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# MEMORANDUM

Pima County Department of Environmental Quality

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**DATE:** 11/23/2010

**TO:** Richard Oros  
Director of Plant Operations

**FROM:** Beth Gorman  
Program Manager

**RE: Pima County DEQ Beryllium Monitoring Report 3rd Quarter 2010**

Attached is the Pima County Department of Environmental Quality's (PDEQ) Air Monitoring Division Beryllium Monitoring Network Summary for the 3<sup>rd</sup> Quarter of 2010.

**Highlights:**

- 108 samples collected resulting in 98 valid and 10 invalid samples (90.7 % data recovery). EPA requires monitoring data recovery at 75%.
- No beryllium values were detected over the Practical Quantitation Limit (PQL).
- 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**

**3<sup>rd</sup> Quarter 2010**



*Pima County Department of Environmental Quality  
33 N. Stone Avenue, Suite 700  
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.

For the 3<sup>rd</sup> quarter of 2010 there was a total of 108 PM<sub>10</sub> samples collected resulting in 98 valid and 10 invalid samples; for a data recovery of 90.7 %. Eight 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 105 samples analyzed for beryllium. Beryllium concentrations are reported as <0.225 ng/m<sup>3</sup> 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, PM<sub>10</sub> concentrations (µg/m<sup>3</sup>) calculated in standard conditions, PM<sub>10</sub> 24-hour NAAQS standard, precision measurements, Beryllium analysis results, accompanying graphs and a brief explanation of all invalid samples for the 3<sup>rd</sup> quarter of 2010.

## PM<sub>10</sub> /Beryllium Concentrations

### Monthly Summary of PM<sub>10</sub>/Beryllium Data

July - 2010

Date	Location	Standard Concentration PM <sub>10</sub> (µg/m <sup>3</sup> )	24-hour NAAQS PM <sub>10</sub> (µg/m <sup>3</sup> )	Beryllium (ng/m <sup>3</sup> )
07/01/10	Ocotillo #1	19.5	150	<0.225
07/01/10	Ocotillo #2	22.0	150	<0.225
07/02/10	Los Amigos	14.7	150	<0.225
07/03/10	Los Niños	29.8	150	<0.225
07/04/10	Chaparral M.S.	34.1	150	<0.225
07/05/10	Transportation Bldg	20.3	150	<0.225
07/06/10	Sunnyside H.S.	30.0	150	<0.225
07/07/10	Ocotillo #1	28.0	150	<0.225
07/07/10	Ocotillo #2	30.0	150	<0.225
07/08/10	Los Amigos	19.4	150	<0.225
07/09/10	Los Niños	19.3	150	<0.225
07/10/10	Chaparral M.S.	16.7	150	<0.225
07/11/10	Transportation Bldg	14.5	150	<0.225
07/12/10	Sunnyside H.S.	22.0	150	<0.225
07/13/10	Ocotillo #1	21.3	150	<0.225
07/13/10	Ocotillo #2	22.3	150	<0.225
07/14/10	Los Amigos	19.7	150	<0.225
07/15/10	Los Niños	23.0	150	<0.225
07/16/10	Chaparral M.S.	INVALID	150	<0.225
07/17/10	Transportation Bldg	19.9	150	<0.225
07/18/10	Sunnyside H.S.	17.1	150	<0.225
07/19/10	Ocotillo #1	23.1	150	<0.225
07/19/10	Ocotillo #2	24.3	150	<0.225
07/20/10	Los Amigos	14.8	150	<0.225
07/21/10	Los Ninos	19.2	150	<0.225
07/22/10	Chaparral M.S.	INVALID	150	INVALID
07/23/10	Transportation Bldg	14.4	150	<0.225
07/24/10	Sunnyside H.S.	INVALID	150	<0.225
07/25/10	Ocotillo #1	13.7	150	<0.225
07/25/10	Ocotillo #2	14.9	150	<0.225
07/26/10	Los Amigos	14.1	150	<0.225
07/27/10	Los Ninos	10.0	150	<0.225
07/28/10	Chaparral M.S.	9.8	150	<0.225
07/29/10	Transportation Bldg	10.6	150	<0.225
07/30/10	Sunnyside H.S.	14.9	150	<0.225
07/31/10	Ocotillo #1	9.1	150	<0.225
07/31/10	Ocotillo #2	9.8	150	<0.225

Sample running on 07/16/10 invalid for PM10 due to the average flow rate not being between 36 and 44 CFM.

Sample running on 07/22/10 invalid due to no flow rate being annotated resulting in PDEQ not being able to calculate the PM10 concentration.

Sample running on 07/24/10 invalid for PM10 due to the average flow rate not being between 36 and 44 CFM.

NAAQS = National Ambient Air Quality Standard for PM<sub>10</sub>

**PM<sub>10</sub> /Beryllium Concentrations (continued)**

**Monthly Summary of PM<sub>10</sub>/Beryllium Data**

**August - 2010**

<b>Date</b>	<b>Location</b>	<b>Standard Concentration PM<sub>10</sub> (µg/m<sup>3</sup>)</b>	<b>24-hour NAAQS PM<sub>10</sub> (µg/m<sup>3</sup>)</b>	<b>Beryllium (ng/m<sup>3</sup>)</b>
08/01/10	Los Amigos	9.9	150	<0.225
08/02/10	Los Niños	16.9	150	<0.225
08/03/10	Chaparral M.S.	18.3	150	<0.225
08/04/10	Transportation Bldg	13.9	150	<0.225
08/05/10	Sunnyside H.S.	35.8	150	<0.225
08/06/10	Ocotillo #1	14.1	150	<0.225
08/06/10	Ocotillo #2	INVALID	150	INVALID
08/07/10	Los Amigos	11.8	150	<0.225
08/08/10	Los Niños	13.7	150	<0.225
08/09/10	Chaparral M.S.	21.2	150	<0.225
08/10/10	Transportation Bldg	15.3	150	<0.225
08/11/10	Sunnyside H.S.	24.7	150	<0.225
08/12/10	Ocotillo #1	20.1	150	<0.225
08/12/10	Ocotillo #2	INVALID	150	INVALID
08/13/10	Los Amigos	19.6	150	<0.225
08/14/10	Los Ninos	21.6	150	<0.225
08/15/10	Chaparral M.S.	20.3	150	<0.225
08/16/10	Transportation Bldg	9.5	150	<0.225
08/17/10	Sunnyside H.S.	18.6	150	<0.225
08/18/10	Ocotillo #1	17.6	150	<0.225
08/18/10	Ocotillo #2	21.8	150	<0.225
08/19/10	Los Amigos	20.4	150	<0.225
08/20/10	Los Ninos	26.9	150	<0.225
08/21/10	Chaparral M.S.	25.6	150	<0.225
08/22/10	Transportation Bldg	14.1	150	<0.225
08/23/10	Sunnyside H.S.	26.9	150	<0.225
08/24/10	Ocotillo #1	17.3	150	<0.225
08/24/10	Ocotillo #2	19.0	150	<0.225
08/25/10	Los Amigos	13.0	150	<0.225
08/26/10	Los Ninos	14.7	150	<0.225
08/27/10	Chaparral M.S.	12.8	150	<0.225
08/28/10	Transportation Bldg	10.3	150	<0.225
08/29/10	Sunnyside H.S.	17.3	150	<0.225
08/30/10	Ocotillo #1	10.7	150	<0.225
08/30/10	Ocotillo #2	13.0	150	<0.225
08/31/10	Los Amigos	16.4	150	<0.225

Sample running on 08/06/10 invalid due to SUSD not changing the filter resulting in a double exposure.

Sample running on 08/12/10 invalid due to SUSD not changing the filter resulting in a double exposure.

NAAQS = National Ambient Air Quality Standard for PM<sub>10</sub>

**PM<sub>10</sub> /Beryllium Concentrations (continued)**

**Monthly Summary of PM<sub>10</sub>/Beryllium Data**

**September - 2010**

<b>Date</b>	<b>Location</b>	<b>Standard Concentration PM<sub>10</sub> (µg/m<sup>3</sup>)</b>	<b>24-hour NAAQS PM<sub>10</sub> (µg/m<sup>3</sup>)</b>	<b>Beryllium (ng/m<sup>3</sup>)</b>
09/01/10	Los Niños	20.9	150	<0.225
09/02/10	Chaparral M.S.	25.2	150	<0.225
09/03/10	Transportation Bldg	35.0	150	<0.225
09/04/10	Sunnyside H.S.	21.1	150	<0.225
09/05/10	Ocotillo #1	13.5	150	<0.225
09/05/10	Ocotillo #2	17.4	150	<0.225
09/06/10	Los Amigos	16.1	150	<0.225
09/07/10	Los Niños	19.6	150	<0.225
09/08/10	Chaparral M.S.	18.6	150	<0.225
09/09/10	Transportation Bldg	20.9	150	<0.225
09/10/10	Sunnyside H.S.	24.0	150	<0.225
09/11/10	Ocotillo #1	17.2	150	<0.225
09/11/10	Ocotillo #2	24.7	150	<0.225
09/12/10	Los Amigos	13.7	150	<0.225
09/13/10	Los Niños	22.6	150	<0.225
09/14/10	Chaparral M.S.	28.7	150	<0.225
09/15/10	Transportation Bldg	24.0	150	<0.225
09/16/10	Sunnyside H.S.	INVALID	150	<0.225
09/17/10	Ocotillo #1	26.4	150	<0.225
09/17/10	Ocotillo #2	36.1	150	<0.225
09/18/10	Los Amigos	20.3	150	<0.225
09/19/10	Los Ninos	24.4	150	<0.225
09/20/10	Chaparral M.S.	29.1	150	<0.225
09/21/10	Transportation Bldg	15.8	150	<0.225
09/22/10	Sunnyside H.S.	INVALID	150	<0.225
09/23/10	Ocotillo #1	12.2	150	<0.225
09/23/10	Ocotillo #2	15.5	150	<0.225
09/24/10	Los Amigos	16.0	150	<0.225
09/25/10	Los Ninos	17.3	150	<0.225
09/26/10	Chaparral M.S.	16.4	150	<0.225
09/27/10	Transportation Bldg	INVALID	150	INVALID
09/28/10	Sunnyside H.S.	25.4	150	<0.225
09/29/10	Ocotillo #1	26.3	150	<0.225
09/29/10	Ocotillo #2	INVALID	150	<0.225
09/30/10	Los Amigos	INVALID	150	INVALID

Sample running on 09/16/10 invalid for PM10 due to the average flow rate not being between 36 and 44 CFM.

Sample running on 09/22/10 invalid for PM10 due to the average flow rate not being between 36 and 44 CFM.

Sample running on 08/27/10 invalid due to SUSD not changing the filter resulting in a double exposure.

Sample running on 09/29/10 invalid for PM10 due to the average flow rate not being between 36 and 44 CFM.

Sample running on 09/30/10 invalid due to the sampler not running on the scheduled run day.

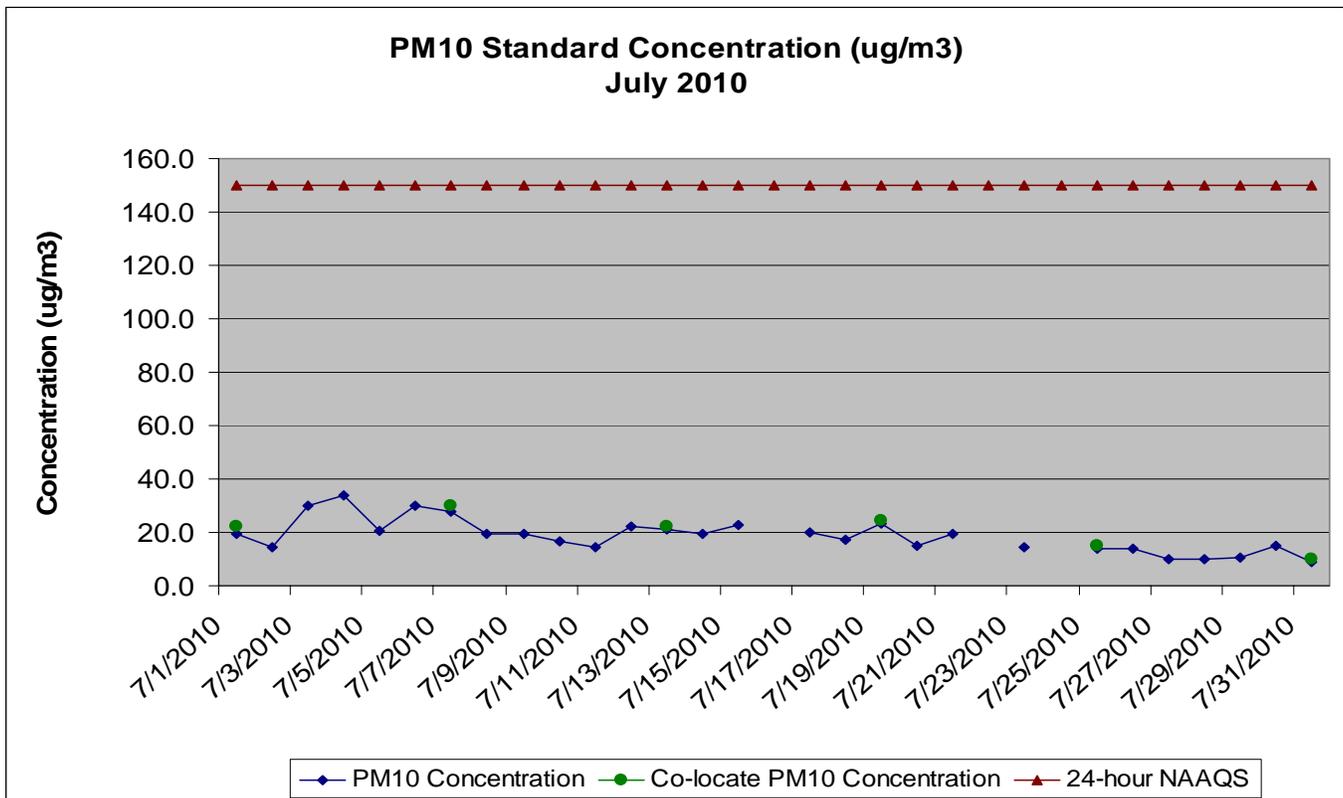
NAAQS = National Ambient Air Quality Standard for PM<sub>10</sub>

## 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 <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	Duplicate Sampler Number	Measured PM <sub>10</sub> ( $\mu\text{g}/\text{m}^3$ )	Difference ( $\mu\text{g}/\text{m}^3$ )	Percent Difference %
07/01/2010	1	19.5	2	22.0	2.5	12.5
07/07/2010	1	28.0	2	30.0	2.0	6.90
07/13/2010	1	21.3	2	22.3	1.0	4.59
07/19/2010	1	23.1	2	24.3	1.2	5.06
08/18/2010	1	17.6	2	21.8	4.2	21.32
08/24/2010	1	17.3	2	19.0	1.7	9.37
09/11/2010	1	17.2	2	24.7	7.5	35.80
09/17/2010	1	26.4	2	36.1	9.7	31.04

## PM<sub>10</sub> Concentration Charts

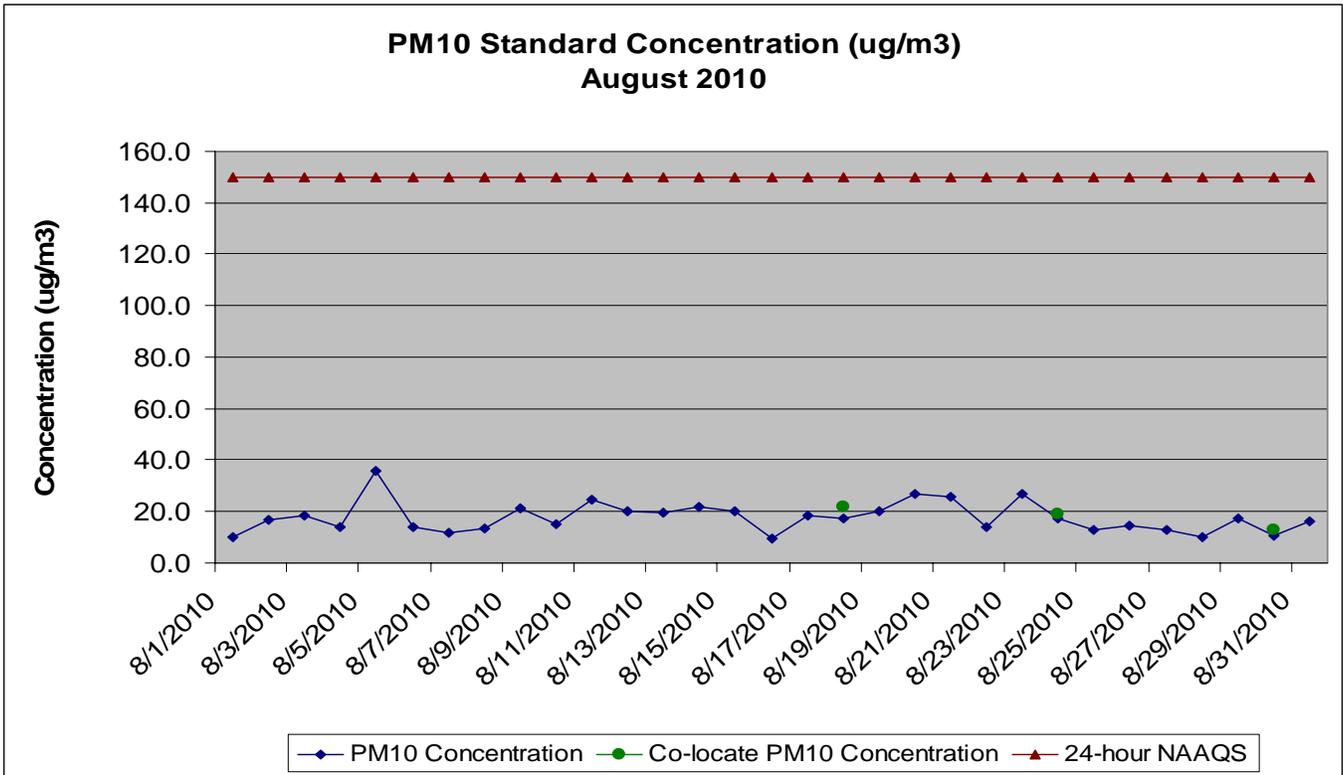


Sample running on 07/16/10 invalid for PM10 due to the average flow rate not being between 36 and 44 CFM.

Sample running on 07/22/10 invalid due to no flow rate being annotated resulting in PDEQ not being able to calculate the PM10 concentration.

Sample running on 07/24/10 invalid for PM10 due to the average flow rate not being between 36 and 44 CFM.

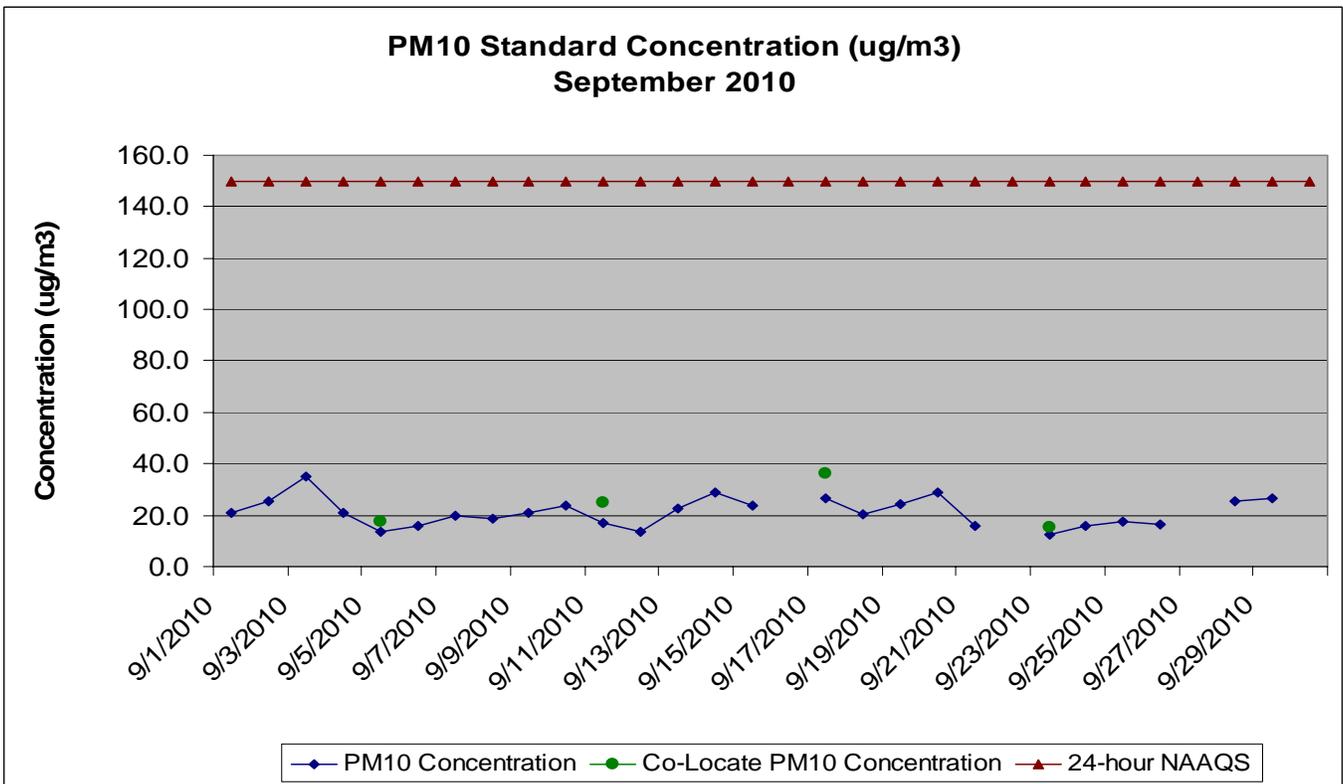
NAAQS = National Ambient Air Quality Standards for PM<sub>10</sub>



Sample running on 08/06/10 invalid due to SUSD not changing the filter resulting in a double exposure.

Sample running on 08/12/10 invalid due to SUSD not changing the filter resulting in a double exposure.

NAAQS = National Ambient Air Quality Standards for PM<sub>10</sub>



Sample running on 09/16/10 invalid for PM10 due to the average flow rate not being between 36 and 44 CFM.

Sample running on 09/22/10 invalid for PM10 due to the average flow rate not being between 36 and 44 CFM.

Sample running on 08/27/10 invalid due to SUSD not changing the filter resulting in a double exposure.

Sample running on 09/29/10 invalid for PM10 due to the average flow rate not being between 36 and 44 CFM.

Sample running on 09/30/10 invalid due to the sampler not running on the scheduled run day.

NAAQS = National Ambient Air Quality Standard for PM<sub>10</sub>

### Audit Results

Audits were performed on all of the samplers for the 3<sup>rd</sup> quarter of 2010. 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 =** 290.1  
**Audit Date:** 09/29/10      **Ps =** 694.9  
**Motor:** 1424      **Temp c =** 32.50  
**Temp f:** 90.5      **Ta =** 305.5  
**Press:** 27.126      **Pa =** 692.0689.0  
**Altim:** 29.782      **Orifice Calibration Relationship**  
                                          **m= 1.31620      b= -0.04542**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.02	32.3	1.58	0.84
13	2.56	29.8	1.39	0.79
10	2.16	27.5	1.22	0.74
7	1.48	23.0	0.89	0.63
5	0.97	18.8	0.62	0.52

Orifice dH2O                      2.038  
 Sample dPex                      1.1  
 Orifice Qa(m3/m)                0.756742  
 Sample Qa dPex                 26.64418

Audit flow rate % diff: 5.19 %

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.038	26.71	0.76
Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.14	28.11	0.80

Sampler Audit Relationship		
<b>m =</b>	0.023	
<b>b =</b>	0.090	
<b>r =</b>	0.999	
	pm10	tsp
<b>Set Point (cfm)</b>	42.5	53.1
<b>Set Point (H2O)</b>	2.6	4.0

**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 =** 290.1  
**Audit Date:** 09/29/10      **Ps =** 694.9  
**Motor:** 1418      **Temp c =** 29.10  
**Temp f:** 84.38      **Ta =** 302.1  
**Press:** 27.205      **Pa =** 691.0  
**Altim:** 29.867      **Orifice Calibration Relationship**  
                                          **m= 1.31620      b= -0.04542**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.97	36.6	2.33	1.01
13	3.43	34.1	2.06	0.95
10	2.89	31.4	1.75	0.87
7	1.95	26.0	1.22	0.73
5	1.28	21.3	0.87	0.62

Orifice dH2O                      2.704  
 Sample dPex                      1.6  
 Orifice Qa(m3/m)                0.860582  
 Sample Qa dPex                 30.32974

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
2.704	30.38	0.86

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.65	31.91	0.90

Sampler Audit Relationship		
<b>m =</b>	0.026	
<b>b =</b>	0.061	
<b>r =</b>	0.999	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	41.9	52.4
<b>Set Point (H2O)</b>	3.0	4.6

Audit flow rate % diff: 5.02 %

**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:** Los Amigos      **Ts =** 290.1  
**Audit Date:** 09/30/10      **Ps =** 694.9  
**Motor:** 1419      **Temp c =** 33.40  
**Temp f:** 92.12      **Ta =** 306.4  
**Press:** 27.205      **Pa =** 691.0  
**Altim:** 29.867      **Orifice Calibration Relationship**  
                                          **m= 1.31620      b= -0.04542**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	2.41	29.0	1.03	0.68
13	2.07	26.9	0.84	0.61
10	1.74	24.8	0.67	0.55
7	1.22	21.0	0.40	0.42
5	0.86	17.8	0.22	0.31

Orifice dH2O                      1.660  
 Sample dPex                      0.60  
 Orifice Qa(m3/m)                0.686344  
 Sample Qa dPex                 24.38517

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
1.660	24.23	0.69

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.63	25.17	0.71

Sampler Audit Relationship		
<b>m =</b>	0.032	
<b>b =</b>	-0.261	
<b>r =</b>	1.000	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	42.5	53.1
<b>Set Point (H2O)</b>	2.8	4.8

Audit flow rate % diff: 3.84 %

**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:** 09/29/10      **Ps =** 694.9  
**Motor:** 1421      **Temp c =** 33.55  
**Temp f:** 92.39      **Ta =** 306.6  
**Press:** 27.126      **Pa =** 689.0  
**Altim:** 29.782      **Orifice Calibration Relationship**  
                                          **m= 1.31620      b= -0.04542**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	2.54	29.7	1.02	0.67
13	2.20	27.8	0.82	0.60
10	1.92	26.0	0.69	0.55
7	1.33	21.9	0.43	0.44
5	0.90	18.2	0.22	0.31

Orifice dH2O                      1.778  
 Sample dPex                      0.60  
 Orifice Qa(m3/m)              0.710259  
 Sample Qa dPex              25.22037

Audit flow rate % diff: 3.87 %

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
1.778	25.07	0.71

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.64	26.05	0.74

Sampler Audit Relationship		
<b>m =</b>	0.031	
<b>b =</b>	-0.240	
<b>r =</b>	0.998	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	42.6	53.3
<b>Set Point (H2O)</b>	2.5	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 #1      **Ts =** 290.1  
**Audit Date:** 09/30/10      **Ps =** 694.9  
**Motor:** 1420      **Temp c =** 31.90  
**Temp f:** 89.42      **Ta =** 304.9  
**Press:** 27.205      **Pa =** 691.0  
**Altim:** 29.867      **Orifice Calibration Relationship**  
                                          **m= 1.31620      b= -0.04542**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	2.49	29.3	1.01	0.67
13	2.12	27.2	0.77	0.58
10	1.77	24.9	0.61	0.52
7	1.21	20.8	0.38	0.41
5	0.81	17.3	0.15	0.26

Orifice dH2O                      1.68  
 Sample dPex                      0.60  
 Orifice Qa(m3/m)              0.688652  
 Sample Qa dPex              24.52851

Audit flow rate % diff: 3.95 %

Orifice		
dH2O	Qa(CFM)	Qa(M3/m)
1.686	24.31	0.69

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.58	25.28	0.72

Sampler Audit Relationship		
<b>m =</b>	0.033	
<b>b =</b>	-0.292	
<b>r =</b>	0.992	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	42.3	52.8
<b>Set Point (H2O)</b>	2.7	4.6

**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:** 09/30/10      **Ps =** 694.9  
**Motor:** 1417      **Temp c =** 31.90  
**Temp f:** 89.42      **Ta =** 304.9  
**Press:** 27.205      **Pa =** 691.0  
**Altim:** 29.867      **Orifice Calibration Relationship**  
                                          **m= 1.31620      b= -0.04542**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	3.86	36.2	1.67	0.86
13	3.24	33.3	1.43	0.79
10	2.73	30.7	1.13	0.71
7	1.85	25.5	0.70	0.56
5	1.21	20.8	0.38	0.41

Orifice	
dH2O	Qa(CFM)      Qa(M3/m)
2.578	29.82      0.84

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
1.06	31.08	0.88

Orifice dH2O	2.578
Sample dPex	1.1
Orifice Qa(m3/m)	0.844835
Sample Qa dPex	29.96148
Audit flow rate % diff:	4.17 %

Sampler Audit Relationship		
<b>m =</b>	0.030	
<b>b =</b>	-0.199	
<b>r =</b>	0.998	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	42.3	52.8
<b>Set Point (H2O)</b>	2.5	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:** Transportation      **Ts =** 290.1  
**Audit Date:** 09/29/10      **Ps =** 694.9  
**Motor:** 1422      **Temp c =** 29.00  
**Temp f:** 84.20      **Ta =** 302.0  
**Press:** 27.166      **Pa =** 690.0  
**Altim:** 29.825      **Orifice Calibration Relationship**  
                                          **m= 1.31620      b= -0.04542**

Plate No.	Orifice dH2O	Qa Orifice	Sampler dPex	Sampler dPext
18	2.87	31.3	1.23	0.73
13	2.45	29.0	1.03	0.67
10	2.06	26.7	0.83	0.60
7	1.42	22.4	0.57	0.50
5	0.94	18.4	0.33	0.38

Orifice	
dH2O	Qa(CFM)      Qa(M3/m)
1.948	25.98      0.74

Sampler w/Orifice		
dPex	Qa(CFM)	Qa(M3/m)
0.80	27.11	0.77

Orifice dH2O	1.948
Sample dPex	0.80
Orifice Qa(m3/m)	0.736043
Sample Qa dPex	26.05176
Audit flow rate % diff:	4.30 %

Sampler Audit Relationship		
<b>m =</b>	0.027	
<b>b =</b>	-0.116	
<b>r =</b>	0.998	
	<b>pm10</b>	<b>tsp</b>
<b>Set Point (cfm)</b>	41.9	52.4
<b>Set Point (H2O)</b>	2.4	3.9