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I. INTRODUCTION

Network Environmental, Inc. was retained by Paramelt of Muskegon, Michigan to conduct emission testing at their Muskegon, Michigan facility located at 2817 McCracken Street. The purpose of the study was to determine the collection efficiency of the Carbon Bed in accordance with their Permit to Install #57-07A.

The sampling was conducted on January 28, 2020 by Stephan K. Byrd and David D. Engelhardt of Network Environmental, Inc. The testing was performed in accordance with EPA Methods 25A. Mr. Scott Evans of EGLE-AQD was present to observe the testing and source operation.

II. PRESENTATION OF RESULTS

II.1 TABLE 1
VOC COLLECTION EFFICIENCY RESULTS (as Propane)
CARBON BED
PARAMELT
MUSKEGON, MICHIGAN
JANUARY 28, 2020

Sample	Time	Concentration PPM[1]		Mass Emission Rate Lbs./Hr		%[2] Collection Efficiency
		Inlet	Exhaust	Inlet	Exhaust	
1	09:20-10:20	12.8	3.9	0.164	0.053	67.50
2	10:47-11:47	11.2	2.7	0.148	0.036	75.42
3	12:14-13:14	23.8	2.3	0.316	0.032	89.95
Average		**15.9**	**3.0**	**0.209**	**0.040**	**77.62**

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

III. DISCUSSION OF RESULTS

Collection Efficiency - The results of the collection efficiency sampling are presented in Section II, Table 1. The collection efficiencies for the three samples were 67.50% for sample one, 75.42% for sample two and 89.95% for sample three. The average of the three samples was 77.62%. The collection efficiencies were calculated using the mass loadings, as propane, at the inlet and outlet of the carbon bed.

IV. SOURCE DESCRIPTION

The source sampled was the carbon bed that services the exhausts of ten mixing tanks. Waxes, resins, fillers, additives, colors, and scents are blended and mixed in steam-heated tanks to produce casting waxes for the investment casting industry. The exhausts of the tanks are passed through a wet scrubber prior to the carbon bed before exhausting to atmosphere.

V. SAMPLING AND ANALYTICAL PROTOCOL

The carbon bed inlet and exhaust sampling was conducted on the 14-inch I.D. inlet duct at a location approximately 6-duct diameters downstream and 1-duct diameter upstream from the nearest disturbances and the 12 inch I.D. outlet duct at a location approximately 8-duct diameters downstream and greater than 2-duct diameters upstream from the nearest disturbance.

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

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

V.1 Collection Efficiency - The total hydrocarbon (THC) sampling was conducted in accordance with U.S. EPA Reference Method 25A. The sample gas was extracted from the inlet and outlet of the carbon bed through heated Teflon sample lines that led to a TECO 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 location. Each sample was sixty (60) minutes in duration. The sampling on the inlet and exhaust was conducted simultaneously.

A system (from the back of the stack probe to the analyzer) calibration was conducted for the analyzers prior to the testing. A span gas of 94.9 PPM propane was used to establish the initial instrument calibration for the analyzers. Propane calibration gases of 30.2 PPM and 50.6 PPM were used to determine the calibration error of the analyzers. After each sample (60-minute sample period), a system zero and system injections of 30.2 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. All quality assurance and quality control requirements specified in the method were incorporated in the sampling and analysis.

V.2 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. Sixteen (16) sample points on the inlet and twelve (12) sample points on the outlet were used for the velocity determinations. Velocity traverses were performed on the inlet and exhaust for each of the three runs. 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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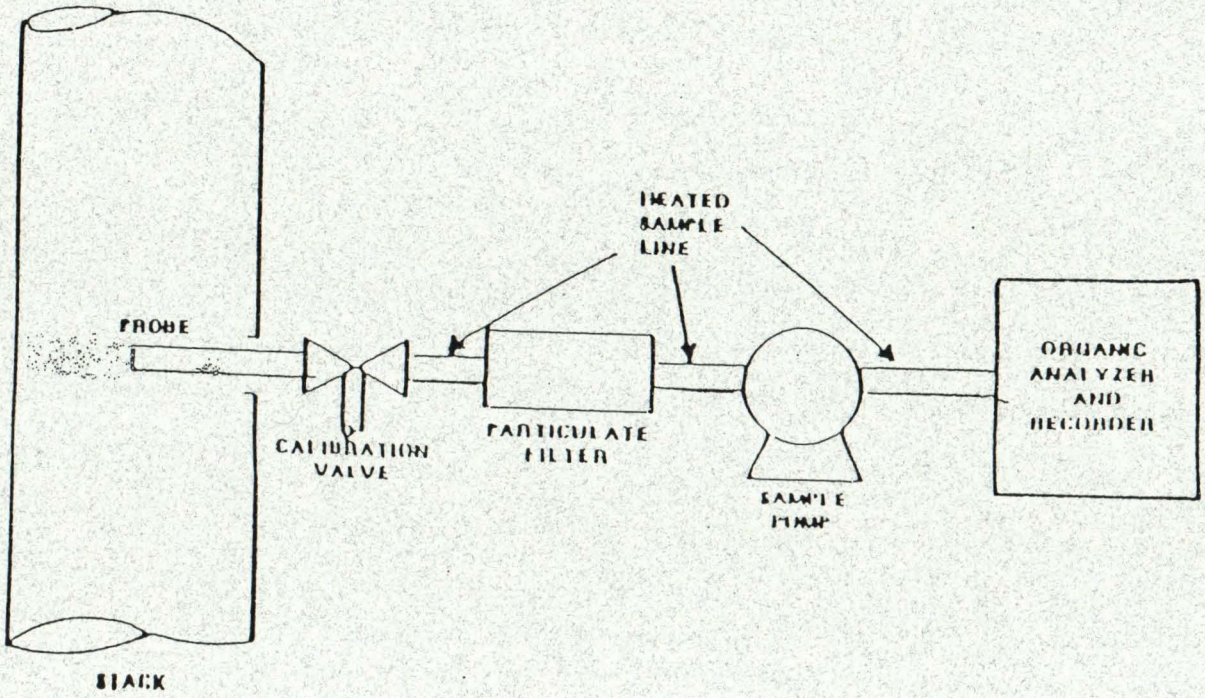

Figure 1

THC Sampling Train