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Report of...

Particulate Emission Sampling

Performed for the...

Michigan Sugar Company
Caro, Michigan

On the...

Pulp Dryer Exhaust
(EUPULPDYER)

December 1, 2022

Project #: 022.60

By...

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Performed For:

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I. INTRODUCTION

Network Environmental, Inc. was retained by the Michigan Sugar Company to conduct particulate emission sampling on their Pulp Dryer exhaust located in Caro, Michigan (SRN: B2875). The purpose of the sampling was to meet the testing requirements of the Michigan Department of Environment, Great Lakes and Energy (EGLE) – Air Quality Division Renewable Operating Permit (ROP) Number MI-ROP-B2875-2019.

The following source was sampled :

Source	Compound(s) Sampled	Emission Limit(s)
Pulp Dryer (EUPULPDYER)	Particulate	<u>Particulate</u> : 0.10 Lbs/1000 Lbs of exhaust gas

The emission sampling was conducted by employing the following reference methods:

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

The sampling in the study was conducted on December 1, 2022 by R. Scott Cargill and Richard D. Eerdmans of Network Environmental, Inc.. Assisting with the study were Ms. Meaghan Martuch of the Michigan Sugar Company and the operating staff of the facility, Ms. Lindsey Wells and Mr. Nathanael Gentle of the Michigan Department of Environment, Great Lakes and Energy (EGLE) - Air Quality Division were present to observe the sampling and source operation

II. PRESENTATION OF RESULTS

**II.1 TABLE 1
PARTICULATE EMISSION RESULTS SUMMARY
PULP DRYER EXHAUST
MICHIGAN SUGAR COMPANY
CARO, MICHIGAN
DECEMBER 1, 2022**

Source	Sample	Date	Time	Air Flow Rate		Concentration	Mass Rate
				SCFM ⁽¹⁾	DSCFM ⁽²⁾	Lbs/1000 Lbs, Actual ⁽³⁾	Lbs/Hr ⁽⁴⁾
Pulp Dryer	1	12/1/22	10:56-11:59	63,524	39,912	0.128	31.87
	2	12/1/22	13:14-14:18	65,420	40,143	0.158	40.20
	3	12/1/22	14:41-15:44	64,898	40,323	0.162	41.02
	Average			64,614	40,126	0.149	37.70

- (1) SCFM = Standard Cubic Feet Per Minute (Standard Temperature & Pressure = 68 °F & 29.92 in. Hg)
 (2) DSCFM = Dry Standard Cubic Feet Per Minute (Standard Temperature & Pressure = 68 °F & 29.92 in. Hg)
 (3) Lbs/1000 Lbs, Actual = Pounds Of Particulate Per Thousand Pounds Of Exhaust Gas On An Actual (Wet) Basis
 (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 Pulp Dryer (EUPULPDYER) Particulate Emission Results (Table 1)

Table 1 summarizes the Pulp Dryer particulate emission results as follows:

- Source
- Sample
- Date
- Time
- Air Flow Rate
 - SCFM – Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
 - DSCFM – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Particulate Concentration (Lbs/1000 Lbs) – Pounds Of Particulate Per Thousand Pounds Of Exhaust Gas On An Actual (Wet) Basis
- Particulate Mass Emission Rate (Lbs/Hr) – Pounds of Particulate Per Hour

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

IV. SAMPLING AND ANALYTICAL PROTOCOL

The sampling location for the source was as follows:

- Pulp Dryer (EUPULPDYER) – A 72 inch I.D. diameter exhaust stack with 2 sample ports in a location that meets the 8 duct diameters downstream and 2 duct diameters upstream requirement. Twelve (12) sampling points were used for the isokinetic sampling.

The emission sampling was conducted by employing the following reference methods:

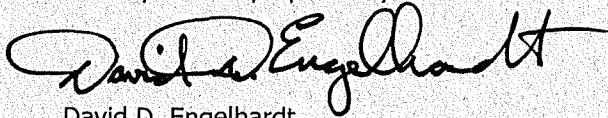
- Particulate – U.S. EPA Method 17
- Exhaust Gas Parameters (air flow, temperature, moisture & density) - U.S. EPA Methods 1-4

IV.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 a minimum of sixty (60) minutes in duration and had a minimum sample volume of thirty (30) dry standard cubic feet. The samples were collected isokinetically and analyzed for particulate by gravimetric analysis. All the quality assurance and quality control procedures listed in the method were incorporated in the sampling and analysis. Figure 1 is a diagram of the particulate sampling train.

IV.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 isokinetic sampling trains. Bag samples were collected from the exhaust of the isokinetic sampling trains and analyzed for %O₂ & %CO₂ 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:



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This report was reviewed by:



R. Scott Cargill
Project Manager

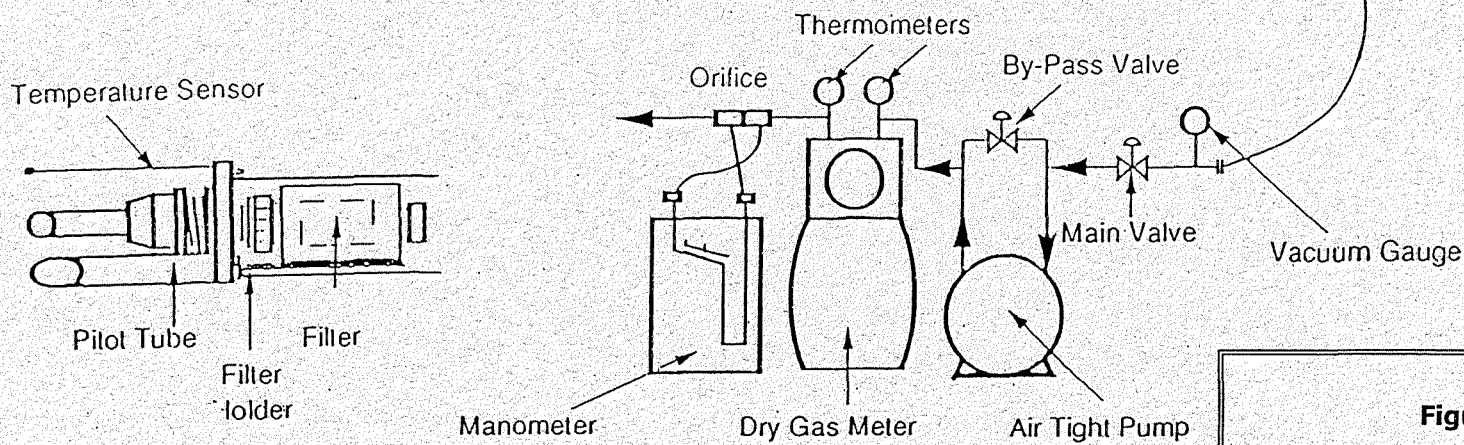
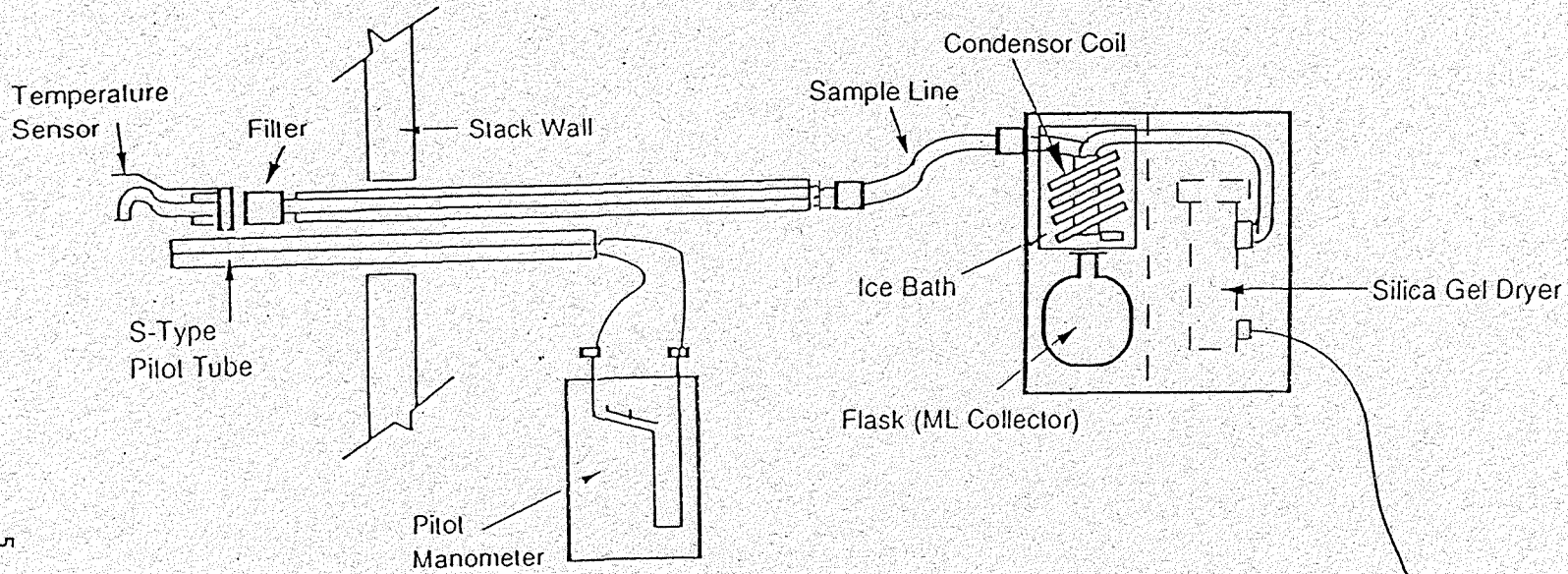


Figure 1
Particulate (Method 17)
Sampling Train

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