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TEST RESULTS SUMMARY

Source Name: Turbine No. 1
Source ID Number: EUTURBINE1
Control Device: N/A
Sampling Location: SVTURBINE1

Test Date: May 21, 2019
Permit No. EGLE Renewable Operating Permit No. MI-ROP-N6838-2014a

Load*	Pollutant	Emission Rate		Emission Limits	
		lb/hr	ppmvd	lb/hr	ppmvd
86%	NO_x	8.93	49.2†	18.95	NA
	CO	303.2	303.2	400	NA
90%	NO_x	15.32	58.9†	18.95	NA
	CO	4.54	18.3	400	NA
94%	NO_x	5.38	15.6†	18.95	NA
	CO‡	<0.50	<1.8	12.57	NA
100%	NO_x	5.58	13.4†	18.95	NA
	CO‡	<0.57	<1.8	12.57	NA

* Production data was provided by Vector Pipeline LP - Highland Compressor Station personnel.
† Concentration corrected to 15% O_2 at ISO standard day conditions.
‡ The compound was not present in quantities above the Minimum Detection Limit (MDL) of the analytical method.

TEST RESULTS SUMMARY

Source Name: Turbine No. 2
Source ID Number: EUTURBINE2
Control Device: N/A
Sampling Location: SVTURBINE2

Test Date: May 22, 2019
Permit No. EGLE Renewable Operating Permit No. MI-ROP-N6838-2014a

Load*	Pollutant	Emission Rate		Emission Limits	
		lb/hr	ppmvd	lb/hr	ppmvd
86%	NO_x	8.65	46.6†	18.95	NA
	CO	291.7	1,359	400	NA
90%	NO_x	14.07	53.4†	18.95	NA
	CO	11.04	44.2	400	NA
94%	NO_x	2.45	7.4†	18.95	NA
	CO‡	<0.47	<1.8	12.57	NA
100%	NO_x	3.84	9.8†	18.95	NA
	CO‡	<0.54	<1.8	12.57	NA

* Production data was provided by Vector Pipeline LP - Highland Compressor Station personnel.
† Concentration corrected to 15% O_2 at ISO standard day conditions.
‡ The compound was not present in quantities above the Minimum Detection Limit (MDL) of the analytical method.

REVIEW AND CERTIFICATION

The results of the Compliance Test conducted on May 21-22, 2019 are a product of the application of the United States Environmental Protection Agency (US EPA) Stationary Source Sampling Methods listed in 40 CFR Part 60, Appendix A, that were in effect at the time of this test.

All work, calculations, and other activities and tasks performed and presented in this document were carried out by me or under my direction and supervision. I hereby certify that, to the best of my knowledge, Montrose operated in conformance with the requirements of the Montrose Quality Management System and ASTM D7036-04 during this test project.

Signature: _____ Date: 7-11-19

Name: Mason Sakshaug Title: Field Project Manager

I have reviewed, technically and editorially, details, calculations, results, conclusions, and other appropriate written materials contained herein. I hereby certify that, to the best of my knowledge, the presented material is authentic, accurate, and conforms to the requirements of the Montrose Quality Management System and ASTM D7036-04.

Signature: _____ Date: 7-11-19

Name: Randal Tysar Title: District Manager

1.0 INTRODUCTION

1.1 SUMMARY OF TEST PROGRAM

The Vector Pipeline L.P.-Highland Compressor Station (State Registration Number: N6838), located in Highland, Michigan, contracted Montrose Air Quality Services, LLC (Montrose) of Detroit, Michigan, to conduct compliance stack emission testing for their Natural Gas-Fired Turbines No. 1 (EUTURBINE1) and No. 2 (EUTURBINE2). Testing was performed to satisfy the emissions testing requirements pursuant to Michigan Department of Environment, Great Lakes and Energy (EGLE) Renewable Operating Permit No. MI-ROP-N6838-2014a. The testing was performed on May 21-22, 2019.

Sampling was performed at the EUTURBINE1 Exhaust Duct (SVTURBINE1) and EUTURBINE2 Exhaust Duct (SVTURBINE2) to determine the emissions of nitrogen oxides (NO_x) (as NO_2) and carbon monoxide (CO). Testing was conducted during four different turbine operating conditions (86% natural gas producer (NGP) load, 90% NGP load, 94% NGP load, and 100% NGP load). During this test, emissions from EUTURBINE1 and EUTURBINE2 were controlled using dry low NO_x control (DLN) technology.

The test methods that were conducted during this test were US EPA Methods 3A, 7E, 10, and 19.

1.2 KEY PERSONNEL

The key personnel who coordinated this test program (and their phone numbers) were:

- James Snider, Environmental Specialist, Vector Pipeline, 218-269-0591
- Alan Shaw, Instrument & Operations Technician, Vector Pipeline, 248-889-2798
- Regina Angelotti, EQA, EGLE, 586-753-3731
- Mason Sakshaug QI, Field Project Manager, Montrose, 989-323-0355

2.0 SUMMARY AND DISCUSSION OF TEST RESULTS

2.1 OBJECTIVES AND TEST MATRIX

The purpose of this test was to determine the emissions of NO_x (as NO_2) and CO at the EUTURBINE1 Exhaust Duct and EUTURBINE2 Exhaust Duct during four different operating conditions. Testing was performed to satisfy the emissions testing requirements pursuant to EGLE Renewable Operating Permit No. MI-ROP-N6838-2014a.

The specific test objectives for this test are as follows:

- Measure the concentration of oxygen (O_2), NO_x, and CO at the EUTURBINE1 Exhaust Duct and EUTURBINE2 Exhaust Duct during four different operating conditions.
- Utilize the above variables, in conjunction with the calculated heat input rate, to determine the emissions of NO_x (as NO_2) and CO at the EUTURBINE1 Exhaust Duct and EUTURBINE2 Exhaust Duct during the four different operating conditions.

Tables 2.1.1 and 2.1.2 present the sampling matrix logs for this test.

2.2 FIELD TEST CHANGES AND PROBLEMS

Run 3 was voided for the 90% NGP Load at the EUTURBINE1 Exhaust Duct due to a production data collection issue. At the request of EGLE, an additional run (Run 4) was performed. Results for Run 3 are not included in this report.

2.3 PRESENTATION OF RESULTS

Single sampling trains were utilized during each run at the EUTURBINE1 Exhaust Duct and EUTURBINE2 Exhaust Duct to determine the emissions of NO_x (as NO_2) and CO while the turbines operated at each NGP load. These sampling trains measured the duct gas concentrations of O_2, NO_x, and CO.

For each test run, the natural gas flowrates and the higher heating values (HHV) of the natural gas were utilized to calculate the heat input rate during each operating load. The natural gas flowrates and HHV were monitored and recorded by each turbine's data acquisition system.

Table 2.2.1 displays the emissions of NO_x (as NO_2) and CO measured at the EUTURBINE1 Exhaust Duct during 86% NGP Load and 90% NGP Load operating conditions.

Table 2.2.2 displays the emissions of NO_x (as NO_2) and CO measured at the EUTURBINE1 Exhaust Duct during 94% NGP Load and 100% NGP Load operating conditions.

Table 2.3.1 displays the emissions of NO_x (as NO_2) and CO measured at the EUTURBINE2 Exhaust Duct during 86% NGP Load and 90% NGP Load operating conditions.

Table 2.3.2 displays the emissions of NO_x (as NO_2) and CO measured at the EUTURBINE2 Exhaust Duct during 94% NGP Load and 100% NGP Load operating conditions.

CO concentration values in Tables 2.2.2 and 2.3.2 denoted with a '<' were measured to be below the minimum detection limit (MDL) of the applicable analytical method. CO mass emission rates denoted with a '<' in Tables 2.2.2 and 2.3.2 were calculated utilizing the applicable MDL concentration value instead of the "as measured" concentration value.

Tables 2.4.1 and 2.4.2 display the results of the Stratification Tests performed during Run 1 at the EUTURBINE1 Exhaust Duct and EUTURBINE2 Exhaust Duct. As displayed, the sampling locations were within the range of the Stratification Acceptance Criteria as specified in US EPA Method 7E, Section 8.1.2. Single point traverses were utilized for the remaining concentration runs at both turbine exhaust ducts.

The graphs that present the raw, uncorrected concentration data measured in the field by the US EPA Method 3A, 7E, and 10 sampling systems at the EUTURBINE1 Exhaust Duct and EUTURBINE2 Exhaust Duct are located in the Field Data section of the Appendix.

TABLE 2.1.1
SAMPLING MATRIX OF TEST METHODS UTILIZED

Date	Run No.	NGP Load	Sampling Location	US EPA METHOD 3A (O_2) Sampling Time / Duration (min)	US EPA METHOD 7E (NO_x) Sampling Time / Duration (min)	US EPA METHOD 10 (CO) Sampling Time / Duration (min)
5/21/2019	1	86%	EUTURBINE1 Exhaust Duct	16:14 - 16:35 / 21	16:14 - 16:35 / 21	16:14 - 16:35 / 21
5/21/2019	2	86%	EUTURBINE1 Exhaust Duct	16:45 - 17:06 / 21	16:45 - 17:06 / 21	16:45 - 17:06 / 21
5/21/2019	3	86%	EUTURBINE1 Exhaust Duct	17:17 - 17:38 / 21	17:17 - 17:38 / 21	17:17 - 17:38 / 21
5/21/2019	1	90%	EUTURBINE1 Exhaust Duct	13:37 - 13:58 / 21	13:37 - 13:58 / 21	13:37 - 13:58 / 21
5/21/2019	2	90%	EUTURBINE1 Exhaust Duct	14:13 - 14:34 / 21	14:13 - 14:34 / 21	14:13 - 14:34 / 21
5/21/2019	4	90%	EUTURBINE1 Exhaust Duct	15:20 - 15:41 / 21	15:20 - 15:41 / 21	15:20 - 15:41 / 21
5/21/2019	1	94%	EUTURBINE1 Exhaust Duct	11:16 - 11:37 / 21	11:16 - 11:37 / 21	11:16 - 11:37 / 21
5/21/2019	2	94%	EUTURBINE1 Exhaust Duct	11:50 - 12:11 / 21	11:50 - 12:11 / 21	11:50 - 12:11 / 21
5/21/2019	3	94%	EUTURBINE1 Exhaust Duct	12:21 - 12:42 / 21	12:21 - 12:42 / 21	12:21 - 12:42 / 21
5/21/2019	1	100%	EUTURBINE1 Exhaust Duct	8:59 - 9:51 / 21	8:59 - 9:51 / 21	8:59 - 9:51 / 21
5/21/2019	2	100%	EUTURBINE1 Exhaust Duct	10:06 - 10:27 / 21	10:06 - 10:27 / 21	10:06 - 10:27 / 21
5/21/2019	3	100%	EUTURBINE1 Exhaust Duct	10:41 - 11:02 / 21	10:41 - 11:02 / 21	10:41 - 11:02 / 21

All times are Eastern Daylight Time.

TABLE 2.1.2
SAMPLING MATRIX OF TEST METHODS UTILIZED

Date	Run No.	NGP Load	Sampling Location	US EPA METHOD 3A (O_2) Sampling Time / Duration (min)	US EPA METHOD 7E (NO_x) Sampling Time / Duration (min)	US EPA METHOD 10 (CO) Sampling Time / Duration (min)
5/22/2019	1	86%	EUTURBINE2 Exhaust Duct	8:09 - 9:04 / 21	8:09 - 9:04 / 21	8:09 - 9:04 / 21
5/22/2019	2	86%	EUTURBINE2 Exhaust Duct	9:18 - 9:39 / 21	9:18 - 9:39 / 21	9:18 - 9:39 / 21
5/22/2019	3	86%	EUTURBINE2 Exhaust Duct	9:52 - 10:13 / 21	9:52 - 10:13 / 21	9:52 - 10:13 / 21
5/22/2019	1	90%	EUTURBINE2 Exhaust Duct	10:45 - 11:06 / 21	10:45 - 11:06 / 21	10:45 - 11:06 / 21
5/22/2019	2	90%	EUTURBINE2 Exhaust Duct	11:16 - 11:37 / 21	11:16 - 11:37 / 21	11:16 - 11:37 / 21
5/22/2019	3	90%	EUTURBINE2 Exhaust Duct	11:47 - 12:08 / 21	11:47 - 12:08 / 21	11:47 - 12:08 / 21
5/22/2019	1	94%	EUTURBINE2 Exhaust Duct	12:18 - 12:39 / 21	12:18 - 12:39 / 21	12:18 - 12:39 / 21
5/22/2019	2	94%	EUTURBINE2 Exhaust Duct	12:52 - 13:13 / 21	12:52 - 13:13 / 21	12:52 - 13:13 / 21
5/22/2019	3	94%	EUTURBINE2 Exhaust Duct	13:24 - 13:45 / 21	13:24 - 13:45 / 21	13:24 - 13:45 / 21
5/22/2019	1	100%	EUTURBINE2 Exhaust Duct	13:59 - 14:20 / 21	13:59 - 14:20 / 21	13:59 - 14:20 / 21
5/22/2019	2	100%	EUTURBINE2 Exhaust Duct	14:33 - 14:54 / 21	14:33 - 14:54 / 21	14:33 - 14:54 / 21
5/22/2019	3	100%	EUTURBINE2 Exhaust Duct	15:05 - 15:26 / 21	15:05 - 15:26 / 21	15:05 - 15:26 / 21

All times are Eastern Daylight Time.

TABLE 2.2.1
EMISSION RESULTS

Parameter	EUTURBINE1 Exhaust Duct							
	CONDITION 1 - 86% NGP				CONDITION 2 - 90% NGP			
	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 4	Average
Natural Gas Flowrate (kscf/hr)*	45.8	46.4	46.6	46.3	67.4	66.5	64.8	66.2
Natural Gas Heating Value (Btu/scf)*	1,066	1,064	1,065	1,065	1,065	1,065	1,066	1,065
Nitrogen Oxides Emissions (lb/hr) (as NO_2)	8.94	8.96	8.90	8.93	15.73	15.39	14.83	15.32
Nitrogen Oxides Concentration Corrected to 15% O_2	49.7	49.3	48.7	49.2	59.5	59.0	58.3	58.9
Nitrogen Oxides Concentration (ppmvd)	24.9	24.9	25.1	25.0	38.0	37.5	37.0	37.5
Carbon Monoxide Emissions (lb/hr)	305.4	304.2	299.8	303.2	3.99	4.49	5.14	4.54
Carbon Monoxide Concentration (ppmvd)	1,399	1,388	1,387	1,391	15.8	18.0	21.1	18.3
Percent by Volume Oxygen in Stack Gas (%-dry)	17.94	17.92	17.86	17.91	17.14	17.15	17.15	17.15
Measured Stack Inner Dimensions (in)†	91.0 X 91.0				91.0 X 91.0			

* Process data was provided by Vector Pipeline L.P. personnel.
† The EUTURBINE1 Exhaust Duct was rectangular in shape.

TABLE 2.2.2
EMISSION RESULTS

Parameter	EUTURBINE1 Exhaust Duct							
	CONDITION 3 - 94% NGP				CONDITION 4 -100% NGP			
	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 3	Average
Natural Gas Flowrate (kscf/hr)*	88.3	87.3	87.5	87.7	106.1	105.6	106.9	106.2
Natural Gas Heating Value (Btu/scf)*	1,066	1,066	1,066	1,066	1,065	1,065	1,065	1,065
Nitrogen Oxides Emissions (lb/hr) (as NO_2)	5.56	5.34	5.25	5.38	5.48	5.53	5.72	5.58
Nitrogen Oxides Concentration Corrected to 15% O_2	16.0	15.6	15.3	15.6	13.2	13.3	13.6	13.4
Nitrogen Oxides Concentration (ppmvd)	12.1	11.8	11.6	11.9	10.5	10.7	10.9	10.7
Carbon Monoxide Emissions (lb/hr)†	<0.50	<0.49	<0.49	<0.50	<0.57	<0.57	<0.57	<0.57
Carbon Monoxide Concentration (ppmvd)†	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Percent by Volume Oxygen in Stack Gas (%-dry)	16.44	16.41	16.42	16.42	16.20	16.18	16.20	16.19
Measured Stack Inner Dimensions (in)‡		91.0 X 91.0				91.0 X 91.0		

* Process data was provided by Vector Pipeline L.P. personnel.
† The "<" symbol indicates that compound was below the Minimum Detection Limit (MDL) of the analytical method. See Section 2.3 for details.
‡ The EUTURBINE1 Exhaust Duct was rectangular in shape.

TABLE 2.3.1
EMISSION RESULTS

Parameter	EUTURBINE2 Exhaust Duct							
	CONDITION 1 - 86% NGP				CONDITION 2 - 90% NGP			
	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 3	Average
Natural Gas Flowrate (kscf/hr)*	47.5	47.1	47.3	47.3	67.2	66.8	66.6	66.9
Natural Gas Heating Value (Btu/scf)*	1,066	1,067	1,067	1,067	1,068	1,068	1,069	1,068
Nitrogen Oxides Emissions (lb/hr) (as NO_2)	8.75	8.55	8.66	8.65	14.19	14.03	13.98	14.07
Nitrogen Oxides Concentration Corrected to 15% O_2	46.9	46.2	46.5	46.6	53.6	53.4	53.3	53.4
Nitrogen Oxides Concentration (ppmvd)	25.0	24.3	24.3	24.6	34.4	34.2	34.1	34.3
Carbon Monoxide Emissions (lb/hr)	277.0	295.4	302.6	291.7	10.36	11.20	11.58	11.04
Carbon Monoxide Concentration (ppmvd)	1,303	1,379	1,393	1,359	41.3	44.8	46.4	44.2
Percent by Volume Oxygen in Stack Gas (%-dry)	17.75	17.80	17.82	17.79	17.11	17.12	17.12	17.12
Measured Stack Inner Dimensions (in)†		91.0 X 91.0				91.0 X 91.0		

* Process data was provided by Vector Pipeline L.P. personnel.
† The EUTURBINE2 Exhaust Duct was rectangular in shape.

TABLE 2.3.2
EMISSION RESULTS

Parameter	EUTURBINE2 Exhaust Duct							
	CONDITION 3 - 94% NGP				CONDITION 4 -100% NGP			
	Run 1	Run 2	Run 3	Average	Run 1	Run 2	Run 3	Average
Natural Gas Flowrate (kscf/hr)*	85.1	84.7	84.2	84.6	99.7	99.4	98.4	99.2
Natural Gas Heating Value (Btu/scf)*	1,069	1,069	1,067	1,068	1,068	1,067	1,067	1,067
Nitrogen Oxides Emissions (lb/hr) (as NO_2)	2.46	2.47	2.42	2.45	3.90	3.88	3.73	3.84
Nitrogen Oxides Concentration Corrected to 15% O_2	7.3	7.4	7.3	7.4	9.9	9.9	9.6	9.8
Nitrogen Oxides Concentration (ppmvd)	5.6	5.7	5.6	5.6	7.9	7.9	7.7	7.8
Carbon Monoxide Emissions (lb/hr)†	<0.48	<0.48	<0.47	<0.47	<0.54	<0.54	<0.53	<0.54
Carbon Monoxide Concentration (ppmvd)†	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
Percent by Volume Oxygen in Stack Gas (%-dry)	16.4	16.4	16.4	16.4	16.2	16.2	16.2	16.2
Measured Stack Inner Dimensions (in)‡		91.0 X 91.0				91.0 X 91.0		

* Process data was provided by Vector Pipeline LP personnel.
† The "<" symbol indicates that compound was below the Minimum Detection Limit (MDL) of the analytical method. See Section 2.3 for details.
‡ The EUTURBINE2 Exhaust Duct was rectangular in shape.

TABLE 2.4.1
15-POINT STRATIFICATION TEST - EUTURBINE1 EXHAUST DUCT

	Duration	Nitrogen Oxides		
Point Number	PASS (min)	MINIMUM SINGLE POINT TRAVERSE (ppm)	Difference from Mean (ppm)	Difference from Mean (%)
1	3.0	10.7	-0.35	-3.35
2	3.0	10.7	-0.35	-3.35
3	3.0	10.5	-0.15	-1.42
4	3.0	10.3	0.05	0.52
5	3.0	10.3	0.05	0.52
6	3.0	10.4	-0.05	-0.45
7	3.0	10.4	-0.05	-0.45
8	3.0	10.3	0.05	0.52
9	3.0	10.2	0.15	1.48
10	3.0	10.2	0.15	1.48
11	3.0	10.3	0.05	0.52
12	3.0	10.3	0.05	0.52
13	3.0	10.3	0.05	0.52
14	3.0	10.2	0.15	1.48
15	3.0	10.2	0.15	1.48
	Mean	**10.4**		

TABLE 2.4.2
15-POINT STRATIFICATION TEST - EUTURBINE2 EXHAUST DUCT

	Duration	Nitrogen Oxides		
Point Number	PASS (min)	MINIMUM SINGLE POINT TRAVERSE (ppm)	Difference from Mean (ppm)	Difference from Mean (%)
1	3.0	24.9	-0.39	-1.61
2	3.0	24.8	-0.29	-1.20
3	3.0	24.7	-0.19	-0.79
4	3.0	24.7	-0.19	-0.79
5	3.0	24.7	-0.19	-0.79
6	3.0	24.5	0.01	0.03
7	3.0	24.4	0.11	0.44
8	3.0	24.5	0.01	0.03
9	3.0	24.5	0.01	0.03
10	3.0	24.4	0.11	0.44
11	3.0	24.3	0.21	0.84
12	3.0	24.3	0.21	0.84
13	3.0	24.3	0.21	0.84
14	3.0	24.3	0.21	0.84
15	3.0	24.3	0.21	0.84
	Mean	**24.5**		

3.0 PLANT AND SAMPLING LOCATION DESCRIPTIONS

3.1 PROCESS DESCRIPTION AND OPERATION

Vector Pipeline LP-Highland Compressor Station operates two natural gas-fired Solar Mars 100 turbine-driven Solar C65 compressors (EUTURBINE1 and EUTURBINE2) which are rated at 15,000 horsepower at a heat input rate of 120 MMBtu/hr. Each turbine exhausts to a single duct.

These turbines are equipped with two separate shafts. The first shaft controls the speed of the compressor turbine (i.e., the NGP), and the second shaft controls the speed of power turbine and natural gas compressor. Each turbine can be regulated in terms of turbine load as well as power turbine and NGP rotational speeds.

Figure 3.1 depicts the process and sampling location schematic.

3.2 CONTROL EQUIPMENT DESCRIPTION

During this test, emissions from EUTURBINE1 and EUTURBINE2 were controlled using DLN technology.

3.3 SAMPLING LOCATION(S)

3.3.1 EUTURBINE1 Exhaust Duct

The EUTURBINE1 Exhaust Duct was rectangular in shape with a measured width and depth of 91.0-inches. The duct was oriented in the horizontal plane and was accessed from the ground. Five sampling ports were located equidistant from one another at a location that met US EPA Method 1, Section 11.1.1 criteria. During Run 1 emissions sampling, a stratification test was performed; and three of the duct sampling ports were traversed for duct gas O_2, NO_x, and CO concentration determinations. During emission sampling for the remainder of the runs at the EUTURBINE1 Exhaust Duct, a single point was used for duct gas O_2, NO_x, and CO concentration determinations.

3.3.2 EUTURBINE2 Exhaust Duct

The EUTURBINE2 Exhaust Duct was rectangular in shape with a measured width and depth of 91.0-inches. The duct was oriented in the horizontal plane and was accessed from the ground. Five sampling ports were located equidistant from one another at a location that met US EPA Method 1, Section 11.1.1 criteria. During Run 1 emissions sampling, a stratification test was performed; and three of the duct sampling ports were traversed for duct gas O_2, NO_x, and CO concentration determinations. During emission sampling for the remainder of the runs at the EUTURBINE2 Exhaust Duct, a single point was used for duct gas O_2, NO_x, and CO concentration determinations.

Figures 3.2 and 3.3 schematically illustrate the traverse point and sample port locations utilized.

3.4 PROCESS SAMPLING LOCATION(S)

The US EPA Reference Test Methods performed did not specifically require that process samples were to be taken during the performance of this testing event. It is in the best knowledge of Montrose that no process samples were obtained and therefore no process sampling location was identified in this report.

FIGURE 3.1
EUTURBINE1 AND EUTURBINE2 SAMPLING LOCATION SCHEMATIC

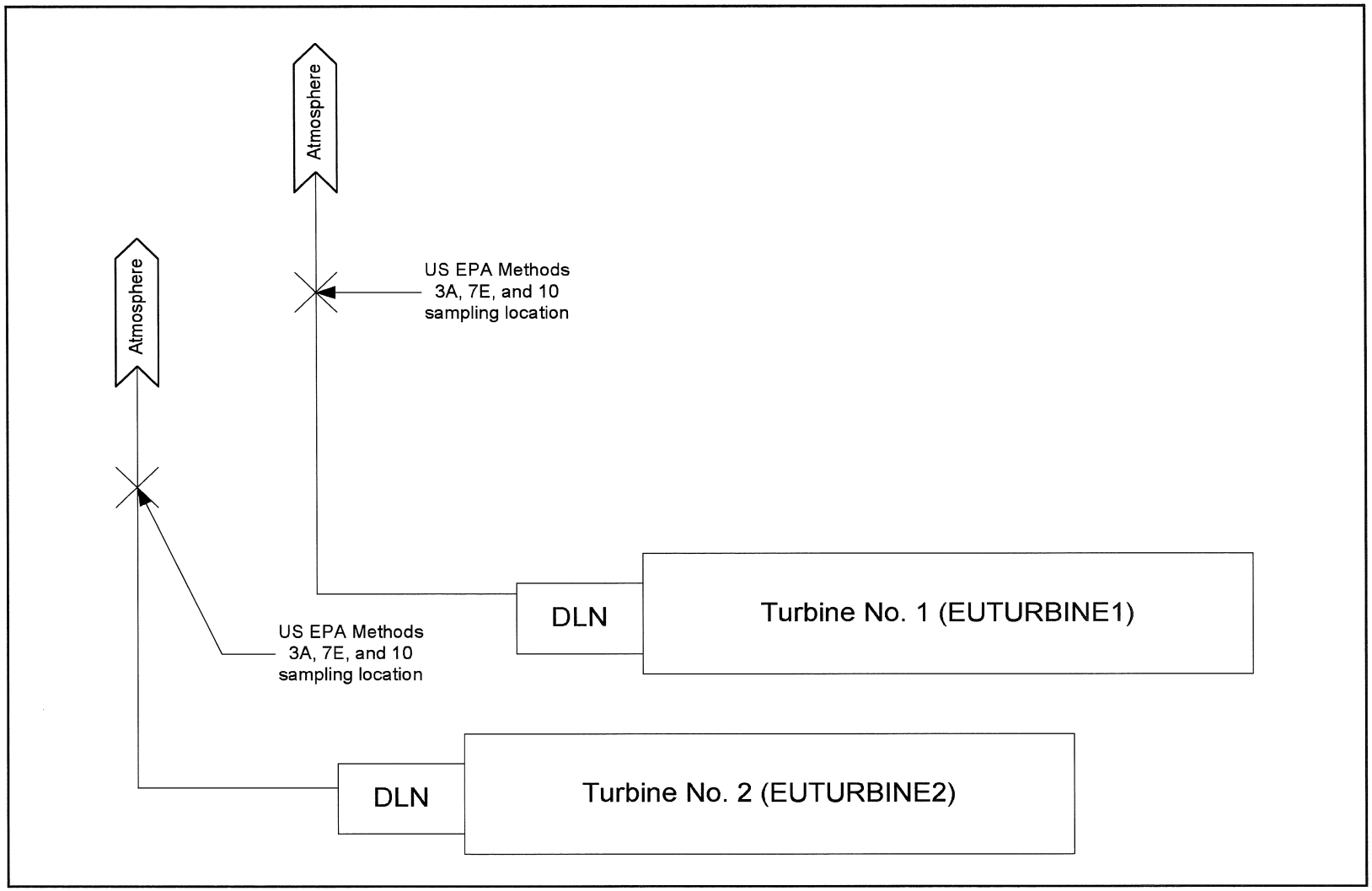
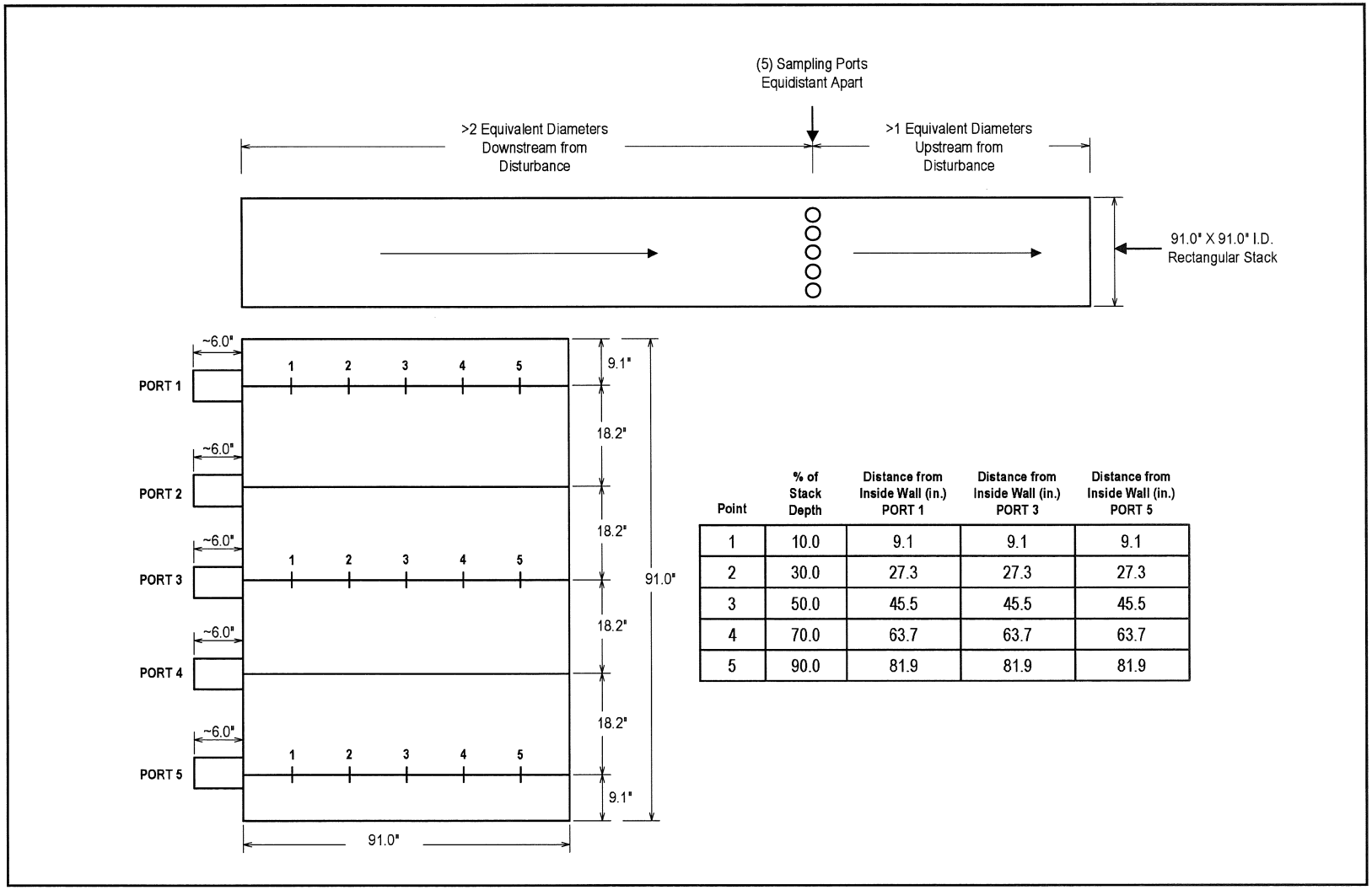
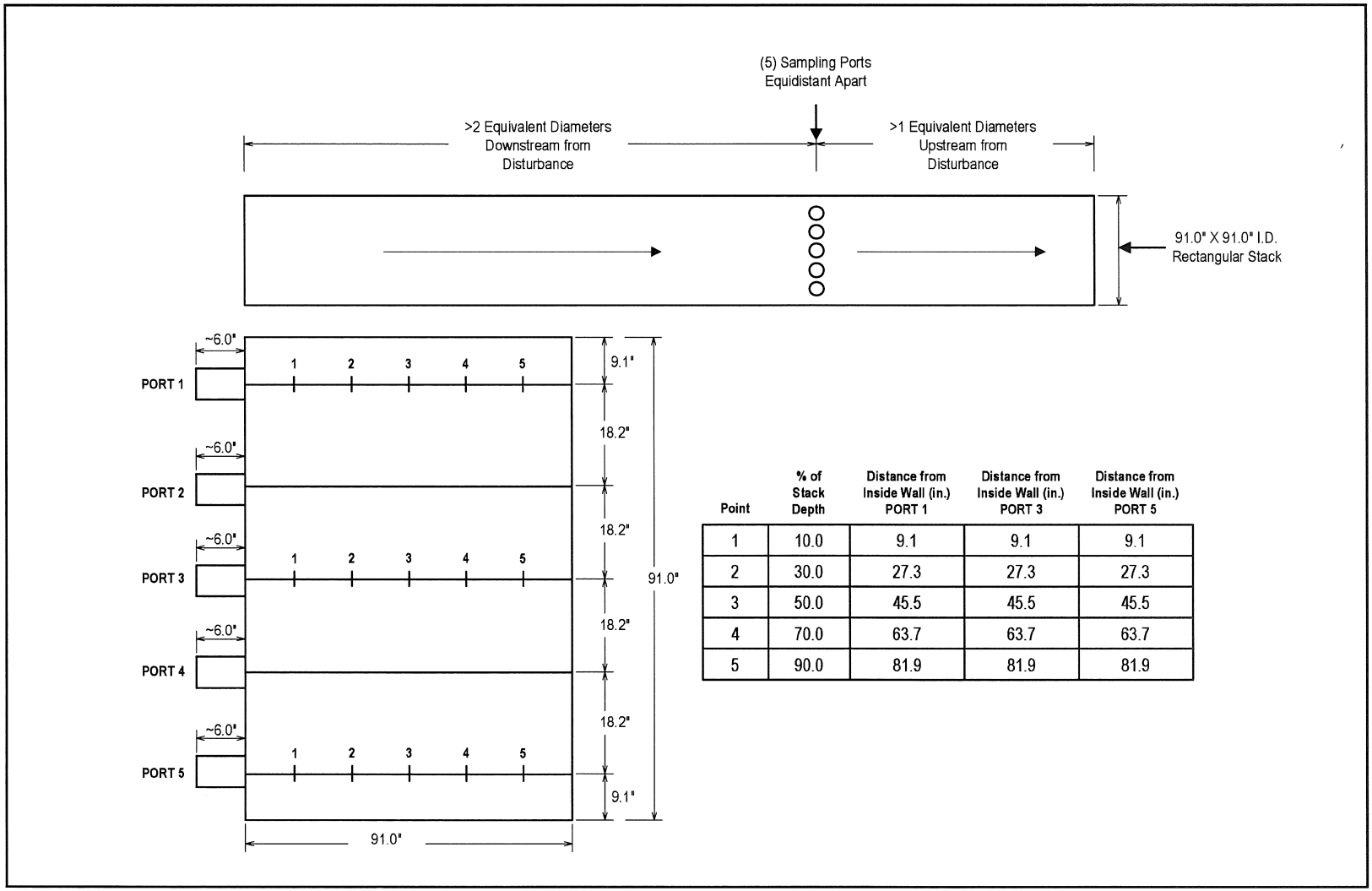


FIGURE 3.2
EUTURBINE1 EXHAUST DUCT (RUN 1) TRAVERSE POINT LOCATION DRAWING



Point	% of Stack Depth	Distance from Inside Wall (in.) PORT 1	Distance from Inside Wall (in.) PORT 3	Distance from Inside Wall (in.) PORT 5
1	10.0	9.1	9.1	9.1
2	30.0	27.3	27.3	27.3
3	50.0	45.5	45.5	45.5
4	70.0	63.7	63.7	63.7
5	90.0	81.9	81.9	81.9

FIGURE 3.3
EUTURBINE2 EXHAUST DUCT (RUN 1) TRAVERSE POINT LOCATION DRAWING



Point	% of Stack Depth	Distance from Inside Wall (in.) PORT 1	Distance from Inside Wall (in.) PORT 3	Distance from Inside Wall (in.) PORT 5
1	10.0	9.1	9.1	9.1
2	30.0	27.3	27.3	27.3
3	50.0	45.5	45.5	45.5
4	70.0	63.7	63.7	63.7
5	90.0	81.9	81.9	81.9

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

4.1.1 US EPA Method 3A: "Determination of Oxygen and Carbon Dioxide Concentrations in Emissions from Stationary Sources (Instrumental Analyzer Procedure)"

Principle: A gas sample is continuously extracted from the effluent stream. A portion of the sample stream is conveyed to an instrumental analyzer(s) for determination of O_2 and CO_2 concentration(s). Performance specifications and test procedures are provided to ensure reliable data. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.2 US EPA Method 7E: "Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure)"

Principle: A gas sample is continuously extracted from the effluent stream. A portion of the sample stream is conveyed to an instrumental analyzer for the determination of NO_x concentration. NO and NO_2 may be measured separately or simultaneously. For the purposes of this method, NO_x is the sum of NO and NO_2. Performance specifications and test procedures are provided to ensure reliable data. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.3 US EPA Method 10: "Determination of Carbon Monoxide Emissions from Stationary Sources (Instrumental Analyzer Procedure)"

Principle: A gas sample is continuously extracted from the effluent stream. A portion of the sample stream is conveyed to an instrumental analyzer for determination of CO concentration. Performance specifications and test procedures are provided to ensure reliable data. This method was utilized in its entirety as per the procedures outlined in 40 CFR Part 60, Appendix A.

4.1.4 US EPA Method 19: "Determination of Sulfur Dioxide Removal Efficiency and Particulate Matter, Sulfur Dioxide, and Nitrogen Oxides Emission Rates"

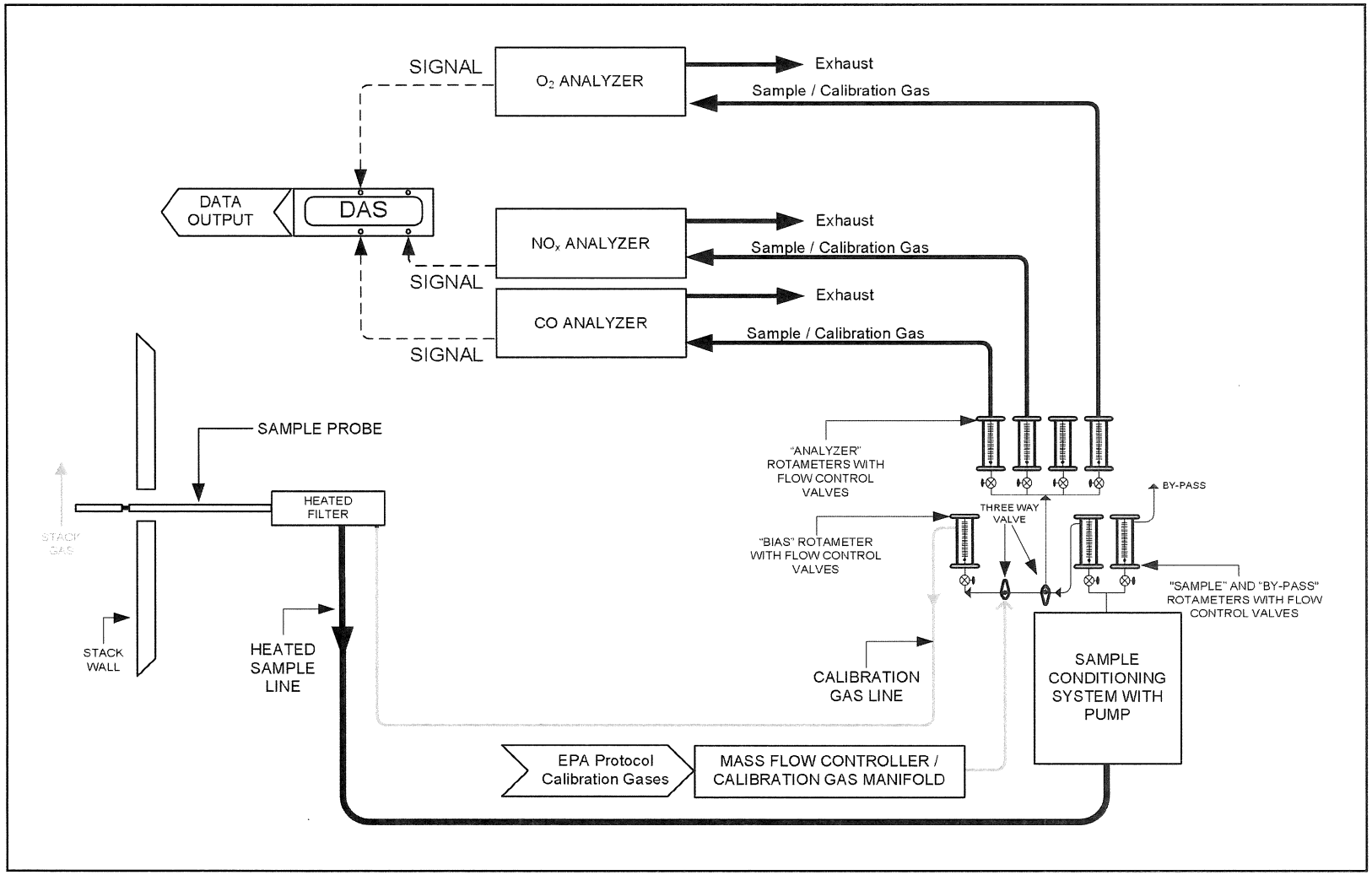
Principle: Oxygen (O_2) or carbon dioxide (CO_2) concentrations and appropriate F factors (ratios of combustion gas volumes to heat inputs) are used to calculate pollutant emission rates from pollutant concentrations.

The sampling train utilized during this testing project is depicted in Figure 4.1.

4.2 PROCEDURES FOR OBTAINING PROCESS DATA

Process data was recorded by Vector Pipeline L.P.-Highland Compressor Station personnel utilizing their typical record keeping procedures. Recorded process data was provided to Montrose personnel at the conclusion of this test event. The process data is located in Tables 2.2.1 to 2.3.2 and in the Appendix.

FIGURE 4.1
US EPA METHODS 3A, 7E, AND 10 SAMPLING TRAIN SCHEMATIC



5.0 INTERNAL QA/QC ACTIVITIES

5.1 QA AUDITS

Tables 5.1.1 to 5.10 illustrate the QA audits that were performed during this test.

Tables 5.1.1 to 5.4.3 illustrate the O_2, NO_x, and CO calibration audits which were performed at the EUTURBINE1 Exhaust Duct during this test (and integral to performing US EPA Method 3A, 7E, and 10 correctly) were all within the Measurement System Performance Specifications of ±3% of span for the Zero and Calibration Drift Checks, ±5% of span for the System Calibration Bias Checks, and ±2% of span for the Calibration Error Checks.

Tables 5.5.1 to 5.8.3 illustrate the O_2, NO_x, and CO calibration audits which were performed at the EUTURBINE2 Exhaust Duct during this test (and integral to performing US EPA Method 3A, 7E, and 10 correctly) were all within the Measurement System Performance Specifications of ±3% of span for the Zero and Calibration Drift Checks, ±5% of span for the System Calibration Bias Checks, and ±2% of span for the Calibration Error Checks.

Table 5.9 displays the NO_2 to NO Converter Efficiency Check. The Converter Efficiency Check was conducted as per the procedures contained in US EPA Method 7E, Section 8.2.4.2 and 16.2.2 (Tedlar Bag Procedure) which requires a mid-level gas be recorded for at least 30-minutes and the final NO_x value to be within 2% of the peak NO_x value. As shown, a post-test difference of 0.0% was achieved. Therefore, the NO_x Converter Efficiency was acceptable.

Table 5.10 displays the US EPA Method 205 field evaluation of the calibration gas dilution system utilized during this test event. As shown, the average concentration output at each dilution level was within ±2% of the predicted value. The average concentration output of the mid-level gas was also within ±2% of the certified concentration.

5.2 QA/QC PROBLEMS

No QA/QC problems occurred during this test event.

5.3 QUALITY STATEMENT

Montrose is qualified to conduct this test program and has established a quality management system that led to accreditation with ASTM Standard D7036-04 (Standard Practice for Competence of Air Emission Testing Bodies). Montrose participates in annual functional assessments for conformance with D7036-04 which are conducted by the American Association for Laboratory Accreditation (A2LA). All testing performed by Montrose is supervised on site by at least one Qualified Individual (QI) as defined in D7036-04 Section 8.3.2. Data quality objectives for estimating measurement uncertainty within the documented limits in the test methods are met by using approved test protocols for each project as defined in D7036-04 Sections 7.2.1 and 12.10. Additional quality assurance information is presented in the report appendices.