



MEMORANDUM

Pima County Department of Environmental Quality

DATE: July 28, 2009

TO: Raul Ochoa
Assistant Superintendent Operations & Facilities Planning

FROM: Teresa Sobolewski
Environmental Manager

RE: Pima County DEQ Beryllium Monitoring Report 4th Quarter 2008

Attached is the Pima County Department of Environmental Quality's (PDEQ) Air Monitoring Division Beryllium Monitoring Network Summary for the 4th Quarter of 2008.

Highlights:

- 110 samples collected resulting in 98 valid and 12 invalid samples (89.1% data recovery). EPA requires monitoring data recovery at 75%.
- No beryllium values were detected over the Practical Quantitation Limit (PQL).

For additional information on this report, please contact me at Pima County Department of Environmental Quality at (520) 740-3340.

Attachment

Cc: Ursula Kramer, Pima County Department of Environmental Quality Director
Richard Grimaldi, Pima County Department of Environmental Deputy Director



Pima County

Department of Environmental Quality

Air Monitoring Division

Beryllium Monitoring Network Summary

4th Quarter 2008



*Pima County Department of Environmental Quality
150 West Congress St., Suite 109
Tucson, Arizona 85701*

Summary

The Pima County Department of Environmental Quality has contracted with the Pima County regional Wastewater Reclamation Department (RWRD) to perform analysis on filters sampled in the Beryllium Monitoring Network located in the Sunnyside Unified School District. The Pima County RWRD will analyze all filters collected from June 1, 2008 and forward.

For the 4th quarter of 2008 there was a total of 110 samples collected (including three field blanks) resulting in 98 valid and 12 invalid samples; for a data recovery of 89.1%. Fourteen samples were collected to be used as precision checks as recommended in *40 CFR, Part 58, Appendix A, Section 5.3.1*. All samples run for a 24-hour period as specified in *40 CFR, Part 50, Appendix B*.

There were a total of 98 samples (including three field blanks) analyzed for beryllium. Beryllium concentrations are reported as $<0.265 \text{ ng/m}^3$ PQL (Practical Quantitation Limits). In the preamble to a November 13, 1985 rulemaking (50 CFR 46906), the PQL was defined as “the lowest concentration of an analyte that can be reliably measured within specific limits of precision and accuracy during routine laboratory operating conditions”. The Agency has used the PQL to estimate or evaluate the minimum concentration at which most laboratories can be expected to reliably measure a specific chemical contaminant during day-to-day analysis.

The following pages display the sampling dates, sampling locations, PM_{10} concentrations ($\mu\text{g/m}^3$) calculated in standard conditions, PM_{10} 24-hour NAAQS standard, precision measurements, Beryllium analysis results, accompanying graphs and a brief explanation of all invalid samples for the first two months of the 4th quarter of 2008.

PM₁₀ /Beryllium Concentrations

Monthly Summary of PM₁₀/Beryllium Data

October - 2008

Date	Location	Standard Concentration PM ₁₀ (µg/m ³)	24-hour NAAQS PM ₁₀ (µg/m ³)	Beryllium (ng/m ³)
10/01/08	Transportation Bldg	30.2	150	<0.265
10/02/08	Sunnyside H.S.	40.6	150	<0.265
10/03/08	Ocotillo #1	19.1	150	<0.265
10/03/08	Ocotillo #2	17.9	150	<0.265
10/04/08	Los Amigos	53.2	150	<0.265
10/05/08	Los Niños	INVALID	150	INVALID*
10/06/08	Chaparral M.S.	INVALID	150	INVALID*
10/07/08	Transportation Bldg	INVALID	150	INVALID*
10/08/08	Sunnyside H.S.	30.8	150	<0.265
10/09/08	Ocotillo #1	24.7	150	<0.265
10/09/08	Ocotillo #2	31.5	150	<0.265
10/10/08	Los Amigos	39.8	150	<0.265
10/11/08	Los Niños	INVALID	150	INVALID*
10/12/08	Chaparral M.S.	23.2	150	<0.265
10/13/08	Transportation Bldg	23.2	150	<0.265
10/14/08	Sunnyside H.S.	35.3	150	<0.265
10/15/08	Ocotillo #1	20.7	150	<0.265
10/15/08	Ocotillo #2	21.2	150	<0.265
10/16/08	Los Amigos	28.8	150	<0.265
10/17/08	Los Niños	INVALID	150	INVALID*
10/18/08	Chaparral M.S.	21.6	150	<0.265
10/19/08	Transportation Bldg	14.5	150	<0.265
10/20/08	Sunnyside H.S.	25.6	150	<0.265
10/21/08	Ocotillo #1	22.2	150	<0.265
10/21/08	Ocotillo #2	23.1	150	<0.265
10/22/08	Los Amigos	38.7	150	<0.265
10/23/08	Los Niños	45.9	150	<0.265
10/24/08	Chaparral M.S.	36.2	150	<0.265
10/25/08	Transportation Bldg	30.1	150	<0.265
10/26/08	Sunnyside H.S.	32.8	150	<0.265
10/27/08	Ocotillo #1	71.4	150	<0.265
10/27/08	Ocotillo #2	74.7	150	<0.265
10/28/08	Los Amigos	35.0	150	<0.265
10/29/08	Los Niños	36.8	150	<0.265
10/30/08	Chaparral M.S.	35.6	150	<0.265
10/31/08	Transportation Bldg.	40.1	150	<0.265

Sample running on 10/5/08 invalid due to sampler not running.

Sample running on 10/06/08 invalid due to sampler flow being >36-44 CFM.

Sample running on 10/07/08 invalid due to the sampler running on the wrong day. The mechanical timer was not advanced during filter set-up by SUSD.

Sample running on 10/11/08 invalid due to double exposure caused by SUSD not changing the filters.

Sample running on 10/17/08 invalid due to a power failure.

*Sample invalid for use in Beryllium analysis.

NAAQS = National Ambient Air Quality Standard for PM₁₀

PM₁₀ /Beryllium Concentrations (continued)

Monthly Summary of PM₁₀/Beryllium Data

November - 2008

Date	Location	Standard Concentration PM₁₀ (µg/m³)	24-hour NAAQS PM₁₀ (µg/m³)	Beryllium (ng/m³)
11/01/08	Sunnyside H.S.	33.7	150	<0.265
11/02/08	Ocotillo #1	24.4	150	<0.265
11/02/08	Ocotillo #2	24.9	150	<0.265
11/03/08	Los Amigos	37.3	150	<0.265
11/04/08	Los Niños	38.9	150	<0.265
11/05/08	Chaparral M.S.	35.5	150	<0.265
11/06/08	Transportation Bldg	35.4	150	<0.265
11/07/08	Sunnyside H.S.	44.4	150	<0.265
11/08/08	Ocotillo #1	26.1	150	<0.265
11/08/08	Ocotillo #2	26.2	150	<0.265
11/09/08	Los Amigos	104.9	150	<0.265
11/10/08	Los Niños	127.5	150	<0.265
11/11/08	Chaparral M.S.	33.8	150	<0.265
11/12/08	Transportation Bldg	27.7	150	<0.265
11/13/08	Sunnyside H.S.	37.4	150	<0.265
11/14/08	Ocotillo #1	29.3	150	<0.265
11/14/08	Ocotillo #2	20.1	150	<0.265
11/15/08	Los Amigos	67.5	150	<0.265
11/16/08	Los Niños	30.6	150	<0.265
11/17/08	Chaparral M.S.	INVALID	150	INVALID*
11/18/08	Transportation Bldg	INVALID	150	INVALID*
11/19/08	Sunnyside H.S.	43.7	150	<0.265
11/20/08	Ocotillo #1	42.2	150	<0.265
11/20/08	Ocotillo #2	37.4	150	<0.265
11/21/08	Los Amigos	152.9	150	<0.265
11/22/08	Los Niños	38.4	150	<0.265
11/23/08	Chaparral M.S.	INVALID	150	INVALID*
11/24/08	Transportation Bldg	INVALID	150	INVALID*
11/25/08	Sunnyside H.S.	62.4	150	<0.265
11/26/08	Ocotillo #1	28.7	150	<0.265
11/26/08	Ocotillo #2	25.1	150	<0.265
11/27/08	Los Amigos	7.8	150	<0.265
11/28/08	Los Niños	5.8	150	<0.265
11/29/08	Chaparral M.S.	INVALID	150	INVALID*
11/30/08	Transportation Bldg	19.5	150	<0.265

Samples running on 11/17/08, 11/18/08, 11/23/08, 11/24/08 and 11/29/08 invalid due to double exposure caused by SUSD not changing filters.

*Sample invalid for use in Beryllium analysis.

NAAQS = National Ambient Air Quality Standard for PM₁₀

PM₁₀ /Beryllium Concentrations (continued)

Monthly Summary of PM₁₀/Beryllium Data

December - 2008

Date	Location	Standard Concentration PM₁₀ (µg/m³)	24-hour NAAQS PM₁₀ (µg/m³)	Beryllium (ng/m³)
12/01/08	Sunnyside H.S.	22.2	150	<0.265
12/02/08	Ocotillo #1	16.0	150	<0.265
12/02/08	Ocotillo #2	16.6	150	<0.265
12/03/08	Los Amigos	27.8	150	<0.265
12/04/08	Los Niños	24.2	150	<0.265
12/05/08	Chaparral M.S.	INVALID	150	INVALID*
12/06/08	Transportation Bldg	22.3	150	<0.265
12/07/08	Sunnyside H.S.	24.7	150	<0.265
12/08/08	Ocotillo #1	16.3	150	<0.265
12/08/08	Ocotillo #2	16.0	150	<0.265
12/09/08	Los Amigos	17.1	150	<0.265
12/10/08	Los Niños	22.8	150	<0.265
12/11/08	Chaparral M.S.	92.6	150	<0.265
12/12/08	Transportation Bldg	79.5	150	<0.265
12/13/08	Sunnyside H.S.	129.8	150	<0.265
12/14/08	Ocotillo #1	29.8	150	<0.265
12/14/08	Ocotillo #2	32.7	150	<0.265
12/15/08	Los Amigos	23.0	150	<0.265
12/16/08	Los Niños	15.9	150	<0.265
12/17/08	Chaparral M.S.	14.7	150	<0.265
12/18/08	Transportation Bldg	INVALID	150	INVALID*
12/19/08	Sunnyside H.S.	18.0	150	<0.265
12/20/08	Ocotillo #1	17.8	150	<0.265
12/20/08	Ocotillo #2	17.8	150	<0.265
12/21/08	Los Amigos	18.4	150	<0.265
12/22/08	Los Niños	17.9	150	<0.265
12/23/08	Chaparral M.S.	12.6	150	<0.265
12/24/08	Transportation Bldg	9.0	150	<0.265
12/25/08	Sunnyside H.S.	5.4	150	<0.265
12/26/08	Ocotillo #1	4.7	150	<0.265
12/26/08	Ocotillo #2	4.7	150	<0.265
12/27/08	Los Amigos	13.0	150	<0.265
12/28/08	Los Niños	13.3	150	<0.265
12/29/08	Chaparral M.S.	7.1	150	<0.265
12/30/08	Transportation Bldg	11.6	150	<0.265
12/31/08	Sunnyside H.S.	18.3	150	<0.265

Sample running on 12/05/08 invalid due to double exposure caused by SUSD not changing filters.

Sample running on 12/18/08 invalid due to the sampler running on the wrong day. The mechanical timer was not advanced during filter set-up by SUSD.

*Sample invalid for use in Beryllium analysis.

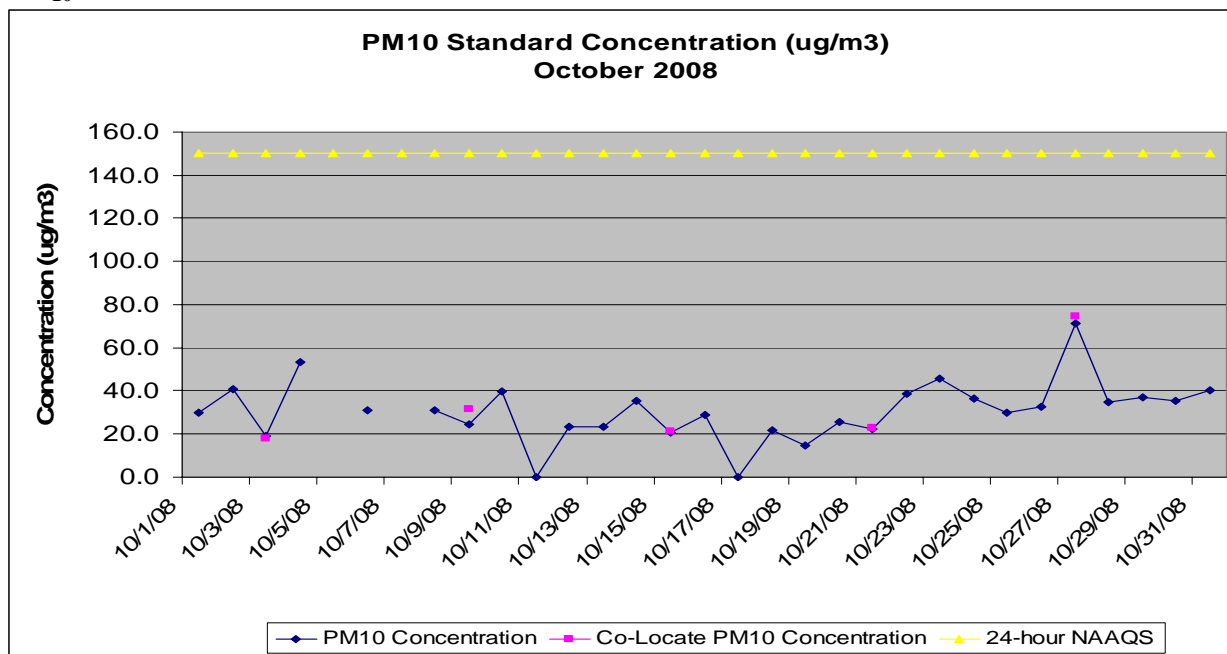
NAAQS = National Ambient Air Quality Standard for PM₁₀

Precision of Duplicate Pairs – PM10

At low concentrations, agreement between the measurements of collocated samplers, expressed as relative percent difference, may be relatively poor. For this reason, collocated measurement pairs are selected for use in the precision and bias calculations only when both measurement pairs are equal to or above $15\mu\text{g}/\text{m}^3$ (40CFR58, Appendix A, Section 4c).

Sample Date	Primary Sampler Number	Measured PM ₁₀ ($\mu\text{g}/\text{m}^3$)	Duplicate Sampler Number	Measured PM ₁₀ ($\mu\text{g}/\text{m}^3$)	Difference ($\mu\text{g}/\text{m}^3$)	Percent Difference %
10/3/08	1	19.1	2	17.9	1.2	-6.49
10/9/08	1	24.7	2	31.5	6.8	24.20
10/15/08	1	20.7	2	21.2	0.5	2.39
10/21/08	1	22.2	2	23.1	0.9	3.97
10/27/08	1	71.4	2	74.7	3.3	4.52
11/2/08	1	24.4	2	24.9	0.5	2.03
11/8/08	1	26.1	2	26.2	0.1	0.38
11/14/08	1	29.3	2	20.1	9.2	-37.25
11/20/08	1	42.2	2	37.4	4.8	-12.06
11/26/08	1	28.7	2	25.1	3.6	-13.38
12/2/08	1	16.0	2	16.6	0.6	3.68
12/8/08	1	16.3	2	16.0	0.3	-1.86
12/14/08	1	29.8	2	32.7	2.9	9.28
12/20/08	1	17.8	2	17.8	0.0	0.00

PM₁₀ Standard Concentration Charts



Sample running on 10/05/08 invalid due to sampler not running.

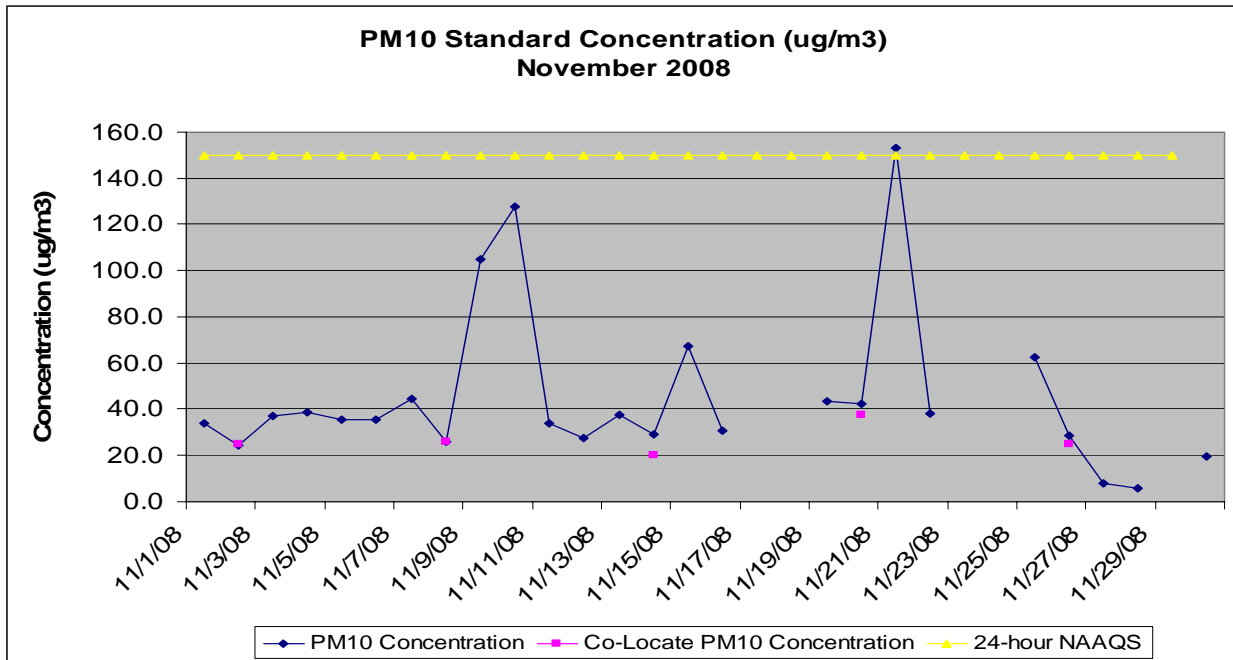
Sample running on 10/06/08 invalid due to sampler flow being >36-44 CFM.

Sample running on 10/07/08 invalid due to the sampler running on the wrong day. The mechanical timer was not advanced during filter set-up by SUSL.

Sample running on 10/11/08 invalid due to double exposure caused by SUSL no changing the filters.

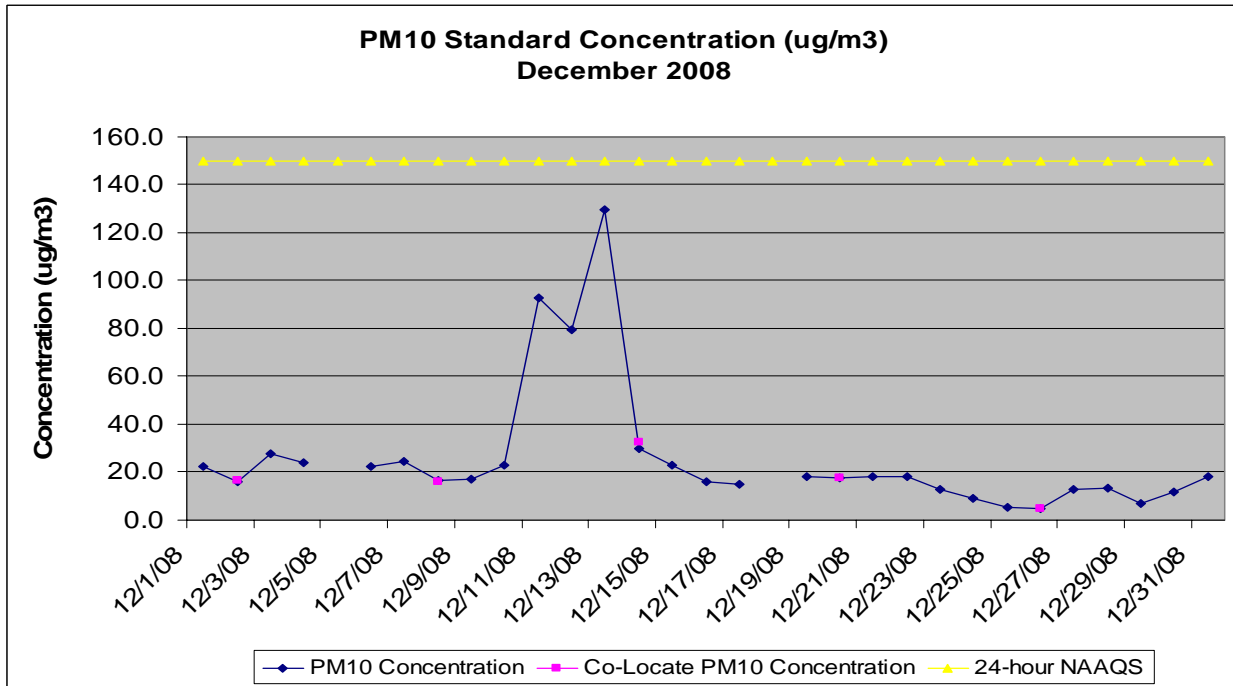
Sample running on 10/17/08 invalid due to a power failure.

NAAQS = National Ambient Air Quality Standard for PM₁₀



Samples running on 11/17/08, 11/18/08, 11/23/08, 11/24/08 and 11/29/08 invalid due to double exposure caused by SUSD not changing filters.

NAAQS = National Ambient Air Quality Standards for PM₁₀



Sample running on 12/05/08 invalid due to double exposure caused by SUSD not changing filters.

Sample running on 12/18/08 invalid due to sampler running on wrong day. The mechanical timer was not advanced during filter set-up by SUSD.

NAAQS = National Ambient Air Quality Standard for PM₁₀

Audit Results

Audits were performed on all of the samplers with the audit flow rate percent difference being below 7% 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 following 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 =** 286.5
Audit Date: 12/19/08 **Ps =** 694.7
Motor: 1424 **Temp c =** 13.70
Temp f: 56.66 **Ta =** 286.7
Press: 27.480 **Pa =** 698.0
Altim: 30.164 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	4.12	36.4	2.23	0.96
13	3.43	33.9	1.89	0.88
10	2.88	30.7	1.59	0.81
7	1.91	25.3	1.05	0.66
5	1.27	20.9	0.81	0.58

Orifice dH2O 2.722
 Sample dPex 1.5
 Orifice Qa(m3/m) 0.846715
 Sample Qa dPex 29.84538

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.722	29.89	0.85

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.51	31.45	0.89

Sampler Audit Relationship		
m =	0.025	
b =	0.039	
r =	0.995	
	pm10	tsp
Set Point (cfm)	39.8	49.8
Set Point (H2O)	2.6	4.1

Audit flow rate % diff: 5.18 %

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 =** 286.5
Audit Date: 12/05/08 **Ps =** 694.7
Motor: 1418 **Temp c =** 18.70
Temp f: 65.66 **Ta =** 291.7
Press: 27.560 **Pa =** 700.0
Altim: 30.250 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	4.14	36.8	2.41	1.00
13	3.50	33.9	2.11	0.94
10	2.90	31.0	1.77	0.86
7	1.98	25.9	1.21	0.71
5	1.28	21.1	0.86	0.60

Orifice dH2O 2.760
 Sample dPex 1.7
 Orifice Qa(m3/m) 0.858138
 Sample Qa dPex 30.25017

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.760	30.29	0.86

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.67	31.84	0.90

Sampler Audit Relationship		
m =	0.026	
b =	0.037	
r =	0.998	
	pm10	tsp
Set Point (cfm)	40.4	50.5
Set Point (H2O)	2.9	4.5

Audit flow rate % diff: 5.07 %

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 =** 286.5
Audit Date: 12/05/08 **Ps =** 694.7
Motor: 1419 **Temp c =** 20.10
Temp f: 68.18 **Ta =** 293.1
Press: 27.518 **Pa =** 699.0
Altim: 30.205 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.26	32.9	1.44	0.78
13	2.79	30.5	1.18	0.70
10	2.35	28.2	0.94	0.63
7	1.58	23.4	0.53	0.47
5	1.00	18.9	0.24	0.32

Orifice dH2O 2.196
 Sample dPex 0.9
 Orifice Qa(m3/m) 0.772482
 Sample Qa dPex 27.48419

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.196	27.27	0.77

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.87	28.40	0.80

Sampler Audit Relationship		
m =	0.033	
b =	-0.300	
r =	1.000	
	pm10	tsp
Set Point (cfm)	40.7	50.8
Set Point (H2O)	2.6	4.5

Audit flow rate % diff: 4.12 %

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 =** 286.5
Audit Date: 12/05/08 **Ps =** 694.7
Motor: 1421 **Temp c =** 21.80
Temp f: 71.24 **Ta =** 294.8
Press: 27.481 **Pa =** 698.0
Altim: 30.165 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.25	33.0	1.41	0.77
13	2.83	30.9	1.10	0.68
10	2.36	28.3	0.84	0.60
7	1.62	23.7	0.48	0.45
5	1.08	19.7	0.22	0.30

Orifice dH2O 2.228
 Sample dPex 0.8
 Orifice Qa(m3/m) 0.780393
 Sample Qa dPex 27.8042

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.228	27.55	0.78

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.81	28.65	0.81

Sampler Audit Relationship		
m =	0.034	
b =	-0.370	
r =	0.998	
	pm10	tsp
Set Point (cfm)	41.0	51.2
Set Point (H2O)	2.5	4.6

Audit flow rate % diff: 3.97 %

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 =** 286.5
Audit Date: 12/05/08 **Ps =** 694.7
Motor: 1420 **Temp c =** 19.30
Temp f: 66.74 **Ta =** 292.3
Press: 27.560 **Pa =** 700.0
Altim: 30.250 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.25	32.8	1.32	0.74
13	2.74	30.2	1.02	0.65
10	2.28	27.7	0.79	0.57
7	1.55	23.1	0.44	0.43
5	1.02	19.0	0.18	0.27

Orifice dH2O 2.168
 Sample dPex 0.8
 Orifice Qa(m3/m) 0.766285
 Sample Qa dPex 27.32484

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.168	27.05	0.77

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.75	26.16	0.80

Sampler Audit Relationship		
m =	0.034	
b =	-0.359	
r =	0.999	
	pm10	tsp
Set Point (cfm)	40.5	50.6
Set Point (H2O)	2.4	4.3

Audit flow rate % diff: 4.07 %

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 =** 286.5
Audit Date: 12/05/08 **Ps =** 694.7
Motor: 1417 **Temp c =** 19.30
Temp f: 66.74 **Ta =** 292.3
Press: 27.560 **Pa =** 700.0
Altim: 30.250 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.24	32.7	1.42	0.77
13	2.74	30.2	1.17	0.70
10	2.29	27.8	0.95	0.63
7	1.59	23.4	0.61	0.50
5	1.02	19.0	0.32	0.37

Orifice dH2O 2.176
 Sample dPex 0.9
 Orifice Qa(m3/m) 0.767617
 Sample Qa dPex 27.21657

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.176	27.10	0.77

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.89	28.26	0.80

Sampler Audit Relationship		
m =	0.029	
b =	-0.190	
r =	0.999	
	pm10	tsp
Set Point (cfm)	40.5	50.6
Set Point (H2O)	2.4	4.0

Audit flow rate % diff: 4.25 %

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 =** 286.5
Audit Date: 12/19/08 **Ps =** 694.7
Motor: 1422 **Temp c =** 13.30
Temp f: 55.94 **Ta =** 286.3
Press: 27.480 **Pa =** 698.0
Altim: 30.164 **Orifice Calibration Relationship**
 m= 1.31700 b= -0.05774

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.43	33.3	1.51	0.79
13	2.88	30.7	1.22	0.71
10	2.46	28.5	1.01	0.64
7	1.64	23.5	0.65	0.52
5	1.07	19.3	0.37	0.39

Orifice dH2O 2.296
 Sample dPex 1.0
 Orifice Qa(m3/m) 0.780703
 Sample Qa dPex 27.64944

dH2O	Orifice	
	Qa(CFM)	Qa(M3/m)
2.296	27.56	0.78

dPex	Sampler w/Orifice	
	Qa(CFM)	Qa(M3/m)
0.95	28.79	0.82

Sampler Audit Relationship		
m =	0.028	
b =	-0.147	
r =	0.999	
	pm10	tsp
Set Point (cfm)	39.8	49.7
Set Point (H2O)	2.3	3.8

Audit flow rate % diff: 4.44 %