



MEMORANDUM

Pima County Department of Environmental Quality

TO: Alex Gallego
Assistant Superintendent Operations & Facilities Planning

DATE: 2/22/13
FROM: Beth Gorman
Program Manager

RE: Pima County DEQ Beryllium Monitoring Report 3rd Quarter 2012

Attached is the Pima County Department of Environmental Quality's (PDEQ) Air Monitoring Division Beryllium Monitoring Network Summary for the 3rd Quarter of 2012.

Highlights:

- 107 samples collected resulting in 104 valid and 3 invalid samples (97.2% data recovery). EPA requires monitoring data recovery at 75%.
- No beryllium values were detected over the Practical Quantitation Limit (PQL).
- The PQL was updated from 0.265 to 0.225 to reflect the lowest standard used in the analysis.
- PDEQ and SUSD staff are continuing to employ stringent monitoring protocols to ensure quality data is being collected properly to better protect public health.

For additional information on this report, please contact me at Pima County Department of Environmental Quality at (520) 243-7400.

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

3rd Quarter 2012



*Pima County Department of Environmental Quality
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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.

For the 3rd quarter of 2012 there was a total of 107 PM₁₀ samples collected resulting in 104 valid and 3 invalid samples; for a data recovery of 97.2 %. Ten 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 104 samples analyzed for beryllium. Beryllium concentrations are reported as <0.225 ng/m³ PQL (Practical Quantitation Level. In the preamble to a November 13, 1985 rulemaking (50 FR 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, PM₁₀ concentrations (µg/m³) calculated in standard conditions, PM₁₀ 24-hour NAAQS standard, precision measurements, beryllium analysis results, accompanying graphs and a brief explanation of all invalid samples for the 3rd quarter of 2012.

PM₁₀ /Beryllium Concentrations

Monthly Summary of PM₁₀/Beryllium Data

July 2012

Date	Location	Standard Concentration PM ₁₀ (µg/m ³)	24-hour NAAQS PM ₁₀ (µg/m ³)	Beryllium (ng/m ³)
07/01/12	Sunnyside H.S.	39.0	150	<0.225
07/02/12	Ocotillo #1	21.4	150	<0.225
07/02/12	Ocotillo #2	21.0	150	<0.225
07/03/12	Los Amigos	20.6	150	<0.225
07/04/12	Los Niños	12.3	150	<0.225
07/05/12	Chaparral M.S.	15.9	150	<0.225
07/06/12	Transportation Bldg	15.3	150	<0.225
07/07/12	Sunnyside H.S.	15.0	150	<0.225
07/08/12	Ocotillo #1	10.1	150	<0.225
07/08/12	Ocotillo #2	10.9	150	<0.225
07/09/12	Los Amigos	14.7	150	<0.225
07/10/12	Los Niños	12.2	150	<0.225
07/11/12	Chaparral M.S.	11.7	150	<0.225
07/12/12	Transportation Bldg	11.0	150	<0.225
07/13/12	Sunnyside H.S.	10.4	150	<0.225
07/14/12	Ocotillo #1	10.6	150	<0.225
07/14/12	Ocotillo #2	10.7	150	<0.225
07/15/12	Los Amigos	10.0	150	<0.225
07/16/12	Los Niños	2.3	150	<0.225
07/17/12	Chaparral M.S.	26.4	150	<0.225
07/18/12	Transportation Bldg	17.2	150	<0.225
07/19/12	Sunnyside H.S.	24.0	150	<0.225
07/20/12	Ocotillo #1	21.5	150	<0.225
07/20/12	Ocotillo #2	15.5	150	<0.225
07/21/12	Los Amigos	9.9	150	<0.225
07/22/12	Los Niños	11.8	150	<0.225
07/23/12	Chaparral M.S.	13.3	150	<0.225
07/24/12	Transportation Bldg.	13.7	150	<0.225
07/25/12	Sunnyside H.S.	18.4	150	<0.225
07/26/12	Ocotillo #1	19.9	150	<0.225
07/26/12	Ocotillo #2	21.6	150	<0.225
07/27/12	Los Amigos	21.9	150	<0.225
07/28/12	Los Niños	INVALID	150	INVALID
07/29/12	Chaparral M.S.	7.7	150	<0.225
07/30/12	Transportation Bldg.	11.4	150	<0.225
07/31/12	Sunnyside H.S.	16.9	150	<0.225

Sample running on 7/28/12 invalid due to no ending flow rate annotated resulting in not being able to calculate concentration.

NAAQS = National Ambient Air Quality Standard for PM₁₀

PM₁₀ /Beryllium Concentrations (continued)

Monthly Summary of PM₁₀/Beryllium Data

August 2012

Date	Location	Standard Concentration PM₁₀ (µg/m³)	24-hour NAAQS PM₁₀ (µg/m³)	Beryllium (ng/m³)
08/01/12	Ocotillo #1	15.1	150	<0.225
08/01/12	Ocotillo #2	19.9	150	<0.225
08/02/12	Los Amigos	18.2	150	<0.225
08/03/12	Los Ninos	21.1	150	<0.225
08/04/12	Chaparral M.S.	21.5	150	<0.225
08/05/12	Transportation Bldg	9.4	150	<0.225
08/06/12	Sunnyside H.S.	23.7	150	<0.225
08/07/12	Ocotillo #1	20.5	150	<0.225
08/07/12	Ocotillo #2	21.0	150	<0.225
08/08/12	Los Amigos	24.4	150	<0.225
08/09/12	Los Ninos	16.3	150	<0.225
08/10/12	Chaparral M.S.	22.4	150	<0.225
08/11/12	Transportation Bldg	17.3	150	<0.225
08/12/12	Sunnyside H.S.	21.5	150	<0.225
08/13/12	Ocotillo #1	27.3	150	<0.225
08/13/12	Ocotillo #2	26.4	150	<0.225
08/14/12	Los Amigos	23.4	150	<0.225
08/15/12	Los Niños	23.5	150	<0.225
08/16/12	Chaparral M.S.	19.3	150	<0.225
08/17/12	Transportation Bldg	11.8	150	<0.225
08/18/12	Sunnyside H.S.	14.2	150	<0.225
08/19/12	Ocotillo #1	15.7	150	<0.225
08/19/12	Ocotillo #2	16.3	150	<0.225
08/20/12	Los Amigos	17.5	150	<0.225
08/21/12	Los Niños	16.2	150	<0.225
08/22/12	Chaparral M.S.	13.0	150	<0.225
08/23/12	Transportation Bldg	10.4	150	<0.225
08/24/12	Sunnyside H.S.	20.8	150	<0.225
08/25/12	Ocotillo #1	13.3	150	<0.225
08/25/12	Ocotillo #2	12.7	150	<0.225
08/26/12	Los Amigos	11.1	150	<0.225
08/27/12	Los Niños	16.5	150	<0.225
08/28/12	Chaparral M.S.	18.8	150	<0.225
08/29/12	Transportation Bldg	19.4	150	<0.225
08/30/12	Sunnyside H.S.	39.6	150	<0.225
08/31/12	Ocotillo #1	21.5	150	<0.225
08/31/12	Ocotillo #2	19.8	150	<0.225

NAAQS = National Ambient Air Quality Standard for PM₁₀

PM₁₀ /Beryllium Concentrations (continued)

Monthly Summary of PM₁₀/Beryllium Data

September 2012

Date	Location	Standard Concentration PM₁₀ (µg/m³)	24-hour NAAQS PM₁₀ (µg/m³)	Beryllium (ng/m³)
09/01/12	Los Amigos	28.9	150	<0.225
09/02/12	Los Niños	22.9	150	<0.225
09/03/12	Chaparral M.S.	22.8	150	<0.225
09/04/12	Transportation Bldg	11.5	150	<0.225
09/05/12	Sunnyside H.S.	21.6	150	<0.225
09/06/12	Ocotillo #1	16.3	150	<0.225
09/06/12	Ocotillo #2	8.5	150	<0.225
09/07/12	Los Amigos	12.7	150	<0.225
09/08/12	Los Niños	25.3	150	<0.225
09/09/12	Chaparral M.S.	28.3	150	<0.225
09/10/12	Transportation Bldg	17.9	150	<0.225
09/11/12	Sunnyside H.S.	17.9	150	<0.225
09/12/12	Ocotillo #1	11.6	150	<0.225
09/12/12	Ocotillo #2	INVALID	150	INVALID
09/13/12	Los Amigos	14.5	150	<0.225
09/14/12	Los Niños	16.5	150	<0.225
09/15/12	Chaparral M.S.	18.3	150	<0.225
09/16/12	Transportation Bldg	12.1	150	<0.225
09/17/12	Sunnyside H.S.	22.6	150	<0.225
09/18/12	Ocotillo #1	21.8	150	<0.225
09/18/12	Ocotillo #2	INVALID	150	INVALID
09/19/12	Los Amigos	30.3	150	<0.225
09/20/12	Los Ninos	29.6	150	<0.225
09/21/12	Chaparral M.S.	32.9	150	<0.225
09/22/12	Transportation Bldg	24.4	150	<0.225
09/23/12	Sunnyside H.S.	25.9	150	<0.225
09/24/12	Ocotillo #1	21.8	150	<0.225
09/24/12	Ocotillo #2	21.8	150	<0.225
09/25/12	Los Amigos	25.2	150	<0.225
09/26/12	Los Ninos	28.3	150	<0.225
09/27/12	Chaparral M.S.	25.1	150	<0.225
09/28/12	Transportation Bldg	17.1	150	<0.225
09/29/12	Sunnyside H.S.	16.9	150	<0.225
09/30/12	Ocotillo #1	18.7	150	<0.225
09/30/12	Ocotillo #2	19.5	150	<0.225

Samples running on 09/12/12 and 09/18/12 invalid due to equipment malfunctions.

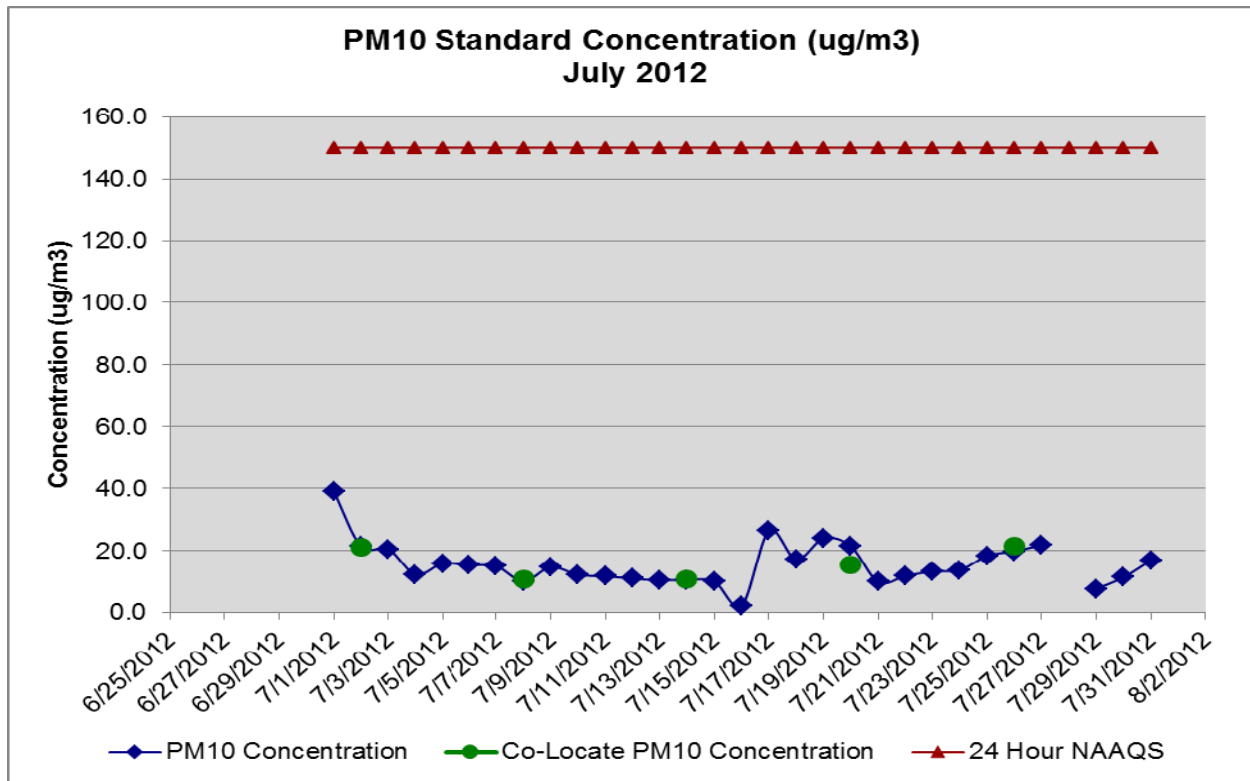
NAAQS = National Ambient Air Quality Standard for PM₁₀

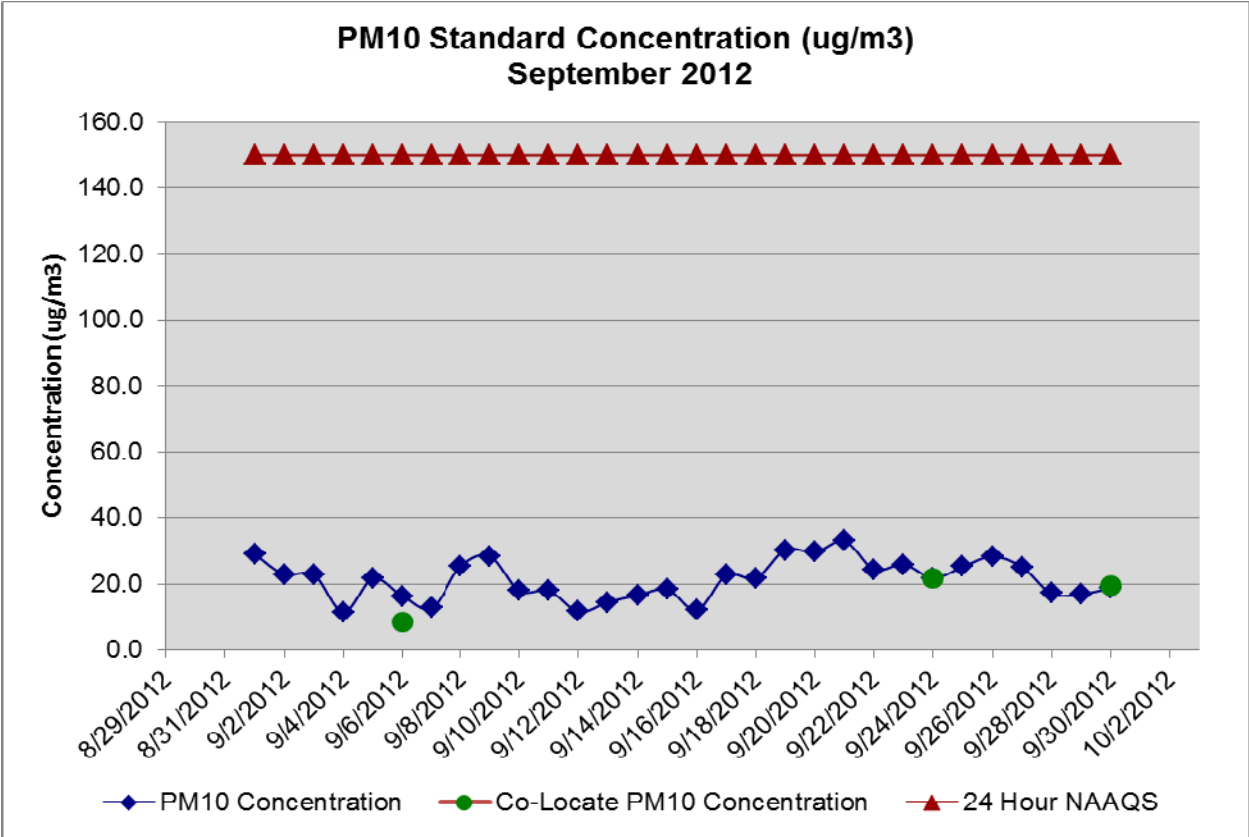
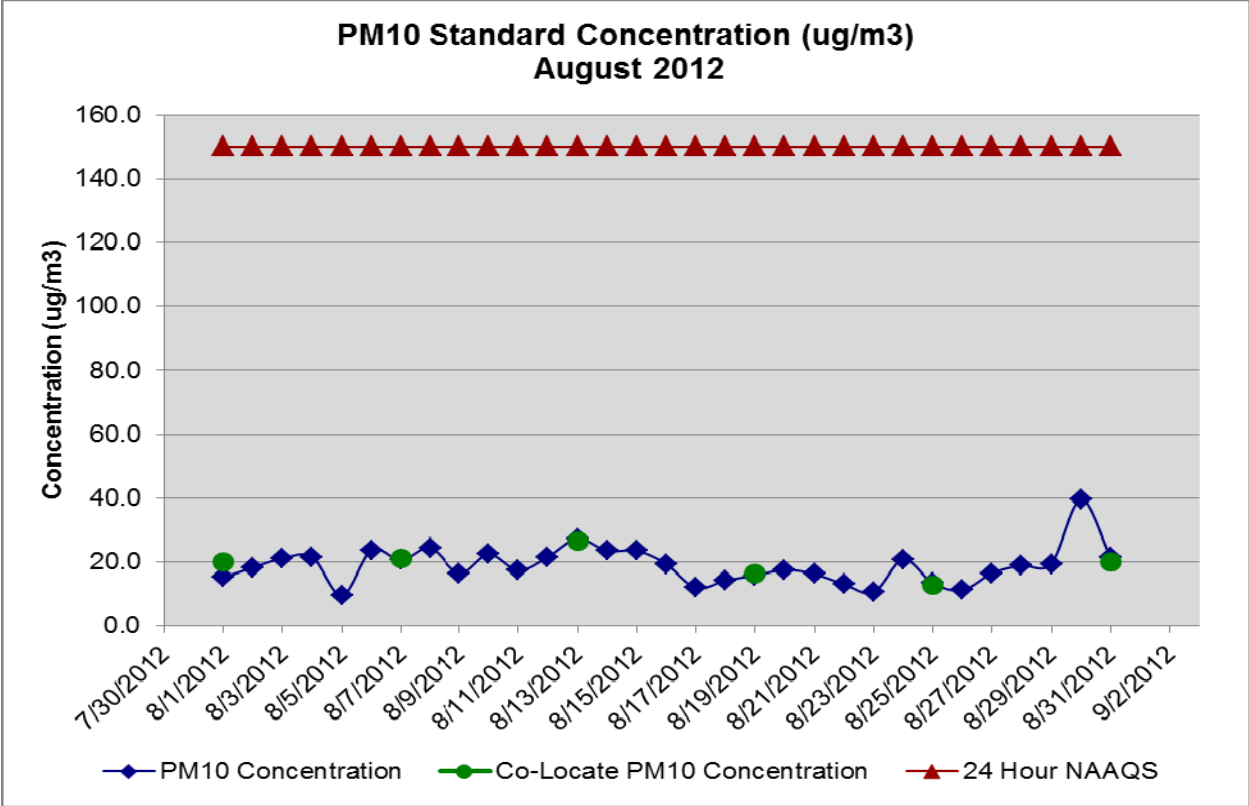
Precision of Duplicate Pairs – PM10

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 %
7/2/12	1	21.4	2	21.0	-0.4	-1.89
7/20/12	1	21.5	2	15.5	-6.0	-32.43
7/26/12	1	19.9	2	21.6	1.7	8.19
8/1/12	1	15.1	2	19.9	4.8	27.43
8/7/12	1	20.5	2	21.0	0.5	2.41
8/13/12	1	27.3	2	26.4	-0.9	-3.35
8/19/12	1	15.7	2	16.3	0.6	3.75
8/31/12	1	21.5	2	19.8	-1.7	-8.23
9/24/12	1	21.8	2	21.8	0.0	0.0
9/30/12	1	18.7	2	19.5	0.8	4.19

PM₁₀ Concentration Charts





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 =** 290.1
Audit Date: 09/27/12 **Ps =** 694.9
Motor: 1419 **Temp c =** 31.50

Ta = 304.5
Pa = 694.0

Orifice Calibration Relationship
m= 1.26505 b= -0.01422

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	4.35	39.0	1.96	0.93
13	3.63	35.6	1.60	0.84
10	2.89	31.8	1.22	0.73
7	1.92	26.0	0.68	0.55
5	1.25	21.1	0.34	0.39

Orifice dH2O 2.808
 Sample dPex 1.2
 Orifice Qa(m3/m) 0.88866
 Sample Qa dPex 31.6049

Audit flow rate % diff: 4.32 %

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.808	31.37	0.89

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
1.16	32.73	0.93

Sampler Audit Relationship		
m =	0.030	
b =	-0.247	
r =	0.999	
	pm10	tsp
Set Point (cfm)	42.0	52.5
Set Point (H2O)	2.4	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: Los Niños **Ts =** 290.1
Audit Date: 09/27/12 **Ps =** 694.9
Motor: 1421 **Temp c =** 31.50

Ta = 304.5
Pa = 693.0

Orifice Calibration Relationship
m= 1.26505 b= -0.01422

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.91	37.0	1.75	0.88
13	3.26	33.8	1.36	0.77
10	2.71	30.9	1.08	0.69
7	1.82	25.4	0.61	0.52
5	1.17	20.4	0.31	0.37

Orifice dH2O 2.574
 Sample dPex 1.0
 Orifice Qa(m3/m) 0.85191
 Sample Qa dPex 30.2998

Audit flow rate % diff: 4.23 %

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.574	30.07	0.85

Sampler w/Orifice		
dPex	Qa (CFM)	Qa (M3/m)
1.02	31.35	0.89

Sampler Audit Relationship		
m =	0.031	
b =	-0.256	
r =	1.000	
	pm10	tsp
Set Point (cfm)	42.1	52.6
Set Point (H2O)	2.4	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: Ocotillo #1 **Ts =** 290.1
Audit Date: 09/27/12 **Ps =** 694.9
Motor: 1420 **Temp c =** 27.40
 Ta = 300.4
 Pa = 684.0
Orifice Calibration Relationship
 m= 1.26505 b= -0.01422

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	4.49	39.3	1.98	0.93
13	3.74	35.9	1.55	0.82
10	3.03	32.4	1.10	0.69
7	1.94	26.0	0.61	0.51
5	1.25	20.9	0.24	0.32

Orifice dH2O 2.89
 Sample dPex 1.1
 Orifice Qa(m3/m) 0.89536
 Sample Qa dPex 31.9664

Audit flow rate % diff: 4.39 %

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.89	31.61	0.90

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.10	33.01	0.93

Sampler Audit Relationship		
m =	0.032	
b =	-0.344	
r =	0.997	
	pm10	tsp
Set Point (cfm)	41.5	51.8
Set Point (H2O)	2.3	4.1

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 =** 290.1
Audit Date: 09/27/12 **Ps =** 694.9
Motor: 1417 **Temp c =** 27.40
 Ta = 300.4
 Pa = 694.0
Orifice Calibration Relationship
 m= 1.26505 b= -0.01422

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	4.61	39.8	2.01	0.93
13	3.85	36.4	1.42	0.78
10	3.13	32.9	1.22	0.73
7	2.02	26.5	0.71	0.55
5	1.33	21.6	0.42	0.43

Orifice dH2O 2.988
 Sample dPex 1.2
 Orifice Qa(m3/m) 0.91023
 Sample Qa dPex 32.2893

Audit flow rate % diff: 4.49 %

Orifice		
dH2O	Qa (CFM)	Qa (M3/m)
2.988	32.13	0.91

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.16	33.59	0.95

Sampler Audit Relationship		
m =	0.027	
b =	-0.152	
r =	0.989	
	pm10	tsp
Set Point (cfm)	41.5	51.8
Set Point (H2O)	2.1	3.5

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 =** 290.1
Audit Date: 09/27/12 **Ps =** 694.9
Motor: 1422 **Temp c =** 31.60
 Ta = 304.6
 Pa = 694.0
Orifice Calibration Relationship
 m= 1.26505 b= -0.01422

Plate No.	Orifice dH20	Qa Orifice	Sampler dPex	Sampler dPext
18	3.55	35.2	1.61	0.84
13	2.97	32.3	1.28	0.75
10	2.44	29.3	1.02	0.67
7	1.61	23.9	0.66	0.54
5	1.06	19.4	0.36	0.40

Orifice dH2O 2.326
 Sample dPex 1.0
 Orifice Qa(m3/m) 0.80994
 Sample Qa dPex 28.7046

Audit flow rate % diff: 4.41 %

dH2O	Orifice	
	Qa (CFM)	Qa (M3/m)
2.326	28.59	0.81

dPex	Sampler w/Orifice	
	Qa (CFM)	Qa (M3/m)
0.99	29.86	0.85

Sampler Audit Relationship		
m =	0.027	
b =	-0.128	
r =	0.998	
	pm10	tsp
Set Point (cfm)	42.1	52.6
Set Point (H2O)	2.4	3.9