

Table of Contents

1.0	INTRODUCTION	1
1.1	TEST PURPOSE AND OBJECTIVES	1
1.2	SUMMARY OF TEST PROGRAM	2
1.2.1	Participating Organizations	2
1.2.2	Industry	2
1.2.3	Air Permit and Federal Requirements	2
1.2.4	Plant Location	2
1.2.5	Equipment Tested	2
1.2.6	Emission Points	2
1.2.7	Emission Parameters Measured	2
1.2.8	Date of Emission Test	2
1.2.9	Federal and State Certifications	2
1.3	KEY PERSONNEL	2
2.0	SUMMARY OF TEST RESULTS	3
3.0	SOURCE OPERATION	4
3.1	PROCESS DESCRIPTION	4
3.2	SAMPLING LOCATION	4
4.0	SAMPLING AND ANALYTICAL PROCEDURES	4
4.1	TEST METHODS	4
4.2	INSTRUMENT CONFIGURATION AND OPERATIONS FOR GAS ANALYSIS	5

APPENDICES

Appendix A	Test Results and Calculations
Appendix B	CEMS and Reference Method Data
Appendix C	Calibration Gas Certifications
Appendix D	Quality Assurance and Quality Control Data
Appendix E	Stratification Test Data

**Relative Accuracy Test Audit
Auxiliary Boiler CEMS
Indeck Niles, LLC
Indeck Niles Energy Center
Niles, Michigan
December 7, 2022**

1.0 INTRODUCTION

Air Hygiene International, Inc. (Air Hygiene) has completed the Relative Accuracy Test Audit (RATA) for nitrogen oxides (NO_x) and oxygen (O₂) from the exhaust of the Auxiliary Boiler for Indeck Niles, LLC at the Indeck Niles Energy Center in Niles, Michigan. This report details the background, results, process description, and the sampling/analysis methodology of the stack sampling survey conducted on December 7, 2022.

The accumulated data from the RATA provides the figures for evaluating the acceptability of the operation of the on-site continuous emission monitoring system (CEMS) for the monitoring of NO_x and O₂ from the Auxiliary Boiler for Indeck Niles, LLC at the Indeck Niles Energy Center in Niles, Michigan.

1.1 TEST PURPOSE AND OBJECTIVES

The purpose of the test was to perform the periodic quality assurance (QA) RATA on the CEMS that serves the Auxiliary Boiler for Indeck Niles, LLC at the Indeck Niles Energy Center in Niles, Michigan. Reference method (RM) testing followed the Code of Federal Regulations (CFR), Title 40 (40 CFR), Part 60 (40 CFR 60), Appendix A, Methods 1, 3A, 7E, and 19. RM values are compared with the on-site CEMS to document performance as required in the 40 CFR 60, Appendix B, Performance Specifications (PS). All relative accuracies were established on-site and were governed by the following sets of rules:

In accordance with 40 CFR 60, Appendix B, PS 2, Section 13.2, the NO_x RATA results are acceptable if the relative accuracy (RA) does not exceed 20.0 percent when average emissions during the test are greater than 50 percent of the emission standard or alternative relative accuracy (ARA) does not exceed 10.0 percent when the average emissions during the test are less than 50 percent of the emission standard. Part 60 further requires that the unit be operating at greater than 50 percent of normal load.

In accordance with 40 CFR 60, Appendix B, PS 3, Section 13.2, the O₂ RATA results are acceptable if the relative accuracy (RA) does not exceed 20.0 percent or if the average difference between the CEMS and reference method (RM) values does not exceed plus or minus 1.0 percent of the measured value.

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, and Energy (EGLE)
 - Indeck Niles, LLC
 - Air Hygiene
- 1.2.2 Industry
 - Electric Utility / Electric Services
- 1.2.3 Air Permit and Federal Requirements
 - Permit Number: 75-16B
 - 40 CFR 60, Appendix B, Performance Specifications (PS)
- 1.2.4 Plant Location
 - Indeck Niles Energy Center in Niles, Michigan
 - GPS Coordinates [Latitude 41.85831, Longitude -86.22417]
 - Physical Address: 2200 Progressive Drive, Niles, Michigan 49120
 - Federal Registry System / Facility Registry Service (FRS) No. – 110017413985
 - Source Classification Code (SCC) – 20100201
- 1.2.5 Equipment Tested
 - Auxiliary Boiler
 - NOx and O₂ Analyzer (Thermo 42i/QLS, Serial No. 1201687924)
- 1.2.6 Emission Points
 - Exhaust from the Auxiliary Boiler
 - For all gases, one sample point in the exhaust duct from the Auxiliary Boiler, determined after conducting a stratification test
- 1.2.7 Emission Parameters Measured
 - NO_x
 - O₂
- 1.2.8 Date of Emission Test
 - December 7, 2022
- 1.2.9 Federal and State Certifications
 - Stack Testing Accreditation Council AETB Certificate No. 3796.02
 - International Standard ISO/IEC 17025:2005 Certificate No. 3796.01

1.3 KEY PERSONNEL

Indeck Niles, LLC:	Tom Krysiak (tkrysiak@indeckenergy.com)	716-225-6478
Indeck Niles Energy Center:	Madison Mosher (madison.mosher@picgroupinc.com)	480-977-8917
Air Hygiene:	Michael Wilmott (mwilmott@airhygiene.com)	918-307-8865
Air Hygiene:	Zane Dees	918-307-8865

2.0 SUMMARY OF TEST RESULTS

Results from the sampling conducted on Indeck Niles, LLC's Auxiliary Boiler located at the Indeck Niles Energy Center on December 7, 2022 are summarized in the following table and relate only to the items tested.

TABLE 2.1
SUMMARY OF ZEECO, W-1766/KD3.00-SIL, UNIT #AUX BOILER, SERIAL #42575-G006A-100 RATA RESULTS

Pollutant	Units	Criteria			Results	Passed / Test Frequency
		CFR	Specification / Section	Standard		
NOx	ppmvd	Part 60	Appendix B, Performance Specification 2, Section 13.2	RA ≤ 20%, or ARA ≤ 10%	RA = 1.43%	YES / ANNUAL
NOx	lb/hr	Part 60	Appendix B, Performance Specification 2, Section 13.2	RA ≤ 20%, or ARA ≤ 10%	RA = 3.55%	YES / ANNUAL
NOx	lb/MMBtu	Part 60	Appendix B, Performance Specification 2, Section 13.2	RA ≤ 20%, or ARA ≤ 10%	RA = 2.14%	YES / ANNUAL
O ₂	%vd	Part 60	Appendix B, Performance Specification 3, Section 13.2	RA ≤ 20%, or d ≤ ±1.0%	RA = 2.20%	YES / ANNUAL
Load	MMBtu/hr	Part 60	Appendix B, Performance Specifications	> 50% max load	46.7	WITHIN TOLERANCE

Notes: RA = relative accuracy, ARA = alternative relative accuracy, RM = reference method value, d = difference between RM and CEMS value

The RATA passed for all pollutants (NOx and O₂) in all units (ppm, lb/hr, lb/MMBtu, and %) under all 40 CFR 60 criteria. Specifically, NOx in units of ppm, lb/hr, and lb/MMBtu passed 40 CFR 60 criteria with an RA less than 20 percent. O₂ in units of % passed the 40 CFR 60 criteria with an RA less than 20 percent.

Unit load was within the 40 CFR 60 required criteria of greater than 50 percent of the maximum load and also fell within the normal or secondary normal load criteria as defined by the plants Quality Control and Monitoring Plan which defined the upper and lower boundary on the unit and the normal and secondary normal load ranges.

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

Indeck Niles, LLC (Indeck) owns and operates the Indeck Niles Energy Center facility located at 2200 Progressive Drive in Niles, Michigan. The interest of this report is the Auxiliary Boiler model W-1766/KD3.00-SIL located within the facility.

3.2 SAMPLING LOCATION

The Auxiliary Boiler stack is vertical, circular, and measures 3 feet (ft) (36 inches) in diameter at the 2 test ports which are approximately 34 ft above grade level with an exit elevation of approximately 95 ft above grade level. The test ports are located approximately 7.5 ft (90.38 inches) [2.51 dia] downstream and approximately 61 ft (731.63 inches) [20.32 dia] upstream from the nearest disturbances. Air Hygiene has field verified the measurable dimensions. Non-field verified dimensions are provided by Indeck Niles, LLC. 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 six points were traversed from each of the two ports. The probe was allowed to remain at a point for at least two times the system response time.

A single, dedicated dry extraction based continuous emissions monitoring system (CEMS) is installed on the unit. The CEMS configuration includes a nitrogen oxide (NOx) analyzer, diluent gas oxygen (O2) analyzer, and a data acquisition and handling system (DAHS).

4.0 SAMPLING AND ANALYTICAL PROCEDURES

4.1 TEST METHODS

The emission test on the Auxiliary Boiler at the Indeck Niles Energy Center 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 December 7, 2022.

**TABLE 4.1
SUMMARY OF SAMPLING METHODS**

Pollutant or Parameter	Sampling Method	Analysis Method
Sample Point Location	EPA Method 1	Equal Area Method
Oxygen	EPA Method 3A	Paramagnetic Cell
Nitrogen Oxides	EPA Method 7E	Chemiluminescent 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, 7E, 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., NO_x 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.

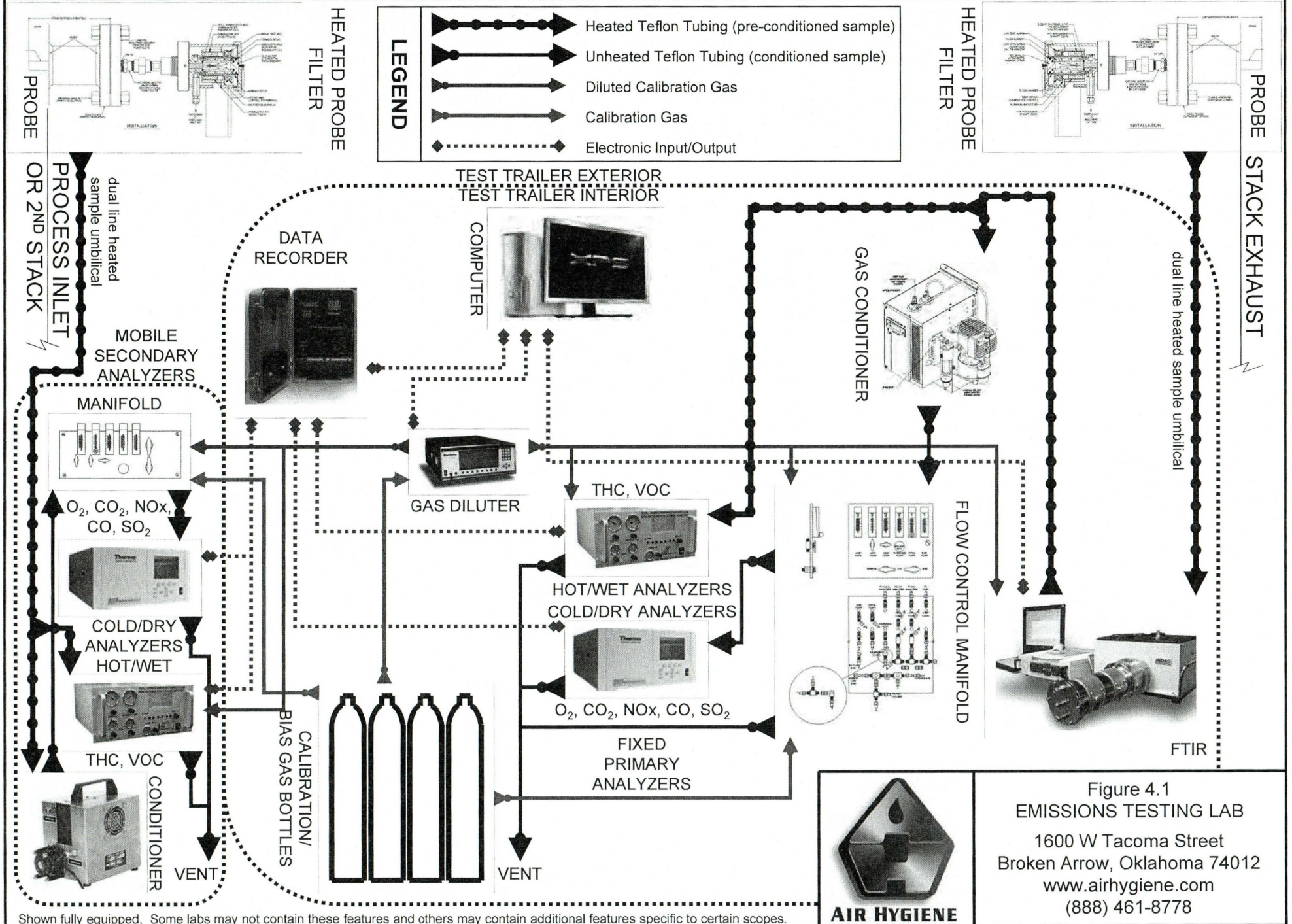
Ten test runs of approximately 21 minutes each were conducted on the Auxiliary Boiler in the "as found" operating condition for NO_x and O₂.

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 7E was used to determine concentrations of NO_x. A chemiluminescent analyzer was used to determine the nitrogen oxides concentration in the gas stream. A NO₂ in nitrogen certified gas cylinder was used to verify at least a 90 percent NO₂ conversion on the day of the test.

**TABLE 4.2
ANALYTICAL INSTRUMENTATION**

Parameter	Manufacturer and Model	Range	Sensitivity	Detection Principle
NO _x	THERMO 42 series	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.
O ₂	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.



Figure 4.1
EMISSIONS TESTING LAB
 1600 W Tacoma Street
 Broken Arrow, Oklahoma 74012
 www.airhygiene.com
 (888) 461-8778

APPENDIX A
TEST RESULTS AND CALCULATIONS