AP32 Section:	12.5.1
Background Chapter	3
Reference:	20
Title:	Source Sampling for Particulate, HCl, CO and Visible Emissions, Acid Regenerator, EAF Baghouse and Pickle Line. Permit No. CP-107-5235. Nucor Steel, Crawfordsville, IN. September 30 - October 1-2, 1997.

RAMCON
Environmental Corporation

Regional Offices:
Philadelphia, Pennsylvania
Houston, Texas

Source Sampling for Particulate, HCl,
CO and Visible Emissions

Acid Regenerator, EAF Baghouse and Pickle Line
Permit No. CP-107-5235

NUCOR STEEL
CRAWFORDSVILLE, INDIANA
September 30 - October 1-2, 1997

Project # 2824

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I. INTRODUCTION

On September 30 - October 1-2, 1997 personnel from RAMCON Environmental Corporation conducted a source emissions test for Nucor Steel on the Acid Regeneration, the EAF Baghouse and the Pickle Line at it's facility located in Crawfordsville, Indiana. RAMCON personnel conducting the test were Allen Turner, Team Leader, Peter J. Colburn, and Robert Smith. The testing was performed for particulate matter, hydrogen chloride (HCl), and visible emissions on both the Acid Regeneration and Pickle Line. The EAF baghouse was tested for carbon monoxide(CO).

The particulate matter and hydrogen chloride emissions were sampled according to US EPA Reference Method 26A. The stack gas moisture, velocity, and volumetric flow rates were also determined during this isokinetic sampling procedure. This data enabled conversion of flue gas pollutant concentrations to emission data values in pounds per hour (lb/hr).

In conjunction with the gaseous analysis for pollutant concentration, a velocity traverse was performed to determine the volumetric flow rate. A velocity determination was conducted before and after the gaseous analysis determination(s) for the first and second test period. This determination provided data that would support the conversion of pollutant concentration in parts per million (ppm) to emission values in pounds per hour (lb/hr).

The gaseous compounds were collected and analyzed by test methods that utilize "real-time" continuous emission monitor (CEM) instrumentation. This technology provides data with a high degree of reliability on-site. Reference Methods 3A and 10 were employed for the analysis of oxygen and carbon dioxide and CO, respectively.

These testing procedures set forth a sampling strategy to continuously extract sample gas from the source. This sample stream is routed to individual CEMs for analysis of the various targeted pollutants and diluent gases. The test results are based on the average value of one-minute averages generated by the CEM instrument data acquisition during the test periods. Three (3) sampling periods were performed in which the gaseous concentrations were continuously monitored for the listed target compounds.

The purpose of the performance test was to determine if the emissions of the targeted gaseous pollutants from this source are equal to or below the allowable emission limitation established by the appropriate regulatory authority. The calculations of these test results are provided in a later section.

Table B – EAF Baghouse
CO Concentration Summary
September 30, 1997

Test Run	Time	% O_2	CO (ppm)	CO (lbs/hr)	CO (lbs/ton of steel)
1	16:12 -17:12	20.34	37.05	125.80	0.59
2	17:26 - 18:26	20.21	45.79	155.38	0.73
3	19:17 - 20:17	20.75	18.49	66.94	0.31
Average:		20.43	33.78	116.04	0.54

The particulate and HCl emissions results for the Pickle Line are reported in Table C below in terms of concentration, grains per dry standard cubic foot (gr/dscf), and emissions, milligrams per dry standard cubic meter, and pounds per hour (lb/hr), values.

Table C – Pickle Line
Particulate and HCl Emissions Test Results
October 1, 1997

Test Run	Time	Particulate			HCl	
		gr/dscf	lb/hr	Isokinetics, %	mg/dscm	lb/hr
1	11:56 - 13:05	0.0139	1.04	101.3	117.79	3.85
2	14:00 - 15:05	0.0064	0.48	99.3	75.99	2.45
3	15:40 - 16:46	0.0005	0.04	99.9	32.18	1.05
Average:		0.0069	0.52		75.32	2.45