Report of a...

Particulate Emission Study

performed for ...

Martin Marietta
Magnesia Specialties

Manistee, Michigan

on the...

#2 Herreshoff Exhaust

November 29, 2016

Project #: 043.17

By...

Network Environmental, Inc.
Grand Rapids, MI

RECEIVED

DEQ

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

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RENEWABLE OPERATING PERMIT REPORT CERTIFICATION

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: Martin Marietta Magnesia Specialties, LLC — County: Manistee

Source Address: 1800 Eastlake Road — City: Manistee

AQD Source ID (SRN): A3900 — ROP No.: MI-ROP-A3900-2015 — ROP Section No.:

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 11/29/2016 To 11/29/2016

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

FGPERICLASEPLANT - Section V.I Reporting

NO. 2 HERRESHOFF STACK TEST REPORT OF RESULTS - PARTICULATE EMISSION STUDY

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

Jim Reithel	VP of Chemical Operations	231-723-1205
Name of Responsible Official (print or type)	Title	Phone Number
Signature of Responsible Official		12-21-16 Date

* Photocopy this form as needed.

EQP 5736 (Rev 11-04)

I. INTRODUCTION

Network Environmental, Inc. was retained by Martin Marietta Magnesia Specialties of Manistee, Michigan to conduct an emission study at their facility. The purpose of the study was to determine the particulate emissions from their #2 Herreshoff exhaust in order to meet the emission testing requirements of Renewable Operating Permit (ROP) No. MI-ROP-A3900-2015a.

The sampling in the study was conducted by Richard D. Eerdmans and David D. Engelhardt of Network Environmental, Inc. on November 29, 2016. U.S. EPA Reference Method 5 was used for the 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 were Mr. Robert Gutowski of Martin Marietta Magnesia Specialties and the operating staff of the facility. Mr. Jeremy Howe of the Michigan Department of Environmental Quality (MDEQ) – Air Quality Division was present to observe the sampling and source operation.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
PARTICULATE EMISSION RESULTS SUMMARY
#2 HERRESHOFF EXHAUST
MARTIN MARIETTA MAGNESIA SPECIALTIES
MANISTEE, MICHIGAN
NOVEMBER 29, 2016

Sample	Time	Air Flow Rate DSCFM (1)	Particulate Concentration		Particulate Mass Rates Lbs/Hr (4)
			Lbs/1000 Lbs (2)	Lbs/1000 Lbs, Dry (3)	
1	09:21-10:29	18,039	0.022	0.030	2.44
2	11:02-12:09	18,394	0.017	0.023	1.93
3	12:34-13:41	18,235	0.021	0.028	2.32
Average		**18,223**	**0.020**	**0.027**	**2.23**

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
(2) Lbs/1000 Lbs = Pounds of Particulate Per Thousand Pounds of Exhaust Gas On a Actual Basis (Stack Conditions)
(3) Lbs/1000 Lbs, Dry = Pounds of Particulate Per Thousand Pounds of Exhaust Gas On a Dry Basis
(4) Lbs/Hr = Pounds of Particulate Per Hour

III. DISCUSSION OF RESULTS

The 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.

III.1 Particulate Concentrations (Actual Basis) – The particulate emission concentrations in terms of pounds of particulate per thousand pounds of exhaust gas on a actual basis at stack conditions (Lbs/1000 Lbs) were 0.022 Lbs/1000 Lbs for sample one, 0.017 Lbs/1000 Lbs for sample two, and 0.021 Lbs/1000 Lbs for sample three. The average of the three samples was 0.020 Lbs/1000 Lbs.

III.2 Particulate Concentrations (Dry Basis) – The particulate emission concentrations in terms of pounds of particulate per thousand pounds of exhaust gas on a dry basis (Lbs/1000 Lbs, Dry) were 0.030 Lbs/1000 Lbs, Dry for sample one, 0.023 Lbs/1000 Lbs, Dry for sample two, and 0.028 Lbs/1000 Lbs, Dry for sample three. The average of the three samples was 0.027 Lbs/1000 Lbs, Dry.

III.3 Particulate Mass Emission Rates – The particulate mass emission rates in terms of pounds of particulate per hour (Lbs/Hr) were 2.44 Lbs/Hr for sample one, 1.93 Lbs/Hr for sample two, and 2.32 Lbs/Hr for sample three. The average of the three samples was 2.23 Lbs/Hr.

III.4 Emission Limit – The emission limit for the #2 Herreshoff exhaust established in ROP No. MI-ROP-A3900-2015a is 0.20 pounds per 1,000 pounds of exhaust gases.

IV. SOURCE DESCRIPTION

The source sampled is the exhaust of the #2 Herreshoff. Exhaust air from the Herreshoff is first passed through an electrostatic precipitator (ESP) before being emitted to the atmosphere through the 77 inch I.D. exhaust stack. It should be noted that no Shaft Kilns were ducted to the ESP during the testing. The source operating parameters were monitored by Martin Marietta Magnesia Specialties staff and can be found in Appendix B.

V. SAMPLING AND ANALYTICAL PROTOCOL

The sampling location was on the 77 inch I.D. exhaust stack at a location approximately eight (8) duct diameters downstream and approximately seven (7) duct diameters upstream from the nearest disturbances. Twelve (12) sampling points (six per port) were used for the particulate and air flow determinations. A diagram of the sampling location can be found in Appendix F.

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

The sampling/traverse points were as follows:

Sample Point	Dimension (Inches)
1	3.38
2	11.24
3	22.79
4	54.20
5	65.75
6	73.61

V.1 Particulate - The particulate emission sampling was conducted in accordance with U.S. EPA Reference Method 5. Method 5 is an out of stack filtration method. Three (3) samples were collected from the Herreshoff 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 a heated probe and collected on a heated filter (maintained at 250 °F plus or minus 25 °F). 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 5 sampling train. Integrated bag samples were collected from the back of the Method 5 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:

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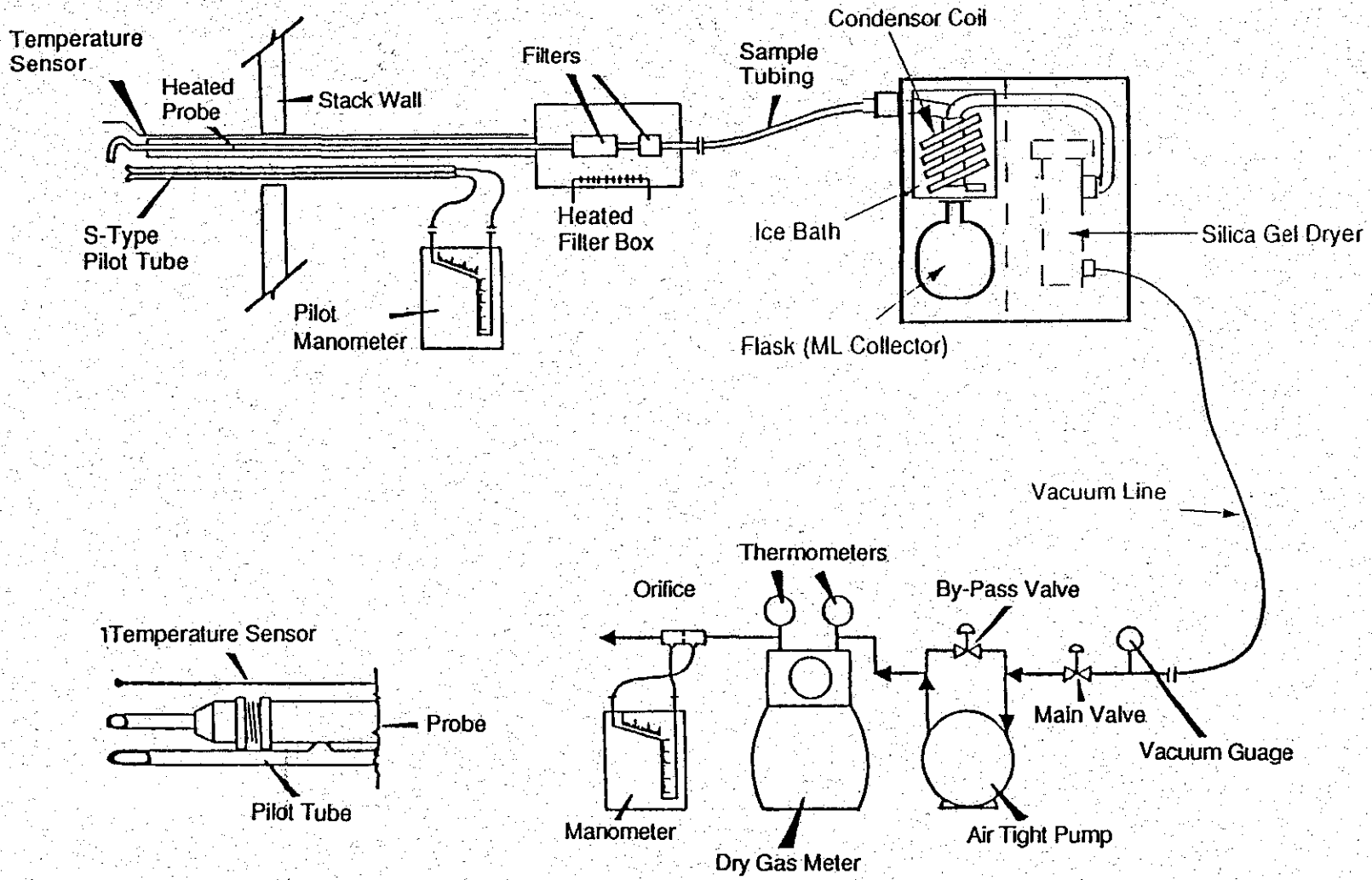

Figure 1

Particulate Sampling Train