AP32 Section:	12.5.1
Background Chapter	3
Reference:	24
Title:	Report on NOx and CO Emissions. Annealing Furnace #15. Performed for: Nucor Steel, Crawfordsville, IN. August 23, 2001.

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REPORT on
NO_x and CO EMISSIONS
Performed for:
Nucor Steel
Crawfordsville, IN
***Annealing Furnace* #15**
on 08/23/01

To the best of our knowledge, the data presented in this report is accurate and complete.

Respectfully Submitted by:

Michael Dicen, Division Manager

Nucor Steel
Crawfordsville, IN

SESCO Project No. 4192

1-1 PROJECT OVERVIEW

SESCo Group was contracted by Nucor Steel in Crawfordsville, Indiana to perform compliance test air sampling of Annealing furnace #15 on August 23, 2001. The objective of the testing was to determine NOx and CO emissions. The following personnel were involved with the testing program:

SESCo	Andrew Young
SESCo	Milo Hatfield
Nucor Steel	David Sulc
IDEM	Jed Wolkins

The testing program included flow determination, nitrogen oxide (Method 7E), and carbon monoxide (Method 10). Below is a summary of the results:

Table 1-1:
Summary of Test Results

Pollutant	Time 08/23/01	Emission (PPM)	Emission (lbs/hr)	Emission (lbs/MMbtu)
NOx	09:41-10:41	52.76	0.3202	0.0936
NOx	10:53-11:53	55.33	0.2310	0.0982
NOx	14:02-15:02	47.58	0.1174	0.0788
	Averages	**51.89**	**0.2229**	**0.0902**
CO	09:41-10:41	0.60	0.0022	0.0006
CO	10:53-11:53	0.50	0.0013	0.0005
CO	14:02-15:02	1.00	0.0015	0.0010
	Averages	**0.70**	**0.0017**	**0.0007**

2-1 RESULTS

Table 2-1:
Annealing Furnace Emissions

Gas Conditions		1	2	3	Avg
Ts	Stack Temperature (°F)	718.50	707.81	560.63	662.31
Bwo	Moisture (volume %)	14.30	15.07	14.60	14.66
O2	Oxygen (dry volume %)	8.5	8.5	8.5	8.5
CO2	Carbon Dioxide (dry volume %)	7.0	7.0	7.5	7.2
Volumetric Flow Rate					
Qa	Actual Conditions (acfm)	2191.55	1507.71	774.59	1491.28
Qstd	Standard Conditions (dscfm)	847.07	582.88	344.54	591.50
NITROGEN OXIDES					
E_T	Emission Rate (PPM)	52.76	55.33	47.58	**51.89**
E_T	Emission Rate (lbs/hr)	0.3202	0.2310	0.1174	**0.2229**
Er	Emission (lbs/MMbtu)	0.0936	0.0982	0.0788	**0.0902**
CARBON MONOXIDE					
E_T	Emission Rate (PPM)	0.60	0.50	1.00	**0.70**
Er	Emission Rate (lbs/hr)	0.0022	0.0013	0.0015	**0.0017**
Er	Emission (lbs/MMbtu)	0.0006	0.0005	0.0010	**0.0007**

3-1 METHODOLOGY

The sampling followed procedures as detailed in U.S. Environmental Protection Agency (EPA) Methods 1-4, 7E, 10. The following table summarizes the methods:

Summary of Sampling Procedures

Title 40 CFR Part 60 Appendix A

Method 1	"Sampling of Velocity Traverses for Stationary Sources"
Method 2	"Determination of Stack Gas Velocity and Volumetric Flow Rate"
Method 3	"Gas Analysis for the Determination of Molecular Weight"
Method 4	"Determination of Moisture Content in Stack Gas"
Method 7E	"Determination of Nitrogen Oxide Emissions from Stationary Sources"
Method 10	"Determination of Carbon Monoxide Emissions from Stationary Sources"

SAMPLE POINT DETERMINATION

Sampling point locations were determined according to EPA Reference Method 1.

Table 3-1:
Sampling Points

Location	Dimensions	Ports	Points per Port	Total Points
Annealing Furnace	13" ID	2	8	16