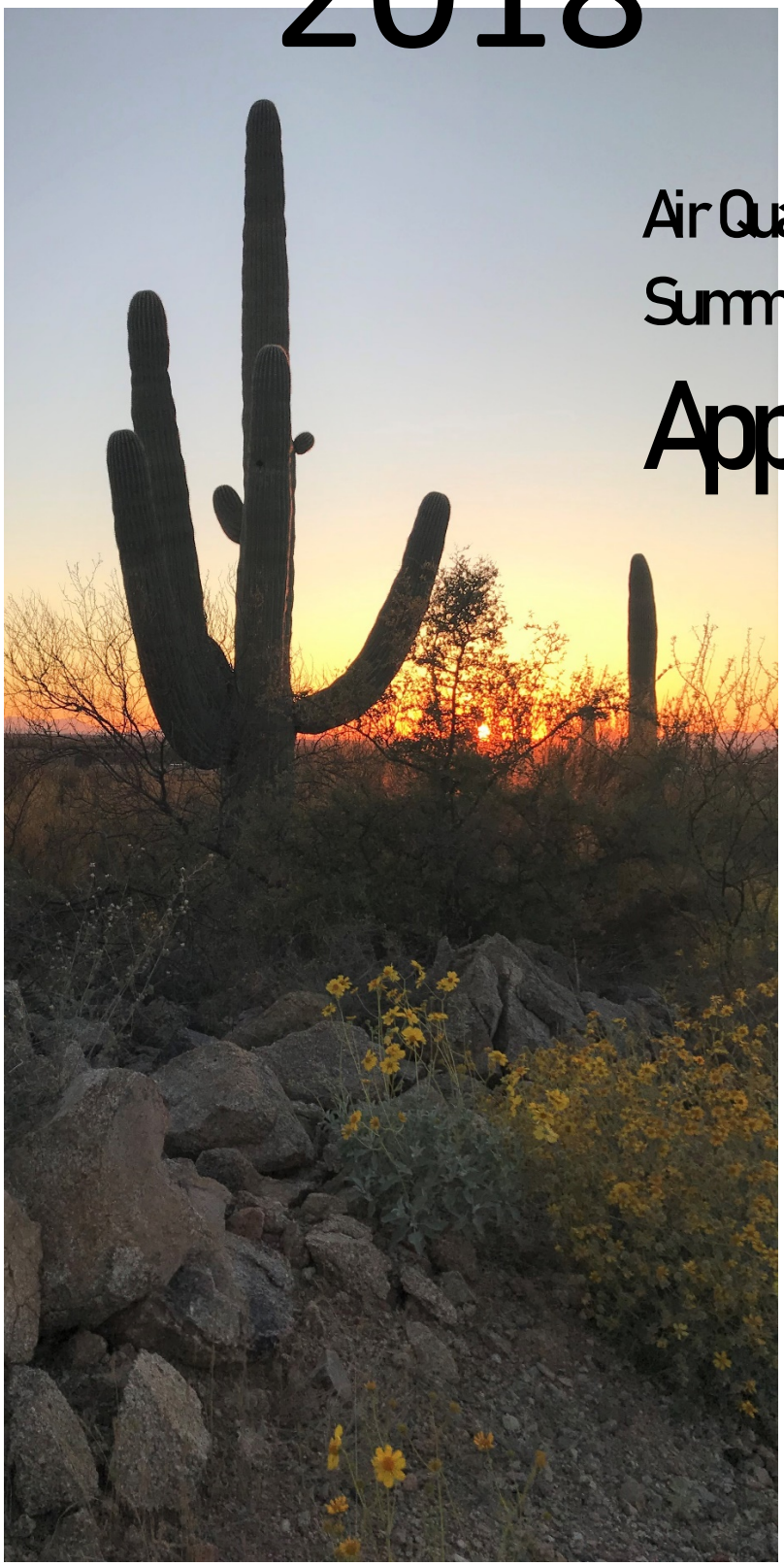
2018



Air Quality Summary Report

Appendix

Pima County Department of
Environmental Quality
33 North Stone Avenue
Tucson, Arizona 85701
AQ-404

2018 AIR QUALITY SUMMARY REPORT

APPENDIX

AIR QUALITY HISTORICAL DATA

National Ambient Air Quality Standards..... 2
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Lead 12
Total Suspended Particulates (TSP) 13-14
Carbon Monoxide 15-23
Ozone 25-36
Nitrogen Dioxide 37-41
Non-Methane Hydrocarbons 42
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National Ambient Air Quality Standards (NAAQS)

Pollutant	Primary (Health Related)		Secondary (Welfare Related)	
	Type of Average	Standard Level Concentration [a]	Type of Average	Standard Level Concentration
CO	1-Hour [b]	35 ppm (40 μg/m^3) [a]	No Secondary Standard	
	8-Hour [b]	9 ppm (10 μg/m^3) [a]	No Secondary Standard	
O_3	8-Hour [c]	0.070 ppm	Same as Primary	
PM_{10}	24-Hour [d]	150 μg/m^3	Same as Primary	
$PM_{2.5}$	Annual Arithmetic Mean [e]	12 μg/m^3	Same as Primary	
	24-Hour [e]	35 μg/m^3	Same as Primary	
NO_2	Annual Arithmetic Mean	53 ppb	Same as Primary	
	1-Hour [f]	100 ppb	None	
SO_2	1-Hour [g]	75 ppb	3-Hour [h]	0.5 ppm
Pb	Rolling 3-month Average	0.15 μg/m^3	Same as Primary	

a Parenthetical value is an approximately equivalent concentration (40 CFR, Part 50).
b Not to be exceeded more than once per year.
c The standard is met when the three year average of the annual fourth highest daily maximum concentration is less than or equal to 0.070ppm (effective December, 2015).
d The 24-hour standard is met when the expected number of exceedances in a year averaged over three years is less than or equal to one (App. K). The annual standard was revoked December 17, 2006.
e The 24-hour standard is met when the three year average of the 98th percentile value is less than or equal to 35 μg/m3 (effective December 14, 2012). The annual standard is met when the annual average of the quarterly concentrations is less than or equal to 12 μg/m3, when averaged over 3 years.
f The 1- hour standard is met when the three year average of the 98th percentile of the daily maximum 1- hour average at each monitor within an area does not exceed 100 ppb (effective January 22, 2010)
g The 1- hour standard is met when the three year average of the 99th percentile of the daily maximum 1-hour average at each monitor within an area does not exceed 75 ppb. (effective June 2, 2010)
h Not to be exceeded more than once per year.
Reference: Http://www.epa.gov/air/criteria.html

PM_{10} ANNUAL AVERAGES

Measurements reported in µg/m^3

	Downtown	22nd/ Craycroft	South Tucson	Prince Road	Magnetic Observe.	Corona de Tucson	Green Valley	Orange Grove	Golf Links / Harrison	University of Arizona	Broadway / Swan	Hidden Valley	Fairgrounds	Tangerine	Santa Clara	Central
‘88	50	--	47*	49*	35*	21	20*	44*	30*	45*	37*	--	--	--	--	--
‘89	56	--	49	52	36	20*	21	44	29	43	35	--	--	--	--	--
‘90	33	--	46	43*	26	16*	19	38*	25	38	29	--	--	--	--	--
‘91	30	--	34	32	21	13	16	31	20	30	25	--	--	--	--	--
‘92	28	--	32	28	22	12	15	30	20	29	26	--	--	--	--	--
‘93	28	--	32	24*	20	12	16	28	19	25	25	--	--	--	--	--
‘94	29	33	27	25	D	13	16	31	19	D	26	--	12	12	22	--
‘95	31	35	31	38	--	15	16	34	D	--	28	41	14	15	27	32
‘96	33	23	31	35	--	13	15	33	--	--	25	18	15	14	28	28
‘97	29	26	33	34*	--	15	16	31	--	--	28	17	16	15	27	27
‘98	31	22	39	35	--	15	15	25	--	--	26	20*	15	13	27*	25
‘99	35	D	45a	44	--	18	18	43a	--	--	32	D	D	18	34	D
‘00	D	--	38	38	--	18	17	39	--	--	30	--	--	18	31	--
‘01	--	--	31	33	--	16	18	29	--	--	26	--	--	17	26	--
‘02	--	--	39	34	--	15	20	33	--	--	26	--	--	19	28	--
‘03	--	--	34	31	--	17	19	29	--	--	27	--	--	19	27	--

D - Station discontinued

* Annual average data recovery did not meet EPA standards (75% valid samples required).

a – Averages omitted flagged high wind (exceedance) days.

PM_{10} ANNUAL AVERAGES

Measurements reported in $\mu g/m^3$

	South Tucson	Prince Road	Corona de Tucson	Green Valley	Orange Grove	Broadway / Swan	Tangerine	Santa Clara	Geronimo
2004	29	28	12	14	27	21	15	20	
2005	30	37*	15	17	29	24	19	27	
2006	34	35	23	17	32	27	23	36	
2007	31	32	17	20	29	26	22	28	33*
2008	31	33	19	21	28	25	19	30	31
2009	30	33	18	17	27	24	18	27	31
2010	26	30	13	15	23	19	16	22	25
2011	30	31	16	18	26	D	18	26	29
2012	30	34	18	18	27	D	22	29	31
2013	26	31	15	17	27	D	27	27	31
2014	28	**D	17	14	27	D	19	25	28
2015	21	D	13	12	21	D	15	18	25
2016	25	D	15	18	23	D	18	23	25
2017	24	D	17	14	25	D	19	26	32
2018	27	D	12	14	24	D	15	21	30

D - Station discontinued

* Annual average data recovery did not meet EPA standards (75% valid samples required). ** Site closed March, 2014

PM_{10} 24-HR MAXIMUM VALUES

Measurements reported in $\mu g/m^3$

	Downtown	22nd/ Craycroft	South Tucson	Prince Road	Magnetic Observe.	Corona de Tucson	Green Valley	Orange Grove	Golf Links / Harrison	University of Arizona	Broadway / Swan	Hidden Valley	Fairgrounds	Tangerine	Santa Clara	Central
‘88	136	--	70*	84*	54*	45*	44*	305*	51*	61*	109*	--	--	--	--	--
‘89	221	--	105	109	92	59*	46	128	101	99	79	--	--	--	--	--
‘90	117	--	144	89*	77	53*	61	134*	68	81	73	--	--	--	--	--
‘91	73	--	60	75	42	21	26	81	38	51	43	--	--	--	--	--
‘92	70	--	81	73	54	30	26	102	58	114	73	--	--	--	--	--
‘93	77	--	88	49*	38	26	51	61	35	48	54	--	--	--	--	--
‘94	71	82	58	67	D	29	28	52	32	D	61	--	31	24	42	--
‘95	103	106	77	132	--	46	39	107	D	--	75	127	43	44	81	89
‘96	123	38	72	79	--	25	28	67	--	--	40	43	74	24	62	53
‘97	72	62	72	62*	--	34	42	68	--	--	58	36	40	39	64	58
‘98	96	52	87	88	--	44	35	47	--	--	52	35*	45	31	55	51
‘99	129	D	214	118	--	51	38	235	--	--	89	D	D	41	97	D
‘00	D	--	142	89	--	88	63	141	--	--	119	--	--	71	97	--
‘01	--	--	134	125	--	133	78	111	--	--	120	--	--	81	131	--
‘02	--	--	200	83	--	40	98	171	--	--	62	--	--	63	86	--
‘03	--	--	150	126	--	104	127	152	--	--	122	--	--	125	146	--

D - Station discontinued

* Annual average data recovery did not meet EPA standards (75% valid samples required).

PM_{10} 24-HR MAXIMUM VALUES

Measurements Reported in µg/m^3

	South Tucson	Prince Road	Corona de Tucson	Green Valley	Orange Grove	Broadway / Swan	Tangerine	Santa Clara	Geronimo
2004	149	67	37	127	119	35	34	41	
2005	73	88*	33	54	98	46	37	82	
2006	109	72	144	81	101	60	104	104	
2007	97	99	50	123	95	80	88	92	104
2008	146	83	89	115	132	66	54	173	137
2009	184	81	85	84	270	67	101	90	237
2010	79	72	31	57	64	33	58	56	67
2011	119	55	42	75	100	D	66	73	116
2012	104	107	69	67	94	D	102	106	102
2013	165	75	66	434	142	D	73	71	187
2014	149	** D	82	170	158	D	95	108	174
2015	62	D	59	32	54	D	47	55	57
2016	80	D	45	63	83	D	54	53	99
2017	82	D	43	55	94	D	49	58	95
2018	94	D	33	131	75	D	40	48	107

D - Station discontinued

* Annual average data recovery did not meet EPA standards (75% valid samples required). ** Site closed March, 2014

PM_{10} 2ND 24-HR MAXIMUM VALUES

Measurements reported in $\mu g/m^3$

	Downtown	22nd/ Craycroft	South Tucson	Prince Road	Magnetic Observe.	Corona de Tucson	Green Valley	Orange Grove	Golf Links / Harrison	University of Arizona	Broadway / Swan	Hidden Valley	Fairgrounds	Tangerine	Santa Clara	Central
‘88	124	--	59*	81*	51*	37*	25*	187	48*	56*	76*	--	--	--	--	--
‘89	203	--	93	100	63	41*	44	122	101	88	67	--	--	--	--	--
‘90	108	--	108	75*	58	49*	59	116*	61	72	61	--	--	--	--	--
‘91	62	--	58	70	38	19	24	67	35	51	43	--	--	--	--	--
‘92	69	--	60	67	51	30	25	79	42	69	56	--	--	--	--	--
‘93	61	--	73	44	38	25	32	58	34	46	43	--	--	--	--	--
‘94	58	80	54	46	D	21	26*	48	31	D	52	--	23	--	41	--
‘95	69	63	58	70	--	43	34	106	D	--	53	96	37	34	54	59
‘96	81	36	53	60	--	24	27	62	--	--	39	38	29	24	54	45
‘97	71	56	69	58	--	31	30	66	--	--	57	35	33	30	46	52
‘98	78	39	74	70	--	40	33	44	--	--	51	34*	34	26	44	48
‘99	117	D	207	80	--	46	33	176	--	--	51	D	D	36	76	D
‘00	D	--	123	68	--	50	35	100	--	--	56	--	--	38	72	--
‘01	--	--	115	83	--	85	73	100	--	--	70	--	--	62	111	--
‘02	--	--	192	62	--	30	75	125	--	--	54	--	--	58	53	--
‘03	--	--	128	56	--	47	118	120	--	--	66	--	--	50	63	--

D - Station discontinued

* Annual average data recovery did not meet EPA standards (75% valid samples required).

PM_{10} 2ND 24-HR MAXIMUM VALUES Measurements Reported in µg/m^3									
	South Tucson	**Prince Road**	**Corona de Tucson**	**Green Valley**	**Orange Grove**	**Broadway / Swan**	**Tangerine**	**Santa Clara**	**Geronimo**
2004	117	50	24	96	100	34	26	41	
2005	73	88	31	51	74	44	35	55	
2006	85	71	70	50	88	55	59	93	
2007	96	62	48	77	95	80	44	60	77
2008	121	68	67	97	88	42	50	81	112
2009	127	75	52	78	97	52	41	48	124
2010	66	58	29	32	57	33	35	50	66
2011	87	55	38	70	89	D	65	68	85
2012	89	81	36	63	88	D	41	75	88
2013	156	64	34	95	115	D	72	71	149
2014	101	D	57	104	117	D	53	69	143
2015	52	D	30	30	53	D	28	40	53
2016	74	D	29	57	56	D	34	42	67
2017	78	D	42	54	59	D	45	56	92
2018	76	D	31	118	70	D	39	45	86

$PM_{2.5}$ VALUES
Dichotomous sampling
Measurements Reported in $\mu g/m^3$
1998

	98th percentile 24-hr Avg	**24- Hr Max**	**Annual Mean**
22nd/Craycroft	12.3	12.8	6.3
Orange Grove	14.3	20.6	7.3
Fairgrounds	10.2	22.2	5.0
Tangerine	10.1	10.3	4.6
Central	15.4	16.1	7.5

Data based on local conditions
Central, 22nd and Craycroft and Orange Grove sites monitored for visibility studies in 1999.
Fairgrounds and Tangerine dichotomous sampling was discontinued January 1999.

$PM_{2.5}$ VALUES
Measurements Reported in µg/m^3
24-Hr Maximum

	Children's Park	Orange Grove	Rose Elementary[3,4]	Coachline[3,4]	Green Valley[3,4]	Geronimo[3,4]
1999	22.8	56.2				
2000	13.6	13.3				
2001	17.5	20.9	32	23 [1]	19	28 [2]
2002	27.6	26.2	35	37	23	45
2003	18.8	18.0	39	30	20	32
2004	12.2	16.5	21.0	21.1	11.2	25.8
2005	13.2	16.1	19.0	22.2	16.4	28.3
2006	16.2	18.5	34.5	19.7	8.6	22.6
2007	13.4	20.7	24.4	20.8	14.5	23.6
2008	15.3	18.3	22.6	21.3	20.6	28.2
2009	15.8	13.9	22.3	29.0	12.3	30.8
2010	13.5	15.7	22.4	18.2	10.2	29.0
2011	12.2	13.8	33.3	33.7	18.8	24.7
2012	14.3	19.1	21.0	21.0	12.8	27.7
2013	16.5	21.3	37.5	25.3	78.2	33.6
2014	16.9	21.0	24.9	25.2	30.2	34.7
2015	18.2	19.5	25.0	16.7	8.1	19.0
2016	18.4	27.9	35	34	14	39
2017	21.7	23.2	18	21	16	23
2018	24.6	41.2	16	33	14	37

[1] Monitoring began 03/13/01, Annual Mean based on limited number of samples
[2] Monitoring began 08/01/01, Annual Mean based on limited number of samples
[3] Special Purpose sites or Other
[4] Data prior to 2004 was in raw form and not adjusted to be FRM like.

$PM_{2.5}$ VALUES
Measurements Reported in µg/m^3
Annual Mean

	Children's Park	Orange Grove	Rose Elementary[3,4]	Coachline[3,4]	Green Valley[3,4]	Geronimo[3,4]
1999	8.5	9.3				
2000	6.6	7.7				
2001	6.8	7.6	14	11 [1]	8	11 [2]
2002	7	6	14	13	7	13
2003	7	6	13	11	7	11
2004	5.6	5.8	6.3	6.4	3.5	7.0
2005	5.9	6.3	6.7	7.5	3.8	8.9
2006	5.8	5.8	9.0	7.9	2.8	8.5
2007	5.7	5.8	6.5	5.8	4.3	7.0
2008	5.4	5.7	6.5	7.6	5.0	6.8
2009	5.5	5.3	5.4	5.5	4.0	8.2
2010	5.0	5.2	5.4	5.1	3.8	9.5
2011	5.4	5.7	8.7	8.1	4.9	9.5
2012	5.4	5.9	5.6	7.7	6.2	9.3
2013	5.0	5.2	7.5	6.1	4.9	9.3
2014	5.5	6.2	6.6	6.1	3.0	7.3
2015	4.4	4.6	8.6	5.8	2.7	6.0
2016	5.8	6.3	7.8	6.7	5.0	5.3
2017	6.7	8.1	7.5	7.4	7.2	6.7
2018	4.5	5.5	5.2	5.5	4.1	6.3

[1] Monitoring began 03/13/01, Annual Mean based on limited number of samples
[2] Monitoring began 08/01/01, Annual Mean based on limited number of samples
[3] Special Purpose sites
[4] Data prior to 2004 was in raw form and not adjusted to be FRM like.

LEAD VALUES Measurements Reported in µg/m^3			
Children's Park			
Year	Annual Average (ppm)	Maximum 24-Hr. (ppm)	% Data Recovery
2012	.0018	.005	85
2013	.002	.007	97
2014	.003	.007	95
2015	.003	.008	95
2016	.004	.011	88
Monitoring discontinued May 31, 2016.			

LEAD

State and federal Standards Primary & Secondary:
Calendar Quarter Average
1.5 µg/m^3

High Quarterly Average in µg/m^3

Site	**'96**	**'95**	**'94**	**'93**	**'92**	**'91**	**'90**	**'89**	**'88**	**'87**
22nd / Craycroft	0.05	0.01	0.02	0.02	0.01	--	--	--	--	--
Prince Road (TSP)**	0.04	0.02	0.05	0.04	0.06	0.05	0.05	--	--	0.10
Prince Road (PM_{10})**	--	--	--	--	--	--	0.03	0.06	0.10	--
Broadway / Swan (TSP)**	--	--	--	--	--	--	--	--	--	0.04
Broadway / Swan (PM10)**	--	--	--	--	0.01	0.01	0.01	0.04	0.05	--
South Tucson***	--	--	--	--	0.03	--	--	--	--	--

Site	**'86**	**'85**	**'84**	**'83**	**'82**	**'81**	**'80**	**'79**	**'78**	**'77**
Magnetic Observatory*	--	--	--	0.24	0.21	0.22	0.23	0.40	0.42	--
Prince Road (TSP)**	0.27	0.58	0.59	0.65	0.58	0.52	0.82	1.14	1.017	1.61
Broadway / Swan (TSP)**	0.16	0.50	0.37	0.50	--	--	--	--	--	--

* Magnetic Observatory discontinued in 1984.

** On 2/21/88 Prince Rd. was converted from using TSP to PM_{10} filters for lead sampling. Then on10/20/90 a TSP sampler was placed back at Prince Rd. just for use in determining lead concentrations. On 6/26/87 Broadway / Swan converted from TSP to PM_{10}. Lead values determined from PM_{10} filters will be lower than those utilizing TSP filters. Since health standards are based on the TSP method of determining concentrations, all lead samplers were converted to TSP filters on 3/1/92.

*** Started TSP sampling on 6/17/91. Moved to 22nd / Craycroft on 3/1/92.

TOTAL SUSPENDED PARTICULATES (TSP)
Annual Geometric Means in µg/m^3

	‘96	‘95	'94	'93	'92	'91	'90	'89	'88	'87	'86	'85	'84	'83	'82	'81
22nd / Craycroft	51	52	--	--	--	--	--	--	--	--	--	--	--	--	--	--
University of Arizona*	--	--	--	--	45	67	70	71	86	66	82	77	70	54	59	76
South Tucson Tucson	--	--	--	--	55	66	81	89	81	83	95	99	91	79	89	112
Downtown	67	70	--	--	--	--	--	--	--	--	--	--	63	52	64	67
Prince Road	--	--	70	65	73	72	62	--	88	87	93	102	91	77	93	101
Magnetic * Observatory	--	--	--	--	--	--	--	--	--	--	--	--	54	45	53	62
Corona de Tucson	--	--	--	--	--	--	--	37	30	25	20	20	25	18	22	35
Green Valley	--	--	--	--	--	51	30	37	31	39	39	37	39	27	33	46
Border Patrol*	--	--	--	--	--	--	--	--	--	--	--	--	69	48	52	58
Orange Grove	--	--	--	--	--	–	82	91	82	80	86	87	92	78	86	107
Hughes Nogales*	--	--	--	--	--	--	--	--	--	--	--	52	48	34	44	54
Alvernon / Ft. Lowell*	--	--	--	--	--	--	--	--	--	--	--	76	73	70	89	98
Golf Links / Harrison*	--	--	--	--	--	--	--	--	--	52	42	47	55	48	58	67
Broadway / Swan	--	--	--	--	--	--	--	--	--	66	62	76	65	59	--	--
Rillito*	--	--	--	--	--	--	--	--	--	--	--	84	--	--	107	112
Pima College*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	36	47
Davis Monthan*	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	68
Sahuarita Jr. High *	--	--	36	37	34	35	39									

* Sites discontinued or put on reserve.

TOTAL SUSPENDED PARTICULATES (TSP)
Annual Geometric Means in µg/m^3

	'80	'79	'78	'77	'76	'75	'74	'73	'72	'71	'70	'69	'68	'67
22nd / Craycroft	--	--	--	--	--	--	--	--	--	--	--	--	--	--
U of A *	75	89	61	71	73	71	69	67	98	88	96	78	70	89
S. Tucson	97	101	117	119	118	96	106	116	95	140	143	136	115	145
Downtown	61	69	56	68	71	67	77	77	88	109	88	98	91[1]	102
Prince Road	117	129	110	122	94	74	81	109	110	101	--	--	--	–
Magnetic * Observatory	59	61	56	67	59	60	47	46	53	--	--	--	--	--
Corona de Tucson	22	28	20	24	28	27	24	25	26	--	--	--	--	--
Green Valley	39	54	45	55	54	53	53	50	43	59	--	--	--	--
Border Ptrl*	61	69	66	72	76	79	60	73	--	--	--	--	--	--
Orange Grove	108	109	84	85	85	87	76	--	--	--	--	--	--	--
Hughes / Nogales*	54	54	43	50	51	54	54	--	--	--	--	--	--	--
Alvernon / Ft. Lowell*	101	120	126	155	168	174	--	--	--	--	--	--	--	--
Golf Links / Harrison*	59	65	55	63	57	62	59	--	--	--	--	--	--	--
Broadway/ Swan	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Rillito*	114	132	100	143	112	--	--	--	--	--	--	--	--	--
Pima College*	43	47	42	50	--	--	--	--	--	--	--	--	--	--
Davis Monthan*	67	69	69	76	72	73	80	88	--	--	--	--	--	--
Florence / Magee*	--	60	50	72	54	66	64	44	--	--	--	--	--	--
Pantano Fire *	--	--	--	93	93	84	89	101	--	--	--	--	--	--
Tanque Verde *	--	--	--	--	--	--	--	--	130	115	86	91	72	114
Romero / Roger*	--	--	--	--	--	--	--	--	--	247	164	156	--	232

* Sites discontinued or put on reserve.
[1] Old Downtown site Relocated to new Downtown site.

CARBON MONOXIDE						
	1- Hour Average (in ppm)		8- Hour Average (in ppm)			
DOWNTOWN	**1st Maximum**	**2nd Maximum**	**1st Maximum**	**2nd Maximum**	**# Over 8- Hr. Standard**	**% Data Recovery**
1975	23.0	18.0	8.2	7.9	0	99
1976	17.0	16.5	10.4	8.9	1	90
1977	21.0	18.5	9.9	9.4	1	99
1978	14.1	10.7	7.1	7.1	0	95
1979	10.0	10.0	6.1	5.9	0	84
1980	14.0	11.0	6.5	6.1	0	42
1981	15.5	15.2	9.3	8.6	0	93
1982	15.5	15.5	9.1	8.8	0	95
1983	18.5	17.2	9.6	7.8	1	92
1984	11.0	10.0	5.8	5.6	0	95
1985	12.0	10.6	7.1	5.3	0	98
1986	13.8	13.0	9.2	7.8	0	89
1987	10.3	9.1	5.3	4.7	0	94
1988	15.6	14.8	12.7	6.8	1	96
1989	9.7	9.4	6.5	5.8	0	98
1990	13.8	9.3	4.4	4.3	0	91
1991	10.7	8.6	5.1	4.7	0	96
1992	8.7	8.1	5.0	4.8	0	92
1993	7.7	7.0	4.9	4.4	0	95
1994	10.8	7.4	5.0	4.5	0	92
1995	11.3	10.4	5.5	4.5	0	95
1996	9.9	7.6	4.6	4.4	0	98
1997	8.2	7.8	4.8	4.4	0	99
1998	7.6	7.5	4.3	3.9	0	97
1999	10.6	6.3	4.3	3.9	0	99
2000	6.7	6.0	3.8	3.5	0	99
2001	5.6	5.1	2.7	2.5	0	99
2002	6.6	5.1	3.7	2.3	0	99
2003	10	9.6	3.1	2.7	0	98
2004	5.5	4.7	3.7	2.5	0	99
2005	3.0	2.8	1.9	1.7	0	100
2006	2.9	2.6	1.4	1.2	0	100
2007	3.4	2.7	1.9	1.4	0	99
2008	2.2	1.8	1.3	1.0	0	99
2009	1.8	1.5	1.0	1.0	0	99

- All values before 1985 were recorded in $\mu g/m^3$. All historical data has been converted to ppm.
- Downtown site closed 08-13-2009

CARBON MONOXIDE						
	1- Hour Average (in ppm)		8- Hour Average (in ppm)			
22ND/ ALVERNON	**1st Maximum**	**2nd Maximum**	**1st Maximum**	**2nd Maximum**	**# Over 8- Hr. Standard**	**% Data Recovery**
1975	25.5	23.0	15.4	15.2	24	71
1976	27.0	27.0	14.6	13.4	36	98
1977	24.0	24.0	11.2	11.2	10	64
1978	22.9	22.3	12.7	12.0	16	80
1979	25.1	23.9	11.0	10.1	4	93
1980	24.8	21.2	12.2	11.9	4	98
1981	21.0	19.5	11.6	9.7	2	97
1982	27.0	20.5	11.0	10.8	4	90
1983	25.0	19.3	11.8	10.4	10	98
1984	21.0	17.4	10.4	10.2	3	95
1985	19.2	19.2	10.0	8.9	1	97
1986	18.2	16.3	9.3	8.5	0	79
1987	15.2	15.0	6.9	6.9	0	98
1988	18.4	18.4	11.2	6.8	1	88
1989	14.6	13.7	7.9	7.1	0	98
1990	12.8	11.7	6.8	6.5	0	95
1991	12.3	12.1	6.4	5.7	0	96
1992	12.5	11.2	6.1	5.8	0	98
1993	14.3	13.5	6.5	6.0	0	95
1994	10.3	9.4	6.0	5.5	0	96
1995	11.9	10.6	6.0	5.9	0	99
1996	10.0	9.9	5.2	5.1	0	99
1997	9.0	8.6	5.3	4.4	0	99
1998	7.8	7.6	4.0	4.0	0	100
1999	8.5	7.8	4.2	3.8	0	100
2000	8.9	7.5	5.0	4.7	0	99
2001	5.8	5.7	3.0	2.9	0	99
2002	5.7	5.1	2.6	2.5	0	98
2003	6.0	5.8	2.7	2.6	0	99
2004	4.0	4.0	2.1	2.0	0	99
2005	4.1	3.6	2.2	2.1	0	99
2006	3.4	3.4	2.0	1.8	0	99
2007	3.7	3.1	2.1	1.9	0	99
2008	2.9	2.5	1.4	1.3	0	99
2009	2.3	2.2	1.2	1.1	0	100

* All values before 1985 were recorded in ug/m^3. All historical data has been converted to ppm.

CARBON MONOXIDE						
	1- Hour Average (in ppm)		8- Hour Average (in ppm)			
22ND / CRAYCROFT	**1st Maximum**	**2nd Maximum**	**1st Maximum**	**2nd Maximum**	**% Data Recovery**	
1975	16.5	15.0	7.0	6.8	67	
1976	14.0	14.0	6.7	6.5	87	
1977	21.0	17.5	8.5	6.6	92	
1978	15.9	14.5	6.5	6.3	93	
1979	11.0	10.8	5.9	5.8	74	
1980	16.5	16.0	6.1	5.7	98	
1981	11.2	18.5	5.7	4.7	88	
1982	12.0	9.5	6.0	5.0	88	
1983	16.5	10.2	5.8	5.2	95	
1984	11.9	11.8	7.5	4.7	74	
1985	12.2	9.4	5.4	5.1	78	
1986	7.9	7.7	3.8	2.9	66	
1987	9.0	8.2	3.8	3.8	47	
1988	11.1	10.0	5.4	5.1	88	
1989	9.5	9.1	5.0	4.3	94	
1990	6.8	6.2	3.1	3.1	91	
1991	6.4	5.9	3.5	2.8	92	
1992	7.5	7.2	3.5	3.3	85	
1993	8.3	8.2	5.1	3.1	96	
1994	7.0	6.6	3.9	3.2	92	
1995	6.7	6.4	3.0	2.6	98	
1996	6.7	6.0	3.1	2.8	99	
1997	7.2	6.9	3.4	2.6	99	
1998	4.8	4.6	2.6	2.3	97	
1999	5.4	4.7	2.3	2.0	99	
2000	5.4	5.4	2.7	2.4	97	
2001	3.7	3.6	1.9	1.7	97	
2002	3.8	3.8	2.0	1.9	98	
2003	4.4	4.3	2.1	1.9	99	
2004	3.6	3.4	1.6	1.6	99	
2005	3.5	3.3	1.7	1.5	100	
2006	3.2	2.9	1.6	1.4	100	
2007	2.6	2.5	1.2	1.2	99	
2008	2.6	2.1	1.1	1.1	99	
2009	1.9	1.8	1.0	0.8	99	

* All values before 1985 were recorded in $\mu g/m^3$. All historical data has been converted to ppm.

CARBON MONOXIDE					
	1- Hour Average (in ppm)		8- Hour Average (in ppm)		
22ND / CRAYCROFT	**1st Maximum**	**2nd Maximum**	**1st Maximum**	**2nd Maximum**	**% Data Recovery**
2010	2.0	1.7	1.1	.9	99
2011	2.1	2.0	0.9	0.9	99
2012	1.9	1.8	1.0	1.0	99
2013	1.6	1.6	0.7	0.7	99
2014	1.9	1.6	0.9	0.8	97
2015	1.7	1.6	0.8	0.8	99
2016	1.4	1.2	0.7	0.7	99
2017	2.0	1.5	1.0	0.9	98
2018	1.2	1.1	0.6	0.5	98

CARBON MONOXIDE					
	1- Hour Average (in ppm)		8- Hour Average (in ppm)		
22ND/ ALVERNON	**1st Maximum**	**2nd Maximum**	**1st Maximum**	**2nd Maximum**	**% Data Recovery**
2010	2.5	2.5	1.1	1.1	99
2011	3.1	2.5	1.8	1.6	99
2012	3.0	2.3	1.3	1.2	97
2013	2.3	1.8	1.1	1.1	97
2014	1.9	1.8	1.2	1.0	96
2015	2.2	1.9	1.0	1.0	98
2016	2.1	1.8	0.9	0.9	99
2017	1.8	1.7	1.2	1.0	99
2018	2.0	1.6	1.0	0.8	99

CARBON MONOXIDE					
Special Purpose Site					
	1- Hour Average (in ppm)		**8- Hour Average (in ppm)**		
CHILDREN'S PARK	**1st Maximum**	**2nd Maximum**	**1st Maximum**	**2nd Maximum**	**% Data Recovery**
1999	3.3	3.0	1.9	1.9	95
2000	3.8	3.5	1.9	1.9	99
2001	2.9	2.9	1.7	1.7	97
2002	2.5	2.5	1.6	1.6	99
2003	2.4	2.3	1.5	1.4	99
2004	2.2	2.2	1.4	1.4	100
2005	2.0	1.8	1.1	1.1	100
2006	1.7	1.7	1.1	1.0	99
2007	1.9	1.8	1.1	1.0	98
2008	1.5	1.3	1.0	0.9	97
2009	1.6	1.2	1.0	0.9	95
2010	1.2	1.1	0.8	0.8	99
2011	1.1	1.1	0.7	0.6	99
2012	1.2	1.0	0.6	0.6	98
2013	1.0	0.9	0.7	0.6	99
2014	1.0	0.95	0.8	0.7	93
2015	1.0	1.0	.8	.8	99
2016	1.0	1.0	0.7	0.6	99
2017	1.3	1.1	1.0	0.7	99
2018	0.91	0.84	0.7	0.7	99
Children's Park carbon monoxide monitoring began October, 1998.					

CARBON MONOXIDE						
Special Purpose Site						
	1- Hour Average (in ppm)		**8- Hour Average (in ppm)**			
GOLF LINKS & KOLB	**1st Maximum**	**2nd Maximum**	**1st Maximum**	**2nd Maximum**	**% Data Recovery**	
2002	4.9	4.2	3.3	2.6	25	
2003	3.9	3.8	2.2	2.2	98	
2004	3.6	3.5	2.1	2.1	99	
2005	3.3	3.2	2.2	2.1	100	
2006	3.8	2.9	1.8	1.6	100	
2007	2.5	2.1	1.3	1.3	100	
2008	2.0	1.8	1.3	1.2	97	
2009	1.7	1.7	1.1	1.0	100	
2010	2.8	2.3	1.4	1.2	98	
2011	1.7	1.6	1.1	1.1	99	
2012	1.5	1.4	0.9	0.9	98	
2013	1.4	1.3	0.9	0.8	99	
2014	1.3	1.2	1.0	0.9	98	
2015	1.6	1.6	1.0	0.9	99	
2016	1.3	1.1	0.8	0.7	99	
2017	1.1	1.1	0.8	0.7	99	
2018	1.0	1.0	0.8	0.6	99	
Golf Links and Kolb carbon monoxide monitoring began September 28, 2002. Golf Links and Kolb site monitors for carbon monoxide seasonally.						

CARBON MONOXIDE				
Special Purpose Site				
	1- Hour Average (in ppm)		8- Hour Average (in ppm)	
Cherry / Glenn	**1st Maximum**	**2nd Maximum**	**1st Maximum**	**2nd Maximum**
1989			6.9	6.3
1990			4.5	4.3
1991			4.9	4.8
1992	8.6	7.6	5.7	5.0
1993	6.6	6.5	4.5	4.4
1994	8.7	7.3	5.4	5.1
1995	9.2	7.9	4.9	4.5
1996	8.2	7.8	4.1	4.0
1997	6.5	5.6	4.1	3.4
1998	5.9	5.1	4.3	3.1
1999	5.2	5.2	3.4	3.4
2000	5.3	5.0	3.7	3.3
2001	3.9	3.6	2.8	2.6
2002	3.9	2.6	2.6	2.3
2003	4.2	3.9	2.9	2.7
2004	4.0	3.9	2.7	2.2
2005	3.8	3.4	2.5	2.4
2006	3.4	3.3	2.3	2.0
2007	2.8	2.7	1.9	1.5
2008	2.5	2.5	1.9	1.5
2009	2.2	1.9	1.3	1.2
2010	2.1	2.1	1.4	1.3
2011	1.8	1.7	1.3	1.2
2012	1.5	1.4	1.3	1.2
2013	2.1	1.8	1.2	1.1
2014	1.8	1.6	1.1	1.1
2015	2.0	2.0	1.4	1.4
2016	1.7	1.7	1.4	1.2
2017	1.9	1.8	1.3	1.2
2018	1.4	1.3	1.2	0.9

CARBON MONOXIDE			
Special Purpose Sites			
Broadway / Craycroft	**Year**	**1st Maximum 8-Hour (in ppm)**	**2nd Maximum 8-Hour (in ppm)**
PAG Study (Dec-Mar) ADEQ Study (Dec) PDEQ (Oct-Dec) Closed Jan 5, 1993	**1986**	10.1	8.5
	1987	9.2	8.1
	1988	7.1	6.4
	1989	7.6	7.5
	1990	6.7	6.1
	1991	6.2	6.0
	1992	5.4	5.3
Grant / Campbell			
PAG Study (Jan-Mar)	**1987**	8.4	8.2
22nd / Alvernon			
ADEQ (Oct- Dec) SE Corner	**1987**	9.3	7.9
Sabino Canyon*			
Mar-Apr & Oct-Dec	**1986**	2.3	2.2
	1987	2.5	2.3
	1988	3.8	3.1
	1989	3.0	2.6
	1990	3.0	3.0
	1991	3.1	3.0
	1992	2.2	1.8
	1993	1.8	1.6
Closed at the end of 1994	**1994**	1.9	1.8
* All values before 1985 were recorded in ug/m^3. All historical data has been converted to ppm.			

CARBON MONOXIDE			
Special Purpose Sites			
Highland Park	**Year**	**1st Maximum 8-Hour (in ppm)**	**2nd Maximum 8-Hour (in ppm)**
Dec	**1987**	4.7	2.1
Nov-Dec	**1988**	4.1	4.1
	1989	5.4	4.8
Jan-Apr 15 & Sep 15-Dec	**1990**	3.1	3.0
	1991	3.5	3.1
	1992	4.1	3.9
Closed Apr 15, 1993	**1993**	2.5	2.5
Tangerine Rd.			
May-Dec	**1990**	1.6	1.6
	1991	1.9	1.6
	1992	1.3	1.3
	1993	0.7	0.7
Closed first quarter of 1994	**1994**	0.8	0.8
All values before 1985 were recorded in ug/m^3. All historical data has been converted to ppm.			

CARBON MONOXIDE						
Special Purpose Sites						
	1- Hour Average (in ppm)		**8- Hour Average (in ppm)**			
POMONA[1]	**1st Maximum**	**2nd Maximum**	**1st Maximum**	**2nd Maximum**	**% Data Recovery**	
1991	6.8	6.3	4.2	3.7	25	
1992	8.2	8.0	5.0	4.8	85	
1993	6.3	6.0	3.7	3.7	99	
1994	8.5	8.4	4.0	3.9	98	
1995	9.4	7.4	3.8	3.3	75	
1996 [2]	5.6	5.5	2.7	2.7	66	

[1] Pomona site start-up on October 1, 1991.
[2] Pomona closed in August of 1996.
* All values before 1985 were recorded in ug/m^3. All historical data has been converted to ppm.

<u>NOTICE:</u>

Some data reported in the OZONE section of this document may not match data reported by the EPA Air Quality System (AQS). The reason for this discrepancy is the measuring period used by the EPA does not match the measuring period used by PDEQ. The EPA uses a twelve hour period to encompass daylight hours only. The Tucson area often experiences episodes of elevated OZONE concentrations after sunset and therefore uses a twenty four hour period for reporting purposes.

OZONE					
DOWNTOWN	**Annual Average (ppm)**	**1- Hour Average (ppm)**		**4th Highest 8-Hour Average (ppm)**	**% Data Recovery**
		1st Maximum	**2nd Maximum**		
Year					
1975	0.018	0.110	0.100	0.076	94
1976	0.020	0.110	0.110	0.071	99
1977	0.018	0.100	0.090	0.063	98
1978	0.018	0.103	0.100	0.066	92
1979	0.022	0.109	0.102	0.075	91
1980	0.021	0.122	0.112	0.064	99
1981	0.022	0.088	0.088	0.066	98
1982	0.027	0.123	0.107	0.076	95
1983	0.023	0.109	0.097	0.070	98
1984	0.020	0.103	0.102	0.065	95
1985	0.020	0.097	0.094	0.069	96
1986	0.021	0.091	0.090	0.070	91
1987	0.021	0.089	0.083	0.065	95
1988	0.019	0.091	0.087	0.064	96
1989	0.020	0.087	0.086	0.065	98
1990	0.021	0.090	0.087	0.071	95
1991	0.022	0.084	0.082	0.071	89
1992**	0.020	0.079	0.078	0.063	99
1993	0.020	0.086	0.081	0.068	99
1994	0.022	0.083	0.080	0.067	100
1995	0.019	0.090	0.087	0.070	98
1996	0.020	0.085	0.085	0.069	97
1997	0.019	0.084	0.082	0.065	98
1998	0.018	0.079	0.078	0.062	96
1999	0.019	0.078	0.076	0.064	99
2000	0.018	0.077	0.076	0.067	94
2001	0.022	0.083	0.081	0.065	99
2002	0.023	0.085	0.082	0.072	99
2003	0.023	0.085	0.078	0.068	99
2004	0.021	0.076	0.076	0.063	99
2005	0.022	0.084	0.083	0.070	99
2006	0.025	0.082	0.082	0.073	99
2007	0.025	0.079	0.079	0.067	99
2008	0.026	0.078	0.074	0.065	99
2009	0.029*	0.082	0.079	0.066	99

* Annual average based on a limited number of samples.
** Site was relocated to improved sampling location.
Downtown site closed 08-13-2009

OZONE					
22nd / CRAYCROFT	**Annual Average (ppm)**	**1- Hour Average (ppm)**		**4th Highest 8-Hour Average (ppm)**	**% Data Recovery**
		1st Maximum	**2nd Maximum**		
YEAR					
1975	0.025	0.130	0.130		77
1976	0.022	0.090	0.090	0.070	80
1977	0.022	0.100	0.100	0.068	81
1978	0.024	0.107	0.105	0.071	86
1979	0.027	0.103	0.103	0.073	82
1980	0.034	0.110	0.102	0.080	90
1981	0.027	0.124	0.120	0.069	93
1982	0.025	0.121	0.120	0.076	85
1983	0.024	0.105	0.101	0.076	84
1984	0.026	0.111	0.108	0.072	93
1985	0.027	0.106	0.105	0.084	85
1986	0.020	0.078	0.078	0.065	48
1987	0.030	0.092	0.091	0.075	84
1988	0.022	0.093	0.092	0.068	94
1989	0.023	0.084	0.084	0.063	97
1990	0.025	0.094	0.089	0.069	97
1991	0.026	0.084	0.081	0.069	96
1992	0.028	0.110	0.094	0.078	93
1993	0.027	0.096	0.094	0.075	99
1994	0.027	0.094	0.093	0.075	99
1995	0.027	0.107	0.101	0.080	98
1996	0.028	0.091	0.090	0.077	98
1997	0.028	0.106	0.097	0.077	99
1998	0.028	0.104	0.095	0.073	99
1999	0.029	0.095	0.092	0.071	99
2000	0.028	0.089	0.084	0.075	100
2001	0.027	0.089	0.084	0.069	99
2002	0.028	0.094	0.086	0.075	99
2003	0.027	0.090	0.087	0.073	99
2004	0.026	0.079	0.078	0.069	99
2005	0.026	0.093	0.089	0.074	99
2006	0.028	0.082	0.079	0.069	99
2007	0.029	0.088	0.083	0.068	100
2008	0.029	0.085	0.078	0.066	100
2009	0.029	0.079	0.077	0.063	100

* Annual average based on a limited number of samples. 1973-75 data from 22nd/Craycroft site are total oxidants.

OZONE				
22nd / CRAYCROFT	**Annual Average (ppm)**	**Highest 1- Hour Average (ppm)**	**4th Highest 8-Hour Average (ppm)**	**% Data Recovery**
YEAR				
2010	0.029	0.076	0.066	100
2011	0.031	0.090	0.070	100
2012	0.031	0.077	0.068	99
2013	0.028	0.083	0.063	100
2014	0.027	0.071	0.062	100
2015	0.029	0.074	0.065	99
2016	0.027	0.072	0.061	99
2017	0.030	0.079	0.067	94
2018	0.032	0.078	0.068	98

OZONE				
TANGERINE	**Annual Average (ppm)**	**Highest 1- Hour Average (ppm)**	**4th Highest 8- Hour Average (ppm)**	**% Data Recovery**
YEAR				
1989	0.031*	0.056	0.047	17
1990	0.038	0.096	0.074	95
1991	0.038	0.087	0.073	98
1992	0.035	0.085	0.068	99
1993	0.036	0.102	0.077	99
1994	0.038	0.082	0.069	99
1995	0.035	0.087	0.074	99
1996	0.035	0.082	0.071	97
1997	0.037	0.083	0.070	99
1998	0.036	0.095	0.070	99
1999	0.039	0.087	0.073	99
2000	0.037	0.081	0.073	99
2001	0.035	0.078	0.067	99
2002	0.036	0.093	0.075	98
2003	0.039	0.085	0.074	99
2004	0.037	0.076	0.068	100
2005	0.037	0.080	0.073	99
2006	0.039	0.088	0.076	99
2007	0.037	0.080	0.069	100
2008	0.038	0.082	0.071	99
2009	0.038	0.084	0.068	99
2010	0.038	0.076	0.069	100
2011	0.038	0.076	0.069	99
2012	0.038	0.076	0.069	99
2013	0.036	0.085	0.066	99
2014	0.035	0.081	0.065	100
2015	0.035	0.071	0.065	100
2016	0.035	0.072	0.064	99
2017	0.037	0.076	0.069	99
2018	0.037	0.077	0.068	98
* Annual average based on a limited number of samples.				

OZONE				
PIMA COUNTY FAIRGROUNDS	**Annual Average (ppm)**	**Highest 1- Hour Average (ppm)**	**4th Highest 8-Hour Average (ppm)**	**% Data Recovery**
Year				
1989	0.025*	0.063	0.051	19
1990	0.032	0.099	0.074	88
1991	0.033	0.090	0.074	98
1992	0.030	0.082	0.068	99
1993	0.031	0.091	0.074	95
1994	0.033	0.091	0.073	100
1995	0.031	0.095	0.076	97
1996	0.031	0.084	0.070	98
1997	0.030	0.080	0.065	99
1998	0.031	0.088	0.071	96
1999	0.032	0.085	0.068	99
2000	0.032	0.083	0.074	100
2001	0.030	0.080	0.066	98
2002	0.032	0.087	0.072	99
2003	0.032	0.085	0.070	99
2004	0.031	0.078	0.064	99
2005	0.031	0.085	0.073	97
2006	0.033	0.083	0.068	99
2007	0.034	0.085	0.071	97
2008	0.035	0.084	0.072	99
2009	0.034	0.079	0.064	99
2010	0.034	0.079	0.069	99
2011	0.035	0.085	0.073	97
2012	0.035	0.077	0.069	100
2013	0.034	0.087	0.072	99
2014	0.032	0.075	0.063	99
2015	0.032	0.077	0.063	96
2016	0.033	0.077	0.066	99
2017	0.037	0.078	0.070	98
2018	0.035	0.079	0.069	99

* Annual average based on a limited number of samples.

OZONE				
SAGUARO NATIONAL MONUMENT	**Annual Average (ppm)**	**Highest 1-Hour Average (ppm)**	**4th Highest 8-Hour Average (ppm)**	**% Data Recovery**
Year				
1982	0.032	0.100		55
1983	0.038	0.111		92
1984	0.038	0.108		92
1985	0.038	0.105		85
1986	0.030	0.103		91
1987	SITE TAKEN OVER BY NATIONAL PARK SERVICE 1987 TO 1993			
1993	0.036	0.102	0.082	97
1994	0.042	0.109	0.080	98
1995	0.039	0.118	0.083	97
1996	0.039	0.092	0.076	94
1997	0.042	0.099	0.079	98
1998	0.042	0.099	0.077	99
1999	0.041	0.090	0.069	94
2000	0.036	0.087	0.074	94
2001	0.036	0.083	0.066	95
2002	0.038	0.091	0.077	99
2003	0.041	0.098	0.078	97
2004	0.041	0.085	0.073	99
2005	0.041	0.101	0.079	100
2006	0.042	0.087	0.076	99
2007	0.041	0.084	0.073	98
2008	0.042	0.090	0.074	100
2009	0.041	0.075	0.067	100
2010	0.041	0.082	0.068	99
2011	0.042	0.098	0.075	100
2012	0.043	0.081	0.071	99
2013	0.041	0.084	0.074	99
2014	0.040	0.082	0.069	100
2015	0.039	0.075	0.066	99
2016	0.041	0.080	0.069	99
2017	0.042	0.082	0.073	99
2018	0.041	0.082	0.071	99

OZONE				
CHILDREN'S PARK	**Annual Average (ppm)**	**Highest 1- Hour Average (ppm)**	**4th Highest 8- Hour Average (ppm)**	**% Data Recovery**
YEAR				
1997	0.023*	0.093	0.065	38
1998	0.026	0.086	0.072	98
1999	0.027	0.092	0.071	99
2000	0.026	0.094	0.077	98
2001	0.025	0.084	0.069	99
2002	0.025	0.090	0.073	99
2003	0.027	0.089	0.076	99
2004	0.026	0.082	0.068	99
2005	0.027	0.086	0.075	99
2006	0.027	0.082	0.072	99
2007	0.028	0.081	0.071	98
2008	0.028	0.084	0.069	99
2009	0.029	0.080	0.067	100
2010	0.028	0.082	0.066	99
2011	0.029	0.082	0.068	100
2012	0.029	0.071	0.065	99
2013	0.029	0.082	0.071	100
2014	0.028	0.082	0.066	100
2015	0.028	0.070	0.063	99
2016	0.028	0.070	0.063	99
2017	0.030	0.079	0.068	99
2018	0.030	0.082	0.070	99
* Based on a limited number of samples.				

OZONE				
ROSE ELEMENTARY	**Annual Average (ppm)**	**Highest 1- Hour Average (ppm)**	**4th Highest 8- Hour Average (ppm)**	**% Data Recovery**
YEAR				
2001	0.025	0.082		95
2002	0.025	0.087		99
2003	0.025	0.086	0.065	99
2004	0.024	0.073	0.064	99
2005	0.024	0.075	0.067	100
2006	0.026	0.075	0.067	99
2007	0.028	0.082	0.069	99
2008	0.028	0.077	0.065	99
2009	0.027	0.076	0.061	99
2010	0.027	0.075	0.068	99
2011	0.026	0.078	0.066	99
2012	0.028	0.076	0.067	98
2013	0.029	0.082	0.070	99
2014	0.026	0.075	0.061	100
2015	0.028	0.078	0.065	97
2016	0.028	0.078	0.066	99
2017	0.029	0.076	0.066	98
2018	0.029	0.076	0.066	94
* Based on a limited number of samples.				

OZONE				
COACHLINE[2,3]	**Annual Average (ppm)**	**Highest 1- Hour Average (ppm)**	**4th Highest 8-Hour Average (ppm)**	**% Data Recovery**
YEAR				
2001	0.026*	0.078		74
2002	0.024	0.090		99
2003	0.022	0.078	0.061	99
2004	0.023	0.074	0.068	97
2005	0.024	0.075	0.066	99
2006	0.026	0.083	0.071	99
2007	0.025	0.077	0.064	99
2008	0.027	0.080	0.068	99
2009	0.027	0.082	0.062	99
2010	0.025	0.072	0.063	99
2011	0.026	0.072	0.065	99
2012	0.026	0.072	0.066	99
2013	0.029	0.080	0.066	99
2014	0.025	0.071	0.062	100
2015	0.027	0.067	0.062	99
2016	0.026	0.067	0.060	99
2017	0.029	0.076	0.069	98
2018	0.028	0.079	0.070	97

* Annual average based on a limited number of samples.
2 Special Purpose site or Other
3 Monitoring began 03/22/2001
4 Monitoring began 04/01/2002

OZONE				
ARTHUR PACK[1]	**Annual Average (ppm)**	**1- Hour Average (ppm)**		**% Data Recovery**
		1st Maximum	**2nd Maximum**	
YEAR				
1979	0.033*	0.104	0.097	55
1980	0.033	0.092	0.088	79
1981	0.035	0.095	0.090	89
1982	0.033	0.117	0.104	76
1983	0.027*	0.090	0.088	51
1984	0.027*	0.069	0.067	18
SILVERBELL[2]				
1989	0.027	0.094	0.083	80
1990	0.027*	0.079	0.074	39

* Annual average based on a limited number of samples.
1 Arther Pack closed 1985
2 Silverbell closed June 30, 1990.

OZONE				
GREEN VALLEY[1]	**Annual Average (ppm)**	**Highest 1- Hour Average (ppm)**	**4th Highest 8-Hour Average (ppm)**	**% Data Recovery**
YEAR				
2002	0.035*	0.089		76
2003	0.034	0.082	0.066	99
2004	0.032	0.075	0.066	99
2005	0.032	0.081	0.068	98
2006	0.034	0.083	0.070	99
2007	0.033	0.085	0.065	98
2008	0.034	0.069	0.064	99
2009	0.035	0.080	0.065	96
2010	0.035	0.077	0.066	99
2011	0.037	0.079	0.071	99
2012	0.036	0.078	0.070	99
2013	0.035	0.079	0.069	98
2014	0.032	0.073	0.065	99
2015	0.030	0.064	0.059	97
2016	0.034	0.074	0.066	98
2017	0.035	0.078	0.067	99
2018	0.033	0.070	0.065	99

* Annual average based on a limited number of samples.
1 Monitoring began 04/01/2002

OZONE				
SABINO CANYON [1]	**Annual Average (ppm)**	**1- Hour Average (ppm)**		**% Data Recovery**
		1st Maximum	**2nd Maximum**	
Year				
1986	--	0.094	0.085	--
1987	--	0.082	0.078	--
1988	0.029	0.081	0.080	67
1989	0.031	0.094	0.089	81
1990	0.035	0.092	0.088	85
1991	0.030	0.084	0.082	93
1992	0.028	0.090	0.075	97
1993	0.028	0.096	0.081	99
1994	0.027	0.081	0.077	100
1995	0.026	0.078	0.077	97
1996	0.031	0.077	0.076	75
POMONA [2]				
1980	0.025*	0.108	0.106	74
1981	0.028	0.095	0.095	89
1982	0.029	0.130	0.124	89
1983	0.025	0.121	0.108	80
1984	0.026	0.113	0.101	88
1985	0.025	0.110	0.103	92
1986	0.021	0.084	0.082	87
1987	0.022	0.119	0.087	85
1988	0.021	0.087	0.086	92
1989	0.026	0.094	0.088	75
1990	0.026	0.098	0.093	94
1991	0.025	0.082	0.079	95
1992	0.022	0.086	0.084	94
1993	0.023	0.093	0.089	98
1994	0.024	0.086	0.085	98
1995	0.024	0.102	0.097	98
1996	0.030	0.093	0.091	98

* Annual average based on a limited number of samples.
[1] Sabino Canyon closed June 1996
[2] Pomona closed August 1996

NITROGEN DIOXIDE				
22nd / CRAYCROFT				
YEAR	**Annual Average (ppm)**	**Maximum 1-Hour Average (ppm)**	**Maximum 24-Hour Average (ppm)**	**% Data Recovery**
1975	0.028	0.120	0.060	88
1976	0.027	0.130	0.056	89
1977	0.026	0.120	0.050	95
1978	0.022	0.090	0.049	78
1979	0.015	0.070	0.038	56
1980	0.023	0.170	0.062	71
1981	0.029	0.240	0.060	82
1982	0.021	0.140	0.058	82
1983	0.020	0.120	0.042	90
1984	0.019	0.130	0.071	86
1985	0.016	0.100	0.035	94
1986	0.019	0.160	0.050	52
1987	0.019	0.194	0.060	76
1988	0.017	0.125	0.038	90
1989	0.018	0.088	0.045	96
1990	0.019	0.114	0.049	93
1991	0.018	0.075	0.074	92
1992	0.016	0.068	0.038	98
1993	0.018	0.069	0.038	93
1994	0.019	0.073	0.038	96
1995	0.019	0.071	0.038	89
1996	0.018	0.068	0.036	94
1997	0.019	0.068	0.034	99
1998	0.017	0.059	0.037	98
1999	0.018	0.063	0.036	99
2000	0.017	0.075	0.035	97
2001	0.015	0.060	0.031	93
2002	0.017	0.062	0.034	98
2003	0.017	0.062	0.036	97
2004	0.015	0.059	0.031	99
2005	0.015	0.056	0.031	99
2006	0.016	0.051	0.029	99
2007	0.013	0.058	0.056	99
2008	0.013	0.054	0.028	98
2009	0.012	0.050	0.028	99

NITROGEN DIOXIDE				
22nd / CRAYCROFT				
YEAR	**Annual Average (ppb)**	**Maximum 1-Hour Average (ppb)**	**98th Percentile Value**	**% Data Recovery**
2010	11.6	63.7	46.2	99
2011	12.0	50.5	47.0	99
2012	11.1	51.6	47.0	98
2013	9.68	48.1	43.7	99
2014	9.64	47.6	42.8	99
2015	8.56	45.4	40.4	97
2016	8.17	37.7	33.5	96
2017	8.42	44.5	37.4	98
2018	8.36	45.6	41.2	98
2010 Nitrogen Dioxide reported in parts per billion (ppb)				

NITROGEN DIOXIDE				
CHILDREN'S PARK				
YEAR	**Annual Average (ppm)**	**Maximum 1-Hour Average (ppm)**	**Maximum 24-Hour Average (ppm)**	**% Data Recovery**
1998	0.016*	0.061	0.036	64
1999	0.019	0.070	0.036	92
2000	0.016	0.062	0.033	99
2001	0.017	0.058	0.031	99
2002	0.017	0.062	0.034	98
2003	0.017	0.056	0.034	98
2004	0.016	0.063	0.033	99
2005	0.015	0.049	0.029	99
2006	0.015	0.054	0.033	98
2007	0.013	0.049	0.049	92
2008	0.011	0.049	0.027	96
2009	0.010	0.043	0.025	96

NITROGEN DIOXIDE				
CHILDREN'S PARK				
YEAR	**Annual Average (ppb)**	**Maximum 1-Hour Average (ppb)**	**98th Percentile Value**	**% Data Recovery**
2010	10.0	45.0	40.0	97
2011	11.6	46.1	42.2	97
2012	13.4	46.4	44.4	80
2013	10.9	44.6	39.7	99
2014	11.2	42.2	40.0	83
2015	8.83	40.7	35.7	99
2016	7.62	45.7	32.8	98
2017	8.32	42.6	36.0	99
2018	8.14	43.6	35.7	99
2010 Nitrogen Dioxide reported in parts per billion (ppb)				

NITROGEN DIOXIDE				
DOWNTOWN				
YEAR	**Annual Average (ppm)**	**Maximum 1-Hour Average (ppm)**	**Maximum 24-Hour Average (ppm)**	**% Data Recovery**
1975	0.032	0.250	0.084	55
1976	0.027	0.240	0.073	99
1977	0.032	0.150	0.057	95
1978	0.031	0.230	0.074	97
1979	0.025*	0.140	0.052	65
1980	0.036*	0.220	0.128	84
1981	0.037	0.210	0.076	95
1982	0.036	0.270	0.111	83
1983	0.032	0.240	0.111	33
1984	0.026	0.120	0.048	52
1985	0.024	0.110	0.044	48
1986	0.023	0.083	0.054	61
1987	**	--	--	--
1988	--	--	--	--
1989	0.027*	0.079	0.043	26
1990	0.027*	0.116	0.047	28
1991	0.024*	0.056	0.045	5
1992	0.025	0.092	0.043	97
1993	0.028	0.074	0.042	67
1994	site closed			

* Annual average based on a limited number of samples.
** Site discontinued in 1987, restarted in 1989.

NITROGEN DIOXIDE				
SILVERBELL[2]				
YEAR	**Annual Average (ppm)**	**Maximum 1-Hour Average (ppm)**	**Maximum 24-Hour Average (ppm)**	**% Data Recovery**
1989	0.020	0.089	0.041	69
1990	0.020*	0.073	0.033	45
POMONA[1]				
1988	-- *	0.080	0.039	56
1989	0.023	0.093	0.056	68
1990	0.022	0.097	0.042	83
1991	0.024*	0.095	0.085	56
1992	0.023	0.092	0.054	91
1993	0.022	0.081	0.044	91
1994	0.021	0.095	0.041	98
1995	0.020	0.078	0.038	99
1996	0.019*	0.075	0.037	58
SAGUARO PARK EAST[3]				
2001	0.006*	0.039	0.024	67

* Annual average based on a limited number of samples.
1 Pomona site discontinued August 1996.
2 Silverbell site discontinued 1991
3 Monitoring only from 04/10/2001 to 12/10/2001

NON-METHANE HYDROCARBONS
State and Federal Standard
Primary & Secondary
3-Hour Average (6 - 9 a.m.) 160 mg/m^3

DOWNTOWN					
Year	**Annual Average**	**Maximum 3-Hour**	**2nd Maximum 3-Hour**	**# of Exceedances of Standards**	**% Data Recovery**
1975	149	828	806	136	82
1976	113	806	532	96	78
1977	86	435	436	51	74
1978	115*	604	414	89	67
1979	136*	534	519	116	64
1980	73*	399	364	37	74
1981	136*	676	589	76	43
1982	140*	523	469	28	17
1983	**	--	--	--	--

* Annual average based on limited number of samples.
** Non-methane hydrocarbons monitoring discontinued in February 1983, when Federal Standard was rescinded.

SULFUR DIOXIDE State and Federal Standards Primary and Secondary				
	Primary Annual Average 0.03 ppm	**Primary 24-Hour Average 0.14 ppm**	**Secondary 3-Hour Average 0.50 ppm**	
DOWNTOWN				
Year	**Annual Average**	**Maximum 24-Hour**	**Maximum 3-Hour**	**% Data Recovery**
1973	--	--	--	--
1974	0.004*	0.035	0.016	28
1975	0.003	0.097	0.036	85
1976	0.003	0.070	0.021	91
1977	0.003	0.053	0.022	83
1978	0.002	0.060	0.016	77
1979	0.002	0.044	0.012	81
1980	0.001	0.040	0.010	82
1981	0.002*	0.050	0.013	29
1982	SITE DISCONTINUED			
TANQUE VERDE LOOP				
1975	0.004*	0.015	0.050	21
1976	0.002	0.042	0.100	80
1977	0.001	0.026	0.120	95
1978	0.001*	0.014	0.070	73
1979	0.001	0.011	0.037	86
1980	0.002*	0.021	0.060	51
1981	0.002	0.027	0.133	86
1982	0.002*	0.015	0.073	45
1983	0.003	0.028	0.040	69
1984	0.001	0.008	0.023	61
1985	0.001	0.008	0.020	25
1986	SITE DISCONTINUED			
NOTE : Total sulfur reported as Sulfur Dioxide equivalent. * Annual average based on limited number of samples.				

SULFUR DIOXIDE				
22ND / CRAYCROFT				
Year	**Annual Average (ppm)**	**Maximum 24-Hour (ppm)**	**Maximum 3-Hour (ppm)**	**% Data Recovery**
1975	0.001	0.019	0.060	88
1976	0.002	0.015	0.053	90
1977	0.002	0.020	0.057	81
1978	0.001	0.014	0.053	93
1979	0.002	0.020	0.080	97
1980	0.001	0.013	0.030	81
1981	0.003	0.024	0.083	92
1982	0.002*	0.019	0.060	50
1983	0.001	0.016	0.070	95
1984	0.003	0.028	0.060	85
1985	0.005	0.025	0.090	97
1986	0.004	0.016	0.031	70
1987	0.003	0.013	0.061	69
1988	0.002	0.011	0.077	65
1989	0.002	0.007	0.013	78
1990	0.002	0.008	0.020	97
1991	0.002	0.009	0.015	97
1992	0.002	0.007	0.061	98
1993	0.002	0.005	0.022	97
1994	0.002	0.004	0.010	85
1995	0.001	0.004	0.012	98
1996	0.001	0.004	0.009	98
1997	0.002	0.005	0.015	87
1998	0.002	0.005	0.016	99
1999	0.002	0.005	0.012	97
2000	0.002	0.008	0.011	97
2001	0.001	0.003	0.006	99
2002	0.001	0.004	0.019	99
2003	0.001	0.004	0.013	99
2004	0.001	0.006	0.012	99
2005	0.001	0.004	0.010	99
2006	0.001	0.004	0.009	99
2007	0.001	0.003	0.013	99
2008	0.001	0.004	0.014	99
2009	0.001	0.002	0.005	99
2010 **	0.001	0.002	0.007	99
NOTE :Total sulfur reported as Sulfur Dioxide equivalent. * Annual average based on limited number of samples. ** Monitoring discontinued December, 2010.				

SULFUR DIOXIDE					
CHILDREN'S PARK NCore					
Year	**Annual Average (ppb)**	**Maximum 1-Hour. (ppb)**	**Maximum 24-Hour (ppb)**	**99th Percentile (ppb)**	**% Data Recovery**
2010*	0.22	3.0	1.1	3.0	96
2011	0.28	12.4	1.4	5.9	97
2012	0.20	6.8	1.0	4.3	98
2013	0.24	7.5	1.1	6.6	99
2014	0.20	9.6	1.1	5.6	95
2015	0.16	5.1	0.8	4.6	98
2016	0.08	3.2	0.4	1.3	99
2017	0.10	3.8	0.7	1.9	99
2018	0.13	5.1	1.5	2.3	98
Sampling began October 1, 2010 * Averages based on limited number of samples.					

SULFUR DIOXIDE				
Green Valley[1,2]				
Year	**Annual Average (ppm)**	**Maximum 24-Hour (ppm)**	**Maximum 3-Hour (ppm)**	**% Data Recovery**
2001	.000	.000	.002	38
1 Special Purpose site 2 Monitoring discontinued 05/21/2001, Averages based on limited number of samples.				

WATER SOLUBLE SULFATES**													
No State or Federal Standards							Annual Average in µg/m3						
Site	'88	'89	'86	'85	'84	'83	'82	'81	'80	'79	'78	'77	'76
Downtown*	--	--	--	--	4.9	4.9	3.5	4.7	4.1	4.3	5.1	5.1	4.5
South Tucson	3.9	4.2	5.1	5.2	5.0	5.3	3.4	5.5	4.3	4.4	5.4	5.6	4.6
Prince Rd.	3.8	5.1	7.4	5.2	4.9	5.3	3.8	4.7	4.6	4.3	5.7	5.4	--
Davis Monthan*	--	--	--	--	--	--	--	5.4	4.6	4.1	5.6	5.1	4.6
Corona de Tucson	2.7	3.4	4.1	3.2	4.3	3.4	2.1	--	--	--	--	--	--
Green Valley	3.3	4.3	4.7	4.3	5.3	3.5	2.4	4.3	3.4	3.8	4.2	4.0	3.8
Orange Grove	4.4	4.3	5.2	4.5	4.4	5.0	3.8	5.6	4.3	5.3	5.6	5.1	4.8
Alvernon / Ft. Lowell*	--	--	--	4.5	4.3	5.0	3.4	4.6	4.7	3.9	5.7	5.4	4.8

* Davis Monthan Site discontinued in 1982.
Downtown Site discontinued in 1985.
Alvernon / Ft. Lowell Site discontinued 1986.
** Discontinued sampling in 12/88.