Report of...

Compliance Emission Testing

performed for...

Isabella Pellet LLC

Lake Isabella, Michigan

on the

Dryer Exhaust

June 17, 2014

285.02

Network Environmental, Inc.
Grand Rapids, MI

I. INTRODUCTION

Network Environmental, Inc, was retained by Isabella Pellet, to perform compliance emission testing at the facility in Lake Isabella, Michigan. The purpose of the testing was to show compliance with their Permit to Install #30-11A.

Permit #30-11A has established the following limits for the dryer;

FGWOODPELLETS High Efficiency Cyclone	
Pollutant	Emission Limit
VOC	158.3 PPMV and 20.4 Lbs/Hr
CO	201.2 PPMV and 16.5 Lbs/Hr
Formaldehyde	9.1 PPMV and 0.8 Lbs/Hr
Visible Emissions	20% Opacity

The emission testing was performed on June 17, 2014. Stephan K. Byrd, Richard D. Eerdmans and David D. Engelhardt of Network Environmental, Inc. performed the testing. Assisting with the on-site coordination and data collection was Mr. Brock Gutierrez of Isabella Pellet. Mr. Ben Witkopp of the MDEQ Air Quality Division was present to observe the testing and source operation.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
TOTAL HYDROCARBON EMISSION RESULTS
ISABELLA PELLET
DRYER EXHAUST (FGWOODPELLETS)
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate SCFM	PPMV[1]	Lbs/Hr
Dryer Exhaust	1	6/17/14	11:50 – 12:50	28,547	75.1	14.59
	2	6/17/14	13:10 – 14:10	28,547	64.0	12.44
	3	6/17/14	14:26 – 15:26	28,547	77.2	15.00
	Average			**28,547**	**72.1**	**14.01**

PPMV = Parts per million by volume on a wet basis.

II.2 TABLE 2
CO EMISSION RESULTS
ISABELLA PELLET
DRYER EXHAUST (FGWOODPELLETS)
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	PPMV[2]	Lbs/Hr
Dryer exhaust	1	6/17/14	11:50 – 12:50	25,407	80.9	8.90
	2	6/17/14	13:10 – 14:10	25,407	26.8	2.95
	3	6/17/14	14:26 – 15:26	25,407	47.7	5.25
	Average			**25,407**	**51.8**	**5.70**

PPMV = Parts per million by volume on a dry basis.

II.3 TABLE 3
FORMALDEHYDE EMISSION RESULTS
ISABELLA PELLET
DRYER EXHAUST (FGWOODPELLETS)
LAKE ISABELLA, MICHIGAN

Source	Sample	Date	Time	Air Flow Rate DSCFM	PPMV[1]	Lbs/Hr
Dryer Exhaust	1	6/17/14	12:14-13:14	25,407	0.47	0.056
	2	6/17/14	13:32-14:32	25,407	0.26	0.031
	3	6/17/14	15:05-16:05	25,407	0.29	0.034
	Average			**25,407**	**0.34**	**0.040**

PPMV = Parts per million by volume on a dry basis.

III. DISCUSSION OF RESULTS

The results of the testing are summarized in Tables 1 through 3 (Sections II.1 through II.3).

Table II.1 consists of the following test information:

- Sample Dates & Times
- Air Flow Rates in terms of Standard Cubic Feet Per Minute (SCFM) (STP = 68° F & 29.92 in. Hg)
- VOC Concentrations in terms of Parts per million by volume on a wet basis (PPMV)
- VOC Mass Emission Rates in terms of Pounds Per Hour (Lbs/Hr)

Table II.2 consists of the following test information:

- Sample Dates & Times
- Air Flow Rates in terms of Dry Standard Cubic Feet Per Minute (DSCFM) (STP = 68° F & 29.92 in. Hg)
- CO Concentrations in terms of Parts per million by volume on a dry basis (PPMV)
- Mass Emission Rates in terms of Pounds Per Hour (Lbs/Hr)

Table II.3 consists of the following test information:

- Sample Dates & Times
- Air Flow Rates in terms of Dry Standard Cubic Feet Per Minute (DSCFM) (STP = 68° F & 29.92 in. Hg)
- Formaldehyde Concentrations in terms of Parts per million by volume on a dry basis (PPMV)
- Mass Emission Rates in terms of Pounds Per Hour (Lbs/Hr)

In addition to the emission testing, Visible Emssion Observations (VEOs) were performed on the dryer exhaust. The highest six minute average for the three hour observation period was five percent opacity.

IV. SOURCE DESCRIPTION

The source tested is a 20 MMBtu per hour softwood burner with a 4.5 ton per hour (3.02 ODT/hr) rotary dryer that dries softwood chips. The emission control device for the dryer exhaust is a high efficiency cyclone. During each of the three one hour test runs, 8,500 lbs of green chips per hour were processed through the dryer. The dryer was operated at a burn rate of 1,150 lbs per hour for each test run. There were 2.4 tons per hour of finished product produced during each test run.

V. SAMPLING AND ANALYTICAL PROTOCOL

V.1 VOC - The total hydrocarbon (VOC) sampling was conducted in accordance with U.S. EPA Reference Method 25A. The sample gas was extracted from the source through a heated Teflon sample line which led to a J.U.M Model 3-500 portable flame ionization detector (FID). This analyzer produces instantaneous readouts of the total hydrocarbon concentrations (PPM). Three (3) samples were collected from the inlet to the dryer. Each sample was sixty (60) minutes in duration.

A systems (from the back of the stack probe to the analyzer) calibration was conducted for the analyzer prior to the testing. A span gas of 247.1 PPM propane was used to establish the initial instrument calibration for the analyzer. Propane calibration gases of 85.78 PPM and 151.1 PPM were used to determine the calibration error of the analyzer. After each sample (60 minute sample period), a system zero and system injection of 85.78 PPM propane were performed to establish system drift of the analyzer during the test period. All calibration gases used were EPA Protocol 1 Certified. All the results were calibration corrected using Equation 7E-1 from U.S. EPA Method 7E.

The analyzer was calibrated to the output of the data acquisition system (DAS) used to collect the data from the dryer. All quality assurance and quality control requirements specified in the method were incorporated in the performance of this determination. A diagram of the sampling train is shown in Figure 1.

V.2 Carbon Monoxide - The CO sampling was conducted in accordance with U.S. EPA Reference Method 10. A Thermo Environmental Model 48C gas analyzer was used to monitor the dryer inlet. A heated Teflon sample line was used to transport the exhaust gases to a gas conditioner to remove moisture and reduce the temperature. From the gas conditioner stack gases were passed to the analyzer. The analyzer produces instantaneous readouts of the CO concentrations (PPM). The analyzer was operated on the 0-500 PPM scale.

The analyzer was calibrated by direct injection prior to the testing. A span gas of 492.5 PPM was used to establish the initial instrument calibration. Calibration gases of 169.2 and 250.2 PPM was used to determine the calibration error of the analyzer. The sampling system (from the back of the stack probe to the analyzer) was injected using the 169.2 PPM gas to determine the system bias. After each sample, a system zero and system injection of 169.2 PPM were performed to establish system drift and system bias during the test period. All calibration gases were EPA Protocol 1 Certified.

The analyzer was calibrated to the output of the data acquisition system (DAS) used to collect the data from the exhaust. A diagram of the sampling train is shown in Figure 1. Three (3) samples, each sixty (60) minutes in duration were collected.

V.3 Formaldehyde - The formaldehyde determinations were performed in accordance with NCASI Method 98.01. A midget impinger sampling train with Deionized water in the impingers was used to collect the formaldehyde. The sampling train was operated at approximately 1000 cc/min. Three samples of sixty minutes in duration were collected from the dryer inlet. A spiked duplicated sample was collected simultaneously with sample three.

The samples were recovered and refrigerated until they were analyzed. The analysis was performed by spectrophotometry for formaldehyde. The recovery for the spike duplicate sample was 99.3% . All quality assurance and quality control requirements specified in the method were incorporated in the sampling and analysis. A diagram of the sampling train is shown in Figure 2.

V.4 Visible Emissions - The VEOs were performed in accordance with EPA Reference Method 9. A certified observer, located in a position with the sun at his back and the exhaust stack in the line of view, recorded observations at fifteen-second intervals during the testing. Readings were read to the nearest five percent opacity. The highest opacity averages were reported for each one-hour period.

V.5 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. 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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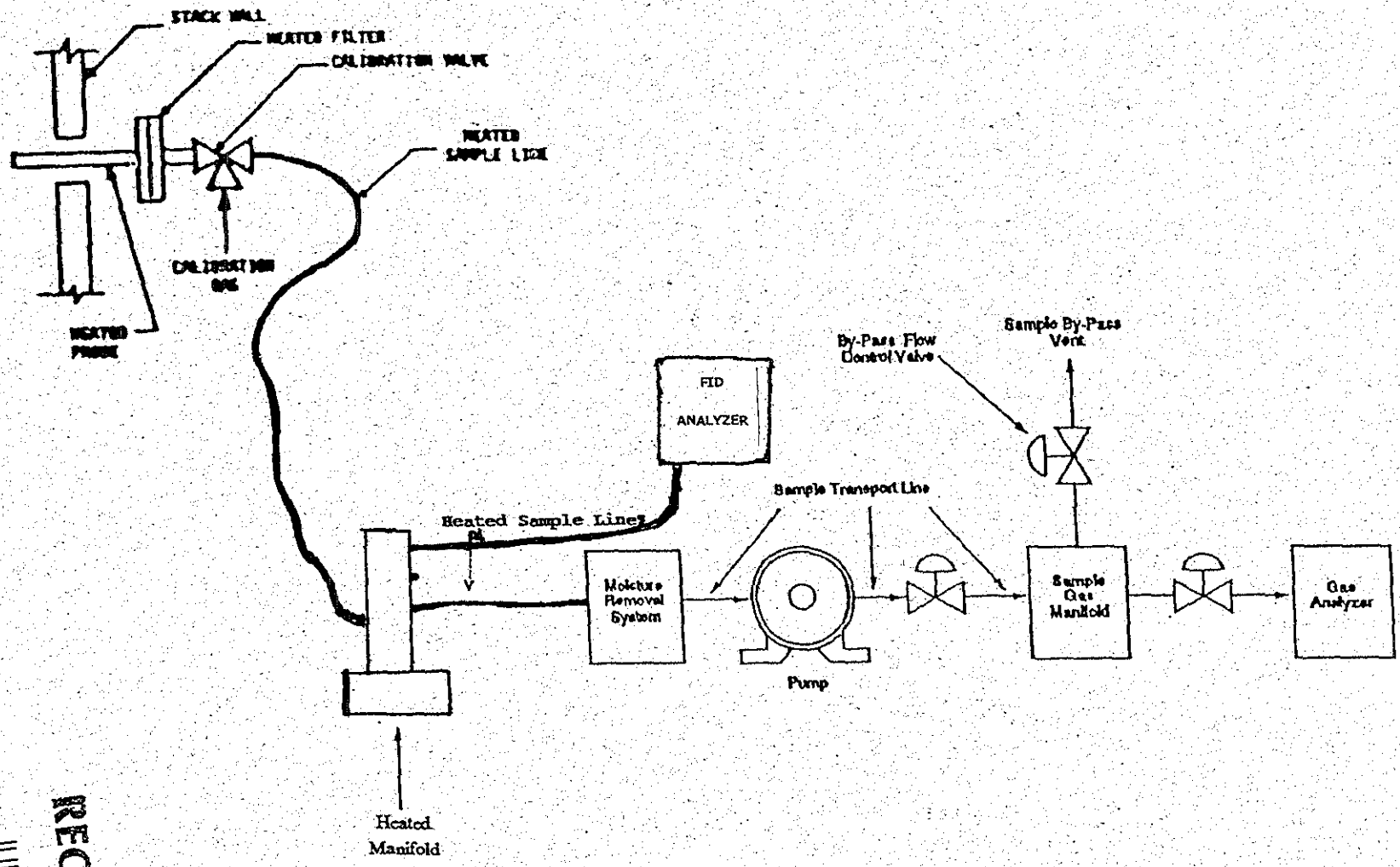

Figure 1

CO & VOC Sampling Train

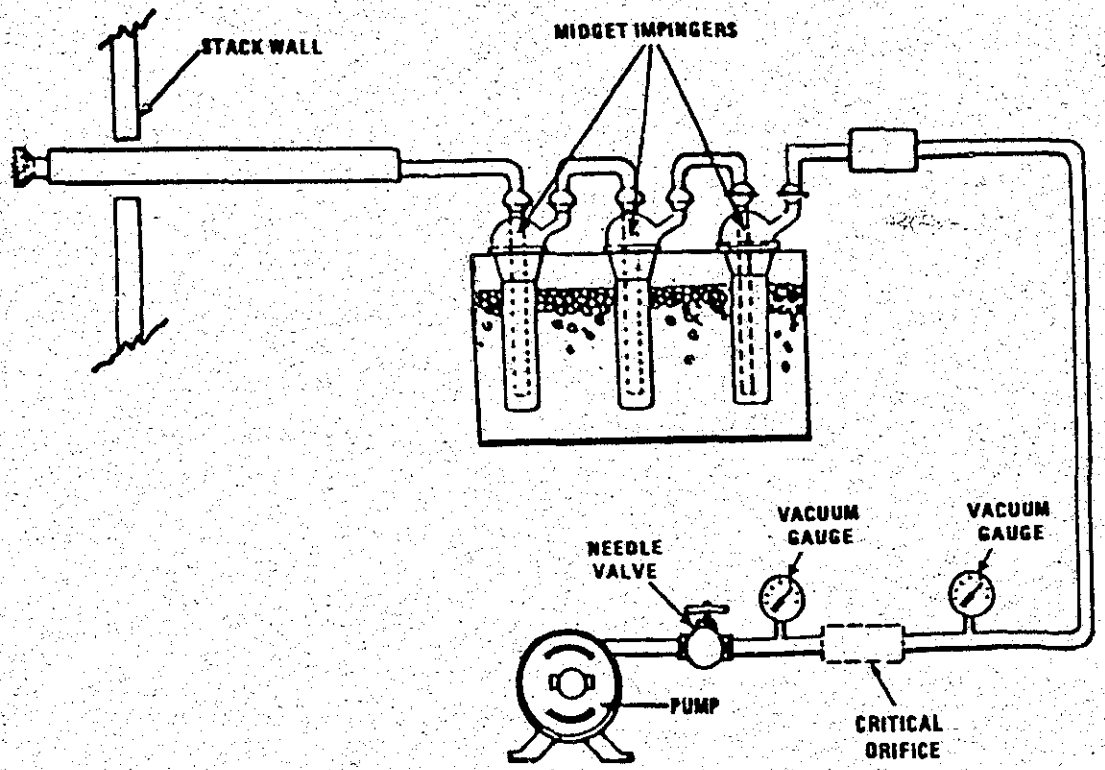

Figure 2

Formaldehyde Sampling Train