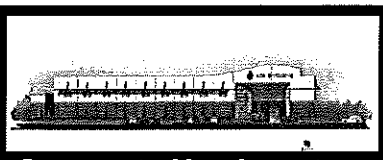
COMPLIANCE TEST REPORT
FOR THE
MITSUBISHI 501G, UNIT EU-TURBINE3/EU-DB3
PREPARED FOR
NEW COVERT GENERATING COMPANY, LLC

AT THE
NEW COVERT GENERATING FACILITY
COVERT, MICHIGAN
AUGUST 12-14, 2013



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Michigan Department of
Environmental Quality
Permit No: MI-ROP-N6767-2009b

AUGUST 12-14, 2013

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Mitsubishi 501G, Unit EU-Turbine3/EU-DB3
New Covert Generating Company, LLC
New Covert Generating Facility
Covert, Michigan
August 12-14, 2013

1.0 INTRODUCTION

Air Hygiene International, Inc. (Air Hygiene) has completed the emissions testing study for nitrogen oxides (NOx), carbon monoxide (CO), volatile organic compounds (VOCs), ammonia (NH_3), formaldehyde (HCHO), and particulate matter less than or equal to 10 microns in diameter (PM_{10}) from the exhaust of the Mitsubishi 501G, Unit EU-Turbine3/EU-DB3 for New Covert Generating Company, LLC (New Covert) at the New Covert Generating Facility near Covert, Michigan. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on August 12-14, 2013.

1.1 TEST PURPOSE AND OBJECTIVES

The purpose of the testing was to conduct periodic compliance emission tests to document levels of selected pollutants at three operating loads [75%, 100% with duct burners (W/DB), and 100% without duct burners (W/O DB)]. The information will be used to confirm compliance with the Permit No: MI-ROP-N6767-2009b issued by the Michigan Department of Environmental Quality (MDEQ). The specific objective was to determine the emission concentration of NOx, CO, VOC, NH_3, PM_{10}, and HCHO from the exhaust of New Covert's Mitsubishi 501G, Unit EU-Turbine3/EU-DB3 at 75%, 100% W/DB and 100% W/O DB of total capacity.

1.2 SUMMARY OF TEST PROGRAM

The following list details pertinent information related to this specific project:

1.2.1 Participating Organizations
- Michigan Department of Environmental Quality (MDEQ)
- New Covert Generating Company, LLC (New Covert)
- Air Hygiene

1.2.2 Industry
- Electric Utility / Electric Services

1.2.3 Air Permit and Federal Requirements
- Permit Number: MI-ROP-N6767-2009b

1.2.4 Plant Location
- New Covert Generating Facility near Covert, Michigan
- 26000 77th Street, Covert, Michigan 49043

1.2.5 Equipment Tested
- Mitsubishi 501G, Unit EU-Turbine3/EU-DB3

1.2.6 Emission Points
- Exhaust from the Mitsubishi 501G, Unit EU-Turbine3/EU-DB3
- For all gases, one sample point in the exhaust duct from the Mitsubishi 501G, Unit EU-Turbine3/EU-DB3, determined after conducting a stratification test (refer to Appendix F)
- For all wet chemistry testing, 24 sampling points in the exhaust duct from the Mitsubishi 501G, Unit EU-Turbine3/EU-DB3 (refer to Appendix A)

1.2.7 Pollutants Measured

- NOx
- CO
- VOC
- NH_3
- HCHO
- PM_{10}

1.2.8 Date of Emission Test

- August 12-14, 2013

1.3 KEY PERSONNEL

New Covert Generating Company, LLC:	Chris Head	269-764-3805
MDEQ:	Tom Gasloli	517-335-4861
Air Hygiene:	Ashwin Ravi	918-307-8865
Air Hygiene:	Darin Grimes	918-307-8865
Air Hygiene:	Patrick Iyonsi	918-307-8865
Air Hygiene:	Aaron Blum	918-307-8865
Air Hygiene:	Huy Nguyen	918-307-8865

2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on New Covert's Mitsubishi 501G, Unit EU-Turbine3/EU-DB3 located at the New Covert Generating Facility on August 12-14, 2013 are summarized in the following tables and relate only to the items tested.

TABLE 2.1
MITSUBISHI 501G, EU-TURBINE3/EU-DB3 75% LOAD DATA SUMMARY

Parameter	Run 1	Run 2	Run 3	Average	Permit Limits
Start Time (hh:mm:ss)	6:54:14	8:03:14	9:12:14	6:54:14	--
End Time (hh:mm:ss)	7:53:44	9:02:44	10:11:44	10:11:44	--
Run Duration (min / run)	60	60	60	60	--
Bar. Pressure (in. Hg)	30.19	30.20	30.22	30.20	--
Amb. Temp. (°F)	47	55	59	54	--
Rel. Humidity (%)	95	78	72	82	--
Spec. Humidity (lb water / lb air)	0.006408	0.007082	0.007554	0.007015	--
Turbine Fuel Flow (SCFH)	1,952,600	1,949,600	1,884,400	1,928,867	--
Stack Flow (RM19) (SCFH)	48,682,724	48,551,239	47,225,747	48,153,237	--
Stack Moisture (% Method 4)	8.2	8.1	7.3	7.9	--
Heat Input (MMBtu/hr)	1,978.9	1,975.8	1,909.8	1,954.8	--
Power Output (megawatts)	299.0	300.0	288.0	295.7	--
NOx (ppmvd)	2.51	2.32	2.24	2.36	--
NOx (ppm@15%O_2)	2.01	1.86	1.81	1.89	2.5
NOx (lb/hr)	14.58	13.43	12.65	13.56	--
NOx (lb/MMBtu)	0.007	0.007	0.007	0.007	--
CO (ppmvd)	0.02	0.02	0.02	0.02	--
CO (ppm@15%O_2)	0.02	0.02	0.02	0.02	--
CO (lb/hr)	0.07	0.07	0.07	0.07	33.7
CO (lb/MMBtu)	0.000	0.000	0.000	0.000	--
THC (ppmvd)	4.06	3.83	3.81	3.90	--
THC (lb/hr)	8.21	7.71	7.47	7.80	--
THC (lb/MMBtu)	0.004	0.004	0.004	0.004	--
CH_4 (ppmvd)	0.90	0.93	0.92	0.92	--
C_2H_6 (ppmvd)	0.26	0.28	0.29	0.27	--
VOC (ppmvd)	2.89	2.62	2.60	2.70	--
VOC (ppm@15%O_2)	2.32	2.10	2.10	2.17	--
VOC (lb/hr)	5.85	5.28	5.10	5.41	7.7
VOC (lb/MMBtu)	0.003	0.003	0.003	0.003	--
HCHO (ppmvd)	0.25	0.38	0.21	0.28	--
HCHO (ppm@15%O_2)	0.20	0.30	0.17	0.22	--
HCHO (lb/hr)	0.96	1.43	0.77	1.05	--
HCHO (ton/day) at 24 hr/day	0.01	0.02	0.01	0.01	--
HCHO (ton/year) at 8760 hr/year	4.19	6.26	3.37	4.61	8.1
HCHO (lb/MMBtu)	0.000	0.001	0.000	0.001	--
PM_{10} Run Start Time (hh:mm)	06:32	09:06	11:40	06:32	--
PM_{10} Run End Time (hh:mm)	08:47	11:14	13:55	13:55	--
Total PM_{10} (mg)	2.74	3.12	4.67	3.51	--
Total PM_{10} (g/dscf)	2.61E-05	3.12E-05	4.68E-05	3.47E-05	--
Total PM_{10} (gr/dscf)	4.02E-04	4.81E-04	7.22E-04	5.35E-04	--
Total PM_{10} (kg/hr)	1.47	1.72	2.55	1.91	--
Total PM_{10} (lb/hr)	3.24	3.79	5.62	4.22	33.8
Total PM_{10} (ton/year) at 8760 hr/year	14.19	16.60	24.60	18.46	--
Total PM_{10} (lb/MMBtu)	0.001	0.002	0.003	0.002	--
NH_3 (ppmvd)	2.79	2.40	2.42	2.54	--
NH_3 (ppm@15%O_2)	2.24	1.93	1.95	2.04	10
NH_3 (lb/hr)	6.00	5.16	5.05	5.40	--
NH_3 (lb/MMBtu)	0.003	0.003	0.003	0.003	--
O_2 (%)	13.55	13.54	13.59	13.56	--

TABLE 2.2
MITSUBISHI 501G, UNIT EU-TURBINE3/EU-DB3 100 % W/O DB LOAD DATA SUMMARY

Parameter	Run 1	Run 2	Run 3	Average	Permit Limits
Start Time (hh:mm:ss)	8:57:14	10:06:14	11:15:14	8:57:14	--
End Time (hh:mm:ss)	9:56:44	11:05:44	12:14:44	12:14:44	--
Run Duration (min / run)	60	60	60	60	--
Bar. Pressure (in. Hg)	30.05	30.05	30.05	30.05	--
Amb. Temp. (°F)	68	62	65	65	--
Rel. Humidity (%)	63	56	53	57	--
Spec. Humidity (lb water / lb air)	0.009138	0.006563	0.006904	0.007535	--
Turbine Fuel Flow (SCFH)	2,340,000	2,336,400	2,336,400	2,337,600	--
Stack Flow (RM19) (SCFH)	57,886,998	57,642,815	57,684,130	57,737,981	--
Stack Moisture (% Method 4)	8.1	8.2	7.7	8.0	--
Heat Input (MMBtu/hr)	2,397.0	2,393.3	2,393.3	2,394.5	--
Power Output (megawatts)	349.0	349.0	349.0	349.0	--
NOx (ppmvd)	1.90	1.91	2.00	1.94	--
NOx (ppm@15%O_2)	1.50	1.50	1.57	1.52	2.5
NOx (lb/hr)	13.15	13.17	13.77	13.36	--
NOx (lb/MMBtu)	0.005	0.006	0.006	0.006	--
CO (ppmvd)	0.05	0.04	0.04	0.05	--
CO (ppm@15%O_2)	0.04	0.03	0.03	0.04	--
CO (lb/hr)	0.23	0.18	0.17	0.19	33.7
CO (lb/MMBtu)	0.000	0.000	0.000	0.000	--
THC (ppmvd)	3.42	3.70	3.57	3.57	--
THC (lb/hr)	8.23	8.87	8.55	8.55	--
THC (lb/MMBtu)	0.003	0.004	0.004	0.004	--
CH_4 (ppmvd)	0.98	0.98	0.97	0.98	--
C_2H_6 (ppmvd)	0.27	0.26	0.25	0.26	--
VOC (ppmvd)	2.18	2.46	2.34	2.33	--
VOC (ppm@15%O_2)	1.71	1.93	1.84	1.83	--
VOC (lb/hr)	5.23	5.90	5.62	5.58	7.7
VOC (lb/MMBtu)	0.002	0.002	0.002	0.002	--
HCHO (ppmvd)	0.28	0.26	0.25	0.27	--
HCHO (ppm@15%O_2)	0.22	0.21	0.20	0.21	--
HCHO (lb/hr)	1.27	1.19	1.13	1.20	--
HCHO (ton/day) at 24 hr/day	0.02	0.01	0.01	0.01	--
HCHO (ton/year) at 8760 hr/year	5.57	5.19	4.94	5.24	8.1
HCHO (lb/MMBtu)	0.001	0.000	0.000	0.000	--
Unspecified Cmpd (lb/MMBtu)	09:12	11:46	14:17	09:12	--
Unspecified Cmpd (g/hp*hr)	11:21	13:57	16:24	16:24	--
Total PM_{10} (mg)	2.12	2.87	4.86	3.28	--
Total PM_{10} (g/dscf)	1.75E-05	2.49E-05	4.32E-05	2.85E-05	--
Total PM_{10} (gr/dscf)	2.71E-04	3.84E-04	6.66E-04	4.40E-04	--
Total PM_{10} (kg/hr)	1.15	1.60	2.70	1.82	--
Total PM_{10} (lb/hr)	2.54	3.52	5.95	4.01	33.8
Total PM_{10} (ton/year) at 8760 hr/year	11.13	15.42	26.08	17.54	--
Total PM_{10} (lb/MMBtu)	0.001	0.001	0.002	0.002	--
NH_3 (ppmvd)	2.29	2.50	2.38	2.39	--
NH_3 (ppm@15%O_2)	1.80	1.96	1.87	1.88	10
NH_3 (lb/hr)	5.85	6.36	6.07	6.09	--
NH_3 (lb/MMBtu)	0.002	0.003	0.003	0.003	--
O_2 (%)	13.41	13.39	13.39	13.40	--

TABLE 2.3
MITSUBISHI 501G, UNIT EU-TURBINE3/EU-DB3 100% - W/DB LOAD DATA SUMMARY

Parameter	Run 1	Run 2	Run 3	Average	Permit Limits
Start Time (hh:mm:ss)	12:58:14	14:07:14	15:16:14	12:58:14	--
End Time (hh:mm:ss)	13:57:44	15:06:44	16:15:44	16:15:44	--
Run Duration (min / run)	60	60	60	60	--
Bar. Pressure (in. Hg)	29.97	29.95	29.97	29.96	--
Amb. Temp. (°F)	75	75	72	74	--
Rel. Humidity (%)	75	69	78	74	--
Spec. Humidity (lb water / lb air)	0.013935	0.012806	0.013084	0.013275	--
Turbine Fuel Flow (SCFH)	2,391,500	2,395,000	2,395,100	2,393,867	--
Stack Flow (RM19) (SCFH)	55,446,985	55,457,925	55,710,244	55,538,385	--
Stack Moisture (% Method 4)	9.4	9.3	9.7	9.5	--
Heat Input (MMBtu/hr)	2,399.9	2,403.4	2,403.5	2,402.3	--
Power Output (megawatts)	357.0	378.0	358.0	364.3	--
NOx (ppmvd)	2.84	2.87	2.53	2.75	--
NOx (ppm@15%O_2)	2.14	2.16	1.91	2.07	2.5
NOx (lb/hr)	18.81	19.02	16.82	18.22	--
NOx (lb/MMBtu)	0.008	0.008	0.007	0.008	--
CO (ppmvd)	0.21	0.16	0.05	0.14	--
CO (ppm@15%O_2)	0.15	0.12	0.04	0.10	--
CO (lb/hr)	0.83	0.64	0.20	0.56	33.7
CO (lb/MMBtu)	0.000	0.000	0.000	0.000	--
THC (ppmvd)	3.68	4.06	4.07	3.94	--
THC (lb/hr)	8.49	9.35	9.43	9.09	--
THC (lb/MMBtu)	0.004	0.004	0.004	0.004	--
CH_4 (ppmvd)	0.96	0.87	0.93	0.92	--
C_2H_6 (ppmvd)	0.26	0.24	0.25	0.25	--
VOC (ppmvd)	2.47	2.94	2.89	2.77	--
VOC (ppm@15%O_2)	1.86	2.22	2.18	2.09	--
VOC (lb/hr)	5.68	6.78	6.68	6.38	7.7
VOC (lb/MMBtu)	0.002	0.003	0.003	0.003	--
HCHO (ppmvd)	0.25	0.24	0.31	0.27	--
HCHO (ppm@15%O_2)	0.19	0.18	0.24	0.20	--
HCHO (lb/hr)	1.08	1.05	1.36	1.16	--
HCHO (ton/day) at 24 hr/day	0.01	0.01	0.02	0.01	--
HCHO (ton/year) at 8760 hr/year	4.73	4.60	5.96	5.10	8.1
HCHO (lb/MMBtu)	0.000	0.000	0.001	0.000	--
PM_{10} Run Start Time (hh:mm)	13:03	15:37	18:09	13:03	--
PM_{10} Run End Time (hh:mm)	15:16	17:53	20:25	20:25	--
Total PM_{10} (mg)	6.40	3.91	3.20	4.50	--
Total PM_{10} (g/dscf)	5.83E-05	3.30E-05	2.82E-05	3.98E-05	--
Total PM_{10} (gr/dscf)	8.99E-04	5.09E-04	4.36E-04	6.14E-04	--
Total PM_{10} (kg/hr)	3.49	2.13	1.77	2.47	--
Total PM_{10} (lb/hr)	7.70	4.70	3.91	5.44	33.8
Total PM_{10} (ton/year) at 8760 hr/year	33.72	20.59	17.11	23.81	--
Total PM_{10} (lb/MMBtu)	0.003	0.002	0.001	0.002	--
NH_3 (ppmvd)	2.26	2.24	2.09	2.20	--
NH_3 (ppm@15%O_2)	1.71	1.68	1.58	1.66	10
NH_3 (lb/hr)	5.55	5.49	5.15	5.39	--
NH_3 (lb/MMBtu)	0.002	0.002	0.002	0.002	--
O_2 (%)	13.07	13.06	13.10	13.08	--

The results of all measured pollutant emissions were below the required limits. All testing was performed without any real or apparent errors. All testing was conducted according to the approved testing protocol.

3.0 SOURCE OPERATION

3.1 PROCESS DESCRIPTION

New Covert owns and operates the New Covert Generating Facility located at 26000 77th Street in Covert, Michigan. The facility consists of three natural gas-fired Mitsubishi 501G turbines with heat recovery steam generators (HRSGs), designated as Emission Unit EU-TURBINE1, EU-TURBINE2, and EU-TURBINE3. Each HRSG contains a duct burner, designated as Emission Unit EU-DB1, EU-DB2, and EU-DB3, to provide additional steam generating capability and increase the maximum power generating capability of the HRSG. Each duct burner is rated at approximately 256 million British thermal units per hour (MMBtu/hr) but were not operated, except for one of the three load conditions. Each turbine and duct burner set are equipped with dry low-NOx combustors, a selective catalytic reduction (SCR) system, and an oxidation catalyst to control nitrogen oxides (NOx) and carbon monoxide (CO) respectively.

3.2 SAMPLING LOCATION

The stack is circular and measures 22.1 feet (ft) (265 inches) in diameter at the test ports which are approximately 140 ft above grade level with an exit elevation of approximately 160 ft above grade level. The test ports are located approximately 85 ft (1020 inches) downstream and approximately 20 ft (240 inches) upstream from the nearest disturbances. All exhaust samples for gaseous emissions were continuously drawn from the exhaust system at the sample ports from a single point determined after conducting a stratification test (Appendix E). During the stratification test three points were traversed from each of the four ports. The probe was allowed to remain at a point for two times the system response time.

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

The emission test on the Mitsubishi 501G, Unit EU-Turbine3/EU-DB3 at the New Covert Generating Facility was performed following United States Environmental Protection Agency (EPA) methods described by the Code of Federal Regulations (CFR). Table 4.1 outlines the specific methods performed on August 12-14, 2013.

TABLE 4.1
SUMMARY OF SAMPLING METHODS

Pollutant or Parameter	Sampling Method	Analysis Method
Sample Point Location	EPA Method 1	Equal Area Method
Stack Flow Rate	EPA Method 2	S-Type Pitot Tube
Molecular Weight (O_2)	EPA Method 3a	Paramagnetic Cell
Stack Moisture Content	EPA Method 4	Gravimetric Analysis
Nitrogen Oxides	EPA Method 7e	Chemiluminescent Analyzer
Carbon Monoxide	EPA Method 10	Nondispersive Infrared Analyzer
Total Hydrocarbons	EPA Method 25a	Flame Ionization Detector
Formaldehyde, Ammonia, Methane, Ethane	EPA Method 320	Fourier Transform Infrared
Particulate Matter (PM_{10})	EPA Method 5/202	Total Filterable/Condensable

4.2 INSTRUMENT CONFIGURATION AND OPERATIONS FOR GAS ANALYSIS

The sampling and analysis procedures used during these tests conform with the methods outlined in the Code of Federal Regulations (CFR), Title 40, Part 60, Appendix A, Methods 1, 2, 3a, 4, 5/202, 7e, 10, 18/25a, and Method 320.

Figure 4.1 depicts the sample system used for the NOx, CO, THC, and O_2 tests. A stainless steel probe was inserted into the sample port of the stack to extract gas measurements from the emission stream at a single point in the stack determined after passing an initial stratification test. The gas sample was continuously pulled through the probe and transported, via heat-traced Teflon® tubing, to a heated head pump and into the FTIR then to a stainless steel minimum-contact condenser designed to dry the sample. Transportation of the sample, through Teflon® tubing, continued into the sample manifold within the mobile laboratory via a stainless steel/Teflon® diaphragm pump. From the manifold, the sample was partitioned to the NOx, CO, THC, and O_2 analyzers through rotameters that controlled the flow rate of the sample.

Figure 4.1 shows that the sample system was also equipped with a separate path through which a calibration gas could be delivered to the probe and back through the entire sampling system. This allowed for convenient performance of system bias checks as required by the testing methods.

All instruments were housed in an air-conditioned, trailer-mounted mobile laboratory. Gaseous calibration standards were provided in aluminum cylinders with the concentrations certified by the vendor. EPA Protocol No. 1 was used to determine the cylinder concentrations where applicable (i.e. NOx calibration gases).

Table 4.2 provides a description of the analyzers used for the instrument portion of the tests. All data from the continuous monitoring instruments were recorded on a Logic Beach Portable Data Logging System Hyperlogger which retrieves calibrated electronic data from each instrument every one second and reports an average of the collected data every 30 seconds. For target compounds measured with the Fourier transform infrared (FTIR) spectrometer, interferograms consisting of 27 co-added scans were recorded continuously during the test periods, and provided approximately 30-second average concentrations. Spectral data was analyzed by the MKS MG2000 software. Data records can be found in Appendix A and B of this report.

Figure 4.2 represents the sample system used for the wet chemistry tests (PM_{10}). A heated stainless steel probe with an inconel liner and stainless steel nozzle was inserted into the sample ports of the stack to extract gas measurements from the emission stream through a filter and glass impinger train. Flow rates are monitored with oil filled manometers and total sample volumes are measured with a dry gas meter.

Three test runs of approximately 60 minutes each were conducted on the Mitsubishi 501G, Unit EU-Turbine3/EU-DB3 for NOx, CO, VOC, NH_3, HCHO and O_2. The stack gas analysis for O2 concentrations was performed in accordance with procedures set forth in EPA Method 3a. The O2 analyzer uses a paramagnetic cell detector. EPA Method 4 was used for Moisture calculations.

VOC emission concentrations were quantified in accordance with principles set forth in EPA Method 25a. A VIG 210 was used for this purpose. The VIG 210 includes both a conventional total hydrocarbon (THC) analyzer and an automated gas chromatograph (GC) for determining VOCs. For this specific testing, just the THC analyzer was used in conjunction with FTIR to determine VOC concentration.

EPA Method 7e was used to determine concentrations of NOx. A chemiluminescent analyzer was used to determine the nitrogen oxides concentration in the gas stream. A NO_2 in nitrogen certified gas cylinder was used to verify at least a 90 percent NO_2 conversion on the day of the test.

CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous nondispersive infrared (NDIR) analyzer was used for this purpose.

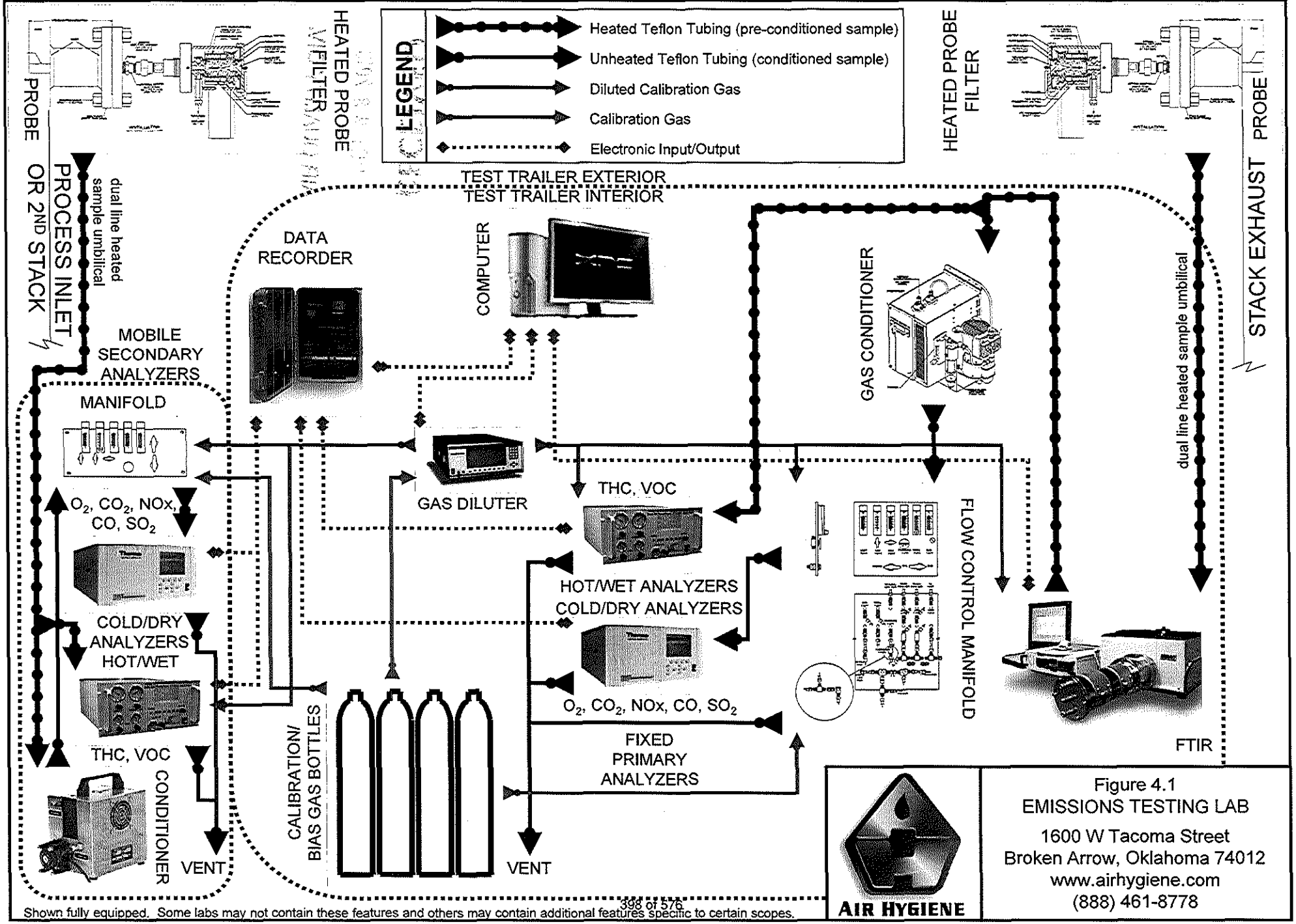
An MKS Instruments - MultiGas™ Fourier Transform Infrared (FTIR) spectrometer, or equivalent, was used for HCHO, NH_3, methane and ethane analysis per EPA Method 320. The FTIR spectrometer spectral resolution was 0.5 cm-1. The system employed a silicon carbide infrared source at 1200°C, a helium neon reference laser, beam splitters, potassium bromide (KBr) cell window, front-surface optical transfer mirrors, and multi-pass absorption cells. MCT detectors were used and cooled with liquid nitrogen in order to maintain a constant temperature of 77 Kelvin. The approximately 5.11-meter multi-pass path cells incorporated aspheric, aberration-correcting mirrors to increase the optical throughput and the detection sensitivity. Transducers and thermocouples were connected directly to the insulated sample cells that provide the pressure and temperatures of the sample streams. During testing, the temperature of the absorption cells was set at 191°C. Elevated temperature prevented gas condensation within the cell and minimized compound adhesion to the cell walls and mirrors. The volume of the absorption cell was 0.5 liters, so at a sample gas flow rate of 4.0 liters per minute, the sample gas in the cell is refreshed approximately four times each minute. Interferograms consisting of 28 co-added scans were recorded continuously during the test periods, and provided approximately 30-second average concentrations.

Results from the FTIR analysis of methane and ethane were subtracted from the total hydrocarbon (THC) concentrations determined in a standard flame ionization detector (FID) type analyzer, calibrated and monitored per EPA Method 25a.

Three PM runs of approximately 120 minutes were conducted on the exhaust of New Covert's Mitsubishi 501G, Unit EU-Turbine3/EU-DB3 at 75%, 100% W/DB and 100% W/O DB of total capacity.

TABLE 4.2
ANALYTICAL INSTRUMENTATION

Parameter	Manufacturer and Model	Range	Sensitivity	Detection Principle
NOx	THERMO 42C	User may select up to 5,000 ppm	0.1 ppm	Thermal reduction of NO_2 to NO. Chemiluminescence of reaction of NO with O_3. Detection by PMT. Inherently linear for listed ranges.
CO	THERMO 48C	User may select up to 10,000 ppm	0.1 ppm	Infrared absorption, gas filter correlation detector, microprocessor based linearization.
O_2	SERVOMEX 1440	0-25%	0.1%	Paramagnetic cell, inherently linear.
HCHO, NH_3, CH_4, C_2H_6	MKS 2030	User may select from Multiple ranges	0.1 ppm	Fourier Transform Infrared Spectrometer – FTIR
THC/VOC	VIG 210	User may select up to 10,000 ppm	0.1 ppm	GC Column and Flame Ionization Detector



Shown fully equipped. Some labs may not contain these features and others may contain additional features specific to certain scopes.

AIR HYGIENE

Figure 4.1
EMISSIONS TESTING LAB

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Broken Arrow, Oklahoma 74012
www.airhygiene.com
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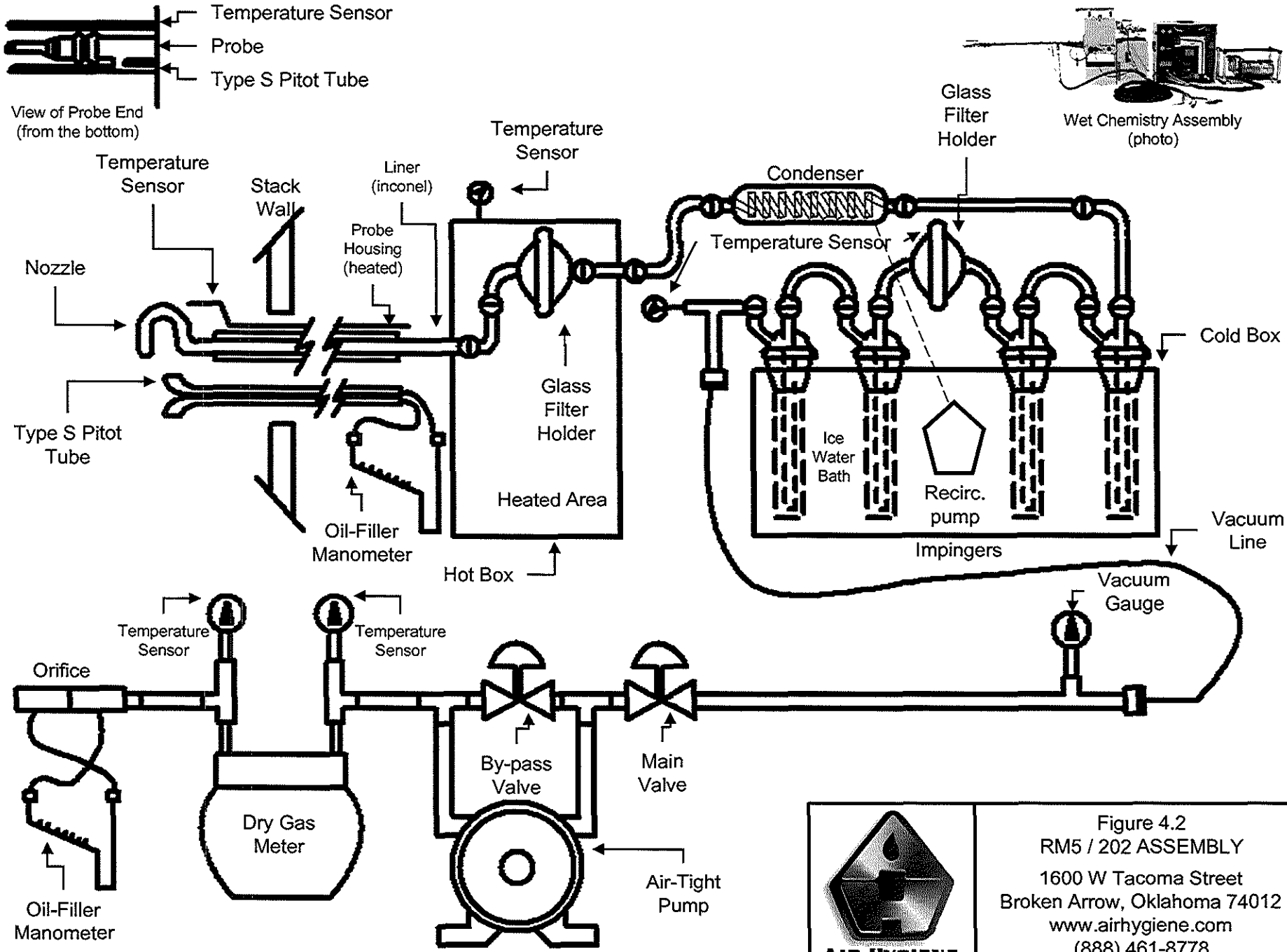

Figure 4.2
RM5 / 202 ASSEMBLY

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APPENDIX A

TEST RESULTS AND CALCULATIONS