Report of...

VOC Compliance Testing

performed for...

Hutchinson Antivibration Systems
Grand Rapids, Michigan

at

Hutchinson
Grand Rapids, Michigan

on the

Regenerative Thermal Oxidizer

April 16, 2015

150.28

Network Environmental, Inc.
Grand Rapids, MI

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION

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: Hutchinson Antivibration Systems, Inc. County: Kent

Source Address: 460 Fuller Avenue, NE City: Grand Rapids

AQD Source ID (SRN): E5094 ROP No.: E5094-2012b 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 _____ To _____

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

This form certifies the stack test report for testing performed April 16, 2015. The testing was conducted in accordance with the approved test plan and the facility operating conditions were at the agreed upon conditions.

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

Eric Jamet	Plant Manager	616-234-8314
Name of Responsible Official (print or type)	Title	Phone Number
Signature of Responsible Official		6/22/15 Date

* Photocopy this form as needed.

EQP 5736 (Rev 11-04)

I. INTRODUCTION

Network Environmental, Inc. was retained by Hutchinson Antivibration Systems of Grand Rapids, Michigan to conduct compliance emission testing at their Grand Rapids, Michigan facility located at 460 Fuller N.E. The purpose of the study was to determine the capture and destruction efficiency of the regenerative thermal oxidizer (RTO) in accordance with their Permit MI-ROP-E5094-2012b.

The sampling was conducted on April 16, 2015 by Stephan K. Byrd, Richard D. Eerdmans and David D. Engelhardt of Network Environmental, Inc. The testing was performed in accordance with EPA Methods 18, 24 and 204 for Capture Efficiency. Mr. Jim Niesen and the staff of Hutchinson coordinated source operation and data collection during the testing. Mr. Nathan Hude and Ms. April Lazzaro of the MDEQ were present to observe the testing and source operation.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
VOC DESTRUCTION EFFICIENCY RESULTS (as Propane)
HUTCHINSON
RTO
GRAND RAPIDS, MICHIGAN
APRIL 16, 2015

Sample	Time	Concentration PPM[1]		Mass Emission Rate Lbs./Hr		%[2] Destruction Efficiency
		Inlet	Exhaust	Inlet	Exhaust	
1	09:47-10:47	723.5	23.5	33.53	1.10	96.72
2	11:15-12:15	522.2	19.2	24.83	0.96	96.14
3	12:40-13:40	796.1	27.4	41.79	1.27	96.96
Average		680.6	23.4	33.38	1.11	**96.61**

(1) PPM = Parts Per Million (v/v) on an actual (wet) basis
(2) Destruction Efficiencies were calculated using the mass emission rates

II.2 TABLE 2
CAPTURE EFFICIENCY RESULTS
HUTCHINSON
GRAND RAPIDS, MICHIGAN
REGENERATIVE THERMAL OXIDIZER
APRIL 16, 2015

Run #	Time	VOC's RM – Lbs.	VOC's Applied - Lbs.	% CE[1]
1	09:47-10:47	45.93	58.37	78.69
2	11:15-12:15	31.21	43.71	71.41
3	12:39-13:39	46.38	55.00	84.32
4	14:45-15:45	31.56	39.47	79.96
5	16:15-17:15	36.79	43.54	84.49
6	17:23-18:23	31.11	34.08	91.29
Average				**81.86**

(1) = CE was calculated using Runs 1, 3, 4, and 5. Runs 2 and 6 did not meet the DQO of 95% of the confidence limit.

III. DISCUSSION OF RESULTS

Destruction Efficiency - The results of the destruction efficiency (DE) sampling are presented in Section II, Table 1. The Destruction Efficiencies for the three samples were 96.72% for sample one, 96.14% for sample two and 96.96% for sample three. The average of the three samples was 96.61%. The Destruction Efficiencies were calculated using the mass loadings, as propane, at the inlet and outlet of the RTO.

Capture Efficiency - The results of the capture efficiency sampling are presented in Section II, Table 2. The capture efficiencies for the six samples were 78.69% for sample one, 71.41% for sample two, 84.32% for sample three, 79.96% for sample four, 84.49% for sample five, and 91.29% for sample six. The average for the capture efficiency was 81.86%. The capture efficiencies were calculated using the mass VOC loading at the RTO inlet compared to the VOC loading in the coatings applied during each test run. Run 2 and Run 6 were not used to calculate the final capture efficiency because they did not meet the Data Quality Objective of being within the 95th percentile of the average of all valid test runs.

IV. SOURCE DESCRIPTION

The source sampled was the inlet to the RTO on the adhesive application process located at the Grand Rapids, Michigan facility. The process applies adhesive to metal parts. The process consists of one chain on edge adhesive spray booth and four coating booths. The booths are enclosed and vented to the RTO. See Appendix F for process data and coating usage.

V. SAMPLING AND ANALYTICAL PROTOCOL

The RTO inlet and exhaust sampling was conducted on the 20-inch I.D. RTO inlet duct at a location approximately 5-duct diameters downstream and 1 duct diameter upstream from the nearest disturbances and the 23-inch I.D. RTO outlet stack at a location approximately 8-duct diameters downstream and greater than two duct diameter upstream from the exit.

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

* Destruction Efficiency - U.S. EPA Method 25A
* Capture Efficiency - U.S. EPA Methods 18, 24, and 204
* Exhaust Gas Parameters (flow rate, temperature, moisture and density) - U.S. EPA Methods 1 - 4.

V.1 Destruction - The total hydrocarbon (VOC) sampling was conducted in accordance with U.S. EPA Reference Method 25A. The sample gas was extracted from the inlet and outlet of the RTO through heated Teflon sample lines that led to a Thermo Model 51 and a J.U.M Model 3-500 portable flame ionization detectors (FIDs). These analyzers produce instantaneous readouts of the total hydrocarbon concentrations (PPM). Three (3) samples were collected from each of the inlet and outlet of the RTO. Each sample was sixty (60) minutes in duration. The sampling on the RTO inlet and exhaust was conducted simultaneously for the DE.

A systems (from the back of the stack probe to the analyzer) calibration was conducted for the analyzers prior to the testing. Span gases of 247.1 PPM and 2019 PPM propane were used to establish the initial instrument calibration for the analyzers. Propane calibration gases of 29.17 PPM, 50.19 PPM, 85.78 PPM, 151.1 PPM, 453.6 PPM and 959.3 PPM were used to determine the calibration error of the analyzers. After each PPM sample (60 minute sample period), a system zero and system injections of 50.19 PPM and 959.3 PPM propane were performed to establish system drift of the analyzers 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.

V.2 Capture Efficiency - The capture efficiency determination was performed in accordance with EPA Methods 18, 24 and 204. A Teflon sample line was used to extract the samples from the inlet to the oxidizer. Two Anasorb CSC sorbent tubes in series were used to collect the samples. The sampling system was operated at approximately 250 cc/min during the testing. A vacuum pump with a calibrated critical orifice was used to collect the samples. Each sample was sixty (60) minutes in duration. A total of six samples were collected.

The samples were recovered and refrigerated until they were analyzed. The samples were analyzed by Gas Chromatograph with a Flame Ionization Detector (FID) for ethylbenzene, methyl ethyl ketone, methyl isobutyl ketone, toluene, and xylene. A spiked duplicate sample was collected with each of the six test runs. The tubes were spiked with approximately 500 ug of each compound. The laboratory spiked tube recoveries for the samples ranged from 77.18% to 102.39%. All quality assurance and quality control requirements specified in the method were incorporated in the sampling and analysis.

The coating usage was determined by weighing containers of coating to the nearest 0.2 pounds. Weights were recorded at the beginning and end of each one (1) hour run. Each booth had its own coating pot sitting on an individual scale. The VOC content of each coating batch used was determined by EPA Method 24. One sample was collected for each different coating used during the testing. The analytical data can

be found in Appendix D and the coating usage data can be found in Appendix E.

V.3 Exhaust Gas Parameters - The exhaust gas parameters (airflow rate, temperature, moisture and density) were determined in accordance with U.S. EPA Methods 1-4. Moisture was determined by employing the wet bulb/dry bulb measurement technique. Oxygen and carbon dioxide concentrations (%) were determined by collecting a bag sample (grab sample) and Orsat analysis. Twelve (12) sample points were used for the velocity determinations.

The sample points were as follows:

Point #	Point Location (Inches)	
	Inlet	Outlet
1	1.88	1.01
2	2.92	3.36
3	5.92	6.81
4	14.08	16.19
5	17.08	16.64
6	19.12	21.99

One velocity traverse was performed at the inlet of the RTO for each CE sample taken. One velocity traverse was performed at the inlet and outlet of the RTO for each DE test run. All quality assurance and quality control requirements specified in the method were incorporated in the sampling and analysis.

This report was prepared by:

Stephan K.Byrd
Project Manager

This report was reviewed by:

David D. Engelhardtl
Vice President

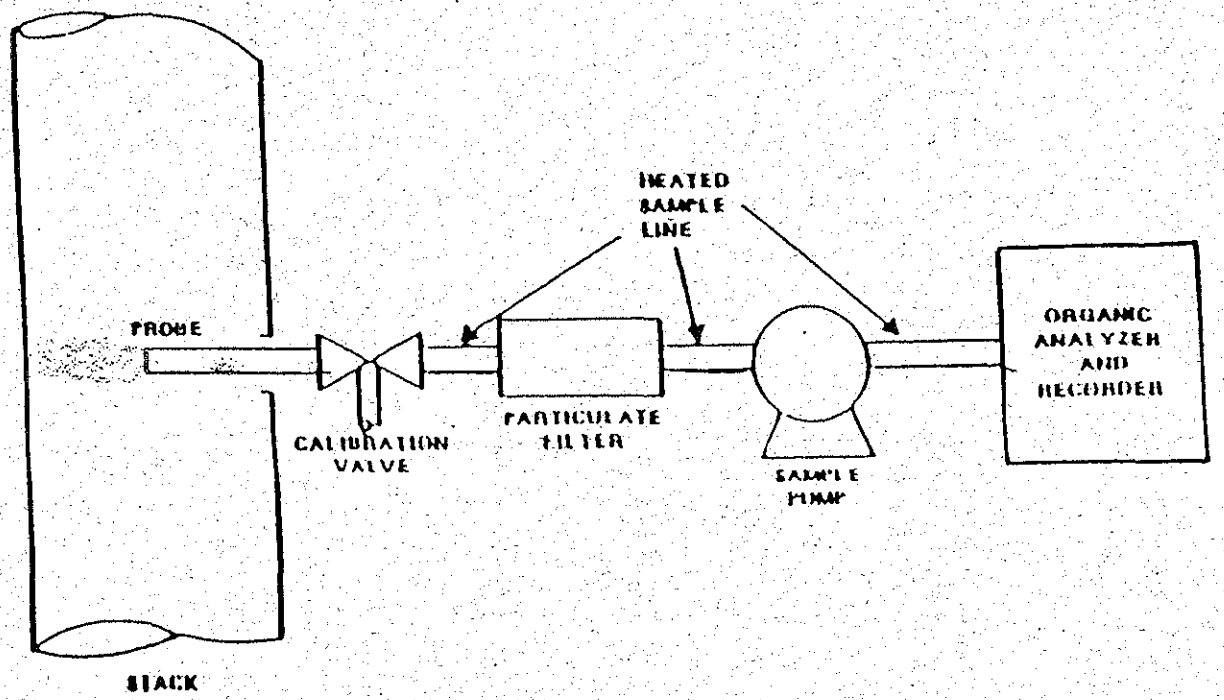

Figure 1

Method 25A Sampling Train

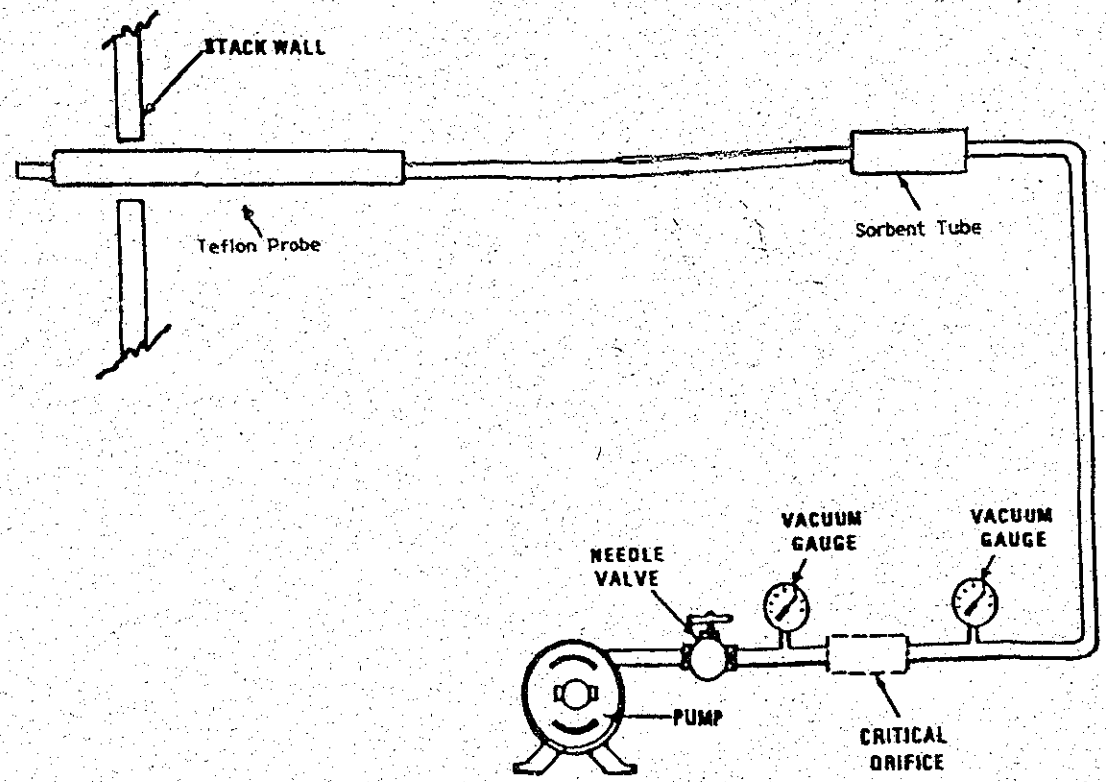

Figure 2

Method 18 Sorbent Tube Sampling Train