

**EMISSION COMPLIANCE TEST  
FOR THE  
GENERAL ELECTRIC, PG7121 (EA), UNIT #4  
PREPARED FOR  
WOLVERINE POWER SUPPLY COOPERATIVE, INC.  
AT THE  
SUMPTER GENERATION PLANT  
BELLEVILLE, MICHIGAN  
JUNE 25, 2021**

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certify this testing was conducted and  
this report was created in conformance  
with the requirements of ASTM D7036

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**Emissions Compliance Test  
General Electric, PG7121 (EA), Unit #4 CEMS  
Wolverine Power Supply Cooperative, Inc.  
Sumpter Generation Plant  
Belleville, Michigan  
June 25, 2021**

## **1.0 INTRODUCTION**

Air Hygiene International, Inc. (Air Hygiene) has completed the Emissions Compliance Test for carbon monoxide (CO) from the exhaust of the General Electric, PG7121 (EA), Unit #4 for Wolverine Power Supply Cooperative, Inc. at the Sumpter Generation Plant near Belleville, Michigan. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on June 25, 2021.

## **1.1 TEST PURPOSE AND OBJECTIVES**

The purpose of the test was to conduct a periodic compliance emission test to document levels of selected pollutants at normal test load (High). The information will be used to confirm compliance with the operating permit issued by the Michigan Department of Environment, Great Lakes & Energy (EGLE). The specific objective was to determine the emission concentration of CO from the exhaust of Wolverine Power Supply Cooperative, Inc.'s General Electric, PG7121 (EA), Unit #4.

## **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 Environment, Great Lakes & Energy (EGLE)
  - Wolverine Power Supply Cooperative, Inc. (WP)
  - Fishbeck
  - Air Hygiene
- 1.2.2 Industry
  - Electric Utility / Electric Services
- 1.2.3 Air Permit Requirements
  - Permit Number: MI-ROP-M4854-2014C
- 1.2.4 Plant Location
  - Sumpter Generation Plant near Belleville, Michigan
    - GPS Coordinates [Latitude 42.167, Longitude -83.532]
    - 8509 Rawsonville Road, Belleville, Wayne County, Michigan 48111-9371
    - Federal Registry System / Facility Registry Service (FRS) No. – 110017414172
    - Source Classification Code (SCC) – 20100201
- 1.2.5 Equipment Tested
  - General Electric, PG7121 (EA), Unit #4
- 1.2.6 Emission Points
  - Exhaust from the General Electric, PG7121 (EA), Unit #4
  - For all gases, one sample point in the exhaust duct from the General Electric, PG7121 (EA), Unit #4, determined after conducting a stratification test

- 1.2.7 Emission Parameters Measured
  - CO
  - O<sub>2</sub>
- 1.2.8 Date of Emission Test
  - June 25, 2021
- 1.2.9 Federal Certifications
  - Stack Testing Accreditation Council AETB Certificate No. 3796.02
  - International Standard ISO/IEC 17025:2005 Certificate No. 3796.01

### 1.3 KEY PERSONNEL

WP:	Michael Wood (mwood@wpsci.com)	734 461 9287
WP:	Ken Sowards (ksowards@wpsci.com)	734-461-9287
Fishbeck:	Stephanie A. Jarrett (sajarrett@ftch.com)	248-324-2146
Air Hygiene:	Michael Stockwell (mstockwell@airhygiene.com)	918-307-8865
Air Hygiene:	Atlas Melchert	918-307-8865

### 2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on Wolverine Power Supply Cooperative, Inc.'s General Electric, PG7121 (EA), Unit #4 located at the Sumpter Generation Plant on June 25, 2021 are summarized in the following table and relate only to the items tested.

**TABLE 2.1  
SUMMARY OF GENERAL ELECTRIC, PG7121 (EA),  
UNIT #4 RESULTS**

Parameter	Normal Load	Permit Limits
Turbine Fuel Flow (SCFH)	881,021	--
Stack Flow (RM19) (SCFH)	28,460,392	--
Power Output (megawatts)	74.9	--
CO (ppmvd)	11.94	--
CO (ppm@15%O <sub>2</sub> )	11.91	--
CO (lb/hr)	24.70	--
CO (lb/MMBtu)	0.027	0.057
O <sub>2</sub> (%)	14.98	--

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

Wolverine Power Supply Cooperative, Inc. (WP) owns and operates the Sumpter Generation Plant located at 8509 Rawsonville Road in Wayne County, Michigan. The station consists of four General Electric (GE) PG7121 (EA) simple cycle combustion turbines, designated as Unit #1, 2, 3, and 4. Each unit has a nominal rating of 83 MW.

#### 3.2 SAMPLING LOCATION

The stack is rectangular and measures 9 feet (ft) (108 inches) deep and 19 ft (228 inches) wide at the test ports which are approximately 45 ft above grade level with an exit elevation of approximately 60 ft above grade level. The test ports are located approximately 13 ft (156 inches) downstream and approximately 29 ft (344 inches) upstream from the nearest disturbances. Air Hygiene has field verified the measurable dimensions. Non-field verified dimensions are provided by Wolverine Power Supply Cooperative, Inc.. 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. During the stratification test two points were traversed from each of the seven ports. The probe was allowed to remain at a point for at least two times the system response time.

### 4.0 SAMPLING AND ANALYTICAL PROCEDURES

#### 4.1 TEST METHODS

The emission test on the General Electric, PG7121 (EA), Unit #4 at the Sumpter Generation Plant 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 June 25, 2021.

**TABLE 4.1  
SUMMARY OF SAMPLING METHODS**

<b>Pollutant or Parameter</b>	<b>Sampling Method</b>	<b>Analysis Method</b>
Sample Point Location	EPA Method 1	Equal Area Method
Oxygen	EPA Method 3A	Paramagnetic Cell
Carbon Monoxide	EPA Method 10	Nondispersive Infrared Analyzer
Stack Flow Rate	EPA Method 19	Dry Oxygen F Factor

#### 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, 3A, 10, and 19.

Figure 4.1 depicts the sample system used for the real-time gas analyzer tests. The gas sample was continuously pulled through the probe and transported, via heat-traced Teflon® tubing, 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 real-time 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 a climate controlled, 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).

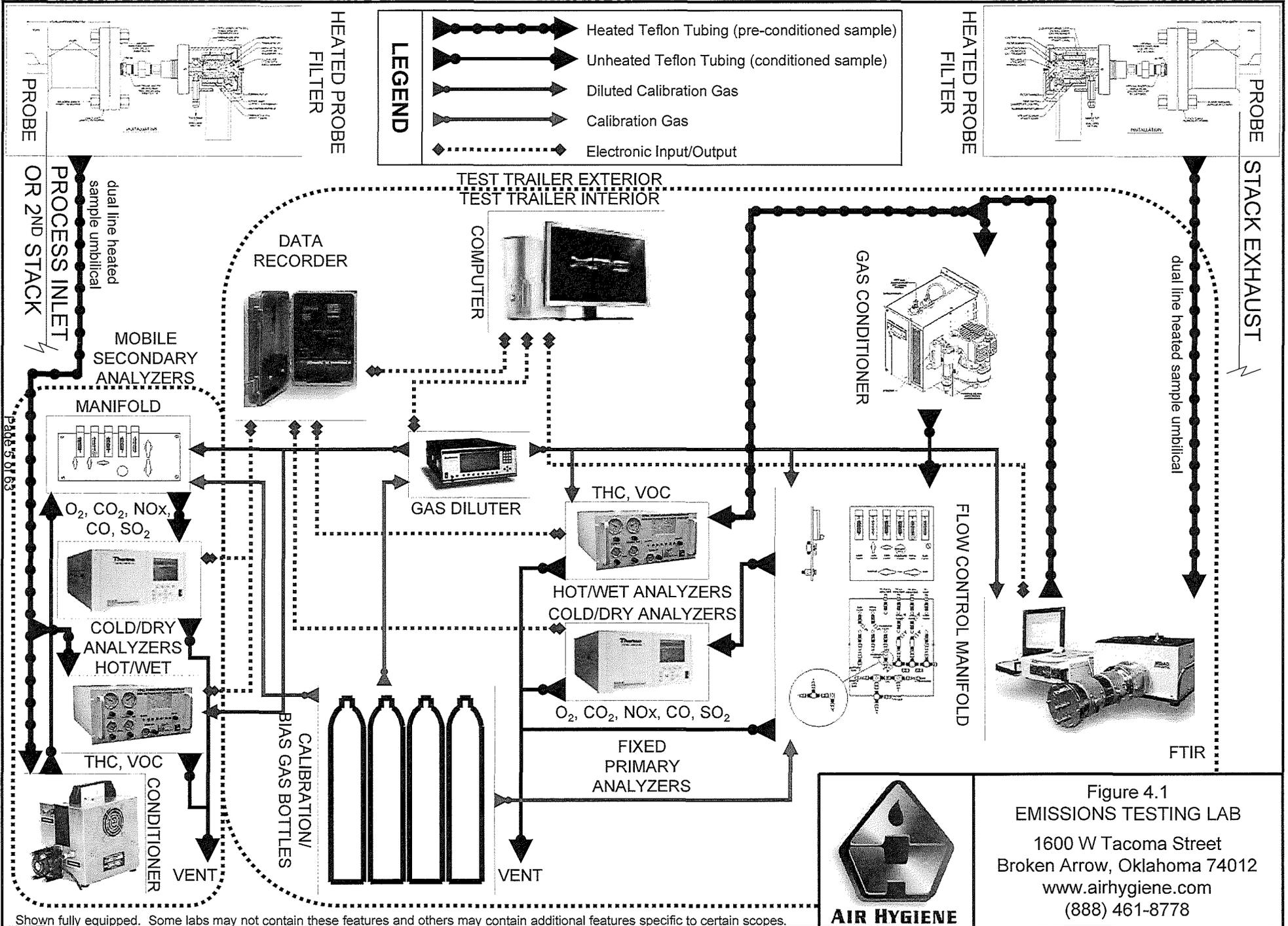
Table 4.2 provides a description of the analyzers used for the instrument portion of the tests. All data from the continuous monitoring instruments were recorded on a Logic Beach Portable Data Logging System which retrieves calibrated electronic data from each instrument every one second and reports an average of the collected data every 30 seconds.

The stack gas analysis for O<sub>2</sub> concentrations was performed in accordance with procedures set forth in EPA Method 3A. The O<sub>2</sub> analyzer uses a paramagnetic cell detector.

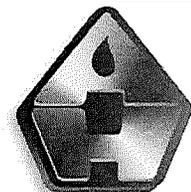
CO emission concentrations were quantified in accordance with procedures set forth in EPA Method 10. A continuous nondispersive infrared (NDIR) analyzer was used for this purpose.

**TABLE 4.2  
ANALYTICAL INSTRUMENTATION**

Parameter	Manufacturer and Model	Range	Sensitivity	Detection Principle
CO	THERMO 48 series	User may select up to 10,000 ppm	0.1 ppm	Infrared absorption, gas filter correlation detector, microprocessor-based linearization.
O <sub>2</sub>	SERVOMEX 1440	0-25%	0.1%	Paramagnetic cell, inherently linear.



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**  
 1600 W Tacoma Street  
 Broken Arrow, Oklahoma 74012  
 www.airhygiene.com  
 (888) 461-8778