



Pima County

Department of Environmental Quality

Air Monitoring Division

Beryllium Monitoring Network Summary

3rd Quarter 2007



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Summary

The Beryllium monitoring network was established, all samplers calibrated, and initial test runs completed on July 6th, 2007. Sampling began on July 11th, 2007. Training of SUSD personnel on field operations began the week of July 16th and continued through August 17th for a total of 8 training sessions. The training consisted of sampler setup; to include chart recorder operations/adjustments, mechanical timer setup/adjustments, bounce plate servicing, filter installation and retrieval, site documentation and chain-of-custody procedures.

For the 3rd quarter of 2007 there were a total of 96 samples collected. Of the 96 collected samples, 89 were valid and 7 invalid; for a data recovery of 92.7%. There were 4 samples collected for use as precision checks. As recommended in *40 CFR, Part 58, Appendix A, Section 5.3.1*, collocated measurement pairs are selected for use in the precision calculations only when both measurement pairs are above 20 $\mu\text{g}/\text{m}^3$.

The proceeding pages display the sampling dates, sampling locations, PM₁₀ concentrations ($\mu\text{g}/\text{m}^3$) calculated in standard conditions, 24-hour NAAQS standard and a brief explanation of all invalid samples for each month of the 3rd quarter.

PM₁₀ Concentrations

Monthly Summary of PM₁₀ Data Compared to Standards

July - 2007

Date	Location	PM ₁₀ ($\mu\text{g}/\text{m}^3$)	24-hour NAAQS PM ₁₀ ($\mu\text{g}/\text{m}^3$)
7/11/07	Ocotillo #1	15.3	150
7/11/07	Ocotillo #2	21.1	150
7/12/07	Los Amigos	INVALID	150
7/13/07	Los Niños	17.4	150
7/14/07	Chaparral M.S.	18.3	150
7/15/07	Transportation Bldg	16.4	150
7/16/07	Sunnyside H.S.	25.7	150
7/17/07	Ocotillo #1	13.4	150
7/17/07	Ocotillo #2	18.0	150
7/18/07	Los Amigos	25.3	150
7/19/07	Los Niños	33.5	150
7/20/07	Chaparral M.S.	12.6	150
7/21/07	Transportation Bldg	8.7	150
7/22/07	Sunnyside H.S.	10.3	150
7/23/07	Ocotillo #1	INVALID	150
7/23/07	Ocotillo #2	INVALID	150
7/24/07	Los Amigos	10.7	150
7/25/07	Los Niños	12.0	150
7/26/07	Chaparral M.S.	10.1	150
7/27/07	Transportation Bldg	19.2	150
7/28/07	Sunnyside H.S.	9.7	150
7/29/07	Ocotillo #1	14.0	150
7/29/07	Ocotillo #2	14.1	150
7/30/07	Los Amigos	16.7	150
7/31/07	Los Niños	12.0	150

- Sample running on 7/12/07 invalid due to equipment malfunction.
- Samples running on 7/23/07 invalid due to power outage caused by storm.

Monthly Summary of PM₁₀ Data Compared to Standards

August - 2007

Date	Location	PM ₁₀ (µg/m ³)	24-hour NAAQS PM ₁₀ (µg/m ³)
8/1/07	Chaparral M.S.	8.8	150
8/2/07	Transportation Bldg	13.5	150
8/3/07	Sunnyside H.S.	18.5	150
8/4/07	Ocotillo #1	INVALID	150
8/4/07	Ocotillo #2	INVALID	150
8/5/07	Los Amigos	INVALID	150
8/6/07	Los Niños	6.6	150
8/7/07	Chaparral M.S.	21.3	150
8/8/07	Transportation Bldg	20.7	150
8/9/07	Sunnyside H.S.	38.8	150
8/10/07	Ocotillo #1	24.2	150
8/10/07	Ocotillo #2	27.3	150
8/11/07	Los Amigos	16.2	150
8/12/07	Los Niños	17.3	150
8/13/07	Chaparral M.S.	22.1	150
8/14/07	Transportation Bldg	25.6	150
8/15/07	Sunnyside H.S.	27.7	150
8/16/07	Ocotillo #1	23.3	150
8/16/07	Ocotillo #2	24.7	150
8/17/07	Los Amigos	26.2	150
8/18/07	Los Niños	25.1	150
8/19/07	Chaparral M.S.	29.9	150
8/20/07	Transportation Bldg	21.4	150
8/21/07	Sunnyside H.S.	31.1	150
8/22/07	Ocotillo #1	26.9	150
8/22/07	Ocotillo #2	29.9	150
8/23/07	Los Amigos	INVALID	150
8/24/07	Los Niños	25.2	150
8/25/07	Chaparral M.S.	15.9	150
8/26/07	Transportation Bldg	10.9	150
8/27/07	Sunnyside H.S.	22.0	150
8/28/07	Ocotillo #1	18.6	150
8/28/07	Ocotillo #2	21.3	150
8/29/07	Los Amigos	23.3	150
8/30/07	Los Niños	18.5	150
8/31/07	Chaparral M.S.	15.7	150

- Samples running on 8/4/07 invalid due to power outage caused by storm.
- Sample running on 8/5/07 invalid due to ink spot transferred from chart recorder onto filter.
- Sample running on 8/23/07 invalid due to sampler hood being left open.

Monthly Summary of PM₁₀ Data Compared to Standards

September - 2007

Date	Location	PM ₁₀ (µg/m ³)	24-hour NAAQS PM ₁₀ (µg/m ³)
9/1/07	Transportation Bldg	12.8	150
9/2/07	Sunnyside H.S.	14.8	150
9/3/07	Ocotillo #1	13.7	150
9/3/07	Ocotillo #2	15.4	150
9/4/07	Los Amigos	23.8	150
9/5/07	Los Niños	25.8	150
9/6/07	Chaparral M.S.	10.2	150
9/7/07	Transportation Bldg	7.7	150
9/8/07	Sunnyside H.S.	20.0	150
9/9/07	Ocotillo #1	14.7	150
9/9/07	Ocotillo #2	17.4	150
9/10/07	Los Amigos	16.4	150
9/11/07	Los Niños	14.8	150
9/12/07	Chaparral M.S.	17.2	150
9/13/07	Transportation Bldg	23.6	150
9/14/07	Sunnyside H.S.	36.4	150
9/15/07	Ocotillo #1	INVALID	150
9/15/07	Ocotillo #2	27.1	150
9/16/07	Los Amigos	9.4	150
9/17/07	Los Niños	16.2	150
9/18/07	Chaparral M.S.	15.6	150
9/19/07	Transportation Bldg	13.4	150
9/20/07	Sunnyside H.S.	20.0	150
9/21/07	Ocotillo #1	9.4	150
9/21/07	Ocotillo #2	8.9	150
9/22/07	Los Amigos	10.0	150
9/23/07	Los Niños	22.5	150
9/24/07	Chaparral M.S.	26.4	150
9/25/07	Transportation Bldg	18.1	150
9/26/07	Sunnyside H.S.	31.4	150
9/27/07	Ocotillo #1	30.6	150
9/27/07	Ocotillo #2	29.5	150
9/28/07	Los Amigos	29.7	150
9/29/07	Los Niños	22.1	150
9/30/07	Chaparral M.S.	16.6	150

- Sample running on 8/15/07 invalid due to corner of filter missing resulting in an invalid gross representation weight.

Audit Results

Audits were performed on all of the samplers with the audit flow rate percent difference being below 5% for all samplers. If the audit flow rate percent difference is $\leq \pm 10\%$, the sampler calibration is accepted. Differences exceeding $\pm 10\%$ require sampler recalibration. Differences exceeding $\pm 15\%$ will result in invalidation of all data subsequent to the last calibration or valid flow check. The proceeding pages display the audit results for each sampling location.

AUDIT SPREADSHEET FOR PARTICULATES

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
June	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

Sampler: Chaparral M.S. **Ts =** 293.8
Audit Date: 09/27/07 **Ps =** 694.5
Motor: 1416 **Temp c =** 34.80
Temp f: 94.64 **Ta =** 307.8
Press: 27.203 **Pa =** 691.0
Altim: 29.865 **Orifice Calibration Relationship**
 m= 1.31823 b= -0.05678

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.95	37.1	1.52	0.82
13	3.32	34.1	1.17	0.72
10	2.72	31.0	0.86	0.62
7	1.80	25.5	0.41	0.43
5	1.15	20.7	0.14	0.25

Orifice dH2O 2.588
 Sample dPex 0.8
 Orifice Qa(m3/m) 0.857593
 Sample Qa dPex 30.70715

Audit flow rate % diff: 4.12 %

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.588	30.27	0.86

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.82	31.53	0.89

Sampler Audit Relationship		
m =	0.035	
b =	-0.469	
r =	1.000	
	pm10	tsp
Set Point (cfm)	42.1	52.7
Set Point (H20)	2.3	4.2

AUDIT SPREADSHEET FOR PARTICULATES

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
June	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

Sampler: Sunnyside H.S. **Ts =** 293.8
Audit Date: 09/27/07 **Ps =** 694.5
Motor: 1418 **Temp c =** 31.30
Temp f: 88.34 **Ta =** 304.3
Press: 27.282 **Pa =** 693.0
Altim: 29.950 **Orifice Calibration Relationship**
 m= 1.31823 b= -0.05678

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	4.29	38.3	2.46	1.04
13	3.60	35.2	2.11	0.96
10	2.98	32.2	1.79	0.89
7	1.98	26.5	1.24	0.74
5	1.27	21.5	0.85	0.61

Orifice dH2O 2.824
 Sample dPex 1.7
 Orifice Qa(m3/m) 0.887847
 Sample Qa dPex 31.27970

Audit flow rate % diff: 4.93 %

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.824	31.34	0.89

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.69	32.90	0.93

Sampler Audit Relationship		
m =	0.026	
b =	0.059	
r =	1.000	
	pm10	tsp
Set Point (cfm)	41.5	51.9
Set Point (H20)	2.9	4.4

AUDIT SPREADSHEET FOR PARTICULATES

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
June	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

Sampler: Los Amigos **Ts =** 293.8
Audit Date: 09/27/07 **Ps =** 694.5
Motor: 1419 **Temp c =** 34.00
Temp f: 93.20 **Ta =** 307.0
Press: 27.283 **Pa =** 693.0
Altim: 29.951 **Orifice Calibration Relationship**
 m= 1.31823 b= -0.05678

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.49	34.8	1.55	0.83
13	2.90	31.9	1.28	0.75
10	2.40	29.1	0.98	0.66
7	1.62	24.2	0.62	0.52
5	1.05	19.8	0.30	0.36

Orifice dH2O 2.292
 Sample dPex 0.9
 Orifice Qa(m3/m) 0.807483
 Sample Qa dPex 28.67115

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.292	28.50	0.81

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.95	29.68	0.84

Sampler Audit Relationship		
m =	0.031	
b =	-0.234	
r =	0.997	
	pm10	tsp
Set Point (cfm)	41.9	52.4
Set Point (H20)	2.5	4.3

Audit flow rate % diff: 4.08 %

AUDIT SPREADSHEET FOR PARTICULATES

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
June	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

Sampler: Los Niños **Ts =** 293.8
Audit Date: 09/27/07 **Ps =** 694.5
Motor: 1421 **Temp c =** 35.80
Temp f: 96.44 **Ta =** 308.8
Press: 27.203 **Pa =** 691.0
Altim: 29.865 **Orifice Calibration Relationship**
 m= 1.31823 b= -0.05678

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.50	35.0	1.48	0.81
13	2.97	32.4	1.20	0.73
10	2.47	29.7	0.93	0.64
7	1.65	24.5	0.55	0.50
5	1.07	20.0	0.28	0.35

Orifice dH2O 2.332
 Sample dPex 0.9
 Orifice Qa(m3/m) 0.817514
 Sample Qa dPex 29.04752

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.332	28.86	0.82

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.89	30.03	0.95

Sampler Audit Relationship		
m =	0.031	
b =	-0.257	
r =	1.000	
	pm10	tsp
Set Point (cfm)	42.3	52.8
Set Point (H20)	2.4	4.1

Audit flow rate % diff: 4.02 %

AUDIT SPREADSHEET FOR PARTICULATES

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
June	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

Sampler: Ocotillo #1 **Ts =** 293.8
Audit Date: 09/28/07 **Ps =** 694.5
Motor: 1420 **Temp c =** 28.00
Temp f: 82.40 **Ta =** 301.0
Press: 27.282 **Pa =** 693.0
Altim: 29.950 **Orifice Calibration Relationship**
 m= 1.31823 b= -0.05678

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.50	34.5	1.51	0.81
13	3.01	32.1	1.21	0.72
10	2.40	28.9	0.91	0.63
7	1.61	23.9	0.50	0.47
5	1.06	19.7	0.23	0.32

Orifice dH2O 2.316
 Sample dPex 0.9
 Orifice Qa(m3/m) 0.803942
 Sample Qa dPex 28.63674

Audit flow rate % diff: 4.08 %

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.316	28.38	0.80

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.87	29.55	0.84

Sampler Audit Relationship		
m =	0.033	
b =	-0.327	
r =	0.999	
	pm10	tsp
Set Point (cfm)	41.1	51.3
Set Point (H2O)	2.4	4.3

AUDIT SPREADSHEET FOR PARTICULATES

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
June	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

Sampler: Ocotillo #2 **Ts =** 293.8
Audit Date: 09/28/07 **Ps =** 694.5
Motor: 1417 **Temp c =** 29.80
Temp f: 85.64 **Ta =** 302.8
Press: 27.282 **Pa =** 693.0
Altim: 29.950 **Orifice Calibration Relationship**
 m= 1.31823 b= -0.05678

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.40	34.2	1.48	0.80
13	2.86	31.5	1.25	0.74
10	2.36	28.7	0.98	0.65
7	1.56	23.6	0.63	0.52
5	1.03	19.5	0.36	0.40

Orifice dH2O 2.242
 Sample dPex 0.9
 Orifice Qa(m3/m) 0.7939225
 Sample Qa dPex 28.114604

Audit flow rate % diff: 4.28 %

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.242	28.03	0.79

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.94	29.23	0.83

Sampler Audit Relationship		
m =	0.028	
b =	-0.138	
r =	0.999	
	pm10	tsp
Set Point (cfm)	41.3	51.6
Set Point (H2O)	2.3	3.8

AUDIT SPREADSHEET FOR PARTICULATES

Month	Ts	Ps
Jan	288.8	693.9
Feb	292.4	693.2
Mar	296.0	692.8
Apr	298.9	692.9
May	300.6	692.9
June	300.3	693.4
Jul	297.6	694.0
Aug	293.8	694.5
Sep	290.1	694.9
Oct	287.2	695.3
Nov	285.8	695.2
Dec	286.5	694.7

Sampler: Transportation **Ts =** 293.8
Audit Date: 09/27/07 **Ps =** 694.5
Motor: 1422 **Temp c =** 31.30
Temp f: 88.34 **Ta =** 304.3
Press: 27.283 **Pa =** 693.0
Altim: 29.951 **Orifice Calibration Relationship**
 m= 1.31823 b= -0.05678

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.10	32.8	1.36	0.77
13	2.59	30.1	1.10	0.70
10	2.15	27.5	0.88	0.62
7	1.45	22.9	0.57	0.50
5	0.92	18.5	0.34	0.39

Orifice dH2O 2.042
 Sample dPex 0.9
 Orifice Qa(m3/m) 0.761411
 Sample Qa dPex 26.9508

Audit flow rate % diff: 4.28 %

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.042	26.88	0.76

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.85	28.04	0.79

Sampler Audit Relationship		
m =	0.027	
b =	-0.118	
r =	0.999	
	pm10	tsp
Set Point (cfm)	41.5	51.6
Set Point (H20)	2.3	3.8