

JANUARY-MARCH 2008
QUARTERLY QUALITY ASSURANCE REPORT

FOR THE
WARREN COUNTY AIR MONITORING PROJECT

Ref. No. 7047.08
May 20, 2008

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FOR THE
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Prepared For:

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List of Abbreviations and Terms Used in This Report

- ACO** – Administrative Consent Order
- AMP** – Air Monitoring Plan – The document that presents the overall scope of work for the monitoring program.
- DQOs** - Data Quality Objectives – Established criteria defining data quality goals (i.e., data accuracy, precision, completeness, and representativeness) for the WCAMP. These criteria presented in Table 1-1 of this report
- NJDEP** - New Jersey Department of Environmental Protection
- NAAQS** – National Ambient Air Quality Standards set by the U.S. EPA for specific “criteria” pollutants.
- PCFA**- Pollution Control Financing Authority of Warren County
- QAPP** – Quality Assurance Project Plan – The document that presents the quality assurance and quality control procedures that will be used in the monitoring program to ensure that high quality, representative data are being measured.
- WCAMP** – Warren County Air Monitoring Project
- SO₂** – Sulfur dioxide – A gas formed from the burning of fossil fuels.
- Precision** - The degree of mutual agreement among a series of individual measurements, values, or results; expressed by the standard deviation.
- Accuracy** - Accuracy refers to the closeness of measurements to the correct or accepted value of the quantity measured.
- Completeness** – The number of data values collected and reported over a given time interval compared to the total number of possible data values for that time interval.
- Null Data Codes** – The United States Environmental Protection Agency’s designated coding system used to replace invalid or missing data values. Typical null data codes that may appear in the tabular data are:
- 9991 - Level 1 Zero/Span Check
 - 9995 – Multipoint Calibration
 - 9986- Meteorological calibration; Zero/Span Check
 - 9980 – Analyzer/Sensor Malfunction or Failure
- ppm** – parts per million; a unit of measurement specifying a concentration
- mph** – miles per hour; a unit of measurement for wind speed
- °C** – degrees Celsius (or centigrade); a unit of measurement for temperature

1. Introduction

As a condition of an Administrative Consent Order (ACO) between Pollution Control Financing Authority of Warren County (PCFA) and the New Jersey Department of Environmental Protection (NJDEP), PCFA has elected to establish an ambient air monitoring program in the vicinity of the town of Belvidere in Warren County, New Jersey. Specifically, the Supplemental Environmental Project mandated under the ACO and described in the associated Air Monitoring Plan (AMP) and Quality Assurance Project Plan (QAPP) calls for the monitoring of Sulfur Dioxide (SO₂), and specified meteorological parameters.

The project has been designated the Warren County Air Monitoring Project (WCAMP). The primary purpose of the WCAMP is to obtain and report air quality information from Belvidere and surrounding areas and, where possible, to compare such air quality concentrations to appropriate federal or state standards.

Under the terms of the ACO, PCFA has retained and oversees a qualified contractor, Enviroplan Consulting, to set up and operate the monitoring program. PCFA is required to coordinate these activities through the New Jersey Department of Environmental Protection (NJDEP).

This report provides the quarterly quality assurance data required for the WCAMP air quality and meteorological monitoring network. Procedures governing operation, maintenance, calibration, data reduction, processing, validation and reporting activities as well as attendant quality control, quality assurance and auditing activities conform to the technical guidance contained in the WCAMP AMP and QAPP. These documents have been reviewed and received conditional approval from the NJDEP.

Section 2 of this report provides an analysis of the pollutant and meteorological data collected during the quarter. Tables 2-1 and 2-2 present the maximum hourly and five-minute averages for continuously - measured pollutants. Tables 2-3 and 2-4 present the SO₂ precision results, Table 2-5 presents the SO₂ accuracy audit results, Tables 2-6 through 2-9 present the meteorological data summary, Table 2-10 presents the data collection efficiencies by parameter and Table 2-11 presents explanations for missing data.

Additionally, one appendix is included in this report, which presents the quarterly QA forms.

Table 1-1: Data Quality Objectives

Parameter	Precision (%)	Accuracy	Completeness (%)
SO ₂	≤ ±15	Within ±15% of Observed	≥75
Wind Speed	n/a	Within ± 0.2 m/s + 5% of Observed	≥90
Wind Direction	n/a	Within ±5 degrees azimuth of Observed	≥90
Air Temperature	n/a	Within ±5°C of Observed	≥90
Solar Radiation	n/a	Within ±10% of Observed	≥90

n/a – not applicable

2 Quality Assurance for Pollutant Data

2.1 Maximum Averages for the Quarter

This section provides a summary of the relevant maximum hourly averages for continuously-measured pollutants as they apply to the NAAQS.

Table 2-1: Maximum Hourly and Five-Minute SO2 Averages – Belvidere High School

NAAQS - National Ambient Air Quality Standards			
Pollutant	Average Time	Primary Standard	Secondary Standard
Sulfur Dioxide (SO2)	Annual Arithmetic Mean	0.03 ppm	-
	24-Hour	0.14 ppm	-
	3-Hour	-	0.50 ppm

Belvidere High School									
Parameter/ Units	Maximum Running 3-Hour Conc.	Date (Hour)	2nd Highest Running 3-Hour Conc.	Date (Hour)	Maximum Running 24-Hour Conc.	Date (Hour)	2nd Highest Running 24-Hour Conc.	Date (Hour)	Annual Arith. Mean-To- Date
SO2 ppm	.052	1/10 (16)	.038	1/28 (8)	.015	1/28 (9)	.011	1/10 (21)	.002
					Maximum 24-Hour Block Conc.	Date	2nd Highest 24-Hour Block Conc.	Date	
					.012	1/28	.010	1/10	

Belvidere High School					
Parameter/Units	Maximum 5-Minute Conc.	Date (Time)	5-Minute Averages of 0.3 ppm or Greater	1-Hour Average Preceding the 0.3 ppm Average	1-Hour Average Following the 0.3 ppm Average
SO2 ppm	.100	2/ 7 (00:00)	None	-	-

Table 2-2: Maximum Hourly and Five-Minute SO2 Averages – Demeter Farm

NAAQS - National Ambient Air Quality Standards			
Pollutant	Average Time	Primary Standard	Secondary Standard
Sulfur Dioxide (SO2)	Annual Arithmetic Mean	0.03 ppm	-
	24-Hour	0.14 ppm	-
	3-Hour	-	0.50 ppm

Demeter Farm									
Parameter/Units	Maximum Running 3-Hour Conc.	Date (Hour)	2 nd Highest Running 3-Hour Conc.	Date (Hour)	Maximum Running 24-Hour Conc.	Date (Hour)	2 nd Highest Running 24-Hour Conc.	Date (Hour)	Annual Arith. Mean-To-Date
SO2 ppm	.042	1/29 (7)	.031	1/28 (8)	.017	1/28 (8)	.016	1/24 (17), 2/26 (6)	.005
					Maximum 24-Hour Block Conc	Date	2 nd Highest 24-Hour Block Conc.	Date	
					.015	1/24, 1/29	.014	2/ 3	

Demeter Farm					
Parameter/Units	Maximum 5-Minute Conc.	Date (Time)	5-Minute Averages of 0.3 ppm or Greater	1-Hour Average Preceding the 0.3 ppm Average	1-Hour Average Following the 0.3 ppm Average
SO2 ppm	.075	2/ 3 (03:45)	None	-	-

Maximum Hourly Averages Report - SO2 Validated DataBase
3-Hour Running, Non-Overlapping Averages

1st Quarter 08

Logger Id : DF
Logger Name : Demeter Farm
Avg Interval: 03 hour
Parameter : SO2
Units : PPM
Avg Type : Backward

Rank	Average	Date	Hour
1	.042	01/29/08	07
2	.031	01/28/08	08
3	.024	01/24/08	05
4	.024	01/26/08	13
5	.024	02/03/08	05
6	.022	02/03/08	22
7	.022	02/26/08	03
8	.021	01/27/08	14
9	.021	02/25/08	10
10	.020	01/19/08	10

Maximum Hourly Averages Report - SO2 Validated DataBase
24-Hour Running, Non-Overlapping Averages

1st Quarter 08

Logger Id : DF
Logger Name : Demeter Farm
Avg Interval: 24 hour
Parameter : SO2
Units : PPM
Avg Type : Backward

Rank	Average	Date	Hour
1	.017	01/28/08	08
2	.016	01/24/08	17
3	.016	02/26/08	06
4	.015	01/29/08	14
5	.014	02/03/08	21
6	.013	01/06/08	04
7	.013	01/19/08	21
8	.012	01/07/08	14
9	.012	01/26/08	13
10	.010	01/01/08	05

2.2 Precision Checks

Precision checks for the continuous gas analyzers are scheduled to be performed at least once every two weeks to assess the quality of the monitoring data being reported. Two-point instrument precision response checks are performed by challenging each continuous pollutant analyzer with a known pollutant test gas concentration between 0.095 ppm and 0.105 ppm and between 0.380 ppm and 0.420 ppm. Pollutant test gas concentrations are generated using a currently-certified NIST-traceable dilution calibrator apparatus and certified gas standards.

The results of Level-1 zero/span checks performed biweekly on the SO₂ analyzers in conjunction with precision checks were within established acceptability limits.

The following equations are used for calculating data precision for the continuous analyzers. These equations conform to those contained in 40 CFR Part 58, Appendix B for reporting single instrument data precision for automated measurements used in PSD monitoring programs.

The percent difference for each precision check is calculated using the following equation:

$$d_i = \frac{Y_i - X_i}{X_i} \times 100 \quad \text{Equation (1)}$$

where, d_i is the percent difference for each precision check,
 x_i is the known concentration of the test gas used for the i -th precision check, and
 y_i is the pollutant analyzer's indicated concentration for the i -th precision check.

For each instrument, the quarterly average percent difference (d_j) is calculated using Equation 2, and the standard deviation of these differences (S_j) using Equation 3.

$$d_j = \frac{1}{n} \sum_{i=1}^n d_i \quad \text{Equation (2)}$$

$$S_j = \sqrt{\frac{1}{n-1} \left[\sum d_i^2 - \frac{1}{n} \left(\sum_{i=1}^n d_i \right)^2 \right]} \quad \text{Equation (3)}$$

where,
 n is the number of precision checks performed on the instrument during the quarter.

The 95% Probability Limits for data precision, are calculated as follows:

$$\text{Upper 95\% Probability Limit} = d_j + (1.96)(S_j) \quad \text{Equation (4)}$$

$$\text{Lower 95\% Probability Limit} = d_j - (1.96)(S_j) \quad \text{Equation (5)}$$

Table 2-3: **SO2 Single Analyzer Precision Check Results for Belvidere High School**

Data Period: January-March 2008

Date	Input ppm	Response ppm	Percent Difference	d _j	S _j	95% Probability Limits	
						Upper	Lower
1/ 3/08	.100	.101	1.00				
1/24/08	.100	.101	1.00				
2/ 6/08	.100	.101	1.00				
2/21/08	.100	.100	0.00				
3/ 5/08	.100	.100	0.00				
3/19/08	.100	.098	-2.00	0.17	1.17	2.46	-2.12

Date	Input ppm	Response Ppm	Percent Difference	d _j	S _j	95% Probability Limits	
						Upper	Lower
1/ 3/08	.400	.395	-1.25				
1/24/08	.400	.398	-0.50				
2/ 6/08	.400	.396	-1.00				
2/21/08	.400	.396	-1.00				
3/ 5/08	.400	.394	-1.50				
3/19/08	.400	.394	-1.50	-1.13	0.38	-0.39	-1.87

Combined Precision Check Statistical Results- Belvidere HS			
d _j	S _j	95% Probability Limits	
		Upper	Lower
-0.48	1.07	1.62	-2.58

Table 2-4: **SO2 Single Analyzer Precision Check Results for Demeter Farm**

Data Period: January-March 2008

Date	Input ppm	Response ppm	Percent Difference	d _j	S _j	95% Probability Limits	
						Upper	Lower
1/9/08	.100	.102	2.00				
1/24/08	.100	.101	1.00				
1/30/08	.100	.101	1.00				
2/21/08	.100	.098	-2.00				
2/27/08	.100	.102	2.00				
3/19/08	.100	.102	2.00				
3/26/08	.100	.100	0.00	0.86	1.46	3.72	-2.00

Date	Input ppm	Response Ppm	Percent Difference	d _j	S _j	95% Probability Limits	
						Upper	Lower
1/9/08	.400	.402	0.50				
1/24/08	.400	.396	-1.00				
1/30/08	.400	.395	-1.25				
2/21/08	.400	.393	-1.75				
2/27/08	.400	.399	-0.25				
3/19/08	.400	.394	-1.50				
3/26/08	.400	.396	-1.00	-0.89	0.78	0.64	-2.42

Combined Precision Check Statistical Results- Demeter Farm			
d _j	S _j	95% Probability Limits	
		Upper	Lower
-0.02	1.45	2.82	-2.86

2.3 Accuracy

Independent quality assurance audits are performed once per quarter on the air quality measurement systems. These audits are conducted by qualified personnel not associated with the routine operation and calibration of the monitoring systems, under the supervision of Enviroplan Consulting's Quality Assurance Department using certified, independent calibration standards and equipment. Table 2-5 summarizes the air quality audit results obtained by Enviroplan Consulting during the quarter.

For continuous gas analyzers, the audit consists of challenging each monitor with gas of five known concentrations (including zero), which fall within the instrument's measurement range (0-2.0 ppm). The five known audit gas test input concentrations are within the ranges specified in 40 CFR Part 58, Appendix B. As Table 2-5 indicates, the response of the SO₂ gas analyzer to the all upscale (i.e., non-zero) audit test gas concentrations by were well within the VDEQ and U.S. EPA quality assurance goal of ±15 percent.

The equation used to calculate measurement accuracy is as follows:

$$d_i = \left[\frac{Y_i - X_i}{X_i} \right] \times 100$$

where:

d_i = the difference, in percent, between the known (audit) flow rate and the corresponding sampler-indicated flow rate.

X_i = the known (audit) flow rate.

Y_i = the corresponding sampler-indicated flow rate.

Table 2-5: SO₂ Accuracy Audit Results

Site	Date	Audit Conc. ppm	Indicated Conc.*(DAS) ppm	Percent Difference
Belvidere High School	3/25/08	1.500	1.466	-2.27
SO ₂		0.800	0.771	-3.63
		0.400	0.382	-4.50
		0.100	0.096	-4.00
		0.000	-0.002	-
Demeter Farm	3/25/08	1.500	1.498	-0.13
SO ₂		0.800	0.781	-2.38
		0.400	0.384	-4.00
		0.100	0.100	0.00
		0.000	0.004	-

Notes to Table 2-5:

*DAS - Data Acquisition System

2.4 Meteorological Data

This meteorological data summary includes the data collected at the Belvidere High School and Demeter Farm sites from January 1, 2008 through March 31, 2008. Tables 2-6 through 2-10 present the maximum and average values for each meteorological parameter.

Table 2-6: **Horizontal Wind Speed Data Summary**

	Belvidere High School				Demeter Farm			
Month	Average mph	Maximum mph	Date	Hour	Average mph	Maximum mph	Date	Hour
January	4.1	19.0	1/30	11	11.1	29.8	1/2	19
February	4.3	15.6	2/10	22	10.9	29.2	2/14	3
March	4.9	17.0	3/8	19	11.2	28.2	3/17	2

Table 2-7: **Horizontal Wind Direction Data Summary**

	Belvidere High School	Demeter Farm
Month	Average Degrees	Average Degrees
January	300	274
February	328	281
March	345	341

Table 2-8: **Ambient Temperature Data Summary**

Demeter Farm				
Month	Average °C	Maximum °C	Date	Hour
January	-0.9	15.0	1/7	15
February	-1.3	15.5	2/18	7
March	2.6	16.1	3/5	3

Table 2-9: **Solar Radiation Data Summary**

Demeter Farm				
Month	Average W/M²	Maximum W/M²	Date	Hour
January	81	551	1/31	12
February	96	702	2/25	12
March	152	834	3/25	12

2.5 Meteorological Audits

Meteorological audits are performed at (minimum) semi-annual intervals subsequent to initial startup calibration of the meteorological monitoring system.

There were no audits performed on the meteorological system during this quarter.

Table 2-10: Quarterly Data Recovery Rates

Site	Parameter	Month	Monthly Data Recovery Rate (%)	Quarterly Data Recovery Rate (%)
Belvidere High School	SO2	January	99.6	97.6
		February	93.7	
		March	99.2	
	Horizontal Wind Speed	January	99.7	99.7
		February	99.7	
		March	99.7	
	Horizontal Wind Direction	January	99.7	99.7
		February	99.7	
		March	99.7	
	Standard Deviation	January	99.7	99.7
		February	99.7	
		March	99.7	
Demeter Farm	SO2	January	91.0	95.8
		February	98.9	
		March	97.9	
	Horizontal Wind Speed	January	98.0	97.4
		February	95.8	
		March	98.4	
	Horizontal Wind Direction	January	98.3	98.2
		February	97.8	
		March	98.4	
	Standard Deviation	January	99.5	98.6
		February	97.8	
		March	98.4	
	Temperature	January	99.5	99.2
		February	99.7	
		March	98.4	
	Solar Radiation	January	99.5	93.9
		February	99.7	
		March	82.9	

General Notes:

Data collection efficiencies are based on the number of valid data values reported from a given monitor divided by the total number of possible data values in the reporting period. For continuously-measured parameters, the total number of possible data values is the number of hours in the reporting period; for episodic monitors, the total number of possible data values is the number of scheduled sample events in the reporting period. The resulting ratio is expressed as a percentage.

When monitoring operations begin other than on the first day and hour of the reporting period, or in instances where agency approval for suspension of monitoring for a portion of the reporting period has occurred, calculation of data collection efficiencies for the reporting period is as described above except that the total number of possible data values is pro-rated in accordance with the actual active monitoring interval.

n/a – not applicable

Table 2-11: **Missing Data Report**

The following table describes periods of invalid data due to instrument malfunction, power outages and weather related data loss. Periods of routine instrument testing are not included in explanations of missing data.

January			
Site	Date (Hours)	Parameter	Explanation
Demeter Farm	1/3 (1-13, 17-23), 1/4 (0-10), 1/20 (20-23), 1/21 (0-11, 20-23), 1/22 (0-8)	SO2	Shelter temperature out of analyzer operating range
	1/18 (0-9)	HWS	Frozen sensor
	1/18 (0-7)	HWD, STDV	Frozen sensor

February			
Site	Date (Hours)	Parameter	Explanation
Belvidere HS	2/13 (10-11)	SO2	Channels down for site check
	2/25 (23)-2/27 (11)	SO2	Analyzer pump failed
Demeter Farm	2/1 (8-17), 2/12 (22)-2/13 (13)	HWS	Frozen sensor
	2/1 (0-19), 2/12 (1-13)	HWD	Frozen sensor
	2/11 (5-10)	SO2	Shelter Temperature out of analyzer operating range

March			
Site	Date (Hours)	Parameter	Explanation
Belvidere HS	All Parameters Satisfactory		
Demeter Farm	3/8 (18)-3/9 (0), 3/31 (14-15)	All parameters	Power outage
	3/26 (16)-3/28 (23), 3/29 (11)-3/31 (23)	Solar Radiation	Sensor malfunction

Appendix A: Quality Assurance Forms

SULFUR DIOXIDE (SO₂) AUDIT FORM

Network: <u>PCFA</u>	Site: <u>Belvidere HS</u>	Audit Date: <u>3/25/08</u>
Time On-Line: <u>13:00 EST</u>	Time On-Line: <u>19:38 EST</u>	Sheath Temperature: <u>24.7°C</u>

Site Equipment	Analyzer Mfg./Model No.: <u>TECO 43C</u>	S/N: <u>43C-62120-336</u>	Cal. Date: <u>3/5/08</u>
	Analyzer Calibration Settings: Span Setting: <u>0.0327</u>		Zero Setting: <u>0.905</u>
	Calibrator Mfg./Model No.: <u>CSI 1700</u>	S/N: <u>4071802</u>	Cal. Date: <u>2/11/08</u>
	Gas Cylinder Vendor and S/N: <u>Scott MacKin Gases # JJ-590</u>		Tank Pressure: <u>137.5</u> PSIG
	Gas Cylinder Cert. Date: <u>12/6/06</u>	SO ₂ Conc. (ppm): <u>50.7</u>	
Audit System	Calibrator Mfg./Model No.: <u>CSI 1700</u>	S/N: <u>13278</u>	Cal. Date: <u>3/13/08</u>
	Zero Air Supply Mfg./Model No.: <u>UNIT</u>		S/N: <u>N/A</u>
	Gas Cylinder Vendor and S/N: <u>Scott MacKin Gases # JJ2384</u>		Tank Pressure: <u>19.50</u> PSIG
	Gas Cylinder Cert. Date: <u>4/10/07</u>	SO ₂ Conc. (ppm): <u>51.8</u>	

Calibrator Gas Flow		Calibrator Dilution Flow		Audit Conc. ppm	System Response			Results Δ%
Calibrator Setting	SCCM	Calibrator Setting	SCCM		Chart Recorder	Analyzer Volts	DAS (ppm)	
OFF	OFF	1.40	1459.56	0.000	-0.2%	-0.009	-0.001	-
43.8	44.14	1.40	↓	1.500	74.3%	7.329	1.466	-2.3
41.2	41.52	2.50	2611.51	0.800	39.0%	3.850	0.771	-3.6
40.9	41.22	5.00	5229.59	0.400	19.4%	1.920	0.352	-4.5
10.2	10.30	↓	↓	0.100	4.8%	0.480	0.096	-4.0
OFF	OFF	↓	↓	0.000	-0.1%	-0.009	-0.002	-
Average Δ% =								-3.6

Slope = 0.977453 Intercept = -0.004574 Correlation Coeff. (R) = 0.999964

Notes: _____

Auditor: [Signature]

QA Review: [Signature]
 ENVIROPLAN CONSULTING

AIR QUALITY SYSTEMS AUDIT CHECKLIST
(Page 1 of 2)

Network: <i>PCFA</i>		Audit Date: <i>3/25/08</i>		
Site: <i>Bulverde H.S.</i>		Auditor: <i>D. Cummings</i>		
Parameter Monitored	Analyzer Model	Analyzer Serial No.	Range (ppm)	Last Calibration
<i>SO2</i>	<i>TECO 43C</i>	<i>43C-62120-336</i>	<i>0.0 → 2.0</i>	<i>3/5/08</i>
GENERAL SITE CONDITIONS				
Is the station interior neat and orderly?			<input checked="" type="checkbox"/>	
Is the condition of the lot exterior acceptable?			<input checked="" type="checkbox"/>	
Is the site temperature maintained between 20° and 30°C?			<input checked="" type="checkbox"/>	
Are the site grounds well maintained?			<input checked="" type="checkbox"/>	
OPERATIONS, MAINTENANCE AND RECORDS				
Are all analyzers operational?			<input checked="" type="checkbox"/>	
Are all analyzer and calibrator fans operational and clean?			<input checked="" type="checkbox"/>	
Are all flow rates for analyzers normal?			<input checked="" type="checkbox"/>	
Is automatic zero/span operational and clean traces stable?			<input checked="" type="checkbox"/>	
Current calibration stickers on all analyzers?				<input checked="" type="checkbox"/>
Are analyzer particulate filters changed bi-weekly?			<input checked="" type="checkbox"/>	
Is the sampling cane intact?			<input checked="" type="checkbox"/>	
Are all unused ports securely plugged?			<input checked="" type="checkbox"/>	
Is sampling cane and manifold clean?			<input checked="" type="checkbox"/>	
Is the manifold blower motor working?			<input checked="" type="checkbox"/>	
Are all sample lines clean and moisture free?			<input checked="" type="checkbox"/>	
Are the chart recorder traces clear and readable?			<input checked="" type="checkbox"/>	
Are all chart recorder trays correct (if applicable)?			<input checked="" type="checkbox"/>	
Is D.A.S. operational and indicating proper time and date?			<input checked="" type="checkbox"/>	
Are minimum of weekly six visits performed?			<input checked="" type="checkbox"/>	
Are zero/span/precision checks performed bi-weekly?			<input checked="" type="checkbox"/>	
Are multi-point calibrations performed quarterly and on time?			<input checked="" type="checkbox"/>	

AIR QUALITY SYSTEMS AUDIT CHECKLIST (Page 2 of 2)

Network: <u>PCFA</u>	Audit Date: <u>3/25/08</u>
Site: <u>Belvidere H.S.</u>	Auditor: <u>D. Cummings</u>

DOCUMENTATION AND FORMS		
Is the station logbook present?	✓	
Are the station logs up-to-date?	✓	
Are the station logs detailed and legible?	✓	
Are the calibration forms present?	✓	
Are calibration certificates for gas cylinders and calibrators posted?	On file at Fairfield, NJ	
Are the strip charts annotated each visit with time and date?	✓	

OVERALL COMMENTS		
Overall, is the station well maintained?	✓	
Overall, is the data quality good?	✓	
Are Quality Assurance/Quality Control maintained?	✓	
Is the site and equipment in good working order?	✓	
Overall, is the site technician knowledgeable and following Standard Operating Procedures?	✓	

Comments: Well-maintained site.

Auditor: D. Cummings
 Site Operator: Road 5/19/08
 ENVIROPLAN CONSULTING

SULFUR DIOXIDE (SO₂) AUDIT FORM

Network: <u>PCFA</u>	Site: <u>Dunster Farm</u>	Audit Date: <u>3/25/08</u>
Time Off-Line: <u>10:58 EST</u>	Time On-Line: <u>12:36 EST</u>	Sheath Temperature: <u>23.7°C</u>

Site Equipment	Analyzer Mfg./Model No.: <u>TECO 43C</u>	S/N: <u>430-62121-336</u>	Cal. Date: <u>3/19/08</u>
	Analyzer Calibration Settings: Span Setting: <u>1.137</u>		Zero Setting: <u>0.0267</u>
	Calibrator Mfg./Model No.: <u>CSI 1700</u>	S/N: <u>4072802</u>	Cal. Date: <u>2/11/08</u>
	Gas Cylinder Vendor and S/N: <u>Scott Marris Gases # J-J-590</u>		Gauge Pressure: <u>1,375</u> PSIG
	Gas Cylinder Cert. Date: <u>12/6/06</u>		SO ₂ Conc. (ppm): <u>50.7</u>

Audit System	Calibrator Mfg./Model No.: <u>CSI 1700</u>	S/N: <u>13278</u>	Cal. Date: <u>3/12/08</u>
	Zero Air Supply Mfg./Model No.: <u>UNTT</u>		S/N: <u>N/A</u>
	Gas Cylinder Vendor and S/N: <u>Scott Marris Gases # JJ2384</u>		Gauge Pressure: <u>1,950</u> PSIG
	Gas Cylinder Cert. Date: <u>4/10/07</u>		SO ₂ Conc. (ppm): <u>51.1</u>

Calibrator Gas Flow		Calibrator Dilution Flow		Audit Conc.	System Response			Results
Calibrator Setting	SCCM	Calibrator Setting	SCCM	ppm	Chart Recorder	Analyzer Value	DAS (ppm)	Δ%
OFF	OFF	<u>1.40</u>	<u>1,459.58</u>	<u>0.000</u>	<u>0.0%</u>	<u>0.002v</u>	<u>0.000</u>	<u>-</u>
<u>43.8</u>	<u>44.14</u>	<u>2.50</u>	<u>2,611.51</u>	<u>1.500</u>	<u>74.9%</u>	<u>7.516v</u>	<u>1.498</u>	<u>-0.1%</u>
<u>41.2</u>	<u>41.52</u>	<u>5.00</u>	<u>5,227.59</u>	<u>0.800</u>	<u>37.2%</u>	<u>3.908v</u>	<u>0.781</u>	<u>-2.4%</u>
<u>40.9</u>	<u>41.22</u>	↓	↓	<u>0.400</u>	<u>19.3%</u>	<u>1.918v</u>	<u>0.384</u>	<u>-4.0%</u>
<u>10.2</u>	<u>10.30</u>	↓	↓	<u>0.100</u>	<u>5.1%</u>	<u>0.4984v</u>	<u>0.100</u>	<u>0.0%</u>
<u>OFF</u>	<u>OFF</u>	↓	↓	<u>0.000</u>	<u>0.0%</u>	<u>0.001v</u>	<u>0.000</u>	<u>-</u>
Average Δ% =								<u>-1.6%</u>

Slope = 0.9974 Intercept = -0.00594 Correlation Coeff. (R) = 0.99989

Notes: _____

Auditor: [Signature]
 QA Review: [Signature] 3/24/08
 ENVIROPLAN CONSULTING

AIR QUALITY SYSTEMS AUDIT CHECKLIST
(Page 1 of 2)

Network: <u>PCFA</u>		Audit Date: <u>3/25/08</u>	
Site: <u>Demeter Farm</u>		Auditor: <u>D. Cummings</u>	
Parameter Monitored:	Analyzer Model:	Analyzer Serial No.:	SPM:
<u>SO2</u>	<u>TECO 43C</u>	<u>43C-42121-336</u>	<u>0.0 → 2.0</u>
			<u>3/19/08</u>
GENERAL SITE CONDITIONS			
Is the station interior neat and orderly?		<input checked="" type="checkbox"/>	
Is the condition of trailer exterior acceptable?		<input checked="" type="checkbox"/>	
Is the site temperature maintained between 20° and 30°C?		<input checked="" type="checkbox"/>	
Are the site grounds well maintained?		<input checked="" type="checkbox"/>	
OPERATIONS (CONTINUED)			
Are all analyzers operational?		<input checked="" type="checkbox"/>	
Are all analyzer and calibrator fans operational and clean?		<input checked="" type="checkbox"/>	
Are all flow rates for analyzers normal?		<input checked="" type="checkbox"/>	
Is automatic zero/span operational and chart traces stable?		<input checked="" type="checkbox"/>	
Current calibration stickers on all analyzers?			<input checked="" type="checkbox"/>
Are analyzer particulate filters changed bi-weekly?		<input checked="" type="checkbox"/>	
Is the sampling cane intact?		<input checked="" type="checkbox"/>	
Are all unused ports securely plugged?		<input checked="" type="checkbox"/>	
Is sampling cane and manifold clean?		<input checked="" type="checkbox"/>	
Is the manifold blower/motor working?		<input checked="" type="checkbox"/>	
Are all sample lines clean and moisture free?		<input checked="" type="checkbox"/>	
Are the chart recorder traces clear and readable?		<input checked="" type="checkbox"/>	
Are all chart recorder times correct (if applicable)?		<input checked="" type="checkbox"/>	
Is D.A.S. operational and indicating proper time and date?		<input checked="" type="checkbox"/>	
Are minimum of weekly site visits performed?		<input checked="" type="checkbox"/>	
Are zero/span/precision checks performed bi-weekly?		<input checked="" type="checkbox"/>	
Are multi-point calibrations performed quarterly and on time?		<input checked="" type="checkbox"/>	

AIR QUALITY SYSTEMS AUDIT CHECKLIST (Page 2 of 2)

Network: <i>PCEA</i>	Audit Date: <i>3/25/08</i>		
Site: <i>Demeter Farm</i>	Auditor: <i>D. Cummings</i>		
DOCUMENTATION AND NORMS		YES	NO
Is the station logbook present?		✓	
Are the station logs up-to date?		✓	
Are the station logs detailed and legible?		✓	
Are the calibration forms present?		✓	
Are calibration certificates for gas cylinders and calibrators posted?		on file at Fairfield NJ	
Are the strip charts annotated each visit with time and date?		✓	
OVERALL COMMENTS		YES	NO
Overall, is the station well maintained?		✓	
Overall, is the data quality good?		✓	
Are Quality Assurance/Quality Control maintained?		✓	
Is the site and equipment in good working order?		✓	
Overall, is the site technician knowledgeable and following Standard Operating Procedures?		✓	

Comments:

Auditor: *[Signature]*
 Site Operator: *[Signature]*
 ENVIROPLAN CONSULTING