

Report of...

Chromium Emission Testing

performed for...

Lacks Enterprises, Inc.
Airplane South Plant
Kentwood, Michigan

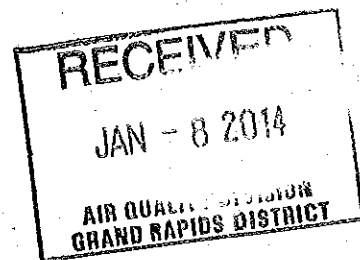
on

Multiple sources

November 5,6,8 and 11, 2013

021.16

Network Environmental, Inc.
Grand Rapids, MI



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AIR QUALITY DIV.

Performed For:

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I. INTRODUCTION

Network Environmental, Inc. was retained by Lacks Enterprises to perform Total Chromium (Cr) compliance emission sampling on the #4 Line Chrome Plating Scrubber Exhaust (SVCR-4), the #10 Line Chrome Plating Scrubber Exhaust (SVS-P10) and the Chrome Etch Scrubber Exhaust (SVS P11) located at their Airline South facility in Kentwood, Michigan. The purpose of the study was to quantify the Cr emissions from the three exhausts to document compliance with Michigan Department of Environmental Quality, Air Quality Division, Renewable Operating Permit MI-ROP-N0895-2012.

The sampling was performed by R. Scott Cargill and Richard D. Eerdmans of Network Environmental, Inc. on November 5-11, 2013 by employing U.S. EPA Method 306. Assisting in the study was Mr. Phil Schneider of Lacks Industries. Mr. Tom Gasloli and Mr. Dave Morgan of the Michigan Department of Environmental Quality, Air Quality Division, were present to observe the testing and source operation.

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II. PRESENTATION OF RESULTS

**II.1 TABLE 1
CHROMIUM (Cr) EMISSION RESULTS
#4 LINE SCRUBBER
CHROME PLATING EXHAUST
LACKS ENTERPRISES
KENTWOOD, MICHIGAN
NOVEMBER 5, 2013**

Sample	Time	Air Flow Rate DSCFM	Concentration Mg/M ³	Mass Emission Rate Lbs/Hr
1	9:00-11:04	21,490	0.0011	8.79E ⁻⁵
2	12:09-14:18	21,191	0.0007	5.60E ⁻⁵
3	14:41-16:45	21,406	0.0007	5.57E ⁻⁵
Average		21,362	0.0008	6.65E⁻⁵

**II.2 TABLE 2
 CHROMIUM (Cr) EMISSION RESULTS
 #10 LINE SCRUBBER
 CHROME PLATING EXHAUST
 LACKS ENTERPRISES
 KENTWOOD, MICHIGAN
 NOVEMBER 6-8, 2013**

Sample	Time	Air Flow Rate DSCFM	Concentration Mg/M ³	Mass Emission Rate Lbs/Hr
1	9:10-11:14 (11/6)	21,045	0.0019	1.50E ⁻⁴
2	12:32-13:32 (11/6) 8:38-9:38 (11/8)	21,658	0.0013	1.06E ⁻⁴
3	9:59-12:03 (11/8)	22,082	0.0014	1.13E ⁻⁴
Average		21,595	0.0015	1.23E⁻⁴

**II.3 TABLE 3
 CHROMIUM (Cr) EMISSION RESULTS
 CHROME ETCH SCRUBBER
 CHROME ETCH EXHAUST
 LACKS ENTERPRISES
 KENTWOOD, MICHIGAN
 NOVEMBER 11, 2013**

Sample	Time	Air Flow Rate DSCFM	Concentration Mg/M ³	Mass Emission Rate Lbs/Hr
1	9:24-11:31	20,308	0.00058	4.38E ⁻⁵
2	12:49-14:56	20,403	0.00059	4.53E ⁻⁵
3	15:11-17:17	20,495	0.00076	5.82E ⁻⁵
Average		20,402	0.00064	4.91E⁻⁵

III. DISCUSSION OF RESULTS

The Cr emission results are presented in Tables 1 through 3 (Section II.1 through II.3).

The Total Chromium emission limits for these sources are:

SVCR-4 Chrome Plate = 0.01 Mg/DSCM and 0.0005 Lbs/Hr

SVS-P10 Chrome Plater = 0.000489 Lbs/Hr

SVS-P11 Chrome Etch = 0.000542 Lbs/Hr

Sample #2 on Stack #10 SVS-P10 scrubber was conducted over the period of November 6-8, 2013. The sample was started and half finished on 11/6/13. The test was completed on 11/8/13. The plant had process issues which caused the testing to be split and completed on two (2) separate days. Mr. Tom Gasloll and Mr. David Morgan of the Michigan Department of Environmental Quality, Air Quality Division approved the testing alteration.

IV. SAMPLING AND ANALYTICAL PROTOCOL

The sampling location for the #4 Line Plater Chrome Scrubber Exhaust was on the forty (40) inch I.D. exhaust stack at a location which met the minimum test location requirements of U.S. EPA Reference Method 1. Twelve (12) sampling points per port were used for the testing (24 points total). The points are as follows:

Point #	Point Location (Inches)
1	0.84
2	2.68
3	4.72
4	7.08
5	10.00
6	14.24
7	25.76
8	30.00

9	32.92
10	35.28
11	37.32
12	39.16

The sampling location for the #10 Line Plater Chrome Scrubber Exhaust was on the forty (40) inch I.D. exhaust stack at a location which met the minimum test location requirements of U.S. EPA Reference Method 1. Twelve (12) sampling points per port were used for the testing (24 points total). The points are as follows:

Point #	Point Location (Inches)
1	0.84
2	2.68
3	4.72
4	7.08
5	10.00
6	14.24
7	25.76
8	30.00
9	32.92
10	35.28
11	37.32
12	39.16

The sampling location for the Chrome Etch Stack #11 Exhaust was on the forty-one (41) inch I.D. exhaust stack at a location which met the minimum test location requirements of U.S. EPA Reference Method 1. Twelve (12) sampling points per port were used for the testing (24 points total). The points are as follows:

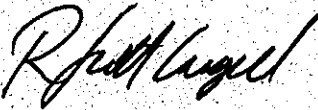
Point #	Point Location (Inches)
1	0.86
2	2.75
3	4.84
4	7.26
5	10.25
6	14.60
7	26.40
8	30.75
9	33.74
10	36.16
11	38.25
12	40.14

IV.1 Chromium (Cr) - The sampling was performed in accordance with U.S. EPA Reference Method 306. Three (3) samples, each 120 minutes in duration, were collected from the exhausts. The samples were collected isokinetically in a 0.1N Sodium Bicarbonate solution as outlined in the method. The samples were analyzed for total chromium (Cr) by ICP - MS. All the quality assurance and quality control procedures listed in the method were incorporated in the sampling and analysis.

A diagram of the sampling train can be seen in Figure 1.

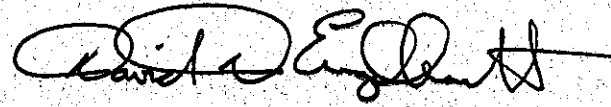
IV.2 Exhaust Gas Parameters - In addition to the Cr sampling, the exhaust gas parameters (air flow rate, temperature, moisture, and density) were determined by employing U.S. EPA Reference Methods 1 through 4. All the quality control and quality assurance requirements listed in the methods were incorporated in the sampling and analysis.

This report was prepared by:



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David D. Engelhardt
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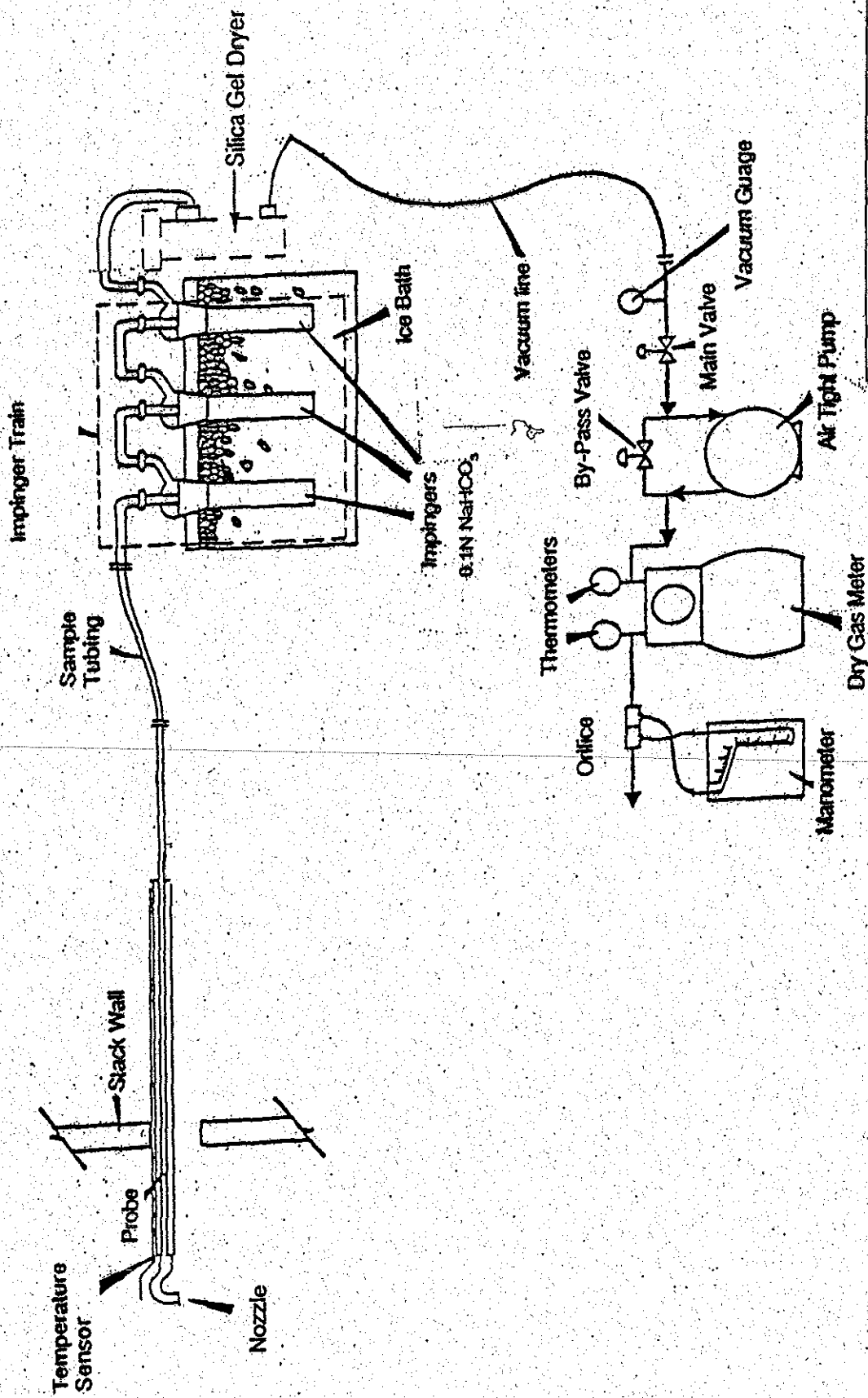


FIGURE 1

TOTAL CHROME SAMPLING TRAIN