE packages to EPA R9 for the 2020 PM_{10} exceedance days. If EPA concurs with the EE demonstration packages submitted for 2018 through 2020, then no sites will violate the PM_{10} NAAQS in 2020. Table 26 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 Exceedance column.

Table 26. 2020 Violations of the PM_{10} NAAQS Excluding EE Data

Site	2018		2019		2020		3-Year Average Rate of Expected Exceedances
	24-hour Maximum ($\mu g/m^3$)	Expected Exceedances	24-hour Maximum ($\mu g/m^3$)	Expected Exceedances	24-hour Maximum ($\mu g/m^3$)	Expected Exceedances	
Buckeye	126	0	131	0	138	0	0
Central Phoenix	146	0	84	0	100	0	0
Durango Complex	154	0	123	0	141	0	0
Dysart	120	0	73	0	136	0	0
Glendale	109	0	44	0	76	0	0
Higley	153	0	114	0	131	0	0
Mesa	154	0	48	0	129	0	0
North Phoenix	147	0	50	0	116	0	0
South Phoenix	96	0	72	0	98	0	0
South Scottsdale	141	0	74	0	107	0	0
Tempe	151	0	67	0	134	0	0
West Chandler	131	0	76	0	89	0	0
West 43rd Avenue	153	0	150	0	130	0	0
West Phoenix	122	0	58	0	120	0	0
Zuni Hills	138	0	113	0	111	0	0

Source: EPA AQS database – *2018 - 2020 Maximum Values Report (AMP440)*

2020 $PM_{2.5}$ Exceedance, Violation, and Exceptional Event Information

This section discusses the monitoring results of the $PM_{2.5}$ network in 2020. It includes NAAQS exceedance information and violation status for 2020.

$PM_{2.5}$ 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 2020, there were no violations of either annual NAAQS levels. Each site's annual $PM_{2.5}$ average was shown previously on Table 18. The site with the highest 3-year annual average was Durango Complex with 10.52 µg/m^3.

$PM_{2.5}$ 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. If the 24-hour 3-year average of the 98th percentile exceeds 35 µg/m^3, then the 24-hour NAAQS is violated. In 2020, and as shown on Table 19, the site with the highest 24-hour 3-year average of the 98th percentile is West Phoenix with a concentration of 29.3 µg/m^3. Therefore, no sites violate the 2012 NAAQS.

Figure 19 shows the exceedance days in 2020 for $PM_{2.5}$.

2020 Exceedance Days of the 24-Hr $PM_{2.5}$ NAAQS
as of 01/03/2021

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

	Diablo	Durango Complex	Glendale	Mesa	North Phoenix	South Phoenix	Tempe	Thirty-Third	West Phoenix
01/01/2020		76.3	64.9		51.4	64.7		141.4	149.1
11/28/2020	*							36.7	
11/29/2020	*							38.7	37.3
12/06/2020	*					43.0			37.1
12/18/2020	*							43.3	36.8
12/19/2020	*					37.4		38.2	38.5
12/20/2020	*					38.7		43.1	37.3
12/21/2020	*							36.4	
12/24/2020	*					45.1			
12/25/2020	*	54.7				56.2		69.4	63.0
12/31/2020	*					63.0		35.6	
Exceedance Days	0	2	1	0	1	7	0	9	7

* - no monitor

Number of Days in 2020 where at least one monitor exceeded the 24-Hr $PM_{2.5}$ NAAQS: 11

NOTES:
Exceedances qualifying for an EE sumbittal to EPA are shown in RED
Diablo - sampling discontinued on 01/12/2020
Thirty-Third - $PM_{2.5}$ sampling started 01/01/2020

Figure 19. 2020 $PM_{2.5}$ Exceedance Days

Source: MCAQD AirVision™ database

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

There were no $PM_{2.5}$ EEs for years 2019 and 2020. EPA R9 has yet to concur or not with the 2018 EE package submittals. Even if the EPA does not concur with the EE demonstration packages for 2018, Maricopa County is in attainment for the $PM_{2.5}$ 2012 NAAQS. The 2019 - 2020 exceedance days did not warrant seeking EE submittal packages due to no risk of the exceedance triggering a violation of the NAAQS.

NETWORK MODIFICATION PROCESS

This section reports on the network modifications made in the prior year as well as any future network modifications MCAQD would like to make or must make for various reasons. The final draft of the AMNRP includes these proposed changes, which is available for review and discussion during the 30-day public comment period and the open forum meeting.

Most modifications will require prior approval by EPA R9. MCAQD's AMD 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 SIPs, EE packages, and permits for new and existing sources.

As mentioned earlier in the $PM_{2.5}$ information, in the event MCAQD needs to move or change a violating $PM_{2.5}$ monitor, 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 R9 for approval. Any action on MCAQD's part will be dependent on EPA R9 approval.

Summary of 2020 Network Changes and Supporting Documentation

Beginning January 1, 2020, MCAQD discontinued reporting air monitoring data from the Diablo site. Delta T (temperature difference) data reporting discontinued on September 1, 2020. Supporting information is provided below. These changes required approval by EPA R9 and supporting documentation can be found in Appendices IV and V.

- Delta T monitoring – AMD ceased monitoring for Delta T (temperature difference) at the following sites: Higley (04-013-4006), North Phoenix (04-013-1004), Tempe (04-013-4005), West 43rd (04-013-4009), and West Phoenix (04-013-0019). This was due to not being able to replace the aging measurement system in-use due to not finding a comparable product on the market; and, AMD discerned that the data have not been used by customers for over fifteen years. The monitors discontinued operating on August 31, 2020.
- Diablo (04-013-4019) – shutdown monitoring site, which had CO, NO_2, $PM_{2.5}$, and meteorological monitors on December 31, 2019.
- Eastwood (04-013-4021) - AMD worked with EPA R9 and ADOT to establish this new near-road site in early 2021 and to ensure compliance with the regulatory requirements for the near-road network. AMD will shift the CO and $PM_{2.5}$ monitors from the Thirty-Third site to the new Eastwood site when the site becomes operational.
- Glendale (04-013-2001) - AMD expanded the brick wall that surrounds the shelter due to it being damaged. The change increased workspace around the shelter.
- Mesa (04-013-1003) - AMD improved safety at the site by installing a permanent ladder to the roof of the shelter.
- South Phoenix (04-013-4003) - began solar radiation monitoring on June 18, 2021.
- Tempe (04-013-4405) – AMD upgraded the shelter roof and added stairs for better access to the roof.
- Thirty-Third (04-013-4020) - AMD continued to meet near-road regulatory requirements by shifting the $PM_{2.5}$ and CO monitors to this site temporarily while the Eastwood site is constructed.

- West 43rd (04-103-4009) - AMD completed the significant upgrades that began last year to the site's infrastructure, including the power supply, and installed the new shelter. The changes will improve safety and ease of maintenance for AMD personnel.
- AMD implemented the use of NumaView™ Software on the TELEDYNE API T-series gaseous analyzers; and is now graphing one-minute data from analyzer responses to concentration challenges during verifications and calibrations.
- AMD replaced four ESC-8832 data loggers with the Agiliare$_{LLC}$/ESC-8864 data loggers at the following sites: Dysart, Fountain Hills, Pinnacle Peak, and South Phoenix.

Proposed Network Modifications and Projects

For 2021, MCAQD does not anticipate any significant interruptions to the monitoring operations. Currently, AMD plans on improving existing sites either by remodeling existing shelters or installing new shelters and improving site safety and security. Improvements to power supplies or communication systems will occur as needed. The following is a list of projects planned for 2021.

- Cave Creek (04-013-4008) – AMD plans on establishing a shelter at this site and vacating the Maricopa County Parks and Recreation building.
- Eastwood (04-013-4021) – the new near-road monitoring site opened on March 5, 2021. The site monitors for CO, NO_2, $PM_{2.5}$, ambient temperature, barometric pressure, relative humidity, wind speed and direction. The site replaces the Diablo near-road site (04-013-4019), which permanently closed December 31, 2020.
- Falcon Field (04-013-1010) - a major safety issue with mounting the wind tower to the roof caused us to discontinue monitoring for wind speed and direction on March 11, 2021. The wind tower's mounting hardware and guy wires were loose and could no longer be secured to the fire station's roof. At this time, AMD is working to secure a better location.
- Thirty-Third (04-013-4020) – AMD discontinued monitoring for CO and $PM_{2.5}$ at this site on February 28, 2021 due the new Eastwood site opening on March 5, 2021. At that time, this site monitors for NO_2, ambient temperature, relative humidity, wind speed and direction.
- AMD plans to continue replacing ESC-8832 data loggers with the Agiliare$_{LLC}$/ESC-8864 data loggers as funds become available.

Information Regarding Maricopa County's Supplementary Air Monitoring Programs

Personnel who work in field operations go through Hazardous Waste Operations and Emergency Response Standard (HAZWOPER) training and medical monitoring requirements as per the U.S. Occupational Safety and Health Administration (OSHA) *29 CFR 1910.120*. Personnel attend an annual refresher training to remain certified.

Rapid Response Notification System (RRNS)

Maricopa County enjoys many days with clean air; however, there are days when PM_{10}, $PM_{2.5}$, or O_3 pollution levels approach or exceed the NAAQS. In particular, PM_{10} and $PM_{2.5}$ concentrations can build up quickly due to a high wind speed or a fire, respectively. Curtailing PM pollution from natural events is challenging; it requires planning and implementing control mechanisms to reduce the likelihood of an exceedance. However, anthropogenic activities that cause high PM concentrations near a site can often be addressed. If a quickly developing PM event is not addressed, it could result in a NAAQS exceedance that may have been avoidable.

To help reduce PM concentrations, MCAQD implemented an automated alarm system that triggers email notifications and/or telephone calls to subscribers when concentrations of PM_{10} and $PM_{2.5}$ escalate. Subscribers include, but are not limited to, MCAQD's compliance and air monitoring personnel as well as industrial source representatives who can take action to reduce PM emissions caused by their work activities. The AirVision™ database is programmed to trigger alerts for elevated PM_{10} five-minute and hourly concentrations. Immediately following an hourly or five-minute PM concentration surpassing an assigned notification level, a high importance alert is sent out via email, text, and/or telephone to employees, stakeholders, and/or customers. In addition, Maricopa County enforces a "no burn restriction" when a $PM_{2.5}$ High Pollution Advisory (HPA) is issued by ADEQ.

RRNS serves as a tool to manage high pollution events using a three-part system:

1. dissemination of as near real-time as possible air quality data to the community;
2. a notification system to alert MCAQD personnel, stakeholders, and customers of a pollution problem; and,
3. onsite response from department inspectors and stakeholders to identify and discourage pollution activity and to reduce the risk of pollution impacts.

The alerts request that dust control permit holders inspect their sites as soon as possible and employ Best Available Control Measures to stabilize disturbed soils to reduce blowing dust following the notification. MCAQCED inspectors also review the data and current circumstances, make site visits, or take other appropriate actions to help stop PM concentrations from increasing. To better expedite response actions, meteorological data such as wind speed and direction are also available in five-minute increments.

Ozone Precursor Study

In 2021, the MCAQD will be monitoring O_3 precursors through canister sampling, and in conjunction with ASU, AMD will be deploying an array of small sensors to help our understanding of spatial distribution of O_3 and its precursors.

Small Sensor Studies

In partnership with EPA OAQPS, MCAQD launched a three-phase monitoring project to gather pollutant data using low-cost sensors. The knowledge gained from these projects will help EPA better determine how pollutant measurements from low-cost sensors compare to those of regulatory analyzers or samplers. Phase I started in late 2018 and Phase II started in 2019. Studies used low-cost small sensors to help locate spatial hotspots of pollution, identify sources, and observe pollution dynamics during the wintertime burn season. Phase I and II provide data that will help determine how well the PurpleAir® sensors measure PM pollution, as well as the effects of an arid, hot climate on the sensors' performance and longevity. Phase I and II continued through 2021. Phase III involved testing a variety of popular, leading small sensors at the West Phoenix site and ended in 2020.

Shared Air Monitoring Responsibilities

For the MCAQD monitoring network, EPA requested that we work with the other S/L/T MOs within the MSA/CBSA to develop a shared monitoring agreement as specified by EPA R9. 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 R9 representatives regarding their direction on how to proceed with this requirement. We are dependent upon representatives at EPA R9 to provide the specifics needed in such an agreement before we can satisfy this requirement. As soon as we do receive guidance, we will pursue working on this effort.

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 several 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
- AIRNow webpage: https://www.airnow.gov/
- 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 AQS AirData website: http://www.epa.gov/airdata
- U.S. EPA NowCast Calculator webpage: https://www3.epa.gov/airnow/aqicalctest/nowcast.htm
- U.S. EPA OAQPS QA Webpage: https://www.epa.gov/amtic/ambient-air-monitoring-quality-assurance
- 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 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

REFERENCES cont.

- MCAQD Annual Monitoring Plans and Network Assessments: http://www.maricopa.gov/1669/Air-Monitoring-Network-Plans-Assessments

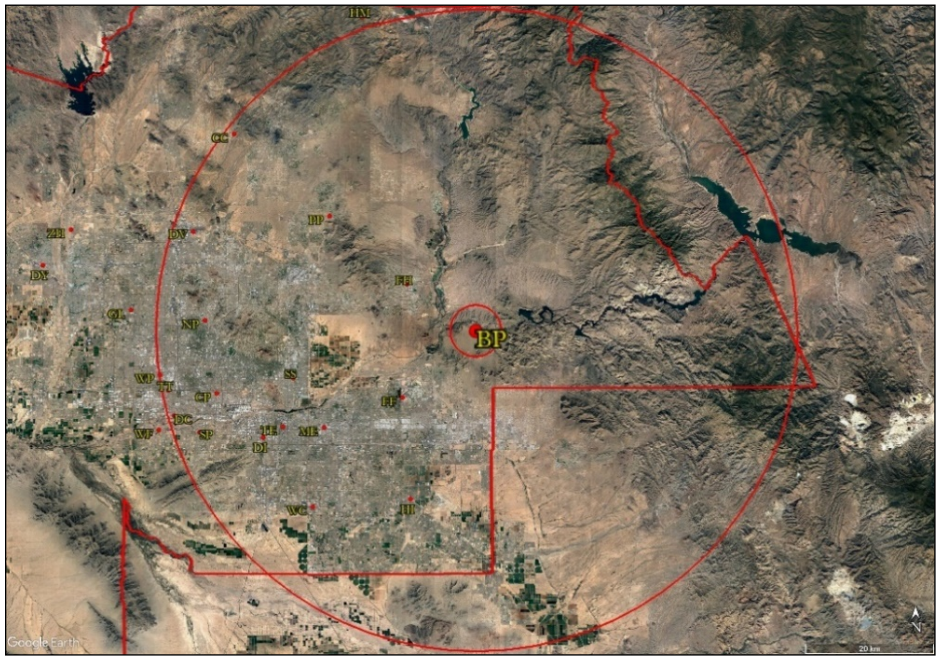
- MCAQD CleanAirMakeMore Restrictions Web page: https://cleanairmakemore.com/our-air/restrictions/

- 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 photographs, site type and spatial scale, and population represented.

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.

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.081†	0.078†	0.094†‡
	Number of O_3 Exceedance Days	21	8	16
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.074#	0.075#	0.077#

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 Exceedance Day Reports for Numbers

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

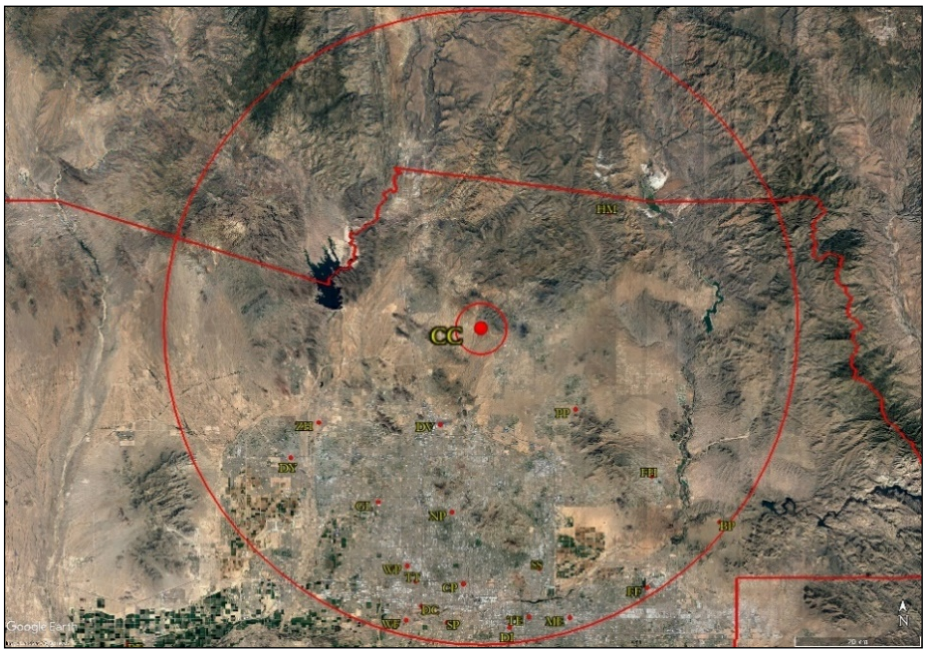
Site Description: The Buckeye site began operating in August 2004. This SLAMS location monitors for CO, NO_2, O_3, and PM_{10}. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

The site is located at the Maricopa County Department of Transportation - Southwest Facility. The immediate area is agriculture and encroaching residential development. This site was closed temporarily in early 2017 for significant building and infrastructure upgrades.

Pollutant	Metric	2018	2019	2020
CO	Maximum 8-hr CO Average (ppm)	0.6	0.8	0.7
	Number of 8-hr CO Exceedances	0	0	0
NO_2	Annual NO_2 Average (ppb)	7.67	7.09	8.12
	NO_2 1-hr Avg. 98th Percentile (ppb)	34.0	33.0	36.0
O_3	Maximum 8-hr O_3 Average (ppm)	0.072†	0.079†	0.084†‡
	Number of O_3 Exceedance Days	1	1	2
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.066	0.067	0.066
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m^3)	285†‡	237†‡	165†‡
	Number of 24-hr PM_{10} Exceedance Days	3	1	1
	Annual PM_{10} Average (µg/m^3)	42.9	35.4	45.8

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 and PM_{10} Exceedance Day Reports for Numbers

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



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

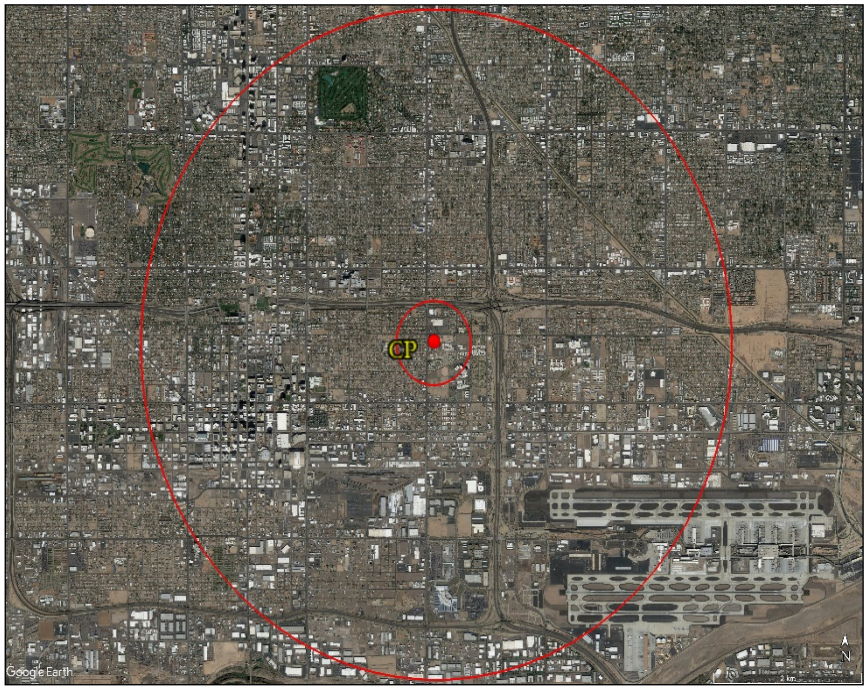
Site Description: The Cave Creek site began operating in July 2001. This SLAMS location monitors for O_3. Meteorological monitoring includes ambient temperature, barometric pressure, rain, relative humidity, and wind speed/direction.

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

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.079†	0.073†	0.086†‡
	Number of O_3 Exceedance Days	11	3	14
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.072#	0.071#	0.074#

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard
Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 Exceedance Day Reports for Numbers

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

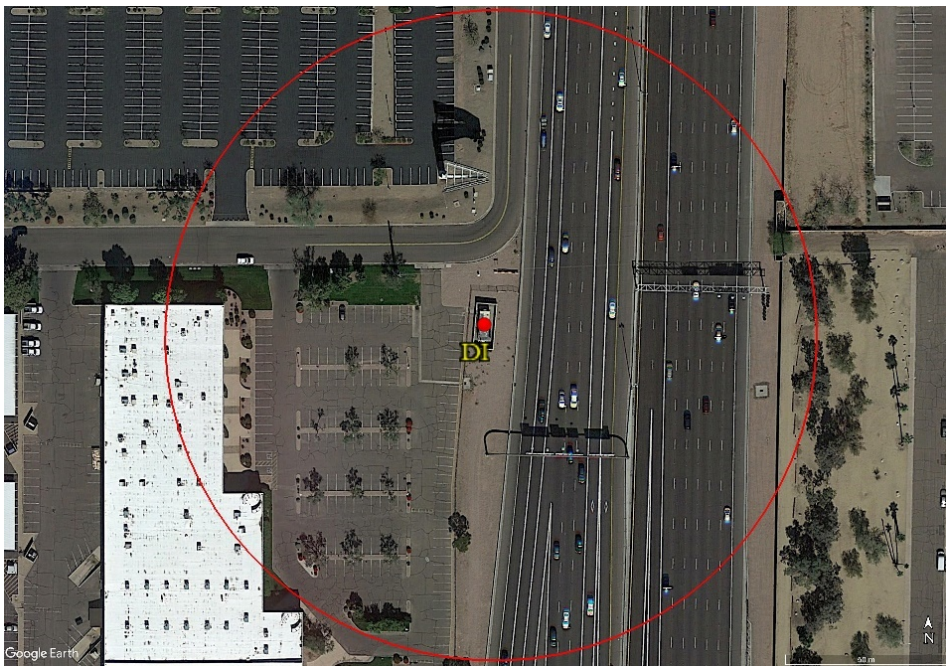
Site Description: The Central Phoenix site began operating in June 1962. This SLAMS location monitors for CO, PM_{10}, NO_2, O_3, and SO_2. Meteorological monitoring includes ambient temperature, barometric pressure, and wind speed/direction.

Pollutant	Metric	2018	2019	2020
CO	Maximum 8-hr CO Average (ppm)	2.4	1.8	1.9
	Number of 8-hr CO Exceedances	0	0	0
NO_2	Annual NO_2 Average (ppb)	17.53	15.71	15.93
	NO_2 1-hour Average 98th Percentile (ppb)	56.0	52.0	54.0
O_3	Maximum 8-hr O_3 Average (ppm)	0.079†	0.077†	0.073†‡
	Number of O_3 Exceedance Days	5	6	7
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.072#	0.073#	0.072#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	337†‡	84	214†‡
	Number of 24-hr PM_{10} Exceedance Days	4	0	1
	Annual PM_{10} Average (µg/m³)	39.2	30.4	37.4
SO_2	SO_2 1-hour 99th Percentile (ppb)	8.0	5.0	5.0
	Number of SO_2 Exceedance Days	0	0	0
	Annual SO_2 Avg. (ppb)	1.07	0.45	0.25

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP4500)*
MCAQD 2018 - 2020 O_3 and PM_{10} Exceedance Day Reports for Numbers

Diablo (DI) (04-013-4019)



Site Location	Fairmont Dr. & Diablo Way, Tempe
Spatial Scale	Micro
Site Type	Source-Oriented

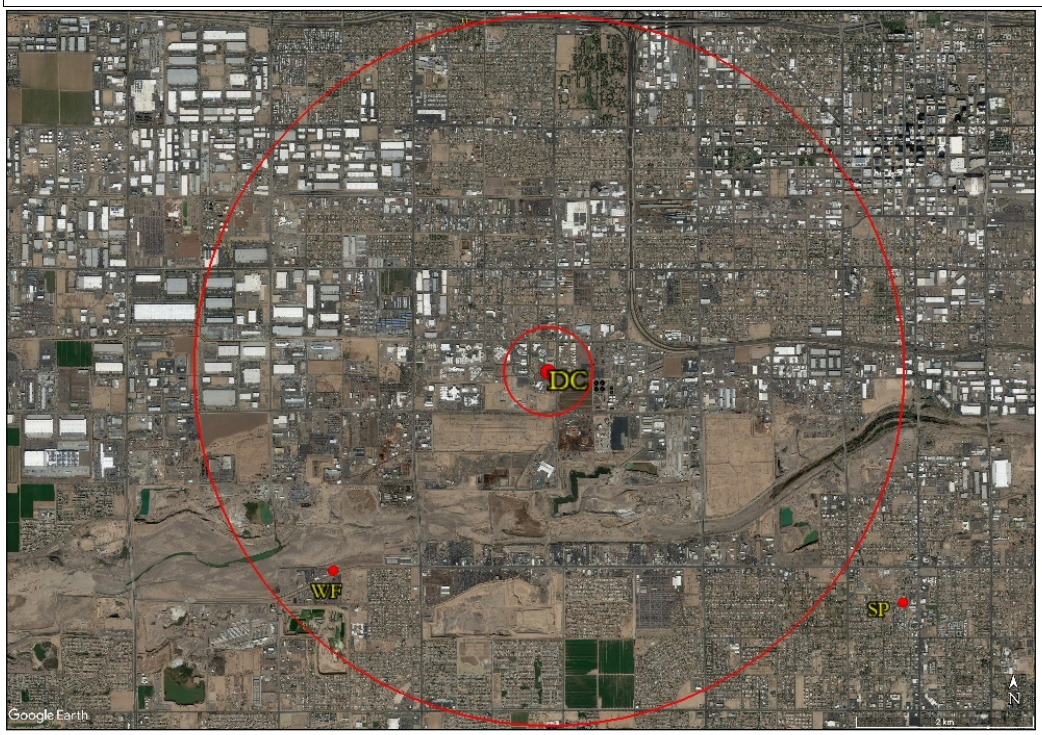
Site Description: The Diablo site began operating in February 2014. This SLAMS location monitored for CO, NO_2, and $PM_{2.5}$. Meteorological monitoring included ambient temperature, relative humidity, and wind speed/direction.

Diablo was the first near-road air monitoring site established by MCAQD. The Diablo site closed on December 31, 2019 due to ADOT making significant design improvements to the I-10 and Broadway Curve area. In 2020, near-road monitoring of CO and $PM_{2.5}$ temporarily shifted to the Thirty-Third near-road site to remain compliant with EPA requirements. The replacement site will be in the same general area as Diablo and is slated to open in early 2021. At that time, CO and $PM_{2.5}$ monitoring will shift to the new site.

Pollutant	Metric	2018	2019	2020
CO	Maximum 8-hr CO Average (ppm)	1.6	1.5	not operating
	Number of 8-hr CO Exceedance Days	0	0	
NO_2	Annual NO_2 Average (ppb)	18.93	16.83	not operating
	NO_2 1-hr Average 98th Percentile (ppb)	56.0	50.0	
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m^3)	49.0†‡	18.4	not operating
	Number of 24-hr $PM_{2.5}$ Exceedance Days	2	0	
	Annual $PM_{2.5}$ Average (µg/m^3)	8.62	6.88	
	$PM_{2.5}$ 98th Percentile Value (µg/m^3)	21.9	13.7	

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
Source: EPA AQS database - *2018 - 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 $PM_{2.5}$ Exceedance Day Reports for Numbers

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



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

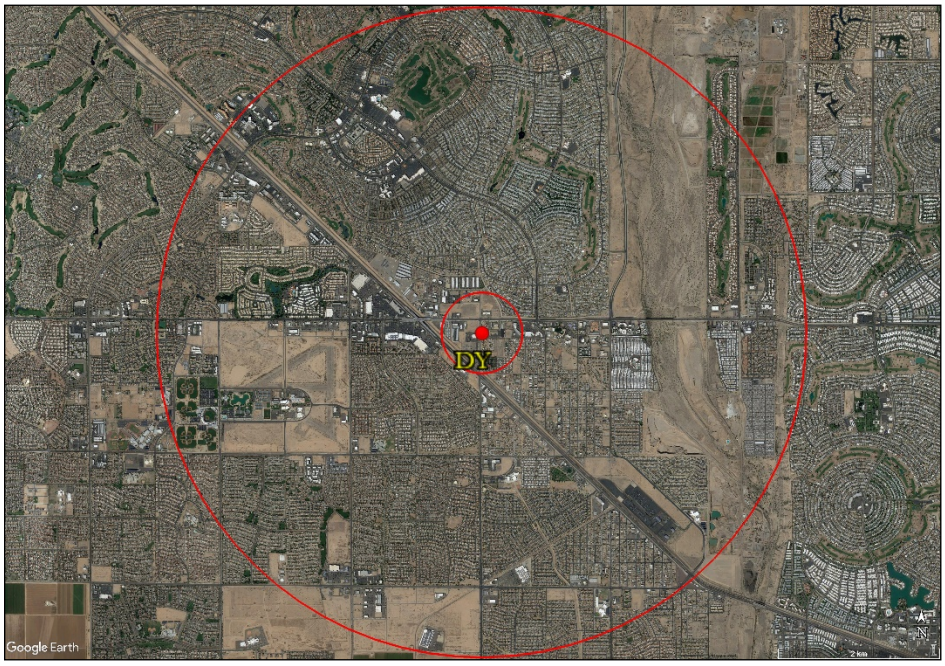
Site Description: This site began operating in January 1999. This SLAMS location monitors for PM_{10}, $PM_{2.5}$, and SO_2. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

The site is located inside the Maricopa County Flood Control District storage yard.

Pollutant	Metric	2018	2019	2020
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	282†‡	123	141
	Number of 24-hr PM_{10} Exceedance Days	3	0	0
	Annual PM_{10} Average (µg/m³)	43.1	31.5	39.3
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	115.3†‡	27.8	76.3†
	Number of $PM_{2.5}$ 24-hr Exceedance Days	1	0	2
	Annual $PM_{2.5}$ Average (µg/m³)	10.10	8.38	10.52
	98th Percentile $PM_{2.5}$ Value (µg/m³)	25.7	21.7	28.8
SO_2	SO_2 1-hour 99th Percentile (ppb)	8.0	5.0	7.0
	Number of SO_2 Exceedance Days	0	0	0
	Annual SO_2 Average (ppb)	0.77	0.91	0.59

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
Source: EPA AQS database - *2018 - 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 $PM_{2.5}$ and PM_{10} Exceedance Day Reports for Numbers

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.

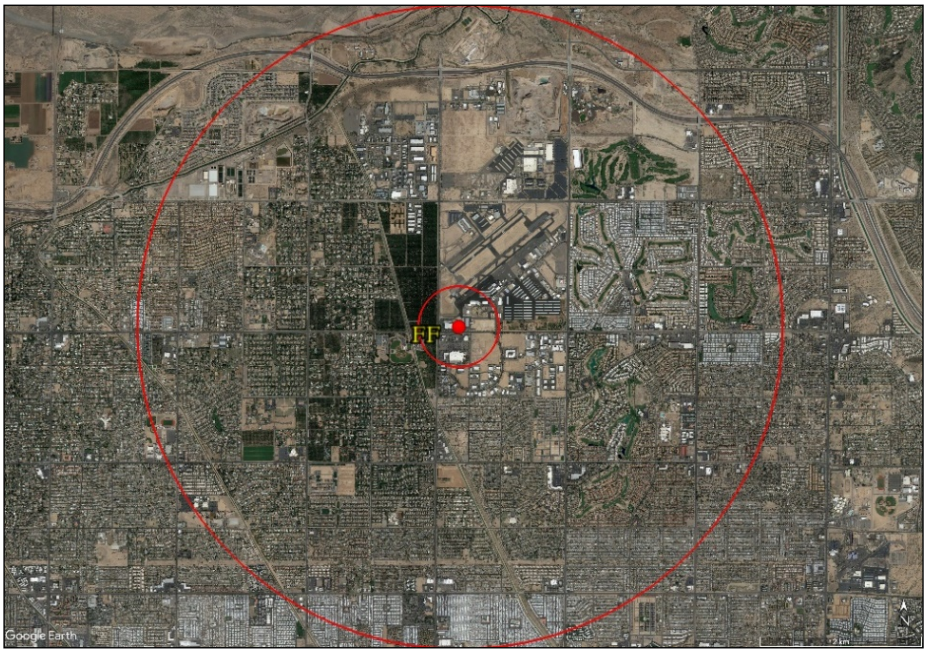
The site is located at the Maricopa County Facility Maintenance Yard on the corner of Bell Rd. and Dysart Rd. The site is in a growing population area in the northwest valley and is surrounded by a variety of land use.

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.086†	0.074†	0.091†‡
	Number of O_3 Exceedance Days	9	1	15
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.072#	0.073#	0.074#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	244†‡	73	136
	Number of 24-hr PM_{10} Exceedance Days	3	0	0
	Annual PM_{10} Average (µg/m³)	30.4	23.0	28.0

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 and PM_{10} Exceedance Day Reports for Numbers

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



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

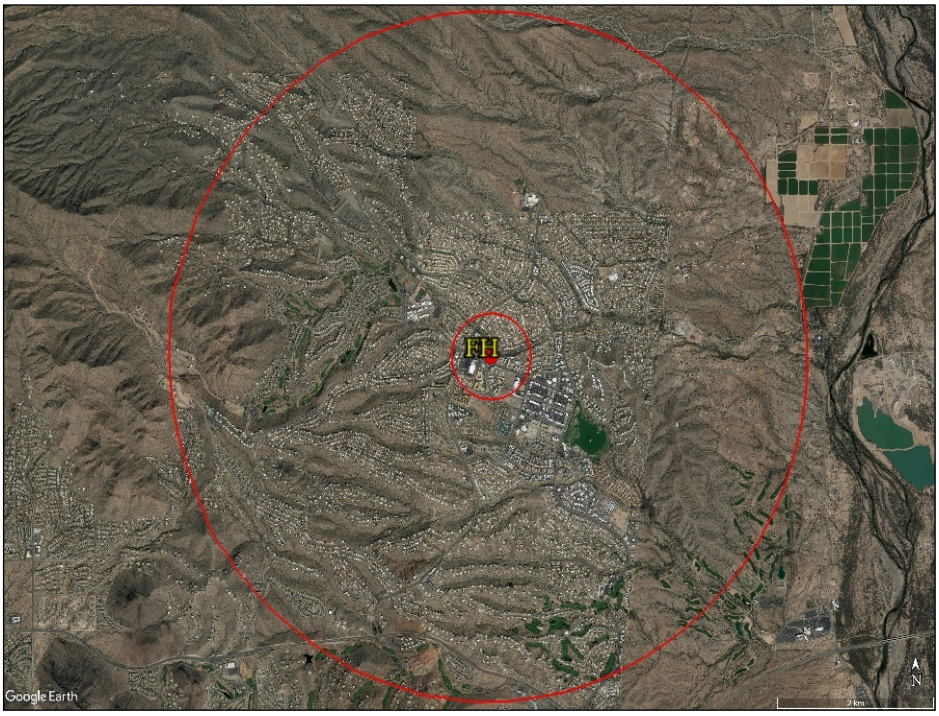
Site Description: This site began operating in June 1989. This SLAMS location monitors for O_3. Meteorological monitoring includes ambient temperature and relative humidity.

The site is located at a fire station near an airfield within a growing residential area. In 2020, wind speed and 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.

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.082†	0.079†	0.089†‡
	Number of O_3 Exceedance Days	22	13	20
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.075#	0.076#	0.078#

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard
Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 Exceedance Day Reports for Numbers

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.

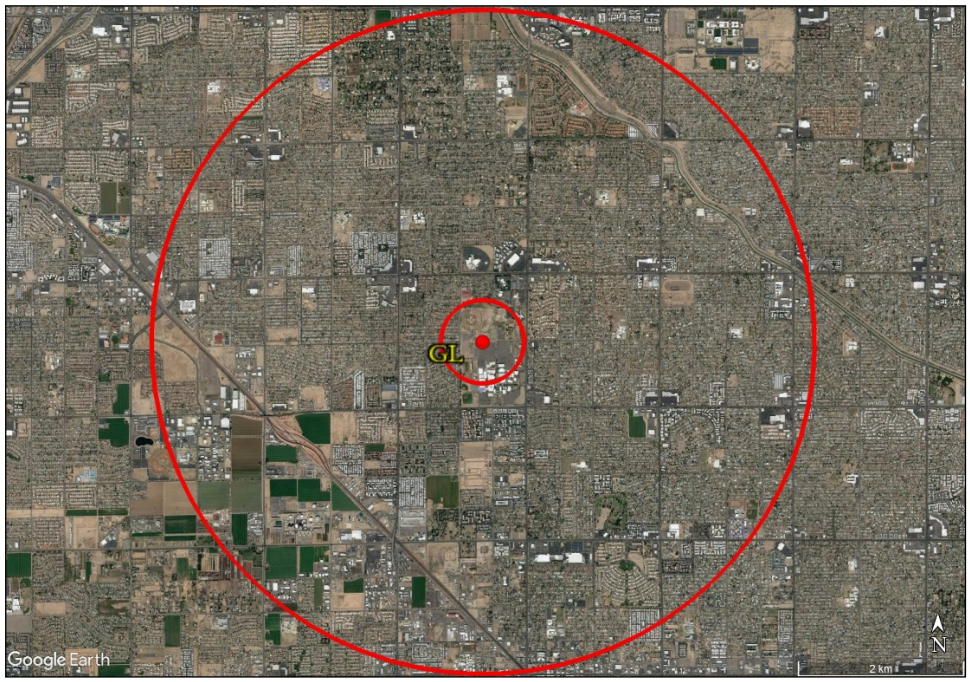
The site is located approximately 15 miles northeast of the Phoenix metropolitan area and represents maximum O_3 concentrations downwind from an urban area. Furthermore, the site sits on the fringes of the central basin district along the predominant summer/fall daytime wind direction.

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.084†	0.072†	0.092†‡
	Number of O_3 Exceedance Days	14	1	8
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.072#	0.072#	0.074#

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 Exceedance Day Reports for Numbers

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.

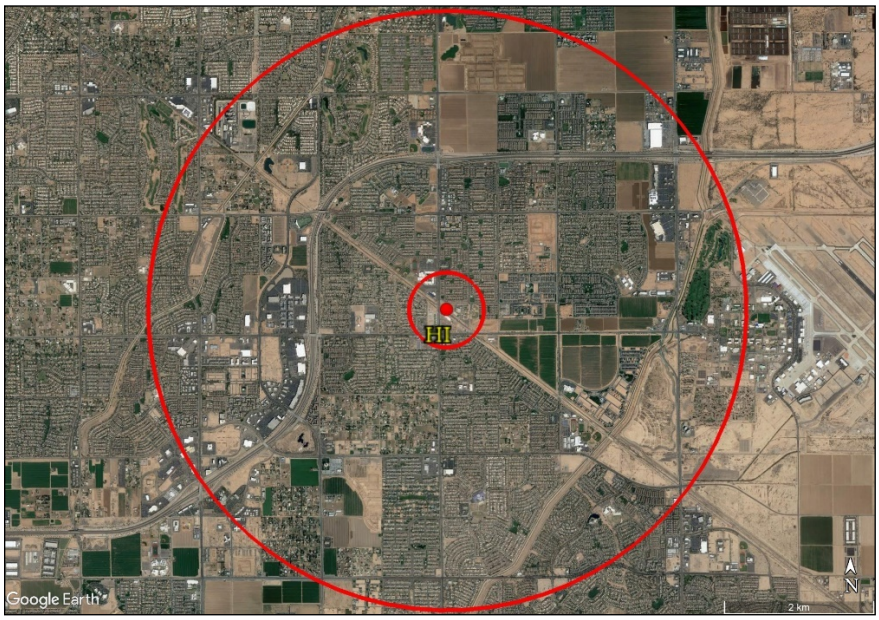
The site is located on the grounds of Glendale Community College near homes, various strip malls, food establishments, and parks.

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.77†	0.074†	0.086†‡
	Number of O_3 Exceedance Days	3	2	5
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.069	0.069	0.071#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	235†‡	44	76
	Number of 24-hr PM_{10} Exceedance Days	2	0	0
	Annual PM_{10} Average (µg/m³)	23.6	17.3	20.1
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	53.2†‡	25.9	64.9†
	Number of 24-hr $PM_{2.5}$ Exceedance Days	1	0	1
	Annual $PM_{2.5}$ Average (µg/m³)	7.33	6.34	7.63
	$PM_{2.5}$ 98th Percentile Value (µg/m³)	19.5	15.1	19.0

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3, $PM_{2.5}$, and PM_{10} Exceedance Day Reports for Numbers

Higley (HI) (04-013-4006)



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

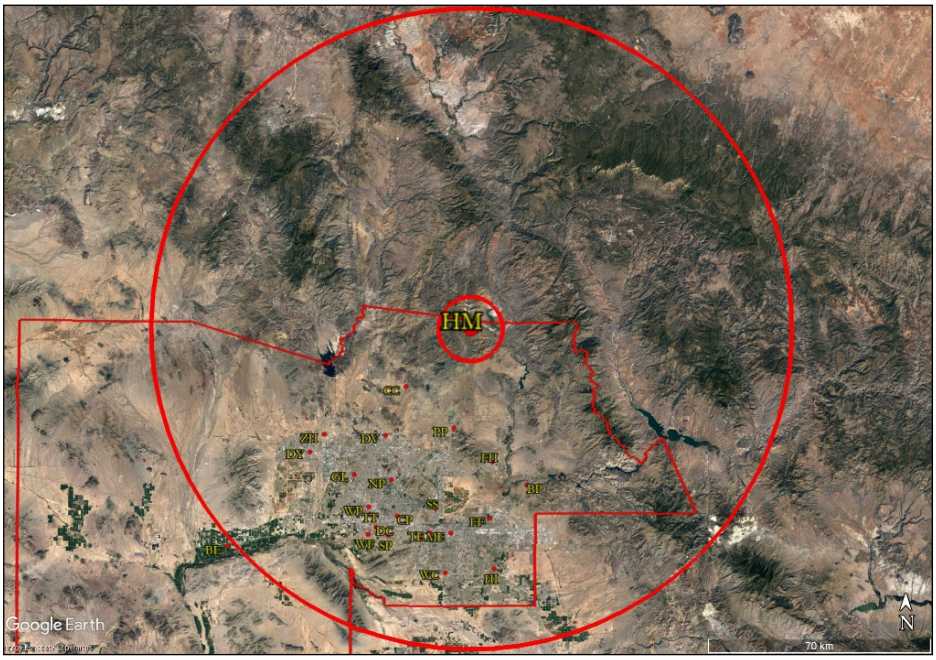
Site Description: Originally, ADEQ began monitoring at this site in 1994 to measure background particulate concentrations near the urban limits of Maricopa County. The MCAQD assumed operating this site in July 2000. This SLAMS location monitors for PM_{10}. Meteorological monitoring includes ambient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

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

Pollutant	Metric	2018	2019	2020
PM_{10}	Maximum 24-hr PM_{10} Average ($\mu g/m^3$)	215†‡	91	131
	Number of 24-hr PM_{10} Exceedance Days	5	0	0
	Annual PM_{10} Average ($\mu g/m^3$)	38.1	30.1	39.2

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
Source: EPA AQS database - *2018 - 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 PM_{10} Exceedance Day Reports for Numbers

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.

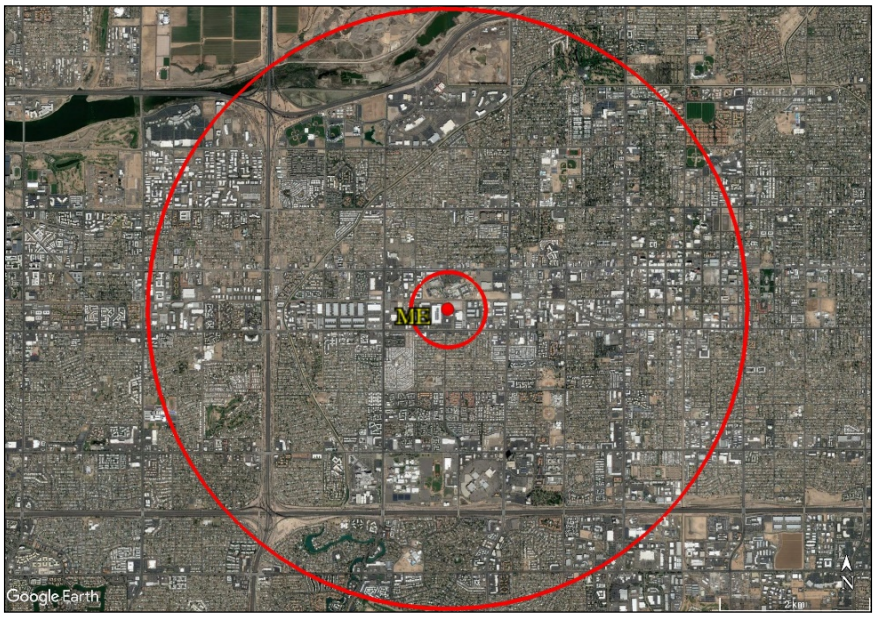
The site is located on Federal Aviation Agency (FAA) property within the Tonto National Forest. In 2019, the long-anticipated move of the station into a new facility occurred. The new station is about 15 meters away from the National Forest Service building that once housed it. This site is located approximately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

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.081†	0.081†	0.078†‡
	Number of O_3 Exceedance Days	12	7	6
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.073#	0.074#	0.073#

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 Exceedance Day Reports for Numbers

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.

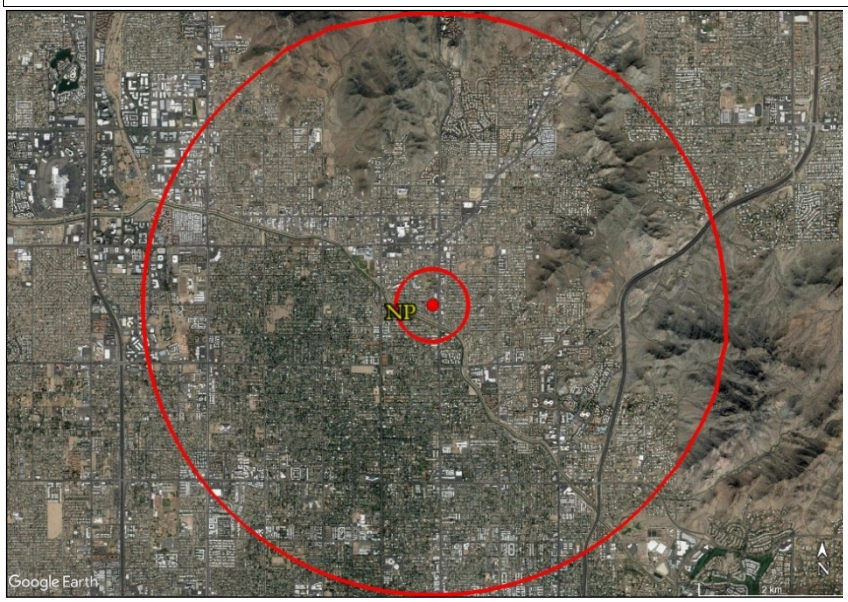
The site is located at Mesa Brooks Reservoir, which is an area that contains residential, commercial, and industrial properties.

Pollutant	Metric	2018	2019	2020
CO	Maximum 8-hr CO Avg. (ppm)	1.4	1.0	1.6
	Number of 8-hr CO Exceedance Days	0	0	0
O_3	Maximum 8-hr O_3 Average (ppm)	0.082†	0.084†	0.093†‡
	Number of O_3 Exceedance Days	23	13	15
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.076#	0.077#	0.078#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m^3)	257†‡	48	129
	Number of 24-hr PM_{10} Exceedance Days	2	0	0
	Annual PM_{10} Average (µg/m^3)	24.3	15.0	21.5
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Avg. (µg/m^3)	41.1†‡	16.6	20.6
	Number of 24-hr $PM_{2.5}$ Exceedance Days	3	0	0
	Annual $PM_{2.5}$ Average (µg/m^3)	7.42	5.20	7.30
	$PM_{2.5}$ 98th Percentile Value (µg/m^3)	19.1	11.1	17.4

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3, $PM_{2.5}$, and PM_{10} Exceedance Day Reports for Numbers

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.

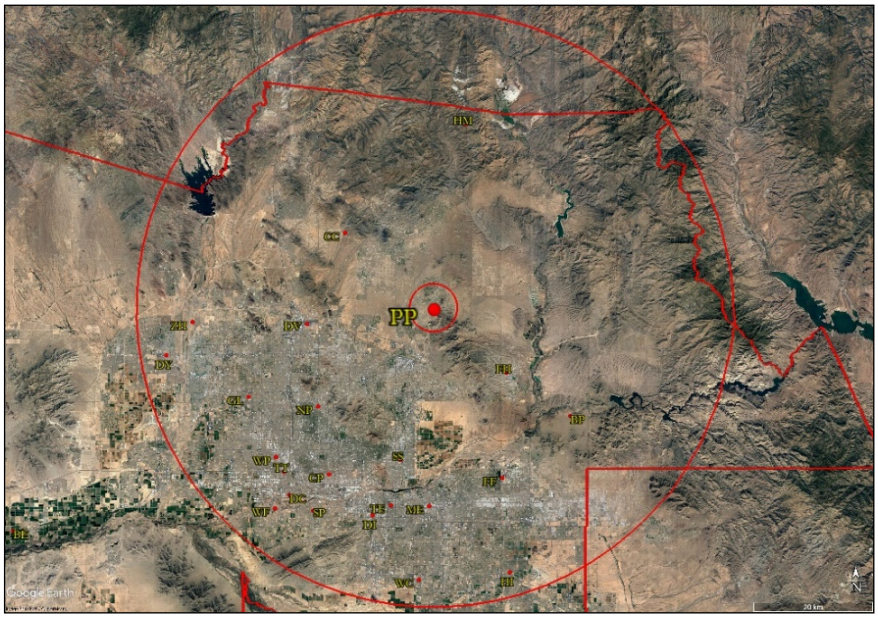
The site is located in a park that in an area that contains residential and commercial properties.

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.085†	0.081†	0.094†‡
	Number of O_3 Exceedance Days	14	13	15
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.076#	0.075#	0.078#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	216†‡	50	116
	Number of 24-hr PM_{10} Exceedance Days	2	0	0
	Annual PM_{10} Avg. (µg/m³)	22.1*	16.8	20.5
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	45.2†‡	19.1	51.4†
	Number of 24-hr $PM_{2.5}$ Exceedance Days	2	0	1
	Annual $PM_{2.5}$ Average (µg/m³)	7.35*	6.31	7.88
	$PM_{2.5}$ 98th Percentile Value (µg/m³)	18.7	14.5	18.4

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard
* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3, $PM_{2.5}$, and PM_{10} Exceedance Day Reports for Numbers

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



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

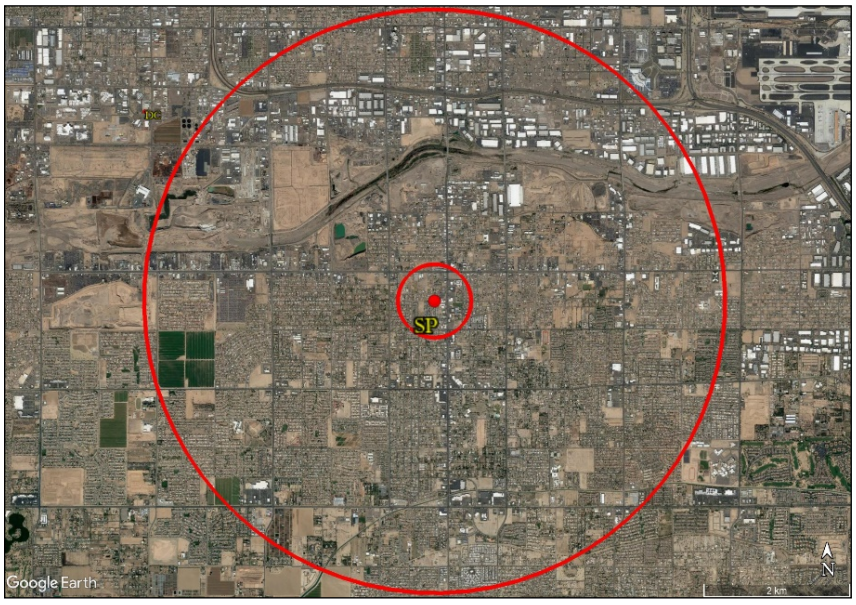
Site Description: This site began operating in February 1988. This SLAMS location monitors for O_3 only. Meteorological monitoring includes ambient temperature, barometric pressure, relative humidity, and wind speed/direction.

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.

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.090†	0.080†	0.094†‡
	Number of O_3 Exceedance Days	27	17	13
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.077#	0.077#	0.079#

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard
Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 Exceedance Day Reports for Numbers

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.

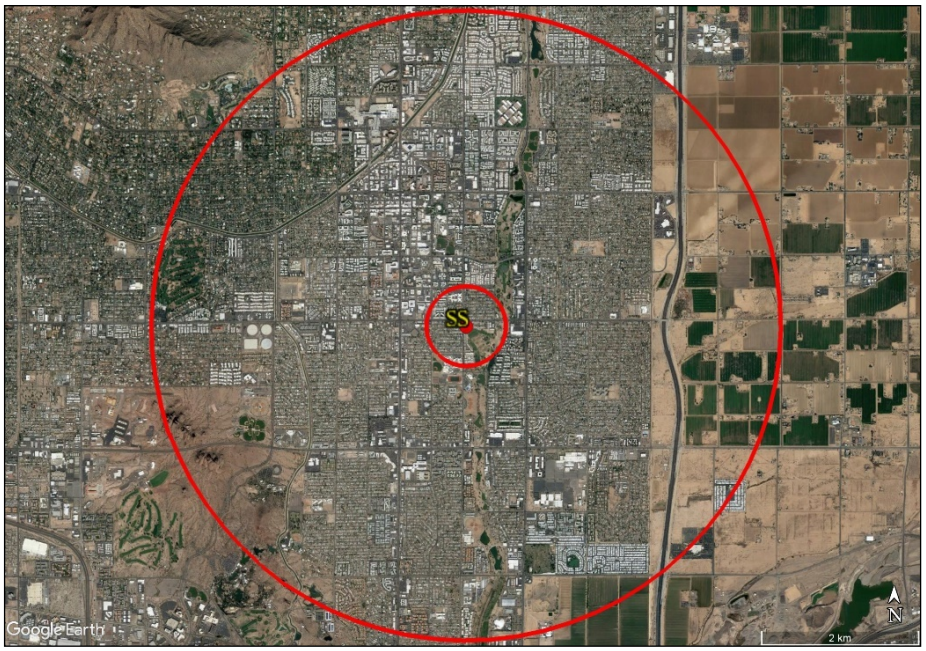
The site borders a mixture of high population density residential and commercial properties.

Pollutant	Metric	2018	2019	2020
CO	Maximum 8-hr CO Average (ppm)	3.2	1.6	2.2
	Number of 8-hr CO Exceedance Days	0	0	0
O_3	Maximum 8-hr O_3 Average (ppm)	0.078†	0.078†	0.086†‡
	Number of O_3 Exceedance Days	6	5	5
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.070	0.072#	0.073#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	171†‡	72	98
	Number of 24-hr PM_{10} Exceedance Days	2	0	0
	Annual PM_{10} Average (µg/m³)	33.9	23.8	34.2
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	134.1†‡	48.4†	64.7†
	Number of 24-hr $PM_{2.5}$ Exceedance Days	4	1	7
	Annual $PM_{2.5}$ Average (µg/m³)	9.37	7.48	10.45
	$PM_{2.5}$ 98th Percentile value (µg/m³)	27.8	21.4	34.1

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3, $PM_{2.5}$, and PM_{10} Exceedance Day Reports for Numbers

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.

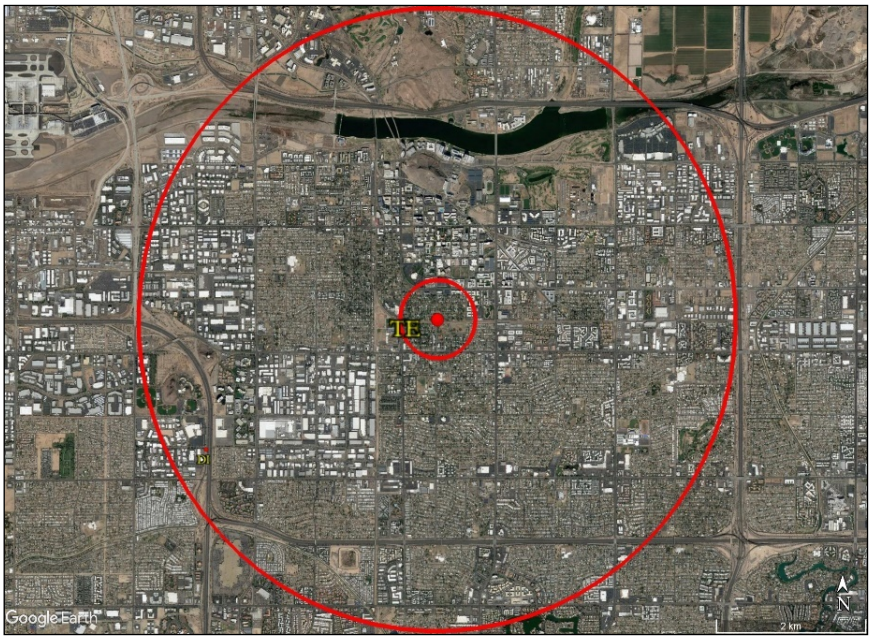
The stations are located in a residential area.

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.072†	0.071†	0.102†‡
	Number of O_3 Exceedance Days	3	1	18
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.070	0.069	0.074#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m^3)	341†‡	74	192†‡
	Number of 24-hr PM_{10} Exceedance Days	4	0	1
	Annual PM_{10} Average (µg/m^3)	31.2	21.4	28.3

† - Indicates an exceedance of the standard
‡ - Indicates EEs submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 and PM_{10} Exceedance Day Reports for Numbers

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.

Pollutant	Metric	2018	2019	2020
O_3	Maximum 8-hr O_3 Average (ppm)	0.071†	0.069	0.080†‡
	Number of O_3 Exceedance Days	2	0	11
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.067	0.066	0.069
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	235†‡	67	134
	Number of 24-hr PM_{10} Exceedance Days	2	0	0
	Annual PM_{10} Average (µg/m³)	26.8	17.8	22.4
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	38.2†‡	14.7	19.4
	Number of 24-hr $PM_{2.5}$ Exceedance Days	1	0	0
	Annual $PM_{2.5}$ Average (µg/m³)	7.11	5.79	6.78
	$PM_{2.5}$ 98th Percentile Value (µg/m³)	16.3	11.9	15.6

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3, $PM_{2.5}$, and PM_{10} Exceedance Day Reports for Numbers

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

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

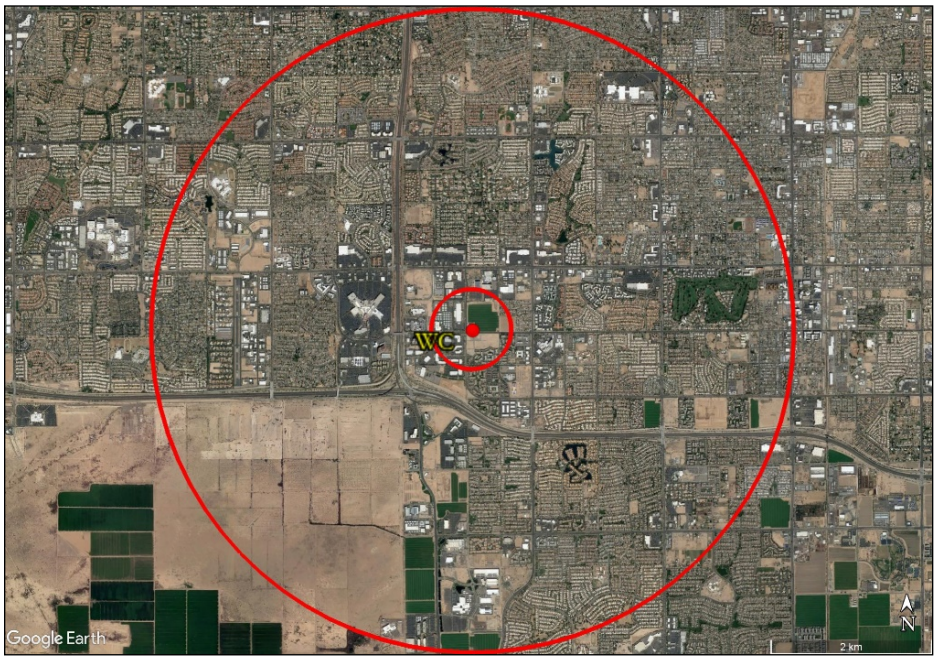
Site Description: This site began operating in September 2015. This SLAMS location monitors for NO_2; and temporarily for CO and $PM_{2.5}$ beginning January 2020. This change was needed to remain compliant with EPA requirements in lieu of the Diablo site closing. The near-road site replacing Diablo is slated to open in early 2021, and CO and $PM_{2.5}$ monitoring will then shift to the new near-road site. 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.

Pollutant	Metric	2018	2019	2020
CO	Maximum 8-hr CO Average (ppm)	not operating		2.9
	Number of 8-hr CO Exceedance Days			0
NO_2	Annual NO_2 Average (ppb)	28.25	24.84	25.11
	NO_2 1-hr 98th Percentile Average (ppb)	62.0	58.0	57.0
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	not operating		141.4†
	Number of 24-hr $PM_{2.5}$ Exceedance Days			9
	Annual $PM_{2.5}$ Average (µg/m³)			13.18*
	$PM_{2.5}$ 98th Percentile Value (µg/m³)			36.7

† - Indicates an exceedance of the standard
* - Indicates that the mean does not satisfy summary criteria, e.g., data completeness
Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 and $PM_{2.5}$ Exceedance Day Reports for Numbers

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 2018 to better reflect land use currently surrounding the site and to match general monitoring requirements found in *40 CFR Part 58 Appendix D, Table D-1*.

Pollutant	Metric	2018	2019	2020
CO	Maximum 8-hr CO Average (ppm)	1.7	1.0	1.3
	Number of 8-hr CO Exceedance Days	0	0	0
O_3	Maximum 8-hr O_3 Average (ppm)	0.075†	0.082†	0.081†‡
	Number of O_3 Exceedance Days	2	6	5
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.070	0.072#	0.072#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	382†‡	67	263
	Number of 24-hr PM_{10} Exceedance Days	7	0	1
	Annual PM_{10} Average (µg/m³)	35.1	24.3	30.7

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3 and PM_{10} Exceedance Day Reports for Numbers

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

Site Location 43rd Ave. & Broadway Rd., Phoenix

Spatial Scale Middle

Site Type Highest Concentration

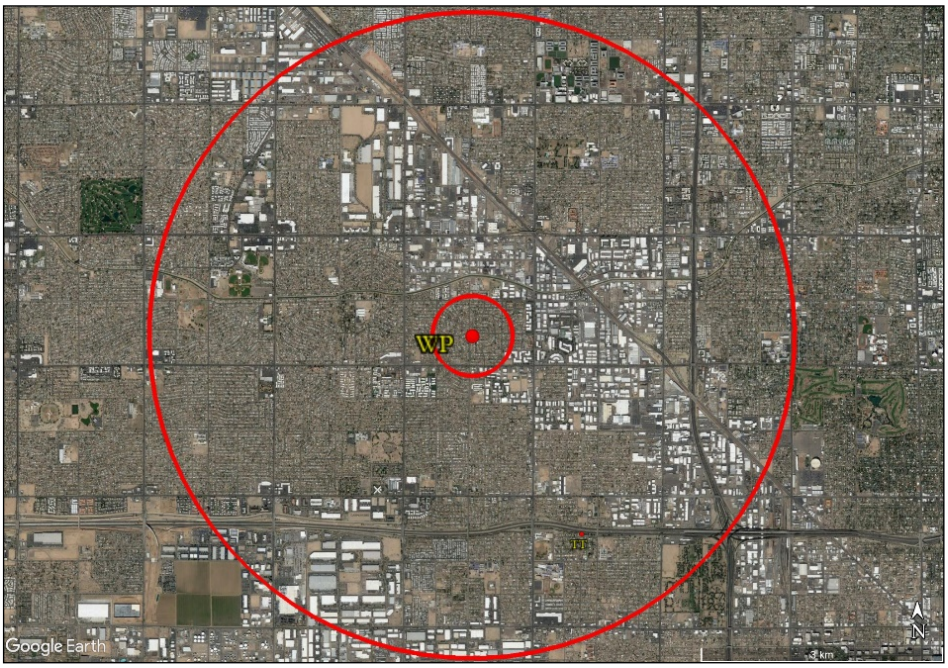
Site Description: This site began operating in April 2002. This SLAMS location monitors for PM_{10}. Meteorological monitoring includes ambient temperature, barometric pressure, and wind speed/direction.

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.

Pollutant	Metric	2018	2019	2020
PM_{10}	Maximum 24-hr PM_{10} Avg. ($\mu g/m^3$)	385†‡	235†‡	226
	Number of 24-hr PM_{10} Exceedance Days	8	3	3
	Annual PM_{10} Avg. ($\mu g/m^3$)	60.4	50.8	58.2

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 PM_{10} Exceedance Day Reports for Numbers

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 $PM_{2.5}$

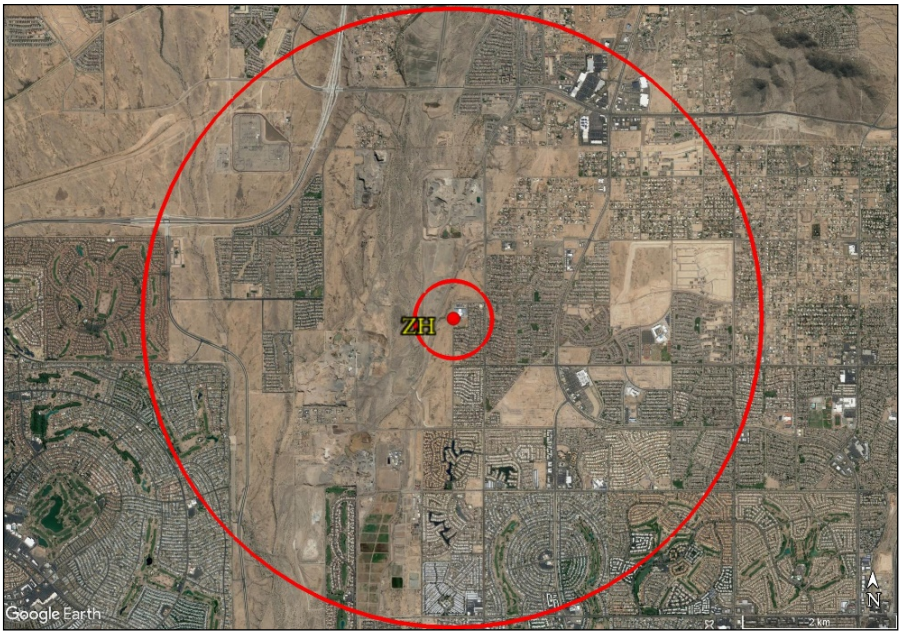
Site Description: This site began operating in January 1984. This SLAMS location monitors for CO, NO_2, O_3, PM_{10}, and $PM_{2.5}$. Meteorological monitoring includes ambient temperature, barometric pressure, and wind speed/direction. The site is located in an area of stable, high-density, residential 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*.

Pollutant	Metric	2018	2019	2020
CO	Maximum 8-hr CO Average (ppm)	4.4	2.4	3.0
	Number of 8-hr CO Exceedance Days	0	0	0
NO_2	Annual NO_2 Average (ppb)	16.12	14.07	13.36
	NO_2 1-hr Average 98th Percentile (ppb)	52.0	47.0	48.0
O_3	Maximum 8-hr O_3 Average (ppm)	0.086†	0.078†	0.091†‡
	Number of O_3 Exceedance Days	6	3	10
	3-yr 8-hr 4th Highest O_3 Average (ppm)	0.074#	0.073#	0.074#
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	259†‡	58	159†
	Number of 24-hr PM_{10} Exceedance Days	4	0	1
	Annual PM_{10} Average (µg/m³)	33.3	23.0	30.8
$PM_{2.5}$	Maximum 24-hr $PM_{2.5}$ Average (µg/m³)	199.3†‡	40.4†	149.1†
	Number of 24-hr $PM_{2.5}$ Exceedance Days	3	1	7
	Annual $PM_{2.5}$ Average (µg/m³)	9.92	8.17	10.47
	$PM_{2.5}$ 98th Percentile Value	30.6	23.4	33.9

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
# - Indicates a violation of the standard

Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 O_3, $PM_{2.5}$, and PM_{10} Exceedance Day Reports for Numbers

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.

Pollutant	Metric	2018	2019	2020
PM_{10}	Maximum 24-hr PM_{10} Average (µg/m³)	231†‡	113	111
	Number of 24-hr PM_{10} Exceedance Days	2	0	0
	Annual PM_{10} Average (µg/m³)	27.7	20.6	25.4

† - Indicates an exceedance of the standard
‡ - Indicates EE submission – listed value is currently the official maximum concentration in AQS
Source: EPA AQS database - *2018 – 2020 Quicklook Criteria Report (AMP450)*
MCAQD 2018 - 2020 PM_{10} Exceedance Day Reports for Numbers

APPENDIX II - EPA-REQUIRED SITE METADATA

This appendix provides site and monitor metadata required by *40 CFR §58.10 and Appendices A, B, C, D, and E,* as applicable. Information includes, but is not limited to, quality assurance metrics, site identification and type, each monitor's type and scale of representativeness as well as basic monitoring objective, collection frequency of air samples, i.e., operating schedule, and any proposals to change a monitoring station within the next 18 months.

(See Appendix VII for the Glossary)

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 in 2020 (Gases)	26
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed in 2020	2
Dates of PE Audits	05/13/20 11/13/21
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/21
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

BLUE POINT		
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
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc (degrees around probe/inlet)		360°
Probe/Sample Line Material (Gases)		FEP
Pollutant Sample Residence Time (Gases)		8.48 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2 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	11 meters
Distance from Dripline of Closest Tree(s)		11 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		1,000
Groundcover		Pavement

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	26	25	26	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	Not Applicable	Not Applicable	26
Frequency of Flow Rate Verifications				Bi-Weekly
Number of PE Audits Performed in 2020	2	2	2	4
Dates of PE Audits	01/14/20 8/11/20	01/14/20 08/24/20	06/15/20 12/14/20	01/14/20 04/07/20 07/28/20 10/12/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21	04/30/21
Appendix B Requirements - PSD Monitoring - Not Applicable				

BUCKEYE					
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
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 meters	4 meters	4 meters	4 meters
Probe Sample Line Material		FEP	FEP	FEP	Not Applicable
Pollutant Sample Residence Time		9.81 seconds	9.81 seconds	9.81 seconds	Not Applicable
Airflow Arc		360°	360°	360°	360°
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters	0 meters
	Vertical	4.4 meters	4.4 meters	4.4 meters	4.4 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

BUCKEYE					
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)		7.6 meters	7.6 meters	7.6 meters	7.6 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		3,000	3,000	3,000	3,000
Groundcover		Pavement	Pavement	Pavement	Pavement

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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?	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 in 2020 (Gases)	24
Frequency of 1-Point QC (Precision) Checks	Bi-weekly
2Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed in 2020	2
Dates of PE Audits	03/09/20 10/05/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/21
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

CAVE CREEK		
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
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc		360°
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		9.95 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2 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	10 meters
Distance from Dripline of Closest Tree(s)		10 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		1,000
Groundcover		Pavement

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	26	25	26	26	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-weekly	Bi-weekly	Bi-weekly	Bi-weekly	
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	26
Frequency of Flow Rate Verifications					Bi-weekly
Number of PE Audits Performed in 2020	2	2	2	3	4
Dates of PE Audits	05/13/20 11/10/20	02/19/20 07/08/20	06/10/20 12/09/20	04/14/20 09/17/20 10/14/20	01/16/20 04/13/20 07/08/20 10/14/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21	04/30/21	04/30/21

CENTRAL PHOENIX						
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
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)		4.4 meters	4.4 meters	4.4 meters	4.4 meters	4.4 meters
Airflow Arc		360°	360°	360°	360°	360°
Probe Sample Line Material		FEP	FEP	FEP	FEP	Not Applicable
Pollutant Sample Residence Time		11.99 seconds	11.99 seconds	11.99 seconds	11.99 seconds	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	2 meters	2 meters	2 meters	2 meters	2.4 meters

CENTRAL 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	no obstruction
	Vertical	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
	Vertical	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
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		24,000	24,000	24,000	24,000	24,000
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

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	Not Applicable	Not Applicable	26
Frequency of 1-Point QC (Precision) Checks			Bi-Weekly
Number of Flow Rate Checks Performed in 2020 (PM)	26	26	Not Applicable
Frequency of Flow Rate Verifications	Bi-Weekly	Bi-Weekly	
Number of PE Audits Performed in 2020	4	4	2
Dates of PE Audits	01/22/20 04/15/20 07/07/20 10/13/20	01/22/20 04/15/20 07/07/20 10/13/20	02/03/20 08/04/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21
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

DURANGO COMPLEX				
Monitor Make - Model		Thermo - TEOM 1405-DF	Thermo - TEOM 1405-DF	Teledyne API – 100T
Note: The same monitor measures PM_{10} and $PM_{2.5}$.				
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				
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
Note: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.				
Probe Height (distance above ground level to inlet)		4.4 meters	4.4 meters	4.4 meters
Airflow Arc		360º	360º	360º
Probe Sample Line Material		Not Applicable	Not Applicable	FEP
Pollutant Sample Residence Time		Not Applicable	Not Applicable	5.32 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 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	12 meters	12 meters	12 meters
	Vertical	6 meters	6 meters	6 meters

DURANGO COMPLEX			
Distance from Dripline of Closest Tree(s)	10.7 meters	10.7 meters	10.7 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	16,000	16,000	16,000
Groundcover	Pavement	Pavement	Pavement

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	26	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	26
Frequency of Flow Rate Verifications		Bi-Weekly
Number of PE Audits Performed in 2020	2	4
Dates of PE Audits	02/20/20 08/04/20	01/28/20 04/15/20 07/07/20 10/13/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21

DYSART			
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
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)		5.4 meters	5.2 meters
Airflow Arc		360º	360º
Probe Sample Line Material		FEP	Not Applicable
Pollutant Sample Residence Time		4.45 seconds	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters
	Vertical	3 meters	3 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	15.2 meters	15.2 meters
	Vertical	3 meters	3 meters
Distance from Dripline of Closest Tree(s)		no tree	no tree
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

DYSART		
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	43,000	43,000
Groundcover	Pavement / Gravel	Pavement / Gravel

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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?	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 in 2020 (Gases)	24
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed in 2020	2
Dates of PE Audits	01/07/20 07/08/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/20
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	

FALCON FIELD		
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
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc		360°
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		18.33 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	1 meter
	Vertical	2 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	24.4 meters
	Vertical	3 meters
Distance from Dripline of Closest Tree(s)		no tree
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		29,000
Groundcover		Pavement

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	25
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed in 2020	2
Dates of PE Audits	02/12/20 09/09/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/21
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

FOUNTAIN HILLS		
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
Probe Height (distance above ground level to inlet)		4.4 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		9.09 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	2 meters
	/Vertical	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	24.4 meters
	Vertical	4.8 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		8,000
Groundcover		Pavement

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	24	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly		
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	26	26
Frequency of Flow Rate Verifications		Bi-Weekly	Bi-Weekly
Number of PE Audits Performed in 2020	2	6	6
Dates of PE Audits	04/22/20 10/08/20	02/13/20 05/07/20 08/13/20 11/04/20 11/18/20 12/01/20	02/13/20 05/07/20 08/13/20 11/04/20 11/18/20 12/01/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21
Appendix B Requirements - PSD Monitoring - Not Applicable			

GLENDALE				
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
Note: The same monitor measures PM_{10} and $PM_{2.5}$.				
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
Note: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.				
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		FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time		4.84 seconds	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	2 meters	2 meters	2 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

GLENDALE				
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)		no tree	no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
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		30,500	30,500	30,500
Groundcover		Pavement	Pavement	Pavement

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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?	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?	Not Applicable
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs	
Number of 1-Point QC (Precision) Checks Performed in 2020 (Gases)	Not Applicable
Frequency of 1-Point QC (Precision) Checks	
Number of Flow Rate Verifications Performed in 2020 (PM)	25
Frequency of Flow Rate Verifications	Bi-Weekly
Number of PE Audits Performed in 2020	4
Dates of PE Audits	02/18/20 05/11/20 08/05/20 11/25/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	
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

HIGLEY		
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
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)		4.4 meters
Airflow Arc		360º
Probe Sample Line Material		Not Applicable
Pollutant Sample Residence Time		Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2 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	7.6 meters
	Vertical	1.5 meters
Distance from Dripline of Closest Tree(s)		15.2 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		11,500
Nearest Major Roadway B		Williams Field Rd
Distance and Direction to Road		410 meters, S
Average Daily Traffic Count		11,500
Groundcover		Pavement

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	21
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed in 2020 (PM or Pb)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed in 2020	1
Dates of PE Audits	04/15/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/20
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

HUMBOLDT MOUNTAIN		
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		
Distance between collocated samplers		Not Applicable
Probe Height (distance above ground level to inlet)		4 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		6.01 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2 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		No Major Roadway
Distance and Direction to Road		Not Applicable
Average Daily Traffic Count		Not Applicable
Groundcover		Soil / Vegetation

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	26	26	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly		
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	Not Applicable	25	25
Frequency of Flow Rate Verifications			Bi-Weekly	Bi-Weekly
Number of PE Audits Performed in 2020	3	2	5	5
Dates of PE Audits	01/28/20 06/11/20 08/06/20	04/02/20 10/15/20	02/06/20 05/14/20 08/06/20 11/13/20 11/25/20	02/06/20 05/14/20 08/06/20 11/13/20 11/25/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21	04/30/21
Appendix B Requirements - PSD Monitoring - Not Applicable				

MESA					
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
Note: The same monitor measures PM_{10} and $PM_{2.5}$.					
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
NOTE: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.					
Probe Height (distance above ground level to inlet)		4.4 meters	4.4 meters	4.4 meters	4.4 meters
Airflow Arc		360°	360°	360°	360°
Probe Sample Line Material		FEP	FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time		5.84 seconds	5.84 seconds	Not Applicable	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	2 meters	2 meters	2 meters	2 meters
	Horizontal	no obstruction	no obstruction	no obstruction	no obstruction

MESA					
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	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		33,000	33,000	33,000	33,000
Groundcover		Pavement/Gravel	Pavement/Gravel	Pavement/Gravel	Pavement/Gravel

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	26	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly		
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	26	26
Frequency of Flow Rate Verifications		Bi-Weekly	Bi-Weekly
Number of PE Audits Performed in 2020	2	2	2
Dates of PE Audits	06/03/20 12/16/20	02/12/20 05/08/20	02/12/20 05/08/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21
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				
Note: The same monitor measures PM_{10} and $PM_{2.5}$.				
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
NOTE: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.				
Probe Height (distance above ground level to inlet)		4.6 meters	4.5 meters	4.5 meters
Airflow Arc		360º	360º	360º
Probe Sample Line Material		FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time		2.04 seconds	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	2 meters	2 meters	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
	Horizontal	no obstruction	no obstruction	no obstruction

NORTH PHOENIX				
Distance from Obstructions Not on Roof (horizontal distance to the obstruction and vertical height of obstruction above probe/inlet)	Vertical	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		3 meters	3 meters	3 meters
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
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)		32,000	32,000	32,000
Groundcover		Gravel	Gravel	Gravel

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

PINNACLE PEAK	
County ID: PP AQS ID: 04-013-2005 Address: 24295 N Alma School Rd., Scottsdale Coordinates: 33.70639 N, -111.85575 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 in 2020 (Gases)	24
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly
Number of Flow Rate Verifications Performed in 2020 (PM or Pb)	Not Applicable
Frequency of Flow Rate Verifications	
Number of PE Audits Performed in 2020	2
Dates of PE Audits	03/12/20 10/08/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/20
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

PINNACLE PEAK		
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
Probe Height (distance above ground level to inlet)		4.7 meters
Airflow Arc		360º
Probe Sample Line Material		FEP
Pollutant Sample Residence Time		5.37 seconds
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	2.7 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)		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		16,000
Groundcover		Pavement / Grass

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	25	25	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly		
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	Not Applicable	26	26
Frequency of Flow Rate Verifications			Bi-Weekly	Bi-Weekly
Number of PE Audits Performed in 2020	2	2	6	6
Dates of PE Audits	04/07/20 11/03/20	04/07/20 11/03/20	02/11/20 05/05/20 08/11/20 11/03/20 11/17/20 12/01/20	02/11/20 05/05/20 08/11/20 11/03/20 11/17/20 12/01/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21	04/30/21
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
Note: The same monitor measures PM_{10} and $PM_{2.5}$.					
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
Note: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.					
Probe Height (distance above ground level to inlet)		4.4 meters	4.4 meters	4.3 meters	4.3 meters
Airflow Arc		360°	360°	360°	360°
Probe Sample Line Material		FEP	FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time		4.95 seconds	4.95 seconds	Not Applicable	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	2 meters	2 meters	2 meters	2 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	11 meters	11 meters	11 meters	11 meters
	Vertical	3 meters	3 meters	3 meters	3 meters
Distance from Dripline of Closest Tree(s)		11 meters	11 meters	11 meters	11 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		24,000	24,000	24,000	24,000
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		18,000	18,000	18,000	18,000
Groundcover		Pavement	Pavement	Pavement	Pavement

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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?	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 in 2020 (Gases)	24	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	24
Frequency of Flow Rate Verifications		Bi-Weekly
Number of PE Audits Performed in 2020	2	3
Dates of PE Audits	01/08/20	02/13/20 08/05/20 11/20/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21
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

SOUTH SCOTTSDALE			
PM Monitor Collection Type		Not Applicable	Size Specific
Method Type (FRM, FEM, ARM)		FEM	FEM
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)		4.4 meters	3 meters
Airflow Arc		360°	360°
Probe Sample Line Material		FEP	Not Applicable
Pollutant Sample Residence Time		8.38 seconds	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.46 meters	0 meters
	Vertical	2.4 meters	0.46 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	3 meters	no obstruction
	Vertical	2.4 meters	no obstruction
Distance from Dripline of Closest Tree(s)		no tree	no tree
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		33,000	33,000
Nearest Major Roadway B		Miller Rd.	Miller Rd.
Distance and Direction to Road		32 meters, W	35 meters, W
Average Daily Traffic Count		13,000	13,000
Groundcover		Pavement	Pavement

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	24	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly		
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	25	25
Frequency of Flow Rate Verifications		Bi-Weekly	Bi-Weekly
Number of PE Audits Performed in 2020	2	5	5
Dates of PE Audits	05/05/20 11/03/20	02/01/20 05/05/20 08/11/20 11/03/20 11/17/20	02/01/20 05/05/20 08/11/20 11/03/20 11/17/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21
Appendix B Requirements - PSD Monitoring - Not Applicable			

TEMPE				
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
Note: The same monitor measures PM_{10} and $PM_{2.5}$.				
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
Note: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.				
Probe Height (distance above ground level to inlet)		4.4 meters	3.1 meters	3.1 meters
Airflow Arc		360°	360°	360°
Probe Sample Line Material		FEP	Not Applicable	Not Applicable
Pollutant Sample Residence Time		5.13 seconds	Not Applicable	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0.46 meters	0 meters	0 meters
	Vertical	2 meters	0.76 meters	0.76 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

TEMPE				
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
	Vertical	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		no tree	no tree	no tree
Distance to Furnace or Flue		No Furnace or Flue	No Furnace or Flue	No Furnace or Flue
Nearest Major Roadway		Apache Blvd.	Apache Blvd.	Apache Blvd.
Distance and Direction to Road		370 meters, N	370 meters, N	370 meters, N
Average Daily Traffic Count		32,170	32,170	32,170
Groundcover		Gravel	Gravel	Gravel

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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	**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
Any Proposal to Remove or Move Monitor?	Yes	No	Yes
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	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 in 2020 (Gases)	25	25	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly	
Number of Flow Rate Verifications in 2020 (PM)	Not Applicable	Not Applicable	25
Frequency of Flow Rate Verifications			Bi-Weekly
Number of PE Audits Performed in 2020	1	2	4
Dates of PE Audits	03/09/20	02/10/20 08/10/20	01/27/20 06/16/20 07/13/20 12/15/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21
Appendix B Requirements - PSD Monitoring - Not Applicable			
Appendix C Requirements - Monitoring Methodology			
Date Sampling Started	01/01/2020	09/01/2015	01/01/2020
Monitor Type	SLAMS	SLAMS	SLAMS

THIRTY-THIRD				
Monitor Make – Model		Teledyne API – 300T	Thermo 42iQ	Thermo - TEOM 1405-DF
Method Code		093	074	182
Method Type (FRM, FEM, ARM)		FEM	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)		7 meters	7 meters	7 meters
Airflow Arc		360°	360°	360°
Probe Sample Line Material		FEP	FEP	FEP
Pollutant Sample Residence Time		16.13 seconds	16.13 seconds	Not applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	3 meters	3 meters	3 meters	3 meters
	0 meters	0 meters	0 meters	0 meters
Distance from Obstructions on Roof (horizontal distance to obstruction and vertical height of obstruction above probe/inlet)	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)	no obstruction	no obstruction	no obstruction	no obstruction
	no obstruction	no obstruction	no obstruction	no obstruction
Distance from Dripline of Closest Tree(s)		15.2 meters	15.2 meters	15.2 meters
Distance to Furnace or Flue		No Furnace or Flue	No 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		245,632		
Groundcover		Gravel		

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	Not Applicable
Frequency of 1-Point QC (Precision) Checks	
Number of Flow Rate Verifications Performed in 2020 (PM)	25
Frequency of Flow Rate Verifications	Bi-Weekly
Number of PE Audits Performed in 2020	4
Dates of PE Audits	03/05/20 06/11/20 09/02/20 12/11/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/21
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

WEST 43RD AVENUE		
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
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)		5 meters
Airflow Arc		360°
Probe Sample Line Material		Not Applicable
Pollutant Sample Residence Time		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 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)		4.5 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		19,699
Groundcover		Gravel

Sources: For QC, flow rate, and collocation assessment information - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audit dates - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	23	23	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly	
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	Not Applicable	24
Frequency of Flow Rate Verifications			Bi-Weekly
Number of PE Audits Performed in 2020	2	2	4
Dates of PE Audits	03/09/20 09/23/20	04/06/20 10/21/20	03/09/20 06/04/20 09/09/20 11/20/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21
Appendix B Requirements - PSD Monitoring - Not Applicable			

WEST CHANDLER				
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
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)		4.4 meters	4.4 meters	4.4 meters
Airflow Arc		360°	360°	360°
Probe Sample Line Material		FEP	FEP	Not Applicable
Pollutant Sample Residence Time		3.95 seconds	3.95 seconds	Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	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)		14 meters	14 meters	14 meters

WEST CHANDLER			
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	10,566	10,566	10,566
Groundcover	Pavement / Gravel	Pavement / Gravel	Pavement / Gravel

Sources: For 1-pt. precision checks, FR verifications, and collocation assessments - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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**	**NO_2**	**O_3**	**PM_{10}**	**$PM_{2.5}$ Primary**	**$PM_{2.5}$ Secondary**
Note: This is a collocated site for $PM_{2.5}$.						
Parameter Code	42101	42602	44201	81102	88101	88101
Parameter Occurrence Code	1	1	1	1	3	2
Collection Frequency	Continuous	Continuous	Continuous	Continuous	Continuous	1 in 12 days
Analysis Method (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	*As per 40 CFR Part 50, Appendix L*
Analytical Laboratory (filter samples only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Pace Analytical® IML Air Science Laboratory
Any Proposal to Remove or Move Monitor?	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
Is site suitable for comparison to the *annual* PM2.5 NAAQS as per *§58.30*?	Not Applicable	Not Applicable	Not Applicable	Not Applicable	Yes	Yes
Are Data Comparable to Respective NAAQS?	Yes	Yes	Yes	Yes	Ye s	Yes

WEST PHOENIX						
Appendix A Requirements - Quality Assurance Requirements for SLAMS and SPMs						
Number of 1-Point QC (Precision) Checks Performed in 2020 (Gases)	25	23	25	Not Applicable	Not Applicable	Not Applicable
Frequency of 1-Point QC (Precision) Checks	Bi-Weekly	Bi-Weekly	Bi-Weekly			
Number of Flow Rate Verifications Performed in 2020 (PM)	Not Applicable	Not Applicable	Not Applicable	25	25	11
Frequency of Flow Rate Verifications				Bi-Weekly	Bi-Weekly	Bi-weekly
Number of Required Collocated Assessments in 2020 ($PM_{2.5}$ Only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	30	
Number of Valid Collocation Assessments in 2020 ($PM_{2.5}$ Only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	30	
Number of Collocation Assessments in 2020 ($PM_{2.5}$ Only)	Not Applicable	Not Applicable	Not Applicable	Not Applicable	31	
Number of PE Audits Performed in 2020	2	2	0*	5	5	5
Dates of PE Audits	06/12/20 12/08/20	02/04/20 10/13/20	See comment below	03/03/20 06/11/20 09/01/20 11/24/20 12/08/20	03/03/20 06/11/20 09/01/20 11/24/20 12/08/20	01/09/20 04/07/20 07/07/20 10/29/20 12/08/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes	Yes	Yes	Yes	Yes	Yes
Date of Annual Data Certification Submission	04/30/21	04/30/21	04/30/21	04/30/21	04/30/21	04/30/21

* - In 2020, twenty-five 1-pt. precision QC checks were completed. Five 5-pt. verification/calibration QC checks were also completed, which tested the analyzer at the same concentration levels as the annual performance evaluation audit as well as checking linearity and proper installation. The 5-pt. checks

WEST PHOENIX						
occurred when a different analyzer was installed at the site. Although the required annual performance evaluation audit using a separate QA calibrator was missed. Close evaluation of all data (pollutant and P&A) supports that the data are valid.						
Appendix B Requirements - PSD Monitoring - Not Applicable						
Appendix C Requirements - Monitoring Methodology						
Date Sampling Started	01/01/1984	05/24/1990	01/01/1984	02/01/1988	09/01/2005	06/13/2000
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Monitor Make - Model	Teledyne - API 300T	Thermo 42iQ	Teledyne - API 400T	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 2025 sampler collects a QA filter sample once every 12 days.						
Method Code	093	074	087	208	182	145
PM Monitor Flow Type	Not Applicable	Not Applicable	Not Applicable	Low Volume	Low Volume	Low Volume
PM Monitor Collection Type	Not Applicable	Not Applicable	Not Applicable	Dichotomous	Dichotomous	Size Specific & Sequential
Method Type (FRM, FEM, ARM)	FRM	FRM	FEM	FEM	FEM	FRM
Appendix D Requirements - Network Design Criteria						
Site Type	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
Monitoring Scale (Spatial Scale Represented)	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring Season	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
Appendix E Requirements - Probe and Monitoring Path Siting Criteria						
Distance between collocated $PM_{2.5}$ monitors	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	0 meters	0 meters	2 meters
Note: The TEOM 1405-DF collects air for both PM_{10} and $PM_{2.5}$ measurements through the same inlet.						

WEST PHOENIX							
Probe Height (distance above ground level to inlet)		4.3 meters	4.3 meters	4.3 meters	5 meters	5 meters	4 meters
Airflow Arc		360°	360°	360°	360°	360°	360°
Probe Sample Line Material		FEP	FEP	FEP	Not Applicable	Not Applicable	FEP
Pollutant Sample Residence Time		6.61 seconds	6.61 seconds	6.61 seconds	Not Applicable	Not Applicable	Not Applicable
Filter Sample Material		Not Applicable	Not Applicable	Not Applicable	Not Applicable	Not Applicable	FEP
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters	0 meters	0 meters	0 meters	0 meters	0 meters
	Vertical	2 meters	2 meters	2 meters	0.6 meters	0.6 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
	Vertical	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
	Vertical	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction	no obstruction

WEST PHOENIX						
Distance from Dripline of Closest Tree(s)	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
Nearest Major Roadway	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
Average Daily Traffic Count	29,000	29,000	29,000	29,000	29,000	29,000
Groundcover	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel

Sources: For 1-pt. precision checks, FR verifications, and collocation assessments - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

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 in 2020 (Gases)	Not Applicable
Frequency of 1-Point QC (Precision) Checks	
Number of Flow Rate Verifications Performed in 2020 (PM)	24
Frequency of Flow Rate Verifications	Bi-Weekly
Number of PE Audits Performed in 2020	2
Dates of PE Audits	03/12/20 07/01/20
Annual Precision & PE Audit Reports Submitted to AQS?	Yes
Date of Annual Data Certification Submission	04/30/21
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

ZUNI HILLS		
PM Monitor Collection Type		Size Specific
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
Probe Height (distance above ground level to inlet)		3.3 meters
Airflow Arc		360º
Probe Sample Line Material		Not Applicable
Pollutant Sample Residence Time		Not Applicable
Distance from Supporting Structure/Roof (horizontal distance and vertical distance to probe/inlet)	Horizontal	0 meters
	Vertical	1 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	6 meters
	Vertical	3 meters
Distance from Dripline of Closest Tree(s)		9 meters
Distance to Furnace or Flue		No Furnace or Flue
Nearest Major Roadway		Williams Rd.
Distance and Direction to Road		200 meters, N
Average Daily Traffic Count		2,567
Groundcover		Lawn / Soil

Sources: For 1-pt. precision checks, FR verifications, and collocation assessments - EPA AQS database - *2020 QA DQI Report (AMP256)*
For PE audits - EPA AQS database - *2020 QA Raw Assessment Report (AMP251)*

APPENDIX III - 2020 DATA CERTIFICATION DOCUMENTATION

Figure 20 shows the AQS AMP600 Data Certification Report received from EPA R9 with concurrence flags.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

User ID: FRX

CERTIFICATION EVALUATION AND CONCURRENCE

Report Request ID: 1928963 Report Code: AMP600 Apr. 30, 2021

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region
	04										

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
CRITERIA			

AGENCY SELECTIONS

Maricopa County Air Quality

SELECTED OPTIONS

Option Type	Option Value
AGENCY ROLE	CERTIFYING
MERGE PDF FILES	YES

DATE CRITERIA

Start Date	End Date
2020	2020

Selection Criteria Page 1

Data Evaluation and Concurrence Report Summary

Apr. 30, 2021

Certification Year: 2020
Certifying Agency (CA): Maricopa County Air Quality (0643)

Pollutants in Report:

Parameter Name	Code	Monitors Evaluated	Monitors Recommended for Concurrence by AQS	Monitors NOT Recommended for Concurrence by AQS
Carbon monoxide	42101	7	7	0
Nitrogen dioxide (NO2)	42602	4	4	0
Ozone	44201	17	16	1
PM10 Total 0-10um STP	81102	15	15	0
PM2.5 - Local Conditions	88101	9	9	0
Sulfur dioxide	42401	2	2	0

PQAOs in Report:

PQAO Name	PQAO Code	TSA Date
Maricopa County Air Quality	0643	

Summary of 'N' flags for all pollutants:

PQAO	Parameter Code	AQS Site-ID	POC	AQS Recommended Flag	Cert. Agency Recommended Flag	Reason for AQS Recommendation
0643	44201	04-013-0019	1	N	Y	Annual Performance Evaluation Audit Missing or 1 Level.

Signature of Monitoring Organization Representative: _____

Page 1 of 1

Data Evaluation and Concurrence Report for Gaseous Pollutants

Certifying Year 2020
Certifying Agency Code Maricopa County Air Quality (0643)
Parameter Carbon monoxide (42101) (ppm)
PQAO Name Maricopa County Air Quality (0643)
QAPP Approval Date 12/12/2019

NPAP Audit Summary:

Number of Passed Audits	NPAP Bias	Criteria Met
		Y

AQS Site ID	POC	Monitor Type	Routine Data						One Point Quality Check			Annual PE		NPAP			Concur. Flag		
			Mean	Min	Max	Exceed. Count	Outlier Count	Perc. Comp.	Precision	Bias	Complete	Bias	Complete	Bias	PQAO Level Criteria	QAPP Appr.	Aqs Rec Flag	CA Rec Flag	Epa Concur
04-013-0019	1	SLAMS	0.538	0.000	3.800	0	0	97	6.97	+/-6.45	96	1.07	100		Y	Y	Y	Y	Y
04-013-1003	1	SLAMS	0.296	- 0.100	3.200	0	0	90	7.35	+/-6.30	100	- 3.56	100		Y	Y	Y	Y	Y
04-013-3002	1	SLAMS	0.419	0.000	2.400	0	0	98	4.01	+6.17	100	2.49	100		Y	Y	Y	Y	Y
04-013-4003	1	SLAMS	0.381	0.000	2.700	0	0	98	6.30	+/-5.08	96	- 2.19	100		Y	Y	Y	Y	Y
04-013-4004	1	SLAMS	0.326	0.000	1.500	0	0	97	5.56	+/-4.54	88	- 0.09	100		Y	Y	Y	Y	Y
04-013-4011	1	SLAMS	0.143	- 0.200	1.000	0	0	98	5.31	+/-4.33	100	0.03	100		Y	Y	Y	Y	Y
04-013-4020	1	SLAMS	0.679	0.000	3.700	0	0	99	4.21	+5.01	96	- 1.23	100		Y	Y	Y	Y	Y

Data Evaluation and Concurrence Report for Gaseous Pollutants

Certifying Year 2020
Certifying Agency Code Maricopa County Air Quality (0643)
Parameter Nitrogen dioxide (NO2) (42602) (ppb)
PQAO Name Maricopa County Air Quality (0643)
QAPP Approval Date 12/12/2019

NPAP Audit Summary:

Number of Passed Audits	NPAP Bias	Criteria Met
		Y

			Routine Data						One Point Quality Check			Annual PE		NPAP			Concur. Flag		
AQS Site ID	POC	Monitor Type	Mean	Min	Max	Exceed. Count	Outlier Count	Perc. Comp.	Precision	Bias	Complete	Bias	Complete	Bias	PQAO Level Criteria	QAPP Appr.	Aqs Rec Flag	CA Rec Flag	Epa Concur
04-013-0019	1	SLAMS	13.4	0.0	54.0		0	96	9.46	+/-7.74	88	- 2.47	100		Y	Y	Y	Y	Y
04-013-3002	6	SLAMS	15.9	1.0	61.0		0	96	12.50	+/- 11.04	96	2.53	100		Y	Y	Y	Y	Y
04-013-4011	1	SLAMS	8.1	0.0	45.0		0	98	7.91	+8.32	96	- 0.97	100		Y	Y	Y	Y	Y
04-013-4020	1	SLAMS	25.1	0.0	65.0		0	98	6.84	-9.30	96	- 3.56	100		Y	Y	Y	Y	Y

Data Evaluation and Concurrence Report for Gaseous Pollutants

Certifying Year 2020
Certifying Agency Code Maricopa County Air Quality (0643)
Parameter Ozone (44201) (ppm)
PQAO Name Maricopa County Air Quality (0643)
QAPP Approval Date 12/12/2019

NPAP Audit Summary:

Number of Passed Audits	NPAP Bias	Criteria Met
2	2.58516	Y

AQS Site ID	POC	Monitor Type	Routine Data Mean	Min	Max	Exceed. Count	Outlier Count	Perc. Comp.	One Point Quality Check Precision	Bias	Complete	Annual PE Bias	Complete	NPAP Bias	PQAO Level Criteria	QAPP Appr.	Concur. Flag Aqs Rec Flag	CA Rec Flag	Epa Concur
04-013-0019	1	SLAMS	0.053	0.015	0.110	0	0	99	3.10	+/-2.39	96		0		Y	Y	N	Y	Y
Submitter Comment			In 2020, twenty-five 1-pt. precision QC checks were completed. Five 5-pt.verification/calibration QC checks were also completed, which tested the analyzer at the same concentration levels as the annual performance evaluation audit as well as checking linearity and proper instaltion. The 5-pt. checks occurred when a different monitor was installed at the site. Although the required annual performance evaluation audit using a separate QA calibrator was missed, close evaluation of all data (pollutant and P&A) supports that the data are valid.																
04-013-1003	1	SLAMS	0.056	0.022	0.107	0	0	98	2.71	-2.82	100	0.08	100		Y	Y	Y	Y	Y
04-013-1004	1	SLAMS	0.056	0.017	0.118	0	0	99	1.73	-2.34	100	- 3.02	100	2.08	Y	Y	Y	Y	Y
04-013-1010	1	SLAMS	0.056	0.025	0.104	0	0	94	3.27	+/-2.56	92	- 1.02	100		Y	Y	Y	Y	Y
04-013-2001	1	SLAMS	0.051	0.021	0.108	0	0	99	2.77	-3.33	92	- 6.79	100		Y	Y	Y	Y	Y
04-013-2005	1	SLAMS	0.057	0.024	0.114	0	0	99	2.58	+/-2.26	92	- 0.76	100		Y	Y	Y	Y	Y
04-013-3002	1	SLAMS	0.050	0.019	0.088	0	0	99	2.23	+/-1.81	100	- 0.78	100		Y	Y	Y	Y	Y
04-013-3003	1	SLAMS	0.054	0.015	0.113	0	0	98	2.68	+/-2.07	92	0.84	100		Y	Y	Y	Y	Y
04-013-4003	1	SLAMS	0.051	0.017	0.100	0	0	98	3.77	+/-3.69	96	- 1.72	100		Y	Y	Y	Y	Y
04-013-4004	1	SLAMS	0.051	0.019	0.091	0	0	96	3.25	-3.40	88	- 3.82	100		Y	Y	Y	Y	Y
04-013-4005	1	SLAMS	0.051	0.018	0.097	0	0	96	2.35	+/-1.73	92	- 7.06	100	3.10	Y	Y	Y	Y	Y
04-013-4008	1	SLAMS	0.056	0.023	0.102	0	0	97	3.12	+/-2.64	92	- 3.53	100		Y	Y	Y	Y	Y
04-013-4010	1	SLAMS	0.054	0.023	0.102	0	0	98	3.18	+/-2.61	100	0.34	100		Y	Y	Y	Y	Y
04-013-4011	1	SLAMS	0.049	0.013	0.106	0	0	98	1.74	+/-1.45	100	0.74	100		Y	Y	Y	Y	Y
04-013-9508	1	SLAMS	0.054	0.028	0.086	0	0	98	3.97	+/-3.24	81	4.63	100		Y	Y	Y	Y	Y
04-013-9702	1	SLAMS	0.057	0.021	0.100	0	0	97	1.73	+/-1.42	100	- 1.60	100		Y	Y	Y	Y	Y
04-013-9704	1	SLAMS	0.055	0.027	0.100	0	0	94	2.67	+/-2.23	96	2.17	100		Y	Y	Y	Y	Y

Data Evaluation and Concurrence Report for Gaseous Pollutants

Certifying Year 2020
Certifying Agency Code Maricopa County Air Quality (0643)
Parameter Sulfur dioxide (42401) (ppb)
PQAO Name Maricopa County Air Quality (0643)
QAPP Approval Date 12/12/2019

NPAP Audit Summary:

Number of Passed Audits	NPAP Bias	Criteria Met
		Y

AQS Site ID	POC	Monitor Type	Routine Data						One Point Quality Check			Annual PE		NPAP			Concur. Flag		
			Mean	Min	Max	Exceed. Count	Outlier Count	Perc. Comp.	Precision	Bias	Complete	Bias	Complete	Bias	PQAO Level Criteria	QAPP Appr.	Aqs Rec Flag	CA Rec Flag	Epa Concur
04-013-3002	4	SLAMS	0.3	0.0	6.0		0	96	4.46	-6.08	100	- 6.97	100		Y	Y	Y	Y	Y
04-013-9812	1	SLAMS	0.6	0.0	8.0		0	97	6.76	+/-6.04	100	- 4.71	100		Y	Y	Y	Y	Y

Data Evaluation and Concurrence Report for Particulate Matter

Certifying Year: 2020
Certifying Agency: Maricopa County Air Quality (0643)

Parameter: PM10 Total 0-10um STP (81102) CONTINUOUS
PQAO Name: Maricopa County Air Quality (0643)
Quality Assurance Project Plan Approval Date: 12/12/2019

Monitors Summaries

			Routine Data (ug/m3)						Flow Rate Verification		Flow Rate Audit			Collocation	Concurrence Flag	
AQS Site ID	POC	Monitor Type	Mean	Min	Max	Exceed. Count	Outlier Count	% Complete	Bias	% Complete	Bias	% Complete	QAPP Appr.	AQS Rec Flag	CA Rec Flag	EPA Concur
04-013-0019	1	SLAMS	31.34	-4.2	737.5	0	96		+/-1.63	100	-0.06	100	Y	Y	Y	Y
04-013-1003	1	SLAMS	22.00	-5.6	896.3	0	96		+/-1.24	100	-1.77	100	Y	Y	Y	Y
04-013-1004	1	SLAMS	21.01	-4.6	624.8	0	100		+/-1.71	100	-0.21	70	Y	Y	Y	Y
04-013-2001	1	SLAMS	20.50	-4.8	332.5	0	92		+/-1.73	100	+2.36	100	Y	Y	Y	Y
04-013-3002	4	SLAMS	37.92	-6.0	********	0	99		+/-0.79	100	-0.03	100	Y	Y	Y	Y
04-013-3003	1	SLAMS	28.79	-3.0	********	0	100		+/-1.54	100	+0.18	100	Y	Y	Y	Y
04-013-4003	1	SLAMS	34.62	-3.7	591.9	0	96		+/-0.98	100	+0.19	100	Y	Y	Y	Y
04-013-4004	1	SLAMS	31.24	-3.0	********	0	98		+/-0.82	100	+0.17	100	Y	Y	Y	Y
04-013-4005	1	SLAMS	22.87	-6.9	********	0	98		+1.45	100	+0.83	100	Y	Y	Y	Y
04-013-4006	1	SLAMS	39.73	-7.0	********	0	99		+/-0.93	100	+0.29	100	Y	Y	Y	Y
04-013-4009	1	SLAMS	58.88	-3.0	********	0	97		+/-1.32	100	-0.82	100	Y	Y	Y	Y
04-013-4010	1	SLAMS	28.46	-4.0	********	0	98		+1.08	100	+0.39	100	Y	Y	Y	Y
04-013-4011	1	SLAMS	46.33	-5.0	907.0	0	97		-1.38	100	-1.01	100	Y	Y	Y	Y
04-013-4016	1	SLAMS	25.87	-8.0	791.0	0	100		+/-0.76	100	-0.09	70	Y	Y	Y	Y
04-013-9812	1	SLAMS	39.84	-4.6	********	0	96		+/-1.97	100	+0.67	100	Y	Y	Y	Y

Data Evaluation and Concurrence Report for Particulate Matter

Certifying Year: 2020
Certifying Agency: Maricopa County Air Quality (0643)

Parameter: PM2.5 - Local Conditions (88101)
PQAO Name: Maricopa County Air Quality (0643)
Quality Assurance Project Plan Approval Date: 12/12/2019

Collocation Summary

Method	# Sites	# Sites Req	# Sites Collocated	% Collocated	CV Est	CV UB	Criteria Met?
182	8	1	1	100	7.80	9.45	Y

PEP Summary

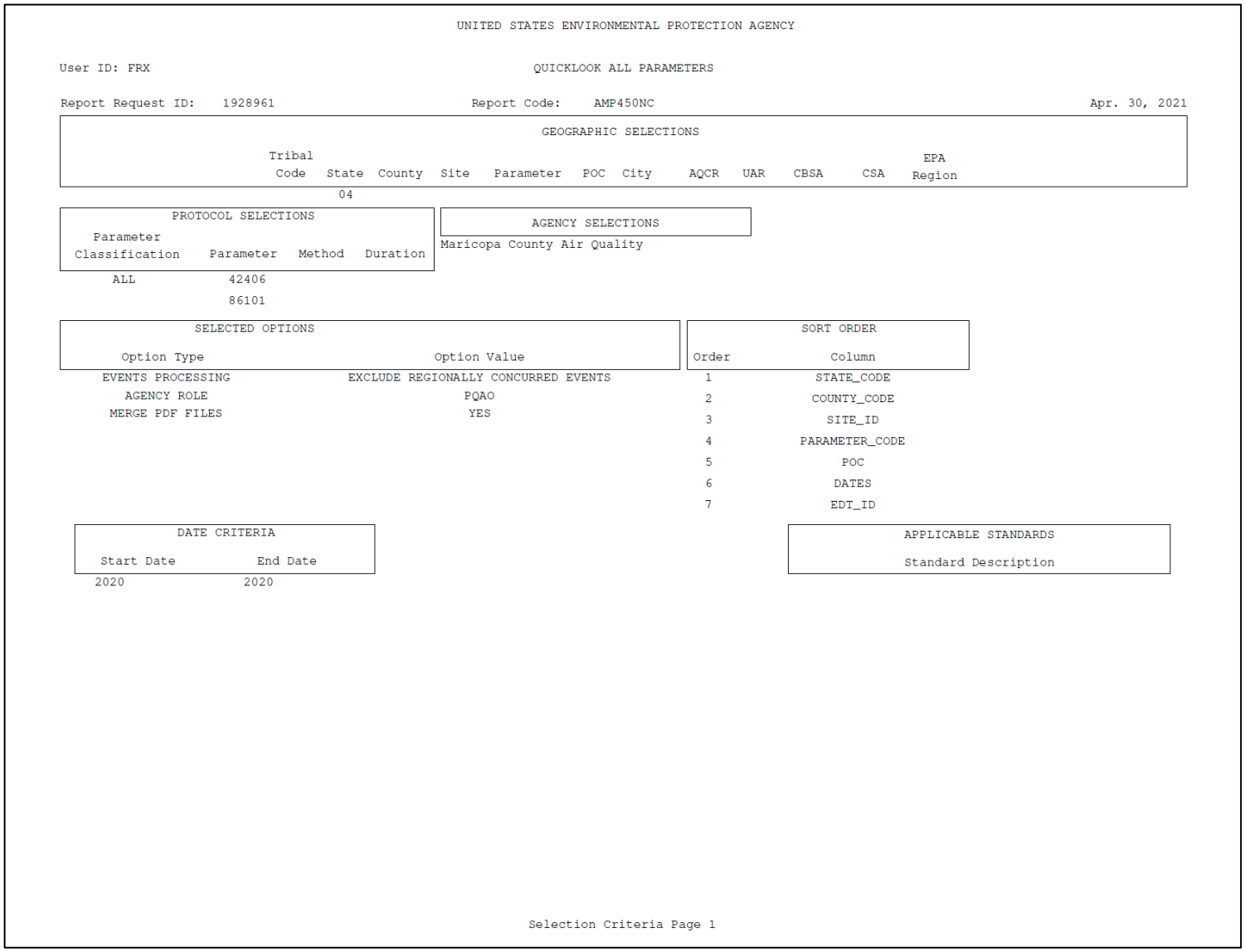
# Methods	# Audited Methods	# PEP Required	# PEP Submitted	% Complete	Bias	Criteria Met?
1	1	8	7	87.5	-11.20	Y

Monitors Summaries

				Routine Data (ug/m3)						Flow Rate Audit		Collocation			PEP PQAO		Concurrence Flag		
AQS Site ID	POC	Method	Monitor Type	Mean	Min	Max	Exceed. Count	Outlier Count	% Complete	Bias	% Complete	CV	% Complete	PQAO Crit. Met	Crit. Met	QAPP Appr.	AQS Rec Flag	CA Rec Flag	EPA Concur
04-013-0019	2	145	SLAMS	9.86	2.4	30.9		0	100	+0.30	100			Y	Y	Y	Y	Y	Y
04-013-0019	3	182	SLAMS	10.48	-3.9	550.0		0	98	-0.06	100	9.45	100	Y	Y	Y	Y	Y	Y
04-013-1003	3	182	SLAMS	7.27	-7.2	90.8		0	97	-1.77	100			Y	Y	Y	Y	Y	Y
04-013-1004	3	182	SLAMS	7.93	-6.3	204.8		0	100	-0.21	70			Y	Y	Y	Y	Y	Y
04-013-2001	3	182	SLAMS	7.61	-8.1	321.1		0	96	+2.36	100			Y	Y	Y	Y	Y	Y
04-013-4003	3	182	SLAMS	10.42	-7.5	544.7		0	98	+0.19	100			Y	Y	Y	Y	Y	Y
04-013-4005	3	182	SLAMS	6.82	-8.5	117.9		0	98	+0.83	100			Y	Y	Y	Y	Y	Y
04-013-4020	3	182	SLAMS	12.68	-9.9	574.3		0	93	+1.39	100			Y	Y	Y	Y	Y	Y
04-013-9812	3	182	SLAMS	10.42	-6.4	236.4		0	97	+0.67	100			Y	Y	Y	Y	Y	Y

Figure 20. 2020 EPA Data Certification Concurrence

Figure 21 shows the 2020 AMP 450 non-criteria (NC) data certification report for PM coarse and the SO_2 hourly 5-minute maximum received from EPA R9 with concurrence flags.



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

User ID: FRX — QUICKLOOK ALL PARAMETERS

Report Request ID: 1928961 — Report Code: AMP450NC — Apr. 30, 2021

GEOGRAPHIC SELECTIONS

Tribal Code	State	County	Site	Parameter	POC	City	AQCR	UAR	CBSA	CSA	EPA Region
	04										

PROTOCOL SELECTIONS

Parameter Classification	Parameter	Method	Duration
ALL	42406		
	86101		

AGENCY SELECTIONS

Maricopa County Air Quality

SELECTED OPTIONS

Option Type	Option Value
EVENTS PROCESSING	EXCLUDE REGIONALLY CONCURRED EVENTS
AGENCY ROLE	PQAO
MERGE PDF FILES	YES

SORT ORDER

Order	Column
1	STATE_CODE
2	COUNTY_CODE
3	SITE_ID
4	PARAMETER_CODE
5	POC
6	DATES
7	EDT_ID

DATE CRITERIA

Start Date	End Date
2020	2020

APPLICABLE STANDARDS

Standard Description

Selection Criteria Page 1

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM

QUICKLOOK ALL PARAMETERS

Apr. 30, 2021

EXCEPTIONAL DATA TYPES

EDT	DESCRIPTION
0	NO EVENTS
1	EVENTS EXCLUDED
2	EVENTS INCLUDED
5	EVENTS WITH CONCURRENCE EXCLUDED

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM

QUICKLOOK ALL PARAMETERS

Apr. 30, 2021

Parameter	Unit	POC	PQAO	Year	Meth	# Obs	1st Max Value	2nd Max Value	3rd Max Value	4th Max Value	Arith. Mean	Duration	Cert& Eval	EDT
Site ID: 04-013-0019 City: Phoenix	County: Maricopa					Address: 3847 W EARLL DR-WEST PHOENIX STATION								
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	3	0643	2020	207	8449	701.6	611.4	379.8	340.3	20.81	1 HOUR	Y	0
Site ID: 04-013-1003 City: Mesa	County: Maricopa					Address: 310 S BROOKS, MESA								
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	3	0643	2020	207	8420	805.2	337.3	309.8	284.9	14.68	1 HOUR	Y	0
Site ID: 04-013-1004 City: Phoenix	County: Maricopa					Address: 601 E BUTLER DR & N 6TH ST,PHOENIX								
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	3	0643	2020	207	8641	553.3	303.5	300.9	263.5	13.03	1 HOUR	Y	0
Site ID: 04-013-2001 City: Glendale	County: Maricopa					Address: 6000 W OLIVE AVE,GLENDALE								
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	3	0643	2020	207	8155	208.9	163.3	153.2	143.4	12.84	1 HOUR	Y	0
Site ID: 04-013-3002 City: Phoenix	County: Maricopa					Address: 1645 E ROOSEVELT ST-CENTRAL PHOENIX STN								
42406 SO2 max 5-min avg	Parts per billion	1	0643	2020	100	8457	23.0	10.0	9.0	7.0	.41	1 HOUR	Y	0
Site ID: 04-013-4003 City: Phoenix	County: Maricopa					Address: 33 W TAMARISK AVE, PHOENIX								
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	3	0643	2020	207	8416	387.8	357.0	315.2	300.8	24.24	1 HOUR	Y	0
Site ID: 04-013-4005 City: Tempe	County: Maricopa					Address: 1525 S COLLEGE AVE, TEMPE								
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	3	0643	2020	207	8492	1215.6	914.0	563.5	421.8	16.00	1 HOUR	Y	0
Site ID: 04-013-9812 City: Phoenix	County: Maricopa					Address: 2702 RC ESTERBROOKS BLVD								
42406 SO2 max 5-min avg	Parts per billion	1	0643	2020	100	8566	47.0	32.0	19.0	19.0	.80	1 HOUR	Y	0
86101 PM10-2.5 - Local Conditions	Micrograms/cubic meter (LC)	3	0643	2020	207	8415	985.1	894.3	645.5	473.9	29.38	1 HOUR	Y	0

Note: The * indicates that the mean does not satisfy summary criteria.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
AIR QUALITY SYSTEM

QUICKLOOK ALL PARAMETERS

Apr. 30, 2021

METHODS USED IN THIS REPORT

PARAMETER	METHOD CODE	COLLECTION METHOD	ANALYSIS METHOD
42406	100	INSTRUMENTAL	ULTRAVIOLET FLUORESCENCE
86101	207	Thermo Scientific 1405-DF Dichotomous FDMS	FDMS Gravimetric

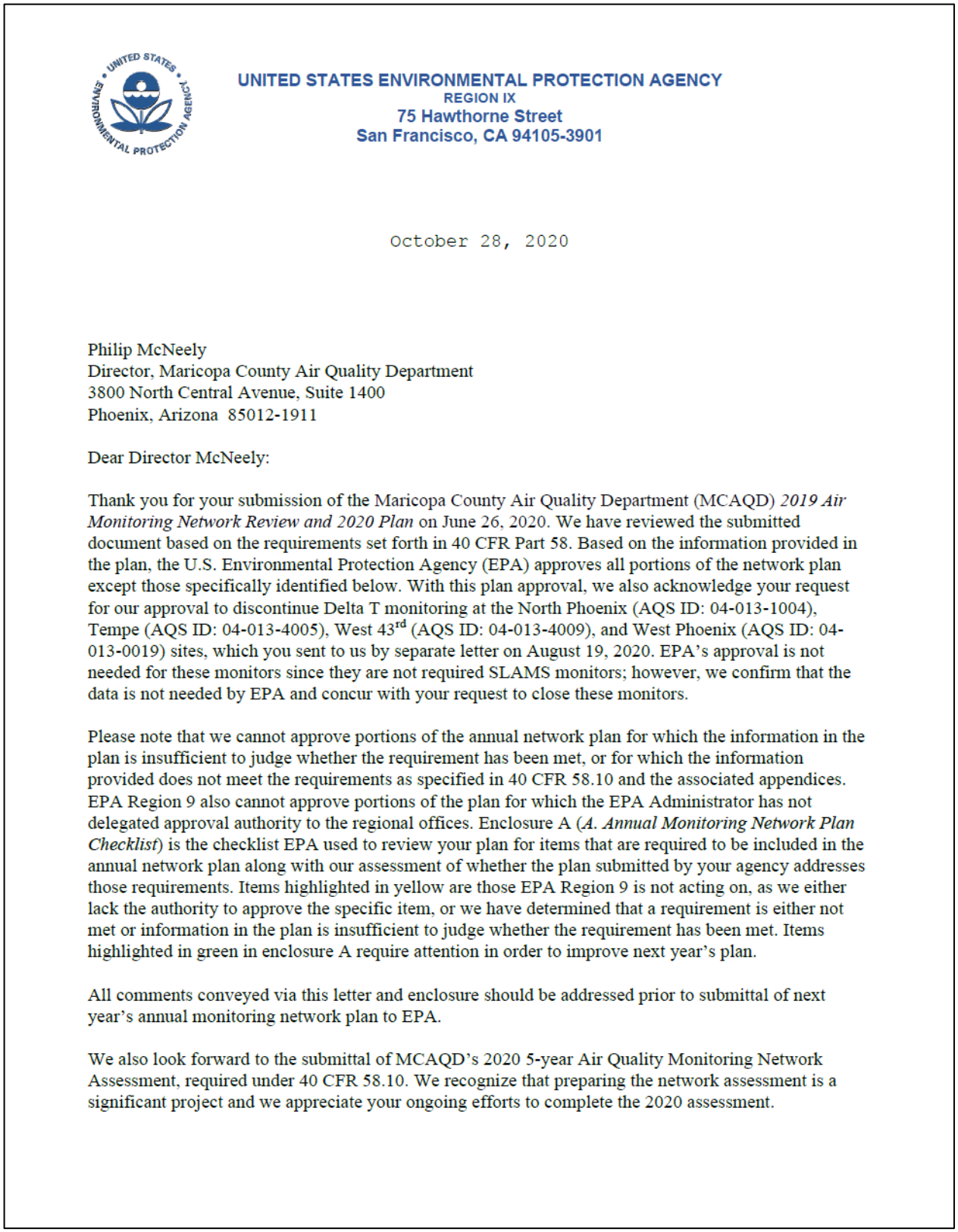
Note: The * indicates that the mean does not satisfy summary criteria.

Page 3 of 5

Figure 21. 2020 Non-Criteria Pollutant Data Certification Report

APPENDIX IV - EPA CORRESPONDENCE

Figure 22 shows EPA R9's letter approving the 2019 Air Monitoring Network and 2021 Plan and checklist used to evaluate it.



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

October 28, 2020

Philip McNeely
Director, Maricopa County Air Quality Department
3800 North Central Avenue, Suite 1400
Phoenix, Arizona 85012-1911

Dear Director McNeely:

Thank you for your submission of the Maricopa County Air Quality Department (MCAQD) *2019 Air Monitoring Network Review and 2020 Plan* on June 26, 2020. We have reviewed the submitted document based on the requirements set forth in 40 CFR Part 58. Based on the information provided in the plan, the U.S. Environmental Protection Agency (EPA) approves all portions of the network plan except those specifically identified below. With this plan approval, we also acknowledge your request for our approval to discontinue Delta T monitoring at the North Phoenix (AQS ID: 04-013-1004), Tempe (AQS ID: 04-013-4005), West 43rd (AQS ID: 04-013-4009), and West Phoenix (AQS ID: 04-013-0019) sites, which you sent to us by separate letter on August 19, 2020. EPA's approval is not needed for these monitors since they are not required SLAMS monitors; however, we confirm that the data is not needed by EPA and concur with your request to close these monitors.

Please note that we cannot approve portions of the annual network plan for which the information in the plan is insufficient to judge whether the requirement has been met, or for which the information provided does not meet the requirements as specified in 40 CFR 58.10 and the associated appendices. EPA Region 9 also cannot approve portions of the plan for which the EPA Administrator has not delegated approval authority to the regional offices. Enclosure A (*A. Annual Monitoring Network Plan Checklist*) is the checklist EPA used to review your plan for items that are required to be included in the annual network plan along with our assessment of whether the plan submitted by your agency addresses those requirements. Items highlighted in yellow are those EPA Region 9 is not acting on, as we either lack the authority to approve the specific item, or we have determined that a requirement is either not met or information in the plan is insufficient to judge whether the requirement has been met. Items highlighted in green in enclosure A require attention in order to improve next year's plan.

All comments conveyed via this letter and enclosure should be addressed prior to submittal of next year's annual monitoring network plan to EPA.

We also look forward to the submittal of MCAQD's 2020 5-year Air Quality Monitoring Network Assessment, required under 40 CFR 58.10. We recognize that preparing the network assessment is a significant project and we appreciate your ongoing efforts to complete the 2020 assessment.

If you have any questions regarding this letter or the enclosed comments, please feel free to contact me at (415) 947-4134 or Anna Mebust at (415) 972-3265.

Sincerely,

GWEN YOSHIMURA Digitally signed by GWEN YOSHIMURA Date: 2020.10.28 12:06:24 -07'00'

Gwen Yoshimura, Manager
Air Quality Analysis Office

Enclosure:
A. Annual Monitoring Network Plan Checklist

cc (via email): Ben Davis, MCAQD

A. ANNUAL MONITORING NETWORK PLAN CHECKLIST
(Updated April 8, 2020)

Year: 2020
Agency: Maricopa County Air Quality Department (MCAQD)

40 CFR 58.10(a)(1) requires that each Annual Network Plan (ANP) shall provide for the documentation of the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations that can include FRM, FEM, and ARM monitors that are part of SLAMS, NCore, CSN, PAMS, and SPM stations.

40 CFR 58.10(a)(1) further directs that, "The plan shall include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, where applicable. The Regional Administrator may require additional information in support of this statement." On this basis, review of the ANPs is based on the requirements listed in 58.10 along with those in Appendices A, C, D, and E.

EPA Region 9 will not take action to approve or disapprove any item for which Part 58 grants approval authority to the Administrator rather than the Regional Administrators, but we will do a check to see if the required information is included and correct. The items requiring approval by the Administrator are: NCore, and Speciation (STN/CSN).

Please note that this checklist summarizes many of the requirements of 40 CFR Part 58, 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.

Key:

White	meets the requirement
Yellow	requirement is not met, or information is insufficient to make a determination. Action requested in next year's plan or outside the ANP process.
Green	item requires attention in order to improve next year's plan.

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, section or page #s.	Does the information provided[3] meet the requirement?[4]	Notes
GENERAL PLAN REQUIREMENTS					
1.	Submit plan by July 1st	58.10 (a)(1)	Y, cover letter	Y	
2.	30-day public comment / inspection period	58.10 (a)(1); 58.10 (c)	Y, p. 179	Y	
3.	Statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E, where applicable	58.10 (a)(1)	Y, p. 6	Y	
4.	Modifications to SLAMS network – case when we are not approving system modifications	58.10 (a)(2); 58.10 (b)(5); 58.10 (e); 58.14	NA	NA	
5.	Modifications to SLAMS network – case when we are approving system modifications per 58.14	58.10 (a)(2); 58.10 (b)(5); 58.10 (e); 58.14	NA	NA	
6.	Does plan include documentation (e.g., attached approval letter) for system modifications that have been approved since last ANP approval?		Y, Appendix IV	Y	Note that EPA approved the Diablo $PM_{2.5}$ and CO closures and NO_2 relocation on June 1, 2020, after this year's plan was already posted for public comment. Please include a copy of this approval in your next network plan.
7.	Any proposals to remove or move a monitoring station within a period of 18 months following plan submittal	58.10 (b)(5)	Y, p. 63-64	Y	
8.	Precision/Accuracy reports submitted to AQS	58.16 (a)	Y, Appendix II	Y	
9.	Annual data certification submitted	58.15	Y, Appendix II	Y	
10.	Statement that SPMs operating an FRM/FEM/ARM that meet Appendix E also meet either Appendix A or an approved alternative. Documentation for any Appendix A	58.11 (a)(2)	Y, p. 29	Y	

[1] Unless otherwise noted.
[2] Response options: NA (Not Applicable), Yes, No, or Incomplete.
[3] Assuming the information is correct.
[4] Response options: NA (Not Applicable) – [reason], Yes, No, Insufficient to Judge, or Incorrect

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, section or page #s.	Does the information provided[3] meet the requirement?[4]	Notes
	approved alternative should be included.[5]				
11.	SPMs operating FRM/FEM/ARM monitors for over 24 months are listed as comparable to the NAAQS or the agency provided documentation that requirements from Appendices A, C, or E were not met.[6]	58.20 (c)	NA, p. 25	Y	
12.	For agencies that share monitoring responsibilities in an MSA/CSA: this agency meets full monitoring requirements or an agreement between the affected agencies and the EPA Regional Administrator is in place	App D 2(e)	Y, p. 66	Insufficient to judge	A draft agreement is in the development process
GENERAL PARTICULATE MONITORING REQUIREMENTS (PM_{10}, $PM_{2.5}$, Pb-TSP, Pb-PM_{10})					
13.	Designation of a primary monitor if there is more than one monitor for a pollutant at a site.	App. A 3.2.3	Y, Appendix II	Y	
14.	Distance between QA collocated monitors. For low volume PM instruments (flow rate < 200 liters/minute) > 1 m. For high volume PM instruments (flow rate > 200 liters/minute) > 2m. [Note: waiver request or the date of previous waiver approval must be included if the distance deviates from requirement.]	App. A 3.2.3.4 (c) and 3.3.4.2 (c)	Y, Appendix II	Y	
$PM_{2.5}$ –SPECIFIC MONITORING REQUIREMENTS					
15.	Document how states and local agencies provide for the review of changes to a $PM_{2.5}$ monitoring network that impact the location of a violating $PM_{2.5}$ monitor.	58.10 (c)	Y, p. 49	Y	
16.	Identification of any $PM_{2.5}$ FEMs and/or ARMs not eligible to be compared to the NAAQS due to poor comparability to FRM(s) [Note 1: must include required data assessment.] [Note 2:	58.10 (b)(13) 58.11 (e)	NA	NA	

[5] Alternatives to the requirements of appendix A may be approved for an SPM site as part of the approval of the annual monitoring plan, or separately.
[6] This requirement only applies to monitors that are eligible for comparison to the NAAQS per 40 CFR §§58.11(e) and 58.30.

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, section or page #s.	Does the information provided[3] meet the requirement?[4]	Notes
	Required SLAMS must monitor $PM_{2.5}$ with NAAQS-comparable monitor at the required sample frequency.]				
17.	Minimum # of monitoring sites for $PM_{2.5}$ [Note 1: should be supported by MSA ID, MSA population, DV, # monitoring sites, and # required monitoring sites] [Note 2: Only monitors considered to be required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.]	App. D 4.7.1(a) and Table D-5	Y, p. 52	Y	
18.	Requirements for continuous $PM_{2.5}$ monitoring (number of monitors and collocation)	App. D 4.7.2	Y, Appendix II	Y	
19.	FRM/FEM/ARM $PM_{2.5}$ QA collocation	App. A 3.2.3	Y, Appendix II	Y	
20.	$PM_{2.5}$ Chemical Speciation requirements for official STN sites	App. D 4.7.4	Y, p. 27	Y	This requirement is fulfilled by ADEQ.
21.	Identification of sites suitable and sites not suitable for comparison to the annual $PM_{2.5}$ NAAQS as described in Part 58.30	58.10 (b)(7)	Y, Appendix II	Y	
22.	Required $PM_{2.5}$ sites represent area-wide air quality	App. D 4.7.1(b)	Y, p. 48	Y	
23.	For $PM_{2.5}$, within each MSA, at least one site at neighborhood or larger scale in an area of expected maximum concentration	App. D 4.7.1(b)(1)	Y, p. 51, p. 62, Appendix II	Y	
24.	If additional SLAMS $PM_{2.5}$ is required, there is a site in an area of poor air quality	App. D 4.7.1(b)(3)	Y, p. 51	Y	
25.	States must have at least one $PM_{2.5}$ regional background and one $PM_{2.5}$ regional transport site.	App. D 4.7.3	NA	NA	This State requirement is fulfilled by ADEQ.
26.	Sampling schedule for $PM_{2.5}$ - applies to year-round and seasonal sampling schedules (note: date of waiver approval must be included if the sampling season deviates from requirement)	58.10 (b)(4); 58.12(d); App. D 4.7	Y, Appendix II	Y	
27.	Frequency of flow rate verification for automated and manual $PM_{2.5}$ monitors	App. A 3.2.1	Y, Appendix II	Y	
28.	Dates of two semi-annual flow rate audits	App. A 3.2.2	Y, Appendix II	Y	

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, section or page #s.	Does the information provided[3] meet the requirement?[4]	Notes
	conducted in **the previous CY** for $PM_{2.5}$ monitors [Note: 5 -7 month interval is recommended but not a requirement.]				
PM_{10} –SPECIFIC MONITORING REQUIREMENTS					
29.	Minimum # of monitoring sites for PM_{10} [Note: Only monitors considered to be required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.]	App. D, 4.6 (a) and Table D-4	Y, p. 47	Y	
30.	Manual PM_{10} method collocation (note: continuous PM_{10} does not have this requirement)	App. A 3.3.4	NA	NA	
31.	Sampling schedule for PM_{10}	58.10 (b)(4); 58.12(e); App. D 4.6	Y, Appendix II	Y	
32.	Frequency of flow rate verification for automated and manual PM_{10} monitors	App. A 3.3.1 and 3.3.2	Y, Appendix II	Y	
33.	Dates of two semi-annual flow rate audits conducted in **the previous CY** for PM_{10} monitors [Note: 5 -7 month interval is recommended but not a requirement.]	App. A 3.3.3	Y, Appendix II	Y	
Pb –SPECIFIC MONITORING REQUIREMENTS					
34.	Minimum # of monitors for non-NCore Pb [Note: Only monitors considered to be required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.]	App D 4.5	NA	NA	On December 19, 2019, EPA approved closure of the Deer Valley Airport Pb monitoring site, based on a reduction in emissions at the airport and historical and recent concentration data from the site. Since Pb emissions at the airport are below the threshold of 1.0 tpd, MCAQD no longer has any required Pb monitors.
35.	Pb collocation: for non-NCore sites	App A 3.4.4 and 3.4.5	NA	NA	

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, section or page #s.	Does the information provided[3] meet the requirement?[4]	Notes
36.	Any source-oriented Pb site for which a waiver has been granted by EPA Regional Administrator	58.10 (b)(10)	NA	NA	
37.	Any Pb monitor for which a waiver has been requested or granted by EPA Regional Administrator for use of Pb-PM_{10} in lieu of Pb-TSP	58.10 (b)(11)	NA	NA	
38.	Designation of any Pb monitors as either source-oriented or non-source-oriented	58.10 (b)(9)	NA	NA	
39.	Sampling schedule for Pb	58.10 (b)(4); 58.12(b); App A 3.4.4.2 (c) and 3.4.5.3 (c)	NA	NA	
40.	Frequency of flow rate verification for Pb monitors audit	App A 3.4.1 and 3.4.2	NA	NA	
41.	Dates of two semi-annual flow rate audits conducted in **the previous CY** for Pb monitors [Note: 5 -7 month interval is recommended but not a requirement.]	App A 3.4.3	NA	NA	
GENERAL GASEOUS MONITORING REQUIREMENTS					
42.	Frequency of one-point QC check (gaseous)	App. A 3.1.1	Y, Appendix II	Y	
43.	Date of Annual Performance Evaluation (gaseous) conducted in **CY2019**	App. A 3.1.2	Y, Appendix II	Y	
O_3 –SPECIFIC MONITORING REQUIREMENTS					
44.	Minimum # of monitoring sites for O_3 [Note 1: should be supported by MSA ID, MSA population, DV, # monitoring sites, and # required monitoring sites] [Note 2: Only monitors considered to be required SLAMs are eligible to be counted towards meeting minimum monitoring requirements.] [Note 3: monitors that do not meet traffic count/distance requirements to be neighborhood or urban scale (40 CFR Appendix E, Table E-1) cannot be counted	App D 4.1(a) and Table D-2	Y, p. 42	Y	

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, section or page #s.	Does the information provided[3] meet the requirement?[4]	Notes
	towards meeting minimum monitoring requirements]				
45.	Identification of maximum concentration O_3 site(s)	App D 4.1 (b)	Y, p. 42	Y	
46.	Sampling season for O_3 (Note: Waivers must be renewed annually. EPA expects agencies to submit re-evaluations of the relevant data each year with the ANP. EPA will then respond as part of the ANP response.)	58.10 (b)(4); App D 4.1(i)	NA	NA	No waivers were requested.
47.	An Enhanced Monitoring Plan for O_3, if applicable, no later than October 1, 2019 or two years following the effective date of a designation to a classification of Moderate or above O_3 nonattainment, whichever is later.	58.10 (a)(11); App D 5 (h)	NA	NA	
NO_2 –SPECIFIC MONITORING REQUIREMENTS					
48.	Minimum monitoring requirements for area-wide NO_2 monitor in location of expected highest NO_2 concentrations representing neighborhood or larger scale	App D 4.3.3	Y, p. 39	Y	
49.	Minimum monitoring requirements for susceptible and vulnerable populations monitoring (aka RA40) NO_2	App D 4.3.4	NA	NA	The RA40 Greenwood monitor shut down in 2016. Please continue to work with EPA to determine if another Maricopa County monitor will be used for this requirement going forward.
50.	Identification of required NO_2 monitors as either near-road, area-wide, or vulnerable and susceptible population (aka RA40)	58.10 (b)(12)	Y, p. 39	Y	
NEAR ROADWAY – SPECIFIC MONITORING REQUIREMENTS					
In CBSAs ≥ 2.5 million, the following near-roadway minimum monitoring requirements apply:					
51.	Two NO_2 monitors	App. D 4.3.2(a); 58.13(c)(3) and (4)	Y, p. 39	Y	The Diablo NO_2 monitor operated throughout 2019 and was closed in early 2020. On June 1, 2020, EPA approved the relocation of this site. See Row 6.

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, section or page #s.	Does the information provided[3] meet the requirement?[4]	Notes
52.	One CO monitor	App. D 4.2.1(a); 58.13(e)(2)	Y, p. 36-37	Y	The Diablo CO and $PM_{2.5}$ monitors were closed in early 2020; monitors reopened at the Thirty-Third site. On June 1, 2020, EPA approved these system modifications. See Row 6.
53.	One $PM_{2.5}$ monitor	App. D 4.7.1(b)(2); 58.13(f)(2)	Y, p. 48	Y	The Diablo CO and $PM_{2.5}$ monitors were closed in early 2020; monitors reopened at the Thirty-Third site. On June 1, 2020, EPA approved these system modifications. See Row 6.
In CBSAs ≥ 1 million and AADT ≥ 250K, the following near-roadway minimum monitoring requirements apply:					
54.	Two NO_2 monitors	App. D 4.3.2(a); 58.13(c)(3) and (4)	NA	NA	
55.	One CO monitor	App. D 4.2.1(a); 58.13(e)(2)	NA	NA	
56.	One $PM_{2.5}$ monitor	App. D 4.7.1(b)(2); 58.13(f)(2)	NA	NA	
In CBSAs ≥ 1 million and ≤ 2.5 million **AND** AADT < 250K, the following near-roadway minimum monitoring requirements apply:					
57.	One NO_2 monitor	App. D 4.3.2(a); 58.13(c)(3)	NA	NA	
58.	One CO monitor	App. D 4.2.1(a); 58.13(e)(2)	NA	NA	
59.	One $PM_{2.5}$ monitor	App. D 4.7.1(b)(2); 58.13(f)(2)	NA	NA	
SO_2 –SPECIFIC MONITORING REQUIREMENTS					
60.	Minimum monitoring requirements for SO_2 based on PWEI and/or RA required monitors under Appendix D 4.4.3 [Note: Only monitors considered to be required SLAMs are eligible to be counted towards meeting minimum	App D 4.4	Y, p. 52	Y	

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	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, section or page #s.	Does the information provided[3] meet the requirement?[4]	Notes
	monitoring requirements.]				
61.	Monitors used to meet Data Requirements Rule	51.1203(c)	NA	NA	No monitors required by the Data Requirements Rule for this CBSA.
NCORE –SPECIFIC MONITORING REQUIREMENTS					
62.	NCore site and all required parameters operational: year-round O_3, SO_2, CO, NO_y, NO, $PM_{2.5}$ mass, $PM_{2.5}$ continuous, $PM_{2.5}$ speciation, $PM_{10-2.5}$ mass, resultant wind speed at 10m, resultant wind direction at 10m, ambient temperature, relative humidity. NOy waiver, if applicable.	App. D 3(b)	NA	NA	
63.	A plan for making Photochemical Assessment Monitoring Stations (PAMS) measurements, if applicable. The plan shall provide for the required PAMS measurements to begin by June 1, 2021.	58.10 (a)(10); 58.13 (h)	NA	NA	
SITE OR MONITOR - SPECIFIC REQUIREMENTS (OFTEN INCLUDED IN DETAILED SITE INFORMATION TABLES)					
64.	AQS site identification number for each site	58.10 (b)(1)	Y, Appendix II	Y	
65.	Location of each site: street address and geographic coordinates	58.10 (b)(2)	Y, Appendix II	Y	
66.	MSA, CBSA, CSA or other area represented by the monitor	58.10 (b)(8)	Y, Appendix II	Y	
67.	Parameter occurrence code for each monitor	Needed to determine if other requirements (e.g., min # and collocation) are met	Y, Appendix II	Y	
68.	Basic monitoring objective for each monitor	App D 1.1; 58.10 (b)(6)	Y, Appendix II	Y	
69.	Site type for each monitor	App D 1.1.1	Y, Appendix II	Y	

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, section or page #s.	Does the information provided[3] meet the requirement?[4]	Notes
70.	Monitor type for each monitor, and Network Affiliation(s) as appropriate	Needed to determine if other requirements (e.g., min # and collocation) are met	Y, Appendix II	Y	
71.	Scale of representativeness for each monitor as defined in Appendix D	58.10(b)(6); App D	Y, Appendix II	Y	
72.	Parameter code for each monitor	Needed to determine if other requirements (e.g., min # and collocation) are met	Y, Appendix II	Y	
73.	Method code and description (e.g., manufacturer & model) for each monitor	58.10 (b)(3); App C 2.4.1.2	Y, Appendix II	Y	
74.	Sampling start date for each monitor	Needed to determine if other requirements (e.g., min # and collocation) are met	Y, Appendix II	Y	
75.	Distance of monitor from nearest road	App E 6	Y, Appendix II	Y	
76.	Traffic count of nearest road	App E	Y, Appendix II	Y	
77.	Groundcover	App E 3(a)	Y, Appendix II	Y	
78.	Probe height	App E 2	Y, Appendix II	Y	
79.	Distance from supporting structure (vertical and horizontal, if applicable, should be provided)	App E 2	Y, Appendix II	Y	
80.	Distance from obstructions on roof (horizontal distance to the obstruction and vertical height of the obstruction above the probe should be provided)	App E 4(b)	Y, Appendix II	Y	
81.	Distance from obstructions not on roof (horizontal distance to the obstruction and vertical height of the obstruction above the probe	App E 4(a)	Y, Appendix II	Y	

	ANP requirement	Citation within 40 CFR 58[1]	Was the information submitted?[2] If yes, section or page #s.	Does the information provided[3] meet the requirement?[4]	Notes
	should be provided)				
82.	Distance from the drip line of closest tree(s)	App E 5	Y, Appendix II	Y	
83.	Distance to furnace or incinerator flue	App E 3(b)	Y, Appendix II	Y	
84.	Unrestricted airflow (expressed as degrees around probe/inlet or percentage of monitoring path)	App E, 4(a) and 4(b)	Y, Appendix II	Y	
85.	Probe material ($NO/NO_2/NO_y$, SO_2, O_3; For PAMS: VOCs, Carbonyls)	App E 9	Y, Appendix II	Y	
86.	Residence time ($NO/NO_2/NO_y$, SO_2, O_3; For PAMS: VOCs, Carbonyls)	App E 9	Y, Appendix II	Y	

Public Comments on Annual Network Plan

Were comments submitted to the S/L/T agency during the public comment period?	**Yes**
Were comments included in ANP submittal?	**Yes**
Were any of the comments substantive? If yes, which ones? If comments were not substantive provide rationale.	Yes. One comment was substantive and submitted within the public comment period. The commenter asserted that the current PM_{10} monitoring network was inadequate to represent air quality in the MSA given population growth, infrastructure development, local sources, and local meteorology and topography. The commenter identified specific zip codes that were not represented by the nearest PM_{10} monitor (Zuni Hills) and noted potential locations for a new monitoring site that would be representative of the area. (A second comment regarding the network was submitted in August 2019, prior to this plan development and outside of the comment period. MCAQD included this comment and their response in the plan. Since this comment was not submitted in response to this plan, it is not addressed further here.)
Were S/L/T responses to substantive comments included in ANP submittal?	No. The plan stated that the comment was forwarded to the Planning and Analysis Division for further evaluation as part of the five-year network assessment due to EPA in 2020, but did not include any direct response to the comment.
Were the S/L/T responses to substantive comments adequate?	No. Response was not included in the plan.
Do the substantive comments require separate EPA response (i.e., agency response wasn't adequate)?	Yes. EPA notes that, based on population estimates and concentrations measured in the Phoenix-Mesa MSA, this area is required to have between six and ten PM_{10} monitors. 40 CFR Part 58, Appendix D, Table D-4. MCAQD operates 15 monitors in the MSA. Plan p. 45. The area therefore meets EPA's minimum monitoring requirements for PM_{10}. Additional monitoring may be necessary to meet monitoring objectives for the area. MCAQD is required to periodically collaborate with ADEQ and EPA on network design and adequacy through the five-year network assessment process as noted by MCAQD. 40 CFR 58.10(d). We recommend that MCAQD expressly address this comment in its 2020 network assessment.
Are the sections of the annual network plan that received substantive comments approvable after consideration of comments? If yes, provide rationale	Yes. See EPA comment above.

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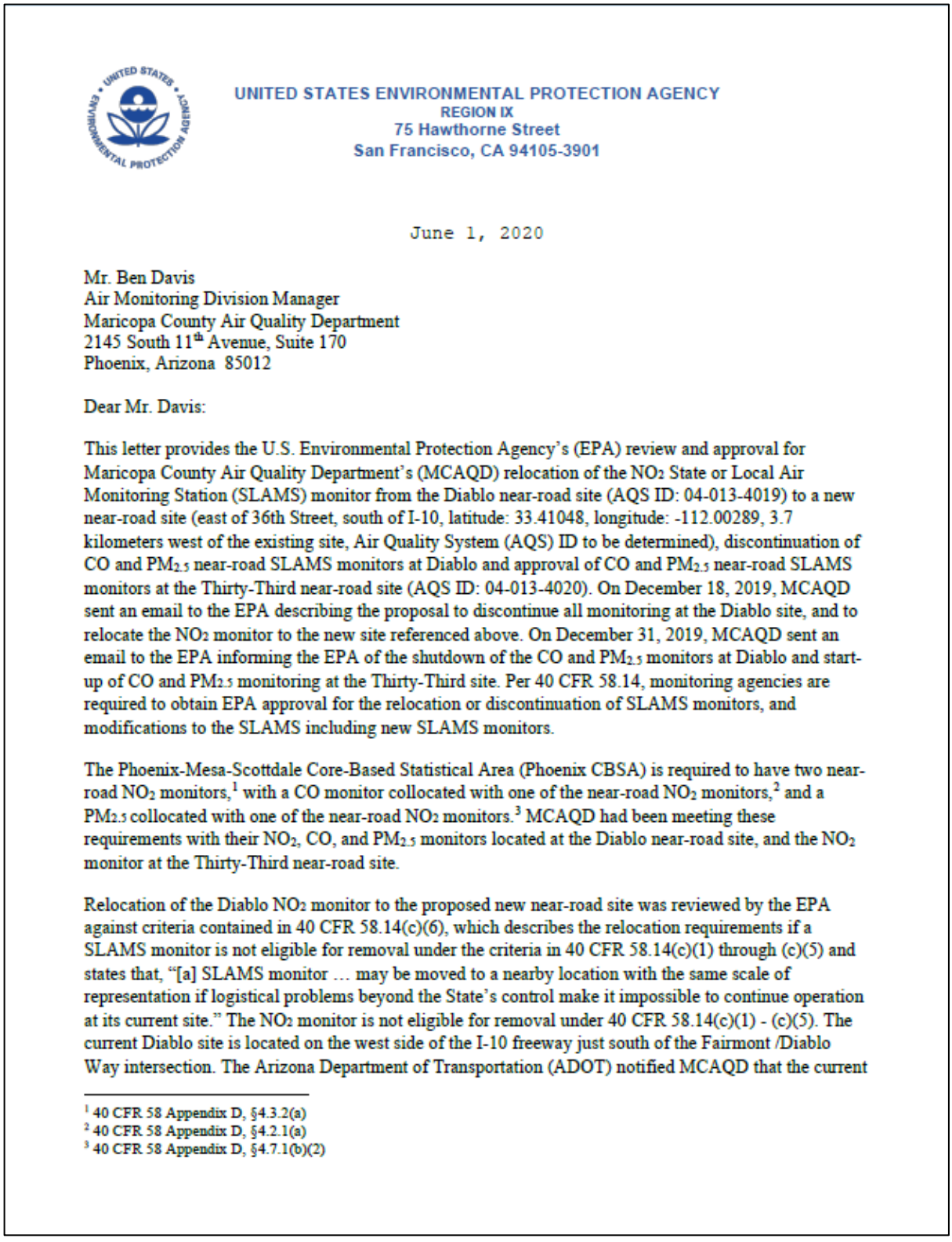
Figure 22. EPA Approval for 2019 Air Monitoring Review and 2020 Plan

Figure 23 shows the approval letter for the closure of Diablo site and establishing a new near-road site in the same general location.



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.

2

	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	

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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	

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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).

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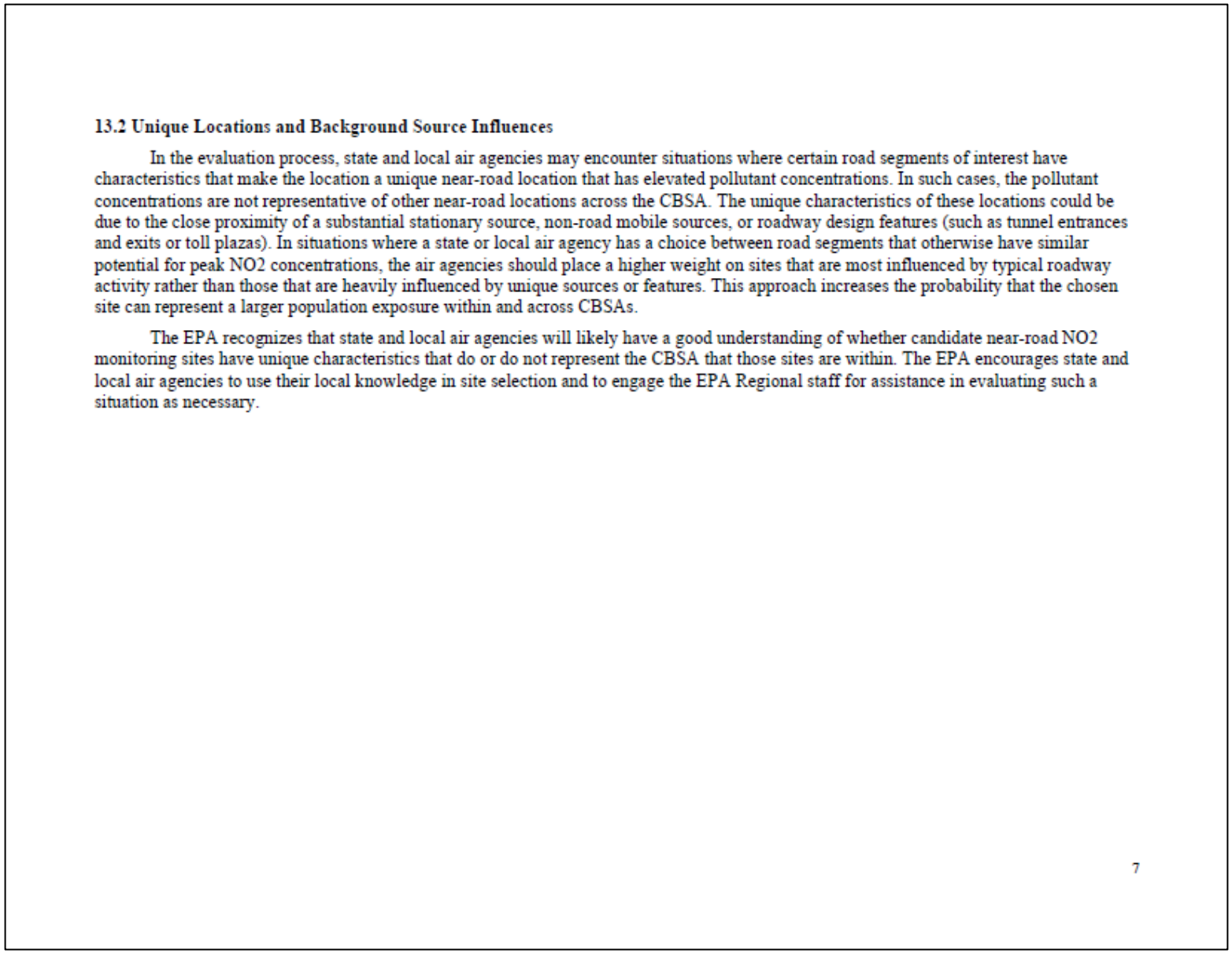

13.2 Unique Locations and Background Source Influences

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.

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Figure 23. Near-Road Network Changes Approval Letter

APPENDIX V - ARIZONA INTERAGENCY CORRESPONDENCE

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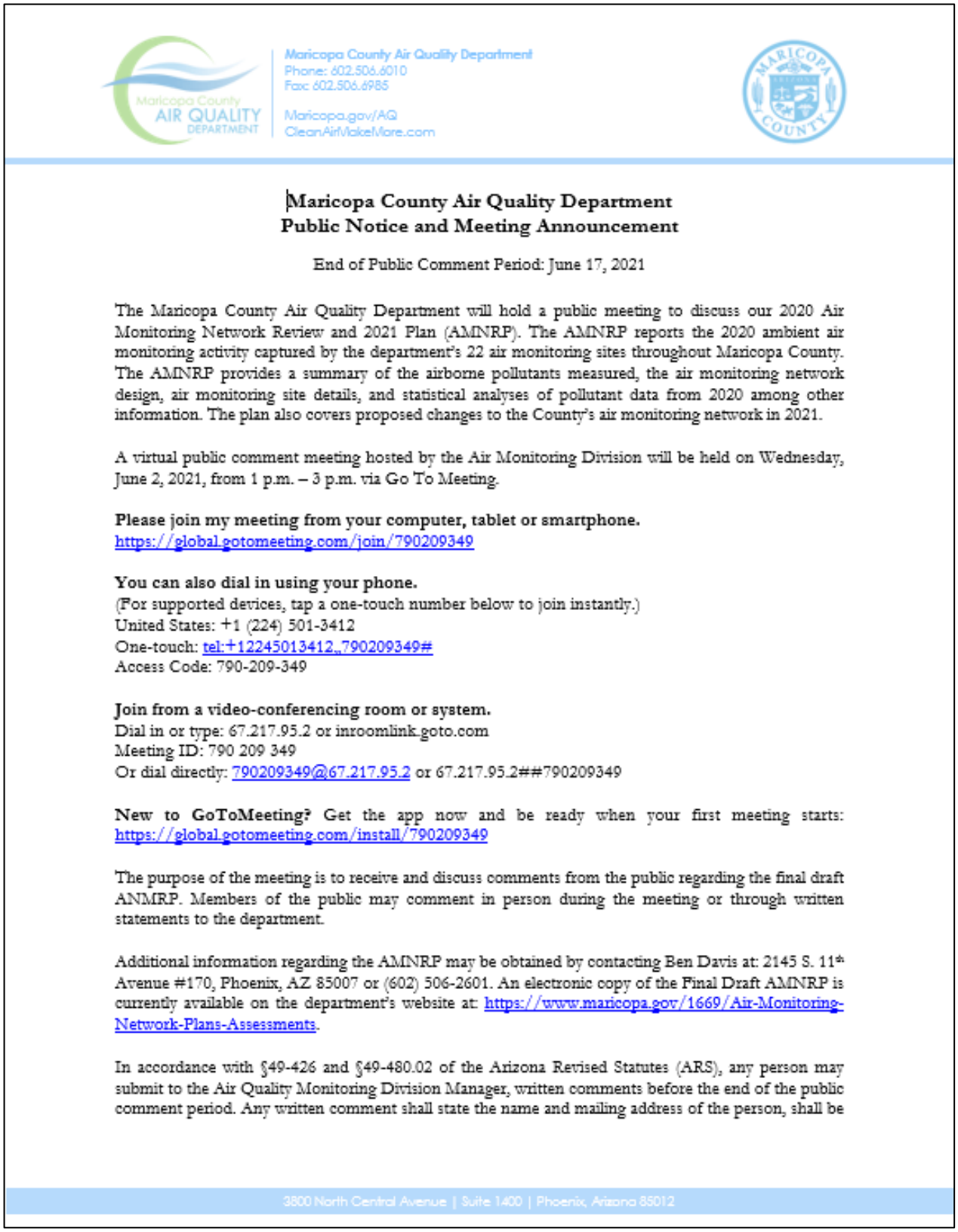
APPENDIX VI - PUBLIC NOTICE AND COMMENT INFORMATION

Figure 24 shows the public comment period announcement, which appeared in *The Record Reporter* on May 12th and May 19th.



Maricopa County Air Quality Department
Phone: 602.506.6010
Fax: 602.506.6985

Maricopa.gov/AQ
CleanAirMakeMore.com

Maricopa County Air Quality Department
Public Notice and Meeting Announcement

End of Public Comment Period: June 17, 2021

The Maricopa County Air Quality Department will hold a public meeting to discuss our 2020 Air Monitoring Network Review and 2021 Plan (AMNRP). The AMNRP reports the 2020 ambient air monitoring activity captured by the department's 22 air monitoring sites throughout Maricopa County. The AMNRP provides a summary of the airborne pollutants measured, the air monitoring network design, air monitoring site details, and statistical analyses of pollutant data from 2020 among other information. The plan also covers proposed changes to the County's air monitoring network in 2021.

A virtual public comment meeting hosted by the Air Monitoring Division will be held on Wednesday, June 2, 2021, from 1 p.m. – 3 p.m. via Go To Meeting.

Please join my meeting from your computer, tablet or smartphone.
https://global.gotomeeting.com/join/790209349

You can also dial in using your phone.
(For supported devices, tap a one-touch number below to join instantly.)
United States: +1 (224) 501-3412
One-touch: tel:+12245013412,,790209349#
Access Code: 790-209-349

Join from a video-conferencing room or system.
Dial in or type: 67.217.95.2 or inroomlink.goto.com
Meeting ID: 790 209 349
Or dial directly: 790209349@67.217.95.2 or 67.217.95.2##790209349

New to GoToMeeting? Get the app now and be ready when your first meeting starts: https://global.gotomeeting.com/install/790209349

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

Additional information regarding the AMNRP may be obtained by contacting Ben Davis at: 2145 S. 11th Avenue #170, Phoenix, AZ 85007 or (602) 506-2601. An electronic copy of the Final Draft AMNRP 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

3800 North Central Avenue | Suite 1400 | Phoenix, Arizona 85012

signed by the person, his agent, or his attorney. Written comments may be mailed to the Air Monitoring Division's address shown above or emailed to: ben.davis@maricopa.gov. All comments are due to the department by 5 p.m. Thursday, June 17, 2021.

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 medidas razonables para proveer acceso a los servicios del departamento para personas con capacidad limitada para hablar, escribir o entender Inglés y / o para las personas con discapacidad. Las solicitudes de servicios de interpretación del lenguaje o de alojamiento de discapacidad deben hacerse por lo menos 48 horas de antelación poniéndose en contacto con: (602) 506-6443.

Figure 24. 2020 Public Comment Period Announcement

Public Meeting Attendance

Attendance to the virtual open forum meeting was taken by Ceresa Stewart in lieu of a sign-in sheet, and, a list of attendees is shown on Table 27.

Table 27. 2020 Open Forum Meeting Attendees

ATTENDANCE SHEET			
NAME	AGENCY/COMPANY	EMAIL ADDRESS	PHONE
Ben Davis	MCAQD	Ben.davis@maricopa.gov	602-506-2601
Ceresa Stewart	MCAQD	Ceresa.stewart@maricopa.gov	602-506-2608
Ron Pope	MCAQD	Ron.pope@maricopa.gov	602-506-5697
Phil Mizell	ADEQ	mizell.philip@azdeq.gov	602-771-2359
Delbert Altaha	White Mountain Apache Tribe	daltaha@wmat.us	

Public Comments Received and MCAQD Responses

As stated in the announcement, the agenda for the open forum meeting is to provide an opportunity for members of the public and air monitoring community to discuss the County's air monitoring network. At the meeting, a summary of the 2020 network and NAAQS violations was presented followed by general discussion among attendees about monitoring operations and instrumentation. There were no comments submitted by the public this year.

APPENDIX VII - 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
AMNRP:	Air Monitoring Network Review and 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 CP.
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.
CP:	Criteria Pollutant, or the Central Phoenix site, depending upon context
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 98th 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 CP 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 CP, but in Maricopa County, most recent EEs have been related to high PM_{10} events.
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 CP 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 CP 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/m³:	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 AMD 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 CPs.
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:	Refers to the AMD QA section's audits on pollutant monitors. • For gaseous analyzers, the EPA requires that an Annual Performance Evaluation be performed on each analyzer at least once annually, e.g., as per *40 CFR Part 58, Appendix A, §3.2.2*., 25 percent of the monitors operating within each gaseous pollutant's network are evaluated quarterly; thereby, each monitor is evaluated once per year. • For PM and Pb monitors, e.g., analyzers and samplers, EPA requires that a Semi-Annual Flow Rate Audit be performed on each monitor at least twice annually, e.g., as per *40 CFR Part 58, Appendix A, §§3.2.4 and 3.3.4*, and *40 CFR Part 58, Appendix A, §3.4,* respectively.
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)*
RRNS:	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 AMD 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 CP 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:

a. 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

b. The amount of data in a file or database.