Appendix D

AK STEEL EMISSION REDUCTIONS

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10/19/2007

AK STEEL - MIDDLETOWN WORKS
SINTER PLANT EMISSIONS BANKING DOCUMENT

Annual Production, Past Ten Years:

	Net Tons Sinter Produced	Two Year total	Two Year Average
1997	895,452	895,452	447,726
1998	848,040	1,743,492	871,746
1999	833,052	1,681,092	840,546
2000	825,012	1,658,064	829,032
2001	713,784	1,538,796	769,398
2002	665,460	1,379,244	689,622
10 year average	796,800		

For emissions banking purposes the twenty four month period beginning with June, 1999 was used

Oper/Hrs	**8,256**	hrs/yr.
Production	**807,715**	Tons/yr.

TSP

	tons raw matls/yr	EF: lbs/ton	lbs/ton		tons/year
Raw Materials Unloading (F009)	950,476.0	0.22	2000		**104.55**
Windbox (P908)					
	stack test lb/hr	hrs. of oper.	lbs/ton		tons/year
	44.6	8256	2000		**184.11**
Breaker end (P936)					
	tons sinter/yr	Unc.EF:lb/ton	1-eff.	lbs/ton	tons/year
	807,715	6.46	0.0595	2000	**155.23**
Cold Sinter Screening (F007)					
	tons sinter/yr	Unc.EF: lb/ton	1-eff	lbs/ton	tons/year
	807,715	0.34	0.5	2000	**68.66**
			Total TSP:		**512.55**

PM10,PM2.5

	tons raw matls/yr	EF: lbs/ton	lbs/ton		tons/year
Raw Materials Unloading (F009)	950,476.0	0.055	2000		**26.14**

PM10,PM2.5, cont.

Windbox (P908)

	stack test lb/hr	hrs. of oper.	lbs/ton		tons/year
PM10	42.8	8256	2000		**176.68**
PM2.5	39.69	8256	2000		**163.84**

Breaker end (P936)

	tons sinter/yr	Unc.EF:lb/ton	1-eff.	lbs/ton	tons/year
PM10	807,715	2.067	0.0595	2000	**49.67**
PM2.5	807,715	0.711	0.0595	2000	**17.08**

Cold Sinter Screening (F007)

tons sinter/yr	Unc.EF: lb/ton	1-eff	lbs/ton	tons/year
807,715	0.085	0.5	2000	**17.16**

TOTAL PM10: **269.65**

TOTAL PM2.5: **224.23**

NOx

Windbox (P908)

stack test lb/hr	hrs. of oper.	lbs/ton		tons/year
95.8	8256	2000		**395.46**

SO2

Windbox (P908)

tons sinter/yr	EF: lbs/ton	lbs/ton		tons/year
807,715	4	2000		**1615.43**

H2SO4 3% of SO2 EF EF:0.12 lbs/ton sinter **48.5 tons/yr**

OC's,VOC's

Windbox (P908)

stack test lb/hr	hrs. of oper.	lbs/ton		tons/year
39.9	8256	2000		**164.71**

CO

Windbox (P908)

dscfm	CO in gas	min/yr oper	density lbs/cf	lbs/ton	tons/yr
206,000	0.0037	495,360	0.077	2000	**14,536.19**

	stack tests lb/hr	hrs. of oper.	lbs/ton		tons/yr
Pb	0.63	8256	2,000		**2.58**

Summary of Sinter Plant Emission Credits: tons/year

TSP	**512.55**
PM10	**269.65**
PM2.5	**224.23**
NOx	**395.46**
SO2	**1,615.43**
H2SO4	**48.5**
OC,VOC	**164.71**
CO	**14,536.19**
Pb	**2.58**

Basis of Sinter Plant Netting Credits for Sun Coke Project-10/07
Emission Factors and Stack Tests

Emission Source	Emission Factor	Source of Emission Factor
TSP – Raw Materials	0.22 lbs/ton	(1990 Lee Gruber Mtg)
TSP – Windbox	44.6 lb/hr	October 12, 1998 Stack Test
TSP – Breaker End	6.46 Unc. Lb/ton 0.0595 (1-eff)	95% of 6.8 AP-42 Table 7.5-1
TSP – Cold Sinter Scr	0.34 Unc. Lb/ton 0.50 (1-eff)	5% of 6.8 AP-42 Table 7.5-1
PM10 & 2.5 Raw Material	0.055 lbs/ton	25% of TSP
PM10-Windbox	42.8 lb/ton	96% of TSP AP-42 Table 7.5-2
PM 2.5-Windbox	39.69 lb/ton	89% of TSP AP-42 Table 7.5-2
PM10-Breaker end	2.067 lb/ton 0.0595 (1-eff)	32% of TSP AP-42 Table 7.5-2
PM2.5-Breaker End	0.711 lb/ton 0.0595 (1-eff)	11% of TSP AP-42 Table 7.5-2
PM10 & 2.5-Cold Sinter Screening	0.085 Unc. Lb/ton 0.5 (1-eff)	25% of TSP
NOx – Windbox	95.8 lb/hr	Nov.22-23,1993 Stack Tests
SO2 – Windbox	4 lbs/ton	Sept. 29, 1995 Stack Tests
H2SO4	0.12 lbs/ton	3% of SO2 Emission Factor
OCs, VOCs	39.9 lb/hr	Nov.22-23,1993 Stack Tests
CO	0.37 %	October 12, 1998 Stack Test
Lead	0.63 lb/hr	Nov.22-23,1993 Stack Tests

AK Steel Corporation-Middletown Works

No. 2 Boiler House Flame Safety Management Project

NOX Netting Credits

August 21, 2007

A. Introduction

Approximately 49.5 tons of NOX emission reduction credits are available for netting purposes associated with the Sun Coke Project from the implementation of this project. The NOX credits have been calculated by the difference in the pilot burner sizes before the project compared to the reduction in pilot flame safety burner sizes after the project has been implemented multiplied times the average pilot flame safety operating hours for the four boilers during the 24 consecutive months from June 4, 2005 through June 3, 2007. The four boilers operated an average of 354.5 days per year for the twenty four month period.

The purpose of the No. 2 Boiler House Flame Safety Management Project is to provide a flame safety burner management system that will allow switching fuels without shutting down the boilers if the primary fuel system is lost and to obtain compliance with the NFPA 85 regulations.

The installation of the new pilot flame safety burner management system on one of the boilers has been completed. The remainder of the work on the three remaining boilers is anticipated to be completed by 2/28/08.

B. Existing Equipment Description

The four boilers at No. 2 Boiler House are rated @173 mmBTU/hr. They typically burn blast furnace gas to generate steam. That steam is used primarily to drive the turbines that provide hot blast air to No. 3 Blast Furnace. The remaining steam produced at No. 2 Boiler House is used for other processes at the plant. The boiler house is also permitted to burn natural gas and/or fuel oil. Generally, these other fuels are only burned to generate steam when blast furnace gas is unavailable. However, there is a current pilot system on each boiler that uses only natural gas to maintain pilot flames whenever the boiler is in service.

The four boilers at No.2 Boiler House are not currently equipped with a Flame Management System. There are four multi-fuel burners in each boiler. There is a continuous natural gas pilot for each of the four burners in each boiler. The current natural gas pilots use 2.6 mm BTU/hr. per burner (10.5 mm BTU/hr. per boiler). For No.2 Boiler House in total, 42 mm BTU/hr. of natural gas is used just for the pilots on the four boilers. The pilots are used to assure combustion of the fuel from the main burner in the event of a flame out. Without a pilot flame safety burner management system, continuous pilots are required to be maintained during boiler operation and fuel switching.

C. Proposed Equipment Description

The new pilot flame safety management system design will significantly reduce the amount of natural gas used for the pilots. A separate forced draft dual pilot system will be installed consisting of a small size pilot that will be lit anytime the boiler is operating or on standby and a main pilot that typically will **not** be lit unless required for fuel switching. The lance pilot will use 0.03 mmBTU/hr. of natural gas per burner. There will be four small size pilots per boiler. As a result, No. 2 Boiler House will use only a total of 0.48 mmBTU/hr. for the new pilot flame safety burner management system.

Each main burner will have its own IR flame scanner. This will be in addition to the flame rod for the igniter and the U/V scanner for the pilot burners. Thus, each burner will have a total of three flame scanners. All sixteen flame relays for each boiler will be contained in a panel located in the proximity of the boiler. There will also be pressure sensors and safety shutoff switches installed on the blast furnace gas piping as part of the pilot flame safety management system.

D. Netting Calculations

AK Steel Corporation's Middletown Works currently has four (4) pilot burners installed on each of the four boilers at No. 2 Boiler House. Each pilot burner is rated at 2.6 mmBTU/hr. for a total of 10.5 mmBTU/hr. per boiler or a total 42 mmBTU/hr. for the boiler house. These pilot burners are in operation continuously unless a boiler is down for maintenance purposes.

By February 28, 2008, AK Steel Corporation will have replaced the existing pilot burners with new, smaller size pilot burners as part of its flame safety burner management project. The new pilot burners will be rated at 0.03 mmBTU/hour per burner. The total mmBTU/hour for the pilots on each boiler will be 0.12 mmBTU/hour or a total of 0.48 mmBTU/hour for all four boilers after project installation. These new pilot burners will also be in operation continuously unless a boiler is down for maintenance purposes.

Based on No. 2 Boiler House's average operating hours for the twenty four consecutive month period from June 4, 2005 through June 3, 2007, there will be a reduction of 49.5 tons per year of NOX from the combustion of natural gas at this boiler house after the flame safety burner management project has been installed. This NOX reduction is based on the new pilot burners operating the same number of hours per year as the current pilot burners or 354.5 days per year. The netting calculations are attached in Table 1 below.

For a worst case analysis, the new pilot burners are assumed to operate twenty four hours a day for three hundred and sixty five days a year. The net NOX emissions decrease for this scenario is 49.4 tons/year. So under a worst case analysis the net emissions decrease is essentially the same. These netting calculations are attached in Table 2 below.

E. Proposed Permit Terms and Conditions

The sixteen (16) existing flame safety pilot burners on the four boilers at No. 2 Boiler House rated at 2.6 mmBTU/hour each will be replaced by the new sixteen (16) flame safety pilot burners rated at 0.03 mmBTU/hour each.

Table 1
NOX Netting Calculations

PRESENT PILOT NAT GAS USAGE RATE

	10.5	MCF/HOUR/BOILER
x	4	BOILERS
	42	MCFH
x	24	HR/DAY
	1,008	MCF/DAY
x	354.5	DAY/YEAR
	357,336	**MCF/YEAR**

NEW LOW FIRE NAT GAS PILOT RATE

	0.03	MCF/HOUR/BURNER
x	4	BURNERS/ BOILER
	0.12	MCFH/BOILER
x	4	BOILERS
	0.48	MCFH
x	24	HR/ DAY
	11.52	MCF/DAY
x	354.5	DAY/YEAR
	4,084	**MCF/YEAR**

Natural Gas Savings

Current Practice NG Usage	357,336	**MCF/YEAR**
NG Usage for Pilots after Project	4,084	**MCF/YEAR**
NG Savings after Project	353,252	**MCF/YEAR**

4 boilers @173 mmbtu/hr

AP42 NOx Emission Factor	280	**lbs/MMCF**
NG Savings from Burner Management Project	353.3	**MMCF/Year**
NOx Reduction from Burner Management Project	98,910.6	**lbs./Year**
NOx Reduction from Burner Management Project	49.5	**tons/Year**

Table 2

NOX Netting Calculations –Worst Case

PRESENT PILOT NAT GAS USAGE RATE

	10.5	MCF/HOUR/BOILER
x	4	BOILERS
	42	MCFH
x	24	HR/DAY
	1,008	MCF/DAY
x	354.5	DAY/YEAR
	357,336	**MCF/YEAR**

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	0.03	MCF/HOUR/BURNER
x	4	BURNERS/ BOILER
	0.12	MCFH/BOILER
x	4	BOILERS
	0.48	MCFH
x	24	HR/ DAY
	11.52	MCF/DAY
x	365	DAY/YEAR
	4,205	**MCF/YEAR**

Natural Gas Savings

Current Practice NG Usage	357,336	**MCF/YEAR**
NG Usage for Pilots after Project	4,205	**MCF/YEAR**
NG Savings after Project	353,131	**MCF/YEAR**

4 boilers @173 mmbtu/hr

AP42 NOx Emission Factor	280	**lbs/MMCF**
NG Savings from Burner Management Project	353.1	**MMCF/Year**
NOx Reduction from Burner Management Project	98,876.7	**lbs./Year**
NOx Reduction from Burner Management Project	49.4	**tons/Year**

Carl Batliner/AKSTEEL
08/21/2007 03:44 PM

To bradley.miller@hamilton-co.org
cc Pat Gallo/AKSTEEL@AKSTEEL, Larry Schutte/AKSTEEL@AKSTEEL, dpack@sunocoinc.com, john_r_carson@urscorp.com
bcc
Subject Netting credits-Sinter Plant & No. @ Boiler House

Brad, attached are the netting credits associated with the shutdown of the Sinter Plant in 2003. I also attached the NOX netting credits associated with the Flame Safety Pilot Burner Management Project for No.2 Boiler House. Proposed terms and conditions are included in that document.

Please review the attachments and let us know at your earliest convenience if you have any concerns with the netting credits and the proposed permit enforceable language. Thanks.

Sinter Plant Shutdown Netting Credits.xls

No. 2 Boiler House Flame Safety Mgmt NOX Netting Credits.doc

8/8/2007

AK STEEL - MIDDLETOWN WORKS
SINTER PLANT EMISSIONS BANKING DOCUMENT

Annual Production, Past Ten Years:

	Net Tons Sinter Produced	Two Year total	Two Year Average
1997	895,452	895,452	447,726
1998	848,040	1,743,492	871,746
1999	833,052	1,681,092	840,546
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10 year average	796,800		

For emissions banking purposes the twenty four month period beginning with June, 1999 was used

Oper/Hrs	**8,256**	hrs/yr.
Production	**807,715**	Tons/yr.

TSP

	tons raw matls/yr	EF: lbs/ton	lbs/ton		tons/year
Raw Materials Unloading (F009)	950,476.0	0.22	2000		**104.55**
Windbox (P908)	stack test lb/hr	hrs. of oper.	lbs/ton		tons/year
	44.6	8256	2000		**184.11**
Breaker end (P936)	tons sinter/yr	Unc.EF:lb/ton	1-eff.	lbs/ton	tons/year
	807,715	6.46	0.0595	2000	**155.23**
Cold Sinter Screening (F007)	tons sinter/yr	Unc.EF: lb/ton	1-eff	lbs/ton	tons/year
	807,715	0.34	0.5	2000	**68.66**
			Total TSP:		**512.55**

PM10,PM2.5

	tons raw matls/yr	EF: lbs/ton	lbs/ton	tons/year
Raw Materials Unloading (F009)	950,476.0	0.055	2000	**26.14**

PM10,PM2.5, cont.

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	stack test lb/hr	hrs. of oper.	lbs/ton		tons/year
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Cold Sinter Screening (F007)

tons sinter/yr	Unc.EF: lb/ton	1-eff	lbs/ton	tons/year
807,715	0.085	0.5	2000	**17.16**

TOTAL PM10: **269.65**

TOTAL PM2.5: **224.23**

NOx

Windbox (P908)

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95.8	8256	2000	**395.46**

SO2

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OC's,VOC's

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	dscfm	CO in gas	min/yr oper	density lbs/cf	lbs/ton	tons/yr
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	stack tests lb/hr	hrs. of oper.	lbs/ton	tons/yr
Pb	0.63	8256	2,000	**2.58**

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	tons/year
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AK Steel Corporation-Middletown Works

No. 2 Boiler House Flame Safety Management Project

NOX Netting Credits

August 21, 2007

A. Introduction

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Table 1
NOX Netting Calculations

PRESENT PILOT NAT GAS USAGE RATE

	10.5	MCF/HOUR/BOILER
x	4	BOILERS
	42	MCFH
x	24	HR/DAY
	1,008	MCF/DAY
x	354.5	DAY/YEAR
	357,336	**MCF/YEAR**

NEW LOW FIRE NAT GAS PILOT RATE

	0.03	MCF/HOUR/BURNER
x	4	BURNERS/ BOILER
	0.12	MCFH/BOILER
x	4	BOILERS
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x	354.5	DAY/YEAR
	4,084	**MCF/YEAR**

Natural Gas Savings

Current Practice NG Usage	357,336	**MCF/YEAR**
NG Usage for Pilots after Project	4,084	**MCF/YEAR**
NG Savings after Project	353,252	**MCF/YEAR**

4 boilers @173 mmbtu/hr each

AP42 NOx Emission Factor	280	**lbs/MMCF**
NG Savings from Burner Management Project	353.3	**MMCF/Year**
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NOx Reduction from Burner Management Project	49.5	**tons/Year**

Table 2

NOX Netting Calculations –Worst Case

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Carl Batliner/AKSTEEL
08/28/2007 02:22 PM

To Pat Gallo/AKSTEEL@AKSTEEL, Larry Schutte/AKSTEEL@AKSTEEL
cc DPACK@sunocoinc.com
bcc
Subject Phone conversation with Brad Miller HCDESnetting credits

I spoke to Brad Miller at HCDES regarding the netting credits for the Sun Coke project. He has reviewed the information in the email I sent him last week on this subject. He is okay with the calculations, but he still needs to get the okay from OEPA Columbus. He hopes to have Columbus's response yet this week.

There is some additional info we will need to provide on the Sinter Plant credits. Pat, I will get with you to begin to assemble that info. HCDES will send us a letter requesting the info.

For the No. 2 Boiler House project, he said they will probably require an additional permit term to the one we proposed. We will need to keep natural gas usage records for the small pilot burners that will replace the current ones. Larry, will you pass this info on to Energy. I don't know if we will be able to obtain that information as part of the boiler house project or if you will need to include that cost as part of the Sun Coke project.

Larry Schutte/AKSTEEL
08/28/2007 04:29 PM

To Carl Batliner/AKSTEEL@AKSTEEL
cc Ken Boesherz/AKSTEEL@AKSTEEL, Mo Reed/AKSTEEL@AKSTEEL, Pat Gallo/AKSTEEL@AKSTEEL
bcc
Subject Re: Phone conversation with Brad Miller HCDESnetting credits

Carl,

This metering would be part of the Sun Coke Project because we would not be doing it otherwise.

Larry
From: Carl Batliner on 08/28/2007 02:22 PM

From: Carl Batliner on 08/28/2007 02:22 PM

To: Pat Gallo/AKSTEEL@AKSTEEL, Larry Schutte/AKSTEEL@AKSTEEL
cc: DPACK@sunocoinc.com
Subject: Phone conversation with Brad Miller HCDESnetting credits

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"Miller, Brad"
<Brad.Miller@hamilton-co.org
>
08/29/2007 11:04 AM

To <Carl_Batliner@aksteel.com>
cc <alan.lloyd@epa.state.oh.us>, "Tedtman, Paul" <Paul.Tedtman@hamilton-co.org>, "Ploetz, Mike" <Mike.Ploetz@hamilton-co.org>
bcc
Subject RE: Netting credits-Sinter Plant & No. 2 Boiler House

History: This message has been forwarded.

Carl,

After reviewing the information submitted and talking with Ohio EPA, this agency needs the following information:

1. For each emissions factor please cite the basis for the factor (i.e., AP-42 Table 12.5-1).
2. Provide further information on how the 8256 hours per year figure was derived.
3. How did AK Steel arrive at the 950,476 TPY value for the raw material unloading?
4. For the stack test information, provide the date of the test.
5. Provide the monthly sinter totals for the time period used to develop the 807,715 TPY value.

For the number 2 boiler house flame safety project, it appears AK Steel used the emission factor for large wall-fired boilers (> 100 MMBtu/hour). In the submittal it states the pilot burner size is 10.5 MMBtu/hour. Since this value is less than 100 MMBtu/hour, should the emissions factor for small boilers be used? If this agency does agree to using the flame safety project, AK Steel will have to maintain records of the natural gas usage for the pilot burners to document the future actual emissions.

If you have any questions, please let me know.

Thanks,

Brad

From: Carl_Batliner@aksteel.com [mailto:Carl_Batliner@aksteel.com]
Sent: Tue 8/21/2007 3:46 PM
To: bradley.miller@hamilton-co.org
Cc: Pat_Gallo@aksteel.com; Larry_Schutte@aksteel.com; dpack@sunocoinc.com; john_r_carson@urscorp.com
Subject: Netting credits-Sinter Plant & No. @ Boiler House

Brad, attached are the netting credits associated with the shutdown of the Sinter Plant in 2003. I also attached the NOX netting credits associated with the Flame Safety Pilot Burner Management Project for No.2 Boiler House. Proposed terms and conditions are included in that document.

Please review the attachments and let us know at your earliest convenience if you have any concerns with the netting credits and the proposed permit enforceable language. Thanks.

Betty Longworth/AKSTEEL
09/07/2007 08:58 AM

To Carl Batliner/AKSTEEL@AKSTEEL
cc
bcc
Subject Fw: Netting Credits-Sinter Plant and No. 2 Boiler House

History: This message has been forwarded.

----- Forwarded by Betty Longworth/AKSTEEL on 09/07/2007 08:58 AM -----

Betty Longworth/AKSTEEL
09/07/2007 08:01 AM

To Brad.Miller@hamilton-co.org, alan.lloyd@epa.state.oh.us, Paul.Tedtman@hamilton-co.org, Mike.Ploetz@hamilton-co.org
cc Pat Gallo/AKSTEEL@AKSTEEL, Larry Schutte/AKSTEEL@AKSTEEL, dpack@sunocoinc.com, john_r_carson@urscorp.com
Subject Netting Credits-Sinter Plant and No. 2 Boiler House

Per Carl Batliner's instructions, the attachments relate to the above-referenced subject.


letter.PDF

emission.PDF

midd_works.PDF

chart.PDF

nox.PDF

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Brad, the information and attachments below should answer the issues you raised in your email from 8/29/07.

For item 1, there is an attached table that shows the basis for the emission factors used for the Sinter Plant. The attached table also gives the date of the stack tests where emission factors were used in the netting calculations. That info should address your item 4.

For item 2 and item 5, we have included two attachements. One of the attachments is titled "Middletown Works Summary of Cost Trends 2.53 Report." That attachment provides the information pertaining to the Sinter Plant (referred to as the Recycle Plant in the 2.53 Report) regarding item 2 for the hours per year. The time frame used was June 1999 thru May 2001. The net tons of sinter production are also shown by month in the 2.53 report. Again the 24 month period ran from June 1999 thru May 2001. The other attachment is a spreadsheet that provides the monthly production, yield, and monthly hours used for the 24 month period.

For item 3 in your email, the raw material unloading was calculated from the net annual sinter tons of 807,715 divided by the sinter yield of 84.78% as shown in the spreadsheet attachment. The difference between the raw materials quantity and the net sinter quantity is the fuel such as coke breeze that was combusted during the sintering process.

For No. 2 Boiler House flame safety project, we believe the emission factor of 280 lbs/mmcf is correct. That emission factor was used based on stack testing performed on the four boilers at No. 3 Boiler House in 2003 as part of the 126 NOX program. The four boilers were tested under several different conditions including testing with only the pilot burners operating. The emission factor averaged 0.307 lbs/mmcf for the pilot burners only tests on the four boilers. Attached are the NOX Emission Factor for the No. 3 Boiler House natural gas pilots and excerpts from the March and April 2003 NOX stack tests conducted as part of the 126 NOX program. The data for the first test runs shown in the excerpts were the results of the stack tests on the natural gas pilot burners only.

After you have had an opportunity to review this information, please call me with any questions. Thank you.

Emission Factors and Stack Tests Referenced in August 8, 2007 Sinter Plant Banking Document

Emission Source	Emission Factor	Source of Emission Factor
TSP – Raw Materials	0.22 lbs/ton	(1990 Lee Gruber Mtg)
TSP – Windbox	44.6 lb/hr	October 12, 1998 Stack Test
TSP – Breaker End	6.46 Unc. Lb/ton 0.0595 (1-eff)	95% of 6.8 AP-42 Table 7.5-1
TSP – Cold Sinter Scr	0.34 Unc. Lb/ton 0.50 (1-eff)	5% of 6.8 AP-42 Table 7.5-1
PM10,2.5 Raw Mater.	0.055 lbs/ton	25% of TSP
PM10,-Windbox	42.8 lb/ton	96% of TSP AP-42 Table 7.5-2
PM 2.5-Windbox	39.69 lb/ton	89% of TSP AP-42 Table 7.5-2
PM10-Breaker end	2.067 lb/ton 0.0595 (1-eff)	32% of TSP AP-42 Table 7.5-2
PM2.5-Breaker End	0.711 lb/ton 0.0595 (1-eff)	11% of TSP AP-42 Table 7.5-2
PM10,2.5-Cold Sinter Screening	0.085 Unc. Lb/ton 0.5 (1-eff)	25% of TSP
NOx – Windbox	95.8 lb/hr	Nov.22-23,1993 Stack Tests
SO2 – Windbox	4 lbs/ton	Sept. 29, 1995 Stack Tests
H2SO4	0.12 lbs/ton	3% of SO2
OCs, VOCs	39.9 lb/hr	Nov.22-23,1993 Stack Tests
CO	0.5 %	Nov.22-23,1993 Stack Tests Stack Test
Lead	0.63 lb/hr	Nov.22-23,1993 Stack Tests Stack Test

Fn: H/Midd/Air/Sinter Plant EF Sources

14-Jan-99
9:40 AM

Middletown Works
1999 Summary of Cost Trends
2.53 Report (Confidential)

Description	Current Mo. 1999 Plan	1999 Jan	1999 Feb	1999 Mar	1999 Apr	1999 May	1999 Jun	1999 Jul	1999 Aug	1999 Sep	1999 Oct	1999 Nov	1999 Dec	1999 YTD Mo. Avg.	99 Plan Annual	Actual 1998
Middletown Blast Furnace																
Production NT	193,992	184,845	184,084	200,342	179,509	163,830	185,871	194,624	201,037	185,106	169,990	173,509	190,560	184,442	194,984	172,403
Metallic Cost	[redacted]															
Non-Metallic Cost																
Burden Cost																
Cost Above - Furnace Repair																
Cost Above - Other																
Salaries \ NT	0.83	0.81	0.77	0.73	0.85	0.97	0.90	0.82	0.73	0.88	0.88	0.88	0.86	0.84	0.83	0.97
Operating Labor \ NT	1.67	1.98	1.69	1.71	1.89	2.15	1.68	1.77	1.69	1.81	2.03	1.97	2.03	1.86	1.63	1.86
Maintenance \ NT	5.42	6.24	6.06	5.65	4.19	6.54	7.85	5.71	6.44	4.98	8.87	5.79	6.27	6.20	5.23	7.99
Supplies \ NT	1.83	1.34	2.31	1.75	2.81	1.81	2.07	1.58	3.48	1.63	1.63	1.89	2.05	2.04	1.85	2.13
Utilities \ NT	6.03	7.17	4.96	5.78	6.02	5.32	6.40	5.98	5.26	6.40	5.91	6.81	5.72	5.97	6.12	6.29
Services \ NT	4.97	5.95	4.48	4.84	5.54	6.35	5.57	6.34	6.20	5.90	5.94	5.15	4.83	5.58	55.30	6.12
Blast Gas Credit	(5.15)	(3.95)	(3.34)	(3.84)	(3.40)	(2.90)	(3.94)	(3.47)	(3.49)	(2.70)	(3.71)	(4.49)	(4.55)	(3.65)	(4.78)	(5.98)
Other \ NT	0.91	0.80	0.40	0.52	0.68	0.92	0.59	0.59	1.65	0.85	0.69	1.10	0.67	0.79	0.90	1.03
Total Cost Above	[redacted]															
Total Cost \ NT																
No. of Casts	270	253	264	267	252	236	265	299	273	269	255	252	231	258	269	251
Avg. NT \ Cast	718	730	697	750	712	694	701	651	736	688	667	748	825	717	726	684
Avg. NT \ Day	6,437	6,367	6,709	6,796	6,046	6,077	6,619	6,665	6,712	6,525	6,199	6,054	6,582	6,446	6,708	6,301
Lbs Coke \ NT Hot Metal	649	639	626	616	647	674	632	628	628	624	634	622	604	631	650	667
% Yield - Theoretical	68.23%	68.72%	68.80%	69.49%	69.23%	68.48%	69.74%	69.41%	69.59%	69.21%	68.71%	69.11%	69.20%	69.16%	68.30%	68.06%
Actual Yield	66.23%	66.43%	66.64%	67.39%	67.76%	67.51%	67.43%	67.64%	66.76%	67.81%	66.27%	66.80%	66.49%	67.08%	66.21%	65.72%
% Mix - Pellets	53.76%	55.33%	51.62%	50.24%	51.30%	48.48%	47.43%	48.10%	50.51%	48.24%	49.48%	47.94%	47.57%	49.70%	54.70%	55.87%
% Mix - HBI	13.68%	14.84%	16.40%	18.44%	17.77%	17.37%	18.60%	19.35%	18.93%	19.25%	17.26%	19.32%	17.43%	17.94%	13.68%	12.65%
% Mag. Ore																
% Mix - Blast Furnace Fines	3.67%	3.73%	4.13%	4.45%	4.10%	4.05%	4.19%	3.49%	4.19%	4.19%	4.80%	4.22%	4.21%	4.14%	3.67%	3.26%
% Sinter - Dry	28.81%	23.88%	25.47%	24.78%	24.41%	26.92%	26.60%	26.21%	23.57%	25.19%	25.53%	24.79%	25.40%	25.21%	27.18%	26.91%
% Slag																
% Iron in Coke	0.10%	0.12%	0.11%	0.11%	0.13%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%	1.80%	0.13%
% Delays	2.0%	6.4%	2.0%	4.9%	4.4%	13.0%	6.4%	5.8%	3.4%	5.4%	11.6%	4.5%	6.6%	6.1%	3.59%	7.78%
Recycle Plant																
Production NT	82,355	67,878	69,345	72,671	64,177	66,325	74,319	76,419	73,488	64,766	67,477	70,400	65,783	69,421	80,043	70,670
Net Rec Mat'L Cost \ NT	29.81	30.16	28.64	30.68	29.35	27.96	27.06	27.16	27.34	25.71	27.17	26.27	26.32	27.82	30.00	30.75
Cost Above NT Mil \ NT	10.59	13.86	12.89	14.75	17.02	10.60	12.80	13.11	16.01	12.92	13.34	11.75	12.79	13.49	11.53	14.27
Total Cost \ NT	**40.40**	**44.02**	**41.53**	**45.43**	**46.37**	**38.56**	**39.86**	**40.27**	**43.35**	**38.63**	**40.51**	**38.02**	**39.11**	**41.31**	**41.53**	**45.02**
% Yield	81.74%	82.99%	89.74%	81.68%	79.57%	81.81%	82.64%	80.44%	83.77%	85.55%	80.19%	85.40%	83.67%	83.03%	81.74%	81.12%
Prod. \ 8 Hr Turn	905	780	867	817	812	850	845	878	855	744	750	828	774	817	897	862
8 Hour Turns	91	87	80	89	79	78	88	87	86	87	90	85	85	85	89	82
Total NT Charged	100,753	81,790	77,274	88,972	80,653	81,068	89,927	95,000	87,723	75,703	84,150	82,438	78,619	83,611	98,067	87,816

Middletown Works
2000 Summary of Cost Trends
2.53 Report (Confidential)

Description	Current Month 2000 Plan	2000 Jan	2000 Feb	2000 Mar	2000 Apr	2000 May	2000 Jun	2000 Jul	2000 Aug	2000 Sep	2000 Oct	2000 Nov	2000 Dec	2000 YTD Mo. Avg.	Rolling 6 Mo Avg	2000 Plan Annual	Actual 1999
Middletown Blast Furnace																	
Production NT	198,831	210,487	192,844	117,995	203,879	213,365	190,294	212,536	211,144	194,633	187,580	178,057	187,453	191,689	195,234	189,341	184,430
Metallic Cost	[redacted]																
Non-Metallic Cost																	
Burden Cost																	
Cost Above - Furnace Repair																	
Cost Above - Other																	
Salaries \ NT	0.80	0.74	0.82	1.57	0.80	0.79	0.85	0.72	0.84	0.85	0.93	0.93	0.88	0.87	0.85	0.85	0.84
Operating Labor \ NT	1.80	1.88	1.76	2.87	1.73	1.65	1.75	1.70	1.70	1.82	1.72	1.78	1.93	1.82	1.77	1.84	1.86
Maintenance \ NT	5.61	4.82	5.56	38.92	4.92	4.84	5.89	4.99	4.68	5.98	5.09	5.37	5.21	6.93	5.21	7.40	6.19
Supplies \ NT	1.90	1.56	1.74	1.60	1.38	1.28	1.69	1.47	1.67	1.50	2.01	2.08	1.55	1.62	1.70	1.99	2.04
Utilities \ NT	6.07	5.58	6.33	9.01	7.10	8.37	8.65	8.12	7.66	9.59	10.75	9.70	10.25	8.35	9.28	6.17	5.97
Services \ NT	6.64	4.78	6.43	7.09	5.71	5.43	5.99	5.79	5.54	6.87	6.48	7.19	5.78	6.03	6.25	6.77	5.59
Blast Gas Credit	(5.39)	(4.53)	(4.76)	(5.05)	(4.46)	(5.03)	(5.84)	(6.20)	(5.99)	(6.50)	(8.75)	(9.56)	(11.46)	(6.48)	(7.97)	(5.07)	(3.65)
Other \ NT	0.75	0.79	0.47	0.95	0.67	0.67	0.50	0.57	0.92	0.75	0.97	0.82	0.37	0.70	0.73	0.79	0.79
Total Cost Above	[redacted]																
Total Cost \ NT																	
No. of Casts		262	253	163	272	285	248	296	309	275	272	262	256	263	278	0	258
Avg. NT \ Cast		803	762	724	750	749	767	718	683	708	690	680	732	731	702	0	715
Avg. NT \ Day	6,414	6,818	6,793	5,196	6,949	7,089	6,937	7,007	6,966	6,808	6,437	6,178	6,182	6,285	6,366	6,208	6,467
Lbs Coke \ NT Hot Metal	648	593	596	766	607	622	635	620	621	627	680	726	731	646	665	655	630
% Yield - Theoretical	68.08%	69.41%	69.76%	67.84%	69.70%	68.72%	68.50%	69.14%	69.37%	69.37%	68.36%	66.90%	66.62%	68.71%	68.35%	68.20%	69.00%
Actual Yield	65.94%	66.83%	67.44%	64.58%	65.62%	65.20%	65.96%	66.43%	66.67%	66.55%	66.29%	65.59%	65.02%	66.07%	66.12%	66.15%	67.08%
% Mix - Pellets	51.63%	48.10%	49.86%	55.26%	52.79%	54.83%	55.35%	54.36%	53.13%	54.39%	56.33%	62.66%	65.32%	55.03%	57.47%	51.30%	49.71%
% Mix - HBI	15.76%	19.59%	19.72%	13.18%	15.88%	13.88%	13.12%	15.58%	16.12%	16.08%	12.79%	6.68%	6.50%	14.27%	12.51%	16.13%	18.06%
% Mix - Blast Furnace Fines	4.15%	4.24%	4.27%	2.90%	3.92%	3.90%	4.20%	4.22%	4.24%	4.23%	4.83%	4.89%	4.91%	4.26%	4.54%	4.12%	4.14%
% Sinter - Dry	25.37%	24.63%	22.69%	25.56%	23.62%	23.71%	25.44%	23.64%	24.13%	23.02%	24.40%	24.59%	20.67%	23.79%	23.42%	25.38%	25.20%
% Slag	1.98%	2.31%	2.42%	2.47%	2.78%	2.55%	0.76%	1.06%	1.23%	1.14%	0.49%	0.19%	1.49%	1.57%	0.95%	1.97%	2.12%
% Iron in Coke	0.11%	0.11%	0.13%	0.14%	0.11%	0.12%	0.12%	0.12%	0.12%	0.12%	0.13%	0.13%	0.14%	0.12%	0.13%	0.12%	0.12%
% Delays	4.3%	0.4%	2.1%	26.7%	2.2%	2.9%	8.6%	2.2%	2.2%	4.7%	6.0%	3.9%	2.2%	4.53%	3.5%	4.8%	6.25%
Recycle Plant																	
Production NT	75,950	74,074	65,320	46,703	72,903	76,083	77,181	73,633	76,915	66,818	68,554	66,255	60,574	68,751	68,792	72,404	69,421
Net Rec Mat'L Cost \ NT	28.35	25.93	23.64	27.30	25.07	27.01	24.38	25.83	25.17	28.28	28.65	29.76	31.72	26.69	28.07	28.79	27.82
Cost Above NT Mtl \ NT	12.15	13.07	14.45	35.84	12.83	12.02	12.00	12.64	12.50	13.20	13.23	13.82	16.72	14.51	13.59	13.98	13.49
Total Cost \ NT	40.50	38.10	38.09	63.14	37.90	39.03	36.38	38.47	37.67	41.48	41.88	43.58	48.44	41.20	41.66	42.77	41.31
% Yield	85.14%	86.93%	89.22%	84.16%	89.78%	85.59%	90.61%	89.43%	85.66%	85.92%	80.91%	79.26%	78.21%	85.69%	83.47%	84.50%	83.03%
Prod. \ 8 Hr Turn	835	832	768	792	878	845	858	818	855	759	762	753	688	801	773	823	817
8 Hour Turns	91	89	85	59	83	90	90	90	90	88	90	88	88	86	89	88	85
Total NT Charged	89,209	85,211	73,212	55,493	81,201	88,893	85,179	82,332	89,786	77,768	84,724	83,592	77,446	80,229	82,420	85,681	83,610

Middletown Works
2001 Summary of Cost Trends
2.53 Report (Confidential)

5-Jan-02
10:07 AM

Description	Current Month Plan 2001	2001 Jan	2001 Feb	2001 Mar	2001 Apr	2001 May	2001 Jun	2001 Jul	2001 Aug	2001 Sep	2001 Oct	2001 Nov	2001 Dec	2001 Jan.-Dec. YTD Mo. Avg.	Rolling 6 Mo Avg	2001 Plan Annual	Actual 2000
Middletown Blast Furnace																	
Production NT	196,607	180,082	164,641	169,865	149,565	195,497	187,129	192,035	193,064	189,498	185,922	183,704	178,117	180,760	187,057	181,245	191,689
Metallic Cost	[redacted]																
Non-Metallic Cost																	
Burden Cost																	
Cost Above - Furnace Repair																	
Cost Above - Other																	
Salaries \ NT	0.84	1.02	0.79	0.75	0.85	0.70	0.73	0.75	0.75	0.78	0.83	0.78	0.92	0.86	0.80	0.93	0.87
Operating Labor \ NT	1.88	1.79	1.56	1.62	1.72	1.52	1.78	1.80	1.76	1.82	1.71	1.65	1.90	1.72	1.77	1.99	1.82
Maintenance \ NT	5.25	5.65	5.70	5.13	7.51	4.97	5.39	4.89	5.14	5.50	5.39	5.12	5.77	5.47	5.30	7.63	6.93
Supplies \ NT	1.55	1.24	1.63	2.08	2.36	1.67	1.96	2.44	2.00	2.16	1.75	1.73	1.61	1.88	1.95	1.69	1.62
Utilities \ NT	7.46	14.14	11.20	12.35	13.36	9.97	9.93	9.61	10.71	9.49	9.37	9.54	9.51	10.69	9.71	8.94	8.35
Services \ NT	6.30	5.65	5.53	5.95	7.32	6.51	6.36	5.82	6.29	5.63	5.15	5.20	5.86	5.92	5.66	6.79	6.03
Blast Gas Credit	(6.60)	(16.00)	(11.55)	(12.58)	(10.93)	(10.59)	(8.68)	(7.77)	(7.68)	(8.14)	(8.87)	(8.63)	(8.60)	(9.93)	(8.27)	(7.37)	(6.48)
Other \ NT	0.66	0.35	0.47	1.43	1.46	1.06	0.60	0.71	1.16	0.67	1.04	0.91	1.02	0.90	0.92	0.72	0.70
Total Cost Above	[redacted]																
Total Cost \ NT																	
No. of Casts		254	252	285	269	280	293	314	271	274	280	250	266	274	276		263
Avg. NT \ Cast		709	653	596	556	698	639	612	712	692	664	735	670	661	681		731
Avg. NT \ Day	6,342	6,003	6,053	5,710	5,579	6,569	6,591	6,514	6,625	6,628	6,204	6,412	6,153	5,943	6,100	5,959	6,285
Lbs Coke \ NT Hot Metal	711	711	737	774	770	658	655	669	669	660	720	704	717	701	689	745	646
% Yield - Theoretical	68.29%	69.56%	69.07%	69.01%	67.99%	70.06%	70.68%	69.83%	69.22%	69.02%	67.05%	67.51%	67.24%	68.88%	68.34%	67.74%	68.71%
Actual Yield	65.69%	67.75%	68.06%	67.43%	67.13%	66.47%	67.15%	67.28%	66.55%	66.60%	65.05%	65.25%	64.93%	66.61%	65.96%	65.24%	66.07%
% Mix - Pellets	56.96%	55.22%	55.26%	57.11%	58.54%	51.70%	50.20%	52.29%	52.70%	53.40%	65.05%	64.37%	62.76%	56.44%	58.30%	58.22%	55.03%
% Mix - HBI	11.59%	15.00%	14.03%	11.18%	11.38%	17.57%	19.81%	17.94%	16.48%	15.84%	8.51%	9.11%	8.31%	13.89%	12.80%	9.82%	14.27%
% Mag. Ore	0.00%													0.00%	0.00%	0.00%	0.00%
% Mix - Blast Furnace Fines	4.96%	5.10%	4.79%	5.55%	5.09%	5.95%	5.76%	5.99%	5.92%	5.89%	5.76%	5.71%	5.62%	5.62%	5.82%	4.84%	4.26%
% Sinter - Dry	25.39%	23.05%	24.67%	22.52%	24.07%	22.60%	21.61%	21.69%	22.76%	20.99%	19.09%	19.56%	22.06%	21.99%	21.04%	26.05%	23.79%
% Slag	0.00%	0.80%	0.42%	0.49%	0.17%	1.54%	1.74%	1.21%	1.19%	1.41%	0.74%	0.50%	0.32%	0.91%	0.91%	0.00%	1.57%
% Iron in Coke	0.11%	0.13%	0.13%	0.13%	0.15%	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%	0.13%	0.12%	0.12%
% Delays	4.6%	3.2%	2.9%	4.0%	10.7%	4.0%	5.4%	4.9%	6.0%	4.7%	3.3%	4.5%	6.6%	4.95%	5.0%	6.3%	4.53%
Recycle Plant																	
Production NT	75,964	62,757	60,191	55,721	53,632	65,464	61,718	60,511	64,425	61,622	54,974	54,560	58,205	59,482	59,050	71,982	68,751
Net Rec Mat'L Cost \ NT	26.64	30.94	24.27	25.17	28.98	26.91	26.32	25.91	25.61	23.48	27.68	28.09	26.01	26.59	26.06	26.43	26.69
Cost Above NT Mtl \ NT	12.42	14.75	13.86	14.21	16.04	13.68	14.81	17.44	15.03	14.02	18.26	20.33	13.17	15.40	16.28	14.07	14.51
Total Cost \ NT	39.06	45.69	38.13	39.38	45.02	40.59	41.13	43.35	40.64	37.50	45.94	48.42	39.18	41.98	42.34	40.50	41.20
% Yield	87.32%	82.12%	88.87%	94.00%	78.71%	83.67%	88.08%	86.28%	88.91%	69.28%	63.48%	61.37%	66.69%	79.59%	73.21%	87.07%	85.69%
Prod. \ 8 Hr Turn	844	690	734	648	646	779	735	747	732	717	679	642	693	703	702	829	801
8 Hour Turns	90	91	82	86	83	84	84	81	88	86	81	85	84	85	84	87	86
Total NT Charged	86,998	76,421	67,729	59,277	68,143	78,242	70,074	70,134	72,461	88,941	86,605	88,909	87,277	74,730	80,658	82,666	80,229

Month	Production NT	8 Hour Turns per month	% Yield	Monthly Hours
Jun-99	74,319	88	82.64%	704
Jul-99	76,419	87	80.44%	696
Aug-99	73,488	86	83.77%	688
Sep-99	64,766	87	85.55%	696
Oct-99	67,477	90	80.19%	720
Nov-99	70,400	85	85.40%	680
Dec-99	65,783	85	83.67%	680
Jan-00	74,074	89	86.93%	712
Feb-00	65,320	85	89.22%	680
Mar-00	46,703	59	84.16%	472
Apr-00	72,903	83	89.78%	664
May-00	76,083	90	85.59%	720
Jun-00	77,181	90	90.61%	720
Jul-00	73,633	90	89.43%	720
Aug-00	76,915	90	85.66%	720
Sep-00	66,818	88	85.92%	704
Oct-00	68,554	90	80.91%	720
Nov-00	66,255	88	79.26%	704
Dec-00	60,574	88	78.21%	704
Jan-01	62,757	91	82.12%	728
Feb-01	60,191	82	88.87%	656
Mar-01	55,721	86	94.00%	688
Apr-01	53,632	83	78.71%	664
May-01	65,464	84	83.67%	672
Monthly Average	67,310	86	84.78%	688
Annual Average	807,715	1032	84.78%	8,256
Raw Material and Loading	952,723	tons/yr		

NOx Emission Factor for Boiler NG Pilots

AK Steel believes that the 280 lbs NOx /MMCF of Natural Gas fired used from AP-42 is a very good number based on actual testing conducted at our No. 3 Boiler House in 2003 for the NOx 126 Progam. The NOx emission data shown below comes from the lowest of four test levels for each boiler. This lowest test level consisted of firing natural gas pilots only. A summary of those results are as follows:

Measured NOx Emission Factors for Natural Gas Pilots

Boiler No.	Lb.NOx /MMBTU
1	0.454
2	0.250
3	0.203
4	0.297
Average	0.301

Converting to Lb/MMCF

0.301 Lb NOx /MMBTU x 1,020 BTU/CF = 307 Lb NOx / MMCF

fn: H/Midd/Air/ NG Pilot NOXEF

AK Steel Corporation
Waste Heat Recovery Boiler 1 (P011)
Initial Certification Application

AK Steel Corporation
1801 Crawford Street
Middletown, Ohio 45043

July, 2003

Prepared by

RMB Consulting & Research
5104 Bur Oak Circle
Raleigh, North Carolina 27612

2.0 CERTIFICATION TESTS

AK Steel successfully completed each of the required certification tests for the Waste Heat Recovery Boiler 1 (source number P011) monitoring system. The NO_x correlation testing was conducted by Environmental Quality Management, Inc. (EQM). For the fuel flowmeters, the transmitter acccuracy tests were conducted by AK Steel personnel and certification of the newly installed orifice-plates were provided by the manufacturer. The DAHS certification tests were conducted by Environmental Systems Corporation (ESC).

2.1 NOx Correlation Tests

On April 8 - 9, 2003, testing was conducted by EQM to develop a separate NO_x correlation curve while Waste Heat Recovery Boiler 1 combusted natural gas and coke oven gas. Combustion air flow to the boiler serves as the NO_x correlation curve quality assurance/quality control (QA/QC) parameter. Tables 2-1 and 2-2 provide a summary of the NO_x correlation test results for coke oven gas and natural gas, respectively. The complete NO_x correlation test report is provided in Appendix C of this certification application. Due to low supply line pressure for coke oven gas, Boiler 1 is unable to operate at the maximum rated heat input when firing only coke oven gas.

Table 2-1: Boiler 1 NOx Correlation Test Results for Coke Oven Gas

Test Levels	Test Run Nos.	Heat Input (mmBtu/hr)	NOx Emissions (lb/mmBtu)	Combustion Air Flow (MSCFH)
1	10 – 12	5.8	0.454	1,217.16
2	1 – 3	99.0	0.352	1,139.0
3	4 – 6	150.0	0.332	1,117.3
4	7 – 9	216.0	0.174	1,650.7

Table 2-2: Boiler 1 NOx Correlation Test Results for Natural Gas

Test Levels	Test Run Nos.	Heat Input (mmBtu/hr)	NOx Emissions (lb/mmBtu)	Combustion Air Flow (MSCFH)
1	10 – 12	5.8	0.454	1,217.2
2	13 – 15	139.0	0.264	1,180.7
3	16 – 18	230.3	0.305	2,108.7
4	19 – 21	297.7	0.264	2,193.9

During the coke oven gas testing, AK Steel collected and analyzed three coke oven gas samples to determine the F_d factor. The average F_d factor of the three coke oven gas samples was used to calculate NO_x mass emissions. Results of the coke oven gas analyses are included in Appendix C of this certification application.

AK Steel Corporation
Waste Heat Recovery Boiler 2 (P010)
Initial Certification Application

AK Steel Corporation
1801 Crawford Street
Middletown, Ohio 45043

July, 2003

Prepared by

RMB Consulting & Research
5104 Bur Oak Circle
Raleigh, North Carolina 27612

2.0 CERTIFICATION TESTS

AK Steel successfully completed each of the required certification tests for the Waste Heat Recovery Boiler 2 (source number P010) monitoring system. The NO_x correlation testing was conducted by Environmental Quality Management, Inc. (EQM). For the fuel flowmeters, the transmitter acccuracy tests were conducted by AK Steel personnel and certification of the newly installed orifice-plates were provided by the manufacturer. The DAHS certification tests were conducted by Environmental Systems Corporation (ESC).

2.1 NOx Correlation Tests

On April 28, 2003, testing was conducted by EQM to develop a separate NO_x correlation curve while Waste Heat Recovery Boiler 2 combusted coke oven gas and natural gas. Combustion air flow to the boiler serves as the NO_x correlation curve quality assurance/quality control (QA/QC) parameter. Tables 2-1 and 2-2 provide a summary of the NO_x correlation test results for coke oven gas and natural gas, respectively. The complete NO_x correlation test report is provided in Appendix C of this certification application. Due to low supply line pressure for coke oven gas, Boiler 2 is unable to operate at the maximum rated heat input when firing only coke oven gas.

Table 2-1: Boiler 2 NOx Correlation Test Results for Coke Oven Gas

Test Levels	Test Run Nos.	Heat Input (mmBtu/hr)	NOx Emissions (lb/mmBtu)	Combustion Air Flow (MSCFH)
1	7 – 9	6.2	0.250	938.1
2	13 – 15	71.7	0.471	885.8
3	16 – 18	112.8	0.485	928.3
4	19 – 21	168.4	0.522	1,699.6

Table 2-2: Boiler 2 NOx Correlation Test Results for Natural Gas

Test Levels	Test Run Nos.	Heat Input (mmBtu/hr)	NOx Emissions (lb/mmBtu)	Combustion Air Flow (MSCFH)
1	7 – 9	6.2	0.250	938.1
2	1 – 3	128.7	0.331	1,204.9
3	4 – 6	225.5	0.283	2,569.4
4	10 – 12	298.6	0.638	2,991.7

During the coke oven gas testing, AK Steel collected and analyzed three coke oven gas samples to determine the F_d factor. The average F_d factor of the three coke oven gas samples was used to calculate NO_x mass emissions. Results of the coke oven gas analyses are included in Appendix C of this certification application.

AK Steel Corporation
Waste Heat Recovery Boiler 3 (P009)
Initial Certification Application

AK Steel Corporation
1801 Crawford Street
Middletown, Ohio 45043

June, 2003

Prepared by

RMB Consulting & Research
5104 Bur Oak Circle
Raleigh, North Carolina 27612

2.0 CERTIFICATION TESTS

AK Steel successfully completed each of the required certification tests for the Waste Heat Recovery Boiler 3 (source number P009) monitoring system. The NO_x correlation testing was conducted by Environmental Quality Management, Inc. (EQM). For the fuel flowmeters, the transmitter acccuracy tests were conducted by AK Steel personnel and certification of the newly installed orifice-plates were provided by the manufacturer. The DAHS certification tests were conducted by Environmental Systems Corporation (ESC).

2.1 NOx Correlation Tests

On March 3, 2003, testing was conducted by EQM to develop a separate NO_x correlation curve while Waste Heat Recovery Boiler 3 combusted natural gas and coke oven gas. Combustion air flow to the boiler serves as the NO_x correlation curve quality assurance/quality control (QA/QC) parameter. Tables 2-1 and 2-2 provide a summary of the NO_x correlation test results for natural gas and coke oven gas, respectively. The complete NO_x correlation test report is provided in Appendix C of this certification application. Due to low supply line pressure for coke oven gas, Boiler 3 is unable to operate at the maximum rated heat input when firing only coke oven gas.

Table 2-1: Boiler 3 NOx Correlation Test Results for Coke Oven Gas

Test Levels	Test Run Nos.	Heat Input Rate (mmBtu)	NOx Emissions (lb/Mmbtu)	Combustion Air Flow (MSCFH)
1	10 – 12	8.6	0.203	1,046.0
2	1 – 3	41.6	0.308	1,212.6
3	4 – 6	97.8	0.374	1,221.3
4	7 – 9	250.3	0.398	2,506.3

Table 2-2: Boiler 3 NOx Correlation Test Results for Natural Gas

Test Levels	Test Run Nos.	Heat Input Rate (mmBtu)	NOx Emissions (lb/Mmbtu)	Combustion Air Flow (MSCFH)
1	10 – 12	8.6	0.203	1,046.0
2	13 – 15	143.5	0.475	1,151.6
-	16 – 19	Voided	Voided	Voided
3	23 – 25	244.2	0.869	2,230.9
4	20 – 22	308.2	0.942	2,821.2

During the coke oven gas testing, AK Steel collected and analyzed three coke oven gas samples to determine the F_d factor. The average F_d factor of the three coke oven gas samples was used to calculate NO_x mass emissions. Results of the coke oven gas analyses are included in Appendix C of this certification application.

AK Steel Corporation
Waste Heat Recovery Boiler 4 (P012)
Initial Certification Application

AK Steel Corporation
1801 Crawford Street
Middletown, Ohio 45043

July, 2003

Prepared by

RMB Consulting & Research
5104 Bur Oak Circle
Raleigh, North Carolina 27612

2.0 CERTIFICATION TESTS

AK Steel successfully completed each of the required certification tests for the Waste Heat Recovery Boiler 4 (source number P012) monitoring system. The NO_x correlation testing was conducted by Environmental Quality Management, Inc. (EQM). For the fuel flowmeters, the transmitter acccuracy tests were conducted by AK Steel personnel and certification of the newly installed orifice-plates were provided by the manufacturer. The DAHS certification tests were conducted by Environmental Systems Corporation (ESC).

2.1 NOx Correlation Tests

On April 1, 2003, testing was conducted by EQM to develop a NO_x correlation curve while Waste Heat Recovery Boiler 4 combusted natural gas (pilots only) and coke oven gas. Combustion air flow to the boiler serves as the NO_x correlation curve quality assurance/quality control (QA/QC) parameter. Table 2-1 provides a summary of the NO_x correlation test results for coke oven gas. The complete NO_x correlation test report is provided in Appendix C of this certification application.

Table 2-1: Boiler 4 NOx Correlation Test Results for Coke Oven Gas

Test Levels	Test Run Nos.	Heat Input Rate (mmBtu/hr)	NOx Emissions (lb/Mmbtu)	Combustion Air Flow (MSCFH)
1	1 – 3	7.7	0.297	683.2
2	4 – 6	65.9	0.501	730.8
3	7 – 9	130.8	0.533	939.9
4	10 – 12	177.7	0.508	1,261.7

During the coke oven gas testing, AK Steel collected and analyzed three coke oven gas samples to determine the F_d factor. The average F_d factor of the three coke oven gas samples was used to calculate NO_x mass emissions. Results of the coke oven gas analyses are included in Appendix C of this certification application.

2.2 Fuel Flowmeter Certification Tests

Each fuel flowmeter was certified in accordance with Appendix D of 40 CFR Part 75 to demonstrate that each fuel flowmeter met the accuracy requirement of ± 2.0% of the fuel flowmeter's upper range value. Prior to the NO_x correlation test program, the orifice-plate for each fuel flowmeter was replaced with a new orifice-plate certified by the manufacturer to meet the specifications in both ASME-MFC-3M-1989 and AGA Report #3. A certificate of conformance is provided in Appendix D of this certification application.

"Miller, Brad"
<Brad.Miller@hamilton-co.org
>
09/11/2007 01:41 PM

To <carl_batliner@aksteel.com>
cc <Pat_Gallo@aksteel.com>, <Larry_Schutte@aksteel.com>, <dpack@sunocoinc.com>, <john_r_carson@urscorp.com>, <alan.lloyd@epa.state.oh.us>, "Tedtman, Paul"
bcc
Subject RE: Netting Credits-Sinter Plant and No. 2 Boiler House

History: This message has been replied to and forwarded.

Carl,

Thanks for providing the additional information which answered most of our questions. One general comment is that AP-42 Section 7 was changed to Section 12 several years ago.T his agency does have the following additional comments/questions based on the information submited by AK Steel:

1. For the TSP - Raw Materials emission factor, we need more information on the basis for this factor. Lee Gruber is retired so he no longer works for this agency.
2. For the TSP - Breaker End, what is the basis for the use of 95%?
3. For TSP - Cold Sinter, we could not find that factor in AP-42. Also what is the basis for the 50% control effciency?
4. For PM-10 Raw Material, what is the basis for the use of 25%?
5. For PM10 Cold Sinter Screen, what is the basis for the 25% factor and control efficiency?
6. For the SO2 emissions test, we do not have a copy of the test report. Could you please provide a copy of the test information?
7. What is the basis for the 3% H2SO4 factor?
8. For CO, why did AK Steel not use the October 12, 1998 stack test?

If you have any questions about the above, please let me know.

Thanks,

Brad

From: Betty_Longworth@aksteel.com [mailto:Betty_Longworth@aksteel.com]
Sent: Fri 9/7/2007 8:01 AM
To: Miller, Brad; alan.lloyd@epa.state.oh.us; Tedtman, Paul; Ploetz, Mike
Cc: Pat_Gallo@aksteel.com; Larry_Schutte@aksteel.com; dpack@sunocoinc.com; john_r_carson@urscorp.com
Subject: Netting Credits-Sinter Plant and No. 2 Boiler House

Per Carl Batliner's instructions, the attachments relate to the above-referenced subject.

Carl Batliner/AKSTEEL
09/21/2007 11:31 AM

To "Miller, Brad" <Brad.Miller@hamilton-co.org>
cc alan.lloyd@epa.state.oh.us, carl_batliner@aksteel.com, dpack@sunocoinc.com, john_r_carson@urscorp.com, Larry_Schutte@aksteel.com, "Ploetz, Mike"
bcc
Subject RE: Netting Credits-Sinter Plant

Brad, the attached word document provides the responses to your 9/11/07 email except for question 7. The response to question 7 is shown in the attached excel file. I hope that answers your questions.

 - Sinter Plant H2SO4 estimate 9-21-07.xls

 - Sinter Plant netting credits response 9-21-07.doc

URS Corporation **CALCULATION SHEET** **Calc. No. 1**

Signature: J. Carson Date: 08/08/2007 Checked: Date: __/__/_

Subject: Estimate H2SO4/SO2 Ratio for Windbox at Sintering

Purpose

Estimate mass ratio of H2SO4/SO2 to determine H2SO4 decreases from shutting down sintering plant.

Assumptions

No site test data regarding SO3 or H2SO4 emissions is available. SO2 emissions are known.
No data is available in AP-42 regarding fraction of sulfur converted to SO3 in windbox at sintering operations.
Molar SO3 level is likely between 1 and 5% of SO2*. SO3 formation is suppressed under rich combustion - enhanced under lean combustion.
Sintering combustion is lean with 17-18% oxygen present in the flue gas.
SO3 will convert to H2SO4 with moisture available in flue gas.

Basis

Use average SO3/SO2 molar level of 3% for windbox.
Equivalent mass ratio of H2SO4 would be 4.6% since the MW of H2SO4 is 98 and the MW of SO2 is 64.
Use 3.0% mass ratio which is likely conservative.

* Chapter 7-2, Thermodynamics and Kinetics of Sulfur Oxide Formation, in *Air Pollution Its Origin and Control*, Wark and Warner, Thomas Crowell, 1976

Responses to Brad Miller's 9/11/07 e-mail

1. TSP Emission Factor for Sinter Plant Raw Materials Unloading

This emission factor came from Ohio EPA's 1980 RACM Document. We used 0.22 lbs/ton of material unloaded, the average of the range listed for limestone unloading (see attached Table 2.2.2-1 item 2).

2. Breaker End TSP - Basis of 95% of AP-42's 6.8 lb/ton

AP-42 only listed one uncontrolled emission factor for Sinter Plant breaker and screening operations (see attached table 3). We chose to separate the cold screening emissions from the overall breaker end emissions. Cold Screening emissions were estimated to be 5% of the total breaker end emissions. Therefore we assigned 95% to the remaining breaker end emissions.

3. Cold Screening Emissions Factors

As stated above we could not find a separate emission factor for cold screening. It was estimated to be 5% of the emission factor for the breaker and screening combined.

The basis for using the 50% control efficiency came from the attached OEPA RACM Document Table 2.1.3-3 which shows 50% control efficiency for a water spray system for raw materials unloading. When operating the Sinter Plant s utilized a water spray system as the sinter exited the cooler and was entering the Cold Screening Operation.

4. Sinter Plant Raw Materials PM 10

It was simply an estimate that PM 10 makes up about 25% of the total raw materials handling emissions. This was based on visual observation that most of the emissions were large particles.

5. Cold Sinter Screening PM 10 Emission Factors

As Stated above we used a control efficiency number of 50% based on OEPA RACM Document Table 2.1.3-3.

It was simply an estimate that PM 10 makes up about 25% of the Cold Screening TSP emissions. This was based on visual observation that most of the emissions were large particles.

6. Windbox SO2 Emissions Test

The attached pages from the September, 1995 Sinter Plant Stack test shows the SO2 emissions rate to range between 538 and 670 lbs. SO2/hr. With sinter production rate of about 125 ton/hr., the SO2 emission factor is about 4 lb. SO2/ton sinter.

7. H2SO4 Emission Factor

See the attached excel spreadsheet for the calculation.

8. Source of CO Emission Factor Used

We did not examine all former Sinter Plant stack tests for determining the CO emission factor in the initial netting review. Based on review of the stack tests performed in the 1990s, the CO has varied from 0.37% to 0.5% of the stack gas. The average CO in the stack gas from those stack tests was 0.42%. The average CO tons/year for netting purposes would be reduced from 19,643.5 tons/year to 17,842 tons/year. We will accept the lower CO netting credit of 17,842 tons/year, if necessary.

Betty Longworth/AKSTEEL
09/24/2007 08:32 AM

To Brad.Miller@hamilton-co.org
cc alan.lloyd@epa.state.oh.us, dpack@sunocoinc.com, john_r_carson@urscorp.com, Larry Schutte/AKSTEEL@AKSTEEL,
bcc Carl Batliner/AKSTEEL
Subject Netting Credits - Sinter Plant

Per Carl Batliner's instructions, this attachment is in addition to the ones sent on Friday, September 21, 2007.


epa.PDF

REASONABLY AVAILABLE CONTROL MEASURES FOR FUGITIVE DUST SOURCES

OHIO ENVIRONMENTAL PROTECTION AGENCY
Office of Air Pollution Control
Division of Engineering
361 East Broad Street
Columbus, Ohio 43216

September, 1980

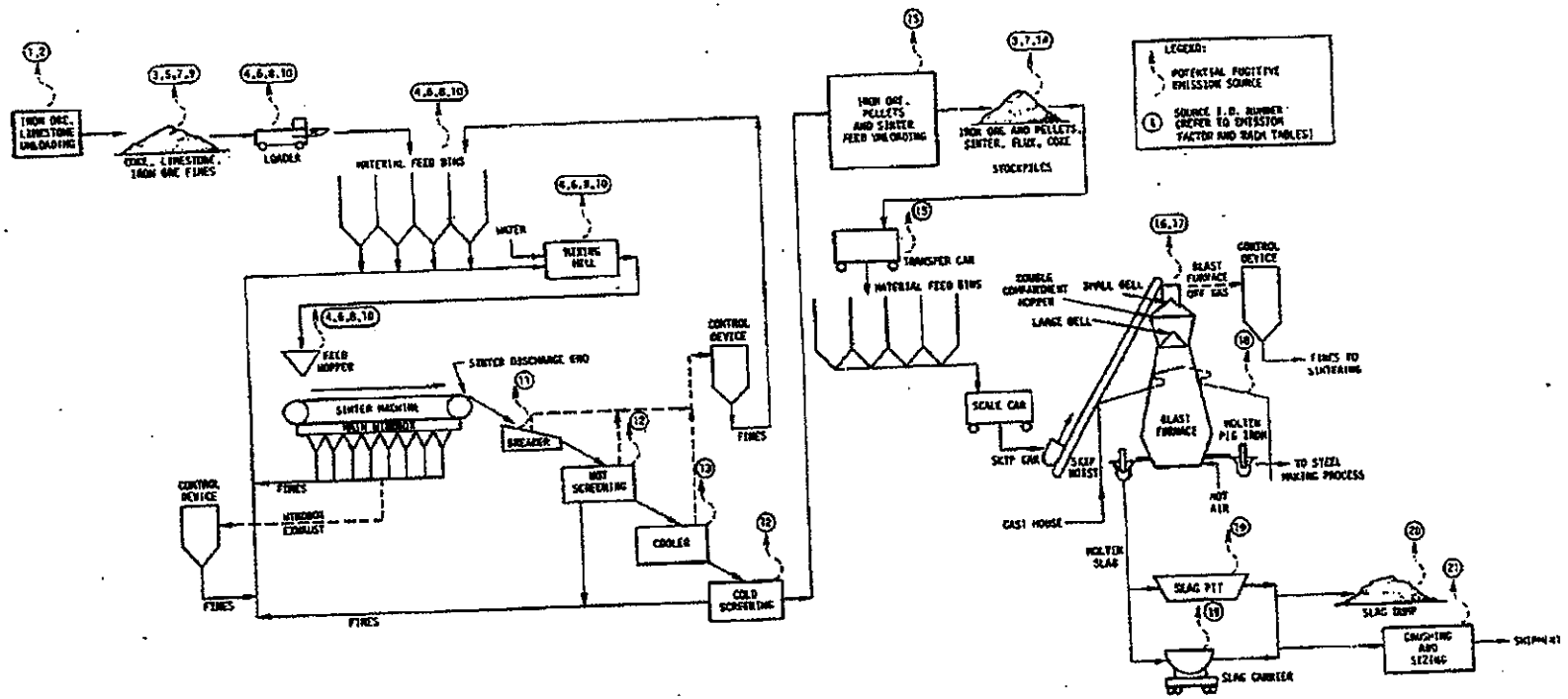


Figure 2.2.2-8. Simplified process flow diagram of iron production and associated fugitive particulate emission sources.

TABLE 2.2.2-1 FUGITIVE DUST EMISSION FACTORS FOR IRON PRODUCTION

Source	Emission factor	Reliability rating	Reference
(1) Iron ore unloading (ship or rail)	0.02 to 0.03 lb/ton ore unloaded .22 AVG	E	1
(2) Limestone unloading (ship or rail)	.03-0.4 lb/ton limestone unloaded	E	2
(3) Iron ore storage			
Loading onto pile	0.21 lb/ton loaded	D	3
Vehicular traffic	0.08 lb/ton stored	D	3
Loading out	0.30 lb/ton loaded out	D	3
Wind erosion	0.25 lb/ton stored	D	3
(4) Iron ore handling and transfer	2.0 lb/ton handled	D	4
(5) Limestone storage			
Loading onto pile	0.04 lb/ton loaded	D	5
Vehicular traffic	0.12 lb/ton stored	D	5
Loading out	0.05 lb/ton loaded out	D	5
Wind erosion	0.10 lb/ton stored	D	5
(6) Limestone handling and transfer	0.8 lb/ton handled	E	6
(7) Coke storage			
Loading onto pile	0.02 lb/ton loaded	D	3
Vehicular traffic	0.03 lb/ton stored	D	3
Loading out	0.03 lb/ton loaded out	D	3
Wind erosion	0.008 lb/ton stored	D	3
(8) Coke handling and transfer	0.11 lb/ton pig iron produced	E	7
(9) Blast furnace flue dust storage	Negligible	D	8
(10) Blast furnace flue dust handling and transfer	0.03 lb/ton flue dust	E	8

(continued)

TABLE 3. PARTICULATE EMISSION FACTORS FOR IRON AND STEEL MILLS[a]

Source	Units	Emission factors		Emission factor rating	Size data
Sintering					
Windbox emissions	kg/Mg (lb/T) finished sinter				
Uncontrolled					
Leaving grate		5.56	(11.1)	B	Yes
After coarse particulate removal		4.35	(8.7)	A	
Controlled by dry ESP		0.8	(1.6)	B	
Controlled by wet ESP		0.085	(0.17)	B	Yes
Controlled by venturi scrubber		0.235	(0.47)	B	Yes
Controlled by cyclone		0.5	(1.0)	B	Yes
Sinter discharge (breaker and hot screens)	kg/Mg (lb/T) finished sinter				
Uncontrolled		3.4	(6.8)	B	
Controlled by baghouse		0.05	(0.1)	B	Yes
Controlled by venturi scrubber		0.295	(0.59)	A	
Windbox and discharge	kg/Mg (lb/T) finished sinter				
Controlled by baghouse		0.15	(0.3)	A	
Blast Furnaces					
Slips	kg/Mg (lb/T)/slip	39.5	(87.0)	D	
Uncontrolled casthouse emissions	kg/Mg (lb/T) hot metal				
Roof Monitor[b]		0.3	(0.6)	B	Yes

(continued)

TABLE 2.1.3-3. A SUMMARY OF CONTROL TECHNIQUES, EFFICIENCIES, AND COSTS FOR FUGITIVE EMISSIONS FROM UNLOADING, CONVEYING, AND TRANSFER OPERATIONS

Control method	Estimated control efficiency, %	Initial cost (1980 dollars)	Annual cost (1980 dollars)
Unloading			
Truck			
• Enclosure			
- total with fabric filter	95	76,000[a]	17,000[a]
- partial with fabric filter	90	50,000[a]	12,500[a]
• Spray system-water	50	b	b
Vessel			
• Enclosed bucket elevator leg, vent to fabric filters	95	51,600[a]	11,600[a]
Rail			
• Enclosures			
- total with fabric filter	99[c]	120,000[d]	b
- total without fabric filter	70	b	b
• Spray systems with chemicals	80	37,000[d]	b
Conveying			
• Partial (top) enclosure	70[e]	43/ft[d]	b
• Total enclosures	99[f]	86/ft[d]	b
Transfer			
• Enclosures	70 - 99[g]	4,000 to 22,000[d]	b
• Spray systems with chemicals	70 - 95	18,000 to 245,000[d,h]	0.02 to 0.05 per ton of material treated[i]

[a] Reference 6, pages 6-23 through 6-75.

[b] Unavailable.

[c] Enclosure is accompanied with high efficiency (99+%) bag filter.

[d] Reference 1, page 6-3.

[e] "Weather-tight" system; no active dust collection system.

[f] Value utilized active dust collection system.

[g] Lower value represents simple enclosure; high value includes bag filter.

[h] Lower value represents cost of control at a single transfer station; high value represents total cost for a large multiple transfer station system.

[i] Annual cost applies to single transfer station only.

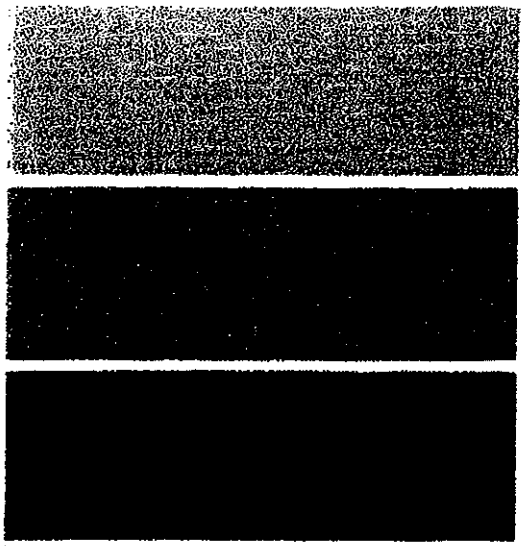
Envisage Environmental Incorporated
P.O. Box 152, Richfield, Ohio 44286
Phone (216) 526-0990

REPORT NO. 95-1719 / 5709
COMPANY AK STEEL CORPORATION
TITLE Sinter Plant Evaluation
DATE September 29, 1995

AK STEEL CORPORATION - MIDDLETOWN WORKS
SINTER PLANT AIR POLLUTION CONTROLS EMISSION EVALUATION

Middletown, Ohio

Conducted - September 29, 1995



Envisage Environmental Incorporated

[redacted]

October 10, 1995

Mr. Bill Davis
Senior Operations Engineer - Sinter Plant
AK Steel Corporation - Middletown Works
1801 Crawford Street
Middletown, Ohio 45043-0001

Dear Mr. Davis:

The following report is the result of the emission evaluation conducted on September 29, 1995 at the above facility. Testing was performed on the air pollution control system serving the Sinter Plant Operations. Specifically, the emissions of particulate, particle size distribution, sulfur dioxide, and opacity were determined on the system for engineering purposes.

The results are true and accurate to the degree specified in the pertinent sections of the Code of Federal Regulations, in force at the time of testing.

I look forward to answering any questions you may have and assisting you in the future.

Respectfully submitted,

ENVISAGE ENVIRONMENTAL INC.

Frank J. Hazoucky
Manager of Air Services

P.O. Box 152 Richfield, Ohio 44286 Phone (216) 526-0990 Fax (216) 526-8555

TEST RESULTS

AK Steel Corporation

Sinter Plant - Scrubber Exhaust

Total Particulate and Sulfur Dioxide Emission Evaluation

	DATE: September 29, 1995	Symbol	Units	Run 1	Run 2	Run 3	
	Time of Day			08:48 09:55	10:17 11:36	12:10 13:17	
1	Gas Volume-dry,std.	Vmstd	cu. ft.	43.84	44.38	45.08	
2	Condensate Vapor Vol.	Vwstd	cu. ft.	7.16	7.49	7.56	
3	Gas Stream Moisture	Bws	vol.dec	0.1404	0.1443	0.1437	
4	Mol.Wt-flue gas (dry)	Msd	lb/lb mo.	29.28	29.24	29.34	
5	Mol.Wt-flue gas (wet)	Ms	lb/lb mo.	27.70	27.62	27.71	
6	Flue Gas Velocity	Vs	ft/sec	42.62	43.45	43.11	
7	Flue Gas Volume-Actual	Qs	ACFM	281,205	286,729	284,484	
8	Flue Gas Volume-Std.	Qs (Std)	DSCFM	220,435	226,893	226,873	
9	Particulate Conc.	Cs					
	Probe		gr/dscf	0.0268	0.0176	0.0184	
	Filter		gr/dscf	0.01158	0.01704	0.01335	
	Total Particulate		gr/dscf	0.0384	0.0347	0.0317	
	Sulfur Dioxide		lbs/dscf	4.07E-05	4.93E-05	4.08E-05	
10	Emission Rate	E					Avg.
	Probe		lb/hr	50.6041	34.2832	35.7462	
	Filter		lb/hr	21.8775	33.1337	25.9609	
	Total Particulate		lb/hr	72.48	67.42	61.71	
	Sulfur Dioxide		lb/hr	538.57	670.94	555.26	588
11	Isokinetic Rate	I	%	106.9	105.2	106.8	

Envisage Environmental Incorporated
P.O. Box 182 Richfield, Ohio 44286
Phone (216) 526-0990

TEST RESULTS

AK Steel Corporation

Sinter Plant - Scrubber Exhaust

Sulfur Dioxide Evaluation

DATE: September 29, 1995

			Run 1	Run 2	Run 3
Normality of Ba(ClO4)2	N	meq/ml	0.01000	0.01000	0.01000
Volume of solution	Valn	ml	280	295	280
Volume aliquot titrant	Va	ml	1.00	1.00	1.00
Volume Ba(ClO4)2 Blank	Vtb	ml	0.00	0.00	0.00
Volume Ba(ClO4)2 Sample	Vt	ml	9.03	10.50	9.30
Concentration SO2	Cso2	lb/dscf	4.07E-05	4.93E-05	4.08E-05
Concentration SO2	PPM	ppmV	244.93	296.45	245.36
Emission Rate SO2	Eso2	lb/hr	538.57	670.94	555.26

Envisage Environmental Incorporated
P.O. Box 552 Richfield, Ohio 44286
Phone (216) 659-0990

"Miller, Brad"
<Brad.Miller@hamilton-co.org
>
10/03/2007 08:38 AM

To <carl_batliner@aksteel.com>
cc <alan.lloyd@epa.state.oh.us>, "Ploetz, Mike" <Mike.Ploetz@hamilton-co.org>, "Tedtman, Paul" <Paul.Tedtman@hamilton-co.org>
bcc
Subject Netting Credits - Sinter Plant

History: This message has been replied to and forwarded.

After discussions with Ohio EPA, this agency has a few comments on your September 21, 2007 e-mail. For the TSP emissions factor for the Sinter Plant Raw Material Unloading, we agree to the use of the factor from RACM but it appears the average value should be approximately 0.19 pounds per ton. For the CO emissions factor, the most recent stack test (October 1998) should be used for determining the CO emissions credit. For the H2SO4 emissions, could you please explain further how the molecular weight impacts the selection of the 3% factor?

Thanks,

Brad

Carl Batliner/AKSTEEL
10/11/2007 09:16 AM

To "Miller, Brad" <Brad.Miller@hamilton-co.org>
cc alan.lloyd@epa.state.oh.us, carl_batliner@aksteel.com, "Ploetz, Mike" <Mike.Ploetz@hamilton-co.org>, "Tedtman, Paul" <Paul.Tedtman@hamilton-co.org>, Pat
bcc
Subject Re: Netting Credits - Sinter Plant

Brad, the information below is provided in response to your email of 10/3/07.

HCDES agreed to allow AK Steel to use the 0.22 lb/ton emission factor from the Ohio RACM Report table 2.2.2-1 source 2 (limestone unloading) for the Sinter Plant Raw Material Unloading in 1990 while Lee Gruber was still at the agency. The range shown in that table is 0.03 – 0.4 lb./ton of limestone unloaded. The average of the range calculates to be 0.215 lb./ton. AK Steel has always used 0.22 lb./ton in its annual emission inventory, emission fees, etc. since 1990. We believe the 0.22 lb/ton emission factor should be used.

AK Steel will accept the CO emission factor from the most recent stack test of October 1998 for determining the CO emissions credit.

For the H2SO4 emissions, the average expected molar SO3 level would be 3% of the SO2 level (i.e., 3 moles of SO3 for every 100 moles of SO2). However, for the netting calculation, H2SO4 was estimated on a mass basis as 3% of the SO2 (i.e., 3 lbs H2SO4 for every 100 lbs SO2).

Each mole of sulfur that forms SO2 forms 64 lbs. Each mole of sulfur that forms H2SO4 forms 98 lbs. So, a molar H2SO4/SO2 ratio of 3% is equivalent to a mass ratio of 4.6% (3% X 98 / 64).

The purpose of pointing out that the mass ratio would be higher was to show that using 3% on a mass basis is conservative (i.e., more likely to underestimate H2SO4 reductions than to overestimate).

If HCDES and OEPA agree with the responses above, we will include the adjusted netting credits analysis with copies of the various communications and attachments in the Sun Coke PTI application.

"Miller, Brad" <Brad.Miller@hamilton-co.org>

"Miller, Brad" <Brad.Miller@hamilton-co.org>
10/03/2007 08:38 AM

To <carl_batliner@aksteel.com>
cc <alan.lloyd@epa.state.oh.us>, "Ploetz, Mike" <Mike.Ploetz@hamilton-co.org>, "Tedtman, Paul" <Paul.Tedtman@hamilton-co.org>
Subject Netting Credits - Sinter Plant

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Thanks,

Brad