

**I. INTRODUCTION**

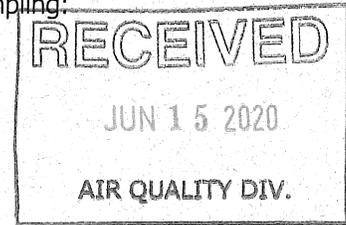
Network Environmental, Inc. was retained by Lacks Enterprises, Inc. to perform an emission study at their Plastic Plate Kraft Avenue facility. The purpose of the study was to document compliance with Renewable Operating Permit (ROP) No. MI-ROP-N7374-2015a.

The following is a list of the applicable emission limits and the compounds sampled:

Stack ID	Emission Limit(s)	Compound(s) Sampled
SVK9 FGSTRIPTANKS (Strip Tanks Exhaust)	Sodium Hydroxide: 0.4 Lbs/Hr Nitric Acid: 1.9 Lbs/Hr	Sodium Hydroxide & Nitric Acid

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

- Sodium Hydroxide & Nitric Acid – U.S. EPA Method 308 (modified)
- Exhaust Gas Parameters – U.S. EPA Methods 1 through 4



The sampling was performed on February 25, 2020 by Stephan K. Byrd and David D. Engelhardt of Network Environmental, Inc.. Assisting with the sampling was Mr. Isaac Andrusiak of Lacks Enterprises, Inc. and the operating staff of the facility. Mr. Matthew Karl and Ms. April Lazzaro 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  
SODIUM HYDROXIDE EMISSION RESULTS SUMMARY  
PLASTIC PLATE, INC.  
KRAFT PLATING  
KENTWOOD, MICHIGAN**

Source	Sample	Date	Time	Air Flow Rate DSCFM <sup>(1)</sup>	Concentration Mg/M <sup>3</sup> <sup>(2)</sup>	Emission Rate Lbs/Hr <sup>(3)</sup>
SVK9 FGSTRIPTANKS (Strip Tanks Exhaust)	1	2/25/20	07:54-08:54	44,537	0.39	0.065
	2	2/25/20	09:06-10:06	45,169	0.34	0.057
	3	2/25/20	10:43-11:43	44,708	0.22	0.036
	<b>Average</b>				<b>44,805</b>	<b>0.32</b>

(1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)

(2) Mg/M<sup>3</sup> = Milligrams Per Dry Standard Cubic Meter

(3) Lbs/Hr = Pounds Per Hour

**(4) Sodium Hydroxide emission limit from MI-ROP-N7374-2015a = 0.4 Lbs/Hr**

**II.2 TABLE 2  
NITRIC ACID EMISSION RESULTS SUMMARY  
PLASTIC PLATE, INC.  
KRAFT PLATING  
KENTWOOD, MICHIGAN**

Source	Sample	Date	Time	Air Flow Rate DSCFM <sup>(1)</sup>	Concentration Mg/M <sup>3</sup> <sup>(2)</sup>	Emission Rate Lbs/Hr <sup>(3)</sup>
SVK9 FGSTRIPTANKS (Strip Tanks Exhaust)	1	2/25/20	07:54-08:54	44,537	0.37	0.062
	2	2/25/20	09:06-10:06	45,169	0.36	0.060
	3	2/25/20	10:43-11:43	44,708	0.48	0.080
	<b>Average</b>			<b>44,805</b>	<b>0.40</b>	<b>0.067</b>

- (1) DSCFM = Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- (2) Mg/M<sup>3</sup> = Milligrams Per Dry Standard Cubic Meter
- (3) Lbs/Hr = Pounds Per Hour
- (4) Nitric Acid emission limit from MI-ROP-N7374-2015a = 1.9 Lbs/Hr**

### **III. DISCUSSION OF RESULTS**

The results of the emission sampling are summarized in Tables 1 through 2 (Sections II.1 through II.2). The results are presented as follows:

#### **III.1 Sodium Hydroxide Emission Results Summary (Table 1):**

Table 1 summarizes the Sodium Hydroxide emission results as follows:

- Source
- Sample
- Time
- Air Flow Rate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Sodium Hydroxide Concentration (Mg/M<sup>3</sup>) – Milligrams Per Dry Standard Cubic Meter
- Sodium Hydroxide Mass Emission Rate (Lbs/Hr) – Pounds Per Hour

A spiked duplicate train was run during Sample 3 to document recovery efficiency for sodium hydroxide. The sample was spiked with 200 ug of sodium. The recovery efficiency was 102.72% (See Appendix C).

#### **III.2 Nitric Acid Emission Results Summary (Table 2):**

Table 2 summarizes the Nitric Acid emission results as follows:

- Source
- Sample
- Time
- Air Flow Rate (DSCFM) – Dry Standard Cubic Feet Per Minute (STP = 68 °F & 29.92 in. Hg)
- Nitric Acid Concentration (Mg/M<sup>3</sup>) – Milligrams Per Dry Standard Cubic Meter
- Nitric Acid Emission Rate (Lbs/Hr) – Pounds Per Hour

### **IV. SAMPLING AND ANALYTICAL PROTOCOL**

The sampling location met the requirements of Methods 1 and 2. The sampling location was on the 54 inch diameter exhaust at a location approximately 4 duct diameters downstream and greater than 8 duct diameters upstream from the nearest disturbances. There are 2 sample ports.

**IV.1 Sodium Hydroxide & Nitric Acid** – The sodium hydroxide and nitric acid emissions were determined by employing U.S. EPA Method 308 (modified). Three (3) samples were collected from the

SVK9 exhaust. In addition, a spiked duplicate train for sodium hydroxide was run during sample 3 to document recovery efficiency for sodium hydroxide.

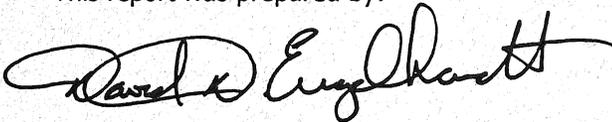
The samples were collected in midjet impingers containing de-ionized distilled water. The train was modified from Method 308 by not using the silica gel tube in back of the impingers for analysis. The samples were collected using a pump equipped with a calibrated critical orifice at approximately 1000 cc/min. The samples were analyzed for sodium hydroxide and nitric acid by using ion chromatography as per the method. 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 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.

Three (3) velocity traverses (one for each sample) were performed on the exhaust stack. Velocity pressures were measured using an S-Type pitot tube. Temperatures were measured with a Type K thermocouple. Sample point dimensions used for the velocity traverses can be found in Appendix D. Moisture was determined by using the wet bulb/dry bulb technique. Ambient gas density (20.9% O<sub>2</sub> & 0.0 % CO<sub>2</sub>) was used for the air flow calculations.

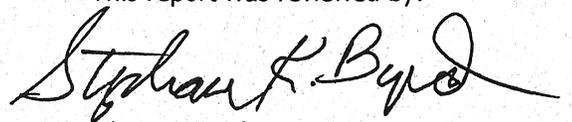
All the quality assurance and quality control procedures listed in the methods were incorporated in the sampling and analysis.

This report was prepared by:

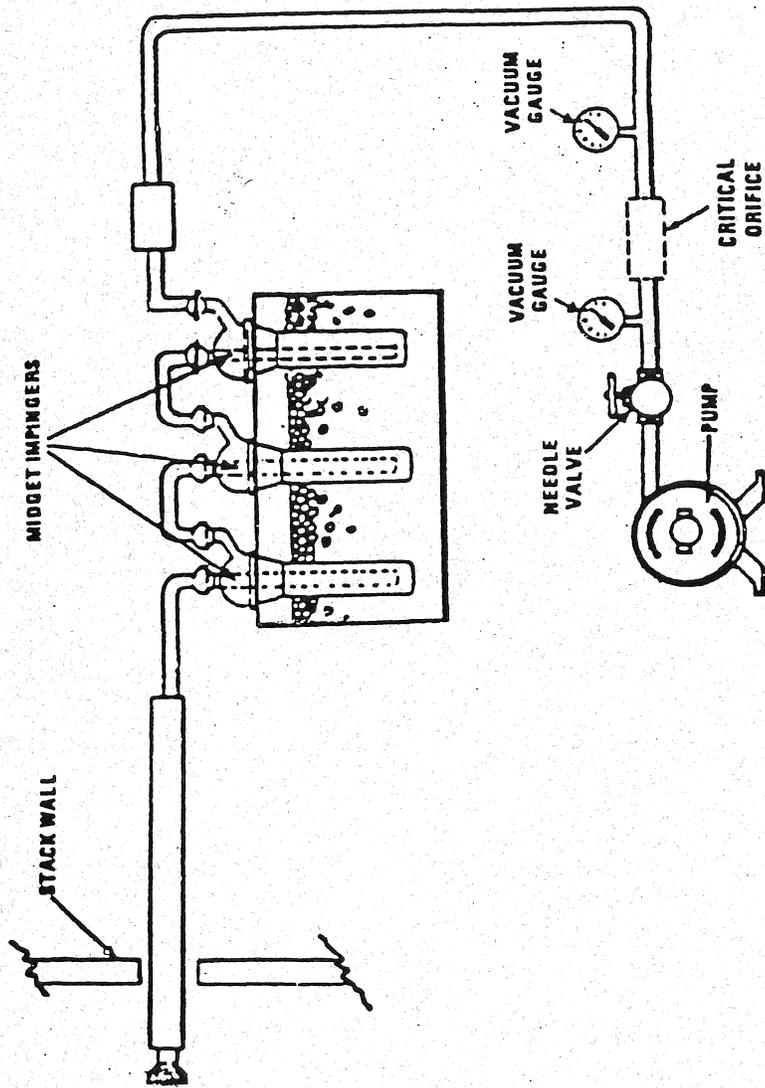


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**Figure 1**  
**Sodium Hydroxide & Nitric Acid**  
**Sampling Train**