

Report of...

# Particulate Emission Sampling

Performed for the...

## Holland Board of Public Works

James DeYoung Generating Station  
Holland, Michigan

On...

### Unit 5

July 29, 2015

215.13

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AIR QUALITY DIV.

Network Environmental, Inc.  
Grand Rapids, MI



MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION

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**RENEWABLE OPERATING PERMIT  
REPORT CERTIFICATION**

AIR QUALITY DIV.

Authorized by 1994 P.A. 451, as amended. Failure to provide this information may result in civil and/or criminal penalties.

Reports submitted pursuant to R 336.1213 (Rule 213), subrules (3)(c) and/or (4)(c), of Michigan's Renewable Operating Permit (ROP) program must be certified by a responsible official. Additional information regarding the reports and documentation listed below must be kept on file for at least 5 years, as specified in Rule 213(3)(b)(ii), and be made available to the Department of Environmental Quality, Air Quality Division upon request.

Source Name HBPW James DeYoung Generation Station & WRF County Ottawa

Source Address 64 Pine Avenue & 42 South River Avenue City Holland

AQD Source ID (SRN) B2357 ROP No. MI-ROP-B2357-2014 ROP-Section No. N/A

Please check the appropriate box(es):

**Annual Compliance Certification (Pursuant to Rule 213(4)(c))**

Reporting period (provide inclusive dates): From \_\_\_\_\_ To \_\_\_\_\_

- 1. During the entire reporting period, this source was in compliance with **ALL** terms and conditions contained in the ROP, each term and condition of which is identified and included by this reference. The method(s) used to determine compliance is/are the method(s) specified in the ROP.
- 2. During the entire reporting period this source was in compliance with all terms and conditions contained in the ROP, each term and condition of which is identified and included by this reference, **EXCEPT** for the deviations identified on the enclosed deviation report(s). The method used to determine compliance for each term and condition is the method specified in the ROP, unless otherwise indicated and described on the enclosed deviation report(s).

**Semi-Annual (or More Frequent) Report Certification (Pursuant to Rule 213(3)(c))**

Reporting period (provide inclusive dates): From \_\_\_\_\_ To \_\_\_\_\_

- 1. During the entire reporting period, **ALL** monitoring and associated recordkeeping requirements in the ROP were met and no deviations from these requirements or any other terms or conditions occurred.
- 2. During the entire reporting period, all monitoring and associated recordkeeping requirements in the ROP were met and no deviations from these requirements or any other terms or conditions occurred, **EXCEPT** for the deviations identified on the enclosed deviation report(s).

**Other Report Certification**

Reporting period (provide inclusive dates): From 1/1/13 To 12/31/15

Additional monitoring reports or other applicable documents required by the ROP are attached as described:

Particulate Matter Emissions Report - Unit 5

I certify that, based on information and belief formed after reasonable inquiry, the statements and information in this report and the supporting enclosures are true, accurate and complete

<u>Ted Siler</u>	<u>Operations Director</u>	<u>616-355-1572</u>
Name of Responsible Official (print or type)	Title	Phone Number

	<u>8-28-15</u>
Signature of Responsible Official	Date

\* Photocopy this form as needed.

## **I. INTRODUCTION**

Network Environmental, Inc. was retained by the Holland Board of Public Works (BPW), Holland, Michigan to conduct particulate emission testing on their Unit 5 exhaust. The Unit is located at the Holland BPW James DeYoung Generating Station. The purpose of the particulate emission sampling was to meet the emission testing requirements of Renewable Operating Permit (ROP) No. MI-ROP-B2357-2014.

The sampling was conducted by Stephan K. Byrd, Richard D. Eerdmans and David D. Engelhardt of Network Environmental, Inc. on July 29, 2015. U.S. EPA Reference Method 17 was used for the total particulate determinations. In addition to the particulate sampling, the exhaust gas parameters (air flow rate, temperature, moisture and density) were determined by employing U.S. EPA Reference Methods 1 through 4.

Assisting in the study was Ms. Judy Visscher of the Holland Board of Public Works. Mr. Steven LaChance and Mr. David Patterson of the Michigan Department of Environmental Quality (MDEQ) – Air Quality Division were present to observe portions of the sampling and source operation.

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**II. PRESENTATION OF RESULTS**

**II.1 TABLE  
PARTICULATE EMISSION RESULTS SUMMARY  
UNIT 5  
JAMES DEYOUNG GENERATING STATION  
HOLLAND BOARD OF PUBLIC WORKS  
HOLLAND, MICHIGAN  
JULY 25, 2015**

Sample	Time	Air Flow Rate SCFM <sup>(1)</sup>	Particulate Concentration Lbs/1000 Lbs @ 50% EA <sup>(2)</sup>	Particulate Mass Rates Lbs/Hr <sup>(3)</sup>
1	09:12-10:27	65,120	0.0117	3.443
2	10:41-11:52	66,917	0.0039	1.205
3 <sup>(4)</sup>	12:06-13:19	67,056	0.0082	2.489
<b>Average</b>		<b>66,364</b>	<b>0.0079</b>	<b>2.379</b>

- (1) SCFM = Standard Cubic Feet per Minute (STP = 68 °F & 29.92 in. Hg)  
 (2) Lbs/1000 Lbs @ 50% EA = Pounds of Particulate Per Thousand Pounds of Exhaust Gas On a Actual Basis Corrected to 50% Excess Air  
 (3) Lbs/Hr = Pounds of Particulate Per Hour  
 (4) Soot was blown during Sample 3

### **III. DISCUSSION OF RESULTS**

The total particulate emission results are summarized in Table 1 (Section II.1). A more detailed presentation of the particulate sampling can be found in Appendix A. It should also be noted, that soot was blown during the sample three test run.

#### **III.1 Unit #5 Particulate Concentrations**

The particulate emission concentrations in terms of pounds of particulate per thousand pounds of exhaust gas on a actual basis corrected to fifty percent excess air (Lbs/1000 Lbs @ 50% EA) were 0.0117 Lbs/1000 Lbs @ 50% EA for sample one, 0.0039 Lbs/1000 Lbs @ 50% EA for sample two, and 0.0082 Lbs/1000 Lbs @ 50% EA for sample three. The average of the three samples was 0.0079 Lbs/1000 Lbs @ 50% EA.

#### **III.2 Unit #5 Particulate Mass Emission Rates**

The particulate mass emission rates in terms of pounds of particulate per hour (Lbs/Hr) were 3.443 Lbs/Hr for sample one, 1.205 Lbs/Hr for sample two, and 2.489 Lbs/Hr for sample three. The average of the three samples was 2.379 Lbs/Hr.

**III.3 Emission Limits** – According to ROP No. MI-ROP-B2357-2014, the maximum particulate emission limit for Unit 5 is as follows;

**Unit 5 – 0.25 Lbs/1000 Lbs @ 50% EA**

### **IV. SOURCE DESCRIPTION**

Unit 5 is a Combustion Engineering, Inc. Model UV-40s wall-fired, coal and natural gas fired boiler. The exhaust gas is controlled by an electrostatic precipitator (ESP) before being emitted to atmosphere. The rated capacity for Unit 5 is 29 MW (Mega Watts) and 290,000 pounds of steam per hour. The source operating parameters were monitored by Holland BPW staff and can be found in Appendix B.

## **V. SAMPLING AND ANALYTICAL PROTOCOL**

The sampling location for Unit 5 was on the 72 inch x 72 inch exhaust stack at a location approximately four (4) duct diameters downstream and four (4) duct diameters upstream from the nearest disturbances. Twenty-four (24) sampling points (four per port) were used for the particulate and air flow determinations.

Prior to the sampling, preliminary velocity traverses and cyclonic/turbulent flow checks were conducted. The measurement location and air flows met the criteria established in U.S. EPA Reference Method 1.

**V.1 Particulate** - The total particulate emission sampling was conducted in accordance with U.S. EPA Reference Method 17. Method 17 is an in stack filtration method. Three (3) samples were collected from the exhaust. Each sample was sixty (60) minutes in duration, and had a minimum sample volume of thirty (30) dry standard cubic feet. The samples were collected isokinetically from the exhaust through an in-stack filtering system.

The filters and probe/nozzle rinses were analyzed for total particulate by gravimetric analysis. All the quality assurance and quality control procedures listed in the method were incorporated in the sampling and analysis. The particulate sampling train is shown in Figure 1.

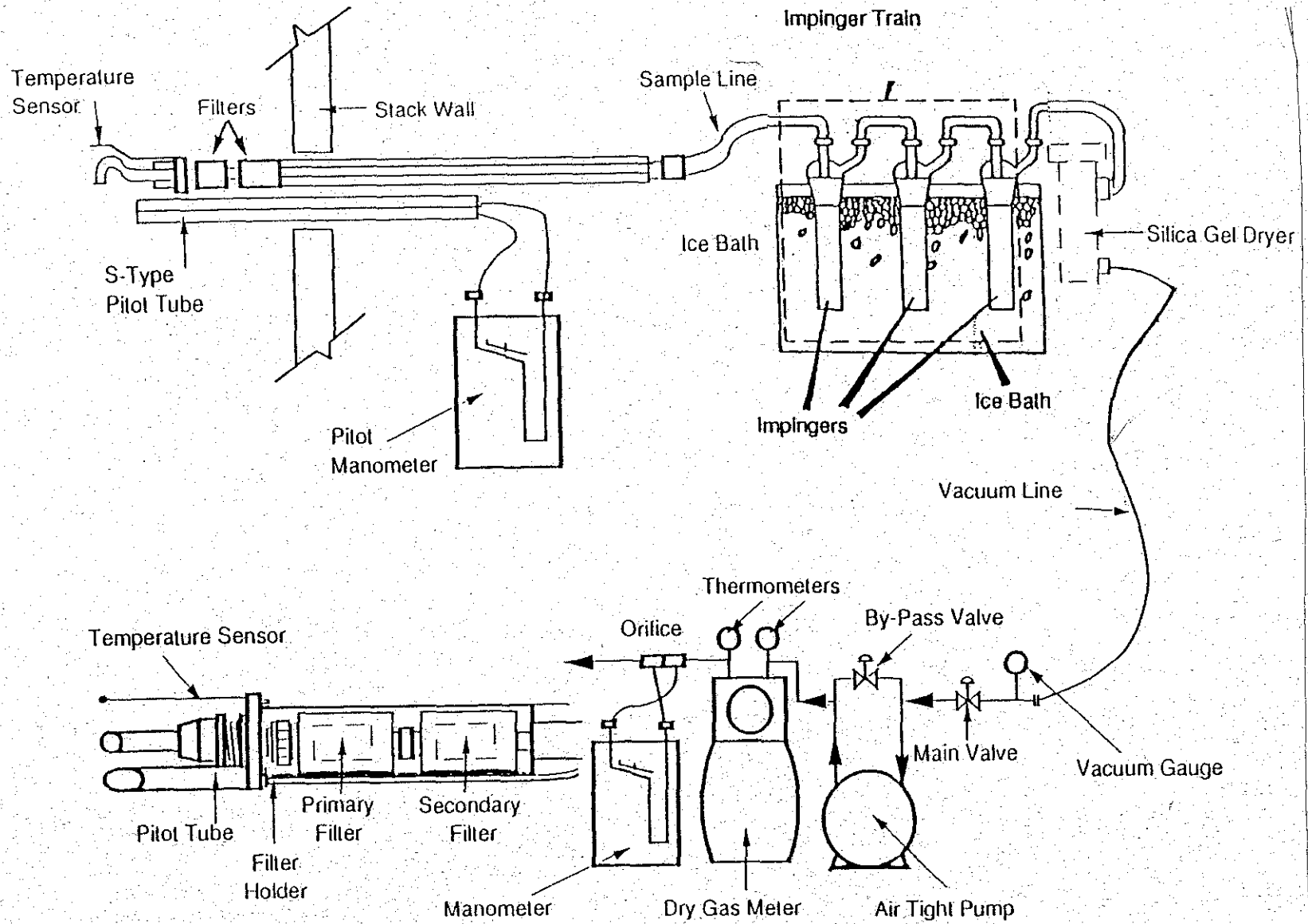
**V.2 Exhaust Gas Parameters** - The exhaust gas parameters (air flow rate, temperature, moisture, and density) were determined in conjunction with the other sampling by employing U.S. EPA Reference Methods 1 through 4. Moisture was determined from the Method 17 sampling train. Integrated bag samples were collected from the back of the Method 17 sampling train and analyzed by Orsat to determine gas density. All the quality assurance and quality control procedures listed in the methods were incorporated in the sampling and analysis.

This report was prepared by:

Stephan K. Byrd  
President

This report was reviewed by:

David D. Engelhardt  
Vice President



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**Figure 1**  
**Particulate Sampling Train**