Note: This is a reference cited in *AP 42, Compilation of Air Pollutant Emission Factors, Volume I Stationary Point and Area Sources.* AP42 is located on the EPA web site at www.epa.gov/ttn/chief/ap42/

The file name refers to the reference number, the AP42 chapter and section. The file name "ref02_c01s02.pdf" would mean the reference is from AP42 chapter 1 section 2. The reference may be from a previous version of the section and no longer cited. The primary source should always be checked.

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RESULTS OF THE JANUARY 8-10, 1980 PARTICULATE EMISSION COMPLIANCE TESTS ON EMISSION SOURCE NOS. 6.39, 6.40, 6.34, 6.44, 6.41, 6.56, 6.43, 8.43, 8.47 AND 8.49 AT THE U.S. STEEL MINNTAC PLANT IN MOUNTAIN IRON, MINNESOTA

PM ONLY

NO CO_2

Submitted to:

UNITED STATES STEEL CORPORATION
P. O. Box 26
Pittsburgh, Pennsylvania 15230

Attention: Jim W. Craft
Buyer

Approved by:

Perry Londes, Ph.D.
Director of Environmental
Measurements Section

Report Number 0-694
February 8, 1980
sk

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M - Method 9 Field Data Sheets
N - Pollution Control Equipment Descriptions Process Rate Data
O - Procedures
P - Calculation Equations
Q - Sampling Train Calibration Data Sheets

SYMBOLS AND ABBREVIATIONS

ACFM	actual cubic feet per minute
DSCFM	standard cubic foot of dry gas per minute
DEG-F	degrees Fahrenheit
FT/SEC	feet per second
GR/ACF	grains per actual cubic foot
GR/DSCF	grains per dry standard cubic foot
g	gram
HRS	hours
IN.	inches
IN. H.G.	inches of mercury
IN. W.C.	inches of water
LB	pound
LB/HR	pounds per hour
LB/10^6BTU	million British Thermal Units heat input
microns (μm)	micrometer
MIN	minutes
SQ. FT.	square feet
v/v	percent by volume
mg/DSCM	milligrams per dry standard cubic meter
LB/DSCF	pounds per dry standard cubic foot
MWH	megawatt hours
ohm-cm	ohm-centimeter
HP	horsepower
PSI	pounds per square inch
w/w	percent by weight

Standard conditions are defined as 68 °F (20 °C) and 29.92 in. of mercury pressure.

1 INTRODUCTION

During the Period of January 8-10, 1980, Interpoll Inc. personnel conducted a series of ten particulate emission compliance tests on ten different emission sources at the United States Steel Corporation Minnesota Ore Operations located near Mountain Iron, Minnesota. On-site testing was performed by a four-man team under the direction of J. Stock. Coordination between plant operation and testing activities was provided by Ted Wirtz and Ray Corradi of U.S. Steel. The tests were not witnessed by a member of the Minnesota Pollution Control Agency (MPCA).

Particulate determinations were performed in accordance with EPA Methods 1-5, CFR Title 40, Part 60, Appendix A and the revisions to these methods, FR 42(160). A preliminary determination of the gas linear velocity profile was made on each source before the start of the first particulate determination to allow selection of the appropriate nozzle diameter required for isokinetic sample withdrawal. Interpoll sampling trains which meet or exceed specifications in the above-cited references were used to extract representative particulate samples by means of heated stainless-steel lined probes.

Test port locations for all ten sources are documented in Appendix B. The testing protocol on the ten sources was identical. A twelve-point sampling traverse was used to extract particulate samples. Each traverse point was sampled five minutes to give a total sampling time of 60 minutes per run. Visible emission determinations conducted on the ten sources showed no visible emissions for any of the sources.

The important results of the ten tests are summarized in Section 2. Detailed results are presented in Section 3. Results of preliminary measurements, field data and all other supporting information are presented in the Appendices.

2 SUMMARY AND DISCUSSION

The important results of each of the individual particulate emission compliance tests are summarized in Tables 1-10. An overview of the ten tests is presented in Table 0. As will be noted, the measured particulate concentrations were all significantly less than the maximum permissible concentration as specified in APC 5, Table 2 of Minnesota State Regulations. In the interpretation of these results, it should be noted that the volumetric flow rates measured in this work were substanstially below design volumes for emission sources No. 8.43, 8.47 and 8.49.

No difficulties were encountered in the field or in the laboratory evaluations of the particulate samples. On the basis of this fact and a complete review of the entire data and results, it is our opinion that the particulate concentrations and emission rates reported herein are accurate and closely reflect the actual values which existed at the time the tests were conducted.

Table 6. Summary of Design and Measured Volumetric Flow and Particulate Loading Data for the Ten Tested Emission Sources

Test No.	Source No.	Equipment No.	Process Rate (TON/HR)	Design Volume (ACFM)	Design Loading (GR/DSCF)	Measured Volume (ACFM)	Measured Loading* (GR/DSCF)	% of Permissible	Maximum Permissible Loading** (GR/DSCF)
1	6.39	078-03-1G1	775 868	26000	.009	24500	.011	16%	.067
2	6.40	078-03-6G1	3490 3909	11000	.005	12000	.0071	8	.085
3	6.34	078-03-7G1	2031 2275	16000	.009	13800	.0053	6.5	.082
4	6.44	078-03-8G1	300 336	23000	.007	23400	.0044	6.5	.068
5	6.41	078-03-22G1	329 368	16000	.012	16100	.036	46	.078
6	6.56	078-03-23G1	339 380	16000	.010	13000	.0058	6.9	.084
7	6.43	078-03-20G1	339 380	37000	.005	37800	.0032	5.5	.058
8	8.4	298-06-04	425 476	15000	.010	2370	.0016	1.6	.100
9	8.47	298-06-6	425 476	46600	.096	9610	.0051	5.7	.090
10	8.49	298-06-7	50 56	24500	.098	15500	.0031	3.9	.079

*Average of three runs

APCS Table [illegible]-26

Table 1. Summary of the Results of the January 8, 1980 Particulate Emission Compliance Test 1 on the Conveyor Transfer Stack at the U.S. Steel Minntac Plant (Emission Source No. 6.39)

ITEM	PRELIMINARY	RUN 1	RUN 2	RUN 3
Date of test	01-08-80	01-08-80	01-08-80	01-08-80
Time of test	0745	0800-0902	0920-1020	1030-1135
Volumetric flow				
ACTUAL (ACFM)	25900	24400	24600	24700
STANDARD (DSCFM)	26200	24700	24900	25000
Gas temperature (DEG-F)	40	40	40	40
Gas moisture content (% v/v)	.85	.85	.85	.85
Gas composition (% v/v, dry)				
carbon dioxide		.03	.03	.03
oxygen		20.90	20.90	20.90
nitrogen		79.07	79.07	79.07
Particulate concentration				
[illegible]		.0091	.0105	.0142
[illegible]		.0090	.0103	.0140
Isokinetic variation (%)		100.5	100.1	100.0
Particulate emission rate (LB/HR)		1.90	2.21	3.00

not analyzed - composition of normal air

S-0134

Table 2. Summary of the Results of the January 8, 1980 Particulate Emission Compliance Test 2 on the Secondary Bins Stack at the U.S. Steel Minntac Plant (Emission Source No. 6.40)

ITEM	PRELIMINARY	RUN 1	RUN 2	RUN 3
Date	01-08-80	01-08-80	01-08-80	01-08-80
Time of [illegible] (HRS)	1145	1155-1300	1315-1420	1435-1540
Volumetric flow				
ACTUAL (ACFM)	12200	11900	12000	12100
STANDARD (DSCFM)	13400	12100	12200	12300
Gas temperature (DEG-F)	40	40	40	40
Gas moisture content (% v/v)	.85	.85	.85	.85
Gas composition (% v/v, dry)*				
carbon dioxide		.03	.03	.03
oxygen		20.90	20.90	20.90
nitrogen		79.07	79.07	79.07
Particulate concentration				
ACTUAL (GR/ACF)		.0084	.0067	.0065
STANDARD (GR/DSCF)		.0082	.0066	.0064
Isokinetic variation (%)		98.6	100.2	99.7
Particulate emission rate (LB/HR)		.85	.69	.67

*not analyzed; composition of normal air

S-0134

Table 3. Summary of the Results of the January 8, 1980 Particulate Emission Compliance Test 3 on the Conveyor Transfer Stack at the U.S. Steel Minntac Plant (Emission Source No. 6.34)

ITEM	PRELIMINARY	RUN 1	RUN 2	RUN 3
Date of test	01-08-80	01-08-80	01-08-80	01-08-80
Time of test	1015	1030-1135	1150-1252	1308-1410
Volumetric flow				
ACTUAL (ACFM)	13900	13800	13800	13800
STANDARD (DSCFM)	14100	14000	14100	14000
Gas temperature (DEG-F)	40	40	40	40
Gas moisture content (% v/v)	.60	.65	.52	.64
Gas composition (% v/v, dry)*				
carbon dioxide		.03	.03	.03
oxygen		20.90	20.90	20.90
nitrogen		79.07	79.07	79.07
Particulate concentration				
ACTUAL (GR/ACF)		.0043	.0082	.0038
STANDARD (GR/DSCF)		.0043	.0080	.0037
Isokinetic variation (%)		99.3	99.2	99.7
Particulate emission rate (LB/HR)		.51	.96	.45

*composition of normal air

S-0134

Table 4. Summary of the Results of the January 8, 1980 Particulate Emission Compliance Test 4 on the Tertiary Crushers Stack at the U.S. Steel Minntac Plant (Emission Source No. 6.44)

ITEM	PRELIMINARY	RUN 1	RUN 2	RUN 3
[illegible]te of test	01-08-80	01-08-80	01-08-80	01-08-80
[illegible]e of test (HRS)	1420	1440-1553	1600-1703	1715-1818
[illegible]metric flow				
ACTUAL (ACFM)	23400	23400	23500	23500
STANDARD (DSCFM)	23500	23500	23800	23900
[illegible] temperature (DEG-F)	45	45	40	40
[illegible]isture content (% v/v)	.63	.51	.63	.75
[illegible] dry)				
[illegible] dioxide		.03	.03	.03
oxygen		20.90	20.90	20.90
[illegible] nitrogen		79.07	79.07	79.07
[illegible]rticulate concentration				
[illegible]AL [illegible]/ACF)		.0056	.0050	.0029
[illegible]ANDARD [illegible]CF)		.0055	.0049	.0029
[illegible]		99.2	99.2	100.4
[illegible]		1.11	1.00	.59

[illegible] analyzed [illegible] composition [illegible] ambient air

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Table 5. Summary of the Results of the January 9, 1980 Particulate Emission Compliance Test 5 on the 6.41 Conveyor Transfer Stack at the U.S. Steel Minntac Plant (Emission Source No. 6.41)

ITEM	PRELIMINARY	RUN 1	RUN 2	RUN 3
	01-09-80	01-09-80	01-09-80	01-09-80
	0900	0915-1017	1030-1131	1140-1242
	16100	16300	15800	16100
	16100	16300	15800	16200
-F)	41	40	40	40
[illegible] % v/v)	.81	.71	.87	.87
[illegible] v/v, dry)*		-		
[illegible]		.03	.03	.03
oxygen		20.90	20.90	20.90
[illegible]		79.07	79.07	79.07
[illegible] tion				
[illegible]		.072	.032	.004
[illegible] DARD		.072	.032	.004
[illegible]		100.0	97.5	94.8
[illegible] rate (L/[illegible]		10.04	4.24	.54

[illegible] tion of normal air

S-0134

Table 6. Summary of the Results of the January 9, 1980 Particulate Emission Compliance Test 6 on the Conveyor Transfer Stack at the U.S. Steel Minntac Plant (Emission Source No. 6.56)

	PRELIMINARY	RUN 1	RUN 2	RUN 3
Date of test	01-09-80	01-09-80	01-09-80	01-09-80
[illegible]	1450	1500-1604	1620-1725	1740-1840
[illegible]				
ACTUAL [illegible]	12900	13000	13000	13100
STANDA[illegible]	12900	13000	13000	13100
[illegible] temper[illegible] F)	40	40	40	40
[illegible] stre[illegible] v/v)	.69	.77	.72	.60
[illegible] composition (% v/v, dry)*				
carbon dioxide		.03	.03	.03
oxygen		20.90	20.90	20.90
nitrogen		79.07	79.07	79.07
Particulate concentration				
ACTUAL [illegible] (GR/ACF)		.0027	.0025	.0123
STANDARD [illegible]		.0027	.0025	.0122
Isokinetic variation (%)		93.9	99.0	99.6
Particulate emission rate (LB/HR)		.29	.27	1.37

[illegible] composition of normal air

S-0134

Table 7. Summary of the Results of the January 9, 1980 Particulate Emission Compliance Test 7 on the Tertiary Storage Bins Stack at the U.S. Steel Minntac Plant (Emission Source No. 6.43)

ITEM	PRELIMINARY	RUN 1	RUN 2	RUN 3
Date of test	01-09-80	01-09-80	01-09-80	01-09-80
Time of test (HRS)	1000	1020-1123	1135-1238	1250-1353
Volumetric flow				
ACTUAL [illegible]	38100	38000	37800	37700
STANDARD [illegible]	38100	38000	37900	37800
Temperature [illegible]	40	40	40	40
[illegible] w/w)	.67	.71	.60	.71
Moisture [illegible] v/v, dry)				
Carbon [illegible]		.03	.03	.03
Oxygen		20.90	20.90	20.90
[illegible]		79.07	79.07	79.07
[illegible] ation				
Actual [illegible]		.0039	.0029	.0028
[illegible] Std (GR/DSCF)		.0038	.0029	.0028
[illegible]		99.0	98.3	99.9
[illegible]		1.25	.93	.92

[illegible] normal air

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Table 8. Summary of the Results of the January 9, 1980 Particulate Emission Compliance Test 8 on the Agglomerator Grate-Feed End Stack at the U.S. Steel Minntac Plant (Emission Source No. 8.43)

ITEM	PRELIMINARY	RUN 1	RUN 2	RUN 3
[illegible]	01-09-80	01-09-80	01-09-80	01-09-80
[illegible]	1600	1610-1711	1725-1827	1827-1930
[illegible]	2330	2370	2390	2350
[illegible]	2160	2190	2210	2170
[illegible]	70	74	73	74
[illegible]	2.42	2.47	2.32	2.46
[illegible]		.03	.03	.03
[illegible]		20.90	20.90	20.90
[illegible]		79.07	79.07	79.07
[illegible]		.0020	.0011	.0015
[illegible]		.0021	.0011	.0016
[illegible]		99.5	100.3	100.7
[illegible] rate (LB/HR)		.04	.02	.03

[illegible] [illegible]ition of normal air

S-0134

Table 9. Summary of the Results of the January 10, 1980 Particulate Emission Compliance Test 9 on the [illegible] Agglomerator Conveyor Transfer Stack at the U.S. Steel Minntac Plant (Emission Source No. 8.47)

ITEM	PRELIMINARY	RUN 1	RUN 2	RUN 3
[illegible] test	01-10-80	01-10-80	01-10-80	01-10-80
[illegible] test [illegible]	0800	0845-0946	0950-1051	1055-1156
[illegible]ometric flow				
ACTUAL [illegible] (ACFM)	9640	9650	9630	9550
STANDARD [illegible] (DSCFM)	8950	8960	8940	8860
Gas temperature (DEG-F)	70	70	70	70
Gas moisture content (% v/v)	2.56	2.55	2.54	2.58
[illegible] gas composition (%v/v, dry)*				
[illegible] dioxide		.03	.03	.03
[illegible]		20.90	20.90	20.90
[illegible]		79.07	79.07	79.07
[illegible] concentration				
[illegible] (ACF)		.0049	.0049	.0045
[illegible] (DSCF)		.0053	.0053	.0048
[illegible]metric variation (%)		100.6	97.2	99.9
[illegible]te (LB/HR)		.41	.40	.36

[illegible] normal air

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Table 10. Summary of the Results of the January 10, 1980 Particulate Emission Compliance Test 10 on the Agglomerator Conveyor Transfer Stack at the U.S. Steel Minntac Plant (Emission Source No. 8.49)

ITEM	PRELIMINARY	RUN 1	RUN 2	RUN 3
Date of test	01-10-80	01-10-80	01-10-80	01-10-80
Time of test (HRS)	0915	0930-1032	1037-1140	1145-1248
Volumetric flow				
ACTUAL (ACFM)	15500	15500	15500	15600
STANDARD (DSCFM)	14500	14400	14400	14500
Temperature (DEG-F)	70	70	70	70
Moisture content (% v/v)	1.92	1.89	1.98	1.89
Composition (% v/v, dry)*				
carbon dioxide		.03	.03	.03
oxygen		20.90	20.90	20.90
nitrogen		79.07	79.07	79.07
Particulate concentration				
ACTUAL		.0032	.0030	.0024
STANDARD		.0034	.0032	.0026
[illegible]		100.3	100.3	100.0
[illegible]		.42	.40	.32

*Not analyzed; composition of normal air

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3 RESULTS

The results of all field and laboratory evaluations are presented in this section. Gas composition results for each source are presented first, followed by the particulate emission and opacity data for each source. Preliminary measurements including traverse point description are given in Appendix A and Appendix B.

The results have been calculated on a CDC 3300 computer using standard Fortran programs. EPA-published equations have been used as the basis of the calculation techniques in these programs. It should be noted in interpreting these results that the particulate emission rates have been calculated by both the "concentration x flow" and the "ratio of areas" methods and the average reported. The average is the best estimate of the true value, since the bias introduced by an isokinetic sampling is approximately equal but of opposite sign in the two calculation techniques and thus cancels in the average.

3.1 Results of Gas Analyses

Note: Oxygen and carbon dioxide concentrations were not determined by Orsat analysis, since each of the ten emission sources in question was drawing room air.

3.1.1 TEST NO. 1 6.39 CONVEYOR TRANSFER STACK

RESULTS OF GAS ANALYSES -- METHOD 3 (PERCENT BY VOLUME)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/08/80	01/08/80	01/08/80
DRY BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.90	20.90	20.90
CARBON MONOXIDE	0	0	0
NITROGEN	79.07	79.07	79.07
WET BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.72	20.72	20.72
CARBON MONOXIDE	0	0	0
NITROGEN	78.40	78.40	78.40
MOISTURE CONTENT	.85	.85	.85
DRY MOLECULAR WEIGHT	28.84	28.84	28.84
WET MOLECULAR WEIGHT	28.75	28.75	28.75
SPECIFIC GRAVITY (RELATIVE TO AIR)	.9930	.9930	.9930

** CONDENSED WATER VAPOR IN GAS STREAM; MOISTURE CONTENT CALCULATED FROM AVERAGE STACK GAS TEMPERATURE ASSUMING SATURATION.

FO	0	0	0

3.1.2 TEST NO. 2 6.40 SECONDARY BIN STACK

RESULTS OF GAS ANALYSES -- METHOD 3 (PERCENT BY VOLUME)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/08/80	01/08/80	01/08/80
DRY BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.90	20.90	20.90
CARBON MONOXIDE	0	0	0
NITROGEN	79.07	79.07	79.07
WET BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.72	20.72	20.72
CARBON MONOXIDE	0	0	0
NITROGEN	78.40	78.40	78.40
MOISTURE CONTENT	.85	.85	.85
DRY MOLECULAR WEIGHT	28.84	28.84	28.84
WET MOLECULAR WEIGHT	28.75	28.75	28.75
SPECIFIC GRAVITY (RELATIVE TO AIR)	.9930	.9930	.9930

** CONDENSED WATER VAPOR IN GAS STREAM; MOISTURE CONTENT CALCULATED FROM AVERAGE STACK GAS TEMPERATURE ASSUMING SATURATION.

FO	0	0	0

3.1.3 TEST NO. 3 6.34 CONVEYOR TRANSFER STACK

RESULTS OF GAS ANALYSES -- METHOD 3 (PERCENT BY VOLUME)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/08/80	01/08/80	01/08/80
DRY BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.90	20.90	20.90
CARBON MONOXIDE	0	0	0
NITROGEN	79.07	79.07	79.07
WET BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.76	20.79	20.77
CARBON MONOXIDE	0	0	0
NITROGEN	78.56	78.66	78.56
MOISTURE CONTENT	.65	.52	.64
DRY MOLECULAR WEIGHT	28.84	28.84	28.84
WET MOLECULAR WEIGHT	28.77	28.78	28.77
SPECIFIC GRAVITY (RELATIVE TO AIR)	.9938	.9943	.9938
FO	0	0	0

3.1.4 TEST NO. 4 6.44 TERTIARY CRUSHER STACK

RESULTS OF GAS ANALYSES -- METHOD 3 (PERCENT BY VOLUME)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/08/80	01/08/80	01/08/80
DRY BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.90	20.90	20.90
CARBON MONOXIDE	0	0	0
NITROGEN	79.07	79.07	79.07
WET BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.79	20.77	20.74
CARBON MONOXIDE	0	0	0
NITROGEN	78.67	78.57	78.48
MOISTURE CONTENT	.51	.63	.75
DRY MOLECULAR WEIGHT	28.84	28.84	28.84
WET MOLECULAR WEIGHT	28.79	28.77	28.76
SPECIFIC GRAVITY (RELATIVE TO AIR)	.9943	.9939	.9934
FO	0	0	0

3.1.5 TEST NO. 5 6.41 CONVEYOR TRANSFER STACK

RESULTS OF GAS ANALYSES --- METHOD 3 (PERCENT BY VOLUME)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/09/80	01/09/80	01/09/80
DRY BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.90	20.90	20.90
CARBON MONOXIDE	0	0	0
NITROGEN	79.07	79.07	79.07
WET BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.75	20.72	20.72
CARBON MONOXIDE	0	0	0
NITROGEN	78.51	78.39	78.39
MOISTURE CONTENT	.71	.87	.87
DRY MOLECULAR WEIGHT	28.84	28.84	28.84
WET MOLECULAR WEIGHT	28.76	28.75	28.75
SPECIFIC GRAVITY (RELATIVE TO AIR)	.9936	.9930	.9930

** CONDENSED WATER VAPOR IN GAS STREAM; MOISTURE CONTENT CALCULATED FROM AVERAGE STACK GAS TEMPERATURE ASSUMING SATURATION.

FO	0	0	0

3.1.6 TEST NO. 6 6.56 CONVEYOR TRANSFER STACK

RESULTS OF GAS ANALYSES -- METHOD 3 (PERCENT BY VOLUME)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/09/80	01/09/80	01/09/80
DRY BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.90	20.90	20.90
CARBON MONOXIDE	0	0	0
NITROGEN	79.07	79.07	79.07
WET BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.74	20.75	20.78
CARBON MONOXIDE	0	0	0
NITROGEN	78.46	78.50	78.60
MOISTURE CONTENT	.77	.72	.60
DRY MOLECULAR WEIGHT	28.84	28.84	28.84
WET MOLECULAR WEIGHT	28.76	28.76	28.78
SPECIFIC GRAVITY (RELATIVE TO AIR)	.9934	.9935	.9940
FO	0	0	0

3.1.7 TEST NO. 7 6.43 TERTIARY STORAGE BIN STACK

RESULTS OF GAS ANALYSES -- METHOD 3 (PERCENT BY VOLUME)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/09/80	01/09/80	01/09/80
DRY BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.90	20.90	20.90
CARBON MONOXIDE	0	0	0
NITROGEN	79.07	79.07	79.07
WET BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.75	20.77	20.75
CARBON MONOXIDE	0	0	0
NITROGEN	78.51	78.60	78.51
MOISTURE CONTENT	.71	.60	.71
DRY MOLECULAR WEIGHT	28.84	28.84	28.84
WET MOLECULAR WEIGHT	28.76	28.78	28.76
SPECIFIC GRAVITY (RELATIVE TO AIR)	.9936	.9940	.9936
FO	0	0	0

3.1.8 TEST NO. 8 8.43 GRATE-FEED END STACK

RESULTS OF GAS ANALYSES -- METHOD 3 (PERCENT BY VOLUME)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/09/80	01/09/80	01/09/80
DRY BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.90	20.90	20.90
CARBON MONOXIDE	0	0	0
NITROGEN	79.07	79.07	79.07
WET BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.38	20.42	20.39
CARBON MONOXIDE	0	0	0
NITROGEN	77.11	77.24	77.12
MOISTURE CONTENT	2.47	2.32	2.46
DRY MOLECULAR WEIGHT	28.84	28.84	28.84
WET MOLECULAR WEIGHT	28.57	28.59	28.57
SPECIFIC GRAVITY (RELATIVE TO AIR)	.9870	.9875	.9870
FO	0	0	0

3.1.9 TEST NO. 9 8.47 CONVEYOR TRANSFER STACK

RESULTS OF GAS ANALYSES -- METHOD 3 (PERCENT BY VOLUME)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/10/80	01/10/80	01/10/80
DRY BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.90	20.90	20.90
CARBON MONOXIDE	0	0	0
NITROGEN	79.07	79.07	79.07
WET BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.37	20.37	20.36
CARBON MONOXIDE	0	0	0
NITROGEN	77.05	77.06	77.03
MOISTURE CONTENT	2.55	2.54	2.58
DRY MOLECULAR WEIGHT	28.84	28.84	28.84
WET MOLECULAR WEIGHT	28.56	28.57	28.56
SPECIFIC GRAVITY (RELATIVE TO AIR)	.9867	.9867	.9866

** CONDENSED WATER VAPOR IN GAS STREAM; MOISTURE CONTENT CALCULATED FROM AVERAGE STACK GAS TEMPERATURE ASSUMING SATURATION.

FO	0	0	0

3.1.10 TEST NO. 10 8.49 CONVEYOR TRANSFER STACK

RESULTS OF GAS ANALYSES -- METHOD 3 (PERCENT BY VOLUME)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/10/80	01/10/80	01/10/80
DRY BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.90	20.90	20.90
CARBON MONOXIDE	0	0	0
NITROGEN	79.07	79.07	79.07
WET BASIS (ORSAT)			
CARBON DIOXIDE	.03	.03	.03
OXYGEN	20.50	20.49	20.51
CARBON MONOXIDE	0	0	0
NITROGEN	77.57	77.50	77.58
MOISTURE CONTENT	1.89	1.98	1.89
DRY MOLECULAR WEIGHT	28.84	28.84	28.84
WET MOLECULAR WEIGHT	28.64	28.63	28.64
SPECIFIC GRAVITY (RELATIVE TO AIR)	.9891	.9888	.9892
FO	0	0	0

3.2 Results of Particle Concentration Determinations

3.2.1 TEST NO. 1 6.39 CONVEYOR TRANSFER STACK

RESULTS OF PARTICLE CONCENTRATION DETERMINATION -- METHOD 5(BE)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/08/80	01/08/80	01/08/80
TIME RUN START/END(HRS)	800/ 902	920/1020	1030/1135
PITOT TUBE COEFFICIENT	.854	.854	.854
TOTAL MOISTURE IN GAS SAMPLE (GRAMS)	7.1	7.2	7.2
TOTAL PARTICULATE MATERIAL COLLECTED(GRAMS) *	.0226	.0263	.0356
VOLUME THROUGH GAS METER			
METER CONDITION (CF)	35.04	35.21	35.31
STANDARD CONDITION (SCF)	38.96	39.15	39.26
TOTAL SAMPLING TIME (MIN)	60.0	60.0	60.0
NOZZLE DIAMETER (IN)	.184	.184	.184
AVERAGE STACK GAS TEMPERATURE DURING DETERMINATION (DEG-F)	40.	40.	40.
VOLUMETRIC FLOW**			
ACTUAL ..... (ACFM)	24360	24555	24652
DRY STANDARD ... (DSCFM)	24722	24920	25019
ISOKINETIC VARIATION (%)	100.5	100.1	100.0
PARTICLE CONCENTRATION			
ACTUAL ..... (GR/ACF)	.0091	.0105	.0142
DRY STANDARD ... (GR/DSCF)	.0090	.0103	.0140
PARTICLE MASS FLOW (LB/HR)	1.90	2.21	3.00

* DRY CATCH ONLY
** CALCULATED ON THE BASIS OF VELOCITY PRESSURES MEASURED DURING THIS PARTICULATE DETERMINATION.

3.2.2 TEST NO. 2 6.40 SECONDARY BIN STACK

RESULTS OF PARTICLE CONCENTRATION DETERMINATION -- METHOD 5(BE)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/08/80	01/08/80	01/08/80
TIME RUN START/END(HRS)	1155/1300	1315/1420	1435/1540
PITOT TUBE COEFFICIENT	.854	.854	.854
TOTAL MOISTURE IN GAS SAMPLE (GRAMS)	7.7	7.9	7.9
TOTAL PARTICULATE MATERIAL COLLECTED(GRAMS) *	.0225	.0184	.0179
VOLUME THROUGH GAS METER			
METER CONDITION (CF)	37.93	38.81	38.98
STANDARD CONDITION (SCF)	42.18	43.16	43.35
TOTAL SAMPLING TIME (MIN)	60.0	60.0	60.0
NOZZLE DIAMETER (IN)	.184	.184	.184
AVERAGE STACK GAS TEMPERATURE DURING DETERMINATION (DEG-F)	40.	40.	40.
VOLUMETRIC FLOW**			
ACTUAL ..... (ACFM)	11943	12022	12137
DRY STANDARD ... (DSCFM)	12121	12202	12318
ISOKINETIC VARIATION (%)	98.6	100.2	99.7
PARTICLE CONCENTRATION			
ACTUAL ..... (GR/ACF)	.0084	.0067	.0065
DRY STANDARD ... (GR/DSCF)	.0082	.0066	.0064
PARTICLE MASS FLOW (LB/HR)	.85	.69	.67

* DRY CATCH ONLY

** CALCULATED ON THE BASIS OF VELOCITY PRESSURES MEASURED DURING THIS PARTICULATE DETERMINATION.

3.2.3 TEST NO. 3 6.34 CONVEYOR TRANSFER STACK

RESULTS OF PARTICLE CONCENTRATION DETERMINATION -- METHOD 5(BE)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/08/80	01/08/80	01/08/80
TIME RUN START/END(HRS)	1030/1135	1150/1252	1308/1410
PITOT TUBE COEFFICIENT	.840	.840	.840
TOTAL MOISTURE IN GAS SAMPLE (GRAMS)	5.0	4.0	5.0
TOTAL PARTICULATE MATERIAL COLLECTED(GRAMS) *	.0100	.0187	.0088
VOLUME THROUGH GAS METER			
METER CONDITION (CF)	32.49	32.54	32.63
STANDARD CONDITION (SCF)	36.12	36.16	36.26
TOTAL SAMPLING TIME (MIN)	60.0	60.0	60.0
NOZZLE DIAMETER (IN)	.184	.184	.184
AVERAGE STACK GAS TEMPERATURE DURING DETERMINATION (DEG-F)	40.	40.	40.
VOLUMETRIC FLOW**			
ACTUAL ..... (ACFM)	13810	13826	13811
DRY STANDARD ... (DSCFM)	14023	14058	14025
ISOKINETIC VARIATION (%)	99.3	99.2	99.7
PARTICLE CONCENTRATION			
ACTUAL ..... (GR/ACF)	.0043	.0082	.0038
DRY STANDARD ... (GR/DSCF)	.0043	.0080	.0037
PARTICLE MASS FLOW (LB/HR)	.51	.96	.45

* DRY CATCH ONLY
** CALCULATED ON THE BASIS OF VELOCITY PRESSURES MEASURED DURING THIS PARTICULATE DETERMINATION.

3.2.4 TEST NO. 4 6.44 TERTIARY CRUSHER STACK

RESULTS OF PARTICLE CONCENTRATION DETERMINATION -- METHOD 5(BE)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/08/80	01/08/80	01/08/80
TIME RUN START/END(HRS)	1440/1553	1600/1703	1715/1818
PITOT TUBE COEFFICIENT	.840	.840	.840
TOTAL MOISTURE IN GAS SAMPLE (GRAMS)	4.0	5.0	6.0
TOTAL PARTICULATE MATERIAL COLLECTED(GRAMS) *	.0131	.0117	.0070
VOLUME THROUGH GAS METER			
METER CONDITION (CF)	32.95	33.39	33.73
STANDARD CONDITION (SCF)	36.61	37.08	37.58
TOTAL SAMPLING TIME (MIN)	60.0	60.0	60.0
NOZZLE DIAMETER (IN)	.184	.184	.184
AVERAGE STACK GAS TEMPERATURE DURING DETERMINATION (DEG-F)	45.	40.	40.
VOLUMETRIC FLOW**			
ACTUAL ..... (ACFM)	23356	23460	23516
DRY STANDARD ... (DSCFM)	23513	23826	23855
ISOKINETIC VARIATION (%)	99.2	99.2	100.4
PARTICLE CONCENTRATION			
ACTUAL ..... (GR/ACF)	.0056	.0050	.0029
DRY STANDARD ... (GR/DSCF)	.0055	.0049	.0029
PARTICLE MASS FLOW (LB/HR)	1.11	1.00	.59

* DRY CATCH ONLY

** CALCULATED ON THE BASIS OF VELOCITY PRESSURES MEASURED DURING THIS PARTICULATE DETERMINATION.

3.2.5 TEST NO. 5 6.41 CONVEYOR TRANSFER STACK

RESULTS OF PARTICLE CONCENTRATION DETERMINATION -- METHOD 5(BE)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/09/80	01/09/80	01/09/80
TIME RUN START/END(HRS)	915/1017	1030/1131	1140/1242
PITOT TUBE COEFFICIENT	.854	.854	.854
TOTAL MOISTURE IN GAS SAMPLE (GRAMS)	6.0	6.9	6.9
TOTAL PARTICULATE MATERIAL COLLECTED(GRAMS) *	.1834	.0764	.0095
VOLUME THROUGH GAS METER			
METER CONDITION (CF)	35.90	34.84	35.62
STANDARD CONDITION (SCF)	39.41	37.25	37.05
TOTAL SAMPLING TIME (MIN)	60.0	60.0	60.0
NOZZLE DIAMETER (IN)	.184	.184	.184
AVERAGE STACK GAS TEMPERATURE DURING DETERMINATION (DEG-F)	40.	40.	40.
VOLUMETRIC FLOW**			
ACTUAL ..... (ACFM)	16262	15788	16140
DRY STANDARD ... (DSCFM)	16305	15805	16158
ISOKINETIC VARIATION (%)	100.0	97.5	94.8
PARTICLE CONCENTRATION			
ACTUAL ..... (GR/ACF)	.0723	.0318	.0040
DRY STANDARD ... (GR/DSCF)	.0718	.0317	.0040
PARTICLE MASS FLOW (LB/HR)	10.04	4.24	.54

* DRY CATCH ONLY

** CALCULATED ON THE BASIS OF VELOCITY PRESSURES MEASURED DURING THIS PARTICULATE DETERMINATION.

3.2.6 TEST NO. 6 6.56 CONVEYOR TRANSFER STACK

RESULTS OF PARTICLE CONCENTRATION DETERMINATION -- METHOD 5(BE)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/09/80	01/09/80	01/09/80
TIME RUN START/END(HRS)	1500/1604	1620/1725	1740/1840
PITOT TUBE COEFFICIENT	.870	.870	.870
TOTAL MOISTURE IN GAS SAMPLE (GRAMS)	6.0	6.0	5.0
TOTAL PARTICULATE MATERIAL COLLECTED(GRAMS) *	.0064	.0062	.0310***
VOLUME THROUGH GAS METER			
METER CONDITION (CF)	33.32	35.31	35.46
STANDARD CONDITION (SCF)	36.63	38.80	39.23
TOTAL SAMPLING TIME (MIN)	60.0	60.0	60.0
NOZZLE DIAMETER (IN)	.184	.184	.184
AVERAGE STACK GAS TEMPERATURE DURING DETERMINATION (DEG-F)	40.	40.	40.
VOLUMETRIC FLOW**			
ACTUAL ..... (ACFM)	12966	13014	13065
DRY STANDARD ... (DSCFM)	12970	13023	13091
ISOKINETIC VARIATION (%)	93.9	99.0	99.6
PARTICLE CONCENTRATION			
ACTUAL ..... (GR/ACF)	.0027	.0025	.0123
DRY STANDARD ... (GR/DSCF)	.0027	.0025	.0122
PARTICLE MASS FLOW (LB/HR)	.29	.27	1.37

* DRY CATCH ONLY
** CALCULATED ON THE BASIS OF VELOCITY PRESSURES MEASURED DURING THIS PARTICULATE DETERMINATION.
*** NOTE: OILY MATERIAL OBSERVED IN SAMPLE

3.2.7 TEST NO. 7 6.43 TERTIARY STORAGE BIN STACK

RESULTS OF PARTICLE CONCENTRATION DETERMINATION -- METHOD 5(BE)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/09/80	01/09/80	01/09/80
TIME RUN START/END(HRS)	1020/1123	1135/1238	1250/1353
PITOT TUBE COEFFICIENT	.870	.870	.870
TOTAL MOISTURE IN GAS SAMPLE (GRAMS)	6.0	5.0	6.0
TOTAL PARTICULATE MATERIAL COLLECTED(GRAMS) *	.0099	.0073	.0073
VOLUME THROUGH GAS METER			
METER CONDITION (CF)	36.01	35.61	36.16
STANDARD CONDITION (SCF)	39.54	39.07	39.63
TOTAL SAMPLING TIME (MIN)	60.0	60.0	60.0
NOZZLE DIAMETER (IN)	.184	.184	.184
AVERAGE STACK GAS TEMPERATURE DURING DETERMINATION (DEG-F)	40.	40.	40.
VOLUMETRIC FLOW**			
ACTUAL ..... (ACFM)	38005	37788	37745
DRY STANDARD ... (DSCFM)	38038	37864	37778
ISOKINETIC VARIATION (%)	99.0	98.3	99.9
PARTICLE CONCENTRATION			
ACTUAL ..... (GR/ACF)	.0039	.0029	.0029
DRY STANDARD ... (GR/DSCF)	.0038	.0029	.0028
PARTICLE MASS FLOW (LB/HR)	1.25	.93	.92

* DRY CATCH ONLY

** CALCULATED ON THE BASIS OF VELOCITY PRESSURES MEASURED DURING THIS PARTICULATE DETERMINATION.

3.2.8 TEST NO. 8 8.43 GRATE-FEED END STACK

RESULTS OF PARTICLE CONCENTRATION DETERMINATION -- METHOD 5(BE)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/09/80	01/09/80	01/09/80
TIME RUN START/END(HRS)	1610/1711	1725/1827	1827/1930
PITOT TUBE COEFFICIENT	.854	.854	.854
TOTAL MOISTURE IN GAS SAMPLE (GRAMS)	21.0	20.0	21.0
TOTAL PARTICULATE MATERIAL COLLECTED(GRAMS) *	.0054	.0029	.0042
VOLUME THROUGH GAS METER			
METER CONDITION (CF)	35.55	35.78	35.30
STANDARD CONDITION (SCF)	38.99	39.67	39.14
TOTAL SAMPLING TIME (MIN)	60.0	60.0	60.0
NOZZLE DIAMETER (IN)	.501	.501	.501
AVERAGE STACK GAS TEMPERATURE DURING DETERMINATION (DEG-F)	74.	73.	74.
VOLUMETRIC FLOW**			
ACTUAL ..... (ACFM)	2368	2385	2351
DRY STANDARD ... (DSCFM)	2185	2207	2168
ISOKINETIC VARIATION (%)	99.5	100.3	100.7
PARTICLE CONCENTRATION			
ACTUAL ..... (GR/ACF)	.0020	.0011	.0015
DRY STANDARD ... (GR/DSCF)	.0021	.0011	.0016
PARTICLE MASS FLOW (LB/HR)	.041	.023	.030

* DRY CATCH ONLY

** CALCULATED ON THE BASIS OF VELOCITY PRESSURES MEASURED DURING THIS PARTICULATE DETERMINATION.

3.2.9 TEST NO. 9 8.47 CONVEYOR TRANSFER STACK

RESULTS OF PARTICLE CONCENTRATION DETERMINATION -- METHOD 5(BE)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/10/80	01/10/80	01/10/80
TIME RUN START/END(HRS)	845/ 945	950/1051	1055/1156
PITOT TUBE COEFFICIENT	.854	.854	.854
TOTAL MOISTURE IN GAS SAMPLE (GRAMS)	26.0	25.0	25.9
TOTAL PARTICULATE MATERIAL COLLECTED(GRAMS) *	.0161	.0154	.0143
VOLUME THROUGH GAS METER			
METER CONDITION (CF)	43.60	42.47	43.07
STANDARD CONDITION (SCF)	46.80	45.11	45.94
TOTAL SAMPLING TIME (MIN)	60.0	60.0	60.0
NOZZLE DIAMETER (IN)	.372	.372	.372
AVERAGE STACK GAS TEMPERATURE DURING DETERMINATION (DEG-F)	70.	70.	70.
VOLUMETRIC FLOW**			
ACTUAL ..... (ACFM)	9650	9629	9546
DRY STANDARD ... (DSCFM)	8956	8937	8857
ISOKINETIC VARIATION (%)	100.6	97.2	99.9
PARTICLE CONCENTRATION			
ACTUAL ..... (GR/ACF)	.0049	.0049	.0045
DRY STANDARD ... (GR/DSCF)	.0053	.0053	.0048
PARTICLE MASS FLOW (LB/HR)	.41	.40	.36

* DRY CATCH ONLY

** CALCULATED ON THE BASIS OF VELOCITY PRESSURES MEASURED DURING THIS PARTICULATE DETERMINATION.

3.2.10 TEST NO. 10 8.49 CONVEYOR TRANSFER STACK

RESULTS OF PARTICLE CONCENTRATION DETERMINATION -- METHOD 5(BE)

	RUN 1	RUN 2	RUN 3
DATE OF RUN	01/10/80	01/10/80	01/10/80
TIME RUN START/END(HRS)	930/1032	1037/1140	1145/1248
PITOT TUBE COEFFICIENT	.840	.840	.840
TOTAL MOISTURE IN GAS SAMPLE (GRAMS)	21.0	22.0	21.0
TOTAL PARTICULATE MATERIAL COLLECTED(GRAMS) *	.0112	.0107	.0087
VOLUME THROUGH GAS METER			
METER CONDITION (CF)	48.99	49.00	49.43
STANDARD CONDITION (SCF)	51.18	51.18	51.37
TOTAL SAMPLING TIME (MIN)	60.0	60.0	60.0
NOZZLE DIAMETER (IN)	.307	.307	.307
AVERAGE STACK GAS TEMPERATURE DURING DETERMINATION (DEG-F)	70.	70.	70.
VOLUMETRIC FLOW**			
ACTUAL ..... (ACFM)	15461	15467	15560
DRY STANDARD ... (DSCFM)	14433	14425	14526
ISOKINETIC VARIATION (%)	100.3	100.3	100.0
PARTICLE CONCENTRATION			
ACTUAL ..... (GR/ACF)	.0032	.0030	.0024
DRY STANDARD ... (GR/DSCF)	.0034	.0032	.0026
PARTICLE MASS FLOW (LB/HR)	.42	.40	.32

* DRY CATCH ONLY

** CALCULATED ON THE BASIS OF VELOCITY PRESSURES [illegible] DURING THIS PARTICULATE DETERMINATION.

3.3 Results of Opacity Observations

3.3.1 TEST NO. 1 SOURCE: No. 6.39 Conveyor Transfer Stack

RESULTS OF OPACITY OBSERVATIONS - EPA METHOD 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0	100
5	.0223	0
10	.0458	0
15	.0706	0
20	.0969	0
25	.1249	0
30	.1549	0
35	.1871	0
40	.2219	0
45	.2596	0
50	.3010	0
55	.3468	0
60	.3979	0
65	.4559	0
70	.5229	0
75	.6021	0
80	.6990	0
85	.8239	0
90	1.000	0
95	1.301	0
100		0
0	0	TIME AVERAGE

OBSERVER: J. Stock

CERTIFICATION DATE: 11-6-79

DATE OF OBSERVATION: 1-8-80

TIME OF OBSERVATION: 1155-1255

3.3.2 TEST NO. 2 SOURCE: No. 6.40 Secondary Bins Stack

RESULTS OF OPACITY OBSERVATIONS - EPA METHOD 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0	100
5	.0223	0
10	.0458	0
15	.0706	0
20	.0969	0
25	.1249	0
30	.1549	0
35	.1871	0
40	.2219	0
45	.2596	0
50	.3010	0
55	.3468	0
60	.3979	0
65	.4559	0
70	.5229	0
75	.6021	0
80	.6990	0
85	.8239	0
90	1.000	0
95	1.301	0
100		0
0	0	TIME AVERAGE

OBSERVER: J. Stock
CERTIFICATION DATE: 11-6-79
DATE OF OBSERVATION: 1-8-80
TIME OF OBSERVATION: 1155-1255

3.3.3 TEST NO. 3 SOURCE: No. 6.34 Conveyor Transfer Stack

RESULTS OF OPACITY OBSERVATIONS - EPA METHOD 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0	100
5	.0223	0
10	.0458	0
15	.0706	0
20	.0969	0
25	.1249	0
30	.1549	0
35	.1871	0
40	.2219	0
45	.2596	0
50	.3010	0
55	.3468	0
60	.3979	0
65	.4559	0
70	.5229	0
75	.6021	0
80	.6990	0
85	.8239	0
90	1.000	0
95	1.301	0
100		0
0	0	TIME AVERAGE

OBSERVER: E. Trowbridge

CERTIFICATION DATE: 11-6-79

DATE OF OBSERVATION: 1-8-80

TIME OF OBSERVATION: 0830-0930

3.3.4 TEST NO. 4 SOURCE: No. 6.44 Tertiary Crusher Stack

RESULTS OF OPACITY OBSERVATIONS - EPA METHOD 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0	100
5	.0223	0
10	.0458	0
15	.0706	0
20	.0969	0
25	.1249	0
30	.1549	0
35	.1871	0
40	.2219	0
45	.2596	0
50	.3010	0
55	.3468	0
60	.3979	0
65	.4559	0
70	.5229	0
75	.6021	0
80	.6990	0
85	.8239	0
90	1.000	0
95	1.301	0
100		0
0	0	TIME AVERAGE

OBSERVER: E. Trowbridge

CERTIFICATION DATE: 11-6-79

DATE OF OBSERVATION: 1-8-80

TIME OF OBSERVATION: 1300-1400

3.3.5 TEST NO. 5 SOURCE: No. 6.41 Conveyor Transfer Stack

RESULTS OF OPACITY OBSERVATION - EPA METHOD 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0	100
5	.0223	0
10	.0458	0
15	.0706	0
20	.0969	0
25	.1249	0
30	.1549	0
35	.1871	0
40	.2219	0
45	.2596	0
50	.3010	0
55	.3468	0
60	.3979	0
65	.4559	0
70	.5229	0
75	.6021	0
80	.6990	0
85	.8239	0
90	1.000	0
95	1.301	0
100		0
0	0	TIME AVERAGE

OBSERVER: J. Stock

CERTIFICATION DATE: 11-6-79

DATE OF OBSERVATION: 1-9-80

TIME OF OBSERVATION: 0900-1000

3.3.6 TEST NO. 6 SOURCE: No. 6.56 Conveyor Transfer Stack

RESULTS OF OPACITY OBSERVATIONS - EPA METHOD 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0	100
5	.0223	0
10	.0458	0
15	.0706	0
20	.0969	0
25	.1249	0
30	.1549	0
35	.1871	0
40	.2219	0
45	.2596	0
50	.3010	0
55	.3468	0
60	.3979	0
65	.4559	0
70	.5229	0
75	.6021	0
80	.6990	0
85	.8239	0
90	1.000	0
95	1.301	0
100		0
0	0	TIME AVERAGE

OBSERVER: E. Trowbridge

CERTIFICATION DATE: 11-6-79

DATE OF OBSERVATION: 1-9-80

TIME OF OBSERVATION: 1400-1500

3.3.7 TEST NO. 7 SOURCE: No. 6.43 Tertiary Storage Bin Stack

RESULTS OF OPACITY OBSERVATIONS - EPA METHOD 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0	100
5	.0223	0
10	.0458	0
15	.0706	0
20	.0969	0
25	.1249	0
30	.1549	0
35	.1871	0
40	.2219	0
45	.2596	0
50	.3010	0
55	.3468	0
60	.3979	0
65	.4559	0
70	.5229	0
75	.6021	0
80	.6990	0
85	.8239	0
90	1.000	0
95	1.301	0
100		0
0	0	TIME AVERAGE

OBSERVER: E. Trowbridge

CERTIFICATION DATE: 11-6-79

DATE OF OBSERVATION: 1-9-80

TIME OF OBSERVATION: 1250-1350

3.3.8 TEST NO. 8 SOURCE: No. 8.43 Grate Feed End Stack

RESULTS OF OPACITY OBSERVATIONS - EPA METHOD 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0	100
5	.0223	0
10	.0458	0
15	.0706	0
20	.0969	0
25	.1249	0
30	.1549	0
35	.1871	0
40	.2219	0
45	.2596	0
50	.3010	0
55	.3468	0
60	.3979	0
65	.4559	0
70	.5229	0
75	.6021	0
80	.6990	0
85	.8239	0
90	1.000	0
95	1.301	0
100		0
0	0	TIME AVERAGE

OBSERVER: J. Stock

CERTIFICATION DATE: 11-6-79

DATE OF OBSERVATION: 1-9-80

TIME OF OBSERVATION: 1600-1700

3.3.9 TEST NO. 9 SOURCE: No. 8.47 Conveyor Transfer Stack

RESULTS OF OPACITY OBSERVATIONS - EPA METHOD 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0	100
5	.0223	0
10	.0458	0
15	.0706	0
20	.0969	0
25	.1249	0
30	.1549	0
35	.1871	0
40	.2219	0
45	.2596	0
50	.3010	0
55	.3468	0
60	.3979	0
65	.4559	0
70	.5229	0
75	.6021	0
80	.6990	0
85	.8239	0
90	1.000	0
95	1.301	0
100		0
0	0	TIME AVERAGE

OBSERVER: J. Stock

CERTIFICATION DATE: 11-12-79

DATE OF OBSERVATION: 1-10-80

TIME OF OBSERVATION: 0900-1000

3.3.10 TEST NO. 10 SOURCE: No. 8.49 Conveyor Transfer Stack

RESULTS OF OPACITY OBSERVATIONS - EPA METHOD 9

PERCENT OPACITY	OPTICAL DENSITY	RELATIVE FREQUENCY (%)
0	0	100
5	.0223	0
10	.0458	0
15	.0706	0
20	.0969	0
25	.1249	0
30	.1549	0
35	.1871	0
40	.2219	0
45	.2596	0
50	.3010	0
55	.3468	0
60	.3979	0
65	.4559	0
70	.5229	0
75	.6021	0
80	.6990	0
85	.8239	0
90	1.000	0
95	1.301	0
100		0
0	0	TIME AVERAGE

OBSERVER: E. Trowbridge

CERTIFICATION DATE: 11-6-79

DATE OF OBSERVATION: 1-10-80

TIME OF OBSERVATION: 0900-1000

APPENDIX A

RESULTS OF PRELIMINARY MEASUREMENTS

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 1 6.39 CONVEYOR TRANSFER STACK

RESULTS OF FLOW DETERMINATION -- METHOD 2

TIME AND DATE	745 HRS, 01/08/80
BAROMETRIC PRESSURE (UNCOMPENSATED IN.HG.)	29.00
PITOT TUBE COEFFICIENT	.854
NUMBER OF SAMPLING PORTS	2
TOTAL NUMBER OF POINTS SAMPLED	12
DUCT OR STACK DIAMETER (IN.)	36.000
CROSS SECTIONAL AREA (SQ.FT)	7.07
DIRECTION OF FLOW	VERTICAL UP
STATIC PRESSURE (IN.WC.)	.19
AVERAGE GAS TEMPERATURE (DEG-F)	40
ABSOLUTE GAS PRESSURE (IN.HG.)	[illegible]
AVERAGE MOISTURE CONTENT (V/V)	.8
AVERAGE LINEAR VELOCITY (FT/SEC)	
(STANDARD DEVIATION, FT/SEC)	
VOLUMETRIC FLOW	
ACTUAL (ACFM)	
DRY STANDARD (SDCFM)	
MASS FLOW OF GAS - WET (LB/HR)	[illegible]

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 1 6.39 CONVEYOR TRANSFER STACK

APPENDIX A -- POINT VELOCITY AND TEMPERATURE DATA

PORT/POINT	GAS TEMPERATURE (DEG-F)	LINEAR VELOCITY (FT/SEC)
A/ 1	40	59.3
A/ 2	40	59.3
A/ 3	40	61.9
A/ 4	40	59.3
A/ 5	40	61.9
A/ 6	40	64.5
B/ 1	40	61.9
B/ 2	40	61.9
B/ 3	40	59.3
B/ 4	40	61.9
B/ 5	40	61.9
B/ 6	40	59.3

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO 0-694

TEST NO. 2 6.40 SECONDARY BIN STACK

RESULTS OF FLOW DETERMINATION -- METHOD 2

TIME AND DATE	1145 HRS, 01/08/80
BAROMETRIC PRESSURE (UNCOMPENSATED IN.HG.)	29.00
PITOT TUBE COEFFICIENT	.854
NUMBER OF SAMPLING PORTS	2
TOTAL NUMBER OF POINTS SAMPLED	12
DUCT OR STACK DIAMETER (IN.)	24.000
CROSS SECTIONAL AREA (SQ.FT)	3.14
DIRECTION OF FLOW	VERTICAL UP
STATIC PRESSURE (IN.WC.)	[illegible]
AVERAGE GAS TEMPERATURE (DEG-F)	40[illegible]
ABSOLUTE GAS PRESSURE (IN.HG.)	29.02
AVERAGE MOISTURE CONTENT (V/V)	.85
AVERAGE LINE[illegible]	[illegible]
(STANDARD [illegible] ATION, FT/SEC)	[illegible]
VOLUMETRIC F[illegible]	[illegible]
[illegible]	[illegible]
[illegible]SS FLOW [illegible]	[illegible]

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO 0-694

TEST NO. 2 6.40 SECONDARY BIN STACK

APPENDIX A -- POINT VELOCITY AND TEMPERATURE DATA

PORT/POINT	GAS TEMPERATURE (DEG-F)	LINEAR VELOCITY (FT/SEC)
A/ 1	40	61.9
A/ 2	40	61.9
A/ 3	40	64.5
A/ 4	40	64.5
A/ 5	40	64.5
A/ 6	40	68.1
B/ 1	40	64.5
B/ 2	40	64.5
B/ 3	40	65.7
B/ 4	40	66.9
B/ 5	40	66.9
B/ 6	40	66.9

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 3 6.34 CONVEYOR TRANSFER STACK

RESULTS OF FLOW DETERMINATION -- METHOD 2

TIME AND DATE	1015 HRS. 01/08/80
BAROMETRIC PRESSURE (UNCOMPENSATED IN.HG.)	29.00
PITOT TUBE COEFFICIENT	.840
NUMBER OF SAMPLING PORTS	[illegible]
TOTAL NUMBER OF POINTS SAMPLED	[illegible]
DUCT OR STACK DIAMETER (IN.)	8.000
CROSS SECTIONAL AREA (SQ.FT)	1.28
DIRECTION OF FLOW	UP
STATIC PRESSURE (IN.WC.)	[illegible]
AVERAGE GAS TEMPERATURE (DEG-F)	[illegible]
ABSOLUTE GAS PRESSURE (IN.HG.)	[illegible]
AVERAGE MOISTURE CONTENT (%V)	[illegible]
AVERAGE LINEAR VELOCITY (FT/SE)	[illegible]
(STANDARD DEVIATION, FT/SE)	[illegible]
VOLUMETRIC FLOW	
ACTUAL (ACFM)	[illegible]
DRY STANDARD	[illegible]
MASS FLOW OF GAS	[illegible]

JOB: US.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 3 6.34 CONVEYOR TRANSFER STACK

APPENDIX A -- POINT VELOCITY AND TEMPERATURE DATA

PORT/POINT	GAS TEMPERATURE (DEG-F)	LINEAR VELOCITY (FT/SEC)
A/ 1	40	49.7
A/ 2	40	51.3
A/ 3	40	51.0
A/ 4	40	54.[illegible]
A/ 5	40	55.[illegible]
A/ 6	40	58.[illegible]
B/ 1	40	55.6
B/ 2	40	53.9
B/ 3	40	53.9
B/ 4	40	55.6
B/ 5	40	56.6
B/ 6	40	54.[illegible]

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 4 6.44 TERTIARY CRUSHER STACK

RESULTS OF FLOW DETERMINATION -- METHOD 2

TIME AND DATE	1420 HRS, 01/08/80
BAROMETRIC PRESSURE (UNCOMPENSATED IN.HG.)	29.00
PITOT TUBE COEFFICIENT	.840
NUMBER OF SAMPLING PORTS	2
TOTAL NUMBER OF POINTS SAMPLED	12
DUCT OR STACK DIAMETER (IN.)	36.000
CROSS SECTIONAL AREA (SQ.FT)	7.07
DIRECTION OF FLOW	VERTICAL UP
STATIC PRESSURE (IN.WC.)	.42
AVERAGE GAS TEMPERATURE (DEG-F)	45.
ABSOLUTE GAS PRESSURE (IN.HG.)	29.02
AVERAGE MOISTURE CONTENT (V/V)	[illegible]
AVERAGE FLUE GAS VELOCITY (FT/SEC)	[illegible]
(STAND. DEVIATION [illegible] SEC)	[illegible]
VOLUMETRIC FLOW	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]
[illegible]	[illegible]

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 4 6.44 TERTIARY CRUSHER STACK

APPENDIX A -- POINT VELOCITY AND TEMPERATURE DATA

PORT/POINT	GAS TEMPERATURE (DEG-F)	LINEAR VELOCITY (FT/SEC)
A/ 1	45	51.8
A/ 2	45	53.0
A/ 3	45	54.2
A/ 4	45	58.1
A/ 5	45	57.3
A/ 6	45	58.6
B/ 1	45	54.5
B/ 2	45	54.8
B/ 3	45	55.9
B/ 4	45	54.2
B/ 5	45	54.8
B/ 6	45	[illegible]

JOB: U.S. MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 5 6.41 CONVEYOR TRNASFER STACK

RESULTS OF FLOW DETERMINATION -- METHOD 2

TIME AND DATE	900 HRS, 01/09/80
BAROMETRIC PRESSURE (UNCOMPENSATED IN.HG.)	28.60
PITOT TUBE COEFFICIENT	.854
NUMBER OF SAMPLING PORTS	
TOTAL NUMBER OF POINTS SAMPLED	12
DUCT OR STACK DIAMETER (IN.)	29.000
CROSS SECTIONAL AREA (SQ.FT)	4.59
DIRECTION OF FLOW	VERTICAL/UP
STATIC PRESSURE (IN.WC)	
AVERAGE GAS TEMPERATURE (DEG-F)	41
ABSOLUTE GAS PRESSURE (IN.HG.)	28.62
AVERAGE MOISTURE CONTENT (V/V)	.81
AVERAGE LINEAR VELOCITY (FT/SEC)	8
STANDARD DEVIATION (FT/SEC)	
VOLUMETRIC FLOW	
ACTUAL (ACFM)	
DRY STANDARD (SDCFM)	
MASS FLOW OF GAS - WET STANDARD	

JOB: U.S. MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 5 6.41 CONVEYOR TRNASFER STACK

APPENDIX A -- POINT VELOCITY AND TEMPERATURE DATA

PORT/POINT	GAS TEMPERATURE (DEG-F)	LINEAR VELOCITY (FT/SEC)
A/ 1	41	59.7
A/ 2	41	58.4
A/ 3	41	57.0
A/ 4	41	[illegible]
A/ 5	41	[illegible]
A/ 6	41	[illegible]
B/ 1	41	[illegible]
B/ 2	41	[illegible]
B/ 3	41	[illegible]
B/ 4	41	[illegible]
B/ 5	41	[illegible]
B/ 6	41	

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 6 6.56 CONVEYOR TRANSFER STACK

RESULTS OF FLOW DETERMINATION -- METHOD 2

TIME AND DATE	1450 HRS, 01/09/80
BAROMETRIC PRESSURE (UNCOMPENSATED IN.HG.)	28.60
PITOT TUBE COEFFICIENT	.8870
NUMBER OF SAMPLING PORTS	2
TOTAL NUMBER OF POINTS SAMPLED	12
DUCT OR STACK DIAMETER (IN.)	26.000
CROSS SECTIONAL AREA (SQ.FT)	3.62
DIRECTION OF FLOW	VERTICAL UP
STATIC PRESSURE (IN.HG)	[illegible]
AVERAGE GAS TEMPERATURE (DEG.F)	[illegible]
ABSOLUTE GAS PRESSURE (IN.HG.)	[illegible]
AVERAGE MOISTURE CONTENT (%V)	[illegible]
AVERAGE LINEAR VELOCITY	[illegible]
(STANDARD DEVIATION)	[illegible]
VOLUMETRIC FLOW	
ACTUAL (ACFM)	
DRY STANDARD	
MASS FLOW OF GAS	

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 6 6.56 CONVEYOR TRANSFER STACK

APPENDIX A -- POINT VELOCITY AND TEMPERATURE DATA

PORT/POINT	GAS TEMPERATURE (DEG-F)	LINEAR VELOCITY (FT/SEC)
A/ 1	40	51.9
A/ 2	40	55.0
A/ 3	40	56.5
A/ 4	40	58.0
A/ 5	40	59.4
A/ 6	40	62.2
B/ 1	40	53.5
B/ 2	40	56.5
B/ 3	40	57.4
B/ 4	40	60.8
B/ 5	40	60.8
B/ 6	40	64.9

JOB: U.S. STEEL [illegible]

INTERPOLL REPORT NO. 0-494

TEST NO. 7 6.43 TERTIARY STORAGE BIN STACK

RESULTS OF FLOW DETERMINATION -- METHOD 2

TIME AND DATE	[illegible] 01/09/80
BAROMETRIC PRESSURE (UNCOMPENSATED IN HG.)	28.60
PITOT TUBE COEFFICIENT	.870
NUMBER OF SAMPLING PORTS	2
TOTAL NUMBER OF POINTS SAMPLED	12
DUCT OR STACK DIAMETER (IN.)	44.000
CROSS SECTIONAL AREA (SQ.FT)	10.56
DIRECTION OF FLOW	VERTICAL,UP
STATIC PRESSURE (IN.WC.)	-.38
AVERAGE GAS TEMPERATURE (DEG-F)	40.
ABSOLUTE GAS PRESSURE (IN.HG.)	28.57
AVERAGE MOISTURE CONTENT (V/V)	.67
AVERAGE LINEAR VELOCITY (FT/SEC)	60.1
(STANDARD DEVIATION, FT/SEC)	3.1
VOLUMETRIC FLOW	
ACTUAL (ACFM)	38052
DRY STANDARD (SDCFM)	39099
MASS FLOW OF GAS - WET (LB/HR)	171979

TEST NO. 7 6.43 TERTIARY STORAGE BIN STACK

APPENDIX A -- POINT VELOCITY AND TEMPERATURE DATA

PORT/POINT	GAS TEMPERATURE (DEG-F)	LINEAR VELOCITY (FT/SEC)
A/ 1	40	60.8
A/ 2	40	59.4
A/ 3	40	59.4
A/ 4	40	58.0
A/ 5	40	56.5
A/ 6	40	55.0
B/ 1	40	64.8
B/ 2	40	63.5
B/ 3	40	63.5
B/ 4	40	60.8
B/ 5	40	62.2
B/ 6	40	56.5

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-494

TEST NO. 8 8.43 GRATE-FEED END STACK

RESULTS OF FLOW DETERMINATION -- METHOD 2

TIME AND DATE	1400 HRS. 01/09/80
BAROMETRIC PRESSURE (UNCOMPENSATED IN.HG.)	28.60
PITOT TUBE COEFFICIENT	.854
NUMBER OF SAMPLING PORTS	2
TOTAL NUMBER OF POINTS SAMPLED	12
DUCT OR STACK DIAMETER (IN.)	29.000
CROSS SECTIONAL AREA (SQ.FT)	4.59
DIRECTION OF FLOW	VERTICAL,UP
STATIC PRESSURE (IN.WC.)	.50
AVERAGE GAS TEMPERATURE (DEG-F)	70.
ABSOLUTE GAS PRESSURE (IN.HG.)	28.42
AVERAGE MOISTURE CONTENT (V/V)	2.42
AVERAGE LINEAR VELOCITY (FT/SEC)	8.5
(STANDARD DEVIATION, FT/SEC)	.2
VOLUMETRIC FLOW	
ACTUAL (ACFM)	2328
DRY STANDARD (SDCFM)	2164
MASS FLOW OF GAS - WET (LB/HR)	9880

TEST NO. 8 8.43 GRATE-FEED END STACK

APPENDIX A -- POINT VELOCITY AND TEMPERATURE DATA

PORT/POINT	GAS TEMPERATURE (DEG-F)	LINEAR VELOCITY (FT/SEC)
A/ 1	70	8.3
A/ 2	70	8.5
A/ 3	70	8.3
A/ 4	70	8.3
A/ 5	70	9.1
A/ 6	70	8.7
B/ 1	70	8.3
B/ 2	70	8.3
B/ 3	70	8.5
B/ 4	70	8.5
B/ 5	70	8.3
B/ 6	70	8.3

JOB: U.S. STEEL HUNTAC

INTERPOLL REPORT NO. 0-494

TEST NO. 9 8.47 CONVERTER TRANSFER STATE

RESULTS OF FLOW DETERMINATION -- METHOD 2

TIME AND DATE	800 HRS, 01/10/80
BAROMETRIC PRESSURE (UNCOMPENSATED IN.HG.)	28.60
PITOT TUBE COEFFICIENT	.854
NUMBER OF SAMPLING PORTS	2
TOTAL NUMBER OF POINTS SAMPLED	12
DUCT OR STACK DIAMETER (IN.)	40.000
CROSS SECTIONAL AREA (SQ.FT)	8.73
DIRECTION OF FLOW	VERTICAL,UP
STATIC PRESSURE (IN.WC.)	.20
AVERAGE GAS TEMPERATURE (DEG-F)	70.
ABSOLUTE GAS PRESSURE (IN.HG.)	28.61
AVERAGE MOISTURE CONTENT (V/V)	2.36
AVERAGE LINEAR VELOCITY (FT/SEC)	18.4
(STANDARD DEVIATION, FT/SEC)	.3
VOLUMETRIC FLOW	
ACTUAL (ACFM)	9642
DRY STANDARD (SDCFM)	8947
MASS FLOW OF GAS - WET (LB/HR)	40880

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 9 8.47 CONVEYOR TRANSFER STACK

APPENDIX A -- POINT VELOCITY AND TEMPERATURE DATA

PORT/POINT	GAS TEMPERATURE (DEG-F)	LINEAR VELOCITY (FT/SEC)
A/ 1	70	18.6
A/ 2	70	18.6
A/ 3	70	18.5
A/ 4	70	18.4
A/ 5	70	18.1
A/ 6	70	18.6
B/ 1	70	18.6
B/ 2	70	18.6
B/ 3	70	18.6
B/ 4	70	18.6
B/ 5	70	17.6
B/ 6	70	18.2

JOB: U.S. STEEL MINNTAC

INTERPOLL REPORT NO. 0-694

TEST NO. 10 8.49 CONVEYOR TRANSFER STACK

RESULTS OF FLOW DETERMINATION -- METHOD 2

TIME AND DATE	915 HRS. 01/10/80
BAROMETRIC PRESSURE (UNCOMPENSATED IN.HG.)	28.60
PITOT TUBE COEFFICIENT	.840
NUMBER OF SAMPLING PORTS	2
TOTAL NUMBER OF POINTS SAMPLED	12
DUCT OR STACK DIAMETER (IN.)	40.000
CROSS SECTIONAL AREA (SQ.FT)	8.73
DIRECTION OF FLOW	VERTICAL,UP
STATIC PRESSURE (IN.WC.)	-.15
AVERAGE GAS TEMPERATURE (DEG-F)	70.
ABSOLUTE GAS PRESSURE (IN.HG.)	28.59
AVERAGE MOISTURE CONTENT (V/V)	1.92
AVERAGE LINEAR VELOCITY (FT/SEC)	29.6
(STANDARD DEVIATION, FT/SEC)	.8
VOLUMETRIC FLOW	
ACTUAL (ACFM)	15518
DRY STANDARD (SDCFM)	14482
MASS FLOW OF GAS - WET (LB/HR)	65893

JOB: U.S. STEEL MINNTAC

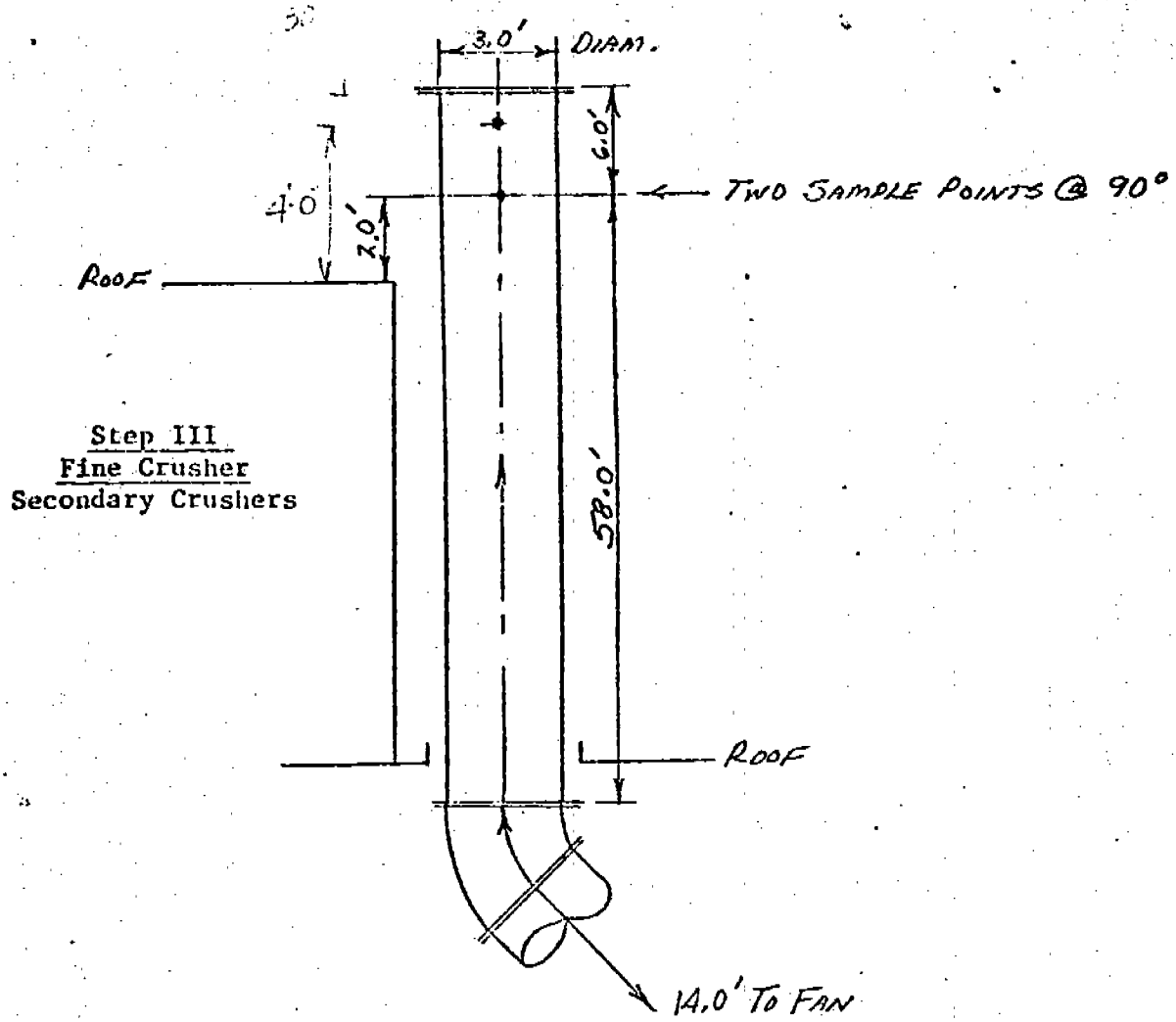
INTERPOLL REPORT NO. 0-694

TEST NO. 10 8.49 CONVEYOR TRANSFER STACK

APPENDIX A -- POINT VELOCITY AND TEMPERATURE DATA

PORT/POINT	GAS TEMPERATURE (DEG-F)	LINEAR VELOCITY (FT/SEC)
A/ 1	70	29.5
A/ 2	70	29.5
A/ 3	70	29.5
A/ 4	70	28.3
A/ 5	70	30.6
A/ 6	70	29.5
B/ 1	70	28.3
B/ 2	70	29.5
B/ 3	70	30.6
B/ 4	70	29.5
B/ 5	70	30.6
B/ 6	70	30.6

APPENDIX B
LOCATION OF TEST PORTS
AND TRAVERSE POINTS



ELEVATION VIEW

1 - Emission source number - 6.39.
2 - Emission source flow sheet no. -078-03-1C1.
3 - Stack diameter - 3.0'.
4 - Stack design gas velocity - 61 FPS.
5 - Stack design gas volume - 26,000 CFM.
6 - Stack design gas temperature - 50 to 70°F.
7 - Pollutant - taconite dust.
8 - Stack loading - 0.009 GR/Cubic feet.
9 - Traverse Points - 12

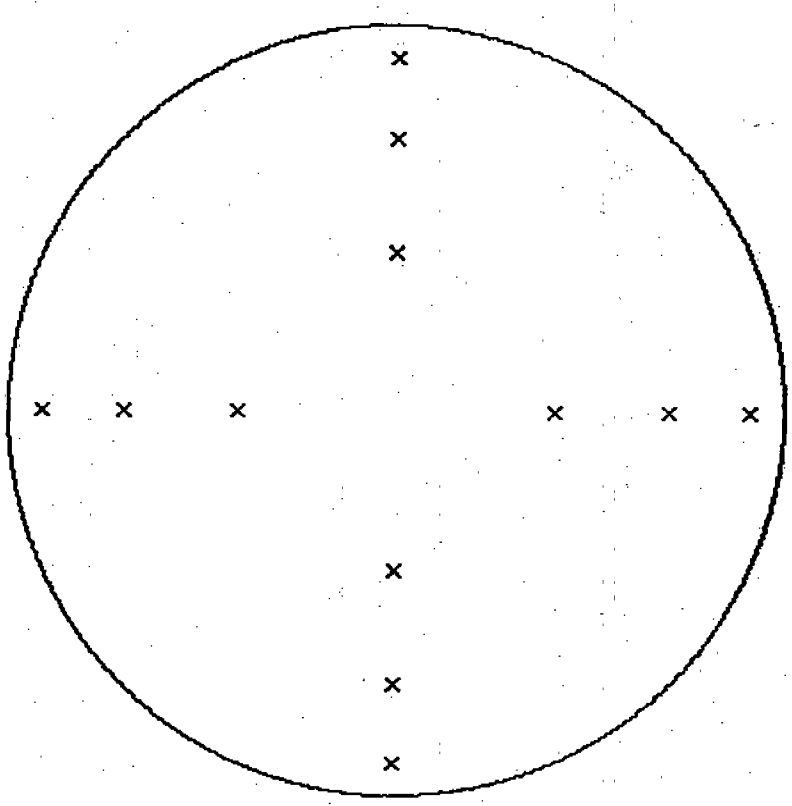
Step III Fine Crusher
Minnesota Ore Operations
Minntac, Mt. Iron, Minn.

REVISED 5-8-79

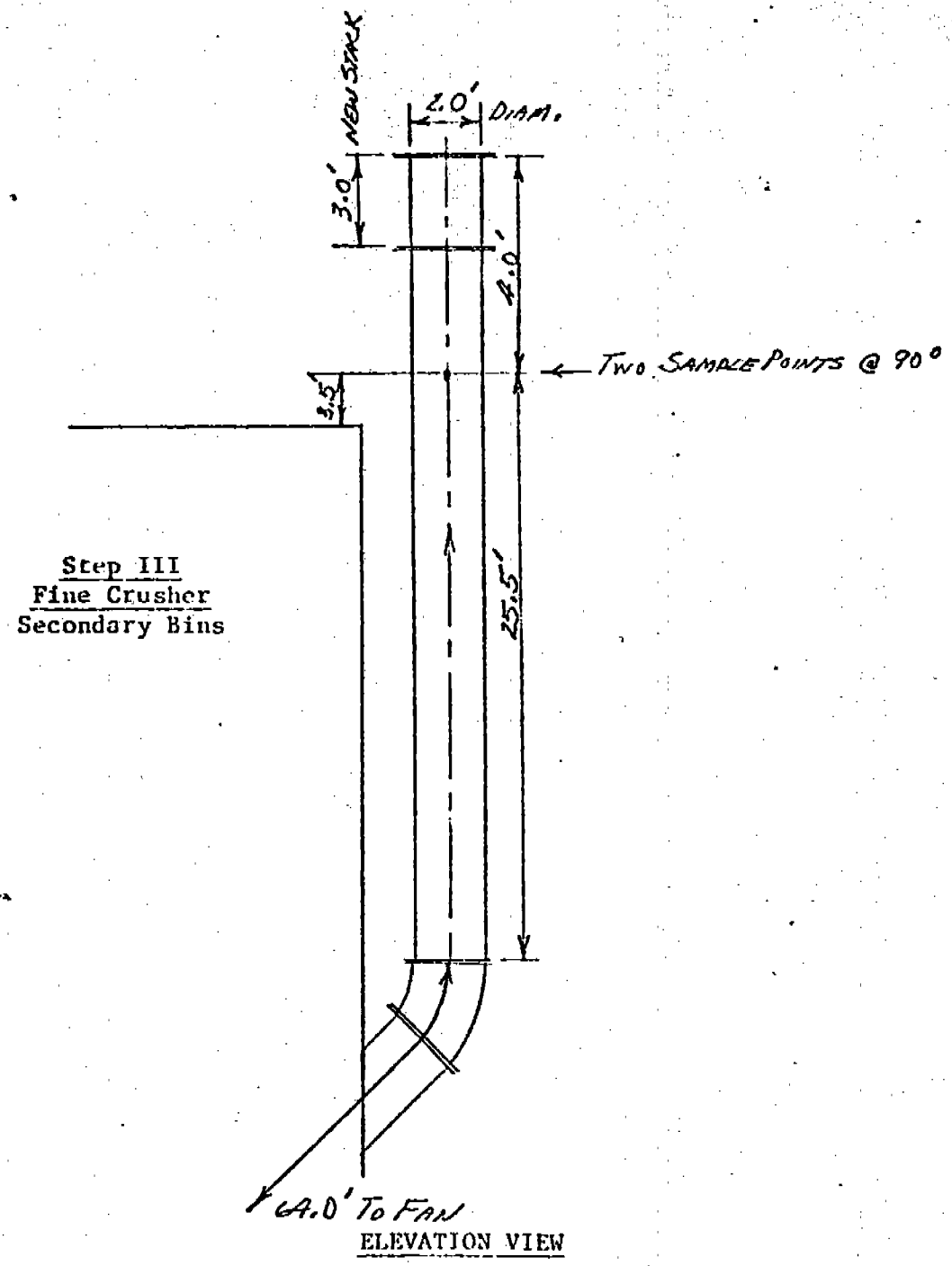
LOCATION OF TRAVERSE POINTS

TEST NO. 1

LOCATION - 6.39 CONVEYOR TRANSFER STACK



DIAMETER (IN.)	36.0
NUMBER OF PORTS	2
NUMBER OF POINTS TRAVERSED	12



Step III
Fine Crusher
Secondary Bins

1 - Emission source number - 6.40.
2 - Emission source flow sheet no. - 078-03-6G1.
3 - Stack diameter - 2.0'.
4 - Stack design gas velocity - 58 FPS.
5 - Stack design gas volume - 11,000 CFM.
6 - Stack design gas temperature - 50 to 70°F.
7 - Pollutant - taconite dust.
8 - Stack loading - 0.005 GR/Cubic Ft
9 - Traverse Points - 8

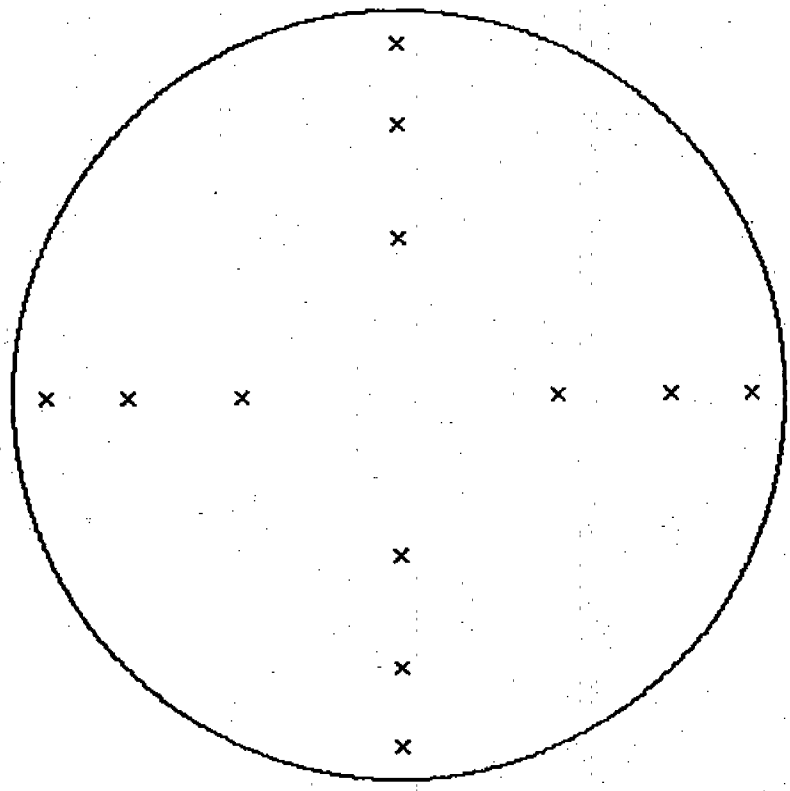
Step III Fine Crusher
Minnesota Ore Operations
Minntac, Mt. Iron, Minn.

REVISED 5-8-79

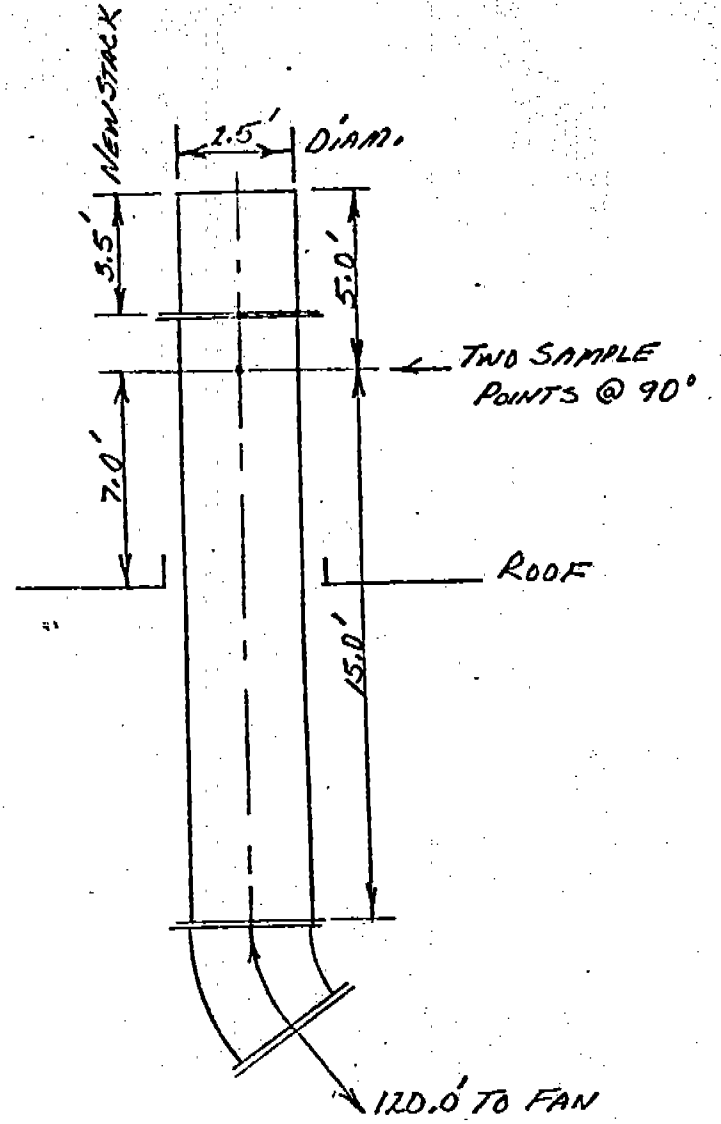
LOCATION OF TRAVERSE POINTS

TEST NO. 2

LOCATION - 6.40 SECONDARY BIN STACK



DIAMETER (IN.)	24.0
NUMBER OF PORTS	2
NUMBER OF POINTS TRAVERSED	12



Elevation View

Step III Fine Crusher
Conveyor Transfer 008 to 009

1. Emission Source Number - 6.34
2. " " Flow Sheet Number - 078-03-7G1
3. Stack Diameter - 2.5'
4. " Design Gas Velocity - 54 FPS
5. " " " Volume - 16,000 CFM
6. " " " Temperature - 50 to 70°F
7. Pollutant - Taconite Dust
8. Stack Loading - 0.009 GR/Cubic Ft
9. Traverse Points - 24

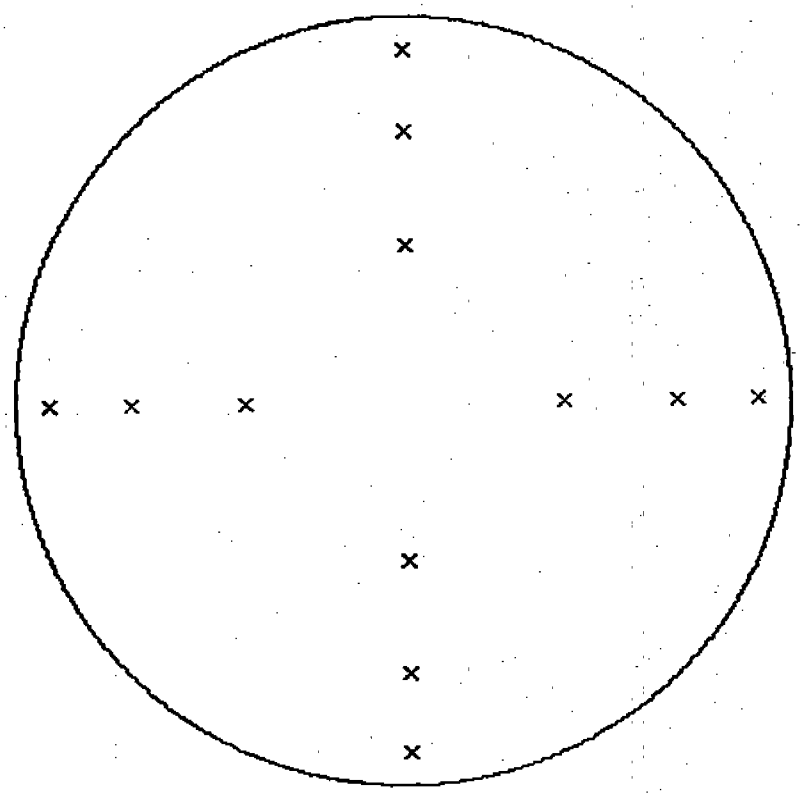
Step III Fine Crusher
Minnesota Ore Operations
Minntac, Mt. Iron, Minnesota

REVISED 5-8-79

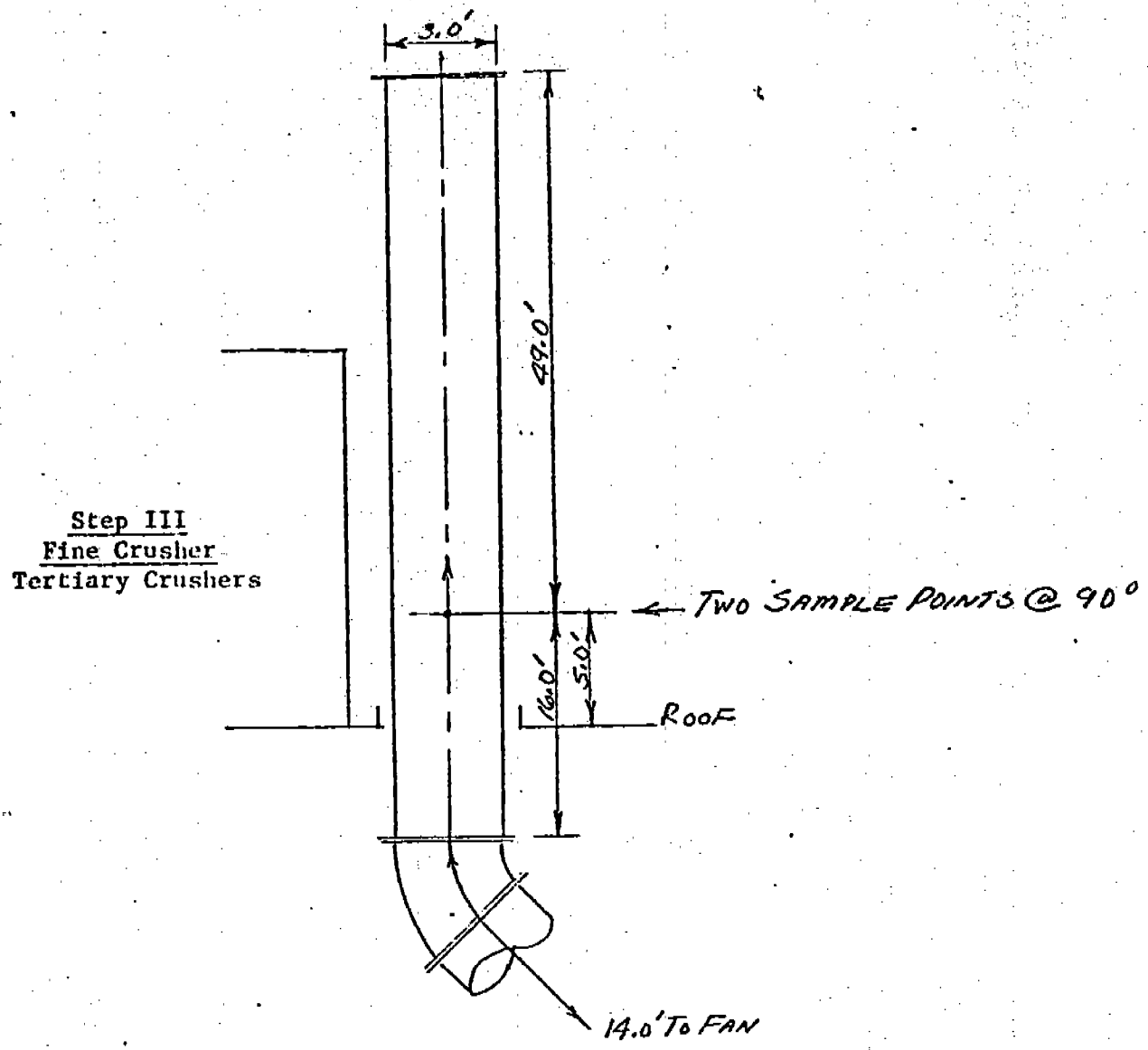
LOCATION OF TRAVERSE POINTS

TEST NO. 3

LOCATION - 6.34 CONVEYOR TRANSFER STACK



DIAMETER (IN.)	28.0
NUMBER OF PORTS	2
NUMBER OF POINTS TRAVERSED	12



ELEVATION VIEW

1 - Emission source number - 6.44.
2 - Emission source flow sheet no. - 078-03-8G1.
3 - Stack diameter - 3.0'.
4 - Stack design gas velocity - 54 FPS.
5 - Stack design gas volume - 23,000 CFM.
6 - Stack design gas temperature - 50 to 70°F.
7 - Pollutant - taconite dust.
8 - Stack loading - 0.007 GR/Cubic feet.
9 - Traverse Points - 28

Step III Fine Crusher
Minnesota Ore Operations
Minntac, Mt. Iron, Minn.

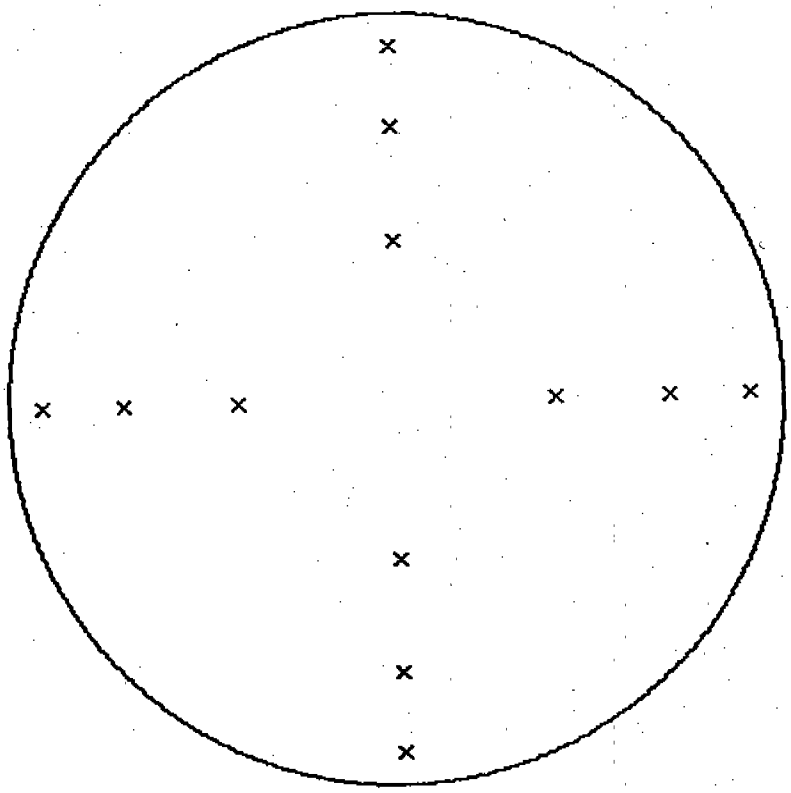
REVISED 5-8-79

JOB: U.S. STEEL MINNTAC
INTERPOLL REPORT NO. 0-694
APPENDIX B

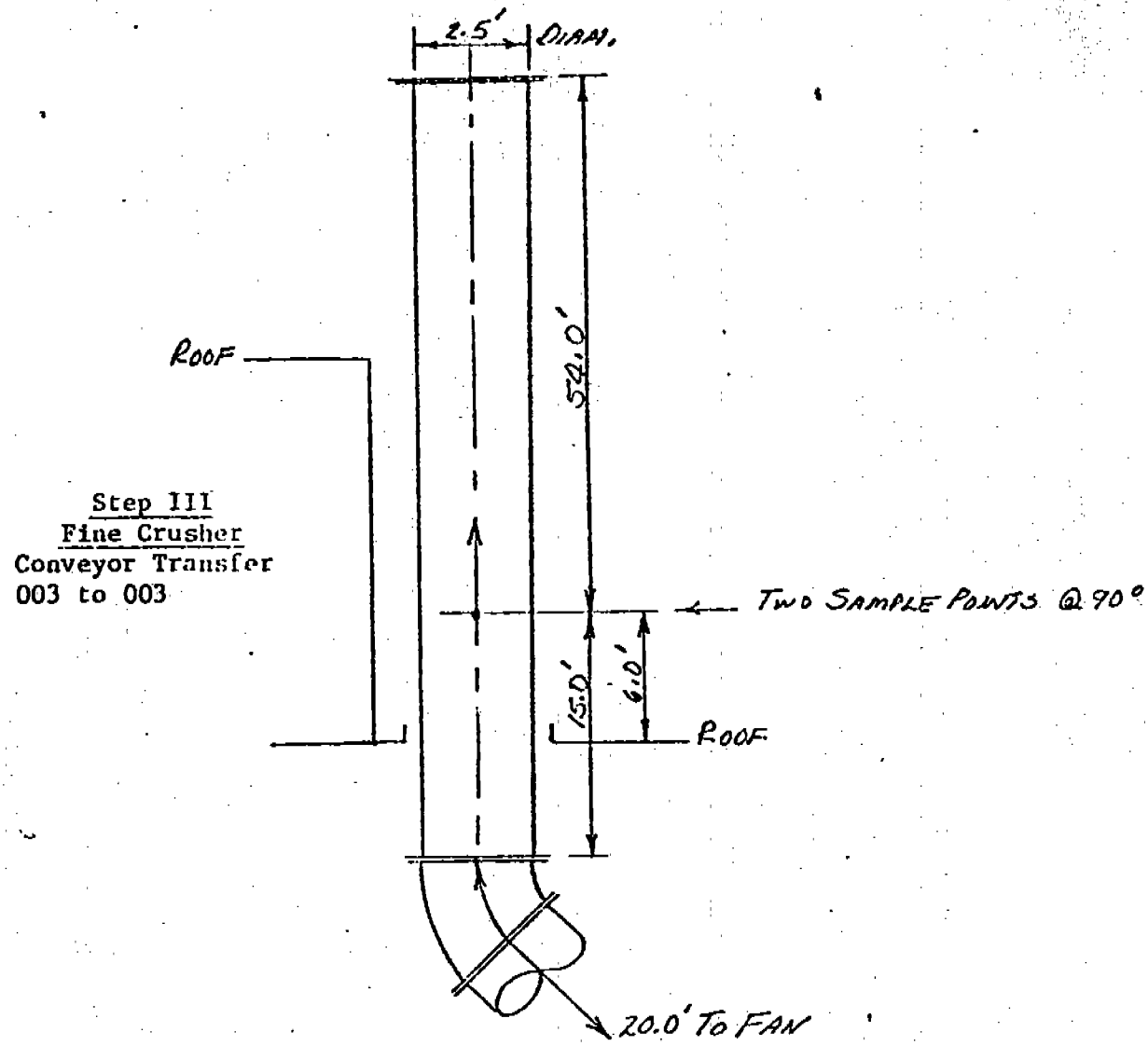
LOCATION OF TRAVERSE POINTS

TEST NO. 4

LOCATION - 6.44 TERTIARY CRUSHER STACK



DIAMETER (IN.)	36.0
NUMBER OF PORTS	2
NUMBER OF POINTS TRAVERSED	12



ELEVATION VIEW

1 - Emission source number - 6.41.
2 - Emission source flow sheet no. - 078-03-22G1.
3 - Stack diameters - 2.5'.
4 - Stack design gas velocity - 54 FPS.
5 - Stack design gas volume - 16,000 CFM.
6 - Stack design gas temperature - 50 to 70°F.
7 - Pollutant - taconite dust.
8 - Stack loading - 0.012 GR/Cubic feet.
9 - Traverse Points - 24

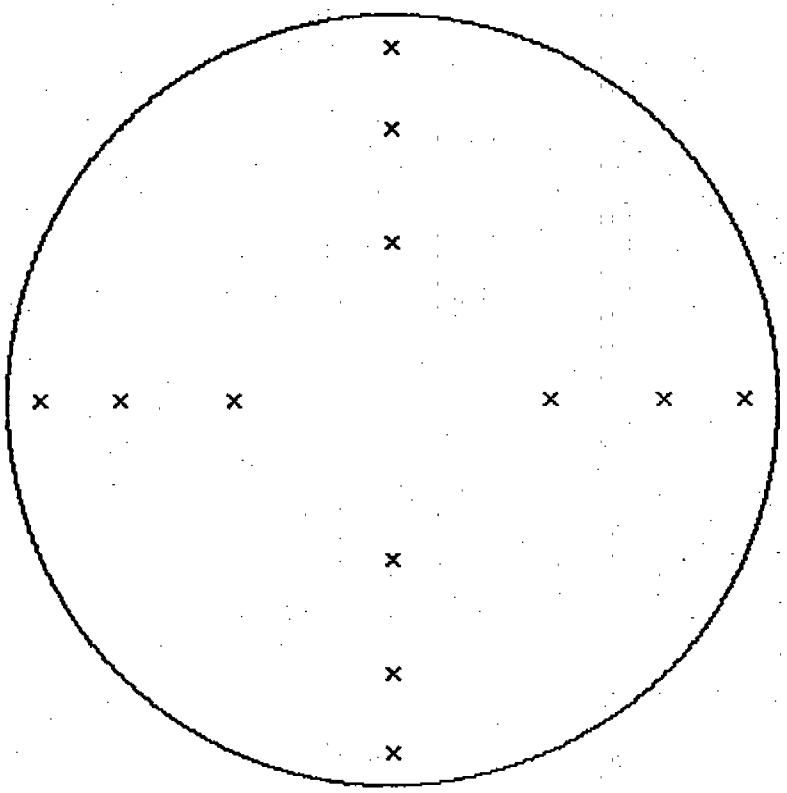
Step III Fine Crusher
Minnesota Ore Operations
Minntac, Mt. Iron, Minn.

REVISED 5-8-77

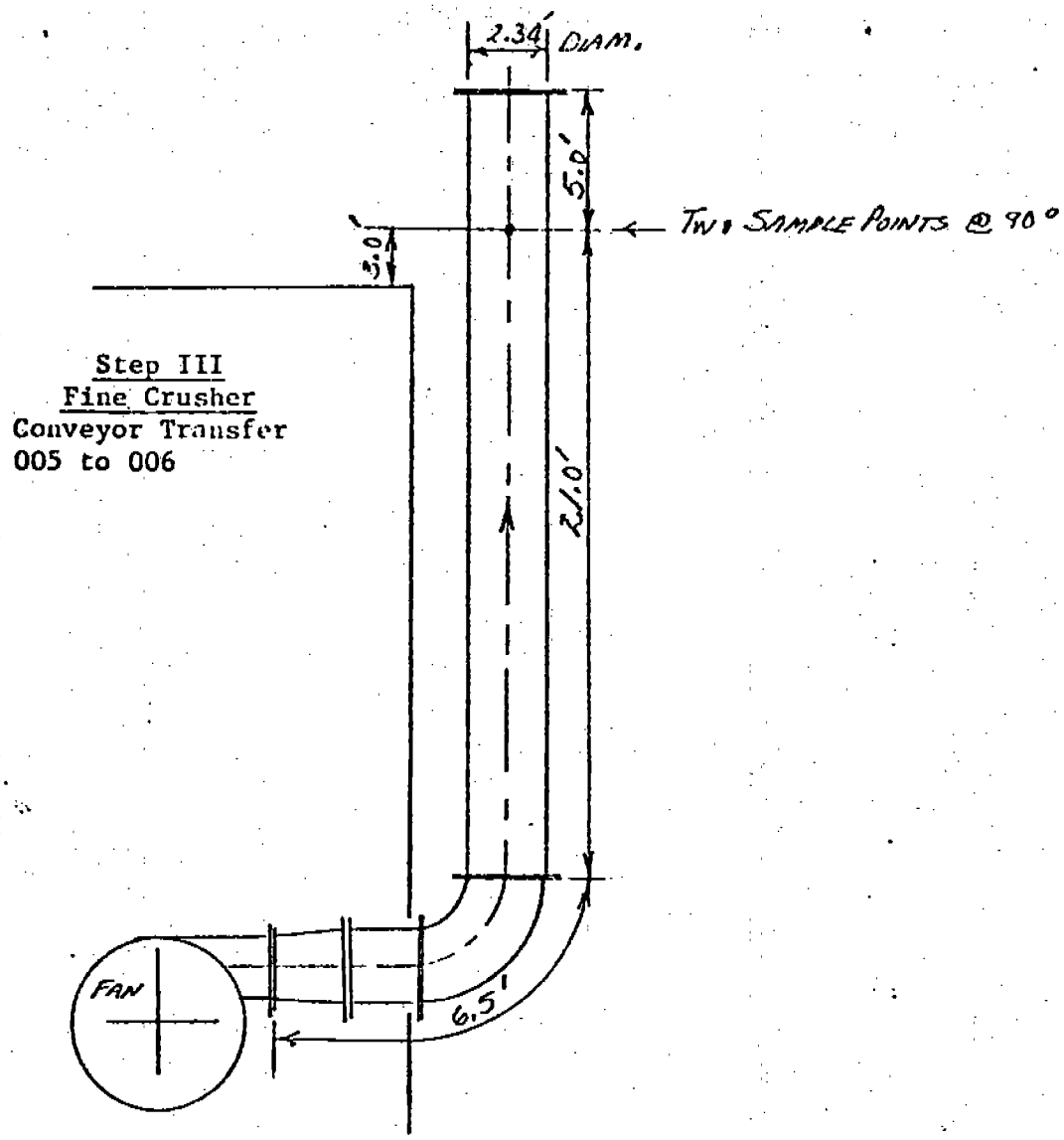
LOCATION OF TRAVERSE POINTS

TEST NO. 5

LOCATION - 6.41 CONVEYOR TRNASFER STACK



DIAMETER (IN.)	29.0
NUMBER OF PORTS	2
NUMBER OF POINTS TRAVERSED	12



ELEVATION VIEW

1 - Emission source number - 6.56.
2 - Emission source flow sheet no. - 078-03-23G1.
3 - Stack diameter - 2.34'
4 - Stack design gas velocity - 62 FPS.
5 - Stack design gas volume - 16,000 CFM.
6 - Stack design gas temperature - 50 to 70°F.
7 - Pollutant - taconite dust.
8 - Stack loading - 0.01 Gr/Cubic Ft
9 - Traverse Points - 12

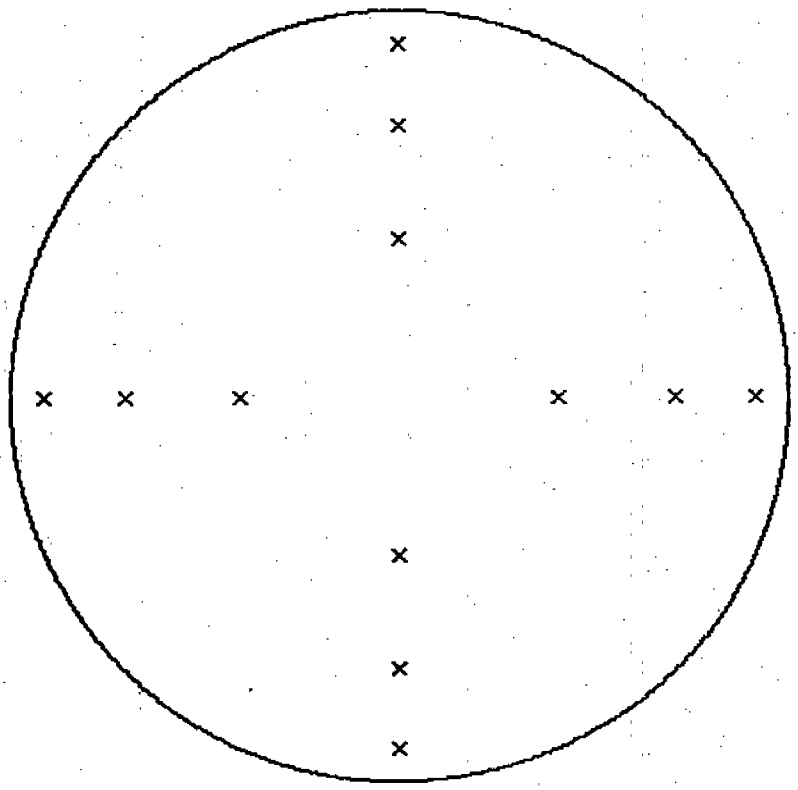
Step III Fine Crusher
Minnesota Ore Operations
Minntac, Mt. Iron, Minn

REVISED 5-8-79

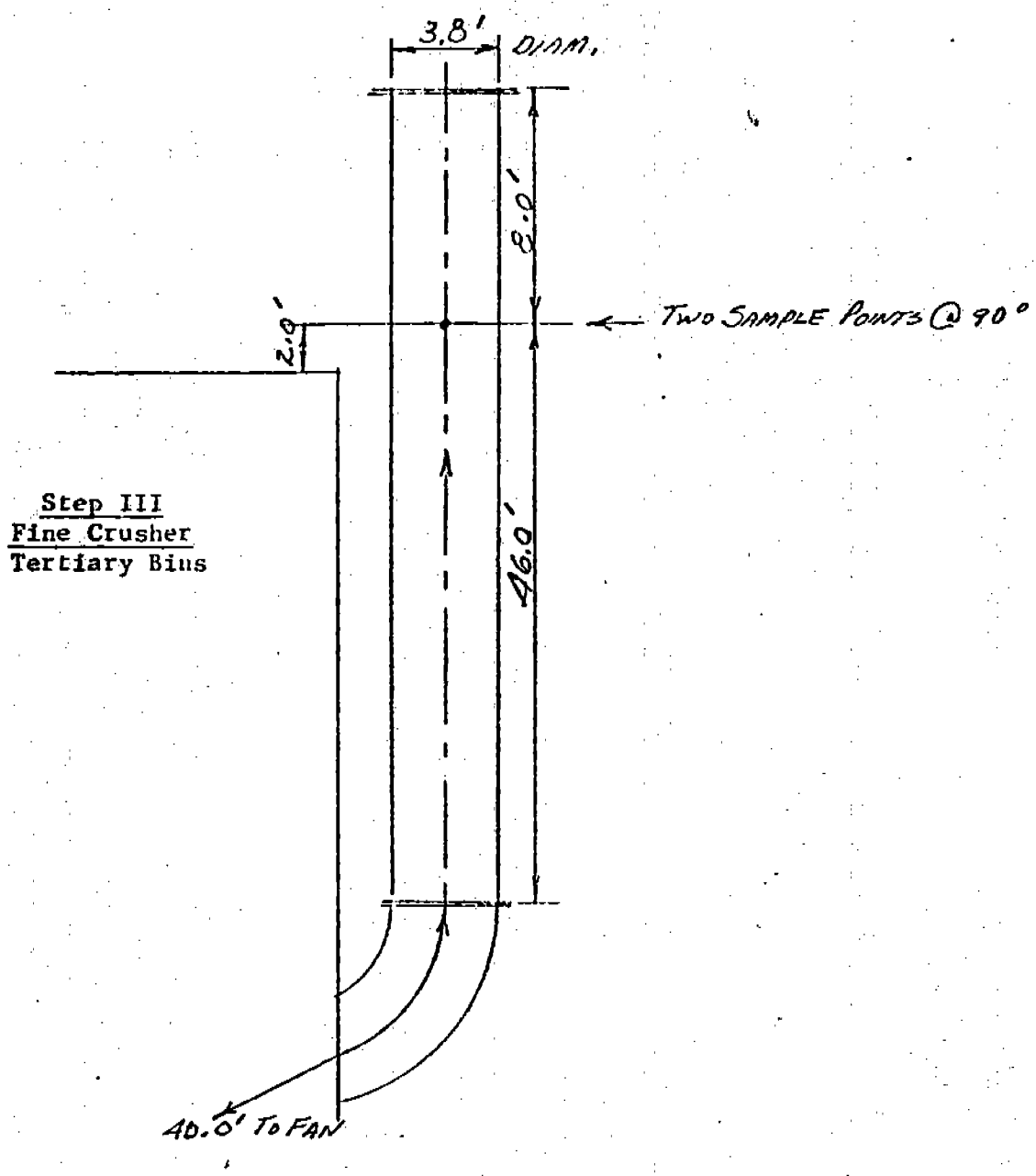
LOCATION OF TRAVERSE POINTS

TEST NO. 6

LOCATION - 6.56 CONVEYOR TRANSFER STACK



DIAMETER (IN.)	26.0
NUMBER OF PORTS	2
NUMBER OF POINTS TRAVERSED	12



ELEVATION VIEW

1 - Emission source number - 6.43.
2 - Emission source flow sheet no. - 078-03-20C1.
3 - Stack diameter - 3.8'.
4 - Stack design gas velocity - 54 FPS.
5 - Stack design gas volume - 37,000 CFM.
6 - Stack design gas temperature - 50 to 70°F.
7 - Pollutant - taconite dust.
8 - Stack loading - 0.005 GR/Cubic Ft
9 - Traverse Points - 12

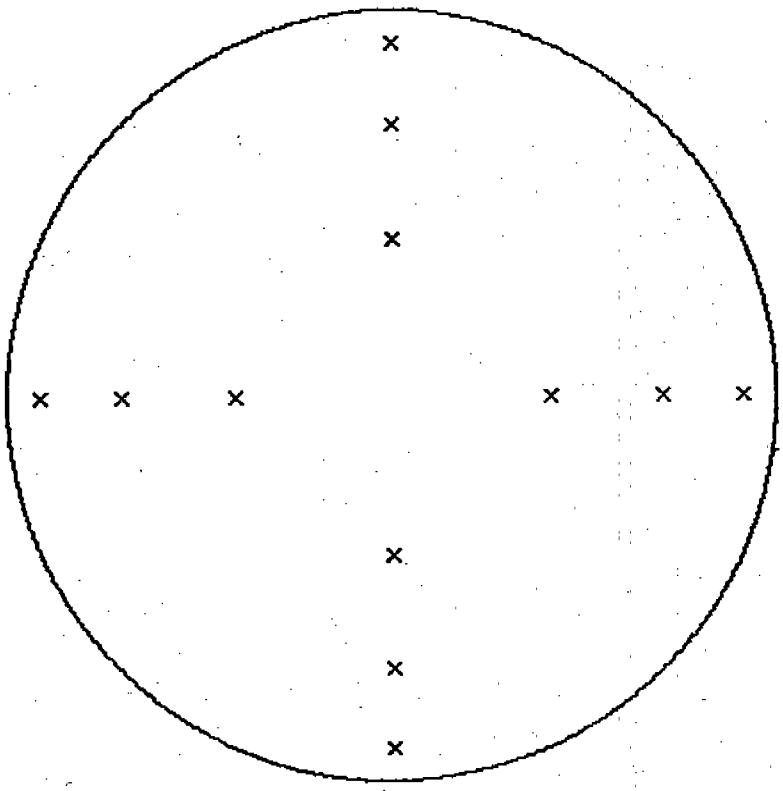
Step III Fine Crusher
Minnesota Ore Operations
Minntac, Mt. Iron, Minn.

REVISED 5-8-79

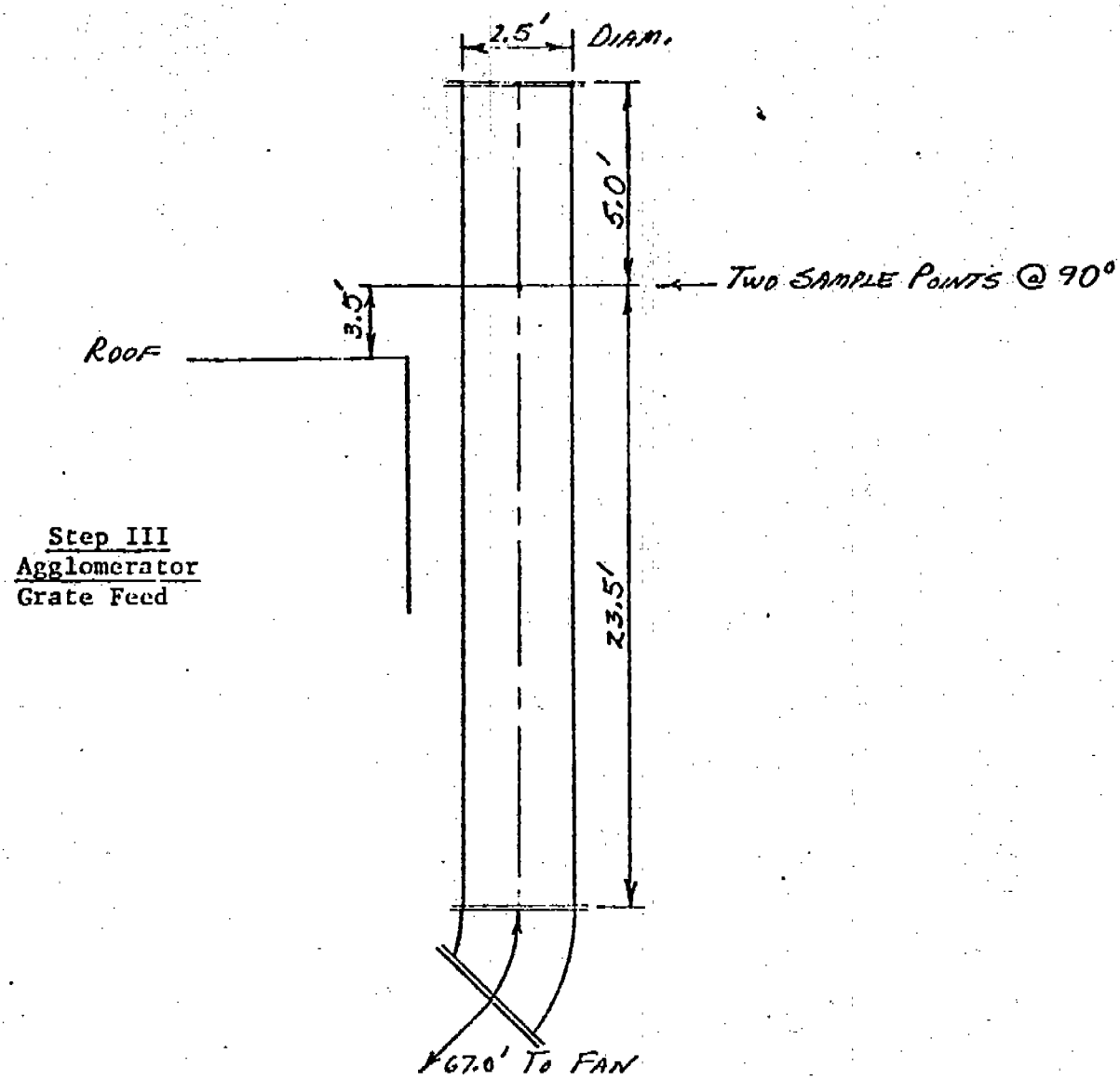
LOCATION OF TRAVERSE POINTS

TEST NO. 7

LOCATION - TERTIARY STORAGE BIN STACK



DIAMETER (IN.)	44.0
NUMBER OF PORTS	2
NUMBER OF POINTS TRAVERSED	12



ELEVATION VIEW

1 - Emission source number - 8.43.
2 - Emission source flow sheet no. 298-06-4.
3 - Stack diameter - 2.5'.
4 - Stack design gas velocity - 51 FPS.
5 - Stack design gas volume - 15,000 CFM.
6 - Stack design gas temperature - 70 to 90°F.
7 - Pollutant - taconite dust.
8 - Stack loading - 0.10 GR/Cubic Feet.
9 - Traverse points - 12.

Step III Agglomerator
Minnesota Ore Operations
Minntac, Mt. Iron, Minn.

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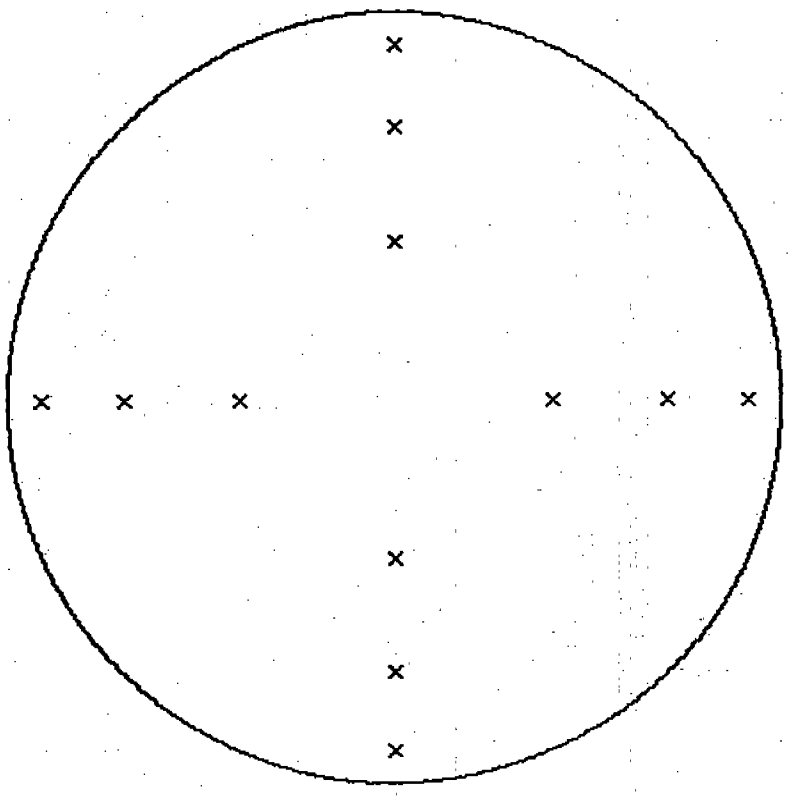
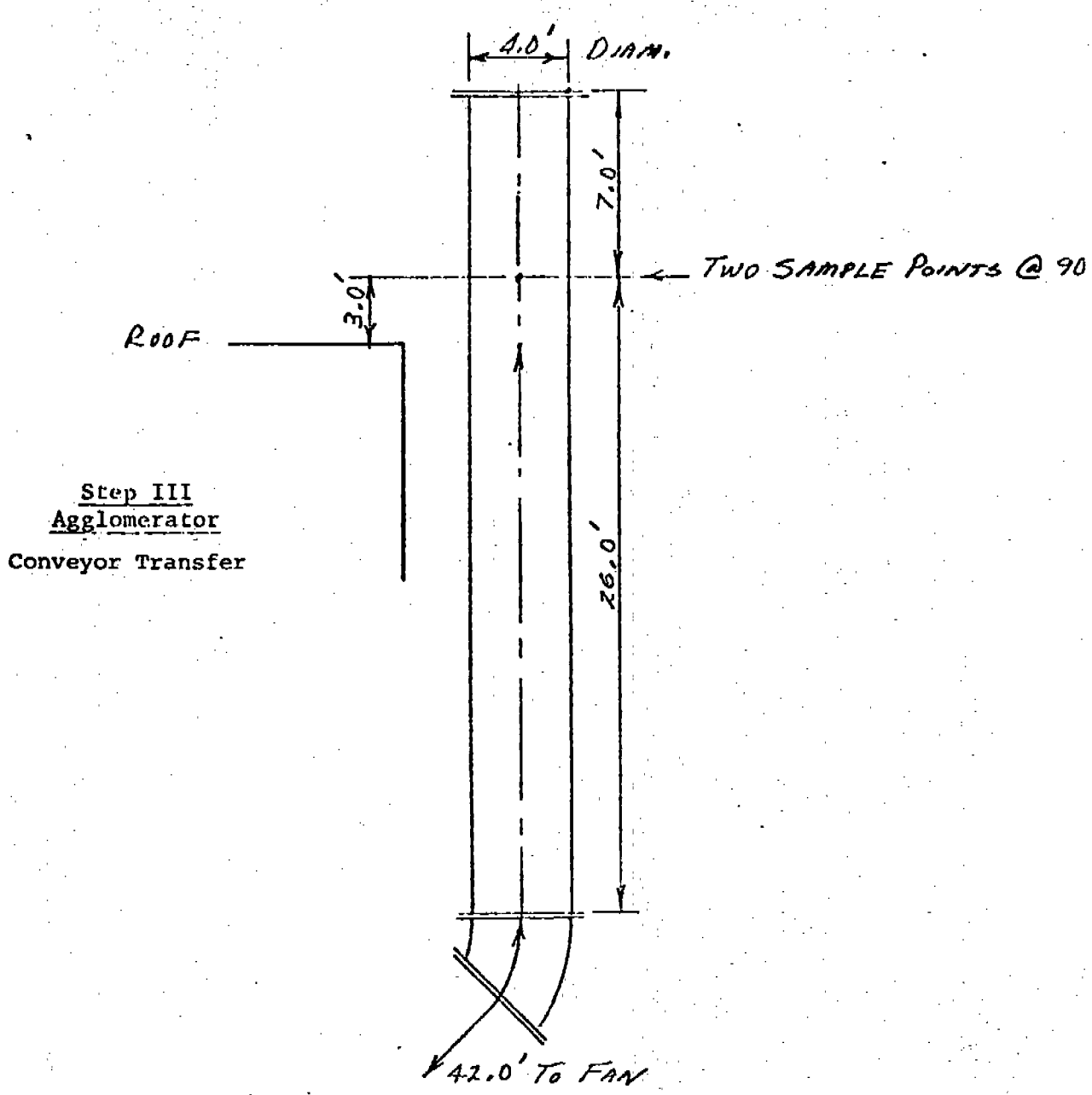
LOCATION OF TRAVERSE POINTS

TEST NO. 8

LOCATION - GRATE-FEED END STACK



DIAMETER (IN.)	29.0
NUMBER OF PORTS	2
NUMBER OF POINTS TRAVERSED	12



ELEVATION VIEW

1 - Emission source number - 8.47.
2 - Emission source flow sheet no. - 298-06-6.
3 - Stack diameter - 4.0'.
4 - Stack design gas velocity - 60 FPS.
5 - Stack design gas volume - 46,600 ACFM.
6 - Stack design gas temperature - 90 to 130°F.
7 - Pollutant - taconite dust.
8 - Stack loading - 0.096 GR/Cubic Ft.
9 - Traverse points - 20.

Step III Agglomerator
Minnesota Ore Operations
Minntac, Mt. Iron, Minn.

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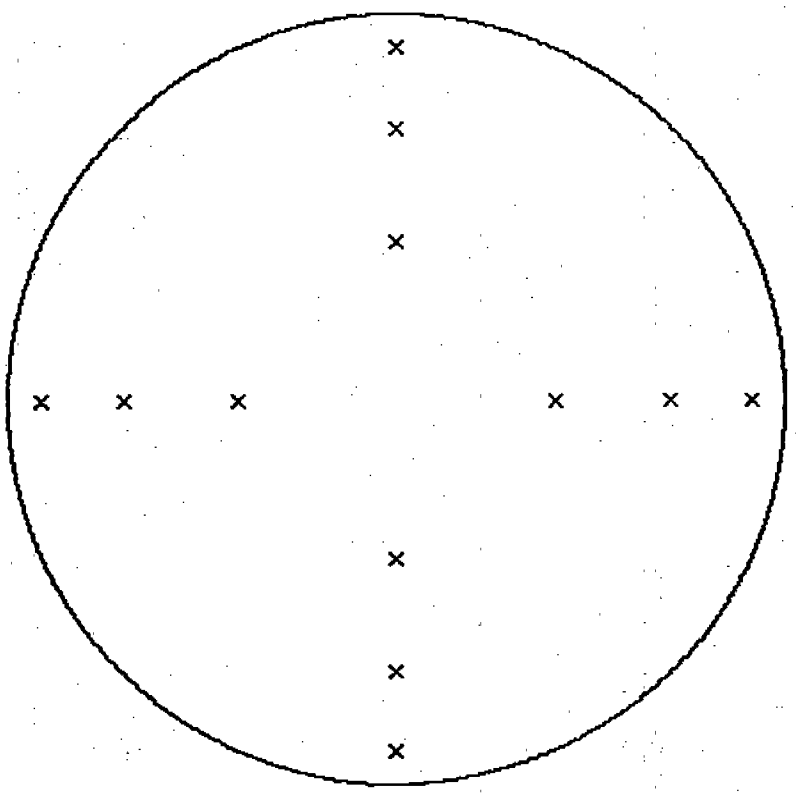
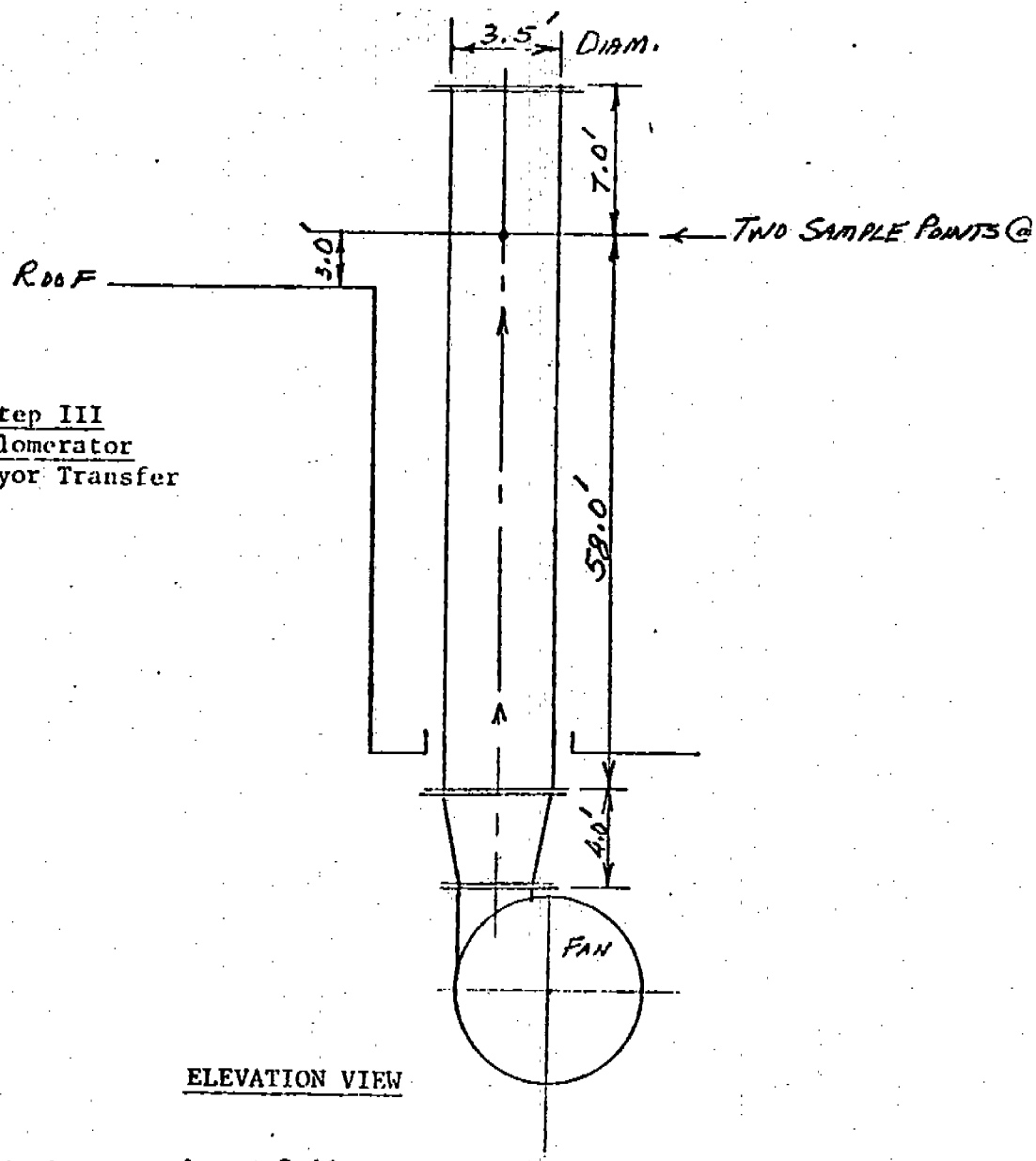
LOCATION OF TRAVERSE POINTS

TEST NO. 9

LOCATION - 8.47 CONVEYOR TRANSFER STACK



DIAMETER (IN.)	40.0
NUMBER OF PORTS	2
NUMBER OF POINTS TRAVERSED	12



Step III
Agglomerator
Conveyor Transfer

ELEVATION VIEW

1 - Emission source number - 8.49.
2 - Emission source flow sheet no. - 298-06-7.
3 - Stack diameter - 3.5'.
4 - Stack design gas velocity - 42 FPS.
5 - Stack design gas volume - 24,500 CFM.
6 - Stack design gas temperature - 70 to 90°F.
7 - Pollutant - taconite dust.
8 - Stack loading - 0.098 GR/Cubic Ft.
9 - Traverse Points - 12.

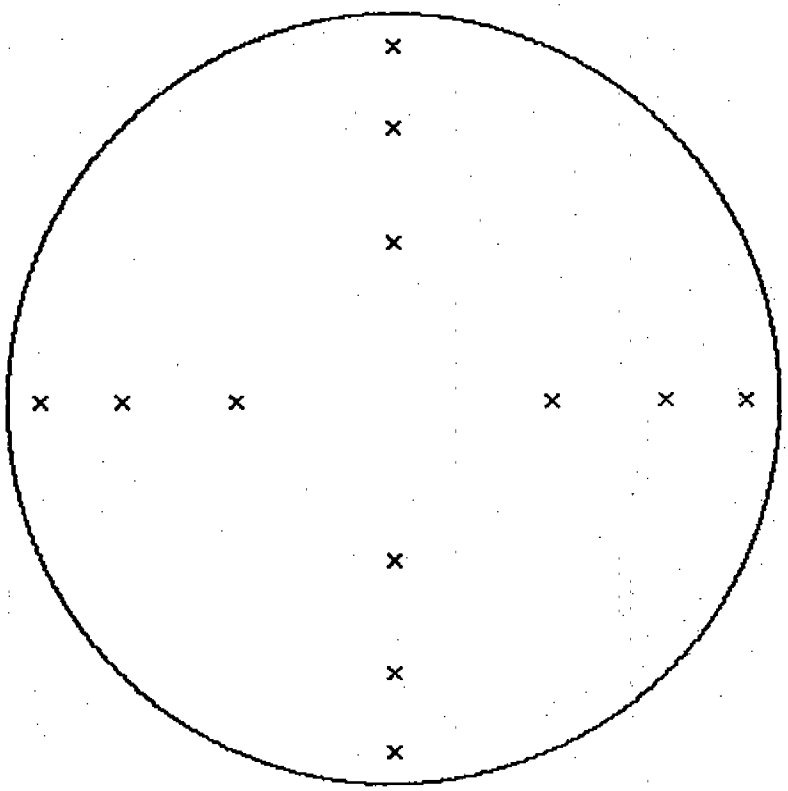
Step III Agglomerator
Minnesota Ore Operations
Minntac, Mt. Iron, Minn.

REVISED 5-8-79

LOCATION OF TRAVERSE POINTS

TEST NO. 10

LOCATION - 8.49 CONVEYOR TRANSFER STACK



DIAMETER (IN.)	40.0
NUMBER OF PORTS	2
NUMBER OF POINTS TRAVERSED	12

APPENDIX C

FIELD DATA SHEETS

SOURCE NO. 6.39 - TEST 1

CONVEYOR TRANSFER STACK

Preliminary Data — Method 2

— Interpoll Inc. —

Job USSC - Minntac

Source 6.39 Conveyor Transfer Stack Date 1/8/80

Test No. 1 Run No. 1

Stack dimensions: 36 in.

Dry bulb ____ °F Wet bulb ____ °F

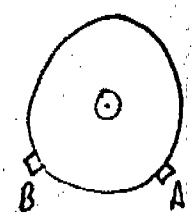
Rel. hum. ____ % B_{wo} 1 ____ %

Barometric pressure (P_b) 29.00 in. Hg

Static pressure (P_g) +.19 in. WC ____ in. Hg

Operators J. Stock + D. VanHoever

Pitot No. 6 C_p .854 Port Length 7 (4" coupling - Sch. 80)



Schematic of Stack Cross Section

Traverse Point No.	Distance from Stack wall	Distance from End of Port	Velocity Head (in. WC)	Temperature (°F)
A- 1	1.58	8 1/2	1.10	
2	5.26	12 1/4	1.10	
3	10.66	17 5/8	1.20	
4	25.34	32 3/8	1.10	
5	30.74	37 3/4	1.20	
6	34.42	41 1/3	1.30	
B-1			1.20	
2			1.20	
3			1.10	
4			1.20	
5			1.20	
6			1.10	
25				avg.

S-0034R

Sample Log Sheet

Job USSC Minntac

Unit and Sampling Location # 6.39 Conveyor Transfer Stack

Date 1-8-77 Test 1 Run 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1853			
Pw			
Total (M_n)			g

Impinger ☐ Condenser ☐

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1219	1210	8
Total (M_{wo})			8 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC Mount Pleasant
Source No. 639 Conveyor Transfer Stack
Date 1/18/79 Test 1 Run 1

Operators J.S + D.V.H
Sampling Train No. 4 $\Delta H_@$ 1.81
Gasmeter coeff. 1.0036 Amb. Temp. 20 °F

Pitot No. 6 C_p .854
Bar. Press. 29.00 in.Hg. B_{wo} 1 %
Nozzle No. 4-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(0800)	(456.20)										
A-6	5	459.06	1.00	1.20			40	250	250	20.9	-5	5
5	10	461.92	1.00	1.20			40		250		-5	5
4	15	464.78	1.00	1.20			40		250		-5	5
3	20	467.64	1.00	1.20			40		250		-5	5
2	25	470.50	1.00	1.20			40		250		-5	5
1	30	473.50	1.10	1.25			40		250		-5	5
B-6	35	476.69	1.10	1.25			40		250		-5	5
5	40	479.75	1.10	1.25			40		250		-5	5
4	45	482.82	1.10	1.25			40		250		-5	5
3	50	485.38	1.00	1.20			40		250		-5	5
2	55	488.35	1.00	1.20			40		250		-5	5
	60	491.11	1.00	1.20			40		250		-5	5
	0902											
	θ=60	V_m=34.91		$\Delta H_@$ 1.81								t_m=0

Sample Log Sheet

Job USSC Clairton

Unit and Sampling Location 6.39 Conveyor Transfer Stack

Date 1/8/80 Test 1 Run 2

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter #1888			
P.W.			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
CONDENSATE	0	0	0
Silica Gel	1218	1226	8
Total (M_{wo})			8 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC Minntac
Source No 6.39 Stack
Date 1-9-86 Test 1 Run 2

Operators JS+DVH
Sampling Train No. 4 $\Delta H_@$ 1.91
Gasmeter coeff. 1.0036 Amb. Temp. -20°F

Pitot No. 6 C_p .854
Bar. Press. 29.00 in.Hg. B_{wo} 1 %
Nozzle No. 4-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(0920)	(491.20)										
B-6	5	494.19	1.10	1.25			40		250	20.9	-5	5
5	10	497.15	1.00	1.10			40		250		-5	5
4	15	499.90	1.00	1.10			40		250		-5	5
3	20	502.90	1.00	1.10			40		250		-5	5
2	25	505.66	1.10	1.25			40		250		-5	5
1	30	508.56	1.10	1.25			40		250		-5	5
A-6	35	511.66	1.10	1.25			40		250		-5	5
5	40	514.50	1.00	1.10			40		250		-5	5
4	45	517.38	1.00	1.10			40		250		-5	5
3	50	520.26	1.10	1.25			40		250		-5	5
2	55	523.20	1.10	1.25			40		250		-5	5
1	60	526.28	1.10	1.25			40		250		-5	5
	(1020)											
		V_m = 35.08		$\overline{\Delta H}$ = 1.19								$\overline{t_m}$ = 0

— Interpoll Inc —

Sample Log Sheet

Job USSC Mingo

Unit and Sampling Location 6.39 CONVEYOR TRANSFER STACK

Date 1/8/80 Test 1 Run 3

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1905			
P.W.			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
CONDENSATE	0	0	0
Silica Gel	1225	1234	9
Total (M_{wo})			9 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC Minntac
Source #6.39 Stack
Date 2-8-80 Test 1 Run 3

Operators JS + DVH
Sampling Train No. 4 $\Delta H_@$ 1.87
Gasmeter coeff. 1.0036 Amb. Temp. -20 F

Pitot No. 6 C_p .854
Bar. Press. 29.00 in.Hg. B_{wo} 1 %
Nozzle No. 4-7 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft^3)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1030)	(526.37)										
A-6	5	529.35	1.10	1.10		1.6	40	250	250	20.9	-5	5
5	10	532.20	1.00	1.10			40		250		-5	5
4	15	535.18	1.10	1.25			40		250		-5	5
3	20	538.10	1.10	1.25			40		250		-5	5
2	25	541.10	1.10	1.25			40		250		-5	5
1	30	543.90	1.10	1.25			40		250		-5	5
B-6	35	546.80	1.00	1.10		1.7	40		250		-5	5
5	40	549.77	1.10	1.10			40		250		-5	5
4	45	552.65	1.10	1.10			40		250		-5	5
3	50	555.96	1.10	1.25			40		250		-5	5
2	55	558.57	1.10	1.25			40		250		-5	5
1	60	561.55	1.10	1.25		1.7	40		250		-5	5
	(1135)											
		V_m: 35.18		$\overline{\Delta H}$ = 1.19								$\overline{T_m}$ = 0

APPENDIX D

FIELD DATA SHEETS

SOURCE NO. 6.40 - TEST 2

SECONDARY BINS STACK

Preliminary Data — Method 2

— Interpoll Inc. —

Job USSC MINNTAC

Source 6.40 Secondary Bin Date 1/18/80

Test No. 2 Run No. 1

Stack dimensions: 24 in.

Dry bulb ____ °F Wet bulb ____ °F

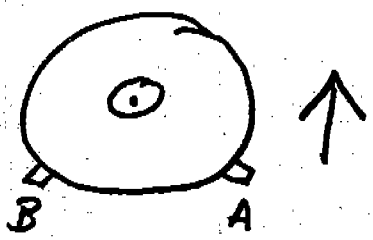
Rel. hum. ____ % B_{wo} 1 %

Barometric pressure (P_b) 29.00 in. Hg

Static pressure (P_g) +.21 in. WC ____ in. Hg

Operators T. Stock & D. Van Heem

Pitot No. 6 C_p .854 Port Length 2½" 3" coupling



Schematic of Stack Cross Section

Traverse Point No.	Distance from Stack wall	Distance from End of Port	Velocity Head (in. WC)	Temperature (°F)
A-1	1.06	3½	1.20	
2	3.50	6.0	1.20	
3	7.10	9⅝	1.30	
4	16.90	19½	1.30	
5	20.50	23	1.30	
6	22.94	24½	1.45	
B 1			1.30	
2			1.30	
3			1.35	
4			1.40	
5			1.20	
6			1.40	
25				avg.

S-0034R

Sample Log Sheet

Job USSC MINNTAC

Unit and Sampling Location 6.40 Secondary Bin

Date 1-8-80 Test 2 Run 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1881			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1248	1240	8
Total (M_{wo})			8 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC MINNTAC Operators J.S + D.V.H Pitot No. 6 C_p .854

Source 6.40 Secondary Bin Stack Sampling Train No. 4 $\Delta H_@$ 1.81 Bar. Press. 29.00 in.Hg. B_{wo} 1 %

Date 1/18/79 Test 2 Run 1 Gasmeter coeff 1.0036 Amb. Temp. -20 °F Nozzle No. 4-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft^3)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1155)	(561.80)										
A-6	5	565.29	1.50	1.70	3.49 / 3.29		40	250	250	20.9	-5	5
5	10	568.56	1.30	1.50	3.25 / 3.54		40		250		-5	5
4	15	571.96	1.30	1.50	3.25 / 1.79		40		250		-5	5
3	20	575.22	1.30	1.50	3.25 / 5.02		40		250		-5	5
2	25	578.15	1.20	1.40	3.12 / 5.14		40		250		-5	5
1	30	581.15	1.20	1.40	3.12 / 1.26		40		250		-5	5
B 6	35	584.38	1.20	1.20	3.12 / 4.38		40		250		-5	5
5	40	587.43	1.20	1.20	3.12 / 7.50		40		250		-5	5
4	45	590.63	1.20	1.30	3.12 / 0.12		40		250		-5	5
3	50	593.40	1.30	1.35	3.25 / 8.25		40		250		-5	5
2	55	596.40	1.20	1.30	3.12 / 6.47		40		250		-5	5
1	60	599.59	1.20	1.30	3.12 / 9.59		40		250		-5	5
	(1300)											
	60.	V_m=37.79		$\overline{\Delta H}$=1.39								$\overline{t_m}$=0

— Interpoll Inc —

Sample Log Sheet

Job USSC MINNTAC

Unit and Sampling Location 6.40 Secondary Bin Stack

Date 1-8-80 Test 2 Run 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1882			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1057	1048	9
Total (M_{wo})			9 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC MINNTAC Operators J.S & D.V.H Pitot No. 6 C_p .854

Source #6.40 Secondary Bin Stack Sampling Train No. 4 $\Delta H_@$ 1.81 Bar. Press. 29.00 in.Hg. B_{wo} 1 %

Date 11/18/79 Test 2 Run 2 Gasmeter coeff. 1.0036 Amb. Temp. -20 °F Nozzle No. 4-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen 4 (% v/v)	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1315)	(599.72)										
B-6	5	603.15	1.30	1.40	3.23/6.15	1.9	40	250	250	20.9	-5	5
5	10	606.38	1.30	1.40	3.23/6.38		40		250		-5	5
4	15	609.60	1.30	1.40	3.23/6.61		40		250		-5	5
3	20	613.11	1.50	1.60	3.49/6.10		40		250		-5	5
2	25	616.27	1.20	1.30	3.12/6.07		40		250		-5	5
1	30	619.39	1.20	1.30	3.12/6.84		40		250		-5	5
M-6	35	622.50	1.30	1.40	3.23/7.57		40		250		-5	5
5	40	625.84	1.30	1.40	3.23/7.80		40		250		-5	5
4	45	629.04	1.30	1.40	3.23/8.03		40		250		-5	5
3	50	632.22	1.20	1.30	3.12/8.15		40		250		-5	5
2	55	635.30	1.20	1.30	3.12/8.27		40		250		-5	5
1	60	638.39	1.20	1.30	3.12/8.39		40		250		-5	5
	(1420)								250		-5	5
		V_m=38.67		$\overline{\Delta H}$=1.38								t_m=0

— Internoll Inc —

Sample Log Sheet

Job USSC - Minntac

Unit and Sampling Location Secondary Bin Stack 6.40

Date 1-8-92 Test 2 Run 3

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1883			
AW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1264	1257	7
Total (M_{wo})			7 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC MINNTAC
Source 6.40 Secondary Bin Stack
Date 4/8/79 Test 2 Run 3

Operators J.S + D.V.H
Sampling Train No. 4 $\Delta H_@$ 1.81
Gasmeter coeff 1.0036 Amb. Temp. -20°F

Pitot No. 6 C_p .854
Bar. Press. 29.00 in.Hg. B_{wo} 1 %
Nozzle No. 4-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen 4 (% v/v)	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1435)	(638.50)										
A-6	5	641.73	1.30	1.40	3.23/1.13	2.0	40	250	250	20.9	-5	5
5	10	645.22	1.50	1.60	3.49/5.22		40		250		-5	5
4	15	648.71	1.50	1.60	3.49/1.71		40		250		-5	5
3	20	651.88	1.30	1.40	3.23/1.94		40		250		-5	5
2	25	655.18	1.30	1.40	3.30/5.17		40		250		-5	5
1	30	658.30	1.20	1.30	3.12/7.29		40		250		-5	5
B-6	35	661.44	1.20	1.30	3.12/1.41		40		250		-5	5
5	40	664.63	1.30	1.40	3.23/4.64		40		250		-5	5
4	45	667.89	1.30	1.40	3.23/7.87		40		250		-5	5
3	50	671.10	1.30	1.40	3.23/1.10		40		250		-5	5
2	55	674.23	1.20	1.30	3.12/4.22		40		250		-5	5
1	60	677.34	1.20	1.30	3.12/7.34		40		250		-5	5
	(1540)											
		V_m=38.94		$\overline{\Delta H}$=1.40								$\overline{t_m}$=0

APPENDIX E

FIELD DATA SHEETS

SOURCE NO. 6.34 - TEST 3

CONVEYOR TRANSFER STACK

Preliminary Data — Method 2

— Interpoll Inc. —

Job U.S. STEEL MINNTAC

Source CONVEYOR TRANSFER 6.34 Date 1-5-80

Test No. 3 Run No. 1

Stack dimensions: 28 in.

Dry bulb _____ °F Wet bulb _____ °F

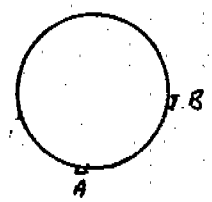
Rel. hum. _____ % B_{wo} _____ %

Barometric pressure (P_b) 29.00 in. Hg

Static pressure (P_g) -.40 in. WC _____ in. Hg

Operators S. Swanlund - B. Drake

Pitot No. 14 C_p .840 Port Length 4" Scribing



Schematic of Stack Cross Section

Traverse Point No.	Distance from Stack wall	Distance from End of Port	1015 hrs Velocity Head (in. WC)	Temperature (°F)
A 1	1.23	5 1/4	.80	
2	4.05	5	.85	
3	5.28	12 1/4	.84	
4	15.75	23 3/4	.96	
5	23.91	25	1.0	
6	26.77	30 3/4	1.1	
B 1			1.0	
2			.94	
3			.94	
4			1.0	
5			1.0	
6			.92	
25				avg. 40

S-0034R

Sample Log Sheet

Job: Y & Steel Minntac

Unit and Sampling Location: Conveyor Transfer No 6, 34

Date: 1-9-80 Test: 3 Run: 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑ Pass ✓

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1725			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1195	1190	5
Total (M_{wo})			5 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. Steel MINNTAC Operators E. Trowbridge - B. Drake Pitot No. 121 C_p .840

Source CONVAIR TRANSFER STACK, 6.34 Sampling Train No. 3 $\Delta H_@$ 1.930 Bar. Press. 29.00 in.Hg. B_{wo} 1 %

Date 1-8-80 Test 3 Run 1 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 7-1 Nozzle Dia. .194 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1030)	(675.60)										
A 6	5	678.46	1.05	1.25	2.84		40	220	252	20.9	0	-4
5	10	681.23	.98	1.18	2.77	1	40				0	-4
4	15	683.95	.95	1.15	2.74		40		250		2	-4
3	20	686.53	.95	1.0	2.58		40				2	-4
2	25	689.06	.82	.98	2.53		40		250		4	-4
1	30	691.56	.80	.95	2.50	1	40				4	-4
B 6	35	694.28	.95	1.15	2.72		40		248		4	-2
5	40	697.05	.98	1.18	2.77		40				4	-2
4	45	699.84	1.0	1.2	2.79	1	40		248		6	-2
3	50	702.56	.95	1.15	2.72		40				6	-4
2	55	705.28	.95	1.15	2.72		40		248		6	-4
1	60	708.05	.98	1.18	2.77	1	40				6	-4
	(1135)											
	θ=60	VM=32.45		ΔH=1.26							TM=1	

Sample Log Sheet

Job U S Steel MINNTAC

Unit and Sampling Location CONVEYOR TRANSFER NO 6,34

Date 1-9-80 Test 5 Run 2

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑ Pitot

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER # 1914			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1199	1195	4
Total (M_{wo})			4 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U. S. STEEL MINNTAC Operators EV & B.D. Pitot No. 14 C_p .840

Source CONVERTER TRANSFER STACK No. 6.34 Sampling Train No. 3 $\Delta H_@$ 1.936 Bar. Press. 29.00 in.Hg. B_{wo} 1 %

Date 1-8-80 Test 3 Run 2 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 2-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1150)	(711.30)										
B 6	5	714.07	.98	1.18	2.77		40	220	248	20.9	2	-4
5	10	716.79	.95	1.15	2.72	1	40				2	-4
4	15	719.56	.98	1.18	2.77		40		250		4	-4
3	20	722.33	.98	1.18	2.77		40				4	-4
2	25	725.05	.95	1.15	2.72	1	40		250		4	-4
1	30	727.77	.95	1.15	2.72		40				6	-4
A 6	35	730.63	1.05	1.25	2.86		40		254		4	-4
5	40	733.42	1.0	1.2	2.74	1	40				6	-4
4	45	736.14	.95	1.15	2.72		40		252		6	-4
3	50	738.72	.85	1.0	2.58		40				4	-4
2	55	741.30	.85	1.0	2.58	1	40		254		6	-4
1	60	743.80	.80	.95	2.52		40				6	-4
	(1252)											
	θ=60	Vm=32.50		$\overline{\Delta H}$=1.13							$\overline{t_m}$=.3	

Sample Log Sheet

Job U.S. Steel Munster

Unit and Sampling Location Conveyor Transfer No. 4, 3rd

Date _____ Test _____ Run _____

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Port ←

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER # 1915			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1205	1200	5
Total (M_{wo})			5 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job: U.S. STEEL - MINNTAC Operators: ET & BD Pitot No. 14 C_p .840

Source: CONVEYOR TRANSFER STACK 634 Sampling Train No. 3 $\Delta H_@$ 1.83 Bar. Press. 29.00 in.Hg. B_{wo} 1 %

Date 1-8-80 Test 3 Run 3 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 7-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1308)	(746.10)										
A-6	5	748.96	1.05	1.2	2.96 / 0.96		40	220	250	20.9	-2	-4
5	10	751.82	.95	1.15	2.72 / 1.82	1	40				2	-4
4	15	754.54	.95	1.15	2.72 / 4.54		40		250		4	-4
3	20	757.12	.85	1.0	2.58 / 7.12		40				4	-4
2	25	759.70	.85	1.0	2.58 / 9.70	1	40		254		4	-4
1	30	762.20	.80	.95	2.52 / 2.20		40				4	-4
B-6	35	764.99	1.0	1.2	2.79 / 4.99		40		254		2	-4
5	40	767.76	.98	1.18	2.77 / 7.76	1	40				2	-4
4	45	770.53	.98	1.18	2.77 / 0.53		40		252		4	-4
3	50	773.25	.95	1.15	2.72 / 3.25		40				4	-4
2	55	775.97	.95	1.15	2.72 / 5.97	1	40		256		6	-4
1	60	778.69	.95	1.15	2.72 / 8.69		40				6	-4
	(1410)											
	θ = 60	Vm = 32.59		$\bar{\Delta H}$ = 1.12							t_m = 3	

- Intercell Inc -

APPENDIX F

FIELD DATA SHEETS

SOURCE NO. 6.44 - TEST 4

TERTIARY CRUSHER STACK

Preliminary Data — Method 2

— Interpoll Inc. —

Job U.S. STEEL MINNTAC

Source TERTIARY CRUSHER-6,44 Date 1-8-80

Test No. 4 Run No. 1

Stack dimensions: 36 in.

Dry bulb ____ °F Wet bulb ____ °F

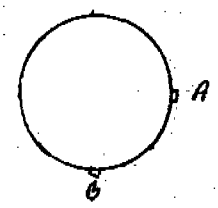
Rel. hum. ____ % B_{wo} 1 %

Barometric pressure (P_b) 29.08 in. Hg

Static pressure (P_g) -.42 in. WC ____ in. Hg

Operators E Twohidge - B Deale

Pitot No. 14 C_p .840 Port Length 4" coupling



Schematic of Stack Cross Section

N ↑

Traverse Point No.	Distance from Stack wall	Distance from End of Port	1420 Velocity Head (in. WC)	Temperature (°F)
A-1	1.584	5 5/8	.86	
2	5.256	9 1/4	.90	
3	10.656	14 5/8	.94	
4	25.34	29 3/8	1.08	
5	30.744	34 3/4	1.05	
6	34.416	38 1/2	1.1	
B-1			.95	
2			.96	
3			1.0	
4			.94	
5			.96	
6			.94	
25				avg. 45

S-0034 R

Sample Log Sheet

Job U.S. STEEL MINNTAC

Unit and Sampling Location TERTIARY CRUSHER STACK No. 6.44

Date 1-8-80 Test 4 Run 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER # 1859			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1226	1222	4
Total (M_{wo})			4 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S STEEL MINNTAC Operators [illegible] BD Pitot No. 14 C_p .840

Source TERTIARY CRUSHER No. 6 & 4 Sampling Train No. 3 $\Delta H_@$ 1.83 Bar. Press. 29.00 in.Hg. B_{wo} 1 %

Date 1-8-80 Test 4 Run 1 Gasmeter coeff. 1.0041 Amb. Temp. ___ °F Nozzle No. 7-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1440)	(782.40)										
A-6	5	785.32	1.1	1.3	2.97/5.32		45	220	250	20.9	2	-2
5	10	788.18	1.05	1.25	2.86/8.18	1	45				2	-2
4	15	791.04	1.05	1.25	2.86/11.04		45	252			4	-2
3	20	793.75	.95	1.15	2.71/13.75		45				4	-2
2	25	796.42	.92	1.08	2.67/16.42		45	252			4	-2
1	30	798.98	.85	1.0	2.56/18.98	1	45				4	-2
B-6	35	801.76	1.0	1.2	2.78/21.76		45	252			2	-4
5	40	804.47	.95	1.15	2.71/24.47		45				2	-4
4	45	807.14	.92	1.08	2.67/27.14		45	250			4	-4
3	50	809.89	.88	1.18	2.75/29.89	1	45				4	-2
2	55	812.60	.95	1.15	2.71/32.60		45	250			4	-2
1	60	815.31	.95	1.15	2.71/35.31		45				4	-2
	(1543)											
	θ=60	Vm=32.91		ΔH=1.16							Fm=.4	

Intersoft Inc

Sample Log Sheet

Job U. S. STEEL MINNTAC

Unit and Sampling Location TERTIARY CRUSHER STACK No. 6.44

Date 1-8-80 Test 4 Run 2

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER #1872			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1231	1226	5
Total (M_{wo})			5 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. STEEL MINNTAC Operators [illegible] B.D Pitot No. 14 C_p .846

Source TERTIARY CRUSHER NO. 6.44 Sampling Train No. 3 $\Delta H_@$ 1.83 Bar. Press. 29.00 in.Hg. B_{wo} 1 %

Date 1-8-80 Test 4 Run 2 Gasmeter coeff. 1.0011 Amb. Temp. -15 °F Nozzle No. 2-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft^3)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1600)	(815.60)										
B-6	5	818.39	1.0	1.2	2.78/1.9		40	220	254	20.9	0	-6
5	10	821.16	.98	1.18	2.77/1.16	1	40				2	-4
4	15	823.88	.95	1.15	2.72/5.88		40				2	-4
3	20	826.65	.98	1.18	2.73/6.65		40				2	-4
2	25	829.42	.98	1.18	2.77/9.42	1	40				4	-4
1	30	832.14	.95	1.15	2.72/2.14		40				4	-4
A 6	35	835.14	1.15	1.4	3.00/5.14		40				4	-4
5	40	838.07	1.1	1.30	2.93/8.07		40				6	-2
4	45	840.93	1.05	1.25	2.86/0.93	1	40				6	-2
3	50	843.65	.95	1.15	2.72/3.65		40				6	-2
2	55	846.37	.95	1.15	2.72/6.37		40				6	-2
1	60	848.95	.95	1.0	2.58/8.95		40				6	-2
	(1703)											
	θ = 60	Vm = 33.35		$\overline{\sqrt{H}}$ = 1.19							$\overline{t_m}$ = 6	

Sample Log Sheet

Job U.S. STEEL MINNTAC

Unit and Sampling Location TERTIARY CRUSHER STACK No. 6.94

Date 1-8-80 Test 4 Run 3

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER # 1887			
PW			
Total (Mn)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1237	1231	6
Total (M_{wo})			6 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. Steel Minntac Operators ST & BD Pitot No. 14 C_p .840

Source Tertiary Cluster No. 6.44 Sampling Train No. 3 $\Delta H_@$ 1.83 Bar. Press. 29.00 in.Hg. B_{wo} 1 %

Date 1-8-80 Test 4 Run 3 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 2-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(17.5)	(849.80)										
A-6	5	852.80	1.15	1.4	3.00/2.80		40		252	20.9	2	-6
5	10	855.66	1.05	1.25	2.86/5.66	1	40				2	-6
4	15	858.52	1.05	1.25	2.86/8.52		40		252		2	-6
3	20	861.38	.98	1.18	2.86/11.38		40				4	-6
2	25	864.10	.95	1.15	2.72/14.10	1	40		250		4	-6
1	30	866.68	.95	1.0	2.58/16.68		40				4	-6
B 6	35	869.54	1.05	1.25	2.86/19.54		40		248		4	-6
5	40	872.33	1.0	1.2	2.79/22.33	1	40				4	-4
4	45	875.19	.98	1.18	2.86/25.19		40		248		4	-4
3	50	878.05	.98	1.18	2.86/28.05		40				4	-4
2	55	880.77	.95	1.15	2.72/30.77	1	40		248		4	-4
1	60	883.49	.95	1.15	2.72/33.49		40				4	-4
	(18.18)											
	θ = 60	V_m = 33.69		ΔH = 1.20							$\bar{T}_m$ = -.8	

Intercall Inc.

APPENDIX G

FIELD DATA SHEETS

SOURCE NO. 6.41 - TEST 5

CONVEYOR TRANSFER STACK

Preliminary Data — Method 2

— Interpoll Inc. —

Job USSC- Minntac

Source #641 Conveyor Trans Date 1-9-80

Test No. 5 Run No. 1

Stack dimensions: 29 in.

Dry bulb ____ °F Wet bulb ____ °F

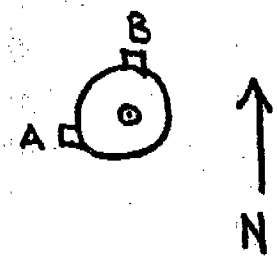
Rel. hum. ____ % B_{wo} 1 %

Barometric pressure (P_b) 28.60 in. Hg

Static pressure (P_g) +.32 in. WC ____ in. Hg

Operators J. Stock & D. Van Hoever

Pitot No. 6 C_p .854 Port Length 3 1/2" (3" coupling)



Schematic of Stack Cross Section

Traverse Point No.	Distance from Stack wall	Distance from End of Port	Velocity Head (in. WC)	Temperature (°F)
A-1	1.28	4 3/4	1.10	
2	4.23	7 3/4	1.05	
3	8.58	12	1.00	
4	20.42	23 7/8	1.00	
5	24.76	28 1/4	1.00	
6	27.72	31 1/4	1.05	
B-1			1.10	
2			1.10	
3			1.10	
4			1.05	
5			1.05	
6			1.10	
25				avg. 41

S-0034R

Sample Log Sheet

Job USSC Minntac

Unit and Sampling Location No. 6.41 Conveyor Transfer Stack

Date 1-9-80 Test 5 Run 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1871			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silicagel	1247	1241	6
Total (M_{wo})			6 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job Minntac USSC Operators J.S. & D.V.H Pitot No. 6 C_p .854

Source 6.41 Conveyor Transfer Stack Sampling Train No. 4 $\Delta H_@$ 1.81 Bar. Press. 28.60 in.Hg. B_{wo} 1 %

Date 1-9-80 Test 5 Run 1 Gasmeter coeff. 1.003 Amb. Temp. -32°F Nozzle No. 1-1 Nozzle Dia. 1.84 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft^3)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(0915)	(676.58)										
A-6	5	679.59	1.10	1.15	3.01/3.09	1.4	40	250	250	20.9	0	-10
5	10	682.61	1.10	1.15	3.01/3.15		40		250		0	-10
4	15	685.54	1.05	1.10	2.91/3.54		40		250		0	-10
3	20	688.41	1.00	1.05	2.87/3.41		40		250		0	-10
2	25	691.35	1.05	1.10	2.94/4.35		40		250		0	-10
1	30	694.29	1.05	1.10	2.94/4.29		40		250		0	-10
B-6	35	697.30	1.10	1.15	3.01/5.30		40		250		0	-10
5	40	700.31	1.10	1.15	3.01/5.31		40		250		0	-10
4	45	703.36	1.10	1.15	3.01/5.32		40		250		0	-10
3	50	706.43	1.10	1.15	3.01/5.33		40		250		0	-10
2	55	709.34	1.10	1.15	3.01/5.34		40		250		0	-10
1	60	712.35	1.10	1.15	3.01/5.35							
	(1017)											
	θ = 60	V_m = 35.77		$\overline{\Delta H}$ 1.13								T_m = -5

— Interpoll Inc —

Sample Log Sheet

Job USSC - Mingo

Unit and Sampling Location Conveyer Transfer stack #6.41

Date 1-9-80 Test 5 Run 2

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1892			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silicagel	1197	1190	7
Total (M_{wo})			7 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC Minntac Operators J.S. & D.V.H. Pitot No. 6 C_p .854

Source #6.41 Conv. Trans. Stack Sampling Train No. 4 $\Delta H_@$ 1.81 Bar. Press. 28.60 in.Hg. B_{wo} 1 %

Date 1-9-80 Test 5 Run 2 Gasmeter coeff. 1.0036 Amb. Temp. -20°F Nozzle No. 4-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft^3)	Velocity Head (in. WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1030)	(712.80)										
B-6	5	715.68	1.00	1.05	2.87 / 5.67	1.8	40	250	250	20.9	10	0
5	10	718.55	1.00	1.05	2.87 / 8.54		40		250		10	0
4	15	721.41	1.00	1.05	2.87 / 11.41		40		250		10	0
3	20	724.28	1.00	1.05	2.87 / 14.28		40		250		20	5
2	25	727.19	1.00	1.05	2.87 / 17.15		40		250		20	5
1	30	730.02	1.00	1.05	2.87 / 20.02		40		250		20	5
A-6	35	732.89	1.00	1.15	2.90 / 22.87		40		250		20	10
5	40	735.90	1.10	1.15	3.01 / 25.90	1.6	40		250		20	10
4	45	738.91	1.10	1.05	3.01 / 28.91		40		250		20	10
3	50	741.78	1.00	1.05	2.87 / 31.78		40		250		20	10
2	55	744.63	1.00	1.05	2.87 / 34.65		40		250		20	10
1	60	747.52	1.00	1.05	2.87 / 37.52		40		250		20	10
	θ=60	V_m=34.72		ΔH=1.07								F_m=11.875

Sample Log Sheet

Job USSC Minntac

Unit and Sampling Location Conveyor Transfer Stands #6.4

Date 1-9-80 Test 5 Run 3

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1880			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate		6	0
Silica gel	1254	1247	7
Total (M_{wo})			7 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC Minntac Operators J.S. & D.V.H Pitot No. 6 C_p .854

Source Conv. Trans. Stack #6.41 Sampling Train No. 4 $\Delta H_@$ 1.81 Bar. Press. 28.60 in.Hg. B_{wo} 1 %

Date 1-9-80 Test 5 Run 3 Gasmeter coeff. 1.003 Amb. Temp. ___ °F Nozzle No. 4-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft^3)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1140)	(747.70)										
A-6	5	750.57	1.00	1.05	2.91/5.5	1.4	40	250	250	20.9	30	20
5	10	753.44	1.00	1.05	2.91/5.41		40		250		30	20
4	15	756.45	1.10	1.15	3.01/5.45		40		250		30	20
3	20	759.45	1.10	1.15	3.0/5.46		40		250		30	20
2	25	762.45	1.10	1.15	3.0/5.47		40		250		30	20
1	30	765.48	1.10	1.15	3.03/5.48		40		250		30	20
B-6	35	768.49	1.10	1.15	3.0/5.49		40		250		30	20
5	40	771.43	1.05	1.10	2.94/5.43		40		250		30	20
4	45	774.37	1.05	1.10	2.94/5.37		40		250		30	20
3	50	777.31	1.05	1.10	2.94/5.31		40		250		30	20
2	55	780.25	1.05	1.10	2.94/5.25		40		250		30	20
1	60	783.19	1.05	1.10	2.94/5.19		40		250		30	20
		V_m=35.49		$\overline{\Delta H}$= 1.10								$\overline{t}_m$= 25

— Interpoll Inc —

APPENDIX H

FIELD DATA SHEETS

SOURCE NO. 6.56 - TEST 6

CONVEYOR TRANSFER STACK

Preliminary Data — Method 2

— Interpoll Inc. —

Job U.S. Steel MINNTAC

Source Conveyor TRANSFER Date 3-9-80

Test No. 6 Run No. 1

Stack dimensions: 26 in.

Dry bulb _____ °F Wet bulb _____ °F

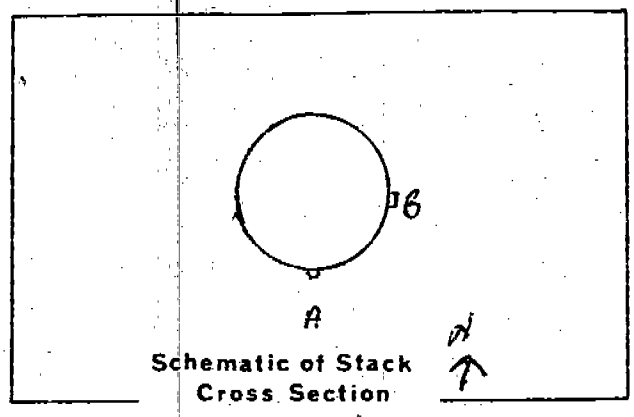
Rel. hum. _____ % B_{wo} 1 %

Barometric pressure (P_b) 28.60 in. Hg

Static pressure (P_g) -.40 in. WC _____ in. Hg

Operators E. Tumbulgo - B. Drake

Pitot No. 10 C_p .840 Port Length 4"



Schematic of Stack Cross Section

Traverse Point No.	Distance from Stack wall	Distance from End of Port	Velocity Head (in. WC)	Temperature (°F)
A 1	1.144	5 1/8	.80	
2	3.796	7 3/4	.90	
3	7.696	11 5/8	.95	
4	18.304	22 5/16	1.0	
5	22.20	26 1/4	1.05	
6	24.86	28 3/4	1.15	
B 1			.85	
2			.95	
3			.98	
4			1.1	
5			1.1	
6			1.25	
25				avg. 40

S-0034R

Sample Log Sheet

Job U.S. Steel MINNTAC

Unit and Sampling Location Converter Transfer Stack No 6.56

Date 1-9-80 Test 6 Run 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter #1861			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1127	1121	6
Total (M_{wo})			6 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. Steel MINNTAC Operators E. Cambridge / G. Drake Pitot No. 10 C_p .870

Source Conveyor Transfer No. 656 Sampling Train No. 3 $\Delta H_@$ 1.830 Bar. Press. 28.60 in.Hg. B_{wo} 1 %

Date 1-9-90 Test 6 Run 1 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 7-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1500)	(994.6)										
A 6	5	997.77	1.2	1.4	3.17	2	40	220	248	20.9	0	-6
5	10	000.81	1.1	1.3	3.04		40				0	-6
4	15	03.71	1.0	1.2	2.90		40		250		2	-6
3	20	06.53	.85	1.1	2.82		40				2	-6
2	25	07.43	.90	1.06	2.75	2	40		250		4	-6
1	30	10.10	.85	1.0	2.67		40				4	-6
B 6	35	13.40	1.3	1.5	3.30		40		254		4	-6
5	40	16.44	1.1	1.3	3.04	2	40				4	-4
4	45	19.48	1.1	1.3	3.04		40		254		4	-4
3	50	22.38	1.0	1.2	2.90		40				4	-4
2	55	25.13	.90	1.06	2.75	2	40		254		4	-4
1	60	27.88	.80	1.06	2.75		40				4	-4
	(1604)											
	θ = 60	V_m = 33.28		$\overline{\Delta H}$ = 1.20							$\overline{t_m}$ = 1.1	

Sample Log Sheet

Job: U S Steel MINNTAC

Unit and Sampling Location: Conveyor Transfer No. 6.56

Date: 1-9-80 Test: 6 Run: 2

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1865			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1133	1127	6
Total (M_{wo})			6 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U S STEEL MINNTAC Operators EI & BD Pitot No. 10 C_p .870

Source CONVEYOR TRANSFER No. 6.56 Sampling Train No. 3 $\Delta H_@$ 1.83 Bar. Press. 28.60 in.Hg. B_{wo} 1 %

Date 1-9-80 Test 6 Run 2 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 2-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1620)	(28.10)										
B 6	5	31.40	1.3	1.5	3.30/1.40	1	40	220	246	20.9	0	-6
5	10	34.51	1.15	1.35	3.11/4.51		40				2	-6
4	15	37.55	1.1	1.3	3.04/7.55	2	40		248		2	-6
3	20	40.45	1.0	1.2	2.90/10.45		40				4	-6
2	25	43.20	.90	1.06	2.75/13.20		40		250		4	-6
1	30	45.87	.85	1.0	2.67/15.87	2	40				4	-6
A 6	35	49.04	1.2	1.4	3.17/19.04		40		250		4	-4
5	40	52.15	1.15	1.35	3.11/22.15	2	40				4	-4
4	45	55.05	1.0	1.2	2.88/25.05		40		254		4	-4
3	50	57.95	1.0	1.2	2.90/27.95		40				4	-4
2	55	60.70	.90	1.06	2.75/30.70	2	40		254		4	-4
1	60	63.37	.85	1.0	2.67/33.37		40				4	-4
	(1725)											
	θ = 60	Vm = 35.27		$\bar{\Delta H}$ = 1.22							$\bar{t}_m$ = -.8	

— Interpoll Inc —

Sample Log Sheet

Job U. S. Steel MINNTAC

Unit and Sampling Location Conveyor Transfer Stack No. 6.56

Date 1-9-80 Test 8 Run 3

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1439			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1138	1133	✓
Total (M_{wo})			✓ g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. Steel MINNTAC Operators ET & BD Pitot No. 10 C_p .870

Source Conveyor Transfer #6656 Sampling Train No. 3 $\Delta H_@$ 1.83 Bar. Press. 28.60 in.Hg. B_{wo} 1 %

Date 1-9-80 Test 6 Run 3 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 7-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1740)	(65.00)										
A-6	5	68.11	1.15	1.35	3.11 / 3.11		40	220	248	20.9	0	-6
5	10	71.22	1.15	1.35	3.11 / 6.22	2	40				2	-6
4	15	74.12	1.0	1.2	2.90 / 9.12		40		248		2	-6
3	20	76.99	.98	1.18	2.87 / 12.99		40				2	-6
2	25	79.81	.95	1.15	2.82 / 15.81		40		252		4	-6
1	30	82.56	.90	1.06	2.75 / 18.56	2	40				4	-6
B 6	35	85.73	1.2	1.4	3.17 / 21.73		40		252		4	-6
5	40	88.84	1.15	1.35	3.11 / 24.84		40				4	-4
4	45	91.88	1.1	1.3	3.04 / 27.88	2	40		248		4	-4
3	50	94.92	1.1	1.3	3.04 / 30.92		40				4	-4
2	55	97.67	.90	1.06	2.75 / 33.67		40		250		4	-4
1	60	100.42	.90	1.06	2.75 / 36.42		40				4	-4
	(1840)											
	θ = 60	V_m = 35.42		$\bar{\Delta H}$ = 1.23							$\bar{t}_m$ = -4	

APPENDIX I

FIELD DATA SHEETS

SOURCE NO. 6.43 - TEST 7

TERTIARY STORAGE BIN

Preliminary Data — Method 2

— Interpoll Inc. —

Job U. S. STEEL MINNTAC

Source TERTIARY STORAGE 643 Date 1-9-80

Test No. 7 Run No. 1

Stack dimensions: 44 in.

Dry bulb ____ °F Wet bulb ____ °F

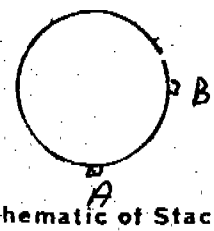
Rel. hum. ____ % B_{wo} 1 %

Barometric pressure (P_b) 28.60 in. Hg

Static pressure (P_g) -.38 in. WC ____ in. Hg

Operators E Trowbridge - B Drake

Pitot No. 10 C_p .870 Port Length 4



Schematic of Stack Cross Section

Traverse Point No.	Distance from Stack wall	Distance from End of Port	1000 Velocity Head (in. WC)	Temperature (°F)
A 1			1.1	
2			1.05	
3			1.05	
4			1.0	
5			.95	
6			.90	
B 1			1.25	
2			1.2	
3			1.2	
4			1.1	
5			1.15	
6.			.95	
25				avg. 40

S-0034 R

Sample Log Sheet

Job U.S. STEEL MINNTAC

Unit and Sampling Location TERTIARY BIN STORAGE STACK 6.43

Date 1-9-80 Test 7 Run 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER # 1910			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1221	1215	6
Total (M_{wo})			6 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. STEEL MINNTAC Operators [illegible] Pitot No. 10 C_p .870

Source TERTIARY STORAGE BIN 6.43 Sampling Train No. 3 $\Delta H_@$ 1.830 Bar. Press. 28.60 in.Hg. B_{wo} 1 %

Date 1-9-80 Test 7 Run 1 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 7-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1030)	(886.0)										
A-6	5	888.78	.92	1.1	2.77/8.78		40	220	250	20.9	2	-6
5	10	891.59	.94	1.12	2.81/1.59	2	40				4	-6
4	15	894.49	1.0	1.2	2.90/4.49		40		256		4	-6
3	20	897.46	1.05	1.25	2.97/7.46		40				4	-6
2	25	900.43	1.05	1.25	2.97/0.43		40		254		4	-6
1	30	903.47	1.1	1.3	3.04/3.47	2	40				4	-6
B-6	35	906.37	1.0	1.2	2.90/6.37		40		254		4	-6
5	40	909.41	1.1	1.3	3.04/9.41		40				4	-6
4	45	912.45	1.1	1.3	3.04/2.45	2	40		252		6	-4
3	50	915.56	1.15	1.35	3.11/5.56		40				6	-4
2	55	918.73	1.2	1.4	3.17/8.73	2	40		252		6	-4
1	60	921.97	1.25	1.48	3.24/1.97		40				6	-4
	(1123)											
	Θ=60	V_m=35.97		$\bar{\Delta H}$=1.27							$\bar{t}_m$=-.5	

Sample Log Sheet

Job US STEEL- MINNTAC

Unit and Sampling Location TERTIARY Bin Storage Stack 6.43

Date 1-9-80 Test 7 Run 2

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER # 1904			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
CONDENSATE	0	0	0
SILICA GEL	1226	1221	✓
Total (M_{wo})			✓ g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. STEEL MINNTAC Operators ET & B D Pitot No. 10 C_p .870

Source TERTIARY STORAGE BIN 6.43 Sampling Train No. 3 $\Delta H_@$ 1.930 Bar. Press. 28.60 in.Hg. B_{wo} 1 %

Date 1-9-80 Test 7 Run 2 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 7-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1135)	(922.20)										
B 6	5	925.07	1.05	1.25	2.87/5.07	2	40	220	252	20.9	2	-6
5	10	927.94	1.05	1.25	2.81/7.44		40				2	-6
4	15	930.98	1.1	1.3	3.04/8.98		40		250		4	-6
3	20	934.02	1.1	1.3	3.04/11.02	2	40				4	-6
2	25	937.19	1.2	1.4	3.17/14.19		40		250		6	-6
1	30	940.43	1.25	1.48	3.24/17.43		40				6	-6
A 6	35	943.37	.90	1.07	2.75/20.18	2	40		252		6	-6
5	40	945.99	.94	1.1	2.81/22.99		40				6	-6
4	45	948.86	.98	1.18	2.87/25.86		40		252		8	-6
3	50	951.76	1.0	1.2	2.90/28.76		40				8	-6
2	55	954.73	1.05	1.25	2.97/31.73	2	40		252		8	-6
1	60	957.97	1.1	1.3	3.24/34.97		40				8	-6
	(1238)											
	θ = 60	V_m = 35.57		$\bar{\Delta H}$ = 1.325							$\bar{t}_m$ = -6	

Interpoll Inc.

Sample Log Sheet

Job U. S. STEEL MINNTAC

Unit and Sampling Location TERTIARY BIN STORAGE BIN STACK 6.43

Date 1-9-80 Test 7 Run 3

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER # 1891			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
CONDENSATE	0	0	0
SILICA GEL	1232	1226	6
Total (M_{wo})			6 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1 ✓			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. STEEL MINNTAC Operators ST & BD Pitot No. 10 C_p .876

Source TEST IAR/STORAGE BIN 6.43 Sampling Train No. 3 $\Delta H_@$ 1.836 Bar. Press. 28.60 in.Hg. B_{wo} 1 %

Date 1-9-80 Test 7 Run 3 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 7-1 Nozzle Dia. .184 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft^3)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1250)	(958.30)										
A 6	5	961.05	.90	1.08	2.75/1.05	2	40	220	250	20.9	2	-4
5	10	963.92	.98	1.18	2.87/3.92		40				2	-4
4	15	966.82	1.0	1.2	2.90/6.82		40		252		2	-4
3	20	969.72	1.0	1.2	2.90/9.72		40				4	-4
2	25	972.96	1.1	1.28	3.24/12.96	2	40		252		4	-4
1	30	976.20	1.1	1.28	3.24/16.20		40				6	-4
B 6	35	979.10	1.0	1.2	2.90/19.10		40		252		6	-4
5	40	982.07	1.05	1.25	2.97/22.07		40				6	-4
4	45	985.04	1.05	1.25	2.97/25.04		40		250		6	-4
3	50	988.08	1.1	1.3	3.04/28.08		40				6	-4
2	55	991.25	1.2	1.4	3.17/31.25	2	40		250		6	-4
1	60	994.42	1.2	1.4	3.17/34.42		40				6	-4
	(1353)											
	θ=60	V_M=36.12		ΔH=1.25							tm=.4	

Interspell Inc.

APPENDIX J

FIELD DATA SHEETS

SOURCE NO. 8.43 - TEST 8

GRATE FEED END STACK

Preliminary Data — Method 2

— Interpoll Inc. —

Job USSC Minntac

Source Grate Feed End Stack - 1.43 Date 1-9-80

Test No. 8 Run No. 1

Stack dimensions: 29 in.

Dry bulb ____ °F Wet bulb ____ °F

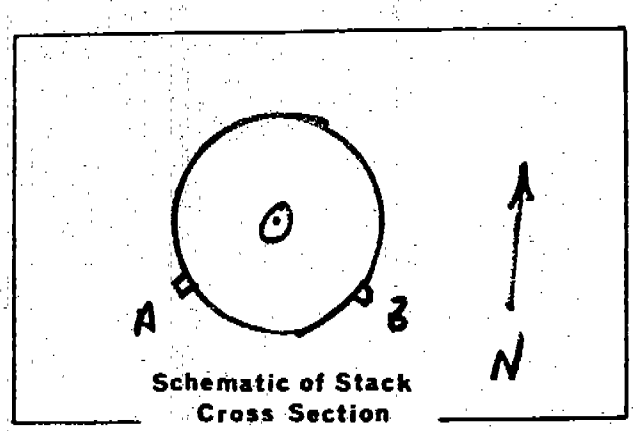
Rel. hum. ____ % B_{wo} ____ %

Barometric pressure (P_b) 28.60 in. Hg

Static pressure (P_g) +.30 in. WC ____ in. Hg

Operators J Stock + D. Von Hoven

Pitot No. 6 C_p .854 Port Length 5 1/2



Schematic of Stack Cross Section

Traverse Point No.	Distance from Stack wall	Distance from End of Port	Velocity Head (in. WC)	Temperature (°F)
A-1	1.28	6 3/4	.020	
2	4.23	9 3/4	.021	
3	8.58	14	.020	
4	20.42	25 7/8	.020	
5	24.76	30 1/4	.024	
6	27.72	33 1/4	.022	
B-1			.020	
2			.020	
3			.021	
4			.021	
5			.020	
6			.020	
25				avg. 70

S-0034 R

Sample Log Sheet

Job CISC Minntac

Unit and Sampling Location Grate Feed End 8.43

Date 1-9-80 Test 8 Run 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1924			
Rel			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica gel	1231	1210	21
Total (M_{wo})			21 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC - Minntac
Source Grate Feed End Stack 8.43
Date 1-9-80 Test 8 Run 1

Operators JS & DUH
Sampling Train No. 4 $\Delta H_@$ 1.81
Gasmeter coeff. 1.0036 Amb. Temp. -30°F

Pitot No. 6 C_p .854
Bar. Press. 28.60 in.Hg. B_{wo} 3 %
Nozzle No. 4-5 Nozzle Dia. .501 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen 4 (% v/v)	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1610)	(783.66)										
A-6	5	786.53	.020	1.10		2.7	70	250	250	20.9	-5	5
5	10	789.40	.020	1.10			70		250		-5	5
4	15	792.88	.022	1.20			76		250		-5	5
3	20	795.39	.022	1.20			76		250		-5	5
2	25	798.50	.024	1.35			76		250		-5	5
1	30	801.60	.024	1.35		2.9	76		250		-5	5
B-6	35	804.61	.022	1.20			76		250		-5	5
5	40	807.40	.022	1.20			76		250		-5	5
4	45	810.47	.020	1.10			72		250		-5	5
3	50	813.34	.020	1.10			72		250		-5	5
2	55	816.21	.020	1.10			72		250		-5	5
1	60	819.08	.020	1.10	2.9		72					
	(1711)											
		Vm = 35.42		$\overline{\Delta H}$ = 1.18								$\overline{t_m}$ = 0

— Interpoll Inc —

Sample Log Sheet

Job USSC Minntac

Unit and Sampling Location Grate Feed Elev 8.43

Date 1-9-90 Test 8 Run 2

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1877			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1256	1236	20
Total (M_{wo})			20 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC Minntac
Source Grate Feed Ero Stack 8.43
Date 1-9-80 Test 8 Run 2

Operators JS + OVH
Sampling Train No. 4 $\Delta H_@$ 1.81
Gasmeter coeff. 1.0036 Amb. Temp. -30°F

Pitot No. 6 C_p .854
Bar. Press. 28.60 in.Hg. B_{wo} 3 %
Nozzle No. 4-5 Nozzle Dia. .501 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1725)	(819.30)										
B-6	5	822.29	.022	1.20			74	250	250	20.9	0	-10
5	10	825.29	.022	1.20			74		250		0	-10
4	15	828.27	.022	1.20			74		250		0	-10
3	20	831.26	.022	1.20			74		250		0	-10
2	25	834.13	.020	1.10			74		250		0	-10
1	30	837.10	.020	1.10			74		250		0	-10
A-6	35	839.87	.020	1.10			74		250		0	-10
5	40	842.99	.024	1.35			74		250		0	-10
4	45	845.98	.022	1.20			74		250		0	-10
3	50	847.97	.022	1.20			70		250		0	-10
2	55	851.94	.022	1.20			70		250		0	-10
1	60	851.15	.022	1.20			70		250		0	-10
	(1827)											
		V_m=35.65		$\overline{\Delta H_@}$ 1.19								T_m -5

— Interpoll Inc —

Sample Log Sheet

Job USSC Minntac

Unit and Sampling Location Grate Feed Coal Stack 8.43

Date 1-9-80 Test 8 Run 3

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1923			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1201	1180	21
Total (M_{wo})			21 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6	—		
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC Minntac
Source Grate Feed End 8.43
Date 8-9-80 Test 8 Run 3

Operators JS+DUA
Sampling Train No. 4 $\Delta H_@$ 1.81
Gasmeter coeff. 1.0036 Amb. Temp. -30°F

Pitot No. 6 C_p .854
Bar. Press. 28.60 in.Hg. B_{wo} 3 %
Nozzle No. 4-5 Nozzle Dia. .501 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1827)	(856.60)										
A-6	5	859.50	.020	1.10	2.91 / 2.47		74	250	250	20.9	0	-10
5	10	862.35	.020	1.10	2.91 / 2.34		74		250		0	-10
4	15	865.19	.020	1.10	2.91 / 2.41		74		250		0	-10
3	20	868.20	.022	1.20	2.99 / 3.20		74		250		0	-10
2	25	871.15	.022	1.20	[illegible] / 2.91		74		250		0	-10
1	30	874.05	.020	1.20	2.89 / 2.86		74		250		0	-10
B-6	35	876.90	.020	1.10	2.82 / 2.73		74		250		0	-10
5	40	879.90	.022	1.20	2.99 / 2.92		74		250		0	-10
4	45	883.00	.024	1.35	3.12 / 3.04		74		250		0	-10
3	50	885.90	.020	1.10	2.87 / 2.91		74		250		0	-10
2	55	888.78	.020	1.10	2.87 / 2.78		74		250		0	-10
1	60	891.77	.022	1.20	2.99 / 2.77		74		250		0	-10
	(1930)											
	θ=60	V_m=35.17		$\overline{\Delta H}$=1.15								T_{m_1}=-5

— Interpoll Inc -

APPENDIX K

FIELD DATA SHEETS

SOURCE NO. 8.47 - TEST 9

CONVEYOR TRANSFER STACK

Preliminary Data — Method 2

— Interpoll Inc. —

Job USSC - Minntac

Source 8.47 Conveyor Trans Date 1-10-80

Test No. 9 Run No. 1

Stack dimensions: 40 in.

Dry bulb _____ °F Wet bulb _____ °F

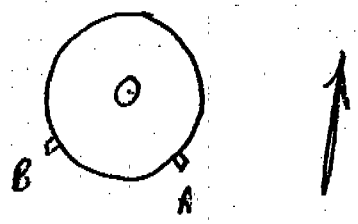
Rel. hum. _____ % B_{wo} 3 %

Barometric pressure (P_b) 28.60 in. Hg

Static pressure (P_g) -.20 in. WC _____ in. Hg

Operators J. Stock + D. Van Horn

Pitot No. G C_p .854 Port Length 6



Schematic of Stack Cross Section

Traverse Point No.	Distance from Stack wall	Distance from End of Port	-0800- Velocity Head (in. WC)	Temperature (°F)
A - 1	1.76	7 3/4	.100	
2	5.84	11 7/8	.100	
3	11.84	17 7/8	.099	
4	28.16	34 1/8	.098	
5	34.16	40 1/8	.095	
6	38.24	44 1/4	.100	
B - 1			.100	
2			.100	
3			.100	
4			.100	
5			.090	
6			.096	
25				avg. 70

S-0034R

Sample Log Sheet

Job USSC Minntac

Unit and Sampling Location No 8.47 Conveyor Transfer Stack

Date 1-10-89 Test 7 Run 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1879			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1256	1230	26
Total (M_{wo})			26 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job CLSSC Minntac Operators JS+DVH Pitot No. 6 C_p .854

Source No. 8.47 Conveyor Transfer Stack Sampling Train No. 4 $\Delta H_@$ 1.81 Bar. Press. 28.60 in.Hg. B_{wo} 3 %

Date 1-9-80 Test 9 Run 1 Gasmeter coeff. 1.0036 Amb. Temp. -20°F Nozzle No. 4-4 Nozzle Dia. .372 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(0845)	(892.70)										
A-6	5	896.35	.10	2.10			70	250	250	20.9	12	8
5	10	900.04	.10	2.10			70		250		12	8
4	15	903.70	.10	2.10			70		250		12	8
3	20	907.32	.10	2.10			70		250		12	8
2	25	910.94	.10	2.10			70		250		12	8
1	30	914.59	.10	2.10			70		250		12	8
B-6	35	918.20	.10	2.10			70		250		12	8
5	40	921.70	.09	1.70			70		250		12	8
4	45	925.25	.095	1.80			70		250		12	8
3	50	928.87	.10	2.10			70		250		12	8
2	55	932.51	.10	2.10			70		250		12	8
1	60	936.40	.095	1.80			70		250		12	8
	(0946)											
		Vm=43.44		$\overline{\Delta H}$=2.08								$\overline{T_m}$=10

Sample Log Sheet

Job USSC Minntac

Unit and Sampling Location Conveyor Transf - Stack # 8.47

Date 1-10-80 Test 9 Run 3

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1925			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silicagel	1185	1160	25
Total (M_{wo})			25 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC Minntac Operators DVH + JS Pitot No. 6 C_p .854

Source #8.47 Conveyor Transfer Stack Sampling Train No. 4 $\Delta H_@$ 1.81 Bar. Press. 28.60 in.Hg. B_{wo} 3 %

Date 1-10-90 Test 9 Run 2 Gasmeter coeff. 1.0036 Amb. Temp. 6 °F Nozzle No. 4-4 Nozzle Dia. .372 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen 4 (% v/v)	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(0950)	(936.30)										
B-6	5	939.96	.100	1.90			70	250	250	20.9	17	12
5	10	943.66	.100	1.90			70		250		18	12
4	15	947.15	.95	1.85			70		250		18	12
3	20	950.72	.95	1.85			70		250		18	12
2	25	954.11	.90	1.70			70		250		18	12
1	30	957.78	.100	1.90			70		250		18	12
A-6	35	960.46	.100	1.90			70		250		18	12
5	40	964.11	.100	1.90			70		250		18	12
4	45	967.71	.100	1.90			70		250		18	12
3	50	971.35	.100	1.90			70		250		18	12
2	55	975.02	[illegible]	1.90			70		250		18	12
1	60	978.62	.095	1.85			70		250		18	12
	(1051)											
		V_m = 42.30		ΔH = 1.87								$\bar{T}_m$ = 15

— Interpoll Inc —

Sample Log Sheet

Job USSC - Minntac

Unit and Sampling Location Conveyor Transfer - Stack # 8.47

Date 1-10-80 Test 9 Run 3

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☒

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
Filter # 1825			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☒

Impinger Number	Weights		
	Final	Tare	Difference
Condensate	0	0	0
Silica Gel	1282	1256	26
Total (M_{wo})			26 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job USSC Minntac Operators JS+DVH Pitot No. 6 C_p .854

Source #8.47 Conveyor Transfer Stack Sampling Train No. 4 $\Delta H_@$ 1.81 Bar. Press. 28.60 in.Hg. B_{wo} 3 %

Date 1-10-80 Test 9 Run 3 Gasmeter coeff 1.0026 Amb. Temp. 0 °F Nozzle No. 4-4 Nozzle Dia. .372 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft^3)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1055)	(978.70)										
A-6	5	982.42	.100	1.90			70	250	250	20.9	16	10
5	10	986.00	.100	1.90			70		250		16	10
4	15	989.62	.100	1.90			70		250		16	10
3	20	993.18	.095	1.85			70		250		16	10
2	25	996.71	.095	1.85			70		250		16	10
1	30	0.16	.090	1.70			70		250		16	10
B-6	35	3.81	.100	1.90			70		250		16	10
5	40	7.43	.100	1.90			70		250		16	10
4	45	11.15	.100	1.90			70		250		16	10
3	50	14.62	.090	1.70			70		250		16	10
2	55	18.06	.090	1.70			70		250		16	10
1	60	21.62	.095	1.85			70		250		16	10
	(1156)											
		V_m=42.92		$\overline{\Delta H}$=1.84								$\overline{T_m}$=13

— Interpoll Inc —

APPENDIX L

FIELD DATA SHEETS

SOURCE NO. 8.49 - TEST 10

CONVEYOR TRANSFER STACK

Preliminary Data — Method 2

— Interpoll Inc. —

Job U.S. Steel MINNTAC

Source CONVEYOR TRANSFER 8.49 Date 1-10-80

Test No. 10 Run No. 1

Stack dimensions: 40 in.

Dry bulb ____ °F Wet bulb ____ °F

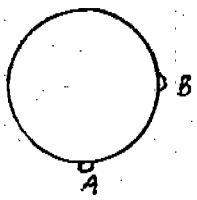
Rel. hum. ____ % B_{wo} 3 %

Barometric pressure (P_b) 28.60 in. Hg

Static pressure (P_g) -.15 in. WC ____ in. Hg

Operators Eisenhelg - B. Drake

Pitot No. 14 C_p .840 Port Length 4" COUPLINGS



Schematic of Stack Cross Section

N

Traverse Point No.	Distance from Stack wall	Distance from End of Port	(0915 hrs) Velocity Head (in. WC)	Temperature (°F)
A-1	1.76	5 3/4	.26	
2	5.84	9 7/8	.26	
3	11.84	15 7/8	.26	
4	28.16	32 1/8	.24	
5	34.16	38 1/8	.28	
6	38.24	42 1/4	.26	
B 1			.24	
2			.26	
3			.28	
4			.26	
5			.28	
6			.28	
25				avg. 40

S-0034R

Sample Log Sheet

Job U.S. STEEL MINNTAC

Unit and Sampling Location CONVEYOR TRANSFER 8.49

Date 1-10-80 Test 10 Run 1

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑ PART ✓

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER # 1895			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
CONDENSATE	0	0	0
SILICA GEL	1208	1187	21
Total - (M_{wo})			21 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. STEEL MINNITAC Operators E. TROWBRIDGE - B. DRAKE Pitot No. 14 C_p .840

Source CONVEYOR TRANSFER 8-49 Sampling Train No. 3 $\Delta H_@$ 1.83 Bar. Press. 28.60 in.Hg. B_{wo} 3 %

Date 1-10-80 Test 10 Run 1 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 7-3 Nozzle Dia. .387 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft^3)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(0930)	(100.85)										
A-6	5	104.92	.26	2.2	4.07/4.92	2	70	220	248	20.9	20	18
5	10	108.99	.26	2.2	4.07/8.99		70				22	18
4	15	113.06	.26	2.2	4.07/3.06	2	70		250		24	18
3	20	116.97	.24	2.1	3.91/6.97		70				24	20
2	25	120.88	.24	2.1	3.91/0.88	2	70		250		26	20
1	30	124.62	.22	1.9	3.74/4.62		70				26	20
B 6	35	128.84	.28	2.5	4.22/8.84	2.5	70		250		28	20
5	40	133.21	.30	2.6	4.37/3.21	3	70				28	20
4	45	137.43	.28	2.5	4.22/7.43		70		252		28	20
3	50	141.65	.28	2.5	4.22/1.65		70				28	22
2	55	145.72	.26	2.2	4.07/5.72	2	70		252		28	22
1	60	149.79	.26	2.2	4.07/9.79		70				28	22
	(1032)											
	θ = 60	V_m = 48.94		$\bar{\Delta H}$ = 2.20							$\bar{T}_m$ = 228	

Sample Log Sheet

Job U. S. STEEL MINNTAC

Unit and Sampling Location CONVEYOR TRANSFER 8.49

Date 1-10-80 Test 10 Run 2

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER # 1436			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
CONDENSATE	0	0	0
Silica Gel	1231	1209	22
Total (M_{wo})			22 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. STEEL MINNTAC Operators EJ + BD Pitot No. 14 C_p .840

Source CONVEYOR TRANSFER 8.49 Sampling Train No. 3 $\Delta H_@$ 1.830 Bar. Press. 28.60 in.Hg. B_{wo} 3 %

Date 1-10-90 Test 10 Run 2 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 2-3 Nozzle Dia. .307 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft³)	Velocity Head (in. WC)	Orifice Meter (in. WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1037)	(150.10)										
B 6	5	154.32	.29	2.5	4.22/8.32		70	220	246	20.9	22	18
5	10	158.54	.29	2.5	4.22/8.54	2	70				24	18
4	15	162.76	.28	2.5	4.22/2.76		70		250		26	18
3.	20	166.83	.26	2.2	4.07/6.83		70				26	20
2	25	170.90	.26	2.2	4.07/8.90	2	70		250		26	20
1	30	174.97	.26	2.2	4.07/4.97		70				26	20
A 6	35	179.04	.26	2.2	4.07/9.04	2	70		250		26	18
5	40	183.26	.28	2.5	4.22/3.26	25	70				26	20
4	45	187.33	.26	2.2	4.07/7.33		70		248		26	20
3	50	191.40	.26	2.2	4.07/1.40	2	70				28	22
2	55	195.31	.24	2.1	3.91/5.31		70		248		28	22
1	60	199.05	.22	1.9	3.73/9.05		70				30	24
	(1140)											
	θ = 60	Vm = 48.95		ΔH = 2.26							tm = 23.1	

Sample Log Sheet

Job U.S. STEEL MINNTAC
Unit and Sampling Location CONVEYOR TRANSFER 8.49
Date 1-10-80 Test 10 Run 3

Sample Train: Leak check: < 0.02 cfm at 15 in. Hg. (vac.) ☑ Port L

Particulate Sample Type and Number	Weights		
	Final	Tare	Difference
FILTER #1435			
PW			
Total (M_n)			g

Impinger ☐ Condenser ☑

Impinger Number	Weights		
	Final	Tare	Difference
CONDENSATE	0	0	0
SILICA GEL	1211	1190	21
Total (M_{wo})			21 g

Orsat	Carbon Dioxide	Oxygen	Carbon Monoxide
1			
2			
3			
4			
5			
6			
7			
8			
Average			

form S-0046

EPA Method 5 Field Data Sheet

Job U.S. STEEL MINNTAC Operators E.T + B.D Pitot No. 14 C_p .840

Source CONVEYOR TRANSFER 8.49 Sampling Train No. 3 $\Delta H_@$ 1.830 Bar. Press. 28.60 in.Hg. B_{wo} 3 %

Date 1-10-90 Test 10 Run 3 Gasmeter coeff. 1.0011 Amb. Temp. ___ °F Nozzle No. 7-3 Nozzle Dia. .307 in.

Traverse Point No.	Sampling Time (min)	Sample Volume (ft^3)	Velocity Head (in.WC)	Orifice Meter (in.WC)	ΔV (mcf)	Vac. (inHg)	Stack Temp (°F) 1	Probe Temp (°F) 2	Oven Temp (°F) 3	Oxygen (% v/v) 4	Gasmeter temp IN (°F) 5	Gasmeter temp OUT (°F) 6
	(1145)	(200.20)										
A-6	5	204.27	.26	2.2	4.07/4.27		70	220	248	20.9	24	22
5	10	208.34	.26	2.2	4.07/8.34	2	70				26	22
4	15	212.41	.26	2.2	4.07/12.41		70		248		26	22
3	20	216.36	.24	2.1	3.95/16.36		70				28	22
2	25	220.31	.24	2.1	3.95/20.31	2	70		250		28	22
1	30	224.26	.24	2.1	3.95/24.26		70				28	22
B 6	35	228.48	.28	2.5	4.22/28.48		70		254		28	22
5	40	232.85	.30	2.6	4.37/32.85	3	70				30	24
4	45	237.22	.30	2.6	4.37/37.22		70		254		30	24
3	50	241.44	.28	2.5	4.22/41.44		70				30	24
2	55	245.51	.26	2.2	4.07/45.51	2	70		252		30	24
1	60	249.58	.26	2.2	4.07/49.58		70				30	24
	(1248)											
	Θ=60	VM=49.38		$\bar{\Delta H}$=2.24							$\bar{t}_M$=25.5	

APPENDIX M

METHOD 9

FIELD DATA SHEETS

Visible Emissions Form

— Interpoll Inc. —

Company USSC Minntac

Date 1-8-80

Address Virginia, Minn.

Observer J Stark

Re-Certification Date NOV 6, 79

Source Conveyor Transfer No 6.43

Source

Start 1155 hrs End 1255 hrs

Start _____ hrs End _____ hrs

Location of Observer (direction & distance) 100 yds SW of Stark

Plume Description (color, etc) Steam plume

Background Description 100% clear Sky

Ambient Temperature (°F) -20°

Wind Speed (mph) 20 Direction From NW

Fuel Type

Load (Specify)

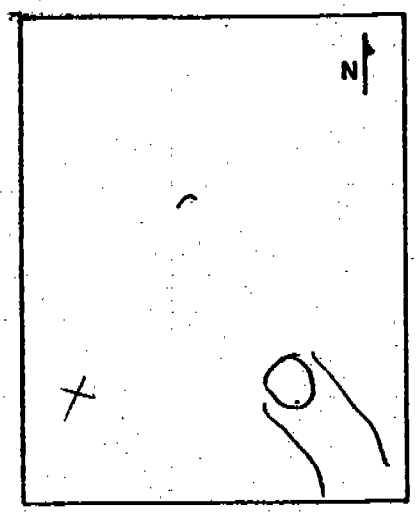
Emission Source Height (ft)

Outlet Dimensions (ins.)

Type of Source No. 1

Source No. 2

Observer position relative to plume and sun



Personnel present at time of observations:

— COMMON STACK —

Unit No. _____ Unit No. _____ Unit No. _____ Unit No. _____

Unit Load (Specify)

Fuel Type & Quantity:

S-0079

Plume Opacity Data — Method 9

— Interpoll Inc. —

Plant: USSC - Mmtl

Date: 1-8-93 Time: 1155 hrs

Source: Con. Transfer

	0	15	30	45		0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0

Source:

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Meteorological Conditions: 100% clear & cold

Observer: [signature]

S-0080

Visible Emissions Form

— Interpoll Inc. —

Company USSC Minntac

Address Virginia, Mn

Date 1-8-80

Observer J. Stock

Re-Certification Date Nov 6, 79

Source Secondary Bin Stack No. 6.40

Start 1155 hrs End 1255 hrs

Source

Star hrs End hrs

Location of Observer (direction & distance) 100 yds SW of stack

Plume Description (color, etc) Steam plume

Background Description 100% clear sky

Ambient Temperature (°F) -20°

Wind Speed (mph) 20 Direction from NW

Fuel Type

Load (Specify)

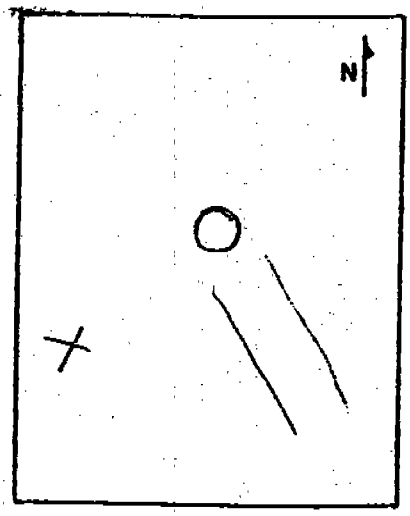
Emission Source Height (ft)

Outlet Dimensions (ins.)

Type of Source No. 1

Source No. 2

Observer position relative to plume and sun



Personnel present at time of observations:

— COMMON STACK —

Unit No. Unit No. Unit No. Unit No

Unit Load (Specify)

Fuel Type & Quantity:

S-0079

Plume Opacity Data – Method 9

— Interpoll Inc. —

Plant: USSC Date: 1-8-79 Time: 1155 hrs

Source: Secondary Bin No. 6 Ya

	0	15	30	45		0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0

Source:

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Meteorological Conditions: 100% clear sky - cold
no pt particulate visible before or after dissipation

Observer: J.J. Stro

S-0080

Visible Emissions Form

— Interpoll Inc. —

Test 3

Company U.S. STEEL MINNTAC Date 1-9-80

Address MT. ILON, MN Observer [illegible]

Re-Certification Date 11-6-79

Source CONVAYOR TRANSFER 634 Source _____

Start 0830 hrs End 0930 hrs Start _____ hrs End _____ hrs

Location of Observer (direction & distance) SE 50'

Plume Description (color, etc) None

Background Description Blue Sky

Ambient Temperature (°F) -20

Wind Speed (mph) 20 Direction SW

Fuel Type _____

Load (Specify) _____

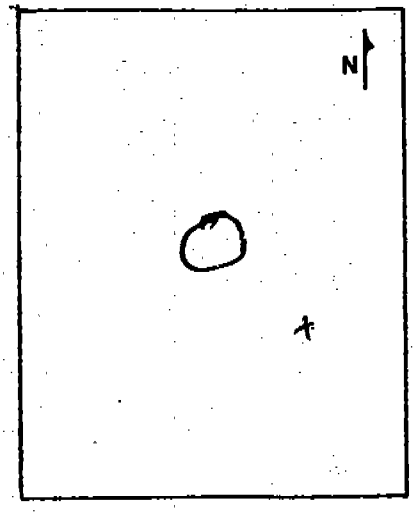
Emission Source Height (ft) _____

Outlet Dimensions (ins.) _____

Type of Source No. 1 _____

Source No. 2 _____

Observer position relative to plume and sun



Personnel present at time of observations: None

— COMMON STACK —

Unit No. _____ Unit No. _____ Unit No. _____ Unit No. _____

Unit Load (Specify)

Fuel Type & Quantity:

S-0079

Plume Opacity Data — Method 9

— Interpoll Inc. —

Plant: U.S. STEEL Date: 1-8-80 Time: 0830 hrs

Source: Conveyor Transfer 6.34

	0	15	30	45		0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0

Source:

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Meteorological Conditions: Blue Sky

Observer: [illegible]

S-0080

Test 4

Visible Emissions Form

— Interpoll Inc. —

Company U.S. STEEL MINNTAC

Address MT. ILON, MN

Date 1-8-80

Observer E. Trowbridge

Re-Certification Date 11-6-79

Source TERTIARY CRUSHER No 6.24

Source _____

Start 1300 hrs End 1400 hrs

Start _____ hrs End _____ hrs

Location of Observer (direction & distance) SW 100'

Plume Description (color, etc) steam plume

Background Description _____

Ambient Temperature (°F) -20

Wind Speed (mph) 20 Direction NNW

Fuel Type _____

Load (Specify) _____

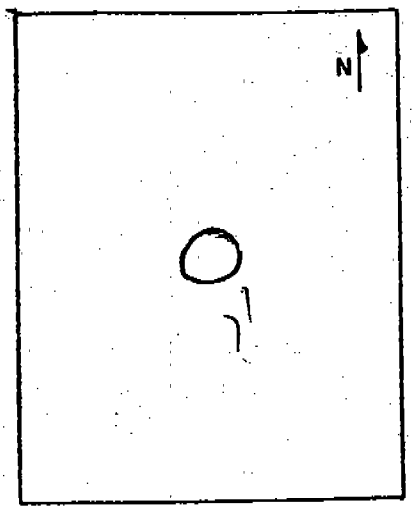
Emission Source Height (ft) _____

Outlet Dimensions (ins.) _____

Type of Source No. 1 _____

Source No. 2 _____

Observer position relative to plume and sun



Personnel present at time of observations: None

— COMMON STACK —

Unit No. _____ Unit No. _____ Unit No. _____ Unit No. _____

Unit Load (Specify)

Fuel Type & Quantity:

S-0079

Plume Opacity Data — Method 9

— Interpoll Inc. —

Plant: U.S. STEEL MINNTAC Date: _____ Time: _____ hrs

Source: No. 6.44

	0	15	30	45		0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0

Source: _____

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Meteorological Conditions: 100% Cloudy

Observer: [illegible]

S-0080

Test No 5

Visible Emissions Form

— Interpoll Inc. —

Company USSC Minfac

Date 1-9-80

Address

Observer J. Stark

Re-Certification Date 11- -79

Source 6.41 Conveyor Transfer

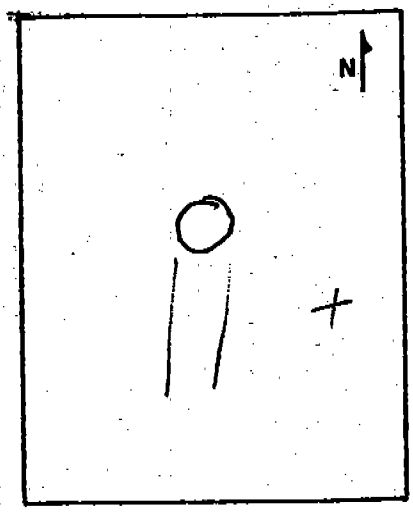
Source

Start 0900 hrs End 1006 hrs

Start hrs End hrs

Location of Observer (direction & distance) 100 yds East of stack

Observer position relative to plume and sun



Plume Description (color, etc) Steam

Background Description 100% clear sky

Ambient Temperature (°F) -30

Wind Speed (mph) 5 Direction From North

Fuel Type

Load (Specify)

Emission Source Height (ft)

Outlet Dimensions (ins.)

Type of Source No. 1

Source No. 2

Personnel present at time of observations:

— COMMON STACK —

Unit No. Unit No. Unit No. Unit No

Unit Load (Specify)

Fuel Type & Quantity:

S-0079

Plume Opacity Data — Method 9

— Interpoll Inc. —

Plant: USSC Date: 1-9-80 Time: 0900 hrs

Source: 641 Conv. Trans

	0	15	30	45		0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0

Source:

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Meteorological Conditions:

Observer:

S-0080

Visible Emissions Form

— Interpoll Inc. —

Test No. 6

Company US Steel Minntac

Address Mt Iron, Minn

Date 1-9-80

Observer [illegible]

Re-Certification Date 11-6-79

Source Conveyor Transfer No. 6.56

Start 1400 hrs End 1500 hrs

Source _____

Start _____ hrs End _____ hrs

Location of Observer (direction & distance) 50' SW

Plume Description (color, etc) Steam

Background Description Blue Sky

Ambient Temperature (°F) -30

Wind Speed (mph) ✓ Direction North

Fuel Type

Load (Specify)

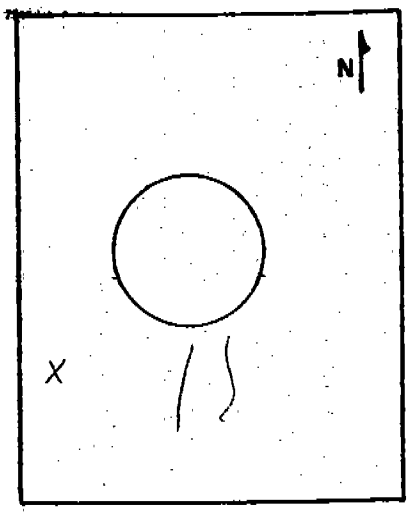
Emission Source Height (ft)

Outlet Dimensions (ins.)

Type of Source No. 1

Source No. 2

Observer position relative to plume and sun



Personnel present at time of observations: None

— COMMON STACK —

Unit No. _____ Unit No. _____ Unit No. _____ Unit No. _____

Unit Load (Specify)

Fuel Type & Quantity:

S-0079

Plume Opacity Data — Method 9

— Interpoll Inc. —

Plant: U.S. Steel Minntac Date: 1-9-80 Time: 1400 hrs

Source: Conveyor Transfer 6.56 Source:

	0	15	30	45		0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Meteorological Conditions: Clear Blue Sky

Observer: [illegible]

S-0080

Visible Emissions Form

— Interpoll Inc. —

Test No. 7

Company U.S. Steel Minntac

Address Mt. Iron, MN

Date 1-9-80

Observer [illegible]

Re-Certification Date 11-6-79

No. 6.43

Source Tertiary Storage Bin Stack

Source _____

Start 1250 hrs End 1350 hrs

Start _____ hrs End _____ hrs

Location of Observer (direction & distance) _____

Plume Description (color, etc) Steam Plume

Background Description Blue Sky

Ambient Temperature (°F) -10

Wind Speed (mph) ✓ Direction N

Fuel Type _____

Load (Specify) _____

Emission Source Height (ft) _____

Outlet Dimensions (ins.) _____

Type of Source No. 1 _____

Source No. 2 _____

Observer position relative to plume and sun

N

Personnel present at time of observations: None

— COMMON STACK —

Unit No. _____ Unit No. _____ Unit No. _____ Unit No. _____

Unit Load (Specify)

Fuel Type & Quantity:

S-0079

Plume Opacity Data — Method 9

— Interpoll Inc. —

Plant: U.S. Steel Minntac Date: Jan 9, 80 Time: 1250 hrs

Source: TERTIARY STORAGE BIN No. 143 Source:

	0	15	30	45		0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Meteorological Conditions: Clear Blue Sky

Observer: [illegible]

S-0080

Visible Emissions Form

— Interpoll Inc. —

Test No. 8

Company USSC Minntac

Address Mt. Iron, Mi

Date 1-9-80

Observer J Stark

Re-Certification Date 11-6-79

Source #8.43 Grate Feed End

Source

Start 1600 hrs End 1700 hrs

Start hrs End hrs

Location of Observer (direction & distance) 80 yds West of stack

Plume Description (color, etc) Steam plume very low velocity

Background Description 90% clear

Ambient Temperature (°F) -20

Wind Speed (mph) 5 Direction fr NE

Fuel Type

Load (Specify)

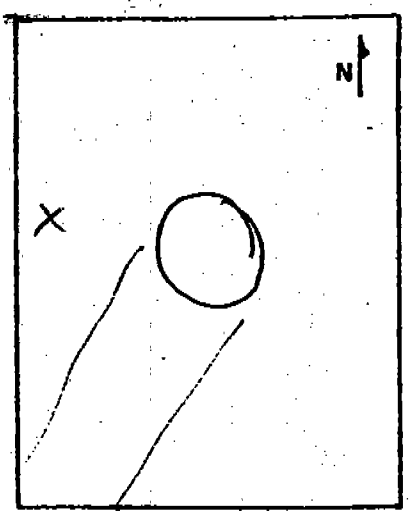
Emission Source Height (ft)

Outlet Dimensions (ins.)

Type of Source No. 1

Source No. 2

Observer position relative to plume and sun



Personnel present at time of observations:

— COMMON STACK —

Unit No. Unit No. Unit No. Unit No.

Unit Load (Specify)

Fuel Type & Quantity:

S-0079

Plume Opacity Data – Method 9

— Interpoll Inc. —

Plant: USS Minntac Date: 1-9-90 Time: 1000 hrs

Source: Grate Feed End

	0	15	30	45		0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0

Source:

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Meteorological Conditions: No opacity visible at stack exit or at point of steam dissipation

Observer: [signature]

S-0080

Visible Emissions Form

— Interpoll Inc. —

Test No 9

Company USSC Minntac

Address Mt. Iron, Minn

Date 1-10-80

Observer J. Stock

Re-Certification Date 11, 6, 79

Source 8.47 Conveyor Transfer

Start 0900 hrs End 1000 hrs

Source _____

Start _____ hrs End _____ hrs

Location of Observer (direction & distance) 60 yds NE of Stack

Plume Description (color, etc) Steam Plume

Background Description 50% cloudy

Ambient Temperature (°F) -5

Wind Speed (mph) 15 Direction from SE

Fuel Type _____

Load (Specify) _____

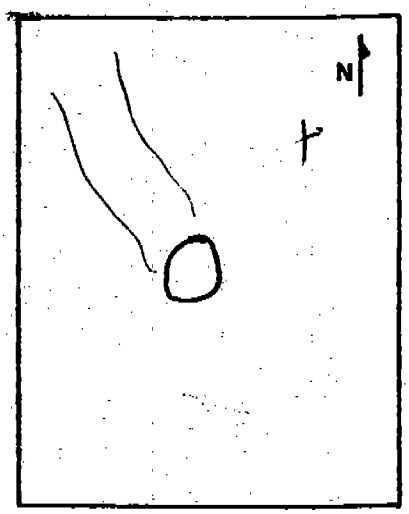
Emission Source Height (ft) _____

Outlet Dimensions (ins.) _____

Type of Source No. 1 _____

Source No. 2 _____

Observer position relative to plume and sun



Personnel present at time of observations: _____

— COMMON STACK —

Unit No. _____ Unit No. _____ Unit No. _____ Unit No _____

Unit Load (Specify)

Fuel Type & Quantity:

S-0079

Plume Opacity Data — Method 9

— Interpoll Inc. —

Plant: Minntac Date: 1-10-90 Time: 0900 hrs

Source: Conv. Trans. #8.47

	0	15	30	45		0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0

Source:

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Meteorological Conditions:

Observer: J. Sher

S-0080

Visible Emissions Form

— Interpoll Inc. —

Test No 10

Company U.S. Steel Minntac

Address Mt. Iron, MN

Date 1-10-80

Observer [illegible]

Re-Certification Date 11-6-79

Source Conveyor Transfer #8.49 Source _____

Start 0900 hrs End 1000 hrs Start _____ hrs End _____ hrs

Location of Observer (direction & distance) 60 yds NE

Plume Description (color, etc) Steam Plume

Background Description 50% Cloudy

Ambient Temperature (°F) -5

Wind Speed (mph) 15 Direction SE

Fuel Type _____

Load (Specify) _____

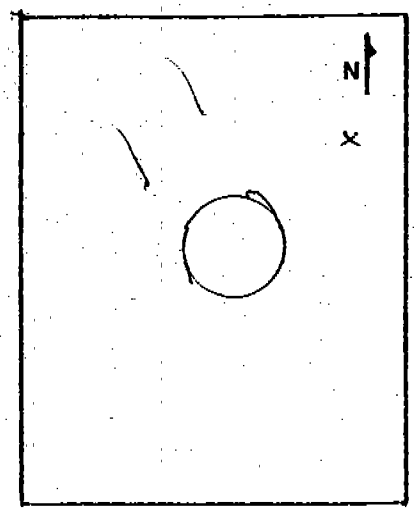
Emission Source Height (ft) _____

Outlet Dimensions (ins.) _____

Type of Source No. 1 _____

Source No. 2 _____

Observer position relative to plume and sun



Personnel present at time of observations: _____

— COMMON STACK —

Unit No. _____ Unit No. _____ Unit No. _____ Unit No _____

Unit Load (Specify)

Fuel Type & Quantity:

S-0079

Plume Opacity Data — Method 9

— Interpoll Inc. —

Plant: U.S. Steel - Minntac Date: 1-10-80 Time: 0800 hrs

Source: Conveyor Transfer #8, 49

	0	15	30	45		0	15	30	45
0	0	0	0	0	30	0	0	0	0
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0

Source:

	0	15	30	45		0	15	30	45
0					30				
1					31				
2					32				
3					33				
4					34				
5					35				
6					36				
7					37				
8					38				
9					39				
10					40				
11					41				
12					42				
13					43				
14					44				
15					45				
16					46				
17					47				
18					48				
19					49				
20					50				
21					51				
22					52				
23					53				
24					54				
25					55				
26					56				
27					57				
28					58				
29					59				

Meteorological Conditions: 50% Cloudy

Observer: [illegible]

S-0080

Minnesota Pollution Control Agency

This is to certify that,

EDWARD TROWBRIDGE

attended and fulfilled the requirements of the

VISIBLE EMISSION EVALUATION RE-CERTIFICATION COURSE

offered by

THE MINNESOTA POLLUTION CONTROL AGENCY

on

NOVEMBER 6, 1979

During the course of the test an average deviation of less than 7.5% for a set of 25 white smoke and a set of 25 black smoke was maintained and none of the readings deviated by 20% or more.

By achieving the above accuracy, certification as a "Smoke Reader" is granted for a period of six months from the date of the test.

James L. Kolar

JAMES L. KOLAR
Instructor
Pollution Control Specialist
MPCA, DAQ

Richard J. Sandberg

RICHARD J. SANDBERG
Instructor
Pollution Control Specialist
MPCA, DAQ

1935 West County Road B2, Roseville, Minnesota 55113
Regional Offices • Duluth / Brainerd / Fergus Falls / Marshall / Rochester / Roseville
Equal Opportunity Employer

Minnesota Pollution Control Agency

This is to certify that,

JEFF STOCK

attended and fulfilled the requirements of the

VISIBLE EMISSION EVALUATION RE-CERTIFICATION COURSE

offered by

THE MINNESOTA POLLUTION CONTROL AGENCY

on

NOVEMBER 6, 1979

During the course of the test an average deviation of less than 7.5% for a set of 25 white smoke and a set of 25 black smoke was maintained and none of the readings deviated by 20% or more.

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Pollution Control Specialist
MPCA, DAQ

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RICHARD J. SANDBERG
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Pollution Control Specialist
MPCA, DAQ

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APPENDIX N

POLLUTION CONTROL EQUIPMENT DESCRIPTIONS

PROCESS RATE DATA

R. E. KOSKI
CHIEF ENGINEER
MINNESOTA ORE OPERATIONS

United States Steel Corporation
P. O. BOX 417
MT. IRON, MINNESOTA 55768

January 16, 1980

Interpoll, Inc.
2982 N. Cleveland
St. Paul, Minnesota 55113

Minnesota Ore Operations
Step III Stack Testing
PO 635-23870-73

Dear Sir:

Attached to this transmittal is a schedule of emission source specifications for your information in reporting our stack test data. Process rates were taken from metallurgical and operating reports at the time of testing for each source.

As per conversation with Perry Lonnes on January 11, we will expect you to test the remaining ten sources on this contract during the week of January 28.

Yours very truly,

R. E. Koski

R. E. Koski

RAC/nat

CC: C. W. Niemi
D. V. Erickson
J. R. Lamprecht
P. G. Haataja

EQUIP. NO.	MODEL NO.	FAN	FAN RPM	MOTOR	MOT. RPM	SCFM
078-03-1G1	ENVIRONEERING #525 HYDROFILTER	233 XL	764	100HP 405T	1750	26000
078-03-6G1	" #225 "	223 XL	1112	40HP 326T	1750	11000
078-03-7G1	" #325 "	226 XL	1000	60HP 365T	1750	16000
078-03-8G1	" #525 "	233 XL	764	75 HP 404T	1750	23000
078-03-20G1	" #850 "	241 XL	644	150HP 445T	1750	37000
078-03-22G1	" #325 "	226 XL	1000	60HP 365T	1750	16000
078-03-23G1	" #325 "	226 XL	938	50HP 364T	1750	16000
298-06-4	WWSLY #160 IMPINJET 6'-0" DIA.	226 XL	937	40 HP 324T	1750	14000
298-06-6	WWSLY #1110 IMPINJET 11'-0" DIA.	245 XL	610	150HP 447T	1200	43740
298-06-7	WWSLY #180 IMPINJET 8'-0" DIA.	237 XL	625	60HP 404T	1200	24767

EQUIP. NO.	FUNCTION	PROCESS RATE
078-03-1G1	SECONDARY CRUSHER	775 LTPH
078-03-6G1	SECONDARY BIN	3490 LTPH
078-03-7G1	CONVEYOR TRANSFER 008-009	2031 LTPH
078-03-8G1	TERTIARY CRUSHER	300 LTPH
078-03-20G1	TERTIARY BIN	339 LTPH
078-03-22G1	CONVEYOR TRANSFERS 003	329 LTPH
078-03-23G1	CONVEYOR TRANSFERS 003-004	339 LTPH
298-06-4	GRATE FEED	425 LTPH
298-06-6	COOLER DISCHARGE + PRODUCT TRANSFER	425 LTPH
298-06-7	PRODUCT TRANSFER 042-043	850 LTPH

RAC

APPENDIX O

PROCEDURES

Particulate Loadings and Emission Rates

The particulate emission rates were determined per Federal Register, Volume 42, Number 160, EPA Methods 1-5. In this procedure, a preliminary velocity profile of the gases in the flue is obtained by means of a temperature and velocity traverse. On the basis of these values, sampling nozzles of appropriate diameter are selected to allow isokinetic sampling, a necessary prerequisite for obtaining a representative sample.

The sampling train consists of a heated stainless steel-lined sampling probe equipped with a Type S pitot and a thermocouple. The probe is attached to a sampling module which houses the all-glass in line filter holder in a temperature controlled oven. In addition, the sampling module also houses the condenser case and a silica gel drying column. The sampling module is connected by means of an umbilical cord to the control module which houses the dry test gasmeter, the calibrated orifice, a leakless pump, two inclined manometers, and all controls required for operating the sampling train.

Particulate samples were collected as follows: The sample gas was drawn in through the sampling probe isokinetically and passed through a 4-inch diameter Gelman Type A/E glass fiber filter. The particulates were removed at this point and collected on the filter. The gases then passed through an ice-cooled condenser and a desiccant-packed drying column which quantitatively absorb all moisture from the sample gas stream after which the sample gas passes through the pump and the dry test gasmeter which integrates the sample gas flow throughout the course of the test. A calibrated orifice attached to the outlet of the gasmeter provides instantaneous flow rate data.

A representative particulate sample was acquired by sampling for equal periods of time at the centroid of a number of equal area regions in the duct. The sampling rate is adjusted at each site such that an isokinetic sampling condition prevails. Nomographs are used to aid in the rapid determination of the sampling rate.

After sampling is complete, the filter is removed and placed in a clean container. The probe is quantitatively washed with acetone and the washings are stored in a second container. A brush is used in the probe cleaning step to help dislodge deposits. The samples are returned to the laboratory and evaporated and/or dried for 24 hours over drierite at 70±10 °F and then weighed to the nearest 0.5 mg in a balance room where the relative humidity is less than 50 percent. The silica gel column is weighed on-site and the water collected by the silica gel is added to the condensate so that the total amount of absorbed water may be ascertained.

Since all of the sources tested take in air from the room, gas composition analyses were not performed except for moisture contents. Gas compositions reported are those of normal air.

APPENDIX P

CALCULATION EQUATIONS

CALCULATION EQUATIONS

METHOD 2

$$\overline{V}_s = 85.48\ C_p\ (\sqrt{\Delta p})_{avg} \sqrt{\frac{T_{s(avg)}}{P_s\ M_s}}$$

$$Q_{s,d} = 60(1 - B_{ws})\ \overline{V}_s\ A\ \left[\frac{528}{T_{s(avg)}}\right]\ \left[\frac{P_s}{29.92}\right]$$

$$Q_a = 60\ \overline{V}_s\ A$$

$$\dot{m}_g = \frac{4.995\ Q_{s,d}\ G_d}{1 - B_{ws}}$$

$$RH^* = 100\ [vp_{twb} - 0.0003641\ P_s\ (T_{db} - T_{wb})/vp_{tbd}]$$

$$B^*_{ws} = RH(vp_{tdb})/P_s$$

METHOD 3

$$\%EA = \frac{100(\%O_2 - 0.5\%\ CO)}{0.264\%\ N_2 - \%O_2 + 0.5\%\ CO}$$

$$M_d = 0.44(\%CO_2) + 0.32\ (\%O_2) + 0.28\ (\%N_2 + \%CO)$$

$$M_s = M_d\ (1 - B_{ws}) + 0.18\ B_{ws}$$

*Alternate equations for calculating moisture content from wet bulb and dry bulb data.

METHOD 5

$$V_{m(std)} = 17.65\ V_m\ \gamma\ \left[\frac{P_{bar} + \overline{\Delta H}/13.6}{T_{m(avg)}}\right]$$

$$V_{w(std)} = 0.0472\ V_{lc}$$

$$B_{ws} = \frac{V_{w(std)}}{V_{w(std)} + V_{m(std)}}$$

$$I = 0.0944\ \left[\frac{T_{s(avg)}\ V_{m(std)}}{P_s\ V_s\ A_n\ \theta\ (1 - B_{ws})}\right]$$

$$C_s = \frac{15.43\ M_p}{V_{m(std)}}$$

$$C_a = \frac{272.3\ M_p\ P_s}{T_{s(avg)}\ [V_{w(std)} + V_{m(std)}]}$$

$$(\dot{m}_p)_1 = 8.5714\times10^{-3}\ C_s\ Q_{s,d}$$

$$(\dot{m}_p)_2 = \frac{1.3228\times10^{-1}\ M_p\ A}{\theta\ A_n}$$

$$\dot{m}_p = \frac{(\dot{m}_p)_1 + (\dot{m}_p)_2}{2}$$

SYMBOLS

A	=	Cross sectional area of stack, SQ. FT.
A_n	=	Cross sectional area of nozzle, SQ. FT.
B_{ws}	=	Water vapor in gas stream, proportion by volume
C_p	=	Pitot tube coefficient, dimensionless
C_a	=	Concentration of particulate matter in stack gas, wet basis, GR/ACF
C_s	=	Concentration of particulate matter in stack gas, dry basis, corrected to standard conditions, GR/DSCF
EA	=	Excess air, percent by volume
γ	=	Dry test meter correction factor, dimensionless
G_d	=	Specific gravity (relative to air), dimensionless
I	=	Isokinetic variation, percent by volume
M_d	=	Molecular weight of stack gas, dry basis, g/g - mole.
$\dot{m}_g$	=	Mass flow of wet flue gas, LB/HR
$\dot{m}_p$	=	Particulate mass flow, LB/HR
M_s	=	Molecular weight of stack gas, wet basis, g/g, mole.
M_p	=	Total amount of particulate matter collected, g
P_{bar}	=	Atmospheric pressure, IN. HG (uncompensated)
P_g	=	Stack static gas pressure, IN. W.C.
P_{std}	=	Standard absolute pressure, 29.92 IN. HG

Q_a = Actual volumetric stack gas flow rate, ACFM

$Q_{s,d}$ = Dry volumetric stack gas flow rate corrected to standard conditions, DSCFM

RH = Relative humidity, %

T_{db} = Dry bulb temperature of stack gas, ^oF

T_{wb} = Wet bulb temperature of stack gas, ^oF

$T_{m(avg)}$ = Absolute average dry gas meter temperature, ^oR

$T_{s(avg)}$ = Absolute average stack temperature, ^oR

T_{std} = Standard absolute temperature, 528 ^oF (68 ^oF)

θ = Total sampling time, min.

V_{lc} = Total volume of liquid collected in impingers and silica gel, ml

V_m = Volume of gas sample as measured by dry gas meter, DSCF

$V_{m(std)}$ = Volume of gas sample measured by the dry gas meter corrected to standard conditions, DSCF

$V_{w(std)}$ = Volume of water vapor in the gas sample corrected to standard conditions, SCF

$\overline{V}_s$ = Average actual stack gas velocity, FT/SEC

vp_{tdb} = Vapor pressure of T_{db}, IN. HG

vp_{twb} = Vapor pressure of T_{wb}, IN. HG

$\overline{\Delta H}$ = Average pressure differential across the orifice meter IN. W.C.

ΔP = Velocity pressure of stack gas, IN. W.C.

γ = Dry test meter correction coefficient, dimensionless

APPENDIX Q

SAMPLING TRAIN

CALIBRATION DATA SHEETS

JOB: U.S. STEEL MINNTAC
INTERPOLL REPORT NO. 0-694

INTERPOLL INC.

METER BOX CALIBRATION DATA SHEET

DATE OF CAL: NOVEMBER 6, 1979
TECHNICIAN: G WOTHE
BAR. PRESS.: 29.58 IN. HG

METER BOX NO. 3
DRY TEST METER SER. NO. 35303
WET TEST METER NO. AL-20

DELTA H ACTUAL (IN. WC)	GAS VOLUME WET TEST METER	CAL. INDEX (%)	DIFF. WET TEST METER (IN. WC)	GAS VOLUME DRY TEST METER VDI (CF)	GAS VOLUME DRY TEST METER VDF (CF)	GAS TEMPERATURE OF METERS TW	GAS TEMPERATURE OF METERS TDI (DEG-F)	GAS TEMPERATURE OF METERS TDO	TIME (MIN)	METER COEFF.	ORIFICE CONSTANT (IN. WC)
.30	5.0	99.90	.09	172.93	177.54	65	76	68	12.65	1.00822	1.781
.70	5.0	99.90	.13	221.97	226.99	65	80	72	9.57	.99426	1.820
1.40	10.0	99.90	.15	211.17	221.36	65	80	70	15.17	.99482	1.781
2.00	10.0	99.90	.19	200.50	210.66	65	80	70	13.02	.99706	1.975
3.00	10.0	99.91	.23	189.90	199.99	65	82	70	10.54	1.00283	1.838
5.00	10.0	99.91	.25	178.94	188.90	65	82	68	8.25	1.00935	1.885

AVERAGE: 1.00106 1.830

JOB: U.S. STEEL MINNTAC
INTERPOLL REPORT NO. 0-694

METER BOX CALIBRATION AND USAGE STATUS REPORT
DATE OF REPORT: JANUARY 24, 1980

CONTROL CASE NO. 3 (ROCKWELL DRY TEST METER SERIAL NO. 35303)

DATE OF LAST CALIBRATION: NOVEMBER 6, 1979
CALIBRATION TECHNICIAN: G WOTHE
WET TEST METER NO. AMERICAN METER AL-20

DATE OF USE	JOB NO.	INITIAL METER READING	FINAL METER READING	VOLUME/JOB (CU. FT.)	TOTAL VOLUME* (CU. FT.)
NOVEMBER 21, 1979	9-669	342.30	451.42	108.92	108.92
NOVEMBER 30, 1979	9-673	453.37	555.99	103.62	212.54
DECEMBER 3, 1979	9-675	554.40	655.19	100.79	311.33
DECEMBER 11, 1979	9-682	774.00	929.52	155.52	466.85
DECEMBER 14, 1979	9-683	929.88	213.96	284.08	750.93

*TOTAL VOLUME THROUGH METER SINCE LAST CALIBRATION

JOB: U.S. STEEL MINNTAC
INTERPOLL REPORT NO. 0-694

INTERPOLL INC.

METER BOX CALIBRATION
DATA SHEET

DATE OF CAL: SEPTEMBER 22, 1979
TECHNICIAN: G. WOTHE
BAR. PRESS.: 29.34 IN. HG

METER BOX NO. 4
DRY TEST METER SER. NO. 676477
WET TEST METER NO. AL-20

DELTA H ACTUAL (IN. WC)	GAS VOLUME WET TEST METER	CAL. INDEX (%)	DIFF. WET TEST METER (IN. WC)	GAS VOLUME DRY TEST METER VDI (CF)	VDF (CF)	GAS TEMPERATURE OF METERS TW (DEG-F)	TDI (DEG-F)	TDO (DEG-F)	TIME (MIN)	METER COEFF.	ORIFICE CONSTANT (IN. WC)
.50	5.0	99.90	.07	718.37	723.37	63	70	66	12.47	1.00780	1.741
.99	5.5	99.90	.11	766.73	772.28	63	76	70	10.48	1.00542	1.815
1.40	10.0	99.90	.14	756.11	766.21	63	78	68	15.29	1.00414	1.819
2.00	10.5	99.90	.17	744.98	755.60	63	78	68	13.33	1.00087	1.792
3.00	10.0	99.91	.20	734.38	744.47	63	78	66	10.47	.99891	1.831
5.00	10.0	99.91	.25	723.87	733.88	63	80	66	8.21	1.00397	1.871
									AVERAGE:	1.00355	1.811

JOB: U.S. STEEL MINNTAC
INTERPOLL REPORT NO. 0-694

METER BOX CALIBRATION AND USAGE STATUS REPORT
DATE OF REPORT: JANUARY 24, 1980

CONTROL CASE NO. 4 (ROCKWELL DRY TEST METER SERIAL NO. 676477)

DATE OF LAST CALIBRATION: SEPTEMBER 22, 1979
CALIBRATION TECHNICIAN: G. WOTHE
WET TEST METER NO. AMERICAN METER AL-20

DATE OF USE	JOB NO.	INITIAL METER READING	FINAL METER READING	VOLUME/JOB (CU. FT.)	TOTAL VOLUME* (CU. FT.)
SEPTEMBER 26, 1979	9-636	778.72	924.10	145.38	145.38
OCTOBER 8, 1979	9-647	974.83	96.71	121.85	267.23
NOVEMBER 14, 1979	9-666	97.25	629.06	531.80	799.06

*TOTAL VOLUME THROUGH METER SINCE LAST CALIBRATION

PITOT TUBE CALIBRATION DATA SHEET

DATE OF CAL: JULY 25, 1979 PITOT TUBE NUMBER 6
TECHNICIAN: G. WOTHE

DIRECTION A

U* (FPS)	H/STD* (IN. WC)	ACTUAL H/STD (IN. WC)	H/S-TYPE (IN. WC)	COEFF
20	.09	.10	.15	.8165
40	.37	.39	.53	.8578
60	.82	.80	1.10	.8528
80	1.46	1.65	2.25	.8565

AVERAGE COEFFICIENT: .8459

DIRECTION B

U* (FPS)	H/STD* (IN. WC)	ACTUAL H/STD (IN. WC)	H/S-TYPE (IN. WC)	COEFF
20	.09	.10	.14	.8452
40	.37	.39	.51	.8748
60	.82	.79	1.05	.8674
80	1.46	1.65	2.24	.8586

AVERAGE COEFFICIENT: .8615

OVERALL AVERAGE COEFFICIENT: .8537

* NOMINAL OR DESIRED

PITOT TUBE CALIBRATION
DATA SHEET

DATE OF CAL: JULY 25, 1979 PITOT TUBE NUMBER 10
TECHNICIAN: G. WOTHE

DIRECTION A

U* (FPS)	H/STD* (IN. WC)	ACTUAL H/STD (IN. WC)	H/S-TYPE (IN. WC)	COEFF
20	.09	.11	.14	.8864
40	.37	.36	.46	.8847
60	.82	.81	1.11	.8542
80	1.46	1.60	2.00	.8944

AVERAGE COEFFICIENT: .8799

DIRECTION B

U* (FPS)	H/STD* (IN. WC)	ACTUAL H/STD (IN. WC)	H/S-TYPE (IN. WC)	COEFF
20	.09	.11	.15	.8563
40	.37	.39	.49	.8690
60	.82	.81	1.15	.8392
80	1.46	1.60	2.10	.8729

AVERAGE COEFFICIENT: .8594

OVERALL AVERAGE COEFFICIENT: .8696

* NOMINAL OR DESIRED

PITOT TUBE CALIBRATION DATA SHEET

DATE OF CAL: JULY 25, 1979 PITOT TUBE NUMBER 14
TECHNICIAN: G. WOTHE

DIRECTION A

U* (FPS)	H/STD* (IN. WC)	ACTUAL H/STD (IN. WC)	H/S-TYPE (IN. WC)	COEFF
20	.09	.10	.14	.8238
40	.37	.37	.51	.8517
60	.82	.83	1.20	.8317
80	1.46	1.46	2.00	.8544
100	2.29	2.30	3.16	.8531

AVERAGE COEFFICIENT: .8429

DIRECTION B

U* (FPS)	H/STD* (IN. WC)	ACTUAL H/STD (IN. WC)	H/S-TYPE (IN. WC)	COEFF
20	.09	.09	.12	.8660
40	.37	.37	.50	.8602
60	.82	.82	1.10	.8214
80	1.46	1.46	2.20	.8146
100	2.29	2.30	3.40	.8224

AVERAGE COEFFICIENT: .8369

OVERALL AVERAGE COEFFICIENT: .8399

* NOMINAL OR DESIRED

JOB: U.S. STEEL MINNTAC
INTERPOLL REPORT NO. 0-694

NOZZLE CALIBRATION
DATA SHEET

DATE OF CAL: JANUARY 8, 1980 NOZZLE NUMBER 4-1
TECHNICIAN: JEFF STOCK

NOZZLE ROTATED BY 36 DEGREE INCREMENTS AND DIAMETER MEASURED TO NEAREST 0.001 INCH. OBSERVED READINGS AND AVERAGE:

POSITION	DIAMETER (INCHES)
1	.183
2	.184
3	.185
4	.185
5	.183
AVERAGE:	.184

JOB: U.S. STEEL MINNTAC
INTERFOLL REPORT NO. 0-694

NOZZLE CALIBRATION
DATA SHEET

DATE OF CAL: JANUARY 9, 1980 NOZZLE NUMBER 4-4
TECHNICIAN: JEFF STOCK

NOZZLE ROTATED BY 36 DEGREE INCREMENTS AND DIAMETER MEASURED TO NEAREST 0.001 INCH. OBSERVED READINGS AND AVERAGE:

POSITION	DIAMETER (INCHES)
1	.370
2	.373
3	.372
4	.373
5	.374
AVERAGE:	.372

JOB: U.S. STEEL MINNTAC
INTERPOLL REPORT NO. Q-694

NOZZLE CALIBRATION
DATA SHEET

DATE OF CAL: JANUARY 10, 1980 NOZZLE NUMBER 4-5
TECHNICIAN: JEFF STOCK

NOZZLE ROTATED BY 36 DEGREE INCREMENTS AND DIAMETER MEASURED TO NEAREST 0.001 INCH. OBSERVED READINGS AND AVERAGE:

POSITION	DIAMETER (INCHES)
1	.501
2	.501
3	.500
4	.501
5	.502
AVERAGE:	.501

JOB: U.S. STEEL MINNTAC
INTERPOLL REPORT NO. 0-694

NOZZLE CALIBRATION
DATA SHEET

DATE OF CAL: JANUARY 8, 1980 NOZZLE NUMBER 7-1
TECHNICIAN: E. TROWBRIDGE

NOZZLE ROTATED BY 36 DEGREE INCREMENTS AND DIAMETER MEASURED TO NEAREST 0.001 INCH. OBSERVED READINGS AND AVERAGE:

POSITION	DIAMETER (INCHES)
1	.184
2	.182
3	.184
4	.185
5	.183
AVERAGE:	.184

JOB: U.S. STEEL MINNTAC
INTERPOLL REPORT NO. 0-694

NOZZLE CALIBRATION
DATA SHEET

DATE OF CAL: JANUARY 10, 1980 NOZZLE NUMBER 7-3
TECHNICIAN: E. TROWBRIDGE

NOZZLE ROTATED BY 36 DEGREE INCREMENTS AND DIAMETER MEASURED TO NEAREST 0.001 INCH. OBSERVED READINGS AND AVERAGE:

POSITION	DIAMETER (INCHES)
1	.308
2	.306
3	.307
4	.307
5	.306
AVERAGE:	.307

TACON 28 8

Source category: Taconite ore processing
Plant name : US steel
Test date : January 8-10, 1980
Process :

Date:
Location:
Ref. No.: 28

Basis for process rate :

Source	Type of control	Pollutant	Run No.	Emission rate, lb/hr	Process rate, ton/hr	Emission factor kg/Mg	Emission factor lb/ton
Conveyor transfer 6.39	Wet scrubber	filt. PM	1	1.90	868	0.0011	0.0022
		filt. PM	2	2.21	868	0.0013	0.0025
		filt. PM	3	3.00	868	0.0017	0.0035
		AVERAGE				0.0014	0.0027
Secondary bin	Wet scrubber	filt. PM	1	0.85	3909	0.00011	0.00022
		filt. PM	2	0.69	3909	8.8E-05	0.00018
		filt. PM	3	0.67	3909	8.6E-05	0.00017
		AVERAGE				9.4E-05	0.00019
Conveyor transfer 6.34	Wet scrubber	filt. PM	1	0.51	2275	0.00011	0.00022
		filt. PM	2	0.96	2275	0.00021	0.00042
		filt. PM	3	0.45	2275	0.00010	0.00020
		AVERAGE				0.00014	0.00028
Tertiary crusher	Wet scrubber	filt. PM	1	1.11	336	0.0017	0.0033
		filt. PM	2	1.00	336	0.0015	0.0030
		filt. PM	3	0.59	336	0.00088	0.0018
		AVERAGE				0.0013	0.0027
Conveyor transfer 6.41	Wet scrubber	filt. PM	1	10.04	368	0.014	0.027
		filt. PM	2	4.24	368	0.0058	0.012
		filt. PM	3	0.54	368	0.00073	0.0015
		AVERAGE				0.0067	0.013
Conveyor transfer 6.56	Wet scrubber	filt. PM	1	0.29	380	0.00038	0.00076
		filt. PM	2	0.27	380	0.00036	0.00071
		filt. PM	3	1.37	380	0.0018	0.0036
		AVERAGE				0.00085	0.0017
Tertiary storage bin	Wet scrubber	filt. PM	1	1.25	380	0.0016	0.0033
		filt. PM	2	0.93	380	0.0012	0.0024
		filt. PM	3	0.92	380	0.0012	0.0024
		AVERAGE				0.0014	0.0027
Grate feed-end	Wet scrubber	filt. PM	1	0.04	476	4.3E-05	8.6E-05
		filt. PM	2	0.02	476	2.4E-05	4.8E-05
		filt. PM	3	0.03	476	3.2E-05	[illegible]E-05

TALON 28 p2

Source category: Taconite ore processing
Plant name : US steel
Test date : January 8-10, 1980
Process :

Date:
Location:
Ref. No.:
Basis for process rate :

Source	Type of control	Pollutant	Run No.	Emission rate, lb/hr	Process rate, ton/hr	Emission factor kg/Mg	Emission factor lb/ton
		AVERAGE				3.3E-05	6.6E-05
Conveyor transfer	Wet scrubber	filt. PM	1	0.41	476	0.00043	0.00086
		filt. PM	2	0.40	476	0.00042	0.00084
		filt. PM	3	0.36	476	0.00038	0.00076
	8.43	AVERAGE				0.00041	0.00082
Conveyor transfer	Wet scrubber	filt. PM	1	0.42	952	0.00022	0.00044
		filt. PM	2	0.40	952	0.00021	0.00042
		filt. PM	3	0.32	952	0.00017	0.00034
	8.49	AVERAGE				0.00020	0.00040

10/16/95

CALL TO NICK BRASCUGLI, USS-MINTAC (218) 749-7532

REF 28, IDENTIFICATION OF SOURCES

6.39 – Entire secondary crusher line – conveyors, crusher, screens, transfer points

6.34 – Conveyor transfer point from 008 conveyor to 009 conveyor
008 collects undersize material from 2nd & 3rd crushing transfers to grinding & metallic separation

6.41 – 003 system – oversize from secondary crusher line – transfer point
→ 004 → 005 → 006

6.56 – 005 → 006 screen oversize material
transfer point

6.47 – 3rd tertiary-stage crushing line (entire line)
pan feeder, crusher, transfers, screens

6.49 – tertiary crusher line (entire)

6.43 – tertiary storage bin – evacuates bin feeding operation
– material going to tertiary crusher (ie, 2nd crushed material)

6.40 – material going to secondary crusher