Report of...

VOC Compliance Testing

performed for...

NBHX Trim Corporation
Comstock Park, Michigan

on the

Regenerative Thermal Oxidizer

August 9-10, 2022

186.04

Network Environmental, Inc.
Grand Rapids, MI

Performed For:

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TABLE OF CONTENTS

Appendices

I. INTRODUCTION

Network Environmental, Inc. was retained by NBHX Trim Corporation of Comstock Park, Michigan to perform a VOC emission study at their facility. The purpose of the study was to determine the destruction efficiency and capture efficiency of the regenerative thermal oxidizer (RTO) in accordance with their Renewable Operating Permit #MI-ROP-N2614-2017a.

The sampling was conducted on August 9 and 10, 2022, by Stephan K. Byrd, Richard D. Eerdmans and David D. Engelhardt of Network Environmental, Inc. The testing was performed in accordance with EPA Method 25A for Capture and Destruction Efficiency. Assisting with the study was Mr. Dan Madden and the operating staff of the facility. Mr. Michael Cox of EGLE-AQD Grand Rapids District Office and Ms. Lindsey Wells of EGLE-AQD Lansing Office were present to observe the testing and source operation.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
VOC[1] DESTRUCTION EFFICIENCY RESULTS
FGRTO
NBHX TRIM CORPORATION
COMSTOCK PARK, MICHIGAN
AUGUST 9, 2022

Sample	Time	Concentration PPM[2]		Mass Emission Rate Lbs/Hr		%[3] Destruction Efficiency
		Inlet	Exhaust	Inlet	Exhaust	
1	12:38-13:38	222.6	24.2	11.57	1.34	88.38
2	14:18-15:18	292.3	31.0	15.78	1.72	89.11
3	15:38-16:38	235.8	25.3	12.68	1.35	89.36
Average		**250.3**	**26.8**	**13.34**	**1.47**	**88.95**

(1) The results are expressed as total hydrocarbons as propane
(2) PPM = Parts Per Million (v/v) on an actual (wet) basis
(3) Destruction Efficiencies were calculated using the mass emission rates

II.2 TABLE 2
CAPTURE EFFICIENCY RESULTS (#/Hr)
NBHX TRIM CORPORATION
FGRTO INLET and STACK PFOS#2
AUGUST 10, 2022

Run #	Time	RTO Inlet	Stack #2	CE%
1	12:28-13:38	15.13	0.51	96.61
2	14:06-15:06	15.66	0.64	95.92
3	15:20-16:20	15.94	0.82	94.83
Average		**15.58**	**0.66**	**95.78**

Capture efficiency was calculated using the VOC mass loading at the RTO inlet and the mass of the VOCs exhausted from Stack 2.

III. DISCUSSION OF RESULTS

The results of the destruction efficiency sampling are presented in Section II, Table 1, the capture efficiency sampling results are presented in Section II, Table 2.

III.1 DE – The destruction efficiencies for the three samples taken were 88.38% for sample one, 89.11% for sample two and 89.36% for sample three. The average of the three samples was 88.95%. The DE's were calculated using the mass emission rates, as propane, for the inlet and outlet of the incinerator.

III.2 CE – The capture efficiency for the coating line was 96.61% for sample one, 95.92% for sample two and 94.83% for sample three. The average of the three samples was 95.78%. The CE was calculated in terms of VOCs as propane. The average mass loading at the inlet to the RTO was compared to the mass emissions from the one operating stack exhaust. The mass emissions rates from the one stack represent the uncontrolled emissions. Three sixty minute runs were simultaneously collected from each stack exhaust.

IV. SOURCE DESCRIPTION

The source sampled was the regenerative thermal oxidizer (RTO) that controls VOC emissions from a polyurethane sealer booth and a polyester coating line. The plant produces laminated wood inserts for the automotive industry. The laminated wood parts are coated in an auto-spray booth. The parts are coated, removed from the booth and allowed to stand on a rack for a period of time before they are returned to the booth and coated again. Five coats are applied. After the fifth coat is applied, the parts are stacked on a rack and placed in an oven to dry. After the parts have dried, they are sealed in the sealer booth and then placed in an oven to dry. The RTO controls the exhausts of the polyester coating booth and the sealer booth. Testing was performed during normal production for the coating line.

V. SAMPLING AND ANALYTICAL PROTOCOL

The sampling locations are shown in the diagram found in Appendix E. The incinerator exhaust sampling was conducted on the 41 inch I.D. exhaust stack at a location approximately 5 duct diameters downstream and 6

duct diameters upstream from the nearest disturbances. The incinerator inlet sampling was conducted on the 38 inch I.D. inlet duct at a location approximately 8 duct diameters downstream and 1 duct diameter upstream from the nearest disturbances.

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

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

V.1 Destruction Efficiency – The total hydrocarbon (VOC) sampling was conducted in accordance with U.S. EPA Reference Method 25A. Thermo Environmental and J.U.M 3-500 flame ionization detector analyzers were used to monitor the inlet and outlet of the RTO. Heated Teflon sample lines were used to transport the inlet and exhaust gases to the analyzers. These analyzers produce instantaneous readouts of the total hydrocarbon concentrations (PPM). The testing consisted of three (3) - sixty (60) minute sampling periods.

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 991.0 PPM propane was used to establish the initial instrument calibration for the inlet analyzer and a span gas of 94.9 PPM for the exhaust. Propane calibration gases of 491.0 PPM, 250.0 PPM, 50.6 PPM, and 30.2 PPM were used to determine the calibration error of the analyzers. After each sample (sixty minute sample period), a system zero and system injections of 250.0 PPM propane and 30.2 PPM propane were performed to establish system drift during the test period. All calibration gases used were EPA Protocol 1 Certified. All the results were calibration corrected using Equation 7E-5 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 RTO. All quality assurance and quality control requirements specified in the method were incorporated in the performance of this determination.

V.2 Capture Efficiency – The capture efficiency determination was performed in accordance with EPA Method 25A. Two FIDs were used to monitor the VOCs at the inlet to the RTO and at the exhaust

of the one uncontrolled stack that exhausted to atmosphere from the coating line. Three sixty minute periods were monitored from the emission point while monitoring the inlet to the RTO. The mass emission rate from the one exhaust was added to the mass loading at the RTO inlet and compared to the loading at the RTO inlet to calculate capture efficiency.

V.3 Exhaust Gas Parameters - The exhaust gas parameters (air flow rate, temperature, moisture and density) were determined in accordance with U.S. EPA Methods 1-4. One velocity traverse was performed during each of the three DE runs at the inlet and outlet of the RTO. One velocity traverse was taken on the exhaust of each of the uncontrolled stack along with one traverse on the inlet of the RTO for each of the three samples. 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). All quality assurance and quality control requirements specified in the method were incorporated in the sampling and analysis.

This report was prepared by:

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This report was reviewed by:

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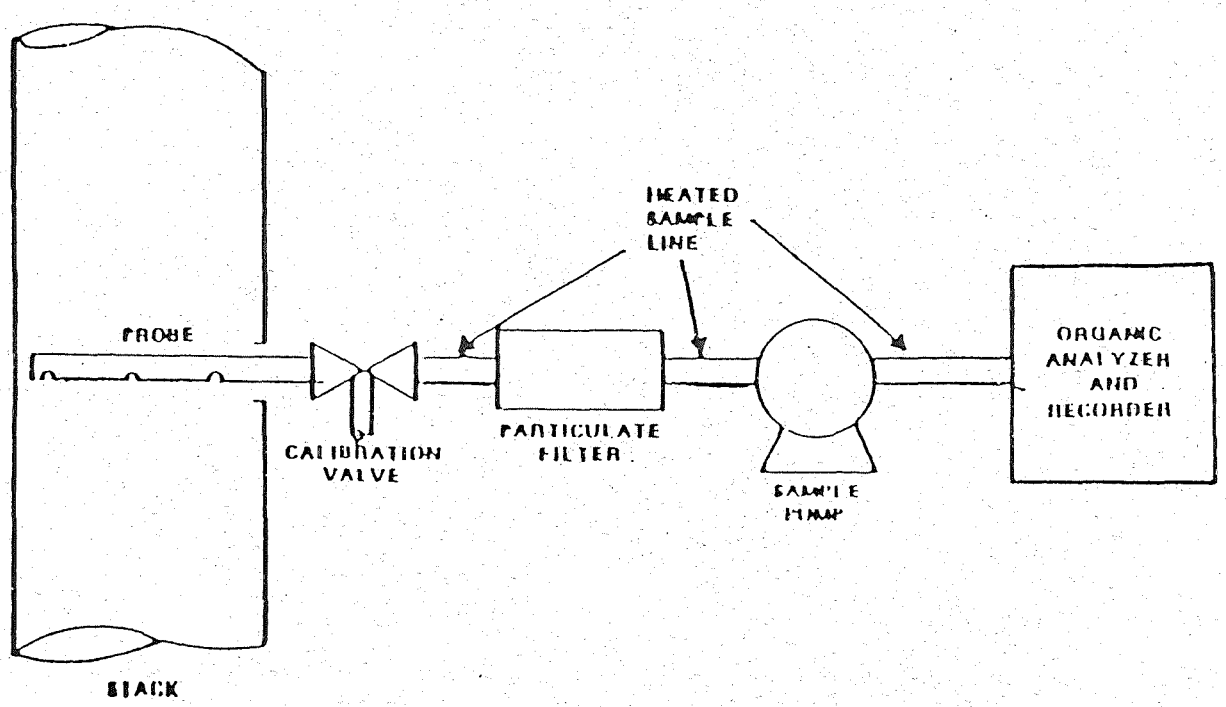

Figure 1

Total Hydrocarbon Sampling Train