Report of...

Particulate Emission Sampling

Performed for...

EJ USA, INC.

East Jordan, Michigan

At the...

East Jordan Foundry LLC.

Elmira, Michigan

On...

Stack D

July 18, 2019

Project #: 058.14

By...

Network Environmental, Inc.
Grand Rapids, MI

Performed for:

EJ USA, Inc.
301 Spring Street
East Jordan, MI 49727
Contact: Tony Pitts
Telephone: (231) 536-4663
Fax: (231) 536-4418
e-mail: tony.pitts@ejco.com

Performed at:

East Jordan Foundry, LLC
2675 N. US 131
Elmira, MI 49730

Performed by:

Network Environmental, Inc.
2629 Remico Street, Suite B
Grand Rapids, MI 49519
Contact: David D. Engelhardt
Telephone: (616) 530-6330
Fax: (616) 530-0001
e-mail: netenviro@aol.com

TABLE OF CONTENTS

		Page
I.	Introduction	1
II.	Presentation of Results	2
	II.1 Table 1 – Total Particulate Emission Results Summary	2
III.	Discussion of Results	3
IV.	Source Description	3
V.	Sampling and Analytical Protocol	4-6
	Figure 1 – Particulate Sampling Train	6

Appendices

Particulate Emission Results & Exhaust Gas Parameters	A
Source Operating Data	B
Field Data	C
Analytical Data	D
Calculations	E
Raw Data	F

I. INTRODUCTION

Network Environmental, Inc. was retained by EJ USA, Inc. of East Jordan, Michigan, to conduct an emission study at the East Jordan Foundry, LLC in Elmira, Michigan. The purpose of this project was to conduct total particulate (front half filterable and back half condensable) emission sampling on Stack D (Baghouse D Exhaust) in order to demonstrate compliance with EGLE Permit To Install No. 185-16.

Permit No. 185-16 has established the following emission limits for this source:

- PM/PM10/PM2.5 – 0.002 Grains/DSCF
- PM – 1.363 Lbs/Hr
- PM10 – 1.363 Lbs/Hr
- PM2.5 – 1.363 Lbs/Hr

Three (3) test runs were conducted. Each test run was one hundred twenty (120) minutes in duration and had minimum sample volumes of sixty (60) dry standard cubic feet.

The total particulate (front half filterable and back half condensable) emissions were determined. By adding the condensable particulate to the filterable particulate the testing was designed to meet the PM10 & PM2.5 requirements of the permit.

The following reference test methods were employed to conduct the emission sampling:

- Particulate – U.S. EPA Methods 17 & 202
- Exhaust Gas Parameters (air flow rate, temperature, moisture & density) – U.S. EPA Reference Methods 1 through 4.

The sampling was performed on July 18, 2019 by Stephan K. Byrd, R. Scott Cargill and David D. Engelhardt of Network Environmental, Inc.. Assisting with the sampling were Mr. Tony Pitts of EJ USA, Inc. and the operating staff of the facility. Mr. Tom Gasloli of the Michigan Department of Environment, Great Lakes and Energy (EGLE) – Air Quality Division was present to observe the sampling and source operation.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
TOTAL PARTICULATE(1) EMISSION RESULTS SUMMARY
STACK D
EAST JORDAN FOUNDRY, LLC.
ELMIRA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM (2)	Concentration Grains/DSCF (3)	Emission Rate Lbs/Hr (4)
Stack D	1	7/18/19	05:45-07:49	72,984	0.00151	0.944
	2	7/18/19	08:41-10:45	72,253	0.00134	0.830
	3	7/18/19	11:20-13:26	71,832	0.00124	0.766
	Average			**72,357**	**0.00136**	**0.847**

(1) Total Particulate = Front Half Filterable Particulate Plus Back Half Condensable Particulate
(2) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
(3) Grains/DSCF = Grains Of Particulate Per Dry Standard Cubic Foot Of Exhaust Gas
(4) Lbs/Hr = Pounds Of Particulate Per Hour

III. DISCUSSION OF RESULTS

The results of the emission sampling are summarized in Table 1 (Section II.1). The results are presented as follows:

III.1 Stack D Particulate Emissions (Table 1)

Table 1 summarizes the particulate emission results for Stack D as follows:

- Sample
- Date
- Time
- Air Flow Rate (DSCFM) – Standard Cubic Feet Per Minute (STP = 68 ^{o}F & 29.92 in. Hg)
- Particulate Concentration (Grains/DSCF) – Grains of Particulate Per Dry Standard Cubic Foot of Exhaust Gas
- Particulate Mass Emission Rate (Lbs/Hr) – Pounds of Particulate Per Hour

A more detailed breakdown of the results for each sample can be found in Appendix A.

III.2 Emission Limits

Permit No. 185-16 has established the following emission limits for this source:

- PM/PM10/PM2.5 – 0.002 Grains/DSCF
- PM – 1.363 Lbs/Hr
- PM10 – 1.363 Lbs/Hr
- PM2.5 – 1.363 Lbs/Hr

IV. SOURCE DESCRIPTION

IV.1 Stack D – Stack D is the exhaust from Baghouse D. Baghouse D controls portions of the emissions from the pouring & cooling (FGPOURCOOL) and shakeout (FGSHAKEOUT) processes. All the sampling was conducted during normal operation of the processes (See Appendix B).

V. SAMPLING AND ANALYTICAL PROTOCOL

The sampling location was as follows:

On the 68.67 inch I.D. exhaust stack with 2 sample ports in a location that meets the sampling requirements of U.S. EPA Method 1. Twelve (12) sampling points (6 per port) were used for this source.

The sampling/traverse points were as follows:

Sample Point	Dimension (Inches)
1	3.02
2	10.03
3	20.33
4	48.34
5	58.64
6	65.65

V.1 Particulate – The particulate emission sampling was conducted in accordance with U.S. EPA Method 17. Method 17 is an in-stack filtration method. Three (3) samples were collected from the exhaust. Each sample was one hundred twenty (120) minutes in duration and had minimum sample volumes of sixty (60) dry standard cubic feet. The samples were collected isokinetically and analyzed for Particulate by gravimetric analysis.

In addition to the standard front half analysis, the back half condensable particulate matter was determined in accordance with U.S. EPA Method 202 (Dry Impinger Technique). A sixty (60) minute nitrogen purge (as specified in Method 202) was conducted for the back half condensables immediately following each sample. The back half samples were extracted and analyzed for condensable particulate in accordance with Method 202. All the quality assurance and quality control procedures listed in the methods 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 Methods 1 through 4. Air flow rates, temperatures and moistures were determined using the Method 17 sampling train. Bag samples were collected from the Method 17 sampling trains and analyzed for oxygen and carbon dioxide by Orsat. All the quality assurance and quality control procedures listed in the methods were incorporated in the sampling and analysis.

This report was prepared by:

David D. Engelhardt
Vice President

This report was reviewed by:

Stephan K. Byrd
President

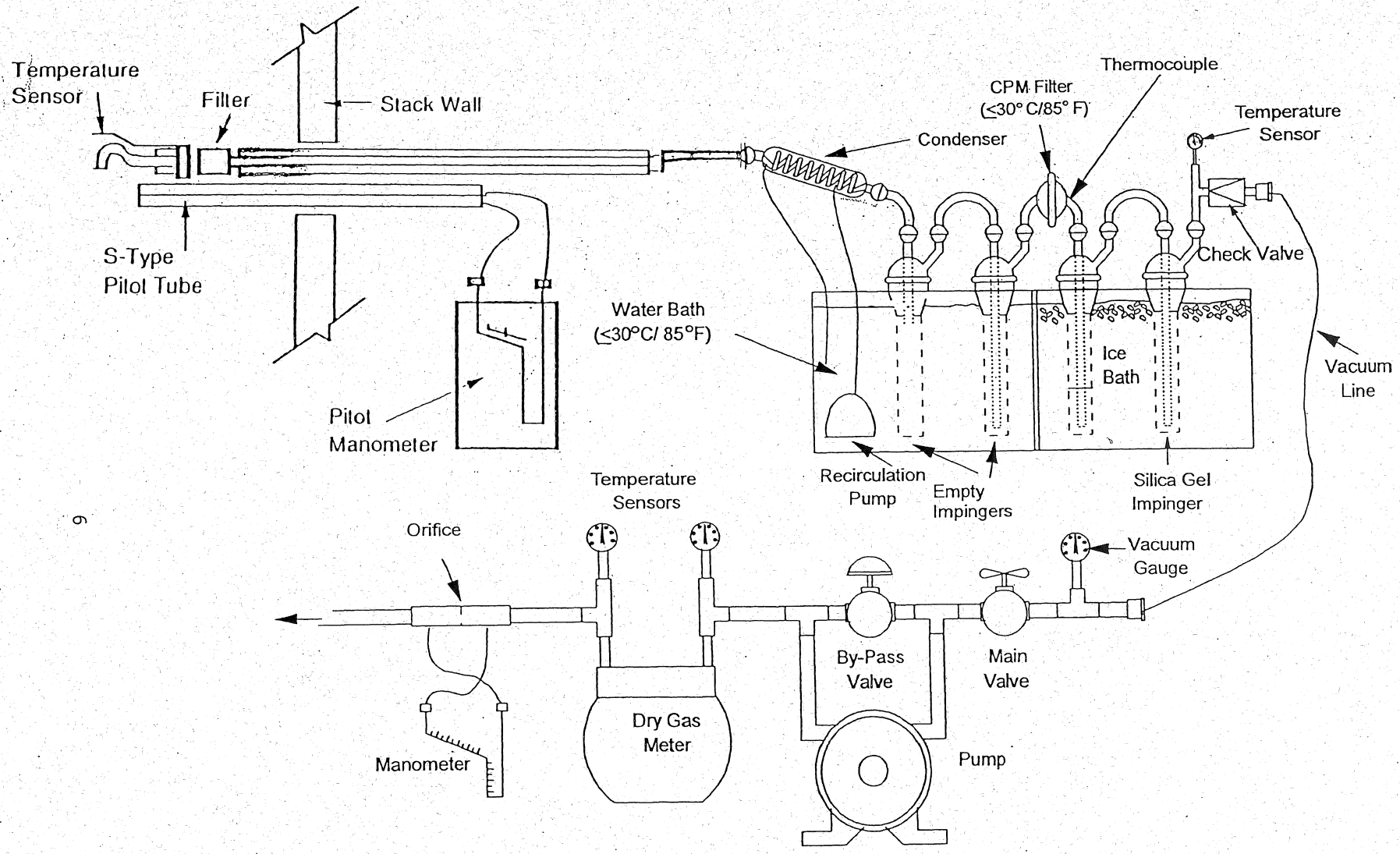

Figure 1

Particulate Sampling Train