

Salt River Pima-Maricopa Indian Community (SRPMIC)



2013 Air Monitoring Network Review

April 2014

Community Development Department (CDD)
Environmental Protection & Natural Resources (EPNR)
10005 East Osborn Road
Scottsdale, AZ 85256

INTRODUCTION

The Salt River Pima-Maricopa Indian Community (Community) has developed an air-monitoring network for measuring ambient concentrations of criteria pollutants and associated meteorological parameters. The operation of these Tribal Monitoring Sites (TMS) follows the United States Environmental Protection Agency (USEPA) State and Local Air Monitoring Sites (SLAMS) guidance recommendations and documents. This Annual Air Monitoring Network Review for 2013 is being submitted by the SRPMIC Environmental Protection & Natural Resources (EPNR) to the United States Environmental Protection Agency (USEPA) Region 9 as outlined in 40 CFR Part 58.10. In addition, changes made to the network design and special projects conducted during 2013 and a 3-year data summary are included in this document.

AMBIENT MONITORING NETWORK

The purpose of the SRPMIC air-monitoring network is to measure ambient concentrations of the selected criteria pollutants at various locations across the Community. These data are used to assess health and welfare effects and determine pollution source both on and off the Community. The criteria pollutants measured are ozone (O₃), PM₁₀ and PM_{2.5}; the meteorological parameters include wind speed, wind direction, sigma theta, ambient temperature, delta temperature, and ambient pressure. The collection of these data began in 2002 and continues to date. Six monitoring objectives and five measuring scales were used to develop the monitoring network.

OBJECTIVES

- Determine the highest concentrations that occur in the area covered by the network;
- Determine the representative concentrations in areas of high population density;
- Determine general background concentrations levels;
- Determine the impact of significant sources or source categories on air quality;
- Determine the extent of regional pollutant transport from populated area, in relation to secondary standards; and
- Measure air pollution impacts on visibility, vegetation damage or other welfare-based impacts.

SCALES

Scale	Defined Parameter (radius)
Micro	0 to 100 meters
Middle	100 to 500 meters
Neighborhood	0.5 to 4 kilometer
Urban	4 to 50 kilometers
Regional	10 to 100s of kilometers

DESCRIPTION

Four monitoring sites were operated by the SRPMIC during 2013 at various locations and for various durations and purposes. The site name, abbreviation, AQS Code and monitoring scale are included in Table 1; the location of each site, including the longitude/latitude and major cross-streets is presented in Table 2; the criteria pollutants monitored and the type of network each site represents is presented in Table 3; and the site instrumentation is presented in Table 4. The location of the Community is presented in Figure 1; the monitoring locations within the SRPMIC are presented in Figure 2. Photographs of the sites and associated data summaries are included at the end of this report.

Table 1: SRP-MIC Ambient Monitoring Sites

Site Name	Site Abbreviation	AQS Code	SCALE
Senior Center	SC	04-013-7020	Neighborhood
Red Mountain	RM	04-013-7021	Urban
Lehi	LE	04-013-7022	Neighborhood
High School	HS	04-013-7024	Neighborhood

Table 2: Site Locations

Site	Latitude	Longitude	Location
SC	33° 29.294'	111° 51.339'	Osborn/Alma School Roads
RM	33° 30.475'	111° 45.277'	SR87/Arizona Canal
LE	33° 28.472'	111° 48.303'	Oak Street/Stapley Drive
HS	33° 30.483'	111° 50.268'	Chaparral Rd/Country Club Dr

Table 3: Criteria Pollutants Monitored by Site/Network

Site Name	O ₃	PM ₁₀	PM _{2.5}
Senior Center	SLAMS	SLAMS	SLAMS
Red Mountain	SLAMS		
Lehi	SLAMS	SLAMS	
High School	SLAMS	SLAMS	

Table 4: Site Instrumentation

Site ID	PM ₁₀	PM _{2.5}	Ozone	Wind System	Ambient Temp	Delta Temp	Ambient Pressure	Rain	Data Logger	Total
SC	2	2	1	1	1	1	1	1	1	11
RM			1	1	1		1		1	5
LE	1		1*	1	1		1	1	1	7
HS	1		1*						1	3
Total	4	2	4	3	3	1	3	2	4	26

* seasonal

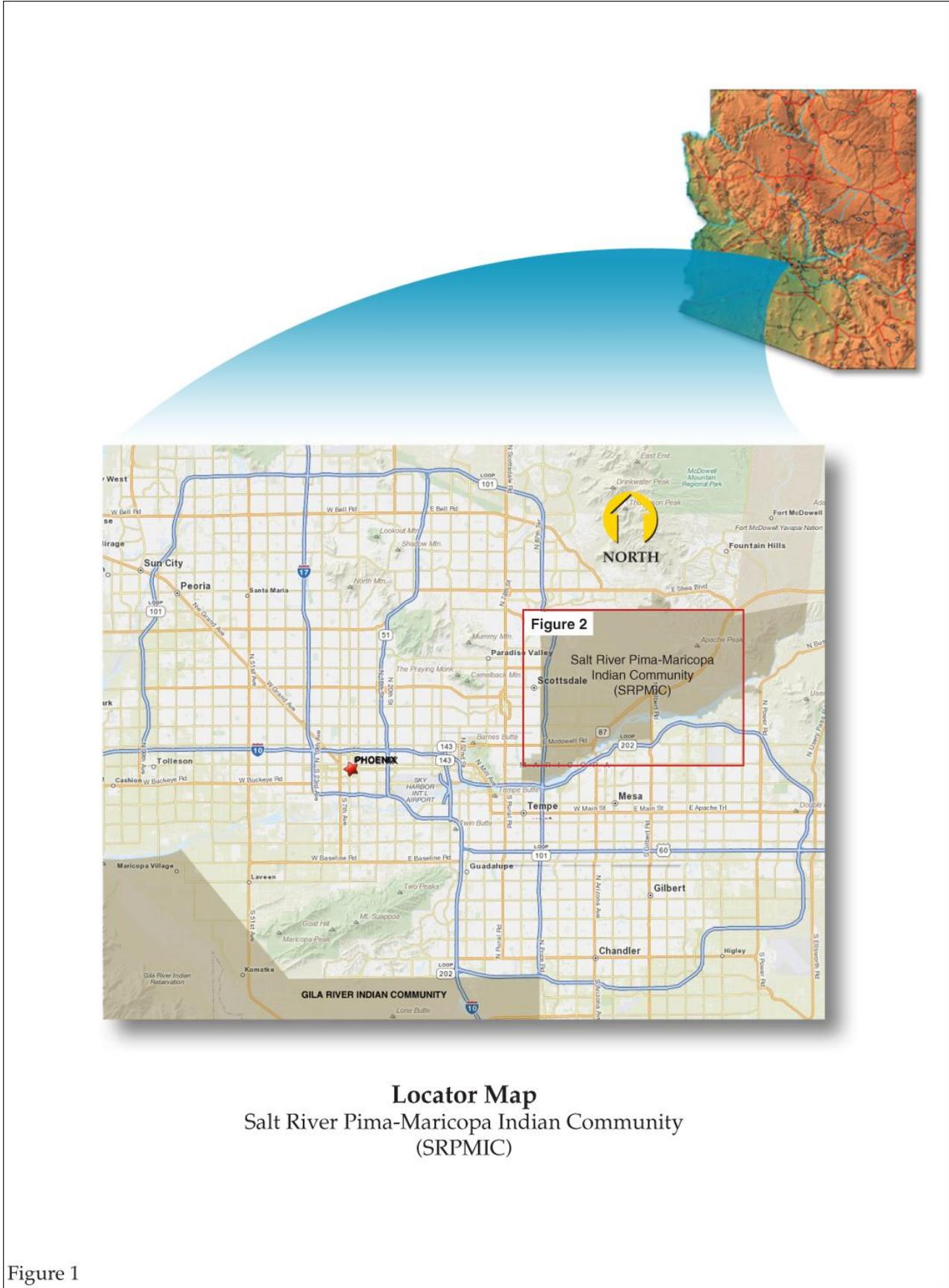
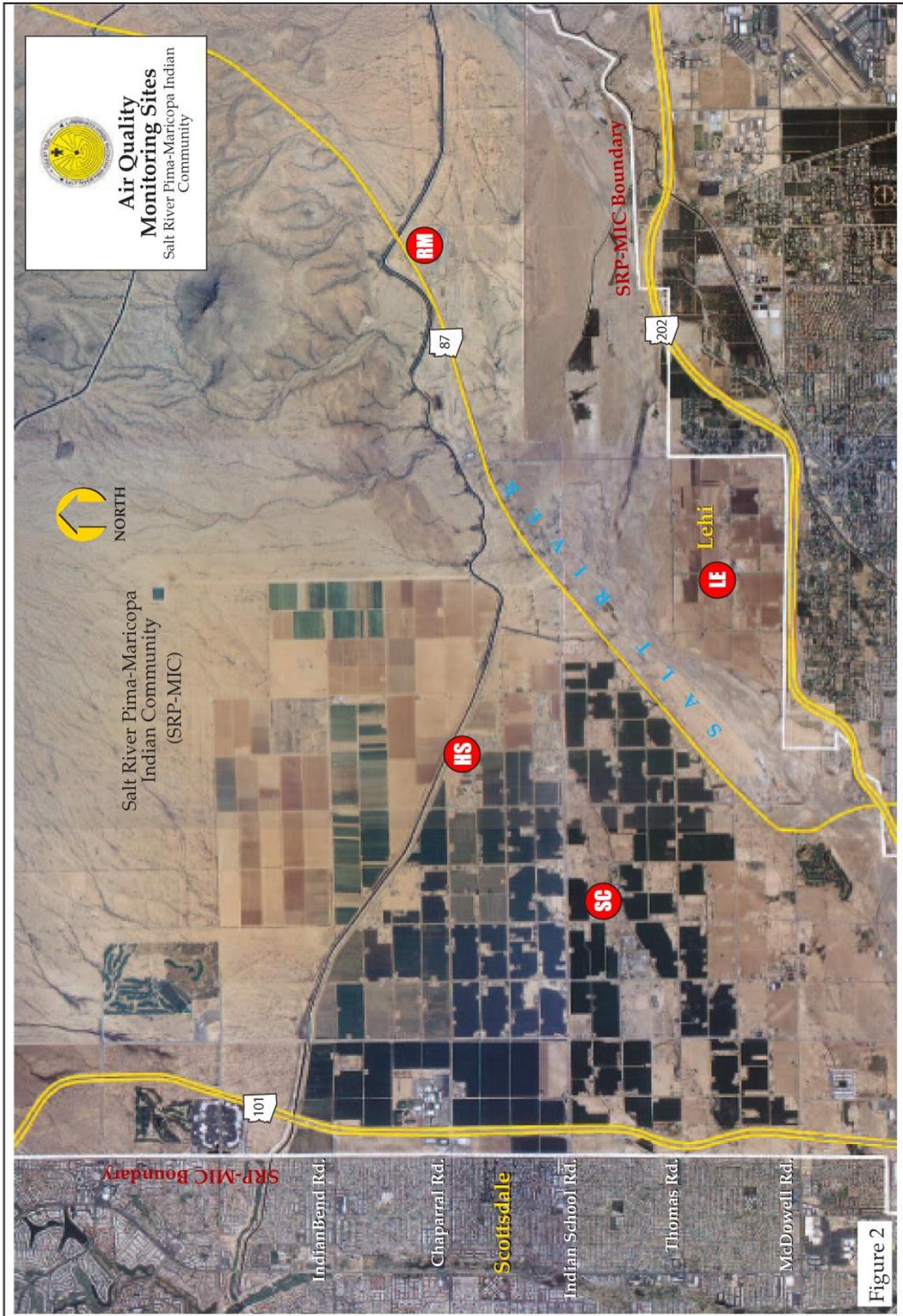


Figure 1



DATA SUMMARIES

CRITERIA POLLUTANTS

The Federal Clean Air Act of 1970 established National Ambient Air Quality Standards (NAAQS) for six pollutants. These pollutants, referred to as the “Criteria Pollutants”, include carbon monoxide (CO), nitrogen dioxide (NO₂), ozone (O₃), particulate matter (PM), sulfur dioxide (SO₂), and lead (Pb). Two Federal Standards exist for most of the criteria pollutants. The primary standard defines levels deemed “. . . necessary, with an adequate margin of safety, to protect the public health.” The secondary standard defines levels “. . . necessary to protect the public welfare . . .” (40 CFR Part 50). The promulgation of these standards, however, does not prohibit any State or Tribal Community from establishing air quality standards that are more stringent. The Federal Standards are also subject to periodic review and revision as deemed necessary by the Administrator of the Environment Protection Agency (EPA).

The SRPMIC monitors criteria pollutants at various locations across the Community; not all pollutants are monitored at all locations. During 2013 four locations were operated for the measurement of O₃, PM₁₀ and PM_{2.5}. The following discussion summarizes the SRPMIC network results in relation to the monitoring objectives of the State and Local Air Monitoring Stations (SLAMS).

Ozone (O₃)

During 2013, four ozone monitors operated at various locations during various intervals. Two locations operated continuously; and two operated seasonally during the year. Each location and operational period is listed in Table 5.

Table 5: Operational Schedule for Ozone

Site Name	Duration
Senior Center	January 1 - December 31
Red Mountain	January 1 - December 31
Lehi	April 1 - November 1
High School	April 1 - November 1

One-hour Average Concentrations

One-hour concentrations of ozone during 2013 were moderate; no exceedance of the former one-hour ozone standard was observed. A summary of the one-hour concentrations obtained at the four locations is presented in Table 6; the distribution of the one-hour concentrations is presented in Table 7.

Table 6: 1-Hour Summary

Site	Max. (ppm) Date Time	2 nd High (ppm) Date Time	3 rd High (ppm) Date Time	4 th High (ppm) Date Time	Number Of Exceedances	Number of Samples
RM	0.106 5/31 1700	0.090 6/28 1600	0.090 7/2 1400	0.089 7/8 1600	0	8721
SC	0.101 5/31 1600	0.090 7/2 1400	0.087 7/7 1300	0.087 6/28 1500	0	8683
LE	0.099 5/31 1700	0.092 7/2 1400	0.089 7/17 1600	0.087 6/28 1500	0	5042
HS	0.098 5/31 1600	0.089 7/2 1400	0.083 6/28 1500	0.083 7/8 1500	0	5060

Table 7: Distributions

Interval:	Number of 1-Hour Average Values (ppm)							
	0.000 to 0.040	0.041 to 0.080	0.081 to 0.120	0.121 to 0.160	0.161 to 0.200	0.201 to 0.240	0.241 to 0.280	>0.280
Site								
RM	5497	3188	36	0	0	0	0	0
SC	5783	2874	26	0	0	0	0	0
LE	2728	2283	31	0	0	0	0	0
HS	2997	2048	15	0	0	0	0	0

Eight-hour Average Concentrations

Eight-hour average concentrations of ozone were moderate to high. There were eight exceedances of the eight-hour ozone standard and one violation of the standard. A summary of the eight-hour concentrations is presented in Table 8; the distribution of the concentrations is presented in Table 9.

Table 8: Eight-Hour Summary

Site	Max. (ppm) Date Time*	2 nd High (ppm) Date Time*	3 rd High (ppm) Date Time*	4 th High (ppm) Date Time*	Number Of Exceedances	Number of Samples
RM	0.079 5/31 1200	0.078 7/8 1100	0.078 7/17 1000	0.075 6/28 1200	3	8760
SC	0.077 5/31 1200	0.076 7/8 1000	0.075 7/17 1000	0.074 7/2 1000	2	8715
LE	0.080 7/17 1000	0.078 5/31 1200	0.076 7/8 1000	0.075 7/2 1000	3	5054
HS	0.075 7/2 1000	0.075 7/8 1000	0.075 5/31 1100	0.074 6/1 1100	0	5064

*Time - Time is beginning hour (Mountain Standard Time)

Table 9: Distribution

Interval:	Number of Eight-Hour Average Values (ppm)							
	0.000 to 0.030	0.031 to 0.060	0.061 to 0.075	0.076 to 0.095	0.096 to 0.115	0.116 to 0.135	0.136 to 0.155	>0.155
Site								
RM	3026	5370	354	10	0	0	0	0
SC	3988	4481	242	4	0	0	0	0
LE	1505	3251	289	9	0	0	0	0
HS	1807	3098	159	0	0	0	0	0

Particulate Matter (PM₁₀)

During 2013, PM₁₀ samplers operated at two locations on a 1 in 6 day schedule throughout the year; one location operated continuously throughout the year. Each location and operational period is listed in Table 10.

Table 10: Operational Schedule for PM₁₀

Site Name	Duration
Senior Center (6-day schedule)	January 1 - December 31
Lehi Fire (6-day schedule)	January 1 - December 31
High School (continuous)	January 1 - December 31

One-hour Average Concentrations

During 2013, a continuous PM₁₀ sampler operated at the High School. A summary of the hourly average concentrations and distribution are provided in Tables 11 and 12, respectively. One-hour average concentrations of PM₁₀ generally were low. Negative and extremely high outliers did occur, although approximately 80% of the values were less than 50 µg/m³ and approximately 97% were less than 150 µg/m³.

Table 11: One-Hour Average PM₁₀ Concentration Summary

Site	Max. (ug/m ³) Date	2 nd High (ug/m ³) Date	Min. (ug/m ³) Date	Annual Average (ug/m ³)	Number of Samples	% Recovery
HS	1062.4 7/12	1038.6 8/20	-9.9 5/9	38.0	8665	98.9

Table 12: One-Hour Average PM₁₀ Concentration Distribution

Interval:	Number of One-hour Average Concentrations (ug/m ³)								
	<0	0 to 50	51 to 100	101 to 150	151 to 250	251 to 500	501 to 750	751 to 1000	>1000
Site									
HS	89	6802	1259	286	162	50	11	4	2

Twenty-Four Hour Average Concentrations

Twenty-four hour average concentrations of PM₁₀ were generally low during 2013. There was one exceedance of the 24-hour standard which the SRPMIC has identified as an exceptional event caused by high winds; one site was in violation of the twenty-four hour standard. A summary of the 24-hour average concentrations is presented in Table 13; the distribution of the concentrations is presented in Table 14.

Table 13: Twenty-Four Hour Average PM₁₀ Concentration Summary

Site	Max. (ug/m ³) Date	2 nd High (ug/m ³) Date	Number of Exceedances	Annual Average (ug/m ³)	Number of Samples
SC - P ^{ac}	113 8/20	70 5/4	0	34.5	60
SC - C ^{bc}	111 8/20	69 5/4	0	34.2	61
LE ^c	69 5/4	66 8/20	0	28.2	59
HS ^d	221 4/8	120 5/3	1	38.0	365

^aPrimary Sampler

^bCollocated Sampler

^cFilter-based (6-day schedule)

^dContinuous (TEOM)

Table 14: Twenty-Four Hour Average PM₁₀ Concentration Distributions

Interval:	Number of Twenty-Four Hour Average Concentrations (ug/m ³)								
	0 to 25	26 to 50	51 to 75	76 to 100	101 to 125	126 to 150	151 to 175	176 to 200	>200
Site									
SC - P ^{ac}	18	34	7	0	1	0	0	0	0
SC - C ^{bc}	19	34	7	0	1	0	0	0	0
LE ^c	27	27	5	0	0	0	0	0	0
HS ^d	118	150	80	12	4	0	0	0	1

^aPrimary Sampler

^bCollocated Sampler

^cFilter-based (6-day schedule)

^dContinuous (TEOM)

Particulate Matter (PM_{2.5})

During 2013, PM_{2.5} samplers operated at one location; the operational period is listed in Table 15.

Table 15: Operational Schedule for PM_{2.5}

Site Name	Duration
Senior Center (6-day schedule)	January 1- December 31

Twenty-four hour average concentrations of PM_{2.5} were low during 2013. There was no exceedance or violation of the 24-hour or annual standards during 2013. A summary of the 24-hour average concentrations is presented in Table 16 for those concentrations obtained on a 6-day schedule; the distributions of the concentrations for the corresponding schedules are presented in Table 17.

Table 16: Twenty-Four Hour Average PM_{2.5} Concentration Summary

6-Day Schedule

Site	Max. (ug/m ³) Date	2 nd High (ug/m ³) Date	Number of Exceedances	98 th Percentile Value	Annual Average (ug/m ³)	Number of Samples
SC - P ^a	12.8 11/30	10.5 2/3	0	10.1	5.3	61
SC - C ^b	13.0 11/30	10.6 2/3	0	10.6	5.2	52

^aPrimary Sampler

^bCollocated Sampler

Table 17: 24-Hour Average Concentration PM_{2.5} Distributions

6-Day Schedule

Number of 24-Hour Average Concentrations (ug/m³)

Interval:	0 to 15	16 to 30	31 to 50	51 to 70	71 to 90	91 to 110	>110
Site							
SC - P ^a	61	0	0	0	0	0	0
SC - C ^b	52	0	0	0	0	0	0

^aPrimary Sampler

^bCollocated Sampler

DATA COMPLETENESS

A summary of the annual data completeness for the criteria pollutants monitored during 2013 is presented in Tables 18-20. These tables represent the number of samples collected during each site's operation versus the number of scheduled samples during each site's operation.

Table 18: Ozone (O₃)

Interval Site	Number of Actual Samples	Number of Scheduled Samples	Data Completeness (Actual/Scheduled)
<u>One-Hour</u>			
RM	8721	8760	99.6%
SC	8683	8760	99.1%
LE*	5042	5160	97.7%
HS*	5060	5160	98.1%
<u>Eight-Hour</u>			
RM	8760	8760	100.0%
SC	8715	8760	99.5%
LE*	5054	5160	97.9%
HS*	5064	5160	98.1%
TOTAL	55099	55680	99.0%

* Seasonal

Table 19: Particulate Matter (PM)

PM₁₀ Interval Site	Number of Actual Samples	Number of Scheduled Samples	Data Completeness (Actual/Scheduled)
<u>1 in 6 days</u>			
SC - P ^{ac}	60	61	98.4%
SC - C ^{bc}	61	61	100.0%
LE ^c	59	61	96.7%
<u>Continuous</u>			
HS ^d	365	365	100.0%
TOTAL PM₁₀	545	548	99.4%
PM_{2.5} Interval Site			
<u>1 in 6 days</u>			
SC - P ^a	61	61	100.0%
SC - C ^b	52	61	85.2%
TOTAL PM_{2.5}	113	122	92.6%

^aPrimary Sampler

^bCollocated Sampler

^cFilter-based (6-day schedule)

^dContinuous (TEOM)

Table 20: Data Completeness Summary

Pollutant	Number of Actual Samples	Number of Scheduled Samples	Data Completeness (Actual/Scheduled)
Ozone	55099	55680	99.0%
PM₁₀	545	548	99.4%
PM_{2.5}	113	122	92.6%
TOTAL	55757	56350	98.9%

EXCEEDANCE OF THE NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS)

Included in Table 21 is a summary of exceedances of the NAAQS during 2013.

Table 21: 2013 NAAQS Exceedances

Pollutant	Interval	Site	Concentration	Date
Ozone	1-Hour	None	-	-
	8-Hour	RM	0.079	5/31
			0.078	7/8
			0.078	7/17
		SC	0.077	5/31
			0.076	7/8
		LE	0.080	7/17
			0.078	5/31
			0.076	7/8
		HS	-	-
PM₁₀	24-Hour	SC	-	-
		LE	-	-
		HS	221	4/8
	Annual	None	-	-
PM_{2.5}	24-Hour	None	-	-
	Annual	None	-	-

VIOLATIONS OF THE NATIONAL AMBIENT AIR QUALITY STANDARDS

Ozone (O₃)

Table 22: Violations of the 8-hour Ozone Standard

Site	2011 4 th High (ppm)	2012 4 th High (ppm)	2013 4 th High (ppm)	3-Year Average of 4 th High (ppm)
RM	0.079	0.077	0.075	0.077
SC	0.075	0.076	0.074	0.075
LE	0.076	0.075	0.075	0.075
HS	0.075	0.074	0.074	0.074

Particulates - PM₁₀

Table 23: Violations of the Twenty-Four Hour PM₁₀ Standard

Site	2011		2012		2013		Rate of Expected Exceedances
	24-Hr Max (ug/m ³)	Expected Exceedances	24-Hr Max (ug/m ³)	Expected Exceedances	24-Hr Max (ug/m ³)	Expected Exceedances	
SC-P ^{ac}	163	5.8	126	0	113	0	1.9
SC-C ^{bc}	163	5.8	122	0	111	0	1.9
LE ^c	167	6.1	150	0	69	0	2.0
HS ^d	NA	NA	90 ^e	-	221 ^f	1.0	-

Table 24: Violations the Annual PM₁₀ Standard

Site	2011 Annual Average (ug/m ³)	2012 Annual Average (ug/m ³)	2013 Annual Average (ug/m ³)	Three-Year Average (ug/m ³)
SC-P ^{ac}	32.5	43.5	34.5	36.8
SC-C ^{bc}	33.6	43.5	34.2	37.1
LE ^c	31.1	36.1	28.2	31.8
HS ^d	NA	40.0 ^e	38.0	-

^aPrimary Sampler

^bCollocated Sampler

^cFilter-based (6-day schedule)

^dContinuous (TEOM)

^e<75% data

^fData submitted to AQS as high winds pursuant to Exceptional Event

NA-Not Applicable

Particulates – PM_{2.5}

Table 25: Violations of the Twenty-Four Hour PM_{2.5} Standard

Site	2011 Annual 98 th Percentile (ug/m ³)	2012 Annual 98 th Percentile (ug/m ³)	2013 Annual 98 th Percentile (ug/m ³)	Three-Year Average 98 th Percentile (ug/m ³)
SC-P ^a	10.8	12.1	10.1	11.0

Table 26: Violations the Annual PM_{2.5} Standard

Site	2011 Annual Average (ug/m ³)	2012 Annual Average (ug/m ³)	2013 Annual Average (ug/m ³)	Three-Year Average (ug/m ³)
SC-P ^a	5.0	6.6	5.3	5.6

^aPrimary Sampler

NETWORK INFORMATION

The following is a list of information on network activities that occurred during 2013.

Season Monitors:

- Ozone seasonal monitoring was operated at Lehi (LE) and High School (HS) site April 1, 2013 and November 1, 2013.

Network Information:

- Salt River High School maintenance yard gravel road was asphalt paved on February 7 – 8, 2013 that gravel road began used more frequent that potentially start emits dust. High School air monitoring station is located in the maintenance building.
- The telecommunication for data collection was transitioned to wireless network at Red Mountain Air Monitoring Station in February 20, 2013.
- Commenced air quality FTP data submission of hourly PM₁₀ continuous data from High School to AIRNow data center on July 30, 2013. Presently, the ozone and PM₁₀ data are submitted to AIRNow data center hourly. The hourly ozone data from Senior Center, Red Mountain, Lehi and High School air stations began submission in 2007.
- Changed ozone concentration range on quality control checks (One Point QC Checks) at all four air monitoring sites from .090 ppm to .070 ppm beginning November 2013 in reference

to monitoring network for quality assurance requirement for SLAMS 40 CFR Part 58 Appendix A Section 3.2.1, that selected concentration should relates to routine concentrations normally measured within the monitoring network.

- An independent auditor conducts Quarterly Audit. Criteria pollutant ozone, PM₁₀ and PM_{2.5} are audit quarterly and all meteorological parameters are done twice annually.
- The program established and distributes public outreach information of air quality advisories through SRPMIC website, Digital Signage Display information at major departments for high pollution and health watch advisory, and operates a program of air quality flag communication network by changing color flags based on daily air quality conditions that matches air quality index (AQI) colors.
- Plans to exchange ozone monitor Teledyne 400E to Teledyne Model T400 at Lehi air monitoring station in 2014.
- Plans to exchange PM₁₀ Partisol 2000 FRM 6-Day sampler to continuous PM₁₀ Thermo 1405 monitor at Lehi air monitoring station in 2014.

EPA Audits

- EPA PM_{2.5} PEP Audits were conducted: February 21, 2013, April 16, 22, 28, 2013, July 21, 2013 and October 31, 2013 all at Senior Center Air Monitoring Station.
- EPA Ozone Through-the-Probe Audit was conducted at High School Air Monitoring Station in April 16, 2013.

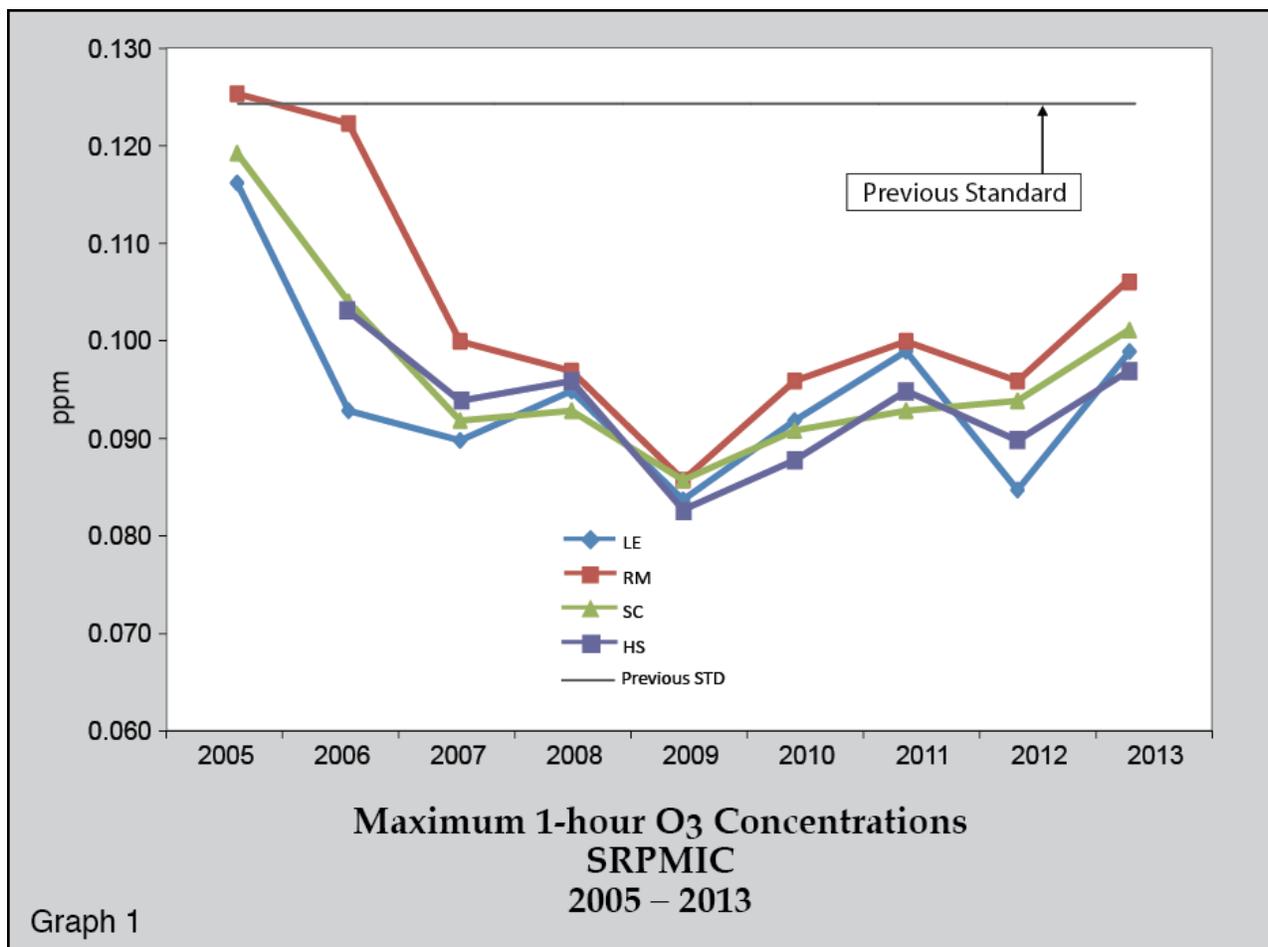
TRENDS

The air quality in the Phoenix Metropolitan Area is generally improving despite the tremendous growth experienced in the region. Since monitoring began in the 1960s, ambient concentrations for most of the criteria pollutants have been reduced to below the NAAQS. Graphs of the trends seen in those criteria pollutants that are monitored on the SRPMIC are illustrated in Graphs 1 through 7.

Ozone (O₃)

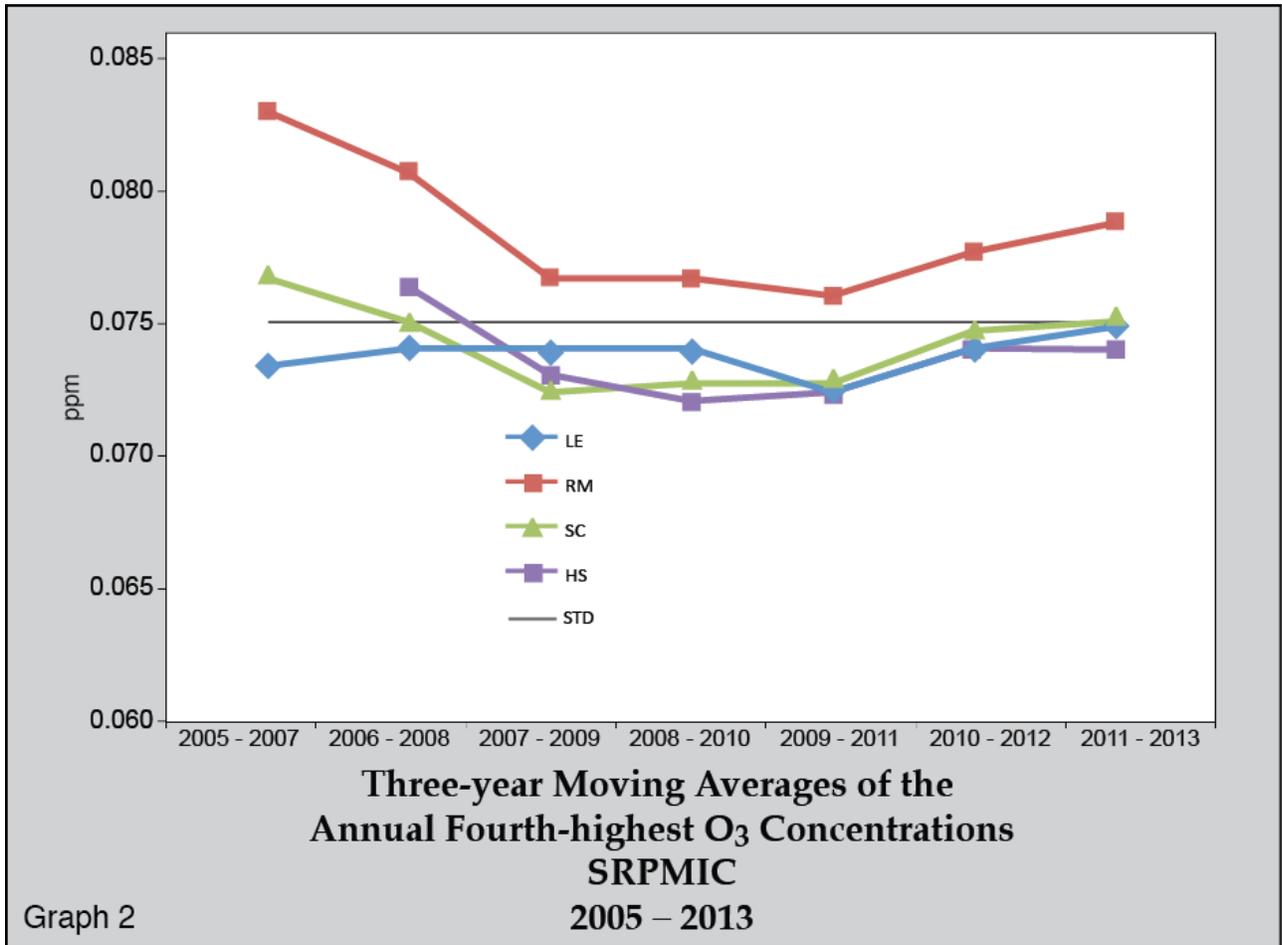
One-Hour Concentrations

Maximum 1-hour concentrations of O₃ at the SRPMIC monitoring locations have shown a large decline during 2005 to 2009, a small increase occurring during 2010-2011, and a decline at all but the Senior Center (SC) location during 2012; increases were seen at all sites during 2013. Between 2005 and 2013, maximum concentrations decreased approximately 20%. A graph of the maximum one-hour concentrations is provided in Graph 1.



Eight-Hour Concentrations

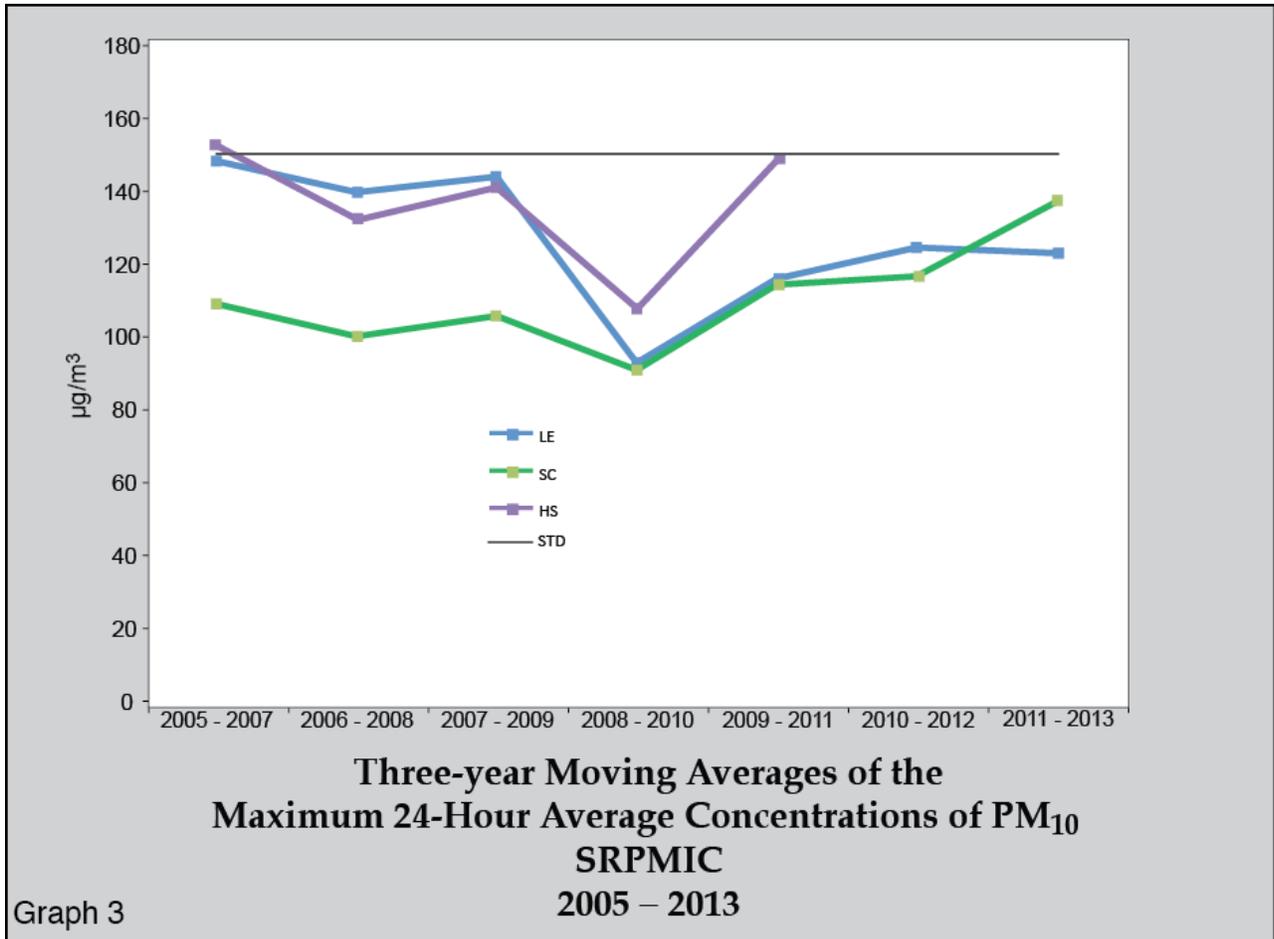
Eight-hour average concentrations of O₃ at the SRPMIC monitoring locations reflect the trend seen in the 1-hour concentrations. The three-year moving averages of the fourth-highest 8-hour concentration at the four locations are illustrated in Graph 2. With the exception of the Lehi (LE) location, the trend in the concentrations has been relatively similar among the locations.



Particulate Matter (PM₁₀)

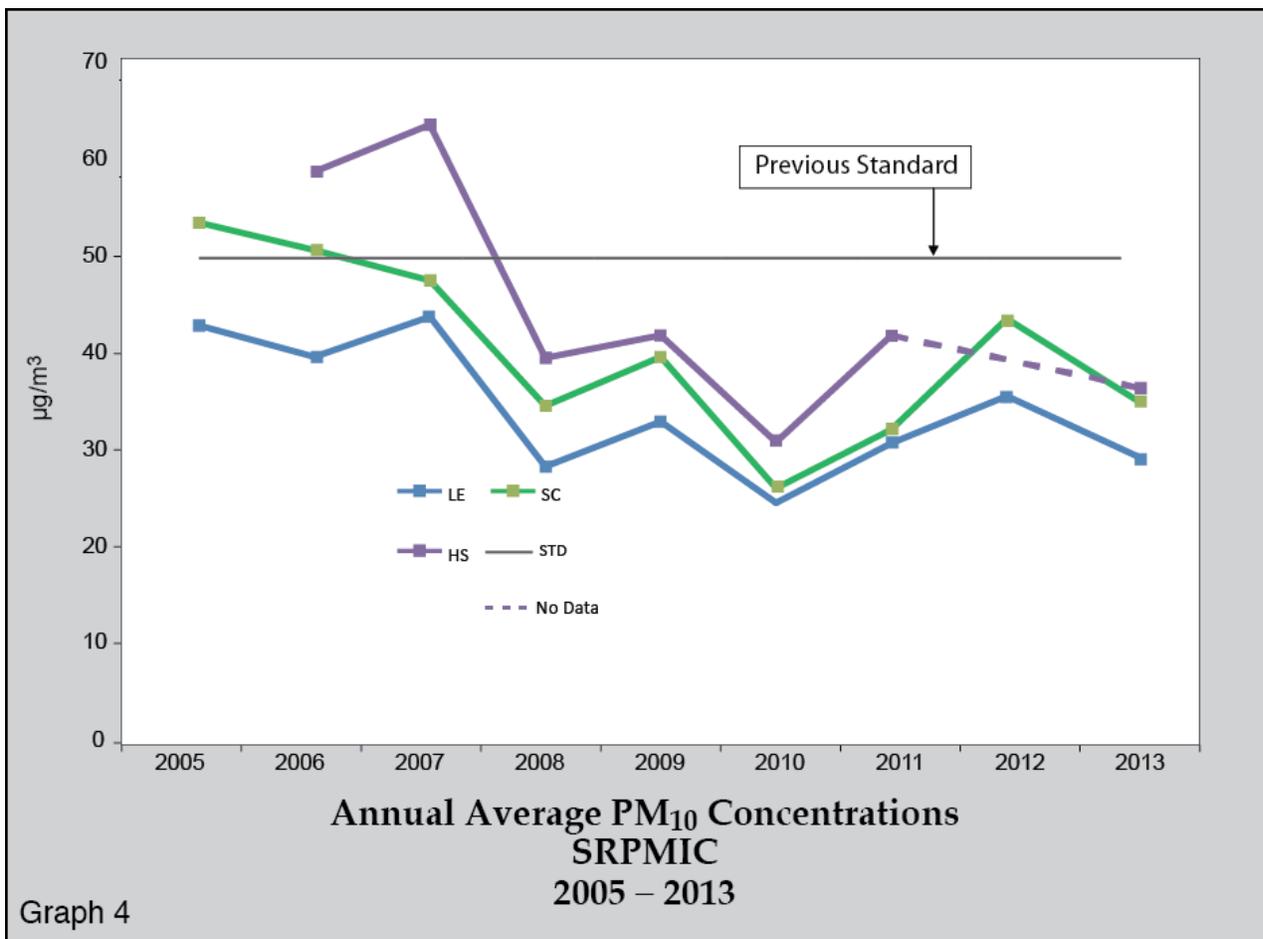
Twenty-Four Hour Concentrations

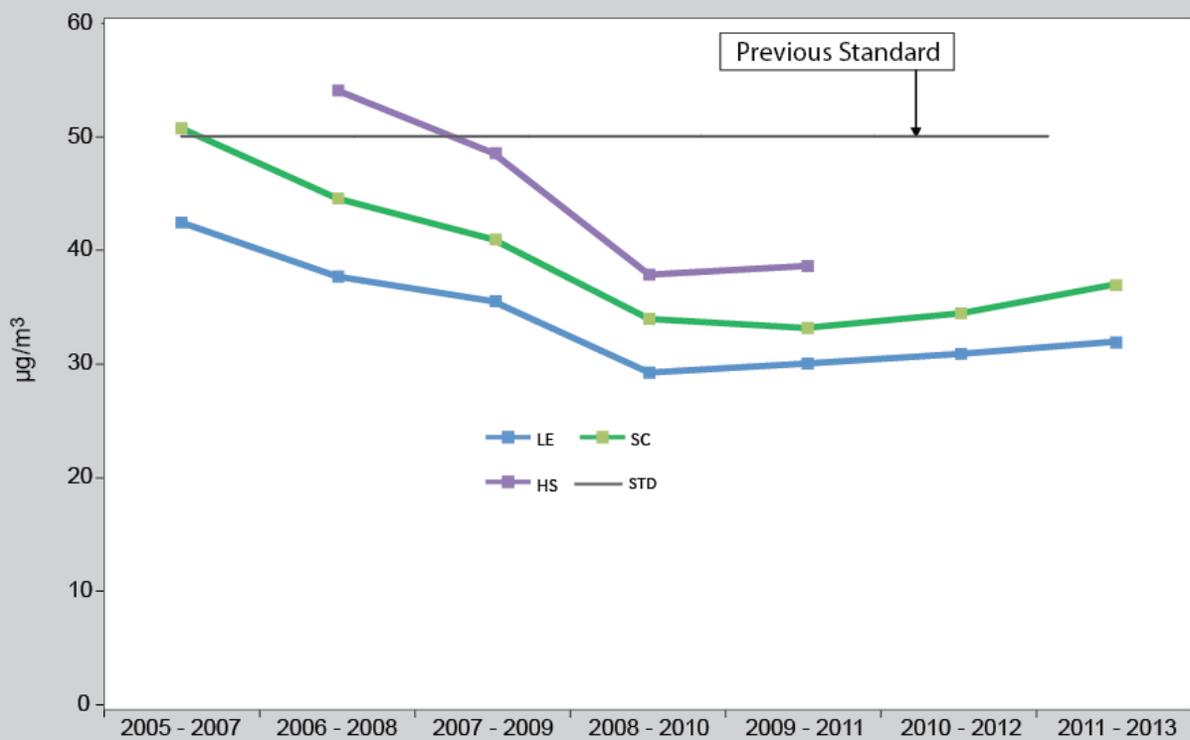
Maximum twenty-four hour average concentrations of PM₁₀ at the three monitoring locations have remained below the standard since 2006. A sharp decline occurred during 2008-2010, followed by a steady increase through 2013. A graph of the trend is provided in Graph 3.



Annual Concentrations

Annual average concentrations of PM₁₀ at the SRPMIC locations have shown a general decline between 2005 and 2013, with increases during 2011 and 2012. There has been no exceedance of the previous annual standard since 2008; a graph is presented in Graph 4. A graph of the three-year moving averages of the annual PM₁₀ concentrations is provided in Graph 5. Data recovery at the High School (HS) location was less than 75% during 2012, therefore, data for 2012 were not included in Graphs 4 and for 5.





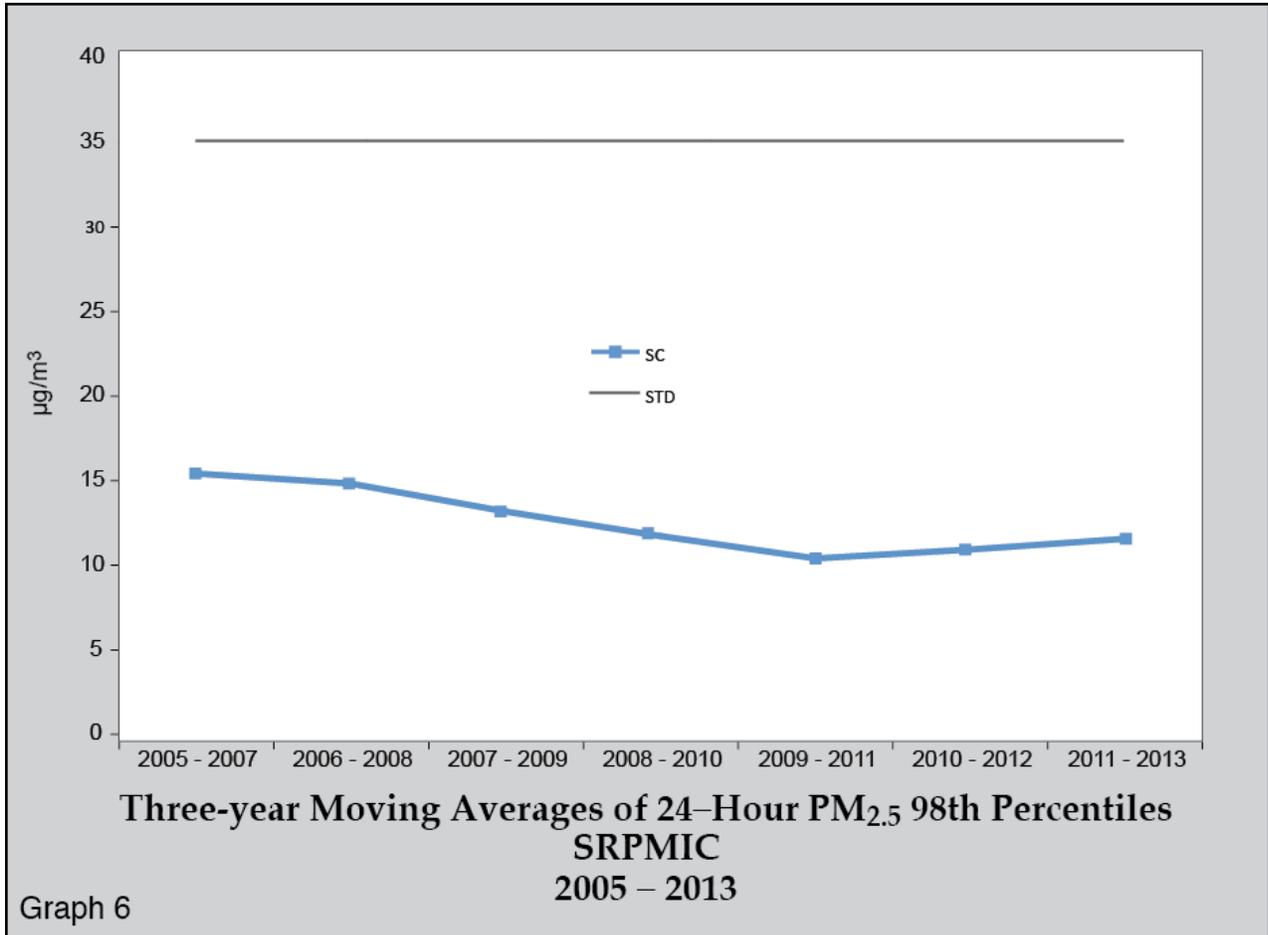
**Three-year Moving Averages of Annual PM₁₀ Concentrations
SRPMIC
2005 – 2013**

Graph 5

Particulate Matter (PM_{2.5})

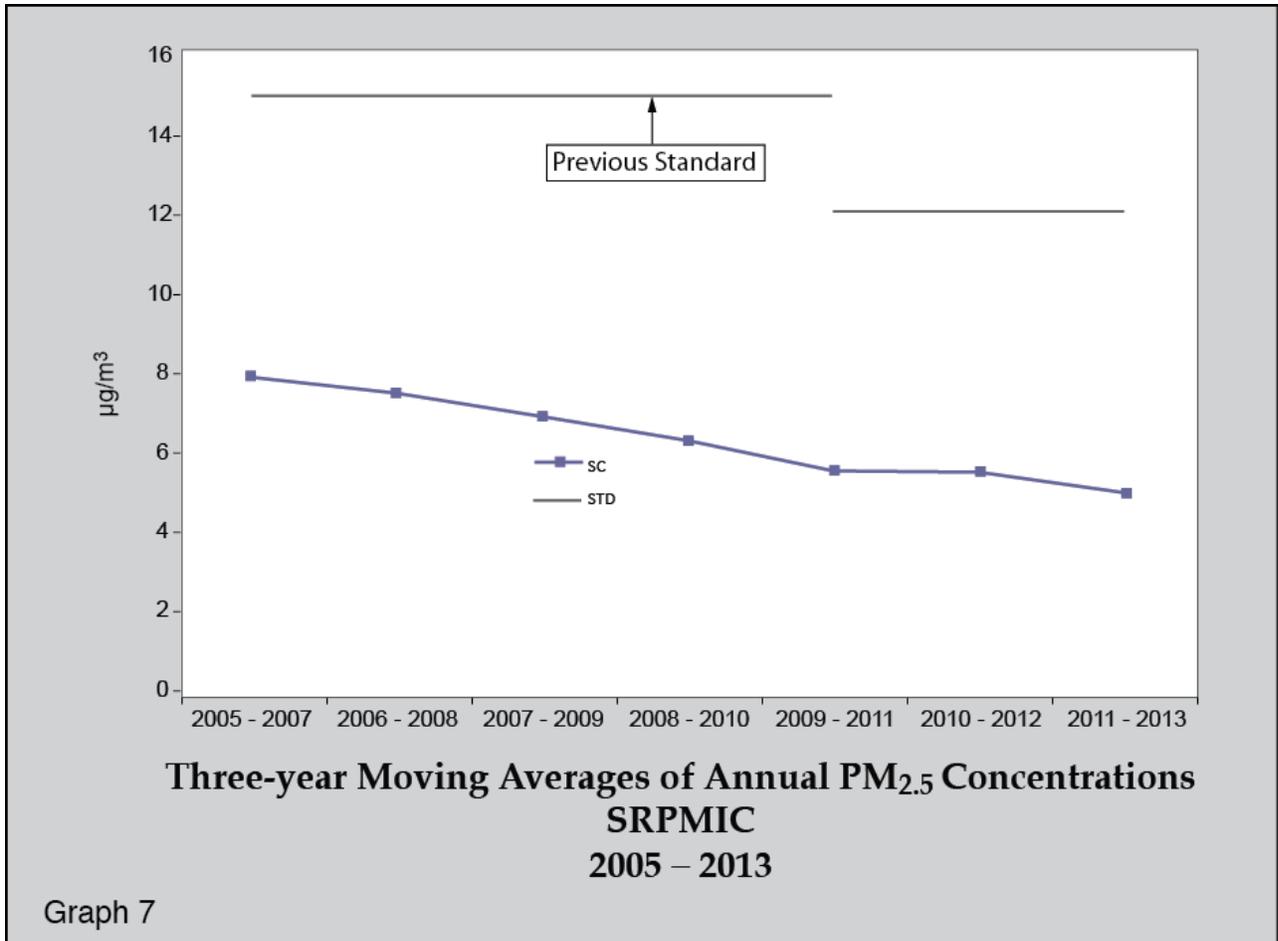
98th Percentiles

Concentrations of PM_{2.5} are well below the standard. A graph of the three-year moving averages of the 98th percentile of the 24-hour average concentrations is provided in Graph 6. Data collected during 2007 was included in the moving averages although data recovery for that year was less than 75%.



Annual Concentrations

Annual average concentrations of PM_{2.5} at the SRPMIC locations have shown a general decline since 2005, although a slight increase occurred during 2012. A graph of the three-year moving averages of the annual PM_{2.5} concentrations is provided in Graph 7. Data collected during 2007 was included in the moving averages although data recovery for that year was less than 75%.



SITE DESCRIPTIONS

Senior Center (SC)



Senior Center Air Monitoring Station

Location: 10844 East Osborn Road, Scottsdale, AZ 85256

Scale of Representative: Neighborhood Scale

Monitoring Objective: High Pollution Exposure

EPA Site ID: 04 013 7020

Site Description: The Senior Center (SC) site was relocated from the Desert Eagle Secondary School air station that began operations in October 2004 and the site was renovated in March to April 2012 with new monitoring shelter, upgraded electrical connections and new meteorological tower. The site is located just west of the Senior Service Center at the northeast section of Osborn Road and Alma School Road approximate less than half mile from Two Waters Administration Tribal Complex. The site is situated in the midst of neighborhood homes with agricultural fields to the south and sparse open fields to the north.

The criteria pollutants of ozone and particulate matters of PM_{10} and the $PM_{2.5}$ are monitored at this station. The network design for the PM_{10} and $PM_{2.5}$ monitoring is established as primary and collocated sample measurement. The meteorological parameter of wind speed, wind direction, atmospheric pressure, relative humidity, precipitation, ambient temperature and the delta temperature measurement are also monitored at this site. The data acquisition network of hourly data reports is in-house along with the ozone calibration monitors.

Senior Center (SC)

Parameter	Instrument #1	Instrument #2 and #3	Instrument #4 and #5	Instrument #6	Instrument #7	Instrument #8	Instrument #9	Instrument #10
Pollutant Type	Ozone	PM ₁₀ Primary/ Collocated	PM _{2.5} Primary/ Collocated	Wind Monitor	Temperature/ Relative Humidity	Pressure	Precipitation	Differential Temperature
Date Established	Oct 2004	May 2004	May 2004	Jan 2005	Jan 2005	Jan 2005	Jan 2005	Sep 2012
Sampler Make/Model	Thermo 49C / 49i (2-10-11)	(both) R&P FRM 2000	(both) R&P FRM 2000	RM Young 05305 AQ	RM Young 41382/41382VF	RM Young 61202V / 61302V	Climatronics 525	RM Young 41342VF
Classification	SLAMS	SLAMS	SLAMS	n/a	n/a	n/a	n/a	n/a
Scale	Neighborhood	Neighborhood	Neighborhood	n/a	n/a	n/a	n/a	n/a
Objective	Population /Transport	Population / Transport	Population / Transport	n/a	n/a	n/a	n/a	n/a
Inlet Height	4.2 meters	3.2 meters	3.2 meters	10.3 meters	2.4 meters	2.3 meters	3 meters	10 meters / 2.4 meters
Distant from Tree Dripline	13.2 meters	15.6 meter	18 meters	14.6 meters	14.6 meters	14.6 meters	19 meters	12.6 meters
Obstacle Description	Shelter	Platform	Platform	Tower	Tower	Tower	Tower	Tower
Airflow Arch	360	360	360	360	360	360	360	360
Nearest Road	Osborn Road	Osborn Road	Osborn Road	Osborn Road	Osborn Road	Osborn Road	Osborn Road	Osborn Road
Distant / Direction to Road	32.3 meters / South	22.3 & 24.3 meters / South	22.3 & 24.3 meters / South	32.9 meters / South	32.9 meters / South	35 meters / South	24.5 meters / South	32.9 meters / South
Distant between Collocated Samplers	n/a	2 meters	2 meters	n/a	n/a	n/a	n/a	n/a
Schedule	Continuou s	1 in 6 Days	1 in 6 Days	Continuous	Continuous	Continuou s	Continuous	Continuous
Probe Material	Stainless Steel	n/a	n/a	n/a	RTD / Intercap	n/a	Tipping Bucket	RTD
Residence Time	< 20 seconds	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Surround Area	Residential	Residential	Residential	Residential	Residential	Residential	Residential	Residential
Site Ground cover	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel	Gravel
Frequency of QC check	Bi-weekly	Bi-weekly	Bi-weekly	n/a	n/a	n/a	n/a	n/a
Frequency of flow verification	n/a	Monthly	Monthly	n/a	n/a	n/a	n/a	n/a
Frequency of audit	Quarterly	Quarterly	Quarterly	Twice Annually	Twice Annually	Twice Annually	n/a	Twice Annually

Red Mountain (RM)



Red Mountain Air Monitoring Station

Location: 15115 Beeline Highway, Scottsdale, AZ 85256

Scale of Representative: Urban and Regional Scale

Monitoring Objective: High Downwind Concentrations

EPA Site ID: 04 013 7021

Site Description: The monitoring site is located south of old Red Mountain Trap & Sheet building. The Trap and Skeet facility was closed with all the buildings removed that used to provide the RV hookups and with a full capacity during the winter months. A large portion of the area is open range populated with creosote scrubs and desert plants and it is approximately 1 mile southeast of State Highway 87 Beeline Highway. The monitoring station was established in the summer of 2002 and immediately began monitoring. In May 2010 the monitoring station was upgraded with new monitoring shelter, new meteorological tower and revamped the electrical connection.

The criteria pollutant ozone is monitored at this site to represent urban and regional scale. The meteorological system of wind speed, wind direction, atmospheric pressure, ambient temperature and relative humidity are also monitored at this station. The data acquisition instrument of hourly data reports is in-house along with the ozone monitor calibration system.

Red Mountain (RM)

Parameter	Instrument #1	Instrument #2	Instrument #3	Instrument #4
Pollutant Type	Ozone	Wind Monitor	Temperature / Relative Humidity	Pressure
Date Established	May 2002 / Jan 2012	April 2002	April 2002	May 2003
Sampler Make/Model	Thermo 49C / Thermo 49i	RM Young 05305 AQ	RM Young 41382	RM Young 61202V
Classification	SLAMS	n/a	n/a	n/a
Scale	Urban / Regional	n/a	n/a	n/a
Objective	Downwind / Transport	n/a	n/a	n/a
Inlet Height	4.1 meters	10.3 meters	2.6 meters	2.5 meters
Distant from Tree Dripline	none	none	none	none
Obstacle Description	Shelter	Tower	Tower	Tower
Airflow Arch	360	360	360	180
Nearest Road	Beeline Highway	Beeline Highway	Beeline Highway	Beeline Highway
Distant / Direction to Road	1 mile / North	1 mile / North	1 mile / North	1 mile / North
Schedule	Continuous	Continuous	Continuous	Continuous
Probe Material	Stainless Steel	n/a	n/a	n/a
Residence Time	< 20 seconds	n/a	n/a	n/a
Surrounding Area	Trap & Skeet / Desert	Trap & Skeet / Desert	Trap & Skeet / Desert	
Site Groundcover	Gravel	Gravel	Gravel	Gravel
Frequency of QC check	Bi-weekly	n/a	n/a	n/a
Frequency of flow verification	n/a	n/a	n/a	n/a
Frequency of audit	Quarterly	Twice-annually	Twice-annually	Twice-annually

Lehi (LE)



Lehi Air Monitoring Station

Location: 3250 North Stapley Drive, Mesa, AZ 85203

Scale of Representative: Neighborhood Scale

Monitoring Objective: High Pollution Exposure

EPA Site ID: 04 013 7022

Site Description: The Lehi monitoring site was situated primarily as ozone saturation studies during the summer months then developed into a monitoring station in January 2005. Community developed areas such as Lehi Community Recreation Building is diagonally across the intersection. The monitoring site is inside the Police/Fire Substation building and also located on the roof for PM and meteorological monitoring. The site is bordered on the north and east by agricultural field, on the west by neighborhood homes, a Booster Pump Facility adjacently north and the Community Recreation directly south.

The SRPMIC monitors the ambient air quality particulate matter (PM₁₀) from this site and also monitors the meteorological system of wind speed, wind direction, relative humidity, barometric pressure, precipitation and ambient temperature along with data acquisition system. The criteria pollutant ozone is monitored here as seasonal monitoring from April 1 to November 1 annually.

Lehi (LE)

Parameter	Instrument #1	Instrument #2	Instrument #3	Instrument #4	Instrument #5	Instrument #6
Pollutant Type	Ozone	PM ₁₀	Wind Monitor	Temperature / RH	Pressure	Precipitation
Date Established	June 2004	January 2005	Dec 2005	Dec 2005	Dec 2005	Dec 2005
Sampler Make/Model	Teledyne 400E	R&P FRM 2000	RM Young 05305 AQ	RM Young 41382	RM Young 61202V	RM Young 52260
Classification	SLAMS	SLAMS	n/a	n/a	n/a	n/a
Scale	Neighborhood	Neighborhood	n/a	n/a	n/a	n/a
Objective	Population / Transport	Population / Transport	n/a	n/a	n/a	n/a
Inlet Height	6.7 meters	6.4 meters	9.5 meters	5 meters	5.1 meters	5.6 meters
Distant from Tree Dripline	10.4 meters	20 meters	12 meters	8 meters	10 meters	10 meters
Obstacle Description	Building	Building	Tower	Building side	Building	Building
Airflow Arch	360	360	360	360	360	360
Nearest Road	Stapley Drive					
Distant / Direction to Road	18.3 meters / East	20.8 meters / East	17.7 meters / East	16.2 meters / East	18.9 meters / East	18.9 meters / East
Schedule	Continuous	1 in 6 Days	Continuous	Continuous	Continuous	Continuous
Probe Material	Stainless Steel	n/a	n/a	RTD / Intercap	n/a	Tipping Bucket
Residence Time	< 20 seconds	n/a	n/a	n/a	n/a	n/a
Surrounding Area	Residential / Agricultural					
Site Groundcover	Pavement / gravel					
Frequency of QC check	Bi-weekly	Bi-weekly	n/a	n/a	n/a	n/a
Frequency of flow verification	n/a	Monthly	n/a	n/a	n/a	n/a
Frequency of audit	Quarterly	Quarterly	Twice-annually	Twice-annually	Twice-annually	n/a

High School (HS)



High School Air Monitoring Station

Location: 4827 North Country Club Drive, Scottsdale, AZ 85256

Scale of Representation: Neighborhood Scale

Monitoring Objective: High Pollution Exposure

EPA Site ID: 04 013 7024

Site Description: The High School site is located on the property of Salt River High School in the annex of the Maintenance Electrical Facility room then moved the monitoring section next door March 2012 to better access for student outreach and the PM monitor is atop the roof. The site was established in April 2006 after relocating from Early Childhood Education Center air station because the ozone monitoring site did not meet the sitting criteria due to facility expansion to adjacent building. The site was operational since July 2002. The area had rapid facility growth that includes the new High School that commenced in the fall 2006, developed Elementary School to the southeast, residential homes constructed to the east, several new school ballparks to the east, and currently a proposed plan facility of Junior High School to the north. The Central Arizona Project Aqueduct canal borders along the north section and the surrounding area of open agricultural fields to the north and south.

Particulate matter (PM₁₀) is one of the criteria pollutant monitored at this site. The ozone seasonal monitoring is monitored from this facility April 1 to November 1 annually.

High School (HS)

Parameter	Instrument #1	Instrument #2
Pollutant Type	Ozone	PM ₁₀
Date Established	May 2006	October 2012
Sampler Make/Model	Thermo 49C	Thermo 1405
Classification	SLAMS	SLAMS
Scale	Neighborhood	Neighborhood
Objective	Population / Transport	Population / Transport
Inlet Height	7.3 meters	6.7 meters
Distant from Tree Dripline	13.1 meters	15 meters
Obstacle Description	Building	Building
Airflow Arch	360	360
Nearest Road	Country Club Drive	Country Club Drive
Distant / Direction to Road	130 meters / West	127 meters / West
Schedule	Continuous	Continuous
Probe Material	Stainless Steel	n/a
Residence Time	< 20 seconds	n/a
Surrounding Area	School Grounds / Agricultural	School Grounds / Agricultural
Site Groundcover	Pavement / Aggregate	Pavement / Aggregate
Frequency of QC check	Bi-weekly	Bi-weekly
Frequency of flow verification	n/a	Monthly
Frequency of audit	Quarterly	Quarterly