Background Report Reference

AP-42 Section Number: 11.23

Background Chapter: 4

Reference Number: 50

Title: Results of the January 10-13, 1995 Air Emission Compliance Testing at teh Northshore Mining Facility in Silver Bay, MN

Interpoll Laboratories, IncInterpoll Laboratories, Inc

Interpoll Laboratories, IncInterpoll Laboratories, Inc

January 1995

27A

Interpoll Laboratories, Inc.
4500 Ball Road N.E.
Circle Pines, Minnesota 55014-1819

TEL: (612) 786-6020
FAX: (612) 786-7854

RESULTS OF THE JANUARY 10 - 13, 1995 AIR EMISSION COMPLIANCE TESTING AT THE NORTHSHORE MINING FACILITY IN SILVER BAY, MINNESOTA

Submitted to:

NORTHSHORE MINING COMPANY
10 Outer Drive
Silver Bay, Minnesota 55614

Attention:

Dennis Wagner

Approved by:

Daniel Despen
Manager
Stationary Source Testing Department

Report Number 5-4664
January 25, 1995
SP/slp

MINN04
ATTACHMENT

NORTHSHORE MINING

Northshore Mining Company
A Subsidiary of Cliffs Minnesota Minerals Company

February 28, 1995

Mr. Stuart Arkley
Division of Air Quality
Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155

Re: Northshore Mining Company
Compliance Re-testing
Week of January 9, 1995

Dear Mr. Arkley:

Enclosed is the Interpoll Report Number 5-4664 entitled "Results of the January 10-13, 1995 Air Emission Compliance Testing at the Northshore Mining Facility in Silver Bay, Minnesota." Due to a communications mix-up, operating data was not included in the report. Northshore will obtain this information from our operating records and submit it under separate cover. In the interim and for the purposes of your initial review, the following preliminary operating information is provided:

Fine Crusher feed rate - 350 to 605 LTPH.
Dry Cobber feed rate - 1052 to 1814 LTPH.
Concentrator bin feed rate - 175 to 200 LTPH.
Furnace 11 WWESP's - 277 LTPH.
Furnace 12 WWESP's - 270 LTPH.
Furnace 12 Rotoclone - 270 LTPH.
Power Boiler #2 - 70 to 78 MW/Hr (75.8 Ave.).
Power Boiler #2 Firing coal.

As soon as I receive the rest of the operating data from Interpoll, I will submit the completed operating data summary forms to the Agency. The enclosed report has been sent out for microfiche and the microfiche will be forwarded to the Agency as soon as returned. Contact me at 218/226-6056 if you have any questions.

Sincerely,

Dennis M Wagner

Dennis M. Wagner
Sr. Environmental Engineer

DMW/pr

Encl.

Minnesota Pollution Control Agency
Air Quality Division
PERFORMANCE TEST EVALUATION REPORT

reviewed 3/21/95 REV/YH/93

I. Description:

Source Cyprus Northshore Mining Co. File 27A-89-OT-1

Location Silver Bay Region 1

Permit Engineer PFO Enforcement RBB Test Reviewer OLV Test Date(s) JAN 10-13, 1995

Emission Point(s)

Process Unit Description

II. Test Report Validity

Is the test report valid?

List any Deficiencies in report below, and any possible reasons for Non-compliance if applicable:

Process Rate information was NOT included with the original test report. It will be submitted under a separate cover

III. Compliance Demonstration

A. Summary of operating conditions during test (please include maximum design or allowable capacities):

Permit Conditions	Test Conditions
	(Interim): see above
	Process Rates
	Fine Crusher Feed Rate: 350 to 665 LTPH
	Dry Cobber Feed Rate: 1052 - 1814 LTPH
	Concentrator Bin Feed Rate: 175 to 200 LTPH
	Furnace 11 WWESP's - 277 LTPH
	Furnace 12 WWESP's - 270 LTPH
	Furnace 12 Rotoclone - 270 LTPH
	Power Boiler #2 - 70 to 78 MW/hr (75.8 ave.)
	Power Boiler #2 - Firing Coal

B. Analysis of the performance test indicates that the following has been demonstrated: REV/YH/93

Pollutant

PM — Limitation Basis or Applicable Rule: S.C. II.A.I of the Permit
Limit: 0.03 gr/dscf
Bin Storage Stack (EP# 48) Measured Emissions (Units of measurement ~~0.0055~~ gr/dscf):
Run 1 _____ Run 2 _____ Run 3 _____
Average 0.0055
Compliance (circle one): YES NO CANNOT DETERMINE

PM — Limitation Basis or Applicable Rule: S.C. II.A.I. of the Permit
Limit: 0.01
1105 Pelletizer Waste Stack (EP# 105) Measured Emissions (Units of measurement gr/dscf):
Run 1 _____ Run 2 _____ Run 3 _____
Average 0.011
Compliance (circle one): YES NO CANNOT DETERMINE

PM — Limitation Basis or Applicable Rule: S.C. II.A.I. of the Permit
Limit: 0.01
1104 Pelletizer Wash Stack (EP# 104) Measured Emissions (Units of measurement gr/dscf):
Run 1 _____ Run 2 _____ Run 3 _____
Average 0.009
Compliance (circle one): YES NO CANNOT DETERMINE

PM — Limitation Basis or Applicable Rule: S.C. II.A.I. of the Permit
Scrand No. 12
Limit: 0.01
1205 Waste Gas Stack (EP# ~~105~~ 107) Measured Emissions (Units of measurement gr/dscf):
Run 1 _____ Run 2 _____ Run 3 _____
Average 0.011
Compliance (circle one): YES NO CANNOT DETERMINE

SO_2 — Limitation Basis or Applicable Rule: Test Required by Permit
Limit: N/A
1205 Waste Gas Stack Measured Emissions (Units of measurement _____):
Run 1 _____ Run 2 _____ Run 3 _____
Average _____
Compliance (circle one): YES NO CANNOT DETERMINE

NO_x — Limitation Basis or Applicable Rule: _____
Limit: _____
1205 Waste Gas Stack Measured Emissions (Units of measurement _____):
Run 1 _____ Run 2 _____ Run 3 _____
Average _____
Compliance (circle one): YES NO CANNOT DETERMINE

B. Analysis of the performance test indicates that the following has been demonstrated:

Pollutant

PM

1204 Waste Gas Stack (EP# 106)

Limitation Basis or Applicable Rule: _____

Limit: _____

Measured Emissions (Units of measurement _____):

Run 1 _____ Run 2 _____ Run 3 _____

Average _____

Compliance (circle one): YES NO CANNOT DETERMINE

PM

Rotoclone Stack (EP#76)

Limitation Basis or Applicable Rule: _____

Limit: _____

Measured Emissions (Units of measurement _____):

Run 1 _____ Run 2 _____ Run 3 _____

Average _____

Compliance (circle one): YES NO CANNOT DETERMINE

PM

No. 2 Boiler Stack (EP#2)

Limitation Basis or Applicable Rule: _____

Limit: _____

Measured Emissions (Units of measurement _____):

Run 1 _____ Run 2 _____ Run 3 _____

Average _____

Compliance (circle one): YES NO CANNOT DETERMINE

SO_2

No. 2 Boiler Stack (EP No. 2)

Limitation Basis or Applicable Rule: _____

Limit: _____

Measured Emissions (Units of measurement _____):

Run 1 _____ Run 2 _____ Run 3 _____

Average _____

Compliance (circle one): YES NO CANNOT DETERMINE

PM

Fine Crusher Stack (EP# 11)

Limitation Basis or Applicable Rule: _____

Limit: _____

Measured Emissions (Units of measurement _____):

Run 1 _____ Run 2 _____ Run 3 _____

Average _____

Compliance (circle one): YES NO CANNOT DETERMINE

PM

Dry Cobber Stack (EP# 22)

Limitation Basis or Applicable Rule: _____

Limit: _____

Measured Emissions (Units of measurement _____):

Run 1 _____ Run 2 _____ Run 3 _____

Average _____

Compliance (circle one): YES NO CANNOT DETERMINE

B. Analysis of the performance test indicates that the following has been demonstrated:

Pollutant

______ Limitation Basis or Applicable Rule: ______

Limit: ______

Measured Emissions (Units of measurement ______):

Run 1 ______ Run 2 ______ Run 3 ______

Average ______

Compliance (circle one): YES NO CANNOT DETERMINE

______ Limitation Basis or Applicable Rule: ______

Limit: ______

Measured Emissions (Units of measurement ______):

Run 1 ______ Run 2 ______ Run 3 ______

Average ______

Compliance (circle one): YES NO CANNOT DETERMINE

______ Limitation Basis or Applicable Rule: ______

Limit: ______

Measured Emissions (Units of measurement ______):

Run 1 ______ Run 2 ______ Run 3 ______

Average ______

Compliance (circle one): YES NO CANNOT DETERMINE

______ Limitation Basis or Applicable Rule: ______

Limit: ______

Measured Emissions (Units of measurement ______):

Run 1 ______ Run 2 ______ Run 3 ______

Average ______

Compliance (circle one): YES NO CANNOT DETERMINE

______ Limitation Basis or Applicable Rule: ______

Limit: ______

Measured Emissions (Units of measurement ______):

Run 1 ______ Run 2 ______ Run 3 ______

Average ______

Compliance (circle one): YES NO CANNOT DETERMINE

______ Limitation Basis or Applicable Rule: ______

Limit: ______

Measured Emissions (Units of measurement ______):

Run 1 ______ Run 2 ______ Run 3 ______

Average ______

Compliance (circle one): YES NO CANNOT DETERMINE

METHOD PM | Test No. 2 | Test Date(s) 1/10/95
Run No. 1 | AQD File 27A
Unit tested: 1105 Pelletizer

Nozzle diameter	Dn	0.247	inches						sqrt avg dp	0.924214
Stack Diameter	Ds	#DIV/0!	inches	A(stack)	27.49	l	0	inches	counter	24
Area of nozzle	Area n	0.000333	square feet	D(stack)	70.99433	w	0	inches	sum sqrt	22.18114
Area of stack	Area s	27.49	square feet			De	#DIV/0!	inches	1.05	1.024695
time of run	theta	60	minutes			As	0	sq ft	0.97	0.984886
meter coefficient	gamma	1.0015	unitless						1	1
volume of water in impingers	Vwc	167	ml		front mass	3.07E-02	grams		1	1
volume of water in silica gel	Vwsg	24	grams		back mass	0.0036	grams		0.96	0.979796
	Vwc,std	7.86069	scf		total mass	0.0343	grams		0.95	0.974679
	Vwsg,std	1.1316	scf		front C	0.00916215	gr/dscf		0.97	0.984886
Moisture content of gas	Bws	0.148157	fraction		front C	1.3089E-06	lb/dscf		0.82	0.905539
vol of gas as measured by dry gas meter	Vm	53.6	dcf		front C	5.52224788	lb/hr		0.77	0.877496
pitot tube coefficient	Cp	0.84			back C	0.00107439	gr/dscf		0.55	0.74162
pitot tube constant	Kp	85.49	*const		back C	1.5348E-07	lb/dscf		0.5	0.707107
Stack temperature (F +460)	Ts	588	R		back C,lb/hr	0.64756001	lb/hr		0.48	0.69282
Meter temperature (F+460)	Tm	541.8	R		total C	0.01023654	gr/dscf		0.6	0.774597
barometric pressure	Pb	29.38	in Hg		total C	1.4624E-06	lb/dscf		0.79	0.888819
static pressure	Pg	-0.22	in H2O		total C	6.1698079	lb/hr		0.92	0.959166
Absolute stack gas pressure	Ps	29.36382353	in Hg		total c	0.02344586	grams/dscm		0.96	0.979796
ave press diff across orifice meter	delta H	2.59	inches		total c	663.912704	micrograms/dscf		0.96	0.979796
ave of square root delta p's	deltap	0.924214	inch		total c	23.4458555	mg/dscm		0.97	0.984886
Stack gas velocity	Vs	56.79005	ft/s						0.94	0.969536
Stack gas volumetric flow rate	Qa	93669.5	acfm		Uncorrected				0.95	0.974679
Stack gas dry volumentric flow rate	Qsd	70317.8	dscfm		at 7%O2	#VALUE!			0.96	0.979796
	Vmstd	51.70194			at 12%CO2	#VALUE!			0.95	0.974679
Wet molecular weight	Ms	27.34983							0.93	0.964365
	%CO2	1.8							0.77	0.877496
	%O2	17.2								0
	%N2	81								0
	%CO	0								0
Dry molelcular weight	Md	28.976								0
	%EA	411.0899								0
CONCENTRATION FROM F FACTOR For Total										0
F-factor		dscf/mmbtu	Front Only							0
C	1E-06	lb/dscf	1.31E-06	lb/dscf						0
Fo	2.0556		0	lb/mmbtu						0
E*	0	lb/mmbtu	Back Only							0
I intermediate values	101.3	%	1.53E-07	lb/dscf						0
I raw	99.359	%	0	lb/mmbtu						0
										0

METHOD	PM	Test No.	1	Test Date(s)	1/10/95								
		Run No.	1	AQD File	27A							sqrt avg dp	1.004695
Nozzle diameter	Dn	0.186	inches	Unit tested:	Bin Storage							counter	24
Stack Diameter	Ds	#DIV/0!	inches	A(stack)	8.51	l	0	inches				sum sqrt	24.11268
Area of nozzle	Area n	0.000189	square feet	D(stack)	39.50036	w	0	inches				0.9	0.948683
Area of stack	Area s	8.51	square feet			De	#DIV/0!	inches				1	1
time of run	theta	60	minutes			As	0	sq ft				1.1	1.048809
meter coefficient	gamma	1.0004	unitless									1.1	1.048809
volume of water in impingers	Vwc	0	ml		front mass	1.17E-02	grams					1.15	1.072381
volume of water in silica gel	Vwsg	8	grams		back mass	0.0001	grams					1.15	1.072381
	Vwc,std	0	scf		total mass	0.0118	grams					1.1	1.048809
	Vwsg,std	0.3772	scf	front	C	0.00476131	gr/dscf					1.12	1.058301
Moisture content of gas	Bws	0.00985	fraction	front	C	6.8019E-07	lb/dscf					1.1	1.048809
vol of gas as measured by dry gas meter	Vm	37.83	dcf	front	C	1.16778516	lb/hr					1.1	1.048809
pitot tube coefficient	Cp	0.84		back	C	4.0695E-05	gr/dscf					1.05	1.024695
pitot tube constant	Kp	85.49	*const	back	C	5.8136E-09	lb/dscf					0.85	0.921954
Stack temperature (F +460)	Ts	518	R	back	C,lb/hr	0.00998107	lb/hr					0.65	0.806226
Meter temperature (F+460)	Tm	520.5	R	total	C	0.004802	gr/dscf					0.7	0.83666
barometric pressure	Pb	29.46	in Hg	total	C	6.86E-07	lb/dscf					0.75	0.866025
static pressure	Pg	-0.65	in H2O	total	C	1.17776623	lb/hr					0.85	0.921954
Absolute stack gas pressure	Ps	29.41220588	in Hg	total	c	0.01099855	grams/dscm					1.1	1.048809
ave press diff across orifice meter	delta H	1.23	inches	total	c	311.444132	micrograms/dscf					1.15	1.072381
ave of square root delta p's	deltap	1.004695	inch	total	c	10.9985456	mg/dscm					1.15	1.072381
Stack gas velocity	Vs	56.48481	ft/s									1.1	1.048809
Stack gas volumetric flow rate	Qa	28841.14	acfm		Uncorrected							1.1	1.048809
Stack gas dry volumentric flow rate	Qsd	28614.33	dscfm		at 7%O2	#VALUE!						1.1	1.048809
	Vmstd	37.91627			at 12%CO2	#VALUE!						1.05	1.024695
Wet molecular weight	Ms	28.73402										0.95	0.974679
	%CO2	0.03											0
	%O2	20.9											0
	%N2	79.07											0
	%CO	0											0
Dry molelcular weight	Md	28.8408											0
	%EA	-81896.55											0
CONCENTRATION FROM F FACTOR For Total													0
F-factor		dscf/mmbtu	Front Only										0
C	7E-07	lb/dscf	6.8E-07	lb/dscf									0
Fo	0		#DIV/0!	lb/mmbtu									0
E*	#DIV/0!	lb/mmbtu	Back Only										0
I intermediate values	99.66	%	5.81E-09	lb/dscf									0
I raw	98.621	%	#DIV/0!	lb/mmbtu									0
													0

METHOD	PM	Test No.	3	Test Date(s)	1/10/95					sqrt avg dp	0.915886
		Run No.	1	AQD File	27A					counter	24
Nozzle diameter	Dn	0.25	inches	Unit tested:	1104 Pelletizer					sum sqrt	21.98125
Stack Diameter	Ds	#DIV/0!	inches	A(stack)	27.49	l	0	inches		1.2	1.095445
Area of nozzle	Area n	0.000341	square feet	D(stack)	70.99433	w	0	inches		1.2	1.095445
Area of stack	Area s	27.49	square feet			De	#DIV/0!	inches		1	1
time of run	theta	60	minutes			As	0	sq ft		0.88	0.938083
meter coefficient	gamma	0.9932	unitless							0.6	0.774597
volume of water in impingers	Vwc	172	ml		front mass	3.78E-02	grams			0.49	0.7
volume of water in silica gel	Vwsg	20	grams		back mass	0.0013	grams			1.2	1.095445
	Vwc,std	8.09604	scf		total mass	0.0391	grams			1.3	1.140175
	Vwsg,std	0.943	scf		front C	0.01136899	gr/dscf			1.2	1.095445
Moisture content of gas	Bws	0.149799	fraction		front C	1.6241E-06	lb/dscf			1	1
vol of gas as measured by dry gas meter	Vm	53.32	dcf		front C	6.75581345	lb/hr			0.85	0.921954
pitot tube coefficient	Cp	0.84			back C	0.000391	gr/dscf			0.44	0.663325
pitot tube constant	Kp	85.49	*const		back C	5.5857E-08	lb/dscf			1.1	1.048809
Stack temperature (F +460)	Ts	592	R		back C,lb/hr	0.23234279	lb/hr			1.1	1.048809
Meter temperature (F+460)	Tm	538.4	R		total C	0.01175999	gr/dscf			1	1
barometric pressure	Pb	29.38	in Hg		total C	1.68E-06	lb/dscf			0.89	0.943398
static pressure	Pg	-0.14	in H2O		total C	6.98815625	lb/hr			0.65	0.806226
Absolute stack gas pressure	Ps	29.36970588	in Hg		total c	0.02693517	grams/dscm			0.45	0.67082
ave press diff across orifice meter	delta H	2.39	inches		total c	762.719051	micrograms/dscf			0.79	0.888819
ave of square root delta p's	deltap	0.915886	inch		total c	26.9351687	mg/dscm			0.7	0.83666
Stack gas velocity	Vs	56.46829	ft/s							0.69	0.830662
Stack gas volumetric flow rate	Qa	93138.8	acfm		Uncorrected					0.75	0.866025
Stack gas dry volumentric flow rate	Qsd	69327.03	dscfm		at 7%O2	#VALUE!				0.64	0.8
	Vmstd	51.30219			at 12%CO2	#VALUE!				0.52	0.72111
Wet molecular weight	Ms	27.34541									0
	%CO2	1.9									0
	%O2	17.2									0
	%N2	80.9									0
	%CO	0									0
Dry molelcular weight	Md	28.992									0
	%EA	413.7002									0
											0
CONCENTRATION FROM F FACTOR For Total											0
F-factor		dscf/mmbtu	Front Only								0
C	2E-06	lb/dscf	1.62E-06	lb/dscf							0
Fo	1.9474		0	lb/mmbtu							0
E*	0	lb/mmbtu	Back Only								0
I intermediate values	99.519	%	5.59E-08	lb/dscf							0
I raw	97.914	%	0	lb/mmbtu							0
											0

METHOD PM | Test No. 4 | Test Date(s) 1/11/95 | Run No. 1 | AQD File 27A | Unit tested: 1205 Waste Gas

Nozzle diameter	Dn	0.247	inches							sqrt avg dp	0.853607
Stack Diameter	Ds	#DIV/0!	inches	A(stack)	27.88	l	0	inches		counter	24
Area of nozzle	Area n	0.000333	square feet	D(stack)	71.49616	w	0	inches		sum sqrt	20.48656
Area of stack	Area s	27.88	square feet			De	#DIV/0!	inches		0.65	0.806226
time of run	theta	60	minutes			As	0	sq ft		0.67	0.818535
meter coefficient	gamma	1.0015	unitless							0.7	0.83666
volume of water in impingers	Vwc	127	ml							0.74	0.860233
volume of water in silica gel	Vwsg	21	grams							0.82	0.905539
	Vwc,std	5.97789	scf							0.9	0.948683
	Vwsg,std	0.99015	scf							0.88	0.938083
Moisture content of gas	Bws	0.1316	fraction							0.83	0.911043
vol of gas as measured by dry gas meter	Vm	47.33	dcf							0.78	0.883176
pitot tube coefficient	Cp	0.84								0.67	0.818535
pitot tube constant	Kp	85.49	*const							0.58	0.761577
Stack temperature (F +460)	Ts	598	R							0.49	0.7
Meter temperature (F+460)	Tm	530.6	R							0.62	0.787401
barometric pressure	Pb	29.02	in Hg							0.69	0.830662
static pressure	Pg	-0.03	in H2O							0.69	0.830662
Absolute stack gas pressure	Ps	29.01779412	in Hg							0.82	0.905539
ave press diff across orifice meter	delta H	1.99	inches							0.94	0.969536
ave of square root delta p's	deltap	0.853607	inch							0.94	0.969536
Stack gas velocity	Vs	53.00738	ft/s							0.85	0.921954
Stack gas volumetric flow rate	Qa	88670.75	acfm							0.87	0.932738
Stack gas dry volumentric flow rate	Qsd	65937.99	dscfm							0.74	0.860233
	Vmstd	45.98056								0.62	0.787401
Wet molecular weight	Ms	27.55935								0.6	0.774597
	%CO2	2.1								0.53	0.728011
	%O2	16.8									0
	%N2	81.1									0
	%CO	0									0
Dry molelcular weight	Md	29.008									0
	%EA	364.3935									0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0
											0

front mass	2.57E-02	grams			
back mass	0.004	grams			
total mass	0.0297	grams			
front C	0.00862432	gr/dscf			
front C	1.232E-06	lb/dscf			
front C	4.87431622	lb/hr			
back C	0.00134231	gr/dscf			
back C	1.9176E-07	lb/dscf			
back C,lb/hr	0.75864844	lb/hr			
total C	0.00996663	gr/dscf			
total C	1.4238E-06	lb/dscf			
total C	5.63296465	lb/hr			
total c	0.02282764	grams/dscm			
total c	646.406855	micrograms/dscf			
total c	22.8276423	mg/dscm			
Uncorrected					
at 7%O2	#VALUE!				
at 12%CO2	#VALUE!				

CONCENTRATION FROM F FACTOR For Total

F-factor		dscf/mmbtu	Front Only	
C	1E-06	lb/dscf	1.23E-06	lb/dscf
Fo	1.9524		0	lb/mmbtu
E*	0	lb/mmbtu	Back Only	
I intermediate values	97.435	%	1.92E-07	lb/dscf
I raw	95.564	%	0	lb/mmbtu

METHOD PM

Test No. 5
Run No. 1

Test Date(s) 1/11/95
AQD File 27A
Unit tested: 1204 Waste Gas

Nozzle diameter	Dn	0.25	inches
Stack Diameter	Ds	#DIV/0!	inches
Area of nozzle	Area n	0.000341	square feet
Area of stack	Area s	27.88	square feet
time of run	theta	60	minutes
meter coefficient	gamma	0.9932	unitless
volume of water in impingers	Vwc	205	ml
volume of water in silica gel	Vwsg	13	grams
	Vwc,std	9.64935	scf
	Vwsg,std	0.61295	scf
Moisture content of gas	Bws	0.180323	fraction
vol of gas as measured by dry gas meter	Vm	47.98	dcf
pitot tube coefficient	Cp	0.84	
pitot tube constant	Kp	85.49	*const
Stack temperature (F +460)	Ts	600	R
Meter temperature (F+460)	Tm	525.7	R
barometric pressure	Pb	29.02	in Hg
static pressure	Pg	0.26	in H2O
Absolute stack gas pressure	Ps	29.03911765	in Hg
ave press diff across orifice meter	delta H	1.92	inches
ave of square root delta p's	deltap	0.866741	inch
Stack gas velocity	Vs	54.43854	ft/s
Stack gas volumetric flow rate	Qa	91064.79	acfm
Stack gas dry volumentric flow rate	Qsd	63752.58	dscfm
	Vmstd	46.64836	
Wet molecular weight	Ms	27.00989	
	%CO2	2	
	%O2	16.8	
	%N2	81.2	
	%CO	0	
Dry molelcular weight	Md	28.992	
	%EA	362.3188	

A(stack)	27.88	l	0 inches
D(stack)	71.49616	w	0 inches
		De	#DIV/0! inches
		As	0 sq ft

front mass	2.31E-02	grams
back mass	0.0009	grams
total mass	0.024	grams
front C	0.00764085	gr/dscf
front C	1.0915E-06	lb/dscf
front C	4.17534627	lb/hr
back C	0.0002977	gr/dscf
back C	4.2528E-08	lb/dscf
back C,lb/hr	0.16267583	lb/hr
total C	0.00793854	gr/dscf
total C	1.1341E-06	lb/dscf
total C	4.3380221	lb/hr
total c	0.01818251	grams/dscm
total c	514.871234	micrograms/dscf
total c	18.1825058	mg/dscm

Uncorrected	
at 7%O2	#VALUE!
at 12%CO2	#VALUE!

CONCENTRATION FROM F FACTOR For Total

F-factor		dscf/mmbtu	Front Only
C	1E-06	lb/dscf	1.09E-06 lb/dscf
Fo	2.05		0 lb/mmbtu
E*	0	lb/mmbtu	Back Only
I intermediate values	99.799	%	4.25E-08 lb/dscf
I raw	98.677	%	0 lb/mmbtu

sqrt avg dp	0.866741
counter	24
sum sqrt	20.80178
0.95	0.974679
0.96	0.979796
0.9	0.948683
0.8	0.894427
0.7	0.83666
0.57	0.754983
0.95	0.974679
0.88	0.938083
0.72	0.848528
0.65	0.806226
0.6	0.774597
0.48	0.69282
0.9	0.948683
0.85	0.921954
0.7	0.83666
0.64	0.8
0.55	0.74162
0.5	0.707107
0.95	0.974679
0.94	0.969536
0.85	0.921954
0.78	0.883176
0.75	0.866025
0.65	0.806226
	0
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	0
	0
	0
	0

METHOD	PM	Test No.	6	Test Date(s)	1/12/95					sqrt avg dp	1.01214
		Run No.	1	AQD File	27A					counter	20
Nozzle diameter	Dn	0.185	inches	Unit tested:	Rotoclone Stack					sum sqrt	20.2428
Stack Diameter	Ds	45.49705	inches	A(stack)	11.29	l	0	inches		0.74	0.860233
Area of nozzle	Area n	0.000187	square feet	D(stack)	45.49705	w	0	inches		0.98	0.989949
Area of stack	Area s	11.29	square feet			De	#DIV/0!	inches		1.1	1.048809
time of run	theta	60	minutes			As	0	sq ft		1.3	1.140175
meter coefficient	gamma	0.9932	unitless							1.2	1.095445
volume of water in impingers	Vwc	33	ml		front mass	1.53E-02	grams			1.3	1.140175
volume of water in silica gel	Vwsg	10	grams		back mass	0.0005	grams			1.1	1.048809
	Vwc,std	1.55331	scf		total mass	0.0158	grams			1	1
	Vwsg,std	0.4715	scf		front C	0.00757793	gr/dscf			1	1
Moisture content of gas	Bws	0.061028	fraction		front C	1.0826E-06	lb/dscf			0.85	0.921954
vol of gas as measured by dry gas meter	Vm	32.67	dcf		front C	2.19577835	lb/hr			0.72	0.848528
pitot tube coefficient	Cp	0.84			back C	0.00024764	gr/dscf			0.94	0.969536
pitot tube constant	Kp	85.49	*const		back C	3.5378E-08	lb/dscf			1.2	1.095445
Stack temperature (F +460)	Ts	597	R		back C,lb/hr	0.07175746	lb/hr			1.3	1.140175
Meter temperature (F+460)	Tm	533.1	R		total C	0.00782557	gr/dscf			1.4	1.183216
barometric pressure	Pb	28.94	in Hg		total C	1.1179E-06	lb/dscf			1.2	1.095445
static pressure	Pg	-0.82	in H2O		total C	2.26753581	lb/hr			0.98	0.989949
Absolute stack gas pressure	Ps	28.87970588	in Hg		total c	0.01792375	grams/dscm			0.97	0.984886
ave press diff across orifice meter	delta H	0.87	inches		total c	507.544205	micrograms/dscf			0.85	0.921954
ave of square root delta p's	deltap	1.01214	inch		total c	17.9237542	mg/dscm			0.59	0.768115
Stack gas velocity	Vs	62.25817	ft/s								0
Stack gas volumetric flow rate	Qa	42173.68	acfm		Uncorrected						0
Stack gas dry volumentric flow rate	Qsd	33805.31	dscfm		at 7%O2	#VALUE!					0
	Vmstd	31.15351			at 12%CO2	#VALUE!					0
Wet molecular weight	Ms	28.1747									0
	%CO2	0									0
	%O2	20.9									0
	%N2	79.1									0
	%CO	0									0
Dry molelcular weight	Md	28.836									0
	%EA	-118750									0
CONCENTRATION FROM F FACTOR For Total											0
F-factor		dscf/mmbtu		Front Only							0
C	1E-06	lb/dscf		1.08E-06	lb/dscf						0
Fo	#DIV/0!			#DIV/0!	lb/mmbtu						0
E*	#DIV/0!	lb/mmbtu		Back Only							0
I intermediate values	92.95	%		3.54E-08	lb/dscf						0
I raw	91.578	%		#DIV/0!	lb/mmbtu						0
											0

METHOD PM

Test No. 7
Run No. 1

Test Date(s) 1/12/95
AQD File 27A
Unit tested: No.2 Boiler

Nozzle diameter	Dn	0.247	inches
Stack Diameter	Ds	45.49705	inches
Area of nozzle	Area n	0.000333	square feet
Area of stack	Area s	66	square feet
time of run	theta	60	minutes
meter coefficient	gamma	1.0026	unitless
volume of water in impingers	Vwc	104	ml
volume of water in silica gel	Vwsg	15	grams
	Vwc,std	4.89528	scf
	Vwsg,std	0.70725	scf
Moisture content of gas	Bws	0.096568	fraction
vol of gas as measured by dry gas meter	Vm	54.26	dcf
pitot tube coefficient	Cp	0.84	
pitot tube constant	Kp	85.49	*const
Stack temperature (F +460)	Ts	761	R
Meter temperature (F+460)	Tm	533.6	R
barometric pressure	Pb	28.94	in Hg
static pressure	Pg	-0.9	in H2O
Absolute stack gas pressure	Ps	28.87382353	in Hg
ave press diff across orifice meter	delta H	2.62	inches
ave of square root delta p's	deltap	1.048106	inch
Stack gas velocity	Vs	71.48618	ft/s
Stack gas volumetric flow rate	Qa	283085.3	acfm
Stack gas dry volumentric flow rate	Qsd	171239.7	dscfm
	Vmstd	52.4136	
Wet molecular weight	Ms	29.21701	
	%CO2	13.7	
	%O2	5.6	
	%N2	80.7	
	%CO	0	
Dry molelcular weight	Md	30.416	
	%EA	35.65789	

A(stack)	66	l	0 inches
D(stack)	110.0039	w	0 inches
		De	#DIV/0! inches
		As	0 sq ft

front mass	3.32E-02	grams
back mass	0.001	grams
total mass	0.0342	grams
front C	0.00977372	gr/dscf
front C	1.3962E-06	lb/dscf
front C	14.3455687	lb/hr
back C	0.00029439	gr/dscf
back C	4.2056E-08	lb/dscf
back C,lb/hr	0.43209544	lb/hr
total C	0.01006811	gr/dscf
total C	1.4383E-06	lb/dscf
total C	14.7776641	lb/hr
total c	0.02306009	grams/dscm
total c	652.989045	micrograms/dscf
total c	23.0600902	mg/dscm

Uncorrected	
at 7%O2	#VALUE!
at 12%CO2	#VALUE!

CONCENTRATION FROM F FACTOR For Total

F-factor		dscf/mmbtu	Front Only
C	1E-06	lb/dscf	1.4E-06 lb/dscf
Fo	1.1168		0 lb/mmbtu
E*	0	lb/mmbtu	Back Only
I intermediate values	101.24	%	4.21E-08 lb/dscf
I raw	99.956	%	0 lb/mmbtu

sqrt avg dp	1.048106
counter	24
sum sqrt	25.15454
1.15	1.072381
1.05	1.024695
1.2	1.095445
1.2	1.095445
1.25	1.118034
1.25	1.118034
1.3	1.140175
1.35	1.161895
1.25	1.118034
1.1	1.048809
0.93	0.964365
0.95	0.974679
1.08	1.03923
1.03	1.014889
1.03	1.014889
1.02	1.00995
1.03	1.014889
1.04	1.019804
1.04	1.019804
1.04	1.019804
1.05	1.024695
1.04	1.019804
1.04	1.019804
1.01	1.004988
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METHOD PM | Test No. 8 | Run No. 1 | Test Date(s) 1/13/95 | AQD File 27A | Unit tested: Fine Crusher

Nozzle diameter	Dn	0.25	inches							sqrt avg dp	0.823571
Stack Diameter	Ds	45.49705	inches	A(stack)	5.67	l	0	inches		counter	12
Area of nozzle	Area n	0.000341	square feet	D(stack)	32.24244	w	0	inches		sum sqrt	9.882857
Area of stack	Area s	5.67	square feet			De	#DIV/0!	inches		0.65	0.806226
time of run	theta	60	minutes			As	0	sq ft		0.7	0.83666
meter coefficient	gamma	0.9932	unitless							0.7	0.83666
volume of water in impingers	Vwc	1	ml							0.8	0.894427
volume of water in silica gel	Vwsg	15	grams							0.7	0.83666
	Vwc,std	0.04707	scf							0.58	0.761577
	Vwsg,std	0.70725	scf							0.75	0.866025
Moisture content of gas	Bws	0.013576	fraction							0.75	0.866025
vol of gas as measured by dry gas meter	Vm	54.72	dcf							0.74	0.860233
pitot tube coefficient	Cp	0.84								0.7	0.83666
pitot tube constant	Kp	85.49	*const							0.6	0.774597
Stack temperature (F +460)	Ts	529	R							0.5	0.707107
Meter temperature (F+460)	Tm	511.1	R								0
barometric pressure	Pb	29.02	in Hg								0
static pressure	Pg	-0.25	in H2O								0
Absolute stack gas pressure	Ps	29.00161765	in Hg								0
ave press diff across orifice meter	delta H	2.56	inches								0
ave of square root delta p's	deltap	0.823571	inch								0
Stack gas velocity	Vs	47.15414	ft/s								0
Stack gas volumetric flow rate	Qa	16041.84	acfm								0
Stack gas dry volumentric flow rate	Qsd	15309.35	dscfm								0
	Vmstd	54.80934									0
Wet molecular weight	Ms	28.69363									0
	%CO2	0.03									0
	%O2	20.9									0
	%N2	79.07									0
	%CO	0									0
Dry molelcular weight	Md	28.8408									0
	%EA	-81896.55									0
CONCENTRATION FROM F FACTOR For Total											0
F-factor		dscf/mmbtu	Front Only								0
C	9E-07	lb/dscf	8.69E-07	lb/dscf							0
Fo	0		#DIV/0!	lb/mmbtu							0
E*	#DIV/0!	lb/mmbtu	Back Only								0
I intermediate values	99.306	%	6.84E-08	lb/dscf							0
I raw	97.985	%	#DIV/0!	lb/mmbtu							0
											0

front mass	2.16E-02	grams	
back mass	0.0017	grams	
total mass	0.0233	grams	
front C	0.00608086	gr/dscf	
front C	8.6869E-07	lb/dscf	
front C	0.79794895	lb/hr	
back C	0.00047859	gr/dscf	
back C	6.8369E-08	lb/dscf	
back C,lb/hr	0.06280154	lb/hr	
total C	0.00655945	gr/dscf	
total C	9.3706E-07	lb/dscf	
total C	0.86075049	lb/hr	
total c	0.01502381	grams/dscm	
total c	425.427039	micrograms/dscf	
total c	15.0238139	mg/dscm	
Uncorrected			
at 7%O2	#VALUE!		
at 12%CO2	#VALUE!		

METHOD	PM	Test No.	9	Test Date(s)	1/13/95						
		Run No.	1	AQD File	27A					sqrt avg dp	0.96543
Nozzle diameter	Dn	0.182	inches	Unit tested:	Dry Cobber					counter	24
Stack Diameter	Ds	45.49705	inches	A(stack)	20.46	l	0	inches		sum sqrt	23.17033
Area of nozzle	Area n	0.000181	square feet	D(stack)	61.24761	w	0	inches		0.91	0.953939
Area of stack	Area s	20.46	square feet			De	#DIV/0!	inches		0.9	0.948683
time of run	theta	60	minutes			As	0	sq ft		0.92	0.959166
meter coefficient	gamma	1.0004	unitless							0.91	0.953939
volume of water in impingers	Vwc	-2	ml		front mass	1.47E-02	grams			0.95	0.974679
volume of water in silica gel	Vwsg	8	grams		back mass	0.0005	grams			0.94	0.969536
	Vwc,std	-0.09414	scf		total mass	0.0152	grams			0.93	0.964365
	Vwsg,std	0.3772	scf	front	C	0.00667208	gr/dscf			0.99	0.994987
Moisture content of gas	Bws	0.008258	fraction	front	C	9.5315E-07	lb/dscf			0.99	0.994987
vol of gas as measured by dry gas meter	Vm	35.25	dcf	front	C	3.70990192	lb/hr			0.94	0.969536
pitot tube coefficient	Cp	0.84		back	C	0.00022694	gr/dscf			0.97	0.984886
pitot tube constant	Kp	85.49	*const	back	C	3.242E-08	lb/dscf			0.88	0.938083
Stack temperature (F +460)	Ts	531	R	back	C,lb/hr	0.12618714	lb/hr			0.95	0.974679
Meter temperature (F+460)	Tm	532.6	R	total	C	0.00689902	gr/dscf			0.98	0.989949
barometric pressure	Pb	29.02	in Hg	total	C	9.8557E-07	lb/dscf			1	1
static pressure	Pg	-0.85	in H2O	total	C	3.83608907	lb/hr			1	1
Absolute stack gas pressure	Ps	28.9575	in Hg	total	c	0.01580156	grams/dscm			0.97	0.984886
ave press diff across orifice meter	delta H	1.02	inches	total	c	447.450492	micrograms/dscf			1	1
ave of square root delta p's	deltap	0.96543	inch	total	c	15.8015648	mg/dscm			1	1
Stack gas velocity	Vs	55.36734	ft/s							0.99	0.994987
Stack gas volumetric flow rate	Qa	67968.95	acfm		Uncorrected					0.92	0.959166
Stack gas dry volumentric flow rate	Qsd	64870.66	dscfm		at 7%O2	#VALUE!				0.83	0.911043
	Vmstd	33.99557			at 12%CO2	#VALUE!				0.73	0.8544
Wet molecular weight	Ms	28.75128								0.8	0.894427
	%CO2	0.03									0
	%O2	20.9									0
	%N2	79.07									0
	%CO	0									0
Dry molelcular weight	Md	28.8408									0
	%EA	-81896.55									0
CONCENTRATION FROM F FACTOR For Total											0
F-factor		dscf/mmbtu	Front Only								0
C	1E-06	lb/dscf	9.53E-07	lb/dscf							0
Fo	0		#DIV/0!	lb/mmbtu							0
E*	#DIV/0!	lb/mmbtu	Back Only								0
I intermediate values	98.972	%	3.24E-08	lb/dscf							0
I raw	97.825	%	#DIV/0!	lb/mmbtu							0
											0

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ACFM	actual cubic feet per minute
cc (ml)	cubic centimeter (milliliter)
DSCFM	dry standard cubic foot of dry gas per minute
DSML	dry standard milliliter
DEG-F (°F)	degrees Fahrenheit
DIA.	diameter
FP	finished product for plant
FT/SEC	feet per second
g	gram
GPM	gallons per minute
GR/ACF	grains per actual cubic foot
GR/DSCF	grains per dry standard cubic foot
g/dscm	grams per dry standard cubic meter
HP	horsepower
HRS	hours
IN.	inches
IN.HG.	inches of mercury
IN.WC.	inches of water
LB	pound
LB/DSCF	pounds per dry standard cubic foot
LB/HR	pounds per hour
LB/10^6BTU	pounds per million British Thermal Units heat input
LB/MMBTU	pounds per million British Thermal Units heat input
LTPD	long tons per day
MW	megawatt
mg/Nm^3	milligrams per dry standard cubic meter
ug/Nm^3	micrograms per dry standard cubic meter
microns (um)	micrometer
MIN.	minutes
ng	nanograms
ohm-cm	ohm-centimeter
PM	particulate matter
PPH	pounds per hour
PPM	parts per million
ppmC	parts per million carbon
ppm,d	parts per million, dry
ppm,w	parts per million, wet
ppt	parts per trillion
PSI	pounds per square inch
SQ.FT.	square feet
TPD	tons per day
ug	micrograms
v/v	percent by volume
w/w	percent by weight
<	≤ (when following a number)

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

g:\stack\wp\misc\abbrev.frm

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Certifications Required For Performance Test Reports

Note: All performance test reports must contain a certification by the responsible parties that the test results have been reported accurately, that the field data is a true representation of the sampling procedures, and that the process data is a true indicator of the operating parameters of the emissions unit at the time of the performance test. (Ref. Minn. Rules pt. 7017.2040). Performance test results will not be accepted without certification of the report.

1. ***Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures:***

"I certify under penalty of law that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this test report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: Duane VanHoever — Printed Name of Person Signing: Duane VanHoever
Title: Field Engineer — Date: 6/13/95

2. **Certification of analytical procedures by the person responsible for the laboratory analysis of field samples:**

"I certify under penalty of law that the analytical procedures were performed in accordance with the requirements of the test methods and that the data presented for use in the test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: David Schneider — Printed Name of Person Signing: David Schneider
Title: QA Officer — Date: 2/16/95

3. **Certification of test report by the senior staff person at the testing company who is responsible for compiling and checking the test report:**

"I certify under penalty of law that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed sampling and analysis relating to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: Daniel J. Despen — Printed Name of Person Signing: Daniel J. Despen
Title: Mgr. Stationary Source — Date: Feb 16, 1995

4. **Certification of test report by owner or operator of the emission facility:**

"I certify under penalty of law that the information submitted in this test report accurately reflects the operating conditions at the emission facility during this performance test and describes the date and nature of all operational and maintenance activities that were performed on process and control equipment during the month prior to the performance test. Based on my inquiry of the person or persons who performed the operational and maintenance activities, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: _____ Printed Name of Person Signing: _____
Title: _____ Date: _____

1-5-94-C:\STACK\WP\FORMS\S-480

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(612) 786-6020

Certifications Required For Performance Test Reports

Note: All performance test reports must contain a certification by the responsible parties that the test results have been reported accurately, that the field data is a true representation of the sampling procedures, and that the process data is a true indicator of the operating parameters of the emissions unit at the time of the performance test. (Ref. Minn. Rules pt. 7017.2040). Performance test results will not be accepted without certification of the report.

1. **Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures:**

"I certify under penalty of law that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this test report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: Gary Howe Printed Name of Person Signing: GARY HOWE
Title: FIELD TECH Date: 1-13-95

2. **Certification of analytical procedures by the person responsible for the laboratory analysis of field samples:**

"I certify under penalty of law that the analytical procedures were performed in accordance with the requirements of the test methods and that the data presented for use in the test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: David J Schneider Printed Name of Person Signing: David Schneider
Title: QA Officer Date: 2/16/95

3. **Certification of test report by the senior staff person at the testing company who is responsible for compiling and checking the test report:**

"I certify under penalty of law that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed sampling and analysis relating to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: Daniel J. Deeden Printed Name of Person Signing: Daniel J. Deeden
Title: Mgr. Stationary Source Date: Feb 16, 1995

4. **Certification of test report by owner or operator of the emission facility:**

"I certify under penalty of law that the information submitted in this test report accurately reflects the operating conditions at the emission facility during this performance test and describes the date and nature of all operational and maintenance activities that were performed on process and control equipment during the month prior to the performance test. Based on my inquiry of the person or persons who performed the operational and maintenance activities, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: _____ Printed Name of Person Signing: _____
Title: _____ Date: _____

1-3-94-G:\STACK\WP\FORMS\S-480

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Certifications Required For Performance Test Reports

Note: All performance test reports must contain a certification by the responsible parties that the test results have been reported accurately, that the field data is a true representation of the sampling procedures, and that the process data is a true indicator of the operating parameters of the emissions unit at the time of the performance test. (Ref. Minn. Rules pt. 7017.2040). Performance test results will not be accepted without certification of the report.

1. **Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures:**

"I certify under penalty of law that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this test report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: Jeff Scripter Printed Name of Person Signing: Jeff Scripter
Title: Field Engineer Date: 1/12/95

2. **Certification of analytical procedures by the person responsible for the laboratory analysis of field samples:**

"I certify under penalty of law that the analytical procedures were performed in accordance with the requirements of the test methods and that the data presented for use in the test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: David J Schneider Printed Name of Person Signing: David Schneider
Title: QA Officer Date: 2/16/95

3. **Certification of test report by the senior staff person at the testing company who is responsible for compiling and checking the test report:**

"I certify under penalty of law that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed sampling and analysis relating to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: Daniel J. Deegan Printed Name of Person Signing: Daniel J. Deegan
Title: Mgr. Stationary Source Date: Feb 16, 1995

4. **Certification of test report by owner or operator of the emission facility:**

"I certify under penalty of law that the information submitted in this test report accurately reflects the operating conditions at the emission facility during this performance test and describes the date and nature of all operational and maintenance activities that were performed on process and control equipment during the month prior to the performance test. Based on my inquiry of the person or persons who performed the operational and maintenance activities, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: _____ Printed Name of Person Signing: _____
Title: _____ Date: _____

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Certifications Required For Performance Test Reports

Note: All performance test reports must contain a certification by the responsible parties that the test results have been reported accurately, that the field data is a true representation of the sampling procedures, and that the process data is a true indicator of the operating parameters of the emissions unit at the time of the performance test. (Ref. Minn. Rules pt. 7017.2040). Performance test results will not be accepted without certification of the report.

1. **Certification of sampling procedures by the team leader of the personnel conducting the sampling procedures:**

"I certify under penalty of law that the sampling procedures were performed in accordance with the approved test plan and that the data presented in this test report are, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: E. Trowbridge Printed Name of Person Signing: E. Trowbridge
Title: Field Eng Date: 1-10-95

2. **Certification of analytical procedures by the person responsible for the laboratory analysis of field samples:**

"I certify under penalty of law that the analytical procedures were performed in accordance with the requirements of the test methods and that the data presented for use in the test report were, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: David Schneider Printed Name of Person Signing: David Schneider
Title: QA Officer Date: 2/16/95

3. **Certification of test report by the senior staff person at the testing company who is responsible for compiling and checking the test report:**

"I certify under penalty of law that this test report and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the test information submitted. Based on my inquiry of the person or persons who performed sampling and analysis relating to the performance test, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: Daniel J Despen Printed Name of Person Signing: Daniel J Despen
Title: Mgr. Stationary Source Date: Feb 16, 1995

4. **Certification of test report by owner or operator of the emission facility:**

"I certify under penalty of law that the information submitted in this test report accurately reflects the operating conditions at the emission facility during this performance test and describes the date and nature of all operational and maintenance activities that were performed on process and control equipment during the month prior to the performance test. Based on my inquiry of the person or persons who performed the operational and maintenance activities, the information submitted in this test report is, to the best of my knowledge and belief, true, accurate, and complete. All exceptions are listed and explained below."

Signature: _____ Printed Name of Person Signing: _____
Title: _____ Date: _____

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1 INTRODUCTION

During January 10 - 13, 1995 Interpoll Laboratories personnel conducted the following air emission tests at the Northshore Mining Facility in Silver Bay, Minnesota:

Source	Parameters	Date
Bin Storage Stack	PM	1-10-95
No. 1105 Pelletizer Waste Gas Stack	PM	1-10-95
No. 1104 Pelletizer Waste Gas Stack	PM	1-10-95
No. 1205 Waste Gas Stack	PM,SO_2,NO_x	1-11-95
No. 1204 Waste Gas Stack	PM	1-11-95
Rotoclone Stack	PM	1-12-95
No. 2 Boiler Stack	PM,SO_2	1-12-95
Fine Crusher Stack	PM	1-13-95
Dry Cobber Stack	PM	1-13-95

On-site testing was performed by Duane Van Hoever, Ed Trowbridge, Gary Hove, Jeff Scripter, Scott Fjelsta, Todd Franceen, and Jamie Bainville. Coordination between testing activities and plant operation was provided by Dennis Wagner of Northshore Mining. The tests were witnessed by Dave Vaaler of the Minnesota Pollution Control Agency.

Particulate evaluations were performed in accordance with EPA Methods 1 - 5, CFR Title 40, Part 60, Appendix A (revised July 1, 1993). A preliminary determination of the gas linear velocity profile was made at each test site before the first particulate determination to allow selection of the appropriate nozzle diameter required for isokinetic sample withdrawal. An Interpoll Labs sampling train which meets or exceeds specifications in the above-cited reference was used to extract particulate samples by means of a heated glass-lined probe. Wet catch samples were collected in the back half of the Method 5 sampling train and analyzed as per Minnesota Rules, Part 7011.0725. Sulfur dioxide samples were collected in accordance with EPA Method 6 using the large impinger version without the isopropanol preimpinger. The recovered samples were returned to the laboratory for sulfate analyses by the standard barium/Thorin I titration.

The oxides of nitrogen samples were collected during the particulate determinations

using an all-glass Method 7 sampling train. A heated stainless steel probe was used to extract the samples from the exhaust stream. A plug of glass-wool was used in the end of the probe to remove particulate material.

The NO_x samples were collected in volume-calibrated two-liter all-glass flasks. An aliquot of 25 cc of absorbing solution was added to each flask on-site; the flask was closed; inserted into the sampling train; and evacuated. The probe was then purged and the sample collected over a 15 second interval. The flask was then closed; the flask removed from the sampling train; shook for two minutes and then secured for transport to the laboratory.

Upon arrival at the laboratory, the NO_x samples are logged in, placed in a designated area and maintained at 72 °F for 24 hours to allow completion of the conversion of NO to NO_2 and absorption in the acidified peroxide reagent. The flasks are then shook to complete absorption; attached to a mercury manometer and the static pressure and temperature recorded. The samples are then recovered and analyzed by ion chromatography.

Testing on the Bin Storage Stack was conducted from 2 test ports oriented at 90 degrees on the stack. The test ports are located 3.3 diameters downstream and 9.1 diameters upstream of the nearest flow disturbances. A 12 point/5 minute per point traverse was used for a total of 60 minutes per run. Visible emissions determinations were attempted by Jeff Scripter, an EPA-certified observer, but were unable to be performed due to heavy snow.

Testing on the No. 1104 and No. 1105 Pelletizers was conducted from two test ports oriented at 90 degrees. The test port location meets EPA specifications. A 24-point traverse was used at each test site. Each traverse point was sampled for 2.5 minutes for a total of 60 minutes per run.

Testing on the Waste Gas Stack was conducted from two test ports oriented at 90 degrees. The test port location meets EPA specifications. A 24-point traverse was used to collect representative particulate and sulfur dioxide samples. Each point was sampled for 2.5 minutes for a total of 60 minutes per run.

Testing on the Rotoclone Stack was conducted from 2 test ports oriented at 90 degrees on the stack. The test ports are located 5.3 diameters downstream and 1.4 diameters

upstream of the nearest flow disturbances. A 20-point traverse was used to collect representative particulate samples. Each point was sampled for 3 minutes for a total sampling time of 60 minutes per run.

Testing on the No. 2 Boiler was conducted from 2 test ports oriented at 90 degrees on the stack. The test ports are located 13 diameters downstream and 0.6 diameters upstream of the nearest flow disturbances. A 24-point traverse was to collect representative particulate samples. Each point was sampled for 2.5 minutes for a total of 60 minutes per run. Visible emissions observations were attempted by Jeff Scripter, an EPA-certified observer, but were unable to be performed due to heavy snow.

Testing on the Fine Crusher was conducted from 2 test ports oriented at 90 degrees on the stack. The test ports are located 9.5 stack diameters downstream and 9.5 diameters upstream of the nearest flow disturbances. A 12-point/5 minute per point traverse was used for a total of 60 minutes per run.

Testing on the Dry Cobber was conducted from 2 test ports oriented at 90 degrees on the stack. The test ports are located 2.7 stack diameters downstream and 0.81 diameters upstream of the nearest flow disturbances. A 24-point/2.5 minute per point traverse was used for a total of 60 minutes per run. Visible emissions observations were attempted by Jeff Scripter, an EPA-certified observer, but were unable to be performed due to heavy snow.

The important results of the test are summarized in Section 2. Detailed results are presented in Section 3. Field data and all other supporting information are presented in the appendices.

2 SUMMARY AND DISCUSSION

The results of the air emission compliance tests are summarized in Tables 1 - 11. An overview of these results and their emission limits is presented below:

PARAMETER	*Limit*	MEASURED
EMISSION POINT 48		
Bin Storage Stack		
Particulate . . . . . (GR/DSCF)	0.03	0.0055
. . . . . (LB/HR)	N/A	1.4
Opacity . . . . . (%)	20	N/A
EMISSION POINT 104 AND 105		
No. 1104 Pelletizer Waste Gas Stack		
Particulate . . . . . (GR/DSCF)	0.01	0.009
. . . . . (LB/HR)	N/A	5.3
No. 1105 Pelletizer Waste Gas Stack		
Particulate . . . . . (GR/DSCF)	0.01	0.011
. . . . . (LB/HR)	N/A	6.6
EMISSION POINT 106 AND 107		
No. 1204 Waste Gas Stack		
Particulate . . . . . (GR/DSCF)	0.01	0.0073
. . . . . (LB/HR)	N/A	3.9
No. 1205 Waste Gas Stack		
Particulate . . . . . (GR/DSCF)	0.03	0.0095
. . . . . (LB/HR)	N/A	5.2
Sulfur Dioxide . . . . . (ppm,d)	N/A	1
. . . . . (LB/HR)	N/A	0.75
Oxides of Nitrogen . . . (ppm,d)	N/A	118
. . . . . (LB/HR)	N/A	54

Please Note: Opacity observations were attempted, but were unable to be performed due to poor weather conditions.

PARAMETER	*Limit*	MEASURED
EMISSION POINT 76		
Rotoclone Stack		
Particulate . . . . . GR/DSCF)	0.03	0.0069
. . . . . (LB/HR)	N/A	2.0
EMISSION POINT 2		
No. 2 Boiler Stack		
Particulate . . . . . ($LB/10^6BTU$)	0.6	0.017
Sulfur Dioxide . . . ($LB/10^6BTU$)	2.5	0.47
*Opacity . . . . . (%)	20	N/A
EMISSION POINT 11		
No. 2 Fine Crusher Stack		
Particulate . . . . . (GR/DSCF)	0.002	0.0047
. . . . . (LB/HR)	N/A	0.62
*Opacity . . . . . (%)	20	N/A
EMISSION POINT 22		
Dry Cobber Stack		
Particulate . . . . . (GR/DSCF)	0.01	0.005
. . . . . (LB/HR)	N/A	2.8
*Opacity . . . . . (%)	20	N/A

* Please Note: Opacity observations were attempted, but were unable to be performed due to poor weather conditions.

No difficulties were encountered in the field or in the laboratory evaluation of the samples. On the basis of these facts and a complete review of the data and results, it is our opinion that the results reported herein are accurate and closely reflect the actual values which existed at the time the test was performed.

Table 1a. Summary of the Results of the January 10, 1995 Particulate Emission Compliance Test on the Bin Storage Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM	Run 1	Run 2	Run 3
Date of test	01-10-95	01-10-95	01-10-95
Time runs were done (HRS)	830/ 938	958/1102	1116/1220
Process rate			
Volumetric flow			
actual (ACFM)	28838	29765	29753
standard (DSCFM)	28616	29522	29692
Gas temperature (DEG-F)	58	57	55
Moisture content (%V/V)	0.99	1.18	0.95
Gas composition (%V/V,dry)			
carbon dioxide	0.03	0.03	0.03
oxygen	20.90	20.90	20.90
nitrogen	79.07	79.07	79.07
Isokinetic variation (%)	99.6	100.3	99.9
Particulate concentration			
actual (GR/ACF)	.00476	.00544	.00625
standard (GR/DSCF)	.00480	.00549	.00626
Part. emission rate (LB/HR)	1.18	1.39	1.59

Note: Dry + Organic Wet Catch

Table 1b. Summary of the Results of the January 10, 1995 Particulate Emission Compliance Test on the Bin Storage Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-10-95	01-10-95	01-10-95
Time runs were done	(HRS)	830/ 938	958/1102	1116/1220
Process rate				
Volumetric flow				
actual	(ACFM)	28838	29765	29753
standard	(DSCFM)	28616	29522	29692
Gas temperature	(DEG-F)	58	57	55
Moisture content	(%V/V)	0.99	1.18	0.95
Gas composition	(%V/V,dry)			
carbon dioxide		0.03	0.03	0.03
oxygen		20.90	20.90	20.90
nitrogen		79.07	79.07	79.07
Isokinetic variation	(%)	99.6	100.3	99.9
Particulate concentration				
actual	(GR/ACF)	.00472	.00513	.00578
standard	(GR/DSCF)	.00476	.00518	.00579
Part. emission rate	(LB/HR)	1.17	1.31	1.47

Note: Dry Catch Only

Table 2a. Summary of the Results of the January 10, 1995 Particulate Emission Compliance Test on the No. 1105 Pelletizer Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM	Run 1	Run 2	Run 3
Date of test	01-10-95	01-10-95	01-10-95
Time runs were done (HRS)	827/ 932	1003/1152	1226/1327
Process rate			
Volumetric flow			
actual (ACFM)	93717	97113	93302
standard (DSCFM)	70316	72787	70134
Gas temperature (DEG-F)	128	129	128
Moisture content (%V/V)	14.79	14.86	14.68
Gas composition (%V/V,dry)			
carbon dioxide	1.80	1.80	1.80
oxygen	17.20	17.30	17.20
nitrogen	81.00	80.90	81.00
Isokinetic variation (%)	101.3	99.7	100.2
Particulate concentration			
actual (GR/ACF)	.00768	.00803	.00859
standard (GR/DSCF)	.0102	.0107	.0114
Part. emission rate (LB/HR)	6.17	6.69	6.88

Note: Dry + Organic Wet Catch

Table 2b. Summary of the Results of the January 10, 1995 Particulate Emission Compliance Test on the No. 1105 Pelletizer Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-10-95	01-10-95	01-10-95
Time runs were done	(HRS)	827/ 932	1003/1152	1226/1327
Process rate				
Volumetric flow				
actual	(ACFM)	93717	97113	93302
standard	(DSCFM)	70316	72787	70134
Gas temperature	(DEG-F)	128	129	128
Moisture content	(%V/V)	14.79	14.86	14.68
Gas composition	(%V/V,dry)			
carbon dioxide		1.80	1.80	1.80
oxygen		17.20	17.30	17.20
nitrogen		81.00	80.90	81.00
Isokinetic variation	(%)	101.3	99.7	100.2
Particulate concentration				
actual	(GR/ACF)	.00687	.00749	.00773
standard	(GR/DSCF)	.00917	.00999	.0103
Part. emission rate	(LB/HR)	5.52	6.23	6.18

Note: Dry Catch Only

Table 3a. Summary of the Results of the January 10, 1995 Particulate Emission Compliance Test on the No. 1104 Pelletizer Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM	Run 1	Run 2	Run 3
Date of test	01-10-95	01-10-95	01-10-95
Time runs were done (HRS)	830/ 935	1005/1155	1226/1330
Process rate			
Volumetric flow			
actual (ACFM)	93129	93410	93219
standard (DSCFM)	69343	69067	69437
Gas temperature (DEG-F)	132	132	131
Moisture content (%V/V)	15.00	15.61	15.12
Gas composition (%V/V,dry)			
carbon dioxide	1.90	1.90	1.90
oxygen	17.20	17.20	17.20
nitrogen	80.90	80.90	80.90
Isokinetic variation (%)	99.5	100.3	100.0
Particulate concentration			
actual (GR/ACF)	.00876	.00656	.00465
standard (GR/DSCF)	.0118	.00887	.00625
Part. emission rate (LB/HR)	6.99	5.25	3.72

Note: Dry + Organic Wet Catch

Table 3b. Summary of the Results of the January 10, 1995 Particulate Emission Compliance Test on the No. 1104 Pelletizer Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-10-95	01-10-95	01-10-95
Time runs were done	(HRS)	830/ 935	1005/1155	1226/1330
Process rate				
Volumetric flow				
actual	(ACFM)	93129	93410	93219
standard	(DSCFM)	69343	69067	69437
Gas temperature	(DEG-F)	132	132	131
Moisture content	(%V/V)	15.00	15.61	15.12
Gas composition	(%V/V,dry)			
carbon dioxide		1.90	1.90	1.90
oxygen		17.20	17.20	17.20
nitrogen		80.90	80.90	80.90
Isokinetic variation	(%)	99.5	100.3	100.0
Particulate concentration				
actual	(GR/ACF)	.00847	.00629	.00414
standard	(GR/DSCF)	.0114	.00851	.00556
Part. emission rate	(LB/HR)	6.76	5.04	3.31

Note: Dry Catch Only

Table 4a. Summary of the Results of the January 11, 1995 Particulate Emission Compliance Test on the No. 1205 Waste Gas Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-11-95	01-11-95	01-11-95
Time runs were done	(HRS)	840/ 940	1022/1125	1153/1253
Process rate				
Volumetric flow				
actual	(ACFM)	88656	91102	89277
standard	(DSCFM)	65952	63717	61936
Gas temperature	(DEG-F)	138	140	139
Moisture content	(%V/V)	13.18	18.07	18.92
Gas composition	(%V/V,dry)			
carbon dioxide		2.10	2.00	2.00
oxygen		16.80	16.80	17.00
nitrogen		81.10	81.20	81.00
Isokinetic variation	(%)	97.4	102.7	101.7
Particulate concentration				
actual	(GR/ACF)	.00741	.00648	.00648
standard	(GR/DSCF)	.00997	.00926	.00935
Part. emission rate	(LB/HR)	5.64	5.06	4.96

Note: Dry + Organic Wet Catch

Table 4b. Summary of the Results of the January 11, 1995 Particulate Emission Compliance Test on the No. 1205 Waste Gas Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-11-95	01-11-95	01-11-95
Time runs were done	(HRS)	840/ 940	1022/1125	1153/1253
Process rate				
Volumetric flow				
actual	(ACFM)	88656	91102	89277
standard	(DSCFM)	65952	63717	61936
Gas temperature	(DEG-F)	138	140	139
Moisture content	(%V/V)	13.18	18.07	18.92
Gas composition	(%V/V,dry)			
carbon dioxide		2.10	2.00	2.00
oxygen		16.80	16.80	17.00
nitrogen		81.10	81.20	81.00
Isokinetic variation	(%)	97.4	102.7	101.7
Particulate concentration				
actual	(GR/ACF)	.00642	.00546	.00537
standard	(GR/DSCF)	.00863	.00781	.00774
Part. emission rate	(LB/HR)	4.88	4.27	4.11

Note: Dry Catch Only

Table 5a. Summary of the Results of the January 11, 1995 Particulate Emission Compliance Test on the No. 1204 Waste Gas Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-11-95	01-11-95	01-11-95
Time runs were done	(HRS)	840/ 942	1022/1126	1153/1257
Process rate				
Volumetric flow				
actual	(ACFM)	91099	89531	90737
standard	(DSCFM)	63727	62512	63698
Gas temperature	(DEG-F)	140	139	139
Moisture content	(%V/V)	18.06	18.37	17.98
Gas composition	(%V/V,dry)			
carbon dioxide		2.00	2.00	2.10
oxygen		16.80	16.90	16.80
nitrogen		81.20	81.10	81.10
Isokinetic variation	(%)	99.8	100.1	99.9
Particulate concentration				
actual	(GR/ACF)	.005553	.004320	.005407
standard	(GR/DSCF)	.007942	.006190	.007705
Part. emission rate	(LB/HR)	4.34	3.32	4.21

Note: Dry + Organic Wet Catch

Table 5b. Summary of the Results of the January 11, 1995 Particulate Emission Compliance Test on the No. 1204 Waste Gas Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-11-95	01-11-95	01-11-95
Time runs were done	(HRS)	840/ 942	1022/1126	1153/1257
Process rate				
Volumetric flow				
actual	(ACFM)	91099	89531	90737
standard	(DSCFM)	63727	62512	63698
Gas temperature	(DEG-F)	140	139	139
Moisture content	(%V/V)	18.06	18.37	17.98
Gas composition	(%V/V,dry)			
carbon dioxide		2.00	2.00	2.10
oxygen		16.80	16.90	16.80
nitrogen		81.20	81.10	81.10
Isokinetic variation	(%)	99.8	100.1	99.9
Particulate concentration				
actual	(GR/ACF)	.005345	.004249	.005012
standard	(GR/DSCF)	.007644	.006089	.007143
Part. emission rate	(LB/HR)	4.18	3.26	3.90

Note: Dry Catch Only

Table 6a. Summary of the Results of the January 12, 1995 Particulate Emission Compliance Test on the Rotoclone Stack at the Northshore Mining Stack Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-12-95	01-12-95	01-12-95
Time runs were done	(HRS)	825/ 926	1005/1107	1136/1322
Process rate				
Volumetric flow				
actual	(ACFM)	42164	42388	42523
standard	(DSCFM)	33820	33708	33616
Gas temperature	(DEG-F)	137	138	138
Moisture content	(%V/V)	6.11	6.66	7.26
Gas composition	(%V/V,dry)			
carbon dioxide		0.00	0.00	0.00
oxygen		20.90	20.90	20.90
nitrogen		79.10	79.10	79.10
Isokinetic variation	(%)	92.9	100.8	101.2
Particulate concentration				
actual	(GR/ACF)	.00628	.00535	.00492
standard	(GR/DSCF)	.00783	.00673	.00622
Part. emission rate	(LB/HR)	2.27	1.94	1.79

Note: Dry + Organic Wet Catch

Table 6b. Summary of the Results of the January 12, 1995 Particulate Emission Compliance Test on the Rotoclone Stack at the Northshore Mining Stack Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-12-95	01-12-95	01-12-95
Time runs were done	(HRS)	825/ 926	1005/1107	1136/1322
Process rate				
Volumetric flow				
actual	(ACFM)	42164	42388	42523
standard	(DSCFM)	33820	33708	33616
Gas temperature	(DEG-F)	137	138	138
Moisture content	(%V/V)	6.11	6.66	7.26
Gas composition	(%V/V,dry)			
carbon dioxide		0.00	0.00	0.00
oxygen		20.90	20.90	20.90
nitrogen		79.10	79.10	79.10
Isokinetic variation	(%)	92.9	100.8	101.2
Particulate concentration				
actual	(GR/ACF)	.00608	.00510	.00470
standard	(GR/DSCF)	.00758	.00641	.00595
Part. emission rate	(LB/HR)	2.20	1.85	1.71

Note: Dry Catch Only

Table 7a. Summary of the Results of the January 12, 1995 Particulate Emission Compliance Test on the No. 2 Boiler Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-12-95	01-12-95	01-12-95
Time runs were done	(HRS)	917/1017	1047/1147	1217/1322
Steam flow	(KLB/HR)			
Volumetric flow				
actual	(ACFM)	283059	312014	310072
standard	(DSCFM)	171211	182659	179781
Gas temperature	(DEG-F)	301	313	321
Moisture content	(%V/V)	9.67	11.18	11.09
Gas composition	(%V/V,dry)			
carbon dioxide		13.70	13.80	13.50
oxygen		5.60	5.50	5.80
nitrogen		80.70	80.70	80.70
Isokinetic variation	(%)	101.2	103.7	105.0
Particulate concentration				
actual	(GR/ACF)	.00609	.00470	.00501
standard	(GR/DSCF)	.0101	.00803	.00865
Part. emission rate	(LB/HR)	14.78	12.57	13.33
Emission factor	(LB/MMBTU)	0.019	0.015	0.017

Note: Dry + Organic Wet Catch

Table 7b. Summary of the Results of the January 12, 1995 Particulate Emission Compliance Test on the No. 2 Boiler Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-12-95	01-12-95	01-12-95
Time runs were done	(HRS)	917/1017	1047/1147	1217/1322
Steam flow	(KLB/HR)			
Volumetric flow				
actual	(ACFM)	283059	312014	310072
standard	(DSCFM)	171211	182659	179781
Gas temperature	(DEG-F)	301	313	321
Moisture content	(%V/V)	9.67	11.18	11.09
Gas composition	(%V/V,dry)			
carbon dioxide		13.70	13.80	13.50
oxygen		5.60	5.50	5.80
nitrogen		80.70	80.70	80.70
Isokinetic variation	(%)	101.2	103.7	105.0
Particulate concentration				
actual	(GR/ACF)	.00591	.00437	.00479
standard	(GR/DSCF)	.00978	.00746	.00827
Part. emission rate	(LB/HR)	14.35	11.68	12.74
Emission factor	(LB/MMBTU)	0.019	0.014	0.016

Note: Dry Catch Only

Table 8a. Summary of the Results of the January 13, 1995 Particulate Emission Compliance Test on the Fine Crusher Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-13-95	01-13-95	01-13-95
Time runs were done	(HRS)	810/ 917	1000/1105	1124/1230
Process rate				
Volumetric flow				
actual	(ACFM)	16053	16039	16203
standard	(DSCFM)	15313	15354	15512
Gas temperature	(DEG-F)	69	68	67
Moisture content	(%V/V)	1.36	1.27	1.42
Gas composition	(%V/V,dry)			
carbon dioxide		0.03	0.03	0.03
oxygen		20.90	20.90	20.90
nitrogen		79.07	79.07	79.07
Isokinetic variation	(%)	99.3	99.3	99.5
Particulate concentration				
actual	(GR/ACF)	.00626	.00465	.00250
standard	(GR/DSCF)	.00656	.00486	.00261
Part. emission rate	(LB/HR)	0.861	0.639	0.347

Note: Dry + Organic Wet Catch

Table 8b. Summary of the Results of the January 13, 1995 Particulate Emission Compliance Test on the Fine Crusher Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-13-95	01-13-95	01-13-95
Time runs were done	(HRS)	810/ 917	1000/1105	1124/1230
Process rate				
Volumetric flow				
actual	(ACFM)	16053	16039	16203
standard	(DSCFM)	15313	15354	15512
Gas temperature	(DEG-F)	69	68	67
Moisture content	(%V/V)	1.36	1.27	1.42
Gas composition	(%V/V,dry)			
carbon dioxide		0.03	0.03	0.03
oxygen		20.90	20.90	20.90
nitrogen		79.07	79.07	79.07
Isokinetic variation	(%)	99.3	99.3	99.5
Particulate concentration				
actual	(GR/ACF)	.00580	.00417	.00215
standard	(GR/DSCF)	.00608	.00435	.00225
Part. emission rate	(LB/HR)	0.798	0.573	0.299

Note: Dry Catch Only

Table 9a. Summary of the Results of the January 13, 1995 Particulate Emission Compliance Test on the Dry Cobber Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-13-95	01-13-95	01-13-95
Time runs were done	(HRS)	820/ 921	1000/1105	1124/1226
Process rate				
Volumetric flow				
actual	(ACFM)	67972	68148	67852
standard	(DSCFM)	64878	65040	65558
Gas temperature	(DEG-F)	71	68	67
Moisture content	(%V/V)	0.83	1.48	0.27
Gas composition	(%V/V,dry)			
carbon dioxide		0.03	0.03	0.03
oxygen		20.90	20.90	20.90
nitrogen		79.07	79.07	79.07
Isokinetic variation	(%)	98.9	100.1	99.3
Particulate concentration				
actual	(GR/ACF)	.00659	.00495	.00272
standard	(GR/DSCF)	.00690	.00519	.00282
Part. emission rate	(LB/HR)	3.84	2.89	1.59

Note: Dry + Organic Wet Catch

Table 9b. Summary of the Results of the January 13, 1995 Particulate Emission Compliance Test on the Dry Cobber Stack at the Northshore Mining Facility Located in Silver Bay, Minnesota.

ITEM		Run 1	Run 2	Run 3
Date of test		01-13-95	01-13-95	01-13-95
Time runs were done	(HRS)	820/ 921	1000/1105	1124/1226
Process rate				
Volumetric flow				
actual	(ACFM)	67972	68148	67852
standard	(DSCFM)	64878	65040	65558
Gas temperature	(DEG-F)	71	68	67
Moisture content	(%V/V)	0.83	1.48	0.27
Gas composition	(%V/V,dry)			
carbon dioxide		0.03	0.03	0.03
oxygen		20.90	20.90	20.90
nitrogen		79.07	79.07	79.07
Isokinetic variation	(%)	98.9	100.1	99.3
Particulate concentration				
actual	(GR/ACF)	.00637	.00465	.00272
standard	(GR/DSCF)	.00667	.00488	.00282
Part. emission rate	(LB/HR)	3.71	2.72	1.59

Note: Dry Catch Only

Table 10. Summary of the Results of the January 11 & 12, 1995 **Sulfur Dioxide** Emission Compliance Tests at the Northshore Mining Facility in Silver Bay, Minnesota.

Test/Run	Date	Time (HRS)	Concentration (ppm,d)	Emission Rate (LB/HR)	Emission Factor (LB/10^6BTU)
(No. 1205 Waste Gas Stack)					
4/1	1-11-95	0840-0940	1	0.77	N/A
4/2	1-11-95	1022-1125	1	0.59	N/A
4/3	1-11-95	1153-1253	1	0.89	N/A
Avg			1	0.75	N/A
(No. 2 Boiler Stack)					
7/1	1-12-95	0917-1017	216	368	0.479
7/2	1-12-95	1047-1147	211	384	0.465
7/3	1-12-95	1217-1317	207	371	0.465
Avg			211	374	0.470

Table 11. Summary of the Results of the January 11, 1995 **Oxides of Nitrogen** Emission Compliance Tests at the Northshore Mining Facility in Silver Bay, Minnesota.

Test/Run	Date	Time (HRS)	Concentration (ppm,d)	Emission Rate (LB/HR)
(No. 1205 Waste Gas Stack)				
4/1	1-11-95	0840-0940	123	58
4/2	1-11-95	1022-1125	112	51
4/3	1-11-95	1153-1253	120	53
Avg			118	54

3 RESULTS

The results of all field and laboratory evaluations are presented in this section. Gas composition (Orsat and moisture) are presented first followed by the computer printout of the particulate, sulfur dioxide, oxides of nitrogen, and opacity observations. Preliminary measurements including test port locations are given in the appendices.

The results have been calculated on a personal computer using programs written in Extended BASIC specifically for source testing calculations. EPA-published equations have been used as the basis of the calculation techniques in these programs. The particulate emission rate has been calculated using the product of the concentration times flow method.

3.1 Results of Orsat & Moisture Analysis

Test No. 1
Bin Storage Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	01-10-95	01-10-95	01-10-95
Dry basis (orsat)			
carbon dioxide.....	0.03	0.03	0.03
oxygen.....	20.90	20.90	20.90
nitrogen.....	79.07	79.07	79.07
Wet basis (orsat)			
carbon dioxide.....	0.03	0.03	0.03
oxygen.....	20.69	20.65	20.70
nitrogen.....	78.29	78.13	78.32
water vapor.....	0.99	1.18	0.95
Dry molecular weight.....	28.84	28.84	28.84
Wet molecular weight.....	28.73	28.71	28.74
Specific gravity.....	0.993	0.992	0.993
Water mass flow.....(LB/HR)	799	992	797

Test No. 2
No. 1105 Pelletizer Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	01-10-95	01-10-95	01-10-95
Dry basis (orsat)			
carbon dioxide.....	1.80	1.80	1.80
oxygen.....	17.20	17.30	17.20
nitrogen.....	81.00	80.90	81.00
Wet basis (orsat)			
carbon dioxide.....	1.53	1.53	1.54
oxygen.....	14.66	14.73	14.68
nitrogen.....	69.02	68.88	69.11
water vapor.....	14.79*	14.86*	14.68*
Dry molecular weight.....	28.98	28.98	28.98
Wet molecular weight.....	27.35	27.35	27.36
Specific gravity.....	0.945	0.945	0.945
Water mass flow.....(LB/HR)	34369	38207	36742

* Free or condensed water in the gas stream.

FO	2.056	2.000	2.056

Test No. 3
No. 1104 Pelletizer Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	01-10-95	01-10-95	01-10-95
Dry basis (orsat)			
carbon dioxide.....	1.90	1.90	1.90
oxygen.....	17.20	17.20	17.20
nitrogen.....	80.90	80.90	80.90
Wet basis (orsat)			
carbon dioxide.....	1.61	1.60	1.61
oxygen.....	14.62	14.52	14.60
nitrogen.....	68.76	68.27	68.67
water vapor.....	15.00	15.61	15.12
Dry molecular weight.....	28.99	28.99	28.99
Wet molecular weight.....	27.34	27.28	27.33
Specific gravity.....	0.944	0.942	0.944
Water mass flow.....(LB/HR)	34337	35837	34684
FO	1.947	1.947	1.947

Test No. 5
No. 1204 Waste Gas Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	01-11-95	01-11-95	01-11-95
Dry basis (orsat)			
carbon dioxide.....	2.00	2.00	2.10
oxygen.....	16.80	16.90	16.80
nitrogen.....	81.20	81.10	81.10
Wet basis (orsat)			
carbon dioxide.....	1.64	1.63	1.72
oxygen.....	13.77	13.79	13.78
nitrogen.....	66.53	66.20	66.52
water vapor.....	18.06	18.37	17.98
Dry molecular weight.....	28.99	29.00	29.01
Wet molecular weight.....	27.01	26.98	27.03
Specific gravity.....	0.933	0.932	0.934
Water mass flow.....(LB/HR)	39404	39473	38819
FO	2.050	2.000	1.952

Test No. 4
No. 1205 Waste Gas Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	01-11-95	01-11-95	01-11-95
Dry basis (orsat)			
carbon dioxide.....	2.10	2.00	2.00
oxygen.....	16.80	16.80	17.00
nitrogen.....	81.10	81.20	81.00
Wet basis (orsat)			
carbon dioxide.....	1.82	1.64	1.62
oxygen.....	14.59	13.76	13.78
nitrogen.....	70.41	66.52	65.68
water vapor.....	13.18	18.07	18.92
Dry molecular weight.....	29.01	28.99	29.00
Wet molecular weight.....	27.56	27.01	26.92
Specific gravity.....	0.952	0.933	0.930
Water mass flow.....(LB/HR)	28087	39429	40532
FO	1.952	2.050	1.950

Test No. 6
Rotoclone Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

Date of run	Run 1 01-12-95	Run 2 01-12-95	Run 3 01-12-95
Dry basis (orsat)			
carbon dioxide.....	0.00	0.00	0.00
oxygen.....	20.90	20.90	20.90
nitrogen.....	79.10	79.10	79.10
Wet basis (orsat)			
carbon dioxide.....	0.00	0.00	0.00
oxygen.....	19.62	19.51	19.38
nitrogen.....	74.26	73.83	73.35
water vapor.....	6.11	6.66	7.26
Dry molecular weight.....	28.84	28.84	28.84
Wet molecular weight.....	28.17	28.11	28.05
Specific gravity.....	0.973	0.971	0.969
Water mass flow.....(LB/HR)	6176	6747	7385

Test No. 7
No. 2 Boiler Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	01-12-95	01-12-95	01-12-95
Dry basis (orsat)			
carbon dioxide.....	13.70	13.80	13.50
oxygen.....	5.60	5.50	5.80
nitrogen.....	80.70	80.70	80.70
Wet basis (orsat)			
carbon dioxide.....	12.37	12.26	12.00
oxygen.....	5.06	4.88	5.16
nitrogen.....	72.89	71.67	71.75
water vapor.....	9.67	11.18	11.09
Dry molecular weight.....	30.42	30.43	30.39
Wet molecular weight.....	29.21	29.04	29.02
Specific gravity.....	1.009	1.003	1.002
Water mass flow.....(LB/HR)	51431	64515	62885
FO	1.117	1.116	1.119

Test No. 8
Fine Crusher Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	01-13-95	01-13-95	01-13-95
Dry basis (orsat)			
carbon dioxide.....	0.03	0.03	0.03
oxygen.....	20.90	20.90	20.90
nitrogen.....	79.07	79.07	79.07
Wet basis (orsat)			
carbon dioxide.....	0.03	0.03	0.03
oxygen.....	20.62	20.63	20.60
nitrogen.....	78.00	78.07	77.95
water vapor.....	1.36	1.27	1.42
Dry molecular weight.....	28.84	28.84	28.84
Wet molecular weight.....	28.69	28.70	28.69
Specific gravity.....	0.991	0.991	0.991
Water mass flow.....(LB/HR)	591	554	627

Test No. 9
Dry Cobber Stack

Results of Orsat & Moisture Analyses-----Methods 3 & 4(%v/v)

	Run 1	Run 2	Run 3
Date of run	01-13-95	01-13-95	01-13-95
Dry basis (orsat)			
carbon dioxide.....	0.03	0.03	0.03
oxygen.....	20.90	20.90	20.90
nitrogen.....	79.07	79.07	79.07
Wet basis (orsat)			
carbon dioxide.....	0.03	0.03	0.03
oxygen.....	20.73	20.59	20.84
nitrogen.....	78.42	77.90	78.85
water vapor.....	0.83	1.48	0.27
Dry molecular weight.....	28.84	28.84	28.84
Wet molecular weight.....	28.75	28.68	28.81
Specific gravity.....	0.993	0.991	0.995
Water mass flow.....(LB/HR)	1515	2744	503

3.2 Results of Particulate Loading Determinations

Test No. 1
Bin Storage Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	01-10-95	01-10-95	01-10-95
Time run start/end.....(HRS)	830/ 938	958/1102	1116/1220
Static pressure.....(IN.WC)	-0.65	-0.65	-0.65
Cross sectional area (SQ.FT)	8.51	8.51	8.51
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	0.0	0.0	0.0
desiccant.....(GRAMS)	8.0	10.0	8.0
total.....(GRAMS)	8.0	10.0	8.0
Total particulate material..			
.....collected(grams)	0.0118	0.0140	0.0160
Gas meter coefficient.....	1.0004	1.0004	1.0004
Barometric pressure..(IN.HG)	29.46	29.46	29.46
Avg. orif.pres.drop..(IN.WC)	1.23	1.33	1.34
Avg. gas meter temp..(DEF-F)	60.5	64.9	66.6
Volume through gas meter....			
at meter conditions...(CF)	37.83	39.60	39.80
standard conditions.(DSCF)	37.90	39.35	39.42
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.186	.186	.186
Avg.stack gas temp ..(DEG-F)	58	57	55
Volumetric flow rate.....			
actual.....(ACFM)	28838	29765	29753
dry standard.....(DSCFM)	28616	29522	29692
Isokinetic variation.....(%)	99.6	100.3	99.9
Particulate concentration...			
actual.....(GR/ACF)	0.00476	0.00544	0.00625
dry standard.....(GR/DSCF)	0.00480	0.00549	0.00626
Particle mass rate...(LB/HR)	1.178	1.389	1.594

Test No. 2
No. 1105 Pelletizer Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	01-10-95	01-10-95	01-10-95
Time run start/end.....(HRS)	827/ 932	1003/1152	1226/1327
Static pressure.....(IN.WC)	-0.22	-0.22	-0.22
Cross sectional area (SQ.FT)	27.49	27.49	27.49
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	167.0	190.0	180.0
desiccant.....(GRAMS)	24.0	19.0	22.0
total.....(GRAMS)	191.0	209.0	202.0
Total particulate material..			
.....collected(grams)	0.0343	0.0366	0.0378
Gas meter coefficient.....	1.0015	1.0015	1.0015
Barometric pressure..(IN.HG)	29.38	29.38	29.38
Avg. orif.pres.drop..(IN.WC)	2.59	2.71	2.51
Avg. gas meter temp..(DEF-F)	81.8	85.0	86.0
Volume through gas meter....			
at meter conditions...(CF)	53.60	54.92	53.31
standard conditions.(DSCF)	51.68	52.66	51.00
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.247	.247	.247
Avg.stack gas temp ..(DEG-F)	128	129	128
Volumetric flow rate.....			
actual.....(ACFM)	93717	97113	93302
dry standard.....(DSCFM)	70316	72787	70134
Isokinetic variation.....(%)	101.3	99.7	100.2
Particulate concentration...			
actual.....(GR/ACF)	0.00768	0.00803	0.00859
dry standard.....(GR/DSCF)	0.01024	0.01072	0.01144
Particle mass rate...(LB/HR)	6.172	6.691	6.875

Test No. 3
No. 1104 Pelletizer Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	01-10-95	01-10-95	01-10-95
Time run start/end.....(HRS)	830/ 935	1005/1155	1226/1330
Static pressure.....(IN.WC)	-0.14	-0.14	-0.14
Cross sectional area (SQ.FT)	27.49	27.49	27.49
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	172.0	186.0	180.0
desiccant.....(GRAMS)	20.0	16.0	15.0
total.....(GRAMS)	192.0	202.0	195.0
Total particulate material..			
.....collected(grams)	0.0391	0.0296	0.0209
Gas meter coefficient.....	0.9932	0.9932	0.9932
Barometric pressure..(IN.HG)	29.38	29.38	29.38
Avg. orif.pres.drop..(IN.WC)	2.39	2.41	2.41
Avg. gas meter temp..(DEF-F)	78.4	82.2	84.1
Volume through gas meter....			
at meter conditions...(CF)	53.32	53.91	54.25
standard conditions.(DSCF)	51.28	51.49	51.63
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.250	.250	.250
Avg.stack gas temp ..(DEG-F)	132	132	131
Volumetric flow rate.....			
actual.....(ACFM)	93129	93410	93219
dry standard.....(DSCFM)	69343	69067	69437
Isokinetic variation.....(%)	99.5	100.3	100.0
Particulate concentration...			
actual.....(GR/ACF)	0.00876	0.00656	0.00465
dry standard.....(GR/DSCF)	0.01176	0.00887	0.00625
Particle mass rate...(LB/HR)	6.993	5.251	3.717

Test No. 4
No. 1205 Waste Gas Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	01-11-95	01-11-95	01-11-95
Time run start/end.....(HRS)	840/ 940	1022/1125	1153/1253
Static pressure......(IN.WC)	-0.03	-0.03	-0.03
Cross sectional area (SQ.FT)	27.88	27.88	27.88
Pitot tube coefficient......	.840	.840	.840
Water in sample gas			
condenser.............(ML)	0.0	0.0	0.0
impingers..........(GRAMS)	127.0	202.0	209.0
desiccant..........(GRAMS)	21.0	17.0	14.0
total..............(GRAMS)	148.0	219.0	223.0
Total particulate material.. ....collected(grams)	0.0297	0.0281	0.0273
Gas meter coefficient.......	1.0015	1.0015	1.0015
Barometric pressure..(IN.HG)	29.02	29.02	29.02
Avg. orif.pres.drop..(IN.WC)	1.99	2.12	1.97
Avg. gas meter temp..(DEF-F)	70.6	81.9	86.7
Volume through gas meter....			
at meter conditions...(CF)	47.33	49.21	47.82
standard conditions.(DSCF)	45.96	46.81	45.07
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.........(IN)	.247	.247	.247
Avg.stack gas temp ..(DEG-F)	138	140	139
Volumetric flow rate........			
actual..............(ACFM)	88656	91102	89277
dry standard.......(DSCFM)	65952	63717	61936
Isokinetic variation.....(%)	97.4	102.7	101.7
Particulate concentration...			
actual............(GR/ACF)	0.00741	0.00648	0.00648
dry standard.....(GR/DSCF)	0.00997	0.00926	0.00935
Particle mass rate...(LB/HR)	5.636	5.059	4.962

Test No. 5
No. 1204 Waste Gas Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	01-11-95	01-11-95	01-11-95
Time run start/end.....(HRS)	840/ 942	1022/1126	1153/1257
Static pressure.....(IN.WC)	0.26	0.26	0.26
Cross sectional area (SQ.FT)	27.88	27.88	27.88
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	205.0	209.0	204.0
desiccant.....(GRAMS)	13.0	10.0	13.0
total.....(GRAMS)	218.0	219.0	217.0
Total particulate material..			
.....collected(grams)	0.0240	0.0184	0.0233
Gas meter coefficient.....	0.9932	0.9932	0.9932
Barometric pressure..(IN.HG)	29.02	29.02	29.02
Avg. orif.pres.drop..(IN.WC)	1.92	1.90	1.97
Avg. gas meter temp..(DEF-F)	65.7	77.0	79.2
Volume through gas meter....			
at meter conditions...(CF)	47.98	48.22	49.24
standard conditions.(DSCF)	46.63	45.87	46.66
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.250	.250	.250
Avg.stack gas temp ..(DEG-F)	140	139	139
Volumetric flow rate.....			
actual.....(ACFM)	91099	89531	90737
dry standard.....(DSCFM)	63727	62512	63698
Isokinetic variation.....(%)	99.8	100.1	99.9
Particulate concentration...			
actual.....(GR/ACF)	0.00555	0.00432	0.00541
dry standard.....(GR/DSCF)	0.00794	0.00619	0.00770
Particle mass rate...(LB/HR)	4.338	3.316	4.207

Test No. 6
Rotoclone Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	01-12-95	01-12-95	01-12-95
Time run start/end.....(HRS)	825/ 926	1005/1107	1136/1322
Static pressure.....(IN.WC)	-0.82	-0.82	-0.82
Cross sectional area (SQ.FT)	11.29	11.29	11.29
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	33.0	44.0	7.0
desiccant.....(GRAMS)	10.0	7.0	49.0
total.....(GRAMS)	43.0	51.0	56.0
Total particulate material..			
.....collected(grams)	0.0158	0.0147	0.0136
Gas meter coefficient.....	0.9932	0.9932	0.9932
Barometric pressure..(IN.HG)	28.94	28.94	28.94
Avg. orif.pres.drop..(IN.WC)	0.87	1.02	1.01
Avg. gas meter temp..(DEF-F)	73.1	74.0	71.2
Volume through gas meter....			
at meter conditions...(CF)	32.67	35.40	35.23
standard conditions.(DSCF)	31.14	33.70	33.71
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.185	.185	.185
Avg.stack gas temp ..(DEG-F)	137	138	138
Volumetric flow rate.....			
actual.....(ACFM)	42164	42388	42523
dry standard.....(DSCFM)	33820	33708	33616
Isokinetic variation.....(%)	92.9	100.8	101.2
Particulate concentration...			
actual.....(GR/ACF)	0.00628	0.00535	0.00492
dry standard.....(GR/DSCF)	0.00783	0.00673	0.00622
Particle mass rate...(LB/HR)	2.269	1.945	1.794

Test No. 7
No. 2 Boiler Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	01-12-95	01-12-95	01-12-95
Time run start/end.....(HRS)	917/1017	1047/1147	1217/1322
Static pressure.....(IN.WC)	-0.90	-0.90	-0.90
Cross sectional area (SQ.FT)	66.00	66.00	66.00
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	104.0	136.0	137.0
desiccant.....(GRAMS)	15.0	17.0	14.0
total.....(GRAMS)	119.0	153.0	151.0
Total particulate material..			
.....collected(grams)	0.0342	0.0298	0.0320
Gas meter coefficient.....	1.0026	1.0026	1.0026
Barometric pressure..(IN.HG)	28.94	28.94	28.94
Avg. orif.pres.drop..(IN.WC)	2.62	3.20	3.14
Avg. gas meter temp..(DEF-F)	73.6	86.6	84.7
Volume through gas meter....			
at meter conditions...(CF)	54.26	60.69	60.28
standard conditions.(DSCF)	52.39	57.29	57.09
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.247	.247	.247
Avg.stack gas temp ..(DEG-F)	301	313	321
Volumetric flow rate.....			
actual.....(ACFM)	283059	312014	310072
dry standard.....(DSCFM)	171211	182659	179781
Isokinetic variation.....(%)	101.2	103.7	105.0
Particulate concentration...			
actual.....(GR/ACF)	0.00609	0.00470	0.00501
dry standard.....(GR/DSCF)	0.01007	0.00803	0.00865
Particle mass rate...(LB/HR)	14.781	12.566	13.327
F-factor .....(DSCF/MMBTU)	9780	9780	9780
Emission factor...(LB/MMBTU)	0.019	0.015	0.017

Test No. 8
Fine Crusher Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	01-13-95	01-13-95	01-13-95
Time run start/end.....(HRS)	810/ 917	1000/1105	1124/1230
Static pressure.....(IN.WC)	-0.25	-0.25	-0.25
Cross sectional area (SQ.FT)	5.67	5.67	5.67
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	1.0	1.0	2.0
desiccant.....(GRAMS)	15.0	14.0	15.0
total.....(GRAMS)	16.0	15.0	17.0
Total particulate material..			
.....collected(grams)	0.0233	0.0173	0.0094
Gas meter coefficient.....	0.9932	0.9932	0.9932
Barometric pressure..(IN.HG)	29.02	29.02	29.02
Avg. orif.pres.drop..(IN.WC)	2.56	2.61	2.67
Avg. gas meter temp..(DEF-F)	51.1	57.2	59.5
Volume through gas meter....			
at meter conditions...(CF)	54.72	55.52	56.45
standard conditions.(DSCF)	54.79	54.94	55.62
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.250	.250	.250
Avg.stack gas temp ..(DEG-F)	69	68	67
Volumetric flow rate.....			
actual.....(ACFM)	16053	16039	16203
dry standard.....(DSCFM)	15313	15354	15512
Isokinetic variation.....(%)	99.3	99.3	99.5
Particulate concentration...			
actual.....(GR/ACF)	0.00626	0.00465	0.00250
dry standard.....(GR/DSCF)	0.00656	0.00486	0.00261
Particle mass rate...(LB/HR)	0.861	0.639	0.347

Test No. 9
Dry Cobber Stack

Results of Particulate Loading Determinations-------Method 5

	Run 1	Run 2	Run 3
Date of run	01-13-95	01-13-95	01-13-95
Time run start/end.....(HRS)	820/ 921	1000/1105	1124/1226
Static pressure.....(IN.WC)	-0.85	-0.85	-0.85
Cross sectional area (SQ.FT)	20.46	20.46	20.46
Pitot tube coefficient.....	.840	.840	.840
Water in sample gas			
condenser.....(ML)	0.0	0.0	0.0
impingers.....(GRAMS)	-2.0	-3.0	-5.0
desiccant.....(GRAMS)	8.0	14.0	7.0
total.....(GRAMS)	6.0	11.0	2.0
Total particulate material..			
.....collected(grams)	0.0152	0.0116	0.0063
Gas meter coefficient.....	1.0004	1.0004	1.0004
Barometric pressure..(IN.HG)	29.02	29.02	29.02
Avg. orif.pres.drop..(IN.WC)	1.02	1.06	1.06
Avg. gas meter temp..(DEF-F)	72.6	75.1	76.6
Volume through gas meter....			
at meter conditions...(CF)	35.25	35.93	36.01
standard conditions.(DSCF)	33.98	34.48	34.46
Total sampling time....(MIN)	60.00	60.00	60.00
Nozzle diameter.....(IN)	.182	.182	.182
Avg.stack gas temp ..(DEG-F)	71	68	67
Volumetric flow rate.....			
actual.....(ACFM)	67972	68148	67852
dry standard.....(DSCFM)	64878	65040	65558
Isokinetic variation.....(%)	98.9	100.1	99.3
Particulate concentration...			
actual.....(GR/ACF)	0.00659	0.00495	0.00272
dry standard.....(GR/DSCF)	0.00690	0.00519	0.00282
Particle mass rate...(LB/HR)	3.838	2.894	1.585

3.3 Results of Sulfur Dioxide Determinations

Test No. 4
No. 1205 Waste Gas Stack

Results of Sulfur Dioxide Determinations----------Method 6

	Run 1	Run 2	Run 3
Date of run	01-11-95	01-11-95	01-11-95
Time run start/end.....(HRS)	0840-0940	1022-1125	1153-1253
Barometric pressure..(IN.HG)	29.02	29.02	29.02
Meter temperature....(DEG-F)	70.60	81.90	86.70
Meter correction coefficient	1.0015	1.0015	1.0015
Volume through gas meter....			
at meter conditions...(CF)	47.330	49.210	47.820
standard conditions..(SCF)	45.962	46.807	45.068
Total sampling time....(MIN)	60.0	60.0	60.0
Moisture content.....(%V/V)	13.18	18.07	18.92
Oxygen content....(%V/V DRY)	16.80	16.80	17.00
Milliequivalents of SO4 in..			
gas sample.....	0.1270	0.1020	0.1530
Sulfur dioxide concentration			
(GR/DSCF).....	0.0014	0.0011	0.0017
(MG/DSCM).....	3	2	4
(PPM-DRY).....	1	1	1
(PPM-WET).....	1	1	1
SO2 Emission rate....(LB/HR)	0.77	0.59	0.89

Test No. 7
No. 2 Boiler Stack

Results of Sulfur Dioxide Determinations----------Method 6

	Run 1	Run 2	Run 3
Date of run	01-12-95	01-12-95	01-12-95
Time run start/end.....(HRS)	0917-1017	1047-1147	1217-1322
Barometric pressure..(IN.HG)	28.94	28.94	28.94
Meter temperature....(DEG-F)	73.60	86.60	84.70
Meter correction coefficient	1.0026	1.0026	1.0026
Volume through gas meter....			
at meter conditions...(CF)	54.260	60.690	60.280
standard conditions..(SCF)	52.393	57.291	57.094
Total sampling time....(MIN)	60.0	60.0	60.0
Moisture content.....(%V/V)	9.67	11.18	11.09
Oxygen content....(%V/V DRY)	5.60	5.50	5.80
Milliequivalents of SO4 in..			
gas sample.....	26.6000	28.4000	27.8000
Sulfur dioxide concentration			
(GR/DSCF).....	0.2509	0.2450	0.2407
(MG/DSCM).....	574	561	551
(PPM-DRY).....	216	211	207
(PPM-WET).....	195	187	184
SO2 Emission rate....(LB/HR)	368.27	383.61	370.86
Sulfur dioxide emission.....			
.....factor (LB/MMBTU)*	0.479	0.465	0.465

* F = 9780 DSCF/MMBTU

3.4 Results of Oxides of Nitrogen Determinations

Test No. 4
No. 1205 Waste Gas Stack

Results of Oxides of Nitrogen (NOx) Determinations---------Method 7

	Run 1A	Run 1B	Run 1C	Run 1D
Date of run.....	01-11-95	01-11-95	01-11-95	01-11-95
Time of run.....(HRS)	851	900	920	941
Flask number.....	1	2	3	4
Volume of flask.....(ML)	2086	2063	2055	2116
Data: time of sampling				
flask temperature..(DEG-F)	70.00	71.00	68.00	71.00
bar. press.....(IN.HG)	29.02	29.02	29.02	29.02
flask vacuum.....(IN.HG)	26.10	26.20	26.20	26.40
flask abs. press...(IN.HG)	2.92	2.82	2.82	2.62
Data: Time of Flask Opening				
flask temperature..(DEG-F)	72.00	72.00	72.00	72.00
lab. bar. press....(IN.HG)	29.24	29.24	29.24	29.24
flask static press.(IN.HG)	-1.10	-0.10	-0.10	-0.70
flask abs. press...(IN.HG)	28.14	29.14	29.14	28.54
Volume gas sampled....(DSML)	1723	1778	1770	1797
Moisture content.....(%V/V)	13.18	13.18	13.18	13.18
Nitrate in gas sample...(JG)	550.0	555.0	550.0	585.0
NO2 in gas sample.....(JG)	408.1	411.8	408.1	434.1
NOx Concentration				
(GR/DSCF).....	0.1035	0.1012	0.1007	0.1056
(MG/DSCM).....	237	232	231	242
(PPM-DRY).....	124	121	121	126
(PPM-WET).....	108	105	105	110
NOX Emission rate....(LB/HR)	58.52	57.21	56.95	59.68

Test No. 4
No. 1205 Waste Gas Stack

Results of Oxides of Nitrogen (NOx) Determinations---------Method 7

	Run 2A	Run 2B	Run 2C	Run 2D
Date of run.....	01-11-95	01-11-95	01-11-95	01-11-95
Time of run.....(HRS)	1041	1050	1105	1120
Flask number.....	5	6	7	9
Volume of flask.....(ML)	2057	2100	2081	2080
Data: time of sampling				
flask temperature..(DEG-F)	69.00	71.00	70.00	69.00
bar. press.....(IN.HG)	29.02	29.02	29.02	29.02
flask vacuum.....(IN.HG)	26.40	26.40	26.20	26.30
flask abs. press...(IN.HG)	2.62	2.62	2.82	2.72
Data: Time of Flask Opening				
flask temperature..(DEG-F)	72.00	72.00	72.00	72.00
lab. bar. press....(IN.HG)	29.24	29.24	29.24	29.24
flask static press.(IN.HG)	1.50	1.90	-1.80	-0.60
flask abs. press...(IN.HG)	30.74	31.14	27.44	28.64
Volume gas sampled....(DSML)	1894	1962	1678	1765
Moisture content.....(%V/V)	18.07	18.07	18.07	18.07
Nitrate in gas sample...(JG)	525.0	575.0	500.0	495.0
NO2 in gas sample.....(JG)	389.5	426.6	371.0	367.3
NOx Concentration				
(GR/DSCF).....	0.0899	0.0950	0.0966	0.0909
(MG/DSCM).....	206	217	221	208
(PPM-DRY).....	108	114	116	109
(PPM-WET).....	88	93	95	89
NOX Emission rate....(LB/HR)	49.10	51.90	52.78	49.66

Test No. 4
No. 1205 Waste Gas Stack

Results of Oxides of Nitrogen (NOx) Determinations---------Method 7

	Run 3A	Run 3B	Run 3C	Run 3D
Date of run.....	01-11-95	01-11-95	01-11-95	01-11-95
Time of run.....(HRS)	1202	1214	1230	1242
Flask number.....	10	11	12	8
Volume of flask.....(ML)	2063	2062	2111	2088
Data: time of sampling				
flask temperature..(DEG-F)	69.00	70.00	70.00	69.00
bar. press.....(IN.HG)	29.02	29.02	29.02	29.02
flask vacuum.....(IN.HG)	26.40	26.30	26.30	26.30
flask abs. press...(IN.HG)	2.62	2.72	2.72	2.72
Data: *Time of Flask Opening*				
flask temperature..(DEG-F)	72.00	72.00	72.00	72.00
lab. bar. press....(IN.HG)	29.24	29.24	29.24	29.24
flask static press.(IN.HG)	-0.30	-0.50	0.10	0.10
flask abs. press...(IN.HG)	28.94	28.74	29.34	29.34
Volume gas sampled....(DSML)	1778	1757	1841	1820
Moisture content.....(%V/V)	18.92	18.92	18.92	18.92
Nitrate in gas sample...(JG)	595.0	565.0	530.0	520.0
NO2 in gas sample.....(JG)	441.5	419.2	393.2	385.8
NOx Concentration				
(GR/DSCF).....	0.1085	0.1043	0.0934	0.0926
(MG/DSCM).....	248	239	214	212
(PPM-DRY).....	130	125	112	111
(PPM-WET).....	105	101	91	90
NOX Emission rate....(LB/HR)	57.62	55.37	49.57	49.19

3.5 Results of Opacity Observations

Interpoll Labs Report No. 5-4664
Northshore Mining Company
Silver Bay, Minnesota

Test No. 1
Bin Storage

Results of Opacity Observations ---------- EPA Method 9*

Percent Opacity	Optical Density	Relative Frequency(%)
0	.0000	
5	.0223	
10	.0458	
15	.0706	
20	.0969	
25	.1249	
30	.1549	
35	.1871	
40	.2219	
45	.2596	
50	.3010	
55	.3468	
60	.3979	
65	.4559	
70	.5229	
75	.6021	
80	.6990	
85	.8239	
90	1.0000	
95	1.3010	
99	2.0000	

Observer: Jeff Scripter
Cert. Date: 10-9-94
Date of Observation: 1-10-95
Time of Observation: 0830-

* Could not read visible emissions due to poor weather conditions.

Test No. 7
No. 2 Boiler Stack

Results of Opacity Observations ---------- EPA Method 9*

Percent Opacity	Optical Density	Relative Frequency(%)
0	.0000	
5	.0223	
10	.0458	
15	.0706	
20	.0969	
25	.1249	
30	.1549	
35	.1871	
40	.2219	
45	.2596	
50	.3010	
55	.3468	
60	.3979	
65	.4559	
70	.5229	
75	.6021	
80	.6990	
85	.8239	
90	1.0000	
95	1.3010	
99	2.0000	

Observer: Jeff Scripter
Cert. Date: 10-9-94
Date of Observation: 1-12-95
Time of Observation: 0920-

* Visible emissions observations could not be performed due to poor weather conditions.

Test No. 9
Dry Cobber Stack

Results of Opacity Observations ---------- EPA Method 9*

Percent Opacity	Optical Density	Relative Frequency(%)
0	.0000	
5	.0223	
10	.0458	
15	.0706	
20	.0969	
25	.1249	
30	.1549	
35	.1871	
40	.2219	
45	.2596	
50	.3010	
55	.3468	
60	.3979	
65	.4559	
70	.5229	
75	.6021	
80	.6990	
85	.8239	
90	1.0000	
95	1.3010	
99	2.0000	

Observer: Jeff Scripter
Cert. Date: 10-9-94
Date of Observation: 1-13-95
Time of Observation: 0820-

* Visible emissions observations could not be performed due to poor weather conditions.

APPENDIX A

VOLUMETRIC FLOW RATE DETERMINATIONS

Test No. 1
Bin Storage Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	01-10-95
Time of Determination.....(HRS)	750
Barometric pressure.....(IN.HG)	29.46
Pitot tube coefficient.....	.84
Number of sampling ports.....	2
Total number of points.....	24
Shape of duct.....	Round
Stack diameter.....(IN)	39.5
Duct area.....(SQ.FT)	8.51
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.65
Avg. gas temp.....(DEG-F)	65
Moisture content.....(% V/V)	0.99
Avg. linear velocity.....(FT/SEC)	58.7
Gas density.....(LB/ACF)	.07377
Molecular weight.....(LB/LBMOLE)	28.84
Mass flow of gas.....(LB/HR)	132684
Volumetric flow rate.....	
actual.....(ACFM)	29976
dry standard.....(DSCFM)	29344

Test No. 3
No. 1104 Pelletizer Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	01-10-95
Time of Determination.....(HRS)	750
Barometric pressure.....(IN.HG)	29.38
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	24
Shape of duct.....	Round
Stack diameter.....(IN)	71
Duct area.....(SQ.FT)	27.49
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.14
Avg. gas temp.....(DEG-F)	126
Moisture content.....(% V/V)	15.00
Avg. linear velocity.....(FT/SEC)	56.7
Gas density.....(LB/ACF)	.06280
Molecular weight.....(LB/LBMOLE)	28.99
Mass flow of gas.....(LB/HR)	352711
Volumetric flow rate.....	
actual.....(ACFM)	93605
dry standard.....(DSCFM)	70367

Test No. 5
No. 1204 Waste Gas Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	01-11-95
Time of Determination.....(HRS)	745
Barometric pressure.....(IN.HG)	29.02
Pitot tube coefficient.....	.84
Number of sampling ports.....	4
Total number of points.....	24
Shape of duct.....	Round
Stack diameter.....(IN)	71.5
Duct area.....(SQ.FT)	27.88
Direction of flow.....	UP
Static pressure.....(IN.WC)	.26
Avg. gas temp.....(DEG-F)	136
Moisture content.....(% V/V)	18.06
Avg. linear velocity.....(FT/SEC)	55.1
Gas density.....(LB/ACF)	.06030
Molecular weight.....(LB/LBMOLE)	28.99
Mass flow of gas.....(LB/HR)	333598
Volumetric flow rate.....	
actual.....(ACFM)	92202
dry standard.....(DSCFM)	64958

Test No. 6
Rotoclone Stack

Results of Volumetric Flow Rate Determination-------Method 2

Date of Determination.....	01-12-95
Time of Determination.....(HRS)	810
Barometric pressure.....(IN.HG)	28.94
Pitot tube coefficient.....	.84
Number of sampling ports.....	2
Total number of points.....	20
Shape of duct.....	Round
Stack diameter.....(IN)	45.5
Duct area.....(SQ.FT)	11.29
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.82
Avg. gas temp.....(DEG-F)	143
Moisture content.....(% V/V)	6.11
Avg. linear velocity.....(FT/SEC)	63.2
Gas density.....(LB/ACF)	.06184
Molecular weight.....(LB/LBMOLE)	28.84
Mass flow of gas.....(LB/HR)	158912
Volumetric flow rate.....	
actual.....(ACFM)	42831
dry standard.....(DSCFM)	33987

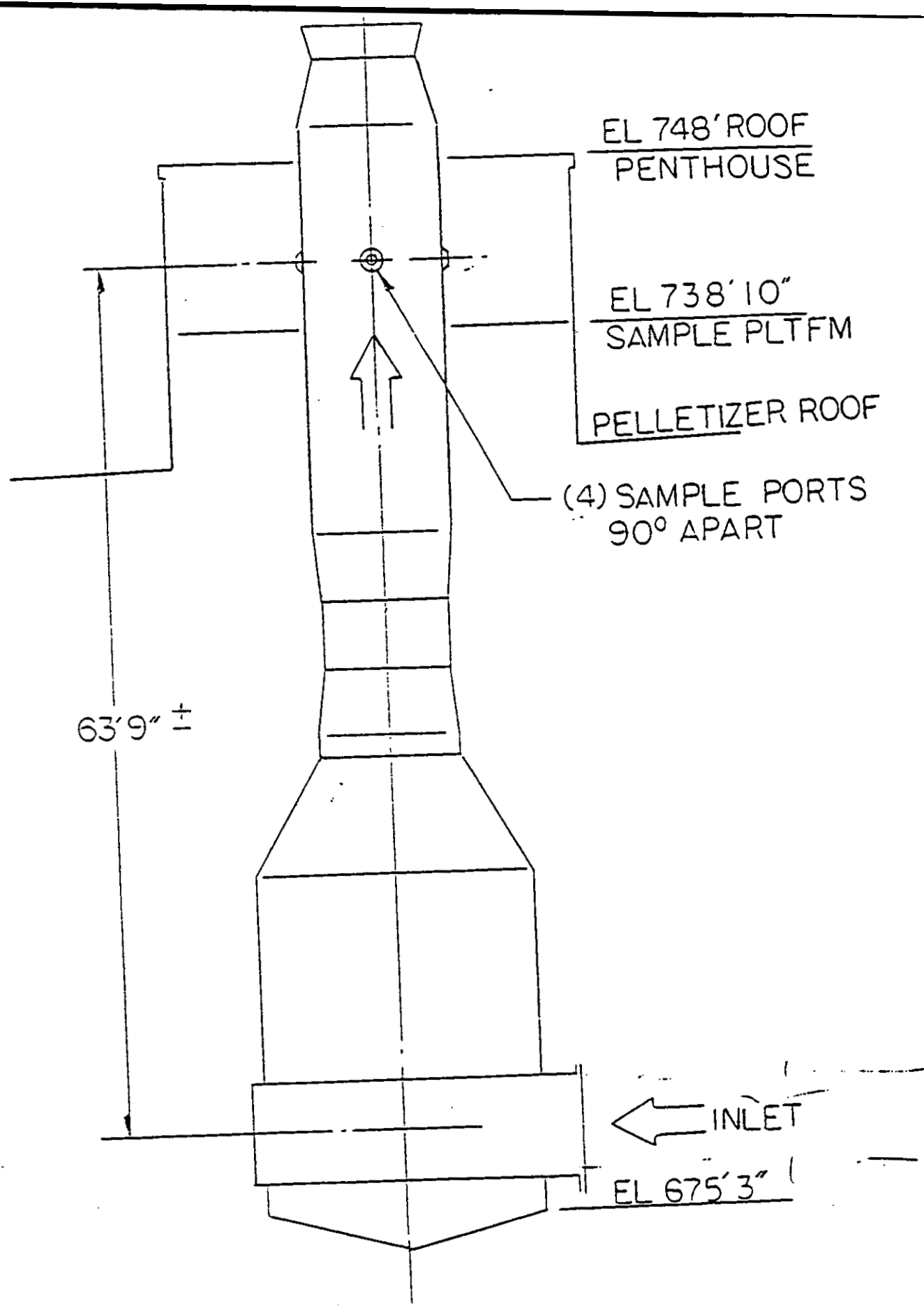
Test No. 8
Fine Crusher Stack

Results of Volumetric Flow Rate Determination-------Method 2

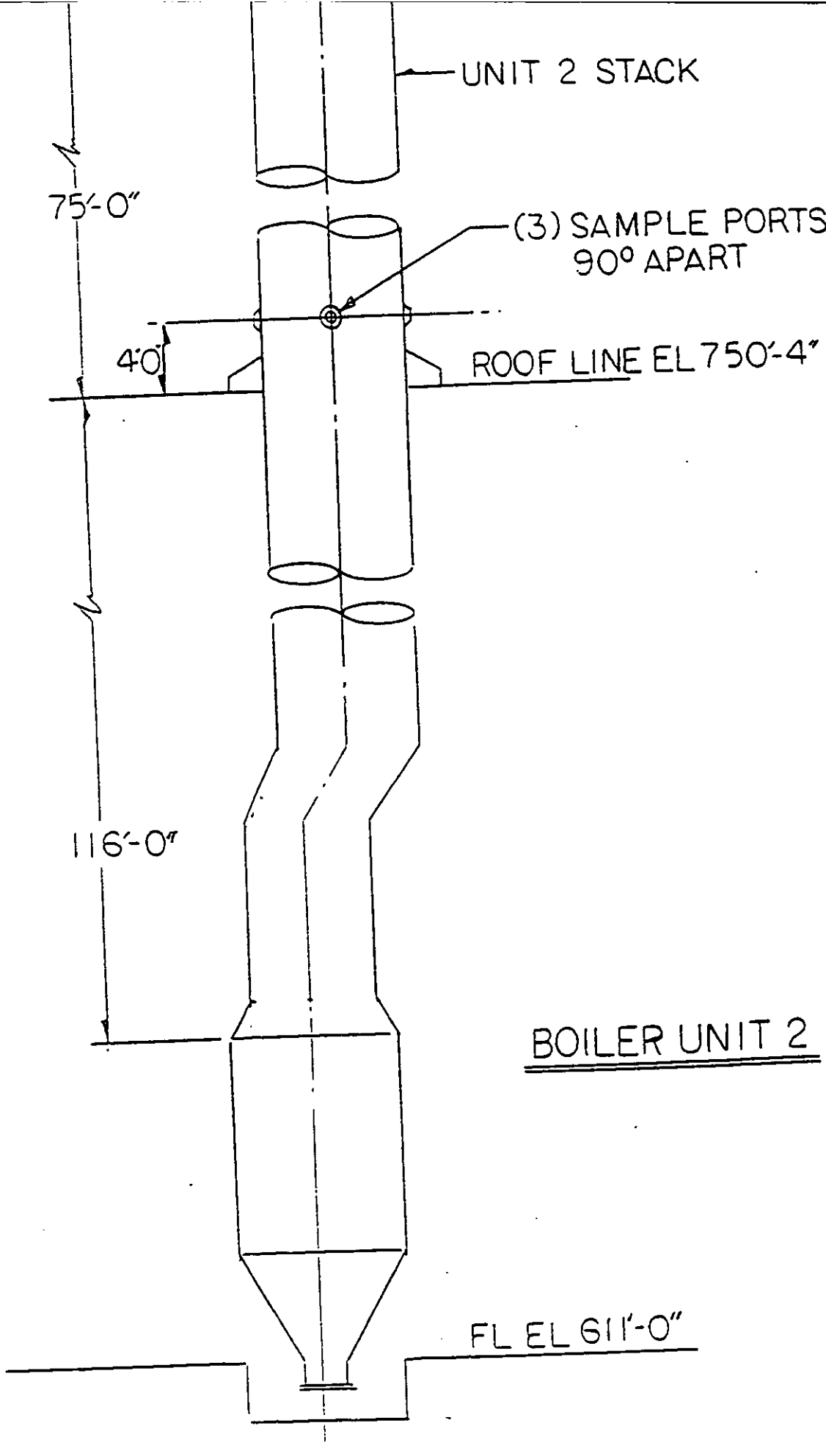
Date of Determination.....	01-13-95
Time of Determination.....(HRS)	750
Barometric pressure.....(IN.HG)	29.02
Pitot tube coefficient.....	.84
Number of sampling ports.....	2
Total number of points.....	12
Shape of duct.....	Round
Stack diameter.....(IN)	32.25
Duct area.....(SQ.FT)	5.67
Direction of flow.....	UP
Static pressure.....(IN.WC)	-.25
Avg. gas temp.....(DEG-F)	86
Moisture content.....(% V/V)	1.36
Avg. linear velocity.....(FT/SEC)	46.4
Gas density.....(LB/ACF)	.06985
Molecular weight.....(LB/LBMOLE)	28.84
Mass flow of gas.....(LB/HR)	66227
Volumetric flow rate.....	
actual.....(ACFM)	15803
dry standard.....(DSCFM)	14612

APPENDIX B

LOCATION OF TEST PORTS



WASTE GAS PRECIPITROL

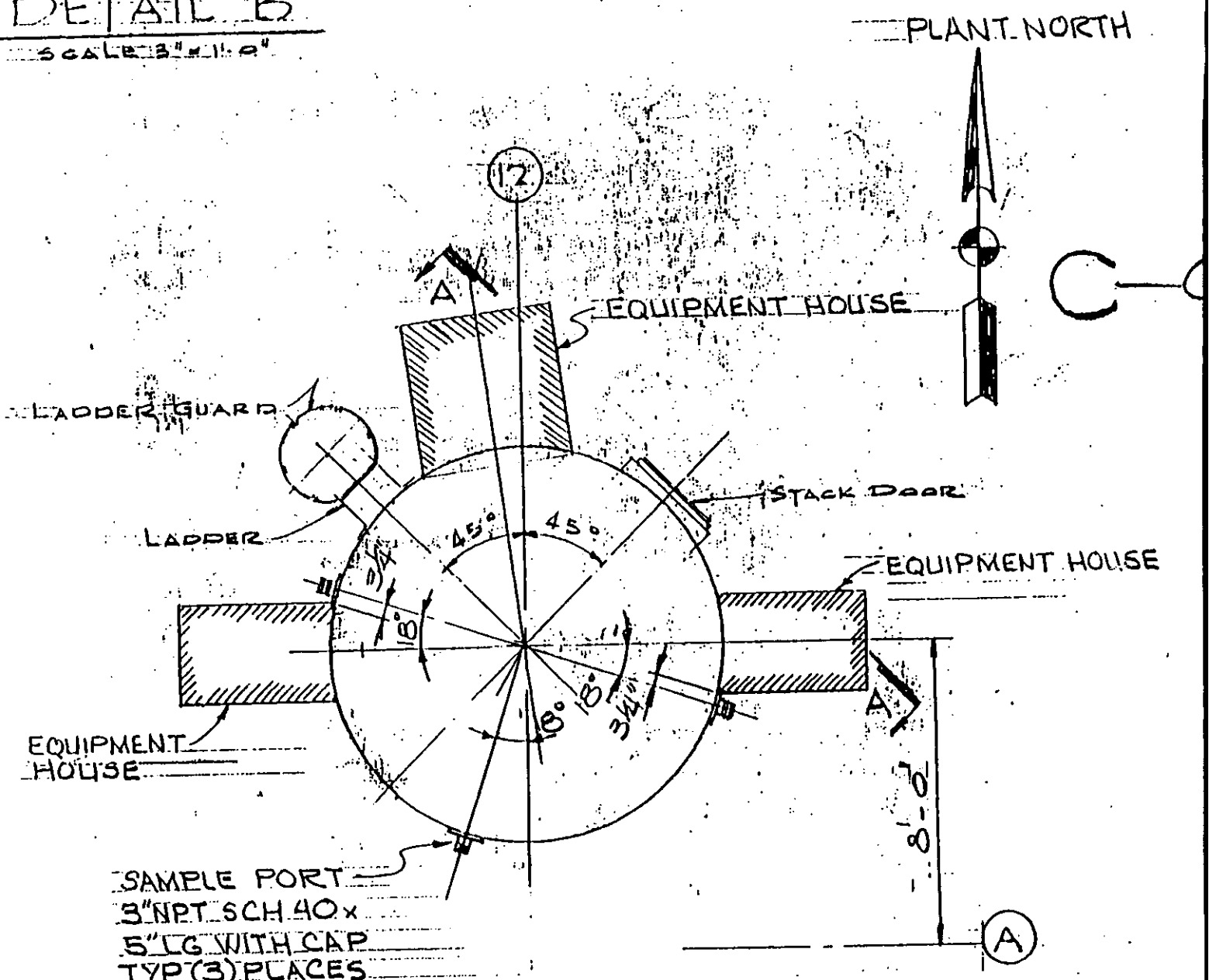

UNIT 2 STACK
75'-0"
(3) SAMPLE PORTS
90° APART
4'0"
ROOF LINE EL 750'-4"
116'-0"
BOILER UNIT 2
FL EL 611'-0"

0'-4"

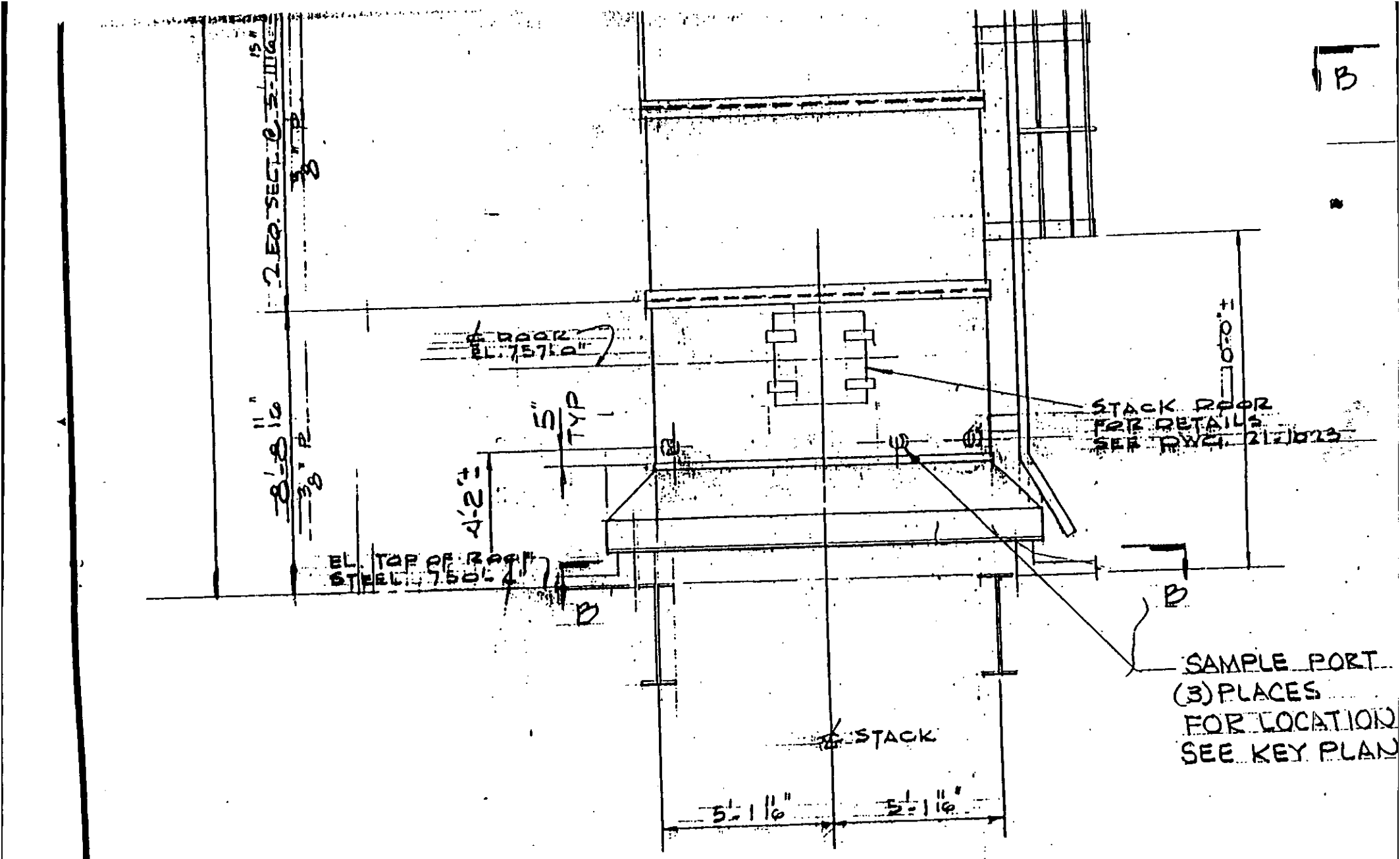
TYPICAL)
ASHER (TYP.)

DETAIL B

SCALE 3"=1'-0"



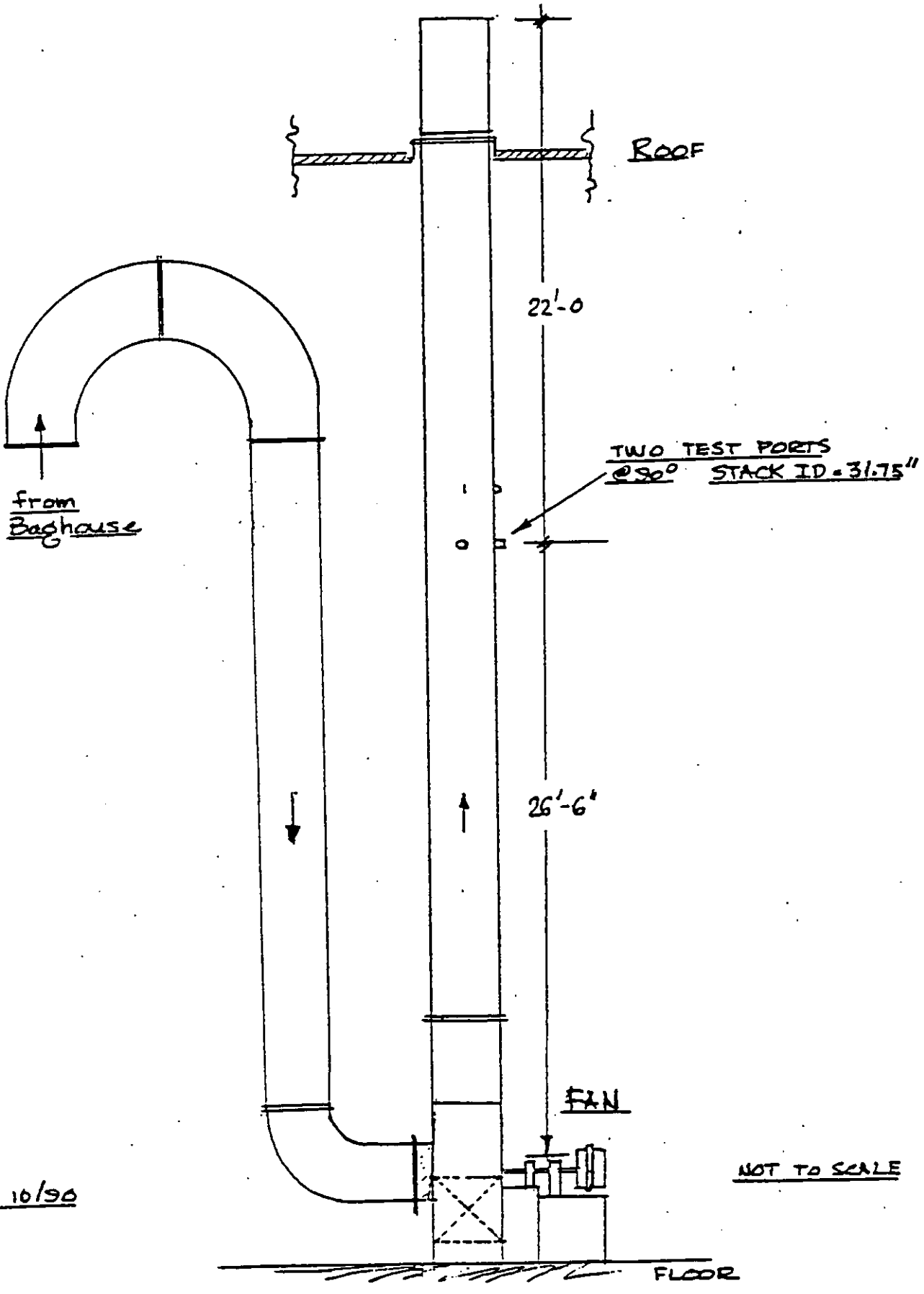
KEY PLAN



ELEVATION A-A

LOOKING SOUTHWEST (SEE KEY PLAN)

SCALE: 1/4" = 1'-0"


ROOF
22'-0
TWO TEST PORTS
@90° STACK ID = 31.75"
from
Baghouse
26'-6"
FAN
FLOOR
NOT TO SCALE
LP 10/90

APPENDIX C

FIELD DATA SHEETS

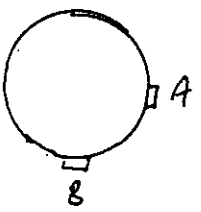
INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job NORTHSHORE MINING
Source 3:N STORAGE STACK
Test 1 Run 1 Date 1-10-95
Stack Dimen. 34 1/2 IN.
Dry Bulb ____ °F Wet bulb ____ °F
Manometer ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure 29.16 IN.HG
Static Pressure -.65 IN.WC
Operators E. TRAUBLDGE -
Pitot No. 37V-4 C_p .84

PM

Drawing of Test Site

Cross-section View	Elevation View
	

Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 4.5 IN.		Time Start: 0750 HRS	
A 1	.082	.83	5.33	1.10	
2	.067	2.65	7.15	1.20	
3	.118	4.66	9.16	1.20	
4	.177	6.94	11.47	1.20	
5	.250	9.88	14.55	1.20	
6	.356	14.06	18.56	1.15	65
7	.644	25.44	29.94	1.15	
8	.750	29.63	34.13	1.20	
9	.823	32.51	37.01	1.10	
10	.882	34.84	39.34	1.10	
11	.933	36.85	41.35	1.05	
12	.979	38.67	43.17	1.05	
B 1				1.90	
2				1.05	
3				1.10	
4				1.10	
5				1.10	
6				1.15	64
7				1.15	
8				1.10	
9				1.00	
10				1.90	
11				1.90	
12				1.75	

Temp. Meas. Device & S/N: DDT-34
Time End: 0805 HRS

R or nothing = reg. manometer; S = expanded; E = electronic

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job NORTHSTAR MINING Date 1-10-95 Test 1 Run 1
Source BIN STORAGE STACK No. of traverse points 24
Method 5 Filter holder: 4" GLASS Filter type: 4" GF

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☑
Post test: 0 cfm at — IN. HG (vac) ☑

Particulate Catch Data:

No. of filters used: 6756

Recovery solvent(s)
☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: ET

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1		100	
Impinger No. 2	200	100	0
Impinger No. 3		0	
Condenser			
Desiccant	1481	1473	8
Total			8

Integrated Gas Sampling Data:

Bag Pump No. _____ Box No. N/A Bag No. _____
Bag Material: 5-laver Aluminized Tedlar Size: 44 L
Pretest leak check: _____ cc/min at _____ IN.HG
Time start: _____ (HRS) Time end: _____ (HRS)
Sampling rate: _____ cc/min Operator: _____

S/N of O_2 Analyzer used to monitor train outlet: _____

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[redacted]

(612) 786-6020

EPA Method 5 Field Data Sheet

Job: NORTHSHORE MINING
Source: BIN STORAGE STACK
Date: 1-10-95 Test: 1 Run: 1

Operators: ET-JB-JS
Meter Box No.: 3 ΔH@ 1.75 in.WC
Gasmeter Coeff.: 1.0004

Nozzle No.: 3-3
Nozzle Dia.: .186 in.
Bar. Press.: 24.46 in.Hg

Pitot No.: 294-4
C_p: .84
H_2O: %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
[redacted]	0930	763.20	[redacted]	[redacted]	[redacted]	[redacted]	65			36	52	50	
A 12	2.5	764.70	.90	1.07	[illegible]	3.5	65				54	51	
11	5	766.30	1.00	1.17	6.20	3.5	65			36	57	51	
10	7.5	767.90	1.10	1.29	7.81	4.0	45				59	51	
9	10	769.50	1.10	1.31	9.43	4.0	60			36	59	51	
8	12.5	771.18	1.15	1.37	1.09	4.0	60				61	53	
7	15	772.83	1.15	1.38	2.75	4.0	56			36	64	54	
6	17.5	774.36	1.10	1.33	4.39	3.5	56				65	54	
5	20	776.04	1.12	1.35	6.05	4.0	58			37	66	55	
4	22.5	777.70	1.10	1.33	7.69	4.0	58				67	55	
3	25	779.32	1.10	1.33	9.33	4.0	57			37	67	55	
2	27.5	780.97	1.05	1.28	0.94	4.0	57				68	56	
1	30	782.40	.85	1.03	2.59	3.3	57			36	46	56	
B 12	32.5	783.72	.65	.79	3.66	2.5	58				68	57	
11	35	784.98	.70	.85	4.48	2.8	56			36	69	57	
10	37.5	786.40	.75	.91	4.35	3.0	56				70	57	
9	40	787.86	.85	1.04	7.81	3.5	56			35	70	58	
8	42.5	789.52	1.10	1.35	9.46	4.0	56				70	58	
7	45	791.24	1.15	1.41	1.16	4.3	56			35	71	58	
6	47.5	792.90	1.15	1.41	2.85	4.3	56				71	58	
5	50	794.60	1.10	1.35	4.52	4.0	56			35	71	58	
4	52.5	796.22	1.10	1.35	6.18	4.0	57				71	59	
3	55	797.85	1.10	1.35	7.85	4.0	57			35	71	59	
2	57.5	799.40	1.05	1.29	9.46	3.8	56				71	59	
1	60	801.03	.95	1.16	1.00	3.5							
	(0938)												
[redacted]	0 - 60	V_m - 37.83	[redacted]	ΔH - 1.23	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Avg. - 60.5		[redacted]

C-3

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job NORTHSHORE MINING Date 1-10-95 Test 1 Run 2
Source BIN STORAGE STACK No. of traverse points 24
Method 5 Filter holder: 4" GLASS Filter type: 4" GF

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at ✓ IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: 6755

Recovery solvent(s)
☒ Acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: ET

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1		100	
Impinger No. 2	200	100	0
Impinger No. 3		0	
Condenser			
Desiccant	1490	1480	10
Total			10

Integrated Gas Sampling Data:

N/A

Bag Pump No. _____ Box No. _____ Bag No. _____
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: _____ cc/min at _____ IN.HG
Time start: _____ (HRS) Time end: _____ (HRS)
Sampling rate: _____ cc/min Operator: _____

S/N of O_2 Analyzer used to monitor train outlet: _____

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(612) 786-6020

EPA Method 5 Field Data Sheet

Job NORTHSHORE MINING
Source BIN STORAGE STACK
Date 1-10-95 Test 1 Run 2

Operators ET-JB-TS
Meter Box No. 3 ΔH@ 1.73 in.WC
Gasmeter Coeff. 1.0004

Nozzle No. 3-3
Nozzle Dia. .186 in.
Bar. Press. 29.46 in.Hg

Pitot No. PV-4
C_p .84
H_2O 1 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	0958	801.30											
B 12	2.5	802.90	.95	1.16	2.83	4.0	57			35	62	57	
11	5	804.50	1.10	1.34	4.48	4.5	57				64	57	
10	7.5	806.19	1.10	1.34	6.13	4.5	57			35	65	57	
9	10	807.84	1.10	1.34	7.78	4.5	57				66	58	
8	12.5	809.55	1.12	1.37	9.45	4.5	57			36	67	58	
7	15	811.20	1.10	1.35	1.11	4.5	57				68	58	
6	17.5	812.90	1.15	1.41	2.80	4.6	57			36	69	59	
5	20	814.50	1.05	1.29	4.43	4.5	57				69	59	
4	22.5	816.10	1.05	1.29	6.06	4.3	57			36	70	59	
3	25	817.74	1.05	1.29	7.68	4.3	57				71	59	
2	27.5	819.30	1.05	1.30	9.31	4.3	57			36	71	59	
1	30	820.90	1.00	1.24	0.91	4.0	56				71	60	
A 12	32.5	822.40	.90	1.11	2.42	4.0	57			45	71	60	
11	35	824.07	1.10	1.36	4.05	4.5	57				72	60	
10	37.5	825.72	1.10	1.36	5.76	4.5	57			49	72	61	
9	40	827.38	1.12	1.39	7.44	4.7	57				72	61	
8	42.5	829.08	1.12	1.39	9.13	4.7	57			50	73	61	
7	45	830.80	1.10	1.37	0.81	4.7	56				72	61	
6	47.5	832.50	1.10	1.36	2.48	4.7	56			√0	73	62	
5	50	434.30	1.20	1.49	4.23	4.4	56				73	62	
4	52.5	835.99	1.15	1.43	5.94	4.8	√6			√0	73	62	
3	55	837.70	1.10	1.37	7.62	4.7	56				73	62	
2	57.5	439.40	1.15	1.43	9.34	4.8	56			50	73	62	
1	60	840.90	.90	1.12	0.85	4.0	57				73	62	
	(1102)												
	θ - 60	V_m - 39.60		ΔH - 1.33							Avg. 64.9		

C-5

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job NORTHSHORE MINING Date 1-10-95 Test 1 Run 3
Source BIN STORAGE STACK No. of traverse points 24
Method 5 Filter holder: 4"GLASS Filter type: 4"GF

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at 5 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: 0759

Recovery solvent(s)
☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: ET

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1		100	
Impinger No. 2	700	100	0
Impinger No. 3		0	
Condenser			
Desiccant	1459	1451	8
Total			8

Integrated Gas Sampling Data:

Bag Pump No. _____ Box No. N/A Bag No. _____
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: _____ cc/min at _____ IN.HG
Time start: _____ (HRS) Time end: _____ (HRS)
Sampling rate: _____ cc/min Operator: _____

S/N of O_2 Analyzer used to monitor train outlet: _____

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(612) 786-6020

EPA Method 5 Field Data Sheet

Job: NORTHSHORE MINING | Operators: ET - TS - JB | Nozzle No.: 3 - 3 | Pitot No.: 29P-4
Source: B.N STOCKPILE STACK | Meter Box No.: 3 ΔH@ 1.73 in.WC | Nozzle Dia.: .186 in. | C_p: .840
Date: 1-10-95 Test: 1 Run: 5 | Gasmeter Coeff.: 1.0004 | Bar. Press.: 29.46 in.Hg | H_2O: %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F)						Oxygen (% v/v)
							Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	
	1116	841.10											
A 12	2.5	842.78	1.05	1.29	2.72	4.1	56			33	62	59	
11	5	844.46	1.05	1.28	4.34	4.1	56				64	59	
10	7.5	846.08	1.10	1.35	6.00	4.2	54			34	65	59	
9	10	847.70	1.10	1.35	7.66	4.2	54				67	59	
8	12.5	849.41	1.12	1.38	9.33	4.3	56			34	67	60	
7	15	851.10	1.20	1.47	1.07	4.8	56				68	60	
6	17.5	852.80	1.15	1.41	2.77	4.7	56			34	69	60	
5	20	854.58	1.20	1.48	4.50	4.8	56				69	61	
4	22.5	856.27	1.20	1.48	6.25	4.8	55			34	70	61	
3	25	857.95	1.10	1.36	7.91	4.7	55				70	61	
2	27.5	859.40	1.10	1.36	9.58	4.7	55			35	71	61	
1	30	861.10	.85	1.05	1.05	3.5	55				71	62	
B 12	32.5	862.70	1.05	1.30	2.69	4.3	55			35	72	62	
11	35	864.40	1.10	1.36	4.36	4.4	55				74	63	
10	37.5	866.09	1.10	1.36	6.04	4.4	56			34	75	63	
9	40	867.78	1.15	1.43	2.76	4.5	56				75	64	
8	42.5	869.43	1.10	1.37	4.44	4.4	55			35	75	64	
7	45	871.07	1.10	1.37	1.12	4.4	54				75	64	
6	47.5	872.74	1.05	1.31	2.77	4.3	54			35	75	64	
5	50	874.40	1.05	1.31	4.41	4.3	54				76	64	
4	52.5	876.05	1.10	1.37	6.10	4.4	54			35	76	64	
3	55	877.70	1.05	1.31	7.74	4.3	56				75	65	
2	57.5	879.35	1.05	1.31	9.38	4.3	56			35	75	65	
1	60	880.90	.85	1.06	0.86		55				75	65	
	(1220)												
	θ - 60	V_m - 59.80		ΔH 1.34							Avg. - 66		

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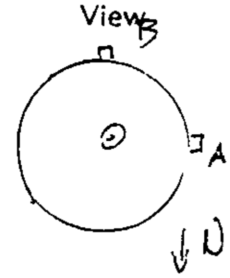
INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Drawing of Test Site

Cross-section View	Elevation View
	

Job Corus North Shore
Source No 405 Billet... Stack
Test 2 Run __ Date 1/1/95
Stack Dimen. 71 IN.
Dry Bulb ____ °F Wet bulb ____ °F
Manometer ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure 29.38 IN.HG
Static Pressure -.22 IN.WC
Operators D. VanHoever + E.T. Franzen
Pitot No. 1/26-6 C_p .84
PM

Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 5	IN.	Time Start:	HRS
A 1	.021	1.49	6.49		
2	.067	4.76	9.76		
3	.118	8.34	13.34		
4	.177	12.56	17.56		
5	.25	17.75	22.75		
6	.356	25.27	30.27		
7	.644	45.72	50.72		
8	.75	53.25	58.25		
9	.823	58.43	63.43		
10	.882	62.62	67.62		
11	.939	66.67	71.67		
12	.979	69.5	74.5		
B 1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
Temp. Meas. Device & S/N:		PDT # 8 + 35		Time End:	HRS

R or nothing = reg. manometer; S = expanded; E = electronic

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job North Shore Date 11/10/95 Test 2 Run 1
Source No. 1105 Pelletizer Stack No. of traverse points 24
Method 5 Filter holder: glass Filter type: glass fiber

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at 5 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: 7067

Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: DLH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	367	200	167
Impinger No. 3			
Condenser			
Desiccant	1358	1334	24
Total			191

Integrated Gas Sampling Data:

Bag Pump No. 36A Box No. 13 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 14 IN.HG
Time start: 0830 (HRS) Time end: 0932 (HRS)
Sampling rate: 400 cc/min Operator: DLH

S/N of O_2 Analyzer used to monitor train outlet: 36A

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: Cyprus North Shore
Source: No 1105 Pellet Izer Stack
Date: 1/10/95 Test 2 Run 1

Operators: Dud + T.F
Meter Box No. 15 ΔH@ 1.85 in.WC
Gasmeter Coeff. 1.0015

Nozzle No. 1-4
Nozzle Dia. .247 in.
Bar. Press. 29.38 in.Hg

Pitot No. 138-6
C_p .84
H_2O 13 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	0527	813.90											
B 12	2.5	816.30	1.05	3.05	6.3	6	135	269	270	40	71	70	18.3
11	5	818.67	.97	2.84	8.64	6	131				75	69	18.5
10	7.5	820.85	1.00	2.93	1.01	6	130				76	69	18.5
9	10	823.31	1.00	2.95	3.40	6	131	263	253	40	81	71	18.7
8	12.5	825.54	.96	2.84	5.74	6	131				83	71	19.0
7	15	827.91	.95	2.83	8.08	6	125				85	71	19.3
6	17.5	830.31	.97	2.90	0.46	6	126	261	257	41	86	72	18.5
5	20	832.58	.92	2.46	2.65	5	126				87	73	18.4
4	22.5	834.85	.77	2.32	4.78	5	125				89	73	18.8
3	25	836.54	.55	1.66	6.58	5	125	260	256	41	89	73	18.5
2	27.5	838.43	.50	1.51	8.30	5	125				90	74	18.5
1	30	839.99	.48	1.45	9.97	5	125				90	75	18.5
#12	32.5	841.95	.60	1.82	1.88	5	125	263	257	48	86	75	18.5
11	35	844.26	.79	2.37	4.03	5	127				91	76	18.7
10	37.5	846.40	.72	2.17	6.34	6	128				93	76	18.5
9	40	848.70	.96	2.89	8.75	6	130	260	254	48	94	77	18.5
8	42.5	851.11	.96	2.89	1.11	6	130				94	77	18.7
7	45	853.45	.97	2.92	3.54	6	130				95	78	18.7
6	47.5	855.95	.94	2.84	5.90	6	130	259	256	48	95	78	18.7
5	50	858.30	.85	2.58	8.29	6	127				96	78	18.7
4	52.5	860.80	.96	2.92	0.67	6	127				96	79	18.5
3	55	863.17	.95	2.89	3.08	6	127	257	258	47	97	79	18.7
2	57.5	865.43	.93	2.81	5.43	6	131				97	80	
1	60	867.50	.77	2.33	7.57	5	131				97	80	
	1032												
	θ = 60	V_m = 53.60		ΔH = 2.59							Avg. = 81.8		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job North Shore Date 1/10/95 Test 2 Run 2
Source A.D. 1105 Pellet Mill Stack No. of traverse points 24's
Method 5 Filter holder: Glass Filter type: Glass fiber

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at 8 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: 7068

Recovery solvent(s)
☒ Acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: D.H

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	390	3700	190
Impinger No. 3			
Condenser			
Desiccant	1324	1305	19
Total			209

Integrated Gas Sampling Data:

Bag Pump No. 36A Box No. 13 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 15 IN.HG
Time start: 1005 (HRS) Time end: 1152 (HRS)
Sampling rate: 700 cc/min Operator: D.H

S/N of O_2 Analyzer used to monitor train outlet: 36A

052394-G:\STACK\WP\FORMS\S-0046RR

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: North Shore
Source: NC 105 Pelletizer Stack
Date: 1/10/95 Test: 2 Run: 2

Operators: D.H. & T.F.
Meter Box No.: 15 ΔH@ 1.85 in.WC
Gasmeter Coeff.: 1.0015

Nozzle No.: 7-4
Nozzle Dia.: .247 in.
Bar. Press.: 29.38 in.Hg

Pitot No.: VBC-6
C_p: .84
H_2O: 14.5 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1003	867.71											
A 12	2.5	869.26	.68	1.99	9.68	4	127	263	270	43	82	79	18.5
11	5	871.51	.76	2.21	1.76	4	130				84	79	19.0
10	7.5	874.86	.96	2.79	4.10	5	130				78	77	19.2
9	10	876.25	1.10	3.17	6.58	6	130	261	266	48	85	77	19.2
8	12.5	879.65	1.10	3.19	9.07	6	130				88	78	19.2
7	15	881.31	1.10	3.21	1.58	6	130				89	78	19.2
6	17.5	883.65	1.0	2.92	3.97	6	130	260	267	48	90	78	19.3
5	20	886.00	.97	2.84	6.33	6	128				91	78	19.5
4	22.5	888.35	.98	2.88	8.71	6	128				91	78	19.3
3	25	890.70	.97	2.84	1.07	6	130	260	266	48	92	78	19.3
2	27.5	893.00	.83	2.42	3.25	5	133				92	79	19.3
1	30	894.88	.62	1.81	5.14	4	133				93	78	19.4
B 12	32.5	897.24	.97	2.83	7.50	5	133	263	263	49	89	79	19.4
11	35	899.39	1.0	2.94	9.90	6	127				93	79	19.3
10	37.5	901.90	1.10	3.23	2.43	7	125				94	79	19.4
9	40	904.25	1.0	2.94	4.84	6	128	265	260	47	95	79	19.1
8	42.5	906.71	1.0	2.95	7.25	6	128				95	80	19.2
7	45	909.16	1.0	2.95	9.67	6	127				95	80	19.2
6	47.5	911.65	.94	2.78	2.01	6	127	260	252	43	95	80	19.5
5	50	914.00	.97	2.87	4.39	6	126				95	80	19.5
4	52.5	916.45	.97	2.87	6.77	6	126				96	80	19.5
3	55	918.85	.95	2.82	9.19	6	126	256	255	44	96	80	19.4
2	57.5	921.09	.75	2.22	1.23	5	126				96	80	19.5
1	60	922.63	.47	1.40	2.40	3	126				96	80	19.5
	1152												
	θ - 60	V_m - 54.92		ΔFT - 2.7							Avg. - 85		

leak check probe [illegible] change probe [illegible] (-.14) 883.15

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[redacted]0811[redacted]STAC[redacted]AFO[redacted]518

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job North Shore Date 1/10/95 Test 2 Run 3
Source No 1105 Pellitizer Stack No. of traverse points 24
Method 5 Filter holder: glass Filter type: glass fiber

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☑
Post test: 0 cfm at 8 IN. HG (vac) ☐

Particulate Catch Data:

No. of filters used: Recovery solvent(s)

☑ acetone 1
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: D.A.

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	380	200	180
Impinger No. 3			
Condenser			
Desiccant	1356	1324	32
Total			202

Integrated Gas Sampling Data:

Bag Pump No. 36A Box No. 13 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 1f IN.HG
Time start: 1230 (HRS) Time end: 1327 (HRS)
Sampling rate: 400 cc/min Operator: RH

S/N of O_2 Analyzer used to monitor train outlet: 36A

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job North Shore
Source No 1105 Pelletizer Stack
Date 1/10/95 Test 2 Run 3

Operators David T, F
Meter Box No. 15 ΔH@ 1.85 in.WC
Gasmeter Coeff. 1.0015

Nozzle No. 7-4
Nozzle Dia. .247 in.
Bar. Press. 24.38 in.Hg

Pitot No. V36-6
C_p .84
H_2O 14.5 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
[redacted]	1226	923.41	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
12	2.5	925.60	.82	2.50	5.58	5	128				82	82	18.5
11	5	927.64	.82	2.40	7.75	5	127	246	240	37	84	79	19.0
10	7.5	929.84	.93	2.72	C.16	6	126				85	79	19.1
9	10	932.15	.98	2.87	2.43	6	127				87	79	19.4
8	12.5	934.44	.96	2.82	4.78	6	126	228	255	38	88	80	19.2
7	15	937.00	.95	2.79	7.12	6	126				89	80	19.2
6	17.5	939.17	.95	2.80	9.47	6	126				89	79	19.3
5	20	941.61	.92	2.71	1.77	6	126	237	256	39	90	79	19.4
4	22.5	943.80	.95	2.78	4.10	6	125				90	79	19.4
3	25	946.11	.90	2.66	6.39	6	125				90	79	19.4
2	27.5	Dup [redacted]948.44	.74	2.18	8.46	6	126	240	251	40	91	79	19.4
1	30	950.31	.61	1.80	0.34	4	126				91	80	19.4
A-12	32.5	952.36	.70	2.07	2.36	5	126				90	80	19.4
11	35	954.43	.76	2.23	4.46	5	130	246	253	41	94	81	19.3
10	37.5	956.71	.91	2.66	6.75	6	138				95	81	19.3
9	40	959.13	.77	2.84	9.12	6	133				96	81	19.3
8	42.5	961.40	.96	2.81	1.48	6	133	253	257	39	96	81	19.4
7	45	963.73	.96	2.81	3.87	6	133				97	81	19.5
6	47.5	966.10	.92	2.72	6.17	6	129				97	82	19.5
5	50	968.39	.94	2.77	8.51	6	131				97	82	19.6
4	52.5	970.74	.94	2.77	0.85	6	131	270	272	40	97	84	19.6
3	55	973.05	.94	2.77	3.20	6	132				97	83	19.6
2	57.5	975.06	.59	1.75		5	127				96	81	19.6
1	60	976.72	.40	1.19	6.61	4	127				97	81	
	(13.27)												
[redacted]	θ 60	V_m = 53.31	[redacted]	ΔH 2.5	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Avg. = 86		[redacted]

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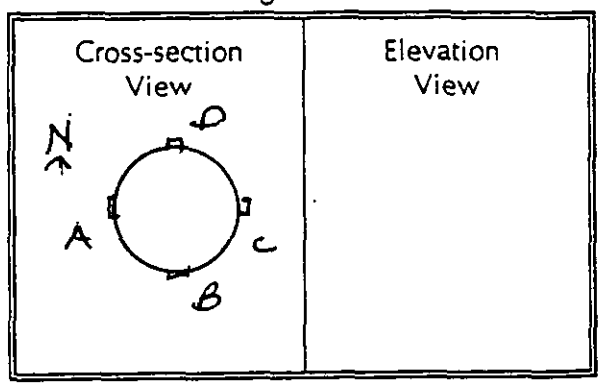
[redacted]0811[redacted]STA[redacted]WP\FOR[redacted]518

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: CYPRUS SILVER BAY
Source: 1104 PELLITIZER STACK
Test: 3 Run Date: 1-10-95
Stack Dimen.: 71 IN.
Drv Bulb: °F Wet bulb: °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.38 IN.HG
Static Pressure: -.14 IN.WC
Operators: GH SP
Pitot No.: 24V2.5 C_p .89
Pm

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length:	IN. 5	Time Start: 0750	HRS
A 1	.021	1.49	6.49	.42	126
2	.067	4.76	9.76	.59	
3	.118	8.38	13.38	.82	
4	.177	12.57	17.57	.95	
5	.250	17.75	22.75	1.2	
6	.356	25.28	30.25	1.2	
B 1				45	127
2				.86	
3				1.2	
4				1.2	
5				1.2	
6				1.3	126
C 1				68	
2				.80	
3				.85	
4				1.2	
5				1.1	
6				1.1	
D 1				.49	126
2				.51	
3				.82	
4				.72	
5				.72	
6				.70	
Temp. Meas. Device & S/N:				0800 Time End:	HRS

R or nothing = reg. manometer; S = expanded; E = electronic

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRUS SILVER BAY Date 1-10-94 Test 3 Run 1
Source 1104 PELLITIZER STACK No. of traverse points 24
Method ____ Filter holder: GLASS Filter type: 4" GF

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .00 cfm at 10 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: 7048

Recovery solvent(s)
☐ acetone ____
☐ other(s) ____

No. of probe wash bottles: 1
Sample recovered by: CH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	670	498	172
Condenser			
Desiccant	1370	1350	20
Total			192

Integrated Gas Sampling Data:

Bag Pump No. 36B Box No. 22 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 33 IN.HG
Time start: 0830 (HRS) Time end: 0935 (HRS)
Sampling rate: 400 cc/min Operator: CH

S/N of O_2 Analyzer used to monitor train outlet: 36B

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(612) 786-6020

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EPA Method 5 Field Data Sheet

Job: CYPRUS SILVER BAY
Source: 1104 PELLITIZER STACK
Date: 1-10-95 Test 3 Run 1

Operators: GH SF
Meter Box No.: 17 ΔH@ 1.73 in.WC
Gasmeter Coeff.: .9932

Nozzle No.: .350
Nozzle Dia.: 1-4/ in.
Bar. Press.: 29.38 in.Hg

Pitot No.: 24 J 4
C_p: .84
H_2O: 15 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	0830	932800											
A 6	2.5	935.43	1.2	3.30	5.42	6	126	239	260	39	70	70	17.2
5	5	938.04	1.2	3.30	8.04	6	128				72	70	17.3
4	7.5	940.49	1.0	2.75	0.45	5	129				73	70	17.3
3	10	942.73	.88	2.43	2.70	5	129	240	261	41	74	70	17.2
2	12.5	944.56	.60	1.62	4.57	5	132				78	71	17.0
1	15	946.29	.49	1.35	6.26	5	132				78	72	17.2
B 6	17.5	948.86	1.2	3.31	8.91	7	132	246	263	42	79	72	17.1
5	20	951.49	1.3	3.59	1.66	7	132				80	72	17.4
4	22.5	954.31	1.2	3.31	4.30	7	132				85	73	17.4
3	25	956.65	1.0	2.77	6.73	6	132	249	251	44	85	73	17.4
2	27.5	958.99	.85	2.36	8.98	6	132				85	73	17.3
1	30	960.54	.44	1.22	0.60	6	132				86	73	17.4
C 6	32.5	963.17	1.1	3.06	3.15	6	132	251	260	45	86	73	17.4
5	35	965.59	1.1	3.04	5.70	6	132				86	74	17.4
4	37.5	968.10	1.0	2.79	8.14	6	131				87	74	17.4
3	40	970.39	.89	2.48	0.44	6	133	253	264	41	87	74	17.4
2	42.5	972.40	.65	1.81	2.41	5	133				87	75	17.4
1	45	974.05	.45	1.26	4.05	5	133				89	75	17.5
D 6	47.5	976.21	.79	2.21	6.22	5	133	254	266	42	89	75	17.5
5	50	978.19	.70	1.96	8.27	5	133				89	75	17.5
4	52.5	980.30	.69	1.93	0.30	5	133				90	75	17.5
3	55	982.44	.75	2.10	2.43	5	132	255	267	43	90	76	17.6
2	57.5	984.31	.64	1.79	4.31	5	133				90	76	17.6
1	60	986.12	.52	1.46	6.14	5	133	257	268	44	90	76	17.6
	0935												
	θ = 60	V_m = 53.32		ΔH = 2.39							Avg. =	73.4	

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRUS SILVER BAY Date 1-10-95 Test 3 Run 2
Source 1104 PELLITIZER STACK No. of traverse points 24
Method ____ Filter holder: GLASS Filter type: 4" GF

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .00 cfm at 10 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: ____

Recovery solvent(s)

☒acetone ____
☐other(s) ____

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	684	498	186
Condenser			
Desiccant	1362	1346	16
Total			202

Integrated Gas Sampling Data:

Bag Pump No. 368 Box No. 22 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 23 IN.HG
Time start: 1005 (HRS) Time end: 1155 (HRS)
Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 368

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INTERPOLE LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job CYPRUS SILVER BAY
Source 1104 PELLITIZER STACK
Date 1-10-95 Test 3 Run 2

Operators BH SF
Meter Box No. 17 ΔH@ 1.73 in.WC
Gasmeter Coeff. .9932

Nozzle No. .250
Nozzle Dia. 1-4 in.
Bar. Press. 29.38 in.Hg

Pitot No. 24 V 25
C_p .84
H_2O 15 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1005	986.40		2.00 ΔH									
D 6	25	988.45	.72	2.05	8.40	5	133	262	249	39	80	75	17.4
5	5	990.03	.74	2.06	0.55	5	130				81	75	17.4
4	75	992.58	.72	2.01	2.62	5	130				82	75	17.4
3	10	994.60	.70	1.95	4.66	5	131	263	251	40	83	75	17.3
2	12.5	996.61	.65	1.82	6.63	5	131				81	76	17.3
1	15	998.45	.55	1.53	8.47	5	131				82	76	17.4
C 6	17.5	1000.98	1.1	3.06	0.99	7	131	264	255	42	82	76	17.6
5	20	1003.61	1.2	3.34	3.65	7	131				87	76	17.5
4	22.5	1006.10	1.0	2.80	6.10	7	130	26			88	77	17.5
3	25	1008.40	.88	2.47	8.40	7	130	266	254	43	89	77	17.5
2	27.5	1010.41	.69	1.93	0.44	5	132				89	76	17.6
1	30	1012.15	.49	1.37	2.15	5	132				90	76	17.5
B 6	32.5	1014.79	1.2	3.36	4.83	7	132	267	259	44	89	77	17.5
5	35	1017.55	1.2	3.36	7.52	7	131				90	77	17.9
4	37.5	1019.97	1.0	2.81	9.97	7	131				90	77	17.5
3	40	1022.42	1.0	2.80	2.42	7	132	266	255	40	91	78	17.5
2	42.5	1024.79	.89	2.50	4.79	7	132				91	77	17.5
1	45	1026.47	.49	1.39	6.47	7	132				91	77	17.4
A 6	47.5	1029.15	1.2	3.36	9.15	8	132	267	256	41	91	77	17.3
5	50	1031.94	1.2	3.36	1.84	8	132				92	78	17.5
4	52.5	1034.28	1.0	2.81	4.29	8	132				92	78	17.7
3	55	1036.66	.92	2.58	6.65	8	133	269	258	42	92	78	17.7
2	57.5	1038.69	.66	1.85	8.65	7 8	133				92	78	17.7
1	60	1040.31	.45	1.24	0.31	7 8	133				92	78	17.7
	(1155)												
	θ - 60	V_m - 53.94		2.41 ΔH -							Avg. -	82.2	

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRUS SILVER BAY Date 12-10-95 Test 3 Run 3
Source 1104 PELLITIZER STACK No. of traverse points 24
Method _____ Filter holder: GLASS Filter type: 4" GF

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .00 cfm at 10 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used:

_____
7110

Recovery solvent(s)

☒acetone _____
☐other(s) _____

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	672	492	180
Condenser			
Desiccant	1385	1370	15
Total			195

Integrated Gas Sampling Data:

Bag Pump No. 36B Box No. 22 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 23 IN.HG
Time start: 400 (HRS) Time end: _____ (HRS)
Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 36B

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[redacted]

(612) 786-6020

EPA Method 5 Field Data Sheet

Job CYPRUS SILVER BAY
Source 1104 PELLITIZER
Date 1-10-95 Test 3 Run 3

Operators CH SP
Meter Box No. 17 ΔH@ 1.73 in.WC
Gasmeter Coeff. .9932

Nozzle No. 1-4
Nozzle Dia. .256 in.
Bar. Press. 29.38 in.Hg

Pitot No. 24 V2.5
C_p .84
H_2O 15 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
[redacted]	(1226)	40.600	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
A 6	2.5	43.16	1.1	308	3.16	7	130	246	251	39	80	77	17.3
5	5	45.72	1.1	5.71	3.06	7	131				86	77	17.3
4	7.5	48.19	1.0	2.83	2.17	7	125				86	77	17.3
3	10	50.59	.95	2.68	0.56	5	127	261	263	49	89	77	17.4
2	12.5	52.61	.60	1.70	2.47	5	127				90	77	17.5
1	15	54.13	.45	1.27	4.13	5	128				91	77	17.4
B 6	17.5	56.85	1.2	338	6.82	7	129	263	265	49	91	77	17.4
5	20	59.69	1.3	3.66	9.62	7	129				91	77	17.5
4	22.5	62.11	1.0	2.81	2.08	7	130				91	77	17.4
3	25	64.49	.96	2.70	4.48	7	130	264	269	51	91	78	17.5
2	27.5	66.78	.87	2.36	6.74	5	132				92	78	17.5
1	30	68.49	.50	1.41	8.48	5	133				92	78	17.5
C 6	32.5	71.89	1.1	3.08	1.80	7	133	266	271	55	91	78	17.4
5	35	73.51	1.0	2.80	3.51	7	133				92	78	17.4
4	37.5	75.96	1.0	2.81	5.94	7	133				92	78	17.4
3	40	78.42	1.0	2.81	8.43	7	131	261	269	51	92	78	17.5
2	42.5	80.77	.90	2.53	0.76	7	133				92	78	17.5
1	45	82.84	.70	1.97	2.82	7	133				92	78	17.6
D 6	47.5	87.91	.75	2.11	4.95	7	132	262	271	52	92	78	17.6
5	50	87.02	.70	1.97	7.01	7	132				92	78	17.6
4	52.5	89.18	.74	2.09	9.13	5	131				93	78	17.6
3	55	91.21	.70	1.91	1.20	5	131	264	264	55	93	78	17.5
2	57.5	93.06	.57	1.61	3.06	5	131				93	78	17.4
1	60	94.85	.45	1.27	4.72	5	131				93	78	17.5
	(1330)												
[redacted]	θ =	V_m = 54.25	[redacted]	8.41 ΔH	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Avg. = 84.1		[redacted]

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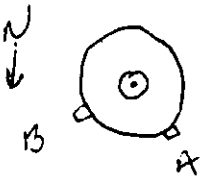
INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: Cyprus Northshore
Source: NB Dock Washings
Test: 4 Run Date: 1/11/95
Stack Dimen.: 71.5 IN.
Dry Bulb: °F Wet bulb: °F
Manometer: ☑ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.02 IN.HG
Static Pressure: -.03 IN.WC
Operators: J.S Dirt TF
Pitot No.: 123-10 C_p .84
PM/SO_2/NO_x

Drawing of Test Site

Cross-section View	Elevation View
	

Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 45 IN.		Time Start:	HRS
A 1	.021	1.50	6.0		
2	.067	4.79	9.29		
3	.118	8.44	12.93		
4	.177	12.66	17.16		
5	.25	17.88	22.38		
6	.356	25.45	29.95		
7	.644	46.05	50.55		
8	.75	53.62	58.12		
9	.823	58.84	63.34		
10	.882	63.06	67.56		
11	.933	66.71	71.21		
12	.979	69.99	74.50		
B 1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Temp. Meas. Device & S/N:
Time End: HRS

R or nothing = reg. manometer; S = expanded; E = electronic

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job NORTH Shore Date 1/11/ Test 4 Run 1
Source NO 1205 WASTE GAS STACK No. of traverse points 24
Method 5/17 Filter holder: GLASS Filter type: GLASS FIBER

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at 12 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: 7065

Recovery solvent(s)

☒ Acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: DLA

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	619	498	121
Impinger No. 3	373	366	6
Condenser			
Desiccant			21
Total			148

Integrated Gas Sampling Data:

Bag Pump No. 36A
Bag Material: 5-layer Aluminized Tedlar
Pretest leak check: 0
Time start: 4:40
Sampling rate: 400 cc/min

Box No. 28 Bag No. 1
Size: 44 L
14 IN.HG
(HRS) Time end: 9:40 (HRS)
cc/min Operator: DLA

S/N of O_2 Analyzer used to monitor train outlet: 36A

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job NORTH Shore Operators RH + T.F + J.S Nozzle No. 7-4 Pitot No. V23-6
Source NO 1205 Waste Gas Stack Meter Box No. 15 ΔH@ 1.85 in.WC Nozzle Dia. .247 in. C_p .84
Date 1/11/95 Test 4 Run 1 Gasmeter Coeff. 1.0015 Bar. Press. 29.02 in.Hg H_2O 16 %

Traverse Point No	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	0840	985.01											
A 12	2.5	986.90	.65	1.74	6.83	6	136	244	234	36	61	61	15.4
11	5	988.72	.67	1.80	8.69	6	136				65	61	18.3
10	7.5	990.59	.70	1.86	0.59	6	136				67	61	18.5
9	10	992.55	.74	1.98	2.54	6	140	236	251	37	70	61	18.6
8	12.5	994.53	.82	2.20	4.61	7	140				72	62	18.7
7	15	996.70	.90	2.42	6.77	8	140				74	62	18.9
6	17.5	998.96	.88	2.37	8.92	9	140	227	252	38	73	62	19.0
5	20	1000.94	.83	2.24	1.01	8	140				74	63	19.0
4	22.5	1003.10	.78	2.13	3.04	9	134				75	64	
3	25	1005.05	.67	1.82	4.92	7	139	220	259	41	77	64	17.9
2	27.5	1006.82	.58	1.57	6.68	6	142				78	65	18.2
1	30	1008.39	.49	1.34	8.30	4	137				80	65	18.2
B 12	32.5	1010.03	.62	1.70	10.12	6	136	228	269		80	66	18.3
11	35	1011.72	.69	1.88	12.05	6	139				82	67	18.5
10	37.5	1013.52	.69	1.74	13.83	6	139				84	67	18.6
9	40	1015.43	.82	2.23	15.93	7	143	227	273	40	86	68	18.6
8	42.5	1017.51	.94	2.57	18.18	9	142				87	68	18.8
7	45	1019.75	.94	2.60	20.44	10	136				87	68	19.0
6	47.5	1022.00	.85	2.35	22.60	10	135	230	268	42	87	69	19.0
5	50	1024.21	.87	2.42	24.79	10	133				87	69	19.1
4	52.5	1026.53	.74	2.06	26.81	11	133				88	70	19.3
3	55	1028.68	.62	1.72	28.66	11	136	236	272	41	88	70	19.4
2	57.5	1030.59	.60	1.66	30.48	7	136				88	71	19.5
1	60	1032.34	.53	1.47	32.19	6	135				89	71	19.6
	0940												
	θ -	V_m - 47.33		ΔH - 1.99							Avg. - 70.6		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Northshore Date 1/11/95 Test 4 Run 2
Source N. 1205 Waste gas No. of traverse points 24
Method 5+6 Filter holder: glass Filter type: glass fiber

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☑
Post test: 0 cfm at 11 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: DVH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	690	493	197
Impinger No. 3	390	385	5
Condenser			
Desiccant	1418	1401	17
Total			219

Integrated Gas Sampling Data:

Bag Pump No. 36A Box No. 28 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 15 IN.HG
Time start: 10:22 (HRS) Time end: 11:25 (HRS)
Sampling rate: 400 cc/min Operator: J.S

S/N of O_2 Analyzer used to monitor train outlet: 36A

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: Cypress Northshore | Operators: QUIT + T.F J.S | Nozzle No.: 7-9 | Pitot No.: U25-6
Source: 1205 W 75k 995 | Meter Box No.: 15 ΔH@ 1.85 in.WC | Nozzle Dia.: .247 in. | C_p: .84
Date: 1/11/95 Test: 4 Run: 2 | Gasmeter Coeff.: 1.0015 | Bar. Press.: 27.02 in.Hg | H_2O: 15 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	10:22	32.60											
A 12	2.5	34.55	.60	1.67	34.40	6	137	230	273	34	74	74	20.4
11	5	36.34	.63	1.76	36.27	6	137				~~78~~ 76	~~78~~ 73	19.9
10	7.5	38.19	.69	1.91	38.20	6	144				~~78~~ 80	~~78~~ 73	20.6
9	10	40.13	.77	2.15	40.26	7	141	232	268	36	83	73	20.0
8	12.5	42.17	.83	2.32	42.41	8	142				85	73	20.0
7	15	44.26	.81	2.29	44.54	8	137				88	73	20.2
6	17.5	46.32	.77	2.18	46.62	8	138	239	275	43	89	73	20.4
5	20	48.40	.84	2.37	48.79	8	139				89	74	20.5
4	22.5	50.55	.84	2.37	50.96	8	140				90	75	20.5
3	25	52.63	.78	2.19	53.06	8	143	246	273	45	90	75	20.6
2	27.5	54.80	.66	1.86	54.98	9	142				91	76	20.8
B 1	30	56.83	.55	1.56	56.75	8	140				91	76	18.4
B 12	32.5	58.92	.74	2.21	58.85	7	140	236	258	50	90	76	18.4
11	35	60.88	.75	2.13	60.92	6	138				90	77	18.5
10	37.5	62.90	.82	2.12	62.98	8	141				90	77	18.5
9	40	64.93	.84	2.31	65.13	8	142	229	266	41	91	78	18.5
8	42.5	67.12	.89	2.52	67.37	9	141				91	78	18.6
7	45	69.32	.91	2.59	69.65	10	138				91	78	18.7
6	47.5	71.61	.88	2.50	71.89	10	138	248	264	43	90	79	18.7
5	50	73.89	.88	2.51	74.13	10	137				90	79	18.6
4	52.5	76.19	.81	2.31	76.28	11	137				90	79	18.7
3	55	78.32	.67	1.90	78.23	8	140	245	267	51	89	79	18.9
2	57.5	80.18	.59	1.67	80.06	6	142				89	79	18.9
1	60	81.81	.54	1.53	81.81	5	142				89	79	18.9
	11:25												
	θ =	V_m = 49.21		ΔH = 2.12							Avg. = 88.9		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job North Shore Date 1/11/95 Test 4 Run 3
Source NO 1205 Waste Gas Stack No. of traverse points 24
Method 5 Filter holder: glass Filter type: glass fiber

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at 13 IN. HG (vac) ☐

Particulate Catch Data:
No. of filters used: Recovery solvent(s)

_____ ☒acetone _____
_____ ☐other(s) _____

No. of probe wash bottles: 1
Sample recovered by: D.A.H

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	687	494 200	193
Impinger No. 3	417	401	16
Condenser			
Desiccant	1378	1364	14
Total			223

Integrated Gas Sampling Data:

Bag Pump No. 36A Box No. 28 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 14 IN.HG
Time start: 11:53 (HRS) Time end: 12:53 (HRS)
Sampling rate: 400 cc/min Operator: DAH

S/N of O_2 Analyzer used to monitor train outlet: 36A

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: Northshore
Source: No 1205 Waste Stacks
Date: 1/11/95 Test 4 Run 3

Operators: QUH T.F. J.S
Meter Box No. 15 ΔH@ 1.85 in.WC
Gasmeter Coeff. 1.0015

Nozzle No. 7-4
Nozzle Dia. .247 in.
Bar. Press. 29.02 in.Hg

Pitot No. U 23-10
C_p .84
H_2O 17 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
[illegible]	11:53	82.20	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
12	2.5	83.78	.70	1.92	84.15	6	135	260	272	40	87	79	19.0
11	5	85.66	.69	1.89	86.10	6.5	135				89	79	19.1
10	7.5	87.67	.74	2.05	88.13	7.5	137				90	79	19.1
9	10	89.74	.81	2.20	90.23	8	143	257	234	41	91	79	19.1
8	12.5	91.85	.89	2.41	92.42	8.5	145				92	79	19.2
7	15	94.11	.92	2.52	94.67	9.5	139	[illegible]	[illegible]		93	79	19.4
6	17.5	96.36	.88	2.37	96.85	10	136	251	246	43	93	80	19.4
5	20	98.62	.87	2.39	99.04	10	137				93	80	19.5
4	22.5	100.92	.79	2.17	101.13	10	137				93	80	19.1
3	25	103.11	.67	1.84	103.06	9	138	259	260	45	94	80	19.2
2	27.5	105.20	.59	1.61	104.86	9	141				94	81	19.2
1	30	106.73	.50	1.38	106.54	4	136				94	81	19.2
12	32.5	108.26	.60	1.65	108.36	4	138	263	272	48	94	81	19.3
11	35	109.84	.56	1.60	110.16	4	138				91	79	19.3
10	37.5	111.63	.67	1.81	112.01	6	145				96	82	19.0
9	40	113.58	.75	2.05	114.10	7.5	145	261	[illegible]	41	96	82	19.1
8	42.5	115.61	.87	2.05	116.17	7	139				96	80	19.3
7	45	117.59	.80	2.44	120.3	8	134				96	81	19.5
6	47.5	119.57	.91	2.44	120.3	8	133	258	265	44	88	75	19.5
5	50	121.59	.76	2.09	122.44	8	139				94	80	19.6
4	52.5	123.68	.69	1.89	124.46	8.5	139				94	80	19.7
3	55	125.79	.61	1.70	126.25	9	139	267	271	54	94	81	19.6
2	57.5	127.92	.59	1.62	128.06	9	141				94	81	19.6
1	60	130.02	.56	1.53	129.82	9	140				94	81	19.6
	12:53												
[illegible]	θ =	V_m = 47.82	[illegible]	1.97 ΔH =	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	Avg. = 86.1		[illegible]

Interpoll Laboratories
(612)786-6020

EPA Method 7 Sample Collection
Field Data Sheet

Job Cyprus NORTH Shore Date 1/11/95 Bar. Pressure 29.02 IN.HG.

Test Location ~~DUH, JB & JS~~ Fuel Type _____ Sample Train No. 1

NO 1205 WASTE GAS Stack Technician DUH + JB + JS Pump No. 23-3

No.	Test Run Point	Flask No.	Time (HRS)	Vacuum (IN.HG.)	Flask Temp. (°F)	Leak Rate <0.4 IN.HG./MIN.
1	4/1/1	1	0857	26.1	70	☒ Yes ☐ No
2	4/1/2	2	0900	26.2	71	☒ Yes ☐ No
3	4/1/3	3	0920	26.2	68	☒ Yes ☐ No
4	4/1/1	4	0941	26.4	71	☒ Yes ☐ No
5	4/2/2	5	1041	26.4	69	☒ Yes ☐ No
6	4/2/3	6	1050	26.4	71	☒ Yes ☐ No
7	4/2/1	7	1105	26.2	70	☒ Yes ☐ No
8	4/2/2	9	1120	26.3	69	☒ Yes ☐ No
9	4/3/3	10	1202	26.4	69	☒ Yes ☐ No
10	4/3/1	11	1214	26.3	70	☒ Yes ☐ No
11	4/3/2	12	1230	26.3	70	☒ Yes ☐ No
12	4/3/3	18	1242	26.3	69	☒ Yes ☐ No
13	BLANK	13				☐ Yes ☐ No
14						☐ Yes ☐ No
15						☐ Yes ☐ No
16						☐ Yes ☐ No
17						☐ Yes ☐ No
18						☐ Yes ☐ No
19						☐ Yes ☐ No
20						☐ Yes ☐ No
21						☐ Yes ☐ No
22						☐ Yes ☐ No
23						☐ Yes ☐ No
24						☐ Yes ☐ No
25						☐ Yes ☐ No
26						☐ Yes ☐ No
27						☐ Yes ☐ No

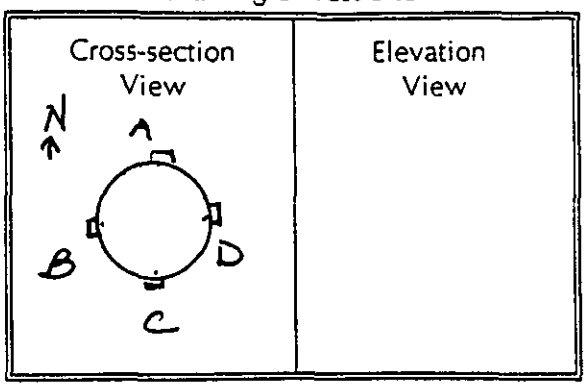
S-263R

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job CYPRUS NORTH SHORE
Source 1204 WASTE GAS STACK
Test .5 Run 0 Date 1-11-95
Stack Dimen. 71.5 IN.
Dry Bulb ____ °F Wet bulb ____ °F
Manometer ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure 29.02 IN.HG
Static Pressure -.26 IN.WC
Operators GH SP
Pitot No. 24 V 2.5 C_p .84
JM

Drawing of Test Site



Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 5 IN.		Time Start: 0745 HRS	
A 1	.021	1.5	6.5	.58	136
2	.067	4.79	9.79	.71	
3	.118	8.44	13.44	.79	
4	.177	12.66	17.66	.94	
5	.250	17.87	22.87	.96	
6	.356	25.45	30.45	.98	
B 1				.50	136
2				.61	
3				.61	
4				.72	
5				.84	
6				.91	
C 1				.55	136
2				.61	
3				.73	
4				.87	
5				.89	
6				.93	
D 1				.71	
2				.78	136
3				.76	
4				.94	
5				.94	
6				.91	
Temp. Meas. Device & S/N:		POT 25		0755 Time End:	HRS

R or nothing = reg. manometer; S = expanded; E = electronic

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRUS N SHORE Date 1-11-94 Test 5 Run 1
Source 1204 WASTE GAS No. of traverse points 24
Method 5 Filter holder: GLASS Filter type: 4" GF

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .016 cfm at 5 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	704	499	205
Condenser			
Desiccant	1395	1362	13
Total			218

Integrated Gas Sampling Data:

Bag Pump No. 368 Box No. 19 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 00 cc/min at 23 IN.HG
Time start: 0840 (HRS) Time end: 0942 (HRS)
Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 368

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INTERPOLL LABORATORIES, INC.
3 (612) 786-6020

2 EPA Method 5 Field Data Sheet

Job CYPRUS N. SHORE
Source 1204 WASTE GAS STACK
Date 1-11-95 Test 5 Run 1

Operators GH SF
Meter Box No. 17 ΔH@ 1.73 in.WC
Gasmeter Coeff. .9953

Nozzle No. 1-4
Nozzle Dia. .250 in.
Bar. Press. 29.02 in.Hg

Pitot No. 24025
C_p .84
H_2O 18 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	ΔP Velocity Head (in.WC)	ΔH Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	0840	106.200											
A 6	2.5	108.42	.95	2.40	8.43	5	136	249	260	39	40	39	17.5
5	5	110.50	.96	2.32	0.54	5	137	247	259	41	59	53	17.2
4	7.5	112.58	.90	2.25	2.74	5	137	250	261	45	62	54	17.7
3	10	114.55	.80	2.00	4.78	5	139	250	261	49	65	55	17.7
2	12.5	116.68	.70	1.76	6.69	5	139	251	263	49	67	56	17.7
1	15	118.30	.57	1.44	8.43	5	139	252	263	49	67	54	17.2
B 6	17.5	120.49	.95	2.39	0.66	5	139	251	263	47	68	57	17.3
5	20	122.70	.89	2.22	2.82	5	139	254	264	48	71	57	17.3
4	22.5	124.60	.72	1.82	4.77	5	141	256	259	50	73	57	17.3
3	25	126.59	.65	1.64	6.63	5	141	254	260	50	73	59	17.3
2	27.5	128.40	.60	1.59	8.42	5	140	255	259	49	74	60	17.3
1	30	130.00	.47	1.21	0.02	5	146	257	260	48	75	60	17.3
C 6	32.5	132.28	.90	2.27	2.21	5	146	261	263	49	75	60	17.3
5	35	134.39	.85	2.18	4.35	5	136	247	263	44	76	64	17.3
4	37.5	136.35	.70	1.79	6.30	5	138	256	266	46	76	62	17.2
3	40	138.19	.64	1.62	8.16	5	139	257	266	47	77	62	17.7
2	42.5	139.84	.55	1.40	9.80	5	144	257	269	46	77	63	17.7
1	45	141.52	.50	1.26	1.52	5	151	258	271	47	77	63	17.7
D 6	47.5	143.77	.95	2.36	3.76	5	151	259	281	44	76	64	17.4
5	50	146.09	.94	2.40	6.02	5	140	260	270	40	79	65	17.4
4	52.5	148.21	.85	2.19	8.18	5	137	261	265	40	80	66	17.3
3	55	150.28	.78	2.01	0.25	5	137	264	259	42	80	66	17.3
2	57.5	152.27	.70	1.94	2.20	5	137	266	260	43	81	66	17.3
1	60	154.18	.65	1.68	4.18		137	267	265	44	81	66	
	(0942)												
	0-60	V_m = 47.98		1.92 ΔH =							Avg. = 65.7		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRUS N SHORE Date 1-11-95 Test 5 Run 2
Source 1204 WASTE GAS No. of traverse points 24
Method 5 Filter holder: GLASS Filter type: 4" GF

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .00 cfm at 10 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: Recovery solvent(s)

_____ ☒acetone_____
_____ ☐other(s)_____

No. of probe wash bottles: 1
Sample recovered by: CH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	899	490	209
Condenser			
Desiccant	1344	1354	10
Total			219

Integrated Gas Sampling Data:

Bag Pump No. 36B Box No. 19 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 23 IN.HG
Time start: 1022 (HRS) Time end: 1126 (HRS)
Sampling rate: 400 cc/min Operator: CH

S/N of O_2 Analyzer used to monitor train outlet: 36B

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job CYPRUS N SHORE — Operators GH SF — Nozzle No. 1-4 — Pitot No. .84
Source 1204 WASTE GAS STACK — Meter Box No. 1.7 ΔH@ 1.73 in.WC — Nozzle Dia. .250 in. — C_p 24 / 2.5
Date 1-11-95 Test 5 Run A — Gasmeter Coeff. .9932 — Bar. Press. 29.02 in.Hg — H_2O 18 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1022	6H 154.510											
A D 6	2.5	156.75	.95	2.35	6.74	5	147	267	235	40	69	67	17.9
5	5	158.89	.93	2.38	8.99	5	136	267	238	41	68	73	17.1
4	7.5	161.95	.86	2.21	1.15	5	137	268	241	42	68	75	17.1
3	10	163.00	.70	1.81	3.12	5	134	270	246	43	68	77	17.1
2	12.5	164.91	.59	1.53	4.92	5	136	259	247	43	79	69	17.0
1	15	166.61	.55	1.42	6.67	5	139	260	251	44	80	69	16.9
C 6	17.5	168.79	.84	2.17	8.82	5	139	264	260	45	81	68	17.0
5	20	170.80	.75	1.94	0.86	5	138	259	233	46	82	70	17.1
4	22.5	172.84	.70	1.82	2.84	5	138	259	236	47	82	70	17.2
3	25	174.70	.62	1.61	4.69	5	137	260	235	49	84	70	17.3
2	27.5	176.39	.57	1.39	6.42	5	145	261	239	49	84	70	17.1
1	30	178.05	.45	1.15	8.00	5	150	262	240	44	85	71	17.2
B 6	32.5	180.29	.95	2.42	0.28	5	150	262	241	45	82	72	17.6
5	35	182.50	.82	2.14	2.42	5	136	266	245	46	85	72	17.2
4	37.5	184.43	.70	1.83	4.41	5	137	265	248	47	86	72	17.2
3	40	186.34	.66	1.72	6.34	5	138	265	249	48	87	72	17.0
2	42.5	188.19	.59	1.54	8.16	5	140	266	250	46	87	73	17.7
1	45	189.90	.50	1.30	9.87	5	143	267	251	42	87	73	17.0
A 6	47.5	192.11	.96	2.50	2.16	5	139	267	252	43	87	74	16.8
5	50	194.41	.94	2.46	4.47	5	136	267	253	41	87	74	17.0
4	52.5	196.69	.89	2.34	6.72	5	135	265	254	42	87	74	17.0
3	55	198.80	.79	2.08	8.84	5	135	266	258	43	88	74	17.0
2	57.5	200.94	.75	1.97	0.91	5	135	266	259	44	89	74	17.0
1	60	202.725	.60	1.58	2.76	5	136	263	260	44	89	74	17.0
	1126												
	0-60	V_m - 48.215		1.9 ΔH -							Avg. -	77.0	

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRO Date 1-11-95 Test 5 Run 3
Source 1204 WASTE GAS No. of traverse points 24
Method 5 Filter holder: GLASS Filter type: _____

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .00 cfm at 10 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: Recovery solvent(s)

_____ ☐acetone _____
_____ ☐other(s) _____

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	700	496	204
Condenser	1360		
Desiccant	1360	1347	13
Total			217

Integrated Gas Sampling Data:

Bag Pump No. 36B Box No. _____ Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 23 IN.HG
Time start: 1153 (HRS) Time end: 1257 (HRS)
Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 36B

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job CYPRUS N SHORE Operators GH ST Nozzle No. 1-4 Pitot No. 24048
Source 204 WASTE GAS STACK Meter Box No. 17 ΔH@ 1.73 in.WC Nozzle Dia. .250 in. C_p .84
Date 7-11-95 Test 5 Run 3 Gasmeter Coeff. .9932 Bar. Press. 29.02 in.Hg H_2O 18 %

Traverse Point No	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	(1153)	203.66			5.30	5	135	246	243	41	76	72	17.3
A 6	2.5	205.36	.95	2.48	7.60	5	132	245	244	42	78	73	17.3
5	5	207.61	.96	2.48	9.81	5	137	246	243	43	81	72	17.1
4	7.5	209.30	.92	2.39	2.04	5	138	248	250	44	81	72	17.0
3	10	212.01	.85	2.21	4.08	5	137	251	247	44	82	73	17.0
2	12.5	214.80	.74	1.92	5.99	5	137	249	251	45	84	73	17.0
1	15	215.96	.65	1.69	8.30	5	137	243	239	46	84	73	17.1
B 6	17.5	218.33	.95	2.48	0.59	5	139	245	240	46	84	73	17.1
5	20	220.49	.94	2.45	2.72	5	135	238	259	43	84	73	17.0
4	22.5	222.61	.80	2.09	4.68	5	137	235	262	43	85	73	17.1
3	25	224.67	.68	1.78	6.55	5	137	233	265	46	85	73	17.1
2	27.5	226.47	.62	1.62	8.42	5	137	239	259	46	86	73	17.1
1	30	228.41	.62	1.62	.41	5	139	241	257	45	86	73	17.1
C 6	32.5	230.41	.85	2.21	2.77	5	137	244	257	45	86	74	17.2
5	35	232.61	.84	2.20	4.70	5	142	251	253	46	87	74	17.3
4	37.5	234.39	.65	1.69	6.55	5	145	257	266	47	87	74	17.3
3	40	236.40	.60	1.55	8.21	5	144	260	268	47	88	74	17.3
2	42.5	238.21	.50	1.29	9.85	5	144	261	260	46	88	74	17.3
1	45	239.79	.48	1.24	1.95	5	144	257	249	46	88	74	17.3
D 6	47.5	241.95	.90	2.33	3.79	5	144	252	247	47	88	74	17.3
5	50	243.79	.90	2.33	6.48	5	137	251	243	47	88	74	17.3
4	52.5	246.44	.80	2.10	8.41	5	137	251	252	47	88	74	17.3
3	55	248.50	.73	1.91	0.40	5	139	257	254	49	89	75	17.3
2	57.5	250.39	.63	1.65	2.21	5	137	263	251	49	89	75	17.3
1	60	252.24	.57	1.49									
	θ - 60	V_m - 49.24		1.97 ΔH -							Avg. 79.2		

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(612) 786-6020

EPA Method 2 Field Data Sheet

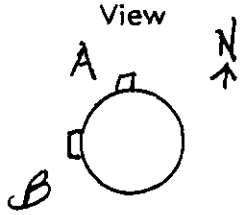
CYPRUS N. SHORE

Job NO 12 PELLITIZER ROTO COOLER STACK
Source STACK
Test 16 Run 1 Date 10-12-95
Stack Dimen. 45.5 IN.
Dry Bulb ____ °F Wet bulb ____ °F
Manometer ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure 28.94 IN.HG
Static Pressure -.82 IN.WC
Operators GM SF
Pitot No. ____ C_p .84

GM

Drawing of Test Site

Cross-section View



Elevation View

Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 4.5 IN.		Time Start: 0810 HRS	
A 1	.026	1.19	5.68	.72	147
2	.082	3.73	8.23	.98	
3	.146	6.64	11.14	1.1	
4	.226	10.38	14.78	1.3	
5	.342	15.56	20.06	1.4	
6	.658	29.94	34.44	1.4	
7	.774	35.22	39.72	1.4	
8	.854	38.86	43.36	1.1	
9	.918	41.77	46.27	.98	
10	.974	44.32	48.87	.74	
B 1				.95	
2				.74	143
3				.98	
4				1.1	
5				1.3	
6				1.2	
7				1.0	
8				1.0	
9				1.1	
10				.86	
				.72	

Temp. Meas. Device & S/N: PPT 25 | 0815 Time End: HRS

R or nothing = reg. manometer; S = expanded; E = electronic

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INTERPOLL LABORATORIES, INC.
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Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRUS N. SHORE Date 1-12-95 Test 6 Run #1
Source NO 12 PELLITIZER ROTOCLONE No. of traverse points 20
Method 5 Filter holder: GLASS STK Filter type: 4" G.F

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .0C cfm at 10 IN. HG (vac) ☑

Particulate Catch Data:

No. of filters used: Recovery solvent(s)

_____ ☒acetone_____
_____ ☐other(s)_____

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	532	499	33
Condenser			
Desiccant	1370	1360	10
Total			43

Integrated Gas Sampling Data:

Bag Pump No. 36B Box No. 16 Bag No. #1
Bag Material: 5-laver Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at .23 IN.HG
Time start: 1005 (HRS) Time end: 1107 (HRS)
Sampling rate: 400 CC cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 36B

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(612) 786-6020

EPA Method 5 Field Data Sheet

Job CYPRUS N. SHORE
Source NO.2 ROTOCODE STACK NORTH
Date 1-12-95 Test 6 Run 1

Operators GH SF
Meter Box No. 17 ΔH@ 1.70 in.WC
Gasmeter Coeff. .9932

Nozzle No. 1-3
Nozzle Dia. .185 in.
Bar. Press. 28.97 in.Hg

Pitot No. 24 V 6
C_p .87
H_2O 2 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	0825	253.50											
B 10	3	254.89	.74	.61	4.85	2	147	294	229	39	72	71	20.8
9	6	256.48	.98	.81	6.47	2	132	276	231	40	72	71	20.8
8	9	258.17	1.1	.92	8.16	2	134	259	240	40	73	71	20.7
7	12	260.00	1.3	1.09	0.00	3	134	261	240	42	73	71	20.7
6	15	261.76	1.2	1.01	1.76	3	134	262	245	43	74	71	20.7
5	18	263.64	1.3	1.09	3.60	3	134	261	248	44	75	71	20.7
4	21	265.29	1.1	.93	5.29	3	135	262	249	45	75	71	20.7
3	24	266.82	1.0	.84	6.89	3	135	263	251	44	75	71	20
2	27	268.47	1.0	.84	8.50	3	135	264	252	45	76	71	20.7
1	30	269.99	.85	.71	9.99	3	135	264	249	45	76	71	20.7
A 10	33	271.37	.72	.60	1.36	3	135	266	251	44	75	71	20.7
9	36	272.94	.94	.79	2.93	3	134	267	249	45	75	71	20.7
8	39	274.70	1.2	1.00	4.69	3	138	268	251	46	76	71	20.7
7	42	276.53	1.3	1.09	6.52	3	138	268	252	47	76	71	20.7
6	45	278.49	1.4	1.17	8.43	3	138	267	251	47	77	72	20.9
5	48	280.54	1.2	1.00	0.19	3	138	268	254	48	77	72	20.9
4	51	281.80	.98	.82	1.79	3	137	269	253	48	77	71	20.9
3	54	283.39	.97	.81	3.38	3	139	259	251	48	77	71	20.9
2	57	284.87	.85	.71	4.86	3	139	260	252	49	77	71	20.9
1	60	286.17	.59	.49	6.10	3	137	261	253	49	77	71	20.9
	(0926)												
	0 - 60	V_m = 32.67		.87 ΔH =							Avg. = 73.1		

West

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRUS N. SHORE Date 1-12-94 Test 6 Run 2
Source NO 12 PELLITIZER ROTOCONE STACK No. of traverse points 20
Method 5 Filter holder: GLASS Filter type: 4" GF

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0.00 cfm at 5 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	534	490	44
Condenser			
Desiccant	1319	1312	7
Total			51

Integrated Gas Sampling Data:

Bag Pump No. 36B Box No. 16 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 23 IN.HG
Time start: 0925 (HRS) Time end: 0926 (HRS)
Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 36B

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(612) 786-6020

EPA Method 5 Field Data Sheet

Job CYPROS N. SHORE Operators CA SF Nozzle No. 1-3 Pitot No. 2446

Source NO 12 ROTOCONE STACK NORTH Meter Box No. 17 ΔH@ 1.73 in.WC Nozzle Dia. .185 in. C_p .84

Date 1-12-95 Test 6 Run 2 Gasmeter Coeff. .9932 Bar. Press. 28.94 in.Hg H_2O 2 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1005	286.50											
A 10	3	288.01	.74	.72	8.00	2	138	248	249	39	72	76	20.9
9	6	289.73	.98	.95	9.72	2	136	247	250	40	73	71	20.9
8	9	291.67	1.3	1.26	1.69	2	138	249	251	41	73	71	20.9
7	12	293.65	1.4	1.36	3.74	2	137	240	246	42	73	71	20.9
6	15	295.69	1.3	1.26	5.71	2	140	241	247	42	73	71	20.9
5	18	297.62	1.2	1.16	7.61	2	140	242	249	43	77	71	20.9
4	21	299.35	1.0	.97	9.34	2	141	243	249	41	77	71	20.9
3	24	300.95	.85	.83	0.95	2	139	244	251	42	77	72	20.9
2	27	302.47	.75	.73	2.45	2	139	245	251	43	77	72	20.9
1	30	303.91	.70	.68	3.91	2	139	247	252	44	77	72	20.9
B 10	33	305.41	.72	.70	5.39	2	137	249	255	43	77	72	20.9
9	36	307.10	.97	.95	7.11	2	136	251	256	45	77	72	20.9
8	39	308.86	1.0	.98	8.85	2	137	255	257	45	78	72	20.9
7	42	310.90	1.4	1.37	0.92	2	136	253	257	40	78	72	20.9
6	45	312.82	1.2	1.18	2.89	2	136	254	258	42	78	72	20.9
5	48	314.72	1.2	1.17	4.73	2	140	255	259	43	78	72	20.9
4	51	316.72	1.3	1.27	6.72	2	140	255	257	44	78	72	20.9
3	54	318.54	1.1	1.07	8.54	2	139	256	257	44	78	72	20.9
2	57	320.25	.90	.88	0.20	2	137	257	259	45	78	72	20.9
1	60	321.90	.85	.83	1.81		137				78	72	20.9
	(1107)												
	θ = 60	V_m = 35.7		1.02 ΔH =							Avg. = 74.0		

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRUS N SHORE Date 1-12-95 Test 6 Run 3
Source NO 12 PELLITIZER No. of traverse points 20
Method 5 Filter holder: ROTOCONE Filter type: 4" GF
Sample Train Leak Check: GLASS
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 100 cfm at 5 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	1377	1370	7
Condenser			
Desiccant	554	505	49
Total			56

Integrated Gas Sampling Data:

Bag Pump No. 36B Box No. 16 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: .00 cc/min at 23 IN.HG
Time start: 1136 (HRS) Time end: 1322 (HRS)
Sampling rate: 400 cc/min Operator: GH

S/N of O_2 Analyzer used to monitor train outlet: 36B

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EPA Method 5 Field Data Sheet

Job CYPRUS N SHORE NORTH Operators GH SF Nozzle No. 1-3 Pitot No. 2406
Source NO12 ROTOCONE STACK Meter Box No. 17 ΔH@ 1.73 in.WC Nozzle Dia. .185 in. C_p .84
Date 1-12-94 Test 6 Run 3 Gasmeter Coeff. .9935 Bar. Press. 28.94 in.Hg H_2O 2 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1136	322.40											
10	3	323.91	.75	.73	3.91	3	136	262	249	41	74	70	20.9
9	6	325.55	.84	.82	5.50	3	136	262	255	43	74	70	20.9
8	9	327.41	1.2	1.17	7.40	3	136	259	257	39	74	70	20.9
7	12	329.37	1.3	1.27	9.37	3	137	260	254	40	75	70	20.9
6	15	331.29	1.2	1.17	1.38	3	137	261	253	42	75	70	20.9
5	18	333.19	1.2	1.17	3.18	3	137	261	254	43	68	66	20.9
4	21	334.97	1.1	1.05	4.97	3	141	262	255	44	69	66	20.9
3	24	336.84	1.2	1.05	6.85	3	140	265	254	43	70	66	20.9
2	27	338.56	1.0	.96	8.57	3	139	266	255	44	72	67	20.9
1	30	340.32	.92	.89	0.23	3	137	265	258	43	72	67	20.9
10	33	341.78	.75	.73	1.73	3	138	266	259	44	72	67	20.9
9	36	343.42	.97	.94	3.43	3	138	235	229	46	73	68	20.9
8	39	345.47	1.4	1.36	5.47	3	138	239	231	45	70	68	20.9
7	42	347.45	1.3	1.26	7.44	3	138	240	241	40	76	69	20.9
6	45	349.47	1.3	1.26	9.42	3	138	241	242	43	77	69	20.9
5	48	351.24	1.1	1.07	1.24	3	139	228	231	44	77	69	20.9
4	51	353.93	.95	.93	2.93	3	139	231	242	44	77	69	20.9
3	54	354.59	.90	.88	4.58	3	137	233	245	46	77	69	20.9
2	57	356.15	.81	.79	6.14	3	138	237	251	45	77	69	20.9
1	60	357.67	.72	.70	7.62	3	138	239	251	46	78	70	20.9
	1322												
	0 - 60	V_m - 35.23		1.01 ΔH -							Avg. -	71.2	

INTERPOLL LABORATORIES, INC.
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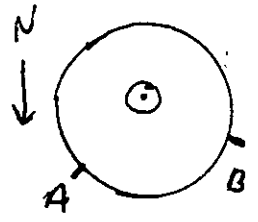
EPA Method 2 Field Data Sheet

Job: Cypress Northshore
Source: No. 2 Boiler Stack
Test: 7 Run 1 Date 1/12/95
Stack Dimen.: 110 IN.
Dry Bulb: ____ °F Wet bulb: ____ °F
Manometer: ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 28.74 IN.HG
Static Pressure: -.90 IN.WC
Operators: DWH, R.V.S., TF
Pitot No.: V23-10 C_p .84
PM/SO_2

Drawing of Test Site

Cross-section View	Elevation View
	

Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 15 IN.		Time Start:	HRS
B 1	.021	2.31	17.31	.80	
2	.067	7.37	22.37	.82	
3	.113	12.98	27.98	.85	
4	.177	19.47	34.47	.83	
5	.250	27.50	42.50	.84	
6	.356	39.16	54.16	.92	
7	.644	70.84	85.84	.99	
8	.750	82.50	97.50	.90	
9	.823	90.53	105.53	.79	
10	.882	97.02	112.02	.78	
11	.933	102.63	117.63	.94	
12	.979	107.69	122.69	.77	
A 1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					

Temp. Meas. Device & S/N:
Time End: HRS

R or nothing = reg. manometer; S = expanded; E = electronic

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Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Cypress Northshore Date 1/12/95 Test 7 Run 1
Source No. 2 Boiler Stack No. of traverse points 24
Method 5/6 Filter holder: glass Filter type: glass fiber

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at 15 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used:

Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: Duit

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	553	458	95
Impinger No. 3	498	489	9
Condenser			
Desiccant	1315	1300	15
Total			119

Integrated Gas Sampling Data:

Bag Pump No. 23 B Box No. 30 Bag No. 1
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 at cc/min at 14 IN.HG
Time start: 9:17 (HRS) Time end: 10:17 (HRS)
Sampling rate: 400 cc/min Operator: J.S

S/N of O_2 Analyzer used to monitor train outlet: 4

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INTERPOLL LABORATORIES, INC.
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EPA Method 5 Field Data Sheet

Job Cyprus Northshore | Operators J.S + Duff + TF | Nozzle No. ~~.297~~ 7-4 | Pitot No. V 23-10
Source No 2 Boiler Stack | Meter Box No. 18 ΔH@ 1.87 in.WC | Nozzle Dia. .297 in. | C_p .84
Date 7/12/95 Test 2 Run 1 | Gasmeter Coeff. 1.0026 | Bar. Press. 28.94 in.Hg | H_2O 8 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	(9:17)	123.70											
A 12	2.5	125.97	1.15	2.65	25.93	9	292	230	252	50	64	59	4.8
11	5	128.15	1.05	2.46	28.12	8	296				66	60	6.0
10	7.5	130.35	1.20	2.83	30.46	8	296				70	61	4.9
9	10	132.59	1.20	2.83	32.80	8.5	298	233	258	40	72	61	4.6
8	12.5	135.00	1.25	2.95	35.19	9	297				73	62	4.5
7	15	137.23	1.25	2.96	37.60	9.5	296				76	64	4.5
6	17.5	139.62	1.30	3.09	40.06	10	297	235	267	43	76	65	4.5
5	20	142.07	1.35	3.20	42.56	11	300				77	65	4.5
4	22.5	144.54	1.25	2.97	44.97	11	300				78	65	4.7
3	25	146.95	1.10	2.63	47.24	10	296	239	265	39	78	66	4.7
2	27.5	149.23	.93	2.23	49.34	8.5	298				79	66	4.6
1	30	151.37	.95	2.27	51.45	7	298				80	67	4.8
B 12	32.5	153.46	1.06	2.58	53.71	7.5	299	243	256	41	80	68	4.9
11	35	155.62	1.03	2.47	55.92	8	296				83	69	4.6
10	37.5	157.77	1.03	2.48	58.14	8	296				84	69	5.0
9	40	159.99	1.02	2.43	60.34	8	304	241	271	46	85	69	4.8
8	42.5	162.22	1.03	2.46	62.55	8	303				86	70	4.9
7	45	164.49	1.04	2.48	64.77	8	306				87	71	5.0
6	47.5	166.66	1.04	2.48	67.00	8	307	238	274	43	87	71	5.1
5	50	168.94	1.04	2.48	69.22	8.5	309				85	71	4.8
4	52.5	171.26	1.05	2.50	71.45	8.5	309				86	72	5.1
3	55	173.55	1.04	2.48	73.68	8.5	311				89	73	5.1
2	57.5	175.82	1.04	2.49	75.91	9.0	309	233	258	36	90	74	4.7
1	60	177.96	1.01	2.42	78.11	8	309				90	74	5.0
	(10:17)												
	θ - 60	V_m - 54.26		2.62 ΔH -							Avg. -	73.6	

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Cypress Northshore Date 1/12/95 Test 7 Run 2
Source No 2 Boiler Stack No. of traverse points 29
Method 5 & 6 Filter holder: glass Filter type: glass fiber

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☑
Post test: 0 cfm at 13 IN. HG (vac) ☑

Particulate Catch Data:
No. of filters used:

Recovery solvent(s)
☑ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: Quit

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	618	490	128
Impinger No. 3	514	506	8
Condenser	1330	1313	17
Desiccant			
			153
Total			

Integrated Gas Sampling Data:

Bag Pump No. 23B Box No. 30 Bag No. 2
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 14 IN.HG
Time start: ~~1259~~ 10:47 (HRS) Time end: 13:47 (HRS)
Sampling rate: 400 cc/min Operator: J-S

S/N of O_2 Analyzer used to monitor train outlet: 4

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INTERPOLL LABORATORIES, INC.
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EPA Method 5 Field Data Sheet

Job: Cypress Northshore
Source: N. 2 Boiler Stack
Date: 1/12/95 Test: 1 Run: 2

Operators: J.S. + Duff + TF
Meter Box No.: 18 ΔH@: 1.84 in.WC
Gasmeter Coeff.: 1.0026

Nozzle No.: 7-4
Nozzle Dia.: .247 in.
Bar. Press.: 28.94 in.Hg

Pitot No.: V 23.10
C_p: .84
H_2O: 7 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	10:47	178.50											
B 12	2.5	180.72	1.00	2.45	80.70	8	309	228	236	37	87	81	5.0
11	5	183.01	1.30	3.16	83.22	6	312				89	81	4.8
10	7.5	185.47	1.40	3.41	85.84	10.5	312				89	81	4.6
9	10	188.01	1.35	3.30	88.41	11	310	239	246	39	90	82	4.7
8	12.5	190.62	1.45	3.55	91.09	11	310				91	82	4.9
7	15	193.29	1.45	3.54	93.76	12	312				91	82	4.8
6	17.5	196.43	1.45	3.55	96.43	12.5	311	240	242	40	91	83	4.7
5	20	199.10	1.50	3.67	99.15	12.5	311				91	83	4.9
4	22.5	201.77	1.40	3.42	01.78	13	314				91	83	4.8
3	25	204.33	1.30	3.18	04.31	12	313	236	249	46	91	84	4.6
2	27.5	206.87	1.15	2.81	06.70	10	314				91	84	4.7
1	30	209.30	1.25	3.05	09.18	9	316				91	85	4.6
A 12	32.5	211.98	1.20	2.93	11.61	9	317	243	231	46	92	85	4.5
11	35	214.33	1.20	2.94	14.05	9	314				91	85	4.6
10	37.5	216.66	1.25	3.05	16.54	8.5	315				91	85	4.4
9	40	218.99	1.25	3.06	19.03	9	314	246	237	49	91	89	4.4
8	42.5	221.34	1.25	3.06	21.51	9	314				91	89	4.5
7	45	223.75	1.30	3.18	24.05	10	312				91	84	4.5
6	47.5	226.21	1.30	3.18	26.59	10	313	251	252	43	91	89	4.5
5	50	228.71	1.35	3.30	29.17	16	314				90	83	4.5
4	52.5	231.26	1.40	3.42	31.80	11	314				89	82	4.6
3	55	233.86	1.35	3.29	34.37	11.5	313	243	255	41	89	82	4.7
2	57.5	236.49	1.35	3.28	36.94	12	315				89	82	4.8
1	60	239.19	1.20	2.92	39.37	13	315				89	81	4.9
	11:47	~~50.69~~											
	θ - 60	V_m - 60.69		3.20 ΔH -							Avg. -	86.6	

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Cypress Northshore
Date 1/12/95 Test 7 Run 3
Source No 2 Boiler Stack
No. of traverse points 24
Method 5&6 Filter holder: glass
Filter type: glass fiber

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0 cfm at 15 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used:

Recovery solvent(s)

☑ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: Quit

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	337	200	137
Impinger No. 3			
Condenser			
Desiccant	1315	1329	14
Total			151

Integrated Gas Sampling Data:

Bag Pump No. 23B
Box No. 30 Bag No. 3
Bag Material: 5-layer Aluminized Tedlar
Size: 44 L
Pretest leak check: 0
cc/min at 14 IN.HG
Time start: 12:17
(HRS) Time end: 13:22 (HRS)
Sampling rate: 400
cc/min Operator: J.S.

S/N of O_2 Analyzer used to monitor train outlet: 4

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: Cyprus Northshore | Operators: J.S. & Dull + TF | Nozzle No.: 7-4 | Pitot No.: U 23-10
Source: No. 3 Boiler Stack | Meter Box No.: 16 ΔH@ 1.64 in.WC | Nozzle Dia.: .247 in. | C_p: .84
Date: 1/12/95 Test 7 Run 3 | Gasmeter Coeff.: 1.0X.26 | Bar. Press.: 28.94 in.Hg | H_2O: 6 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	12:17	239.60											
A 12	2.5	242.06	1.20	2.96	42.04	9	320	235	256	45	84	77	5.1
11	5	244.48	1.20	2.93	44.46	9	319				87	77	4.7
10	7.5	246.94	1.25	3.05	46.93	9	320				87	78	4.7
9	10	249.37	1.25	3.05	49.40	9	321	242	238	44	88	78	4.6
8	12.5	251.79	1.15	2.81	51.78	9	321				88	78	4.6
7	15	254.28	1.30	3.18	54.31	9.5	320				89	78	4.7
6	17.5	256.69	1.35	3.29	56.87	10	323	248	241	46	88	77	4.7
5	20	259.22	1.30	3.17	59.46	10	321				88	78	4.7
4	22.5	261.78	1.30	3.18	61.92	10.5	321				89	79	4.8
3	25	264.23	1.20	2.93	64.35	10.5	323	245	252	52	89	79	5.0
2	27.5	266.47	1.00	2.45	66.57	8	323				89	79	5.0
1	30	268.53	.67	1.64	68.39	7	322				88	77	5.2
B 12	32.5	270.93	1.30	3.18	70.91	7	320	241	260	45	91	82	5.2
11	35	273.38	1.45	3.56	73.59	11	322				93	82	5.2
10	37.5	276.09	1.50	3.69	76.32	13	322				93	83	4.8
9	40	278.82	1.35	3.33	78.91	13	320	241	263	42	91	83	4.8
8	42.5	281.55	1.45	3.55	81.59	13	324				91	83	4.7
7	45	284.25	1.50	3.68	84.31	13	323				90	83	4.7
6	47.5	286.98	1.55	3.80	87.08	13	323	235	269	44	89	83	4.9
5	50	289.63	1.35	3.32	89.66	12.5	321				89	83	4.9
4	52.5	292.17	1.35	3.32	92.25	12	321				89	83	5.1
3	55	294.81	1.30	3.19	94.78	11	322	238	264	41	89	83	5.2
2	57.5	297.41	1.30	3.26	97.32	11	320				89	82	5.2
1	60	299.85	1.20	2.95	99.76	9	320				90	82	5.2
	13:17												
	0-60	V_m - 60.88		3.14 ΔH -							Avg. -	84.7	

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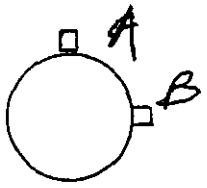
INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: CYPRUS N. SHORE
Source: NO #101 FINE CRUSHER
Test: 8 Run: 1 Date: 1-13-97
Stack Dimen.: 32.25 IN.
Dry Bulb: °F Wet bulb: °F
Manometer: ☒ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.02 IN.HG
Static Pressure: -.25 IN.WC
Operators: GH, SF
Pitot No.: 24V4 Cp .84
pm

Drawing of Test Site

N ↑ Cross-section View	Elevation View
	

Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length: 6.25 IN.		Time Start: 0750 HRS	
A 1	.044	1.41	7.66	.60	86
2	.146	4.70	10.95	.65	
3	.296	9.54	15.79	.70	
4	.704	22.70	28.95	.75	
5	.854	27.54	33.79	.70	
6	.956	30.83	37.08	.68	
B 1				.52	86
2				.50	
3				.65	
4				.60	
5				.65	
6				.67	

Temp. Meas. Device & S/N: PDT 40
Time End: 0800 HRS

R or nothing = reg. manometer; S = expanded; E = electronic

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRUS N. SAKE Date 1-13-97 Test 8 Run 1
Source NO 2 FINE CRUSHER No. of traverse points 12
Method 5 Filter holder: GLASS Filter type: 4" GF

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: ≤ .02 cfm at 6 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: Recovery solvent(s)

☒ Acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	500	499	1
Condenser			
Desiccant	1340	1325	15
Total			16

Integrated Gas Sampling Data:
AMBIENT

Bag Pump No. _____ Box No. _____ Bag No. _____
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: _____ cc/min at _____ IN.HG
Time start: _____ (HRS) Time end: _____ (HRS)
Sampling rate: _____ cc/min Operator: _____

S/N of O_2 Analyzer used to monitor train outlet: _____

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[redacted]

(612) 786-6020

EPA Method 5 Field Data Sheet

Job CYPRUS MESABI
Source NO 2 FINE CRUSHER
Date 1-23-95 Test X Run 1

Operators GH SF
Meter Box No. 17 ΔH@ 1.73 in.WC
Gasmeter Coeff. .9932

Nozzle No. 1-4
Nozzle Dia. .350 in.
Bar. Press. 29.02 in.Hg

Pitot No. 24 U L
C_p = .84
H_2O 2 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F)						Oxygen (% v/v)
							Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	
[redacted]	0810	358.100	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
6	5	362.45	.65	2.35	2.45	5	86	248	240	39	42	46	20.9
5	10	367.80	.70	2.58	7.00	5	70	248	242	40	46	47	20.9
4	15	371.59	.70	2.60	1.58	5	69	250	240	40	50	44	20.7
3	20	376.48	.80	2.99	6.50	5	69	253	237	41	53	44	20.9
2	25	381.58	.70	2.62	1.12	5	69	259	243	41	56	45	20.9
1	30	385.34	.58	2.17	5.33	6	71	251	244	42	56	46	20.9
6	35	390.06	.75	2.81	0.12	6	71	255	243	42	57	46	20.7
5	40	394.91	.75	2.85	4.96	6	65	250	241	42	57	48	20.8
4	45	399.70	.74	2.82	4.71	6	66	252	247	42	59	49	20.8
3	50	404.46	.70	2.68	4.47	6	65	241	247	41	61	50	20.8
2	55	408.89	.60	2.30	8.83	6	65	239	256	40	62	50	20.8
1	60	412.82	.50	1.92	2.82	6	65	245	263	41	63	51	20.8
	(0917)												
[redacted]	θ - 60	V_m - 54.72	[redacted]	ΔH - 2.56	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	Avg. - 51.1		[redacted]

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYRUS N SHORE Date 1-13-94 Test 8 Run 2
Source NO 2 FINE CRUSHER No. of traverse points 12
Method 5 Filter holder: GLASS Filter type: 4" QF

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: 0.00 cfm at 7 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: Recovery solvent(s)

_____ ☐acetone_____
_____ ☐other(s)_____

No. of probe wash bottles: _____
Sample recovered by: _____

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	498	497	1
Condenser			
Desiccant	1340	1326	14
			0
Total			15

Integrated Gas Sampling Data:

AMBIENT

Bag Pump No. _____ Box No. _____ Bag No._____
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: _____ cc/min at _____ IN.HG
Time start: _____ (HRS) Time end: _____ (HRS)
Sampling rate: _____ cc/min Operator: _____

S/N of O_2 Analyzer used to monitor train outlet: _____

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1000

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job CARGILL N. SHORE
Source NO 2 FINE CRUSHER
Date 1-13-95 Test 8 Run 2

Operators GH SF
Meter Box No. 17 ΔH@ 1.73 in.WC
Gasmeter Coeff. .9932

Nozzle No. 1-4
Nozzle Dia. .250 in.
Bar. Press. 29.02 in.Hg

Pitot No. 2404
C_p .84
H_2O 2 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	(1000)	413.11											
B 6	5	417.90	.72	2.42	7.99	6	65	245	251	41	55	51	20.9
5	10	422.66	.78	2.97	2.92	6	66	247	258	41	57	51	20.9
4	15	427.69	.72	2.73	7.66	7	69	251	253	41	59	52	20.9
3	20	432.10	.63	2.38	2.09	7	72	252	258	43	61	52	20.9
2	25	436.48	.59	2.25	6.40	6	69	249	253	43	61	54	20.9
1	30	440.23	.46	1.76	0.22	6	68	243	256	43	62	54	20.9
A 6	35	445.75	.73	2.79	5.03	6	68	240	261	44	62	54	20.9
5	40	449.76	.70	2.68	9.74	6	67	246	259	45	62	54	20.9
4	45	454.58	.74	2.84	4.59	6	68	254	251	44	64	54	20.9
3	50	459.59	.80	3.06	9.63	6	68	257	247	43	64	54	20.9
2	55	464.49	.75	2.89	4.52	6	67	259	243	43	64	54	20.9
1	60	468.63	.53	2.04	8.63	6	67	251	245	44	64	54	20.9
	(1105)												
	θ - 60	V_m - 55.52		261 ΔH -							Avg. 57.2		

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job CYPRUS N. SHORE Date 1-13-94 Test 8 Run 3
Source NO 2 FINE CRUSHER No. of traverse points 12
Method 5 Filter holder: GLASS Filter type: 4" QF

Sample Train Leak Check:

Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☒
Post test: .000 cfm at 7 IN. HG (vac) ☒

Particulate Catch Data:

No. of filters used: Recovery solvent(s)

☒ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by: GH

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	493	491	2
Condenser			
Desiccant	1355	1340	15
Total			17

Integrated Gas Sampling Data:

AMBIENT

Bag Pump No. _____ Box No. _____ Bag No. _____
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: _____ cc/min at _____ IN.HG
Time start: _____ (HRS) Time end: _____ (HRS)
Sampling rate: _____ cc/min Operator: _____

S/N of O_2 Analyzer used to monitor train outlet: _____

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: CYPRUS N SHORE
Source: NO 2 FINE CRUSHER
Date: 1-13-95 Test: 8 Run: 3

Operators: GH
Meter Box No.: 17 ΔH@ 1.73 in.WC
Gasmeter Coeff.: .9932

Nozzle No.: 1-4
Nozzle Dia.: .250 in.
Bar. Press.: 29.02 in.Hg

Pitot No.: 24V4
C_p: .84
H_2O: 2 %

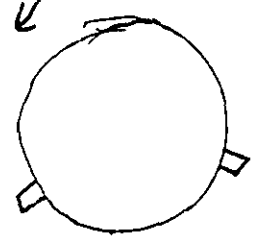
Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	(11:24)	469.02											
A 6	5	473.61	.69	2.64	3.69	6	67	243	251	42	61	55	20.9
5	10	478.30	.68	2.61	8.34	6	67	247	259	42	63	55	20.9
4	15	483.03	.70	2.69	3.06	6	67	249	256	43	64	55	20.9
3	20	488.09	.80	3.07	8.11	7	67	242	251	43	64	55	20.9
2	25	492.98	.75	2.88	2.94	7	68	245	249	43	64	56	20.9
1	30	497.36	.60	2.31	7.37	7	67	250	247	44	64	55	20.9
B 6	35	502.21	.75	2.88	2.26	7	67	255	251	44	64	55	20.9
5	40	507.27	.78	3.00	7.25	7	66	257	261	44	65	55	20.9
4	45	512.13	.76	2.92	2.18	7	67	260	260	45	65	55	20.9
3	50	516.89	.67	2.58	6.81	7	67	252	257	44	65	55	20.9
2	55	521.36	.63	2.42	1.30	7	67	248	251	44	65	55	20.9
1	60	525.47	.54	2.08	5.46	6	67	241	247	44	65	55	20.9
	(1230)												
	θ = 60	V_m = 56.45		ΔH = 2.67							Avg. = 59.54		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 2 Field Data Sheet

Job: Cyprus Northshore
Source: Dry Cobber Stack
Test: 9 Run 1 Date 1/13/95
Stack Dimen.: 61.25 IN.
Dry Bulb: ____ °F Wet bulb: ____ °F
Manometer: ☐ Reg. ☐ Exp ☐ Elec.
Barometric Pressure: 29.02 IN.HG
Static Pressure: -.85 IN.WC
Operators: J.S Nuit TF
Pitot No.: V23-5 C_p .84
9m

Drawing of Test Site

Cross-section View	Elevation View
	

Traverse Point No.	Fraction of Diameter	Distance From Stack Wall (IN.)	Distance From End of Port (IN.)	Velocity	Temp. of Gas (°F)
		Port Length:	IN.	Time Start:	HRS
A1	.021	1.29	3.54		
2	.067	4.10	6.35		
3	.118	7.23	9.48		
4	.177	10.84	13.09		
5	.250	15 31	17.56		
6	.356	21 81	24.06		
B 7	.644	39.45	41.70		
8	.750	45.91	48 19		
9	.823	50.41	52.66		
10	.882	54.02	56.27		
11	.933	57 15	59.40		
12	.979	59 96	62.21		
Temp. Meas. Device & S/N:				Time End:	HRS

R or nothing = reg. manometer; S = expanded; E = electronic

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Cyprus Northshore Date 1/13/95 Test 9 Run 1
Source Dry Cobber Stack No. of traverse points 12
Method 5 Filter holder: glass Filter type: glass fiber

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☑
Post test: 0 cfm at 8 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: 1

Recovery solvent(s)
☑ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by:

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1	501	503	-2
Impinger No. 2			
Impinger No. 3			
Condenser			
Desiccant	1495	1487	8
Total			6

Integrated Gas Sampling Data: Ambient air

Bag Pump No. 5 Box No. ____ Bag No. ____
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: 0 cc/min at 14 IN.HG
Time start: ____ (HRS) Time end: ____ (HRS)
Sampling rate: ____ cc/min Operator: ____

S/N of O_2 Analyzer used to monitor train outlet: ____

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: Cyprus Northshore
Source: Dirt Cooler Stack
Date: 1/13/95 Test 9 Run 1

Operators: J.S DVH TF
Meter Box No. 3 ΔH@ 1.73 in.WC
Gasmeter Coeff. 1.000

Nozzle No. 3-3
Nozzle Dia. .192 in.
Bar. Press. 29.02 in.Hg

Pitot No. U23-5
C_p .84
H_2O 2 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	(820)	891.00											
A 12	2.5	892.54	.91	.97	92.41	3	73	293	247	34	65	61	Ambient
11	5	894.02	.90	.97	93.83	3	73				69	64	Air
10	7.5	895.41	.92	.99	95.27	3	73				71	64	
9	10	896.95	.91	.99	96.71	3	71	253	248	37	73	65	
8	12.5	898.43	.95	1.04	98.18	3	71				74	65	
7	15	899.89	.94	1.02	99.65	3	72				74	65	
6	17.5	901.34	.93	1.02	01.11	3	70	266	265	41	74	66	
5	20	902.80	.99	1.08	02.62	3	70				76	65	
4	22.5	904.26	.99	1.09	4.13	3	70				75	67	
3	25	905.69	.94	1.03	5.61	3	69	269	268	42	77	68	
2	27.5	907.18	.97	1.06	7.10	3	74				78	69	
1	30	908.60	.88	.96	8.53	3	74				79	69	
B 12	32.5	910.11	.95	1.04	0.02	3	74	266	271	43	76	69	
11	35	911.59	.98	1.07	1.52	3	74				79	70	
10	37.5	913.01	1.60	1.10	3.04	3	74				79	70	
9	40	914.54	1.0	1.11	4.57	3	69	267	263	43	80	76	
8	42.5	916.03	.97	1.07	6.08	3	69				80	70	
7	45	917.59	1.0	1.11	7.62	3	69				81	71	
6	47.5	919.16	1.0	1.11	9.15	3	69	263	266	44	81	71	
5	50	920.73	.99	1.10	0.68	3	70				81	72	
4	52.5	922.16	.92	1.02	2.15	3	70				81	72	
3	55	923.66	.83	.92	3.55	3	69	266	263	43	81	72	
2	57.5	924.79	.73	.81	4.67	3	68				81	72	
1	60	926.25	.80	.89	6.25	3	68				81	72	
	(092)												
	θ -60	V_m - 35.25		ΔH -1.02							Avg. - 72.6		

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Cyprus Northshore Date 11/3/95 Test 1 Run 2
Source Dry Cobber Stack No. of traverse points 12
Method 5 Filter holder: glass Filter type: glass fiber

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☑
Post test: 0 cfm at 8 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: 1

Recovery solvent(s)
☑ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by:

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2	197	200	-3
Impinger No. 3			
Condenser			
Desiccant	1498	1484	14
Total			11

Integrated Gas Sampling Data: Ambient air

Bag Pump No. _____ Box No. _____ Bag No. _____
Bag Material: 5-layer Aluminized Tedlar Size: 44 L
Pretest leak check: _____ cc/min at _____ IN.HG
Time start: _____ (HRS) Time end: _____ (HRS)
Sampling rate: _____ cc/min Operator: _____

S/N of O_2 Analyzer used to monitor train outlet: _____

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: Cyprus Northshore
Source: Dry Kiln Stack
Date: 11/13/95 Test 9 Run 2

Operators: J.S DVH T.F
Meter Box No. 3 ΔH@ 1.73 in.WC
Gasmeter Coeff. 1.0004

Nozzle No. 3-3
Nozzle Dia. .182 in.
Bar. Press. 29.02 in.Hg

Pitot No. U33-5
C_p .84
H_2O 1 %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1000	927.92											
B 12	2.5	931.50	1.03	1.14	1.46	5	68	227	236	46	69	68	Ambient
11	5	933.10	.97	1.08	2.96	5	67				72	69	AIR
10	7.5	934.51	.97	1.09	4.47	5	67				74	69	
9	10	936.07	1.03	1.15	6.03	5	68	239	246	47	75	69	
8	12.5	937.51	1.05	1.18	7.61	5	69				76	70	
7	15	939.02	1.05	1.18	9.19	5	68				77	70	
6	17.5	940.55	.93	1.05	0.68	5	68	241	256	47	78	70	
5	20	942.04	.87	.96	2.12	5	68				79	71	
4	22.5	943.57	.87	.98	3.56	5	68				79	71	
3	25	944.98	.80	.90	4.94	5	67	250	257	48	80	71	
2	27.5	946.27	.80	.90	6.26	5	67				80	71	
1	30	947.69	.78	.88	7.63	5	67				80	71	
A 12	32.5	949.16	.92	1.04	9.12	5	67	259	261	49	76	71	
11	35	950.63	.94	1.06	0.61	5	67				81	72	
10	37.5	952.23	.94	1.07	2.12	5	67				81	72	
9	40	953.68	.95	1.08	3.63	5	67	263	261	50	81	72	
8	42.5	955.31	.95	1.08	5.15	5	67				81	72	
7	45	956.69	.94	1.07	6.65	5	67				82	73	
6	47.5	958.31	1.05	1.19	8.25	5	67	267	263	51	82	73	
5	50	959.86	1.0	1.13	9.80	5	68				82	73	
4	52.5	961.43	1.05	1.19	1.39	5	68				82	73	
3	55	962.86	.95	1.08	2.91	5	68	261	263	51	82	73	
2	57.5	964.32	.95	1.08	4.42	5	68				83	73	
1	60	965.85	.83	.94	5.84		67				83	73	
	1:35												
	θ 60	V_m = 35.93		ΔH = 1.06							Avg. = 75.1		

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Interpoll Laboratories EPA Method 5/17 Sample Log Sheet

Job Cyprus Northshore
Source Dry Cooler Stack
Method 5 Filter holder: glass

Date 1/13/95 Test 9 Run 3
No. of traverse points 12
Filter type: glass fiber

Sample Train Leak Check:
Pretest: ≤ 0.02 cfm at 15 IN.HG (vac) ☑
Post test: 0 cfm at 8 IN. HG (vac) ☒

Particulate Catch Data:
No. of filters used: 1

Recovery solvent(s)
☑ acetone
☐ other(s)

No. of probe wash bottles: 1
Sample recovered by:

Condensate Data:

Item	Weight (g)		
	Final	Tare	Difference
Impinger No. 1			
Impinger No. 2			
Impinger No. 3	495	500	-5
Condenser			
Desiccant	1502	1495	7
Total			2

Integrated Gas Sampling Data: Ambient air

Bag Pump No. _____
Bag Material: 5-layer Aluminized Tedlar
Pretest leak check: _____
Time start: _____
Sampling rate: _____

Box No. _____ Bag No. _____
Size: 44 L
cc/min at _____ IN.HG
(HRS) Time end: _____ (HRS)
cc/min Operator: _____

S/N of O_2 Analyzer used to monitor train outlet: _____

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

EPA Method 5 Field Data Sheet

Job: Cyprus Northshore
Source: Dry Coker Stack
Date: 1/13/95 Test 9 Run 3

Operators: J S DVH TF
Meter Box No. 3 ΔH@ 1.73 in.WC
Gasmeter Coeff. 1.0004

Nozzle No. 3-3
Nozzle Dia. .182 in.
Bar. Press. 29.02 in.Hg

Pitot No. V23-5
C_p .84
H_2O / %

Traverse Point No.	Sampling Time (min)	Sample Vol. (cf)	Velocity Head (in.WC)	Orifice Meter (in.WC)	Des. Vol. (cf)	VAC. (in.Hg)	Temperatures (°F) Stack	Probe	Oven	Imp.	Gas/In	Gas/Out	Oxygen (% v/v)
	1124	966.15											
A12	2.5	967.63	.89	1.00	7.61	5	68	231	236	46	71	70	Ambient
11	5	969.10	.89	1.0	9.05	5	68				90	73	Air
10	7.5	970.51	.89	1.0	0.50	5	67				75	71	
9	10	971.96	.93	1.05	1.99	5	68	246	253	45	77	71	
8	12.5	973.53	.99	1.11	3.53	5	68				78	71	
7	15	975.06	.94	1.06	5.03	5	68				79	72	
6	17.5	976.45	.96	1.09	6.54	5	67	252	254	46	79	72	
5	20	978.04	1.05	1.19	8.13	5	67				81	72	
4	22.5	979.70	1.05	1.19	9.72	5	67				81	72	
3	25	981.25	.93	1.05	1.22	5	67	258	263	47	81	72	
2	27.5	982.72	.88	1.00	2.67	5	67				82	73	
1	30	984.17	.83	.95	4.09	5	68				82	73	
B12	32.5	985.66	.98	1.11	5.63	5	68	263	262	49	80	73	
11	35	987.16	.92	1.04	7.12	5	68				82	73	
10	37.5	988.71	.94	1.07	8.62	5	68				83	74	
9	40	990.24	1.0	1.14	0.18	5	67	266	263	50	83	74	
8	42.5	991.76	.98	1.11	1.72	5	68				83	74	
7	45	993.30	1.1	1.25	3.36	5	68				83	74	
6	47.5	994.96	1.1	1.25	4.99	5	67	266	263	51	83	74	
5	50	996.61	1.03	1.17	6.57	5	68				83	74	
4	52.5	998.00	.89	1.01	8.04	5	67				83	75	
3	55	999.42	.87	.99	9.50	5	67	269	264	51	83	75	
2	57.6	1000.88	.79	.9	0.89	5	67				83	75	
1	60	1002.16	.71	.81	2.20	5	67				83	75	
	(1226)												
	θ - 60	V_m -		ΔH - 1.06							Avg. -	76.6	

C-64

Interpoll Laboratories
(612)786-6020

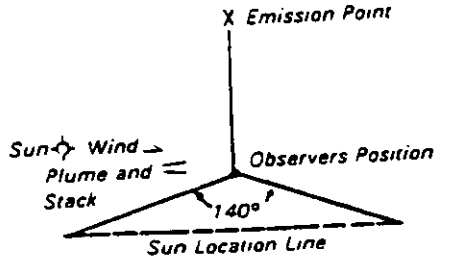
Visible Emissions Form

Test #1

SOURCE NAME: Dry Storage Bin	OBSERVATION DATE: 1-10-95	START TIME	STOP TIME
ADDRESS: Cypress Northshore Mining			
CITY: Silver Bay	STATE: MN	ZIP	
PHONE	SOURCE ID NUMBER		
PROCESS EQUIPMENT	OPERATING MODE		
CONTROL EQUIPMENT	OPERATING MODE		
DESCRIBE EMISSION POINT: START	STOP		
HEIGHT ABOVE GROUND LEVEL: START	STOP	HEIGHT RELATIVE TO OBSERVER: START	STOP
DISTANCE FROM OBSERVER: START	STOP	DIRECTION FROM OBSERVER: START	STOP
DESCRIBE EMISSIONS: START	STOP		
EMISSION COLOR: START	STOP	PLUME TYPE: CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐	
WATER DROPLETS PRESENT: NO ☐ YES ☐		IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☐	
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED: START	STOP		
DESCRIBE BACKGROUND: START	STOP		
BACKGROUND COLOR: START	STOP	SKY CONDITIONS: START	STOP
WIND SPEED: START	STOP	WIND DIRECTION: START	STOP
AMBIENT TEMP.: START	STOP	WET BULB TEMP.	RH,percent

SEC / MIN	0	15	30	45	MIN	0	15	30	45
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				
30					60				

Source Layout Sketch — Draw North Arrow



AVERAGE OPACITY FOR HIGHEST PERIOD	NUMBER OF READINGS ABOVE % WERE	
RANGE OF OPACITY READINGS: MINIMUM	MAXIMUM	
OBSERVER'S NAME (PRINT): Jeff Sciple		
OBSERVER'S SIGNATURE: Jeff Sciple	DATE: 1/10/95	
ORGANIZATION: Interpoll		
CERTIFIED BY: ETA	DATE: 10/9/94	
VERIFIED BY	DATE	

COMMENTS: could not be read - Snow

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SIGNATURE | TITLE | DATE

S-0079R

Interpoll Laboratories
(612)786-6020

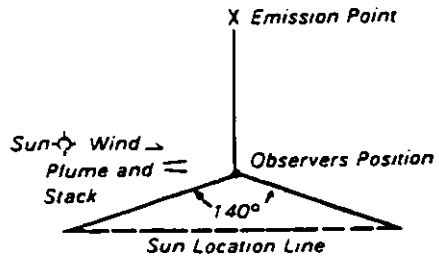
Visible Emissions Form

Test #7

SOURCE NAME: No 2 Boiler Stack	OBSERVATION DATE: 1/12/95
ADDRESS: Northshore Mining	START TIME
CITY: Silver Bay / STATE: MN / ZIP	STOP TIME
PHONE / SOURCE ID NUMBER	
PROCESS EQUIPMENT / OPERATING MODE	
CONTROL EQUIPMENT / OPERATING MODE	
DESCRIBE EMISSION POINT — START / STOP	
HEIGHT ABOVE GROUND LEVEL — START / STOP	HEIGHT RELATIVE TO OBSERVER — START / STOP
DISTANCE FROM OBSERVER — START / STOP	DIRECTION FROM OBSERVER — START / STOP
DESCRIBE EMISSIONS — START / STOP	
EMISSION COLOR — START / STOP	PLUME TYPE. CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT: NO ☐ YES ☐	IF WATER DROPLET PLUME. ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED — START / STOP	
DESCRIBE BACKGROUND — START / STOP	
BACKGROUND COLOR — START / STOP	SKY CONDITIONS — START / STOP
WIND SPEED — START / STOP	WIND DIRECTION — START / STOP
AMBIENT TEMP. — START / STOP	WET BULB TEMP. / RH,percent

SEC / MIN	0	15	30	45	SEC / MIN	0	15	30	45
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				
30					60				

Source Layout Sketch — Draw North Arrow



AVERAGE OPACITY FOR HIGHEST PERIOD	NUMBER OF READINGS ABOVE % WERE
RANGE OF OPACITY READINGS — MINIMUM	MAXIMUM
OBSERVER'S NAME (PRINT): Jeff Scripter	
COMMENTS: could not be done drizzle & fog	OBSERVER'S SIGNATURE: Jeff Scripter — DATE: 1/12/95
	ORGANIZATION: Interpoll
I HAVE RECEIVED A COPY OF THESE OPACITY OBSERVATIONS — SIGNATURE	CERTIFIED BY: ETA — DATE: 10/9/94
TITLE / DATE	VERIFIED BY / DATE

S-0079R

Interpoll Laboratories
(612)736-6020

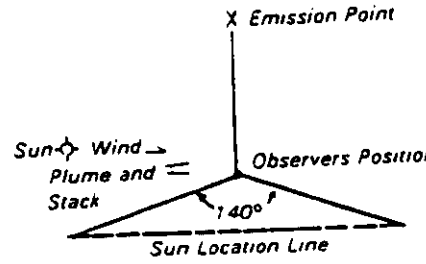
Visible Emissions Form

Test #9

SOURCE NAME: Dry Cobber Stack	OBSERVATION DATE: 11/3/95	START TIME / STOP TIME
ADDRESS: Cyprus Northshore Mining		
CITY: Silver Bay	STATE: MN	ZIP
PHONE	SOURCE ID NUMBER	
PROCESS EQUIPMENT	OPERATING MODE	
CONTROL EQUIPMENT	OPERATING MODE	
DESCRIBE EMISSION POINT: START	STOP	
HEIGHT ABOVE GROUND LEVEL: START	STOP	HEIGHT RELATIVE TO OBSERVER: START STOP
DISTANCE FROM OBSERVER: START	STOP	DIRECTION FROM OBSERVER: START STOP
DESCRIBE EMISSIONS: START	STOP	
EMISSION COLOR: START	STOP	PLUME TYPE: CONTINUOUS ☐ FUGITIVE ☐ INTERMITTENT ☐
WATER DROPLETS PRESENT: NO ☐ YES ☐		IF WATER DROPLET PLUME: ATTACHED ☐ DETACHED ☐
POINT IN THE PLUME AT WHICH OPACITY WAS DETERMINED: START	STOP	
DESCRIBE BACKGROUND: START	STOP	
BACKGROUND COLOR: START	STOP	SKY CONDITIONS: START STOP
WIND SPEED: START	STOP	WIND DIRECTION: START STOP
AMBIENT TEMP.: START	STOP	WET BULB TEMP / RH.percent

SEC / MIN	0	15	30	45	MIN	0	15	30	45
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				
30					60				

Source Layout Sketch — Draw North Arrow



AVERAGE OPACITY FOR HIGHEST PERIOD

NUMBER OF READINGS ABOVE % WERE

RANGE OF OPACITY READINGS: MINIMUM MAXIMUM

OBSERVER'S NAME (PRINT): Jeff Scupki

OBSERVER'S SIGNATURE: Jeff Scupki — DATE: 11/3/95

ORGANIZATION: Interpoll

CERTIFIED BY: ETA — DATE: 10/9/94

VERIFIED BY — DATE

COMMENTS: could not be done heavy snow

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SIGNATURE — TITLE — DATE

S-0079R

VISIBLE EMISSIONS EVALUATOR

This is to certify that

Jeff Scripter

met the specifications of Federal Reference Method 9 and qualified as a visible emissions evaluator. Maximum deviation on white and black smoke did not exceed 7.5% opacity and no single error exceeding 15% opacity was incurred during the certification test conducted by Eastern Technical Associates of Raleigh, North Carolina. This certificate is valid for six months from date of issue.

Thomas Lore
President

245683
Certificate Number

Vice President

Minneapolis
Location

David B. Savage, Jr.
Program Manager

October 5 1994
Date of Issue

APPENDIX D

INTERPOLL LABORATORIES ANALYTICAL DATA

(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job: Cyprus Northshore Mining
Team Leader: DVH
Date Submitted: 1-16-95
Test No.: 2
Date of Analysis: 1-6-95

Source: No. 1105 Pelletizer
Test Site: Stack
Date of Test: 1-10-95
No. of Runs Completed: 3
Technician: B. Drake

Test/Run	Sample Log Number and Type	No. of An.	Buret Readings (ml) Zero Pt.	After CO_2	After O_2	Conc. CO_2 %v/v Dry	Conc. O_2 %v/v Dry	F_o
2/1	4664-09	1	0.00	1.80	19.00	1.80	17.20	
		2	0.00	1.80	19.00	1.80	17.20	
	☑ B ☐ F	Avg				1.80	17.20	
2/2	-10	1	0.00	1.80	19.10	1.80	17.30	
		2	0.00	1.80	19.10	1.80	17.30	
	☑ B ☐ F	Avg				1.80	17.30	
2/3	-11	1	0.00	1.80	19.00	1.80	17.20	
		2	0.00	1.80	19.00	1.80	17.20	
	☑ B ☐ F	Avg				1.80	17.20	
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						

☑ Ambient Air QA Check
☑ Orsat Analyzer System Leak Check
☐ F_o Within EPA M-3 Guidelines for fuel type.

Where $F_o = \frac{20.9 - O_2}{CO_2}$

F=Flask (250 cc all glass)
B=Tedlar Bag (5-layer)

EPA Method 3 Guidelines

Fuel Type	F0 Range
Coal:	
Anthracite/Lignite	1.016-1.130
Bituminous	1.083-1.230
Oil:	
Distillate	1.260-1.413
Residual	1.210-1.370
Gas:	
Natural	1.600-1.836
Propane	1.434-1.586
Butane	1.405-1.553
Wood/Wood Bark	1.000-1.130

LSC-04-BR

(612) 786-6020

EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job: Cyprus Northshore Mining
Team Leader: DUH
Date Submitted: 1-16-95
Test No.: 4
Date of Analysis: 1-16-95

Source: No. 1205 Waste Gas
Test Site: Stack
Date of Test: 1-11-95
No. of Runs Completed: 3
Technician: [illegible]

Test/Run	Sample Log Number and Type	No. of An.	Buret Readings (ml) Zero Pt.	After CO_2	After O_2	Conc. CO_2 %v/v Dry	Conc. O_2 %v/v Dry	F_o
4/1	4664-23	1	0.00	2.10	18.90	2.10	16.80	
		2	0.00	2.10	18.90	2.10	16.80	
	☑ B ☐ F	Avg				2.10	16.80	
4/2	-24	1	0.00	2.00	18.80	2.00	16.80	
		2	0.00	2.00	18.80	2.00	16.80	
	☑ B ☐ F	Avg				2.00	16.80	
4/3	-25	1	0.00	2.00	19.00	2.00	17.00	
		2	0.00	2.00	19.00	2.00	17.00	
	☑ B ☐ F	Avg				2.00	17.00	
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						

☑ Ambient Air QA Check
☑ Orsat Analyzer System Leak Check
☐ F_o Within EPA M-3 Guidelines for fuel type.

Where $F_o = \frac{20.9 - O_2}{CO_2}$

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EPA Method 3 Guidelines

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Coal:	
Anthracite/Lignite	1.016-1.130
Bituminous	1.083-1.230
Oil:	
Distillate	1.260-1.413
Residual	1.210-1.370
Gas:	
Natural	1.600-1.836
Propane	1.434-1.586
Butane	1.405-1.553
Wood/Wood Bark	1.000-1.130

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EPA Method 3 Data Reporting Sheet
Orsat Analysis

Job Cyprus Northshore Mining
Team Leader GH
Date Submitted 1-16-95
Test No. 6
Date of Analysis 1-16-95

Source No. 12 Rotocone - North
Test Site Stack
Date of Test 1-12-95
No. of Runs Completed 3
Technician B. [illegible]

Test/Run	Sample Log Number and Type	No. of An.	Buret Readings (ml) Zero Pt.	After CO_2	After O_2	Conc. CO_2 %v/v Dry	Conc. O_2 %v/v Dry	F_o
6/1	4664-50	1	0.00	0.00	20.90	0.00	20.90	
		2	0.00	0.00	20.90	0.00	20.90	
	☐ B ☐ F	Avg				0.00	20.90	
6/2	-51	1	0.00	0.00	20.90	0.00	20.90	
		2	0.00	0.00	20.90	0.00	20.90	
	☐ B ☐ F	Avg				0.00	20.90	
6/3	-52	1	0.00	0.00	20.90	0.00	20.90	
		2	0.00	0.00	20.90	0.00	20.90	
	☐ B ☐ F	Avg				0.00	20.90	
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						
		1						
		2						
	☐ B ☐ F	Avg						

☑ Ambient Air QA Check
☑ Orsat Analyzer System Leak Check
☐ F_o Within EPA M-3 Guidelines for fuel type.

Where $F_o = \frac{20.9 - O_2}{CO_2}$

F=Flask (250 cc all glass)
B=Tedlar Bag (5-layer)

EPA Method 3 Guidelines

Fuel Type	F0 Range
Coal:	
Anthracite/Lignite	1.016-1.130
Bituminous	1.083-1.230
Oil:	
Distillate	1.260-1.413
Residual	1.210-1.370
Gas:	
Natural	1.600-1.836
Propane	1.434-1.586
Butane	1.405-1.553
Wood/Wood Bark	1.000-1.130

LSC-04-BR

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Impinger Catch Data Reporting Sheet

Protocol: ☒Minnesota ☐Wisconsin ☐Iowa ☐EPA Method 202 ☐Other

Job: Cyprus North Shore | Source/Site: Bin Storage

Date Submitted: 1-16-95 | Test No.: 1

Date of Analysis: 1-17-95 (18 JL 1-25-95) | Technician: J. Lopez

	Solvent Phase	Aqueous Phase
Test: 1 Run: 0	Dish No: 1	Dish No:
Log No: 4664 - 01 I	Dish + Sample Wt: 56.9700 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 56.9696 g	Dish Tare Wt: g
	Fraction Wt: .0004 g	Fraction Wt: g
Comments: Field Blank	Smpl Vol: ml, Aliqt: ml, Factor: 1.000	Smpl Vol: ml, Aliqt: ml, Factor:
	Sample Wt: .0004 g	Sample Wt: g
Test: 1 Run: 1	Dish No: 3	Dish No:
Log No: -02 I	Dish + Sample Wt: 43.8915 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 43.8910 g	Dish Tare Wt: g
	Fraction Wt: .0005 g	Fraction Wt: g
Comments:	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: ml, Aliqt: ml, Factor
	Sample Wt: .0005 g	Sample Wt: g
Test: 1 Run: 2	Dish No: 25	Dish No:
Log No: -03 I	Dish + Sample Wt: 44.3447 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 44.3435 g	Dish Tare Wt: g
	Fraction Wt: .0012 g	Fraction Wt: g
Comments:	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: ml, Aliqt: ml, Factor
	Sample Wt: .0012 g	Sample Wt: g
Test: 1 Run: 3	Dish No: 27	Dish No:
Log No: -04 I	Dish + Sample Wt: 52.4460 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 52.4444 g	Dish Tare Wt: g
	Fraction Wt: .0016 g	Fraction Wt: g
Comments:	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: ml, Aliqt: ml, Factor
	Sample Wt: .0016 g	Sample Wt: g

Note: Factor = Sample Volume/Aliquot Volume

Blank Solvent Wt. .0001 g

VSAB

	RUN 0 Field Blank	RUN 1	RUN 2	RUN 3
Results of Solvent Phase	.0004 D-7	.0001	.0008	.0012
Results of Aqueous Phase				

(612) 786-6020

EPA Method 5 Data Reporting Sheet Probe/Cyclone Wash

Job	North Shore Mining	Source	Bin Storage
Team Leader	ET	Test Site	Stack
Date Submitted	1/16/95	Date of Test	1/10/95
Test No.	1	No. of Runs	3
Date of Analysis	1/16/95	Technician	KT
Transport Leakage ☐	None ☒ ml	Solvent	Acetone

Test: 1	Run: 0	Dish No:	731 -
Field Blank:		Dish Tare Wt:	45.6745 g
Log No: 4664-01P		Dish + Sample Wt:	45.6747 g
Volume of Solvent 120 ml		Sample Wt:	0.0002 g
*Solvent Residue 1.67 ug/ml			
Test: 1	Run: 1	Dish No:	738 -
Vol. of Solvent 130 ml		Dish Tare Wt:	44.9282 g
Log Number -02P		Dish + Sample Wt:	44.9370 g
Comments		Sample Wt:	0.0088 g
Test: 1	Run: 2	Dish No:	739 -
Vol. of Solvent 140 ml		Dish Tare Wt:	45.3591 g
Log Number -03P		Dish + Sample Wt:	45.3681 g
Comments		Sample Wt:	0.0090 g
Test: 1	Run: 3	Dish No:	740 -
Vol. of Solvent 130		Dish Tare Wt:	44.9522 g
Log Number -04P		Dish + Sample Wt:	44.9610 g
Comments		Sample Wt:	0.0088 g
Test:	Run:	Dish No:	
Log No:		Dish Tare Wt:	g
Comments:		Dish + Sample Wt:	g
		Sample Wt:	g
Test:	Run:	Dish No:	
Vol of Solvent	ml	Dish Tare Wt:	g
Log Number		Dish + Sample Wt:	g
Comments		Sample Wt:	g

*Solvent Residue 1.67 ug/ml = [(Sample Wt. 0.0002 g) (10⁶)]/Vol. of Sol. 120 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

Results: Blank Solvent Wt. 0.0002

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0056	0.0088	0.0056	D-8	

EPA Method 5 Data Reporting Sheet Filter Gravimetrics

Job	North Shore Mining	Source	Bin Storage
Team Leader	ET	Test Site	Stack
Date Submitted	1/16/95	Date of Test	1/10/95
Test No.	1	No. of Runs	3
Date of Analysis	1/16/95	Technician	KT

Test: 1 Run: 0		Filter No:	6761
Field Blank:		Filter Type:	4"G.F.
Log No: 4664-01F		Filter Tare Wt:	0.9490 g
Comments:		Filter + Sample Wt:	0.9495 g
		Sample Wt:	0.0005 g
Test: 1 Run: 1		Filter No:	6756
Log No: -02F		Filter Type:	4"GF.
Comments:		Filter Tare Wt:	0.9402 g
		Filter + Sample Wt:	0.9433 g
		Sample Wt:	0.0031 g
Test: 1 Run: 2		Filter No:	6755
Log No: -03F		Filter Type:	4"GF.
Comments:		Filter Tare Wt:	0.9237 g
		Filter + Sample Wt:	0.9281 g
		Sample Wt:	0.0044 g
Test: 1 Run: 3		Filter No:	6759
Log No: -04F		Filter Type:	4"GF.
Comments:		Filter Tare Wt:	0.9296 g
		Filter + Sample Wt:	0.9358 g
		Sample Wt:	0.0062 g
Test: Run:		Filter No.	
Log No:		Filter Type:	
Comments:		Filter Tare Wt:	g
		Filter + Sample Wt.	g
		Sample Wt:	g
Test: Run:		Filter No:	
Log No:		Filter Type:	
Comments:		Filter Tare Wt:	g
		Filter + Sample Wt:	g
		Sample Wt:	g

Results:

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0031	0.0044	0.0062		

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0118	0.0140	0.0160		

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Impinger Catch Data Reporting Sheet

Protocol: ☒Minnesota ☐Wisconsin ☐Iowa ☐EPA Method 202 ☐Other _____

Job: North Shore | Source/Site: No 1 & 5 Pellitizer / Stack

Date Submitted: 1-16-95 | Test No.: 2

Date of Analysis: 1-18-95 | Technician: J. Lopez

	Solvent Phase	Aqueous Phase
Test: 2 Run: 0	Dish No: 60	Dish No:
Log No: 4664-05 I	Dish + Sample Wt: 43.5640 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 43.5635 g	Dish Tare Wt: g
	Fraction Wt: .0005 g	Fraction Wt: g
Comments: Field Blank	Smpl Vol: ml, Aliqt: ml, Factor: 1.000	Smpl Vol: ml, Aliqt: ml, Factor:
	Sample Wt: .0005 g	Sample Wt: g
Test: 2 Run: 1	Dish No: 68	Dish No:
Log No: -06 I	Dish + Sample Wt: 43.1590 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 43.1549 g	Dish Tare Wt: g
	Fraction Wt: .0041 g	Fraction Wt: g
Comments:	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: ml, Aliqt: ml, Factor
	Sample Wt: .0041 g	Sample Wt: g
Test: 2 Run: 2	Dish No: 340	Dish No:
Log No: -07 I	Dish + Sample Wt: 47.9175 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 47.9145 g	Dish Tare Wt: g
	Fraction Wt: .0030 g	Fraction Wt: g
Comments:	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: ml, Aliqt: ml, Factor
	Sample Wt: .0030 g	Sample Wt: g
Test: 2 Run: 3	Dish No: 404	Dish No:
Log No: -08 I	Dish + Sample Wt: 47.6438 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 47.6395 g	Dish Tare Wt: g
	Fraction Wt: .0043 g	Fraction Wt: g
Comments:	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: ml, Aliqt: ml, Factor
	Sample Wt: .0043 g	Sample Wt: g

Note: Factor = Sample Volume/Aliquot Volume

Blank Solvent Wt. .0001 g

	RUN 0	RUN 1	RUN 2	RUN 3
Results of Solvent Phase	.0005	.0036	.0025	.0038
Results of Aqueous Phase	D-10			

EPA Method 5 Data Reporting Sheet Probe/Cyclone Wash

Job	North Shore - Cyprus	Source	No 1105 Pelletizer
Team Leader	DVH	Test Site	Stack
Date Submitted	1/16/95	Date of Test	1/10/95
Test No.	2	No. of Runs	3
Date of Analysis	1/16/95	Technician	KT
Transport Leakage ☐	None ☒ ml	Solvent	Acetone

Test: 2 Run: 0		Dish No:	820
Field Blank:		Dish Tare Wt:	44.1965 g
Log No: 4664-05P		Dish + Sample Wt:	44.1970 g
Volume of Solvent 130 ml		Sample Wt:	0.0005 g
*Solvent Residue 3.85 ug/ml			
Test: 2 Run: 1		Dish No:	791
Vol. of Solvent 200 ml		Dish Tare Wt:	44.0824 g
Log Number 06P		Dish + Sample Wt:	44.1029 g
Comments		Sample Wt:	0.0205 g
Test: 2 Run: 2		Dish No:	792
Vol. of Solvent 240 ml		Dish Tare Wt:	47.2562 g
Log Number -07P		Dish + Sample Wt:	47.2812 g
Comments		Sample Wt:	0.0250 g
Test: 2 Run: 3		Dish No:	793
Vol. of Solvent 160		Dish Tare Wt:	45.9574 g
Log Number -08P		Dish + Sample Wt:	45.9805 g
Comments		Sample Wt:	0.0231 g
Test: Run:		Dish No:	
Log No:		Dish Tare Wt:	g
Comments:		Dish + Sample Wt:	g
		Sample Wt:	g
Test: Run:		Dish No:	
Vol of Solvent ml		Dish Tare Wt:	g
Log Number		Dish + Sample Wt:	g
Comments		Sample Wt:	g

*Solvent Residue 3.85 ug/ml = [(Sample Wt. 0.0005 g) (10^6)]/Vol. of Sol. 130 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

Results: Blank Solvent Wt. 0.0005

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0197	0.0240	0.0225	0-11	

EPA Method 5 Data Reporting Sheet Filter No. 1105 Pebble

Cyprus North Shore	Source	Stack
DVH	Test Site	1/10/95
1/16/95	Date of Test	3
2	No. of Runs	KT
1/16/95	Technician	

2 Run: 0	Filter No:	7063	
	Filter Type:	4" GF	g
	Filter Tare Wt:	0.9565	g
664-05F	Filter + Sample Wt:	0.9567	g
	Sample Wt:	0.0002	
2 Run: 1	Filter No:	7067	
	Filter Type:	4"GF	g
-06F	Filter Tare Wt:	0.9530	g
	Filter + Sample Wt:	0.9640	g
	Sample Wt:	0.0110	
2 Run: 2	Filter No:	7068	
	Filter Type:	4"GF	g
-07F	Filter Tare Wt:	0.9486	g
	Filter + Sample Wt:	0.9587	g
	Sample Wt:	0.0101	
2 Run: 3	Filter No:	7062	
	Filter Type:	4" GF	g
-08F	Filter Tare Wt:	0.9471	g
	Filter + Sample Wt:	0.9586	g
ments:	Sample Wt:	0.0115	
Run:	Filter No.		
	Filter Type:		g
st:	Filter Tare Wt:		g
g No:	Filter + Sample Wt.		g
omments:	Sample Wt:		
Run:	Filter No:		
	Filter Type:		g
Test:	Filter Tare Wt:		g
g No:	Filter + Sample Wt:		g
Comments:	Sample Wt:		

esults:

	Run 1	Run 2	Run 3	Run 4	Run 5
Field Blank	0.0110	0.0101	0.0115		

	Run 1	Run 2	Run 3	Run 4	Run 5
Field Blk.	0.0343	0.0366	0.0378		

EPA Method 5 Data Reporting Sheet Probe/Cyclone Wash

Job	Cyprus North Shore	Source	1104 Pelletizer
Team Leader	GH	Test Site	Stack
Date Submitted	1/16/95	Date of Test	1/10/95
Test No.	3	No. of Runs	3
Date of Analysis	1/16/95	Technician	RT
Transport Leakage ☐	None ☒ ml	Solvent	Acetone

Test: 3 Run: 0		Dish No:	754
Field Blank:		Dish Tare Wt:	45.2821 g
Log No: 4664-12P		Dish + Sample Wt:	45.2826 g
Volume of Solvent 110 ml		Sample Wt:	0.0005 g
*Solvent Residue 4.55 ug/ml			
Test: 3 Run: 1		Dish No:	765
Vol. of Solvent 80 ml		Dish Tare Wt:	44.1893 g
Log Number 4664-13P		Dish + Sample Wt:	44.2135 g
Comments		Sample Wt:	0.0242 g
Test: 3 Run: 2		Dish No:	766
Vol. of Solvent 100 ml		Dish Tare Wt:	42.2415 g
Log Number -14P		Dish + Sample Wt:	42.2595 g
Comments		Sample Wt:	0.0180 g
Test: 3 Run: 3		Dish No:	767
Vol. of Solvent 60		Dish Tare Wt:	42.4095 g
Log Number -15P		Dish + Sample Wt:	42.4164 g
Comments		Sample Wt:	0.0069 g
Test: Run:		Dish No:	
Log No:		Dish Tare Wt:	g
Comments:		Dish + Sample Wt:	g
		Sample Wt:	g
Test: Run:		Dish No:	
Vol of Solvent ml		Dish Tare Wt:	g
Log Number		Dish + Sample Wt:	g
Comments		Sample Wt:	g

*Solvent Residue 4.55 ug/ml = [(Sample Wt. ca. 5 g) (10^6)]/Vol. of Sol. 110 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

Results:

Blank Solvent Wt. 0.0005

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0238	0.0175	0.0066		

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EPA Method 5 Data Reporting

Cyprus North Shore	Source	1104 Preheat	
GH	Test Site	Stack	
1/16/95	Date of Test	1/10/95	Trk
3	No. of Runs	3	
1/16/95	Technician	KT	

3 Run: 0	Filter No:	7227	
	Filter Type:	4"GF.	g
46641-12F	Filter Tare Wt:	0.9115	g
	Filter + Sample Wt:	0.9116	g
	Sample Wt:	0.0001	
3 Run: 1	Filter No:	7048	
	Filter Type:	4"GF	g
-13F	Filter Tare Wt:	0.9576	g
	Filter + Sample Wt:	0.9716	g
	Sample Wt:	0.0140	
3 Run: 2	Filter No:	7049	
	Filter Type:	4"GF.	g
-14F	Filter Tare Wt:	0.9675	g
	Filter + Sample Wt:	0.9784	g
	Sample Wt:	0.0109	
3 Run: 3	Filter No:	7110	
	Filter Type:	4"GF.	g
-15F	Filter Tare Wt:	0.9437	g
	Filter + Sample Wt:	0.9557	g
	Sample Wt:	0.0120	
Run:	Filter No.		
	Filter Type:		g
	Filter Tare Wt:		g
	Filter + Sample Wt.		g
	Sample Wt:		
Run:	Filter No:		
	Filter Type:		g
	Filter Tare Wt:		g
	Filter + Sample Wt:		g
	Sample Wt:		

Results:

	Run 1	Run 2	Run 3	Run 4	Run 5
Field Blank	0.0140	0.0109	0.0120		
Field Blk.	0.0391	0.0296	0.0209		

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EPA Method 5 Data Reporting Sheet Probe/Cyclone Wash

Job	Cypus North Shore	Source	No 1205 Waste Gas
Team Leader	DVH	Test Site	Stack
Date Submitted	1/16/95	Date of Test	1/11/95
Test No.	4	No. of Runs	3
Date of Analysis	1/16/95	Technician	KT
Transport Leakage☐	None☒ ml	Solvent	Acetone

Test: 4 Run: 0		Dish No:	728
Field Blank: 130		Dish Tare Wt:	42.9797 g
Log No: 4661-19P		Dish + Sample Wt:	42.9798 g
Volume of Solvent	100 ml	Sample Wt:	0.0001 g
*Solvent Residue	1.0 ug/ml		
Test: 4 Run: 1		Dish No:	744
Vol. of Solvent	200 ml	Dish Tare Wt:	48.6333 g
Log Number	-20P	Dish + Sample Wt:	48.6515 g
Comments		Sample Wt:	0.0182 g
Test: 4 Run: 2		Dish No:	796
Vol. of Solvent	200 ml	Dish Tare Wt:	44.7964 g
Log Number	-21P	Dish + Sample Wt:	44.8114 g
Comments		Sample Wt:	0.0150 g
Test: 4 Run: 3		Dish No:	797
Vol. of Solvent	190	Dish Tare Wt:	43.0471 g
Log Number	-22P	Dish + Sample Wt:	43.0619 g
Comments		Sample Wt:	0.0148 g
Test: Run:		Dish No:	
Log No:		Dish Tare Wt:	g
Comments:		Dish + Sample Wt:	g
		Sample Wt:	g
Test: Run:		Dish No:	
Vol of Solvent	ml	Dish Tare Wt:	g
Log Number		Dish + Sample Wt:	g
Comments		Sample Wt:	g

*Solvent Residue 1.0 ug/ml = [(Sample Wt. 0.0001 g) (10⁶)]/Vol. of Sol. 100 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

Results: Blank Solvent Wt. 0.0001

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0150	0.0148	0.0146	D-17	

EPA Method 5 Data Reporting Sheet

Cyprus North Shore	Source	No 1205 Waste	
DVH	Test Site	Stack	
1/16/95	Date of Test	1/11/95	
4	No. of Runs	3	
1/16/95	Technician	RH	

4 Run: 0	Filter No:	7100	
	Filter Type:	4"GF	g
46641-19F	Filter Tare Wt:	0.9479	g
	Filter + Sample Wt:	0.9480	g
	Sample Wt:	0.0001	g
4 Run: 1	Filter No:	7065	
	Filter Type:	4"GF	g
-20F	Filter Tare Wt:	0.9472	g
	Filter + Sample Wt:	0.9549	g
	Sample Wt:	0.0077	g
4 Run: 2	Filter No:	7064	
	Filter Type:	4"GF	g
-21F	Filter Tare Wt:	0.9520	g
	Filter + Sample Wt:	0.9609	g
	Sample Wt:	0.0089	g
4 Run: 3	Filter No:	7066	
	Filter Type:	4"GF	g
-22F	Filter Tare Wt:	0.9396	g
	Filter + Sample Wt:	0.9476	g
	Sample Wt:	0.0080	g
Run:	Filter No.		
	Filter Type:		g
Test:	Filter Tare Wt:		g
No:	Filter + Sample Wt.		g
Comments:	Sample Wt:		g
Run:	Filter No:		
	Filter Type:		g
Test:	Filter Tare Wt:		g
Loc No:	Filter + Sample Wt:		g
Comments:	Sample Wt:		g

Results:

	Run 1	Run 2	Run 3	Run 4	Run 5
Field Blank	0.0077	0.0089	0.0080		
Field Blk.	0.0297	0.6281	0.0273		

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EPA Method 5 Data Reporting Sheet Probe/Cyclone Wash

Job	Cyprus North Shore	Source	1204 Waste Gas
Team Leader	GH	Test Site	Stack
Date Submitted	1/16/95	Date of Test	1/11/95
Test No.	5	No. of Runs	3
Date of Analysis	1/16/95	Technician	KT
Transport Leakage☐	None☒ ml	Solvent	Acetone

Test: 5 Run: C		Dish No:	4
Field Blank:		Dish Tare Wt:	47.3797 g
Log No:	4664-39P	Dish + Sample Wt:	47.3802 g
Volume of Solvent	130 ml	Sample Wt:	0.0005 g
*Solvent Residue	3.85 ug/ml		
Test: 5 Run: 1		Dish No:	6
Vol. of Solvent	100 ml	Dish Tare Wt:	48.2716 g
Log Number	-40P	Dish + Sample Wt:	48.2838 g
Comments		Sample Wt:	0.0122 g
Test: 5 Run: 2		Dish No:	8
Vol. of Solvent	80 ml	Dish Tare Wt:	46.9757 g
Log Number	-41P	Dish + Sample Wt:	46.9820 g
Comments		Sample Wt:	0.0063 g
Test: 5 Run: 3		Dish No:	9
Vol. of Solvent	110	Dish Tare Wt:	43.6647 g
Log Number	-42P	Dish + Sample Wt:	43.6748 g
Comments		Sample Wt:	0.0101 g
Test: Run:		Dish No:	
Log No:		Dish Tare Wt:	g
Comments:		Dish + Sample Wt:	g
		Sample Wt:	g
Test: Run:		Dish No:	
Vol of Solvent	ml	Dish Tare Wt:	g
Log Number		Dish + Sample Wt:	g
Comments		Sample Wt:	g

*Solvent Residue 3.85 ug/ml = [(Sample Wt Δwts g) (10^6)]/Vol. of Sol. 130 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

Results: Blank Solvent Wt. 0.0005

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0118	0.0060	0.0097		

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EPA Method 5 Data Reporting Sheet

Cyprus North Shore
GH
1/16/95
5

Source: 1204 Waste Stack
Test Site: Stack
Date of Test: 1/11/95
No. of Runs: 3
Technician: RT

5 Run: 0	Filter No:	7225
	Filter Type:	4"GF
	Filter Tare Wt:	0.9135 g
4664-39F	Filter + Sample Wt:	0.9135 g
	Sample Wt:	0.0000
5 Run: 1	Filter No:	7111
	Filter Type:	4"GF
	Filter Tare Wt:	0.9489 g
-40F	Filter + Sample Wt:	0.9602 g
	Sample Wt:	0.0113
5 Run: 2	Filter No:	7112
	Filter Type:	4"GF
	Filter Tare Wt:	0.9514 g
-41F	Filter + Sample Wt:	0.9635 g
	Sample Wt:	0.0121
5 Run: 3	Filter No:	7113
	Filter Type:	4"GF
	Filter Tare Wt:	0.94167 g
-42F	Filter + Sample Wt:	0.9586 g
	Sample Wt:	0.0119
Run:	Filter No:	
	Filter Type:	g
	Filter Tare Wt:	g
	Filter + Sample Wt:	g
	Sample Wt:	
Run:	Filter No:	
	Filter Type:	g
	Filter Tare Wt:	g
	Filter + Sample Wt:	g
	Sample Wt:	

Test:
Log No:
Comments:

Results:

	Run 1	Run 2	Run 3	Run 4	Run 5
Field Blank	0.0113	0.0121	0.0119		

	Run 1	Run 2	Run 3	Run 4	Run 5
Field Blk.	C.0240	0.0184	0.0233		

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Solvent Rinse Data Reporting Sheet

☒ EPA Method 5 Probe Wash ☐ EPA Method 29 Probe Wash ☐ EPA Method 202 Cup & Tube Wash

Job	Cyprus North Shore	Source/Site	No 12 Rotocone - Stack North
Date Submitted	1/16/95	Test No.	6
Date of Analysis	1/16/95	Technician	KT

Transport Leakage ☐ None ☒ _____ ml Solvent Acetone

Test: 6 Run: 0		Dish No:	15
Log No:	41664-116P	Dish + Sample Wt:	49.9871 g
Volume of Solvent	120 ml	Dish Tare Wt:	49.9873 g
*Solvent Residue	1.67 ug/ml	Sample Wt:	0.0002 g
Test: 6 Run: 1		Dish No:	17
Vol. of Solvent	160 ml	Dish + Sample Wt:	48.3916 g
Log Number	-47P	Dish Tare Wt:	48.4059 g
Comments		Sample Wt:	0.0143 g
Test: 6 Run: 2		Dish No:	20
Vol. of Solvent	100 ml	Dish + Sample Wt:	48.8135 g
Log Number	-48P	Dish Tare Wt:	48.8254 g
Comments		Sample Wt:	0.0119 g
Test: 6 Run: 3		Dish No:	22
Vol. of Solvent	100	Dish + Sample Wt:	51.3601 g
Log Number	-49P	Dish Tare Wt:	51.3697 g
Comments		Sample Wt:	0.0096 g

*Solvent Residue 1.67 ug/ml = [(Sample Wt. 0.0012 g) (10^6)]/Vol. of Sol. 120 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

	RUN 1	RUN 2	RUN 3	RUN
Results of Solvent Rinse g	0.0140	0.0017 D-23	0.0094	

EPA Method 5 Data Reporting Sheet Filter Gravimetrics

Job	Cyprus North Shore	Source	No 12 Rotocone
Team Leader	GH	Test Site	Stack North
Date Submitted	1/16/95	Date of Test	1/10/95
Test No.	6	No. of Runs	3
Date of Analysis		Technician	KT

Test:	6 Run: 0	Filter No:	7226
Field Blank:		Filter Type:	4"GF
Log No:	4664-46F	Filter Tare Wt:	0.9086 g
Comments:		Filter + Sample Wt:	0.9086 g
		Sample Wt:	0.0000 g
Test:	6 Run: 1	Filter No:	7114
Log No:	-0-47F	Filter Type:	4"GF
Comments:		Filter Tare Wt:	0.9423 g
		Filter + Sample Wt:	0.9436 g
		Sample Wt:	0.0013 g
Test:	6 Run: 2	Filter No:	7116
Log No:	-48F	Filter Type:	4"GF
Comments:		Filter Tare Wt:	0.9345 g
		Filter + Sample Wt:	0.9368 g
		Sample Wt:	0.0023 g
Test:	6 Run: 3	Filter No:	7118
Log No:	-49F	Filter Type:	4"GF
Comments:		Filter Tare Wt:	0.9490 g
		Filter + Sample Wt:	0.9526 g
		Sample Wt:	0.0036 g
Test:	Run:	Filter No.	
Log No:		Filter Type:	
Comments:		Filter Tare Wt:	g
		Filter + Sample Wt.	g
		Sample Wt:	g
Test:	Run:	Filter No:	
Log No:		Filter Type:	
Comments:		Filter Tare Wt:	g
		Filter + Sample Wt:	g
		Sample Wt:	g

Results:

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0013	0.0023	0.0036		

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0158	0.0147	0.0136		

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Impinger Catch Data Reporting Sheet

Protocol: ☒Minnesota ☐Wisconsin ☐Iowa ☐EPA Method 202 ☐Other

Job: Cyprus North Shore
Source/Site: No. 2 Boiler / Stack
Date Submitted: 1-16-95
Test No.: 7
Date of Analysis: 1-20-95
Technician: J. Lorenz

	Solvent Phase	Aqueous Phase
Test: 7 Run: 0	Dish No: 15	Dish No:
Log No: 4664-53 I	Dish + Sample Wt: 49.9865 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 49.9861 g	Dish Tare Wt: g
	Fraction Wt: .0004 g	Fraction Wt: g
Comments: Field Blank	Smpl Vol: 50 ml, Alqt: 40 ml, Factor: 1.250	Smpl Vol: ml, Alqt: ml, Factor:
	Sample Wt: .0005 g	Sample Wt: g
Test: 7 Run: 1	Dish No: 17	Dish No:
Log No: -54 I	Dish + Sample Wt: 48.3910 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 48.3898 g	Dish Tare Wt: g
	Fraction Wt: .0012 g	Fraction Wt: g
Comments:	Smpl Vol: 50 ml, Alqt: 40 ml, Factor 1.250	Smpl Vol: ml, Alqt: ml, Factor
	Sample Wt: .0015 g	Sample Wt: g
Test: 7 Run: 2	Dish No: 20	Dish No:
Log No: -55 I	Dish + Sample Wt: 48.8150 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 48.8129 g	Dish Tare Wt: g
	Fraction Wt: .0021 g	Fraction Wt: g
Comments:	Smpl Vol: 50 ml, Alqt: 40 ml, Factor 1.250	Smpl Vol: ml, Alqt: ml, Factor
	Sample Wt: .0026 g	Sample Wt: g
Test: 7 Run: 3	Dish No: 59	Dish No:
Log No: -56 I	Dish + Sample Wt: 44.7352 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 44.7337 g	Dish Tare Wt: g
	Fraction Wt: .0015 g	Fraction Wt: g
Comments:	Smpl Vol: 50 ml, Alqt: 40 ml, Factor 1.250	Smpl Vol: ml, Alqt: ml, Factor
	Sample Wt: .0019 g	Sample Wt: g

Note: Factor = Sample Volume/Aliquot Volume

Blank Solvent Wt. .0001 g

√SAB

	RUN Field Blank 0	RUN 1	RUN 2	RUN 3
Results of Solvent Phase	.0005	.0010	.0021	.0014
Results of Aqueous Phase				

D-25

EPA Method 5 Data Reporting Sheet Probe/Cyclone Wash

Job	Cypress North Shore	Source	No 2 Boiler
Team Leader	DUH	Test Site	Stack
Date Submitted	1/16/95	Date of Test	1/12/95
Test No.	7	No. of Runs	3
Date of Analysis	1/16/95	Technician	KT
Transport Leakage ☐	None ☒ ml	Solvent	Acetone

Test: 7 Run: 0		Dish No:	23
Field Blank: 130		Dish Tare Wt:	46 0853 g
Log No: 46641-53P		Dish + Sample Wt:	46.0858 g
Volume of Solvent	100 ml	Sample Wt:	0.0005 g
*Solvent Residue	5.0 ug/ml		
Test: 7 Run: 1		Dish No:	32
Vol. of Solvent	150 ml	Dish Tare Wt:	57.8077 g
Log Number	-54P	Dish + Sample Wt:	57.8338 g
Comments		Sample Wt:	0.0261 g
Test: 7 Run: 2		Dish No:	39
Vol. of Solvent	140 ml	Dish Tare Wt:	49 4371 g
Log Number	-55P	Dish + Sample Wt:	49.4574 g
Comments		Sample Wt:	0.0203 g
Test: 7 Run: 3		Dish No:	52
Vol. of Solvent	160	Dish Tare Wt:	50.8901 g
Log Number	-56P	Dish + Sample Wt:	50.9118 g
Comments		Sample Wt:	0.0217 g
Test: Run:		Dish No:	
Log No:		Dish Tare Wt:	g
Comments:		Dish + Sample Wt:	g
		Sample Wt:	g
Test: Run:		Dish No:	
Vol of Solvent	ml	Dish Tare Wt:	g
Log Number		Dish + Sample Wt:	g
Comments		Sample Wt:	g

*Solvent Residue 5.0 ug/ml = [(Sample Wt. 0.0005 g) (10^6)]/Vol. of Sol. 100 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

Results: Blank Solvent Wt. _____

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0253	0.0196	0.0209	D-26	

EPA Method 5 Data Reporting Sheet

	Cyprus North Shore	Source	No. 2 Boiler
	DVH	Test Site	Stack
	1/16/95	Date of Test	1/12/95
	7	No. of Runs	3
alysis	1/16/95	Technician	KT

	7 Run:0	Filter No:	7071
lank:		Filter Type:	4" GF
	46664-53F	Filter Tare Wt:	0.9534 g
s:		Filter + Sample Wt:	0.9534 g
		Sample Wt:	0.0000 g
	7 Run: 1	Filter No:	7053
o:	-54F	Filter Type:	4"GF
nts:		Filter Tare Wt:	0.9684 g
		Filter + Sample Wt:	0.9763 g
		Sample Wt:	0.0079 g
	7 Run: 2	Filter No:	7073
No:	-55F	Filter Type:	4"GF
ents:		Filter Tare Wt:	0.9547 g
		Filter + Sample Wt:	0.9628 g
		Sample Wt:	0.0081 g
	7 Run: 3	Filter No:	7099
og No:	-56F	Filter Type:	4"GF
mments:		Filter Tare Wt:	0.9446 g
		Filter + Sample Wt:	0.9543 g
		Sample Wt:	0.0097 g
Test:	Run:	Filter No.	
Log No:		Filter Type:	
omments:		Filter Tare Wt:	g
		Filter + Sample Wt.	g
		Sample Wt:	g
Test:	Run:	Filter No:	
Log No:		Filter Type:	
Comments:		Filter Tare Wt:	g
		Filter + Sample Wt:	g
		Sample Wt:	g

Results:

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0079	0.0081	0.0097		

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0342	0.0298	0.0328		

EPA Method 5 Data Reporting Sheet Probe/Cyclone Wash

Job	Cyprus North Shore	Source	No 101 Fine Crusher
Team Leader	GH	Test Site	Stack
Date Submitted	1/16/95	Date of Test	1/13/95
Test No.	8	No. of Runs	3
Date of Analysis	1/16/95	Technician	KT
Transport Leakage ☐	None ~~X~~ ml	Solvent	Acetone

Test:	8 Run: 0	Dish No:	53
Field Blank:		Dish Tare Wt:	47.4077 g
Log No:	41664-60P	Dish + Sample Wt:	47.4079 g
Volume of Solvent	140 ml	Sample Wt:	0.0002 g
*Soivent Residue	1.43 ug/ml		
Test:	8 Run: 1	Dish No:	98
Vol. of Solvent	120 ml	Dish Tare Wt:	47.2115 g
Log Number	-61P	Dish + Sample Wt:	47.2319 g
Comments		Sample Wt:	0.0204 g
Test:	8 Run: 2	Dish No:	104
Vol. of Solvent	140 ml	Dish Tare Wt:	44.7555 g
Log Number	-62P	Dish + Sample Wt:	44.7709 g
Comments	c	Sample Wt:	0.0154 g
Test:	8 Run: 3	Dish No:	204
Vol. of Solvent	140	Dish Tare Wt:	47.4687 g
Log Number	-63P	Dish + Sample Wt:	47.4764 g
Comments		Sample Wt:	0.0077 g
Test:	Run:	Dish No:	
Log No:		Dish Tare Wt:	g
Comments:		Dish + Sample Wt:	g
		Sample Wt:	g
Test:	Run:	Dish No:	
Vol of Solvent	ml	Dish Tare Wt:	g
Log Number		Dish + Sample Wt:	g
Comments		Sample Wt:	g

*Solvent Residue 1.43 ug/ml = [(Sample Wt 0.0002 g) (10⁶)]/Vol. of Sol. 140 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

Results: Blank Solvent Wt. _____

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0202	0.0152	0.0075		

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EPA Method 5 Data Reporting Sheet Filter Gravimetrics

Job	Cypress North Shore	Source	No 101 Fire Chief
Team Leader	GH	Test Site	Stack
Date Submitted	1/16/95	Date of Test	1/13/95
Test No.	8	No. of Runs	3
Date of Analysis		Technician	KT

Test: 8 Run: 0		Filter No:	7141
Field Blank:		Filter Type:	4"GF
Log No: 4664-60F		Filter Tare Wt:	0.9460 g
Comments:		Filter + Sample Wt:	0.9461 g
		Sample Wt:	0.0001 g
Test: 8 Run: 1		Filter No:	7120
Log No: -61F		Filter Type:	4"GF
Comments:		Filter Tare Wt:	0.9471 g
		Filter + Sample Wt:	0.9485 g
		Sample Wt:	0.0014 g
Test: 8 Run: 2		Filter No:	7119
Log No: -62F		Filter Type:	4"GF
Comments:		Filter Tare Wt:	0.9545 g
		Filter + Sample Wt:	0.9548 g
		Sample Wt:	0.0003 g
Test: 8 Run: 3		Filter No:	7117
Log No: -63F		Filter Type:	4"GF
Comments:		Filter Tare Wt:	0.9569 g
		Filter + Sample Wt:	0.9575 g
		Sample Wt:	0.0006 g
Test: Run:		Filter No.	
Log No:		Filter Type:	
Comments:		Filter Tare Wt:	g
		Filter + Sample Wt.	g
		Sample Wt:	g
Test: Run:		Filter No:	
Log No:		Filter Type:	
Comments:		Filter Tare Wt:	g
		Filter + Sample Wt:	g
		Sample Wt:	g

Results:

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0014	0.0003	0.0006		

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0233	0.0173	0.0094		

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Impinger Catch Data Reporting Sheet

Protocol: ☒Minnesota ☐Wisconsin ☐Iowa ☐EPA Method 202 ☐Other

Job: Cyprus North Shore | Source/Site: Dry Cobber / Stack
Date Submitted: 1-16-95 | Test No.: 9
Date of Analysis: 1-20-95 | Technician: J. Lorenz

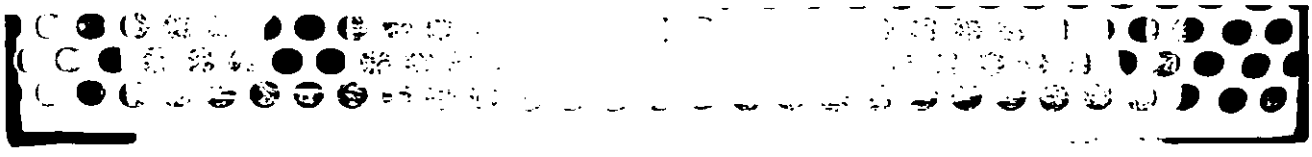
	Solvent Phase	Aqueous Phase
Test: 9 Run: 0	Dish No: 739	Dish No:
Log No: 4664-64 I	Dish + Sample Wt: 45.3591 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 45.3587 g	Dish Tare Wt: g
	Fraction Wt: .0004 g	Fraction Wt: g
Comments: Field Blank	Smpl Vol: ml, Aliqt: ml, Factor: 1.000	Smpl Vol: ml, Aliqt: ml, Factor:
	Sample Wt: .0004 g	Sample Wt: g
Test: 9 Run: 1	Dish No: 740	Dish No:
Log No: -65 I	Dish + Sample Wt: 44.9529 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 44.9520 g	Dish Tare Wt: g
	Fraction Wt: .0009 g	Fraction Wt: g
Comments:	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: ml, Aliqt: ml, Factor
	Sample Wt: .0009 g	Sample Wt: g
Test: 9 Run: 2	Dish No: 741	Dish No:
Log No: -66 I	Dish + Sample Wt: 42.3810 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 42.3799 g	Dish Tare Wt: g
	Fraction Wt: .0011 g	Fraction Wt: g
Comments:	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: ml, Aliqt: ml, Factor
	Sample Wt: .0011 g	Sample Wt: g
Test: 9 Run: 3	Dish No: 744	Dish No:
Log No: -67 I	Dish + Sample Wt: 48.6345 g	Dish + Sample Wt: g
Color & Appearance:	Dish Tare Wt: 48.6341 g	Dish Tare Wt: g
	Fraction Wt: .0004 g	Fraction Wt: g
Comments:	Smpl Vol: ml, Aliqt: ml, Factor 1.000	Smpl Vol: ml, Aliqt: ml, Factor
	Sample Wt: .0004 g	Sample Wt: g

Note: Factor = Sample Volume/Aliquot Volume

Blank Solvent Wt. .0001 g

VOAB

	RUN 0 Field Blank	RUN 1	RUN 2	RUN 3
Results of Solvent Phase	.0004	.0005	.0007	.0000
Results of Aqueous Phase	D-31			



EPA Method 5 Data Reporting Sheet Probe/Cyclone Wash

Job	Cyprus North Shore	Source	Duct Cobber
Team Leader	DVH	Test Site	Stack
Date Submitted	1/16/95	Date of Test	1/13/95
Test No.	9	No. of Runs	3
Date of Analysis	1/16/95	Technician	KT
Transport Leakage?	None ml	Solvent	Acetone

Test: 9 Run: 0		Dish No:	306
Field Blank:		Dish Tare Wt:	42.8337 g
Log No: 46641-64P		Dish + Sample Wt:	42.8341 g
Volume of Solvent 150 ml		Sample Wt:	0.0004 g
*Solvent Residue 2.67 ug/ml			
Test: 9 Run: 1		Dish No:	311
Vol. of Solvent 70 ml		Dish Tare Wt:	43.8108 g
Log Number -65P		Dish + Sample Wt:	43.8239 g
Comments		Sample Wt:	0.0131 g
Test: 9 Run: 2		Dish No:	324
Vol. of Solvent 90 ml		Dish Tare Wt:	46.2159 g
Log Number -66P		Dish + Sample Wt:	46.2262 g
Comments		Sample Wt:	0.0103 g
Test: 9 Run: 3		Dish No:	326
Vol. of Solvent 100		Dish Tare Wt:	43.4733 g
Log Number -67P		Dish + Sample Wt:	43.4796 g
Comments		Sample Wt:	0.0063 g
Test: Run:		Dish No:	
Log No:		Dish Tare Wt:	g
Comments:		Dish + Sample Wt:	g
		Sample Wt:	g
Test: Run:		Dish No:	
Vol of Solvent ml		Dish Tare Wt:	g
Log Number		Dish + Sample Wt:	g
Comments		Sample Wt:	g

*Solvent Residue 2.67 ug/ml = [(Sample Wt. 0.0004 g) (10^6)]/Vol. of Sol. 150 ml

EPA-M5 Acetone Residue Blank Spec. ≤ 7.8 ug/ml

Results: Blank Solvent Wt.

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0129	0.0101	0.0060	D-32	

EPA Method 5 Data Reporting Sheet Filter Gravimetrics

Job	Cyprus North Shore	Source	Dry Cobber
Team Leader	DVH	Test Site	Stack
Date Submitted	KT 1/16 8: 1/16/95	Date of Test	1/13/95
Test No.	9	No. of Runs	3
Date of Analysis	1/16/95	Technician	KT

Test: 9 Run: 0		Filter No:	7069
Field Blank:		Filter Type:	4"GF
Log No: 4664-64F		Filter Tare Wt:	0.9416 g
Comments:		Filter + Sample Wt:	0.9420 g
		Sample Wt:	0.0004 g
Test: 9 Run: 1		Filter No:	6763
Log No: -65F		Filter Type:	4"GF.
Comments:		Filter Tare Wt:	0.9462 g
		Filter + Sample Wt:	0.9480 g
		Sample Wt:	0.0018 g
Test: 9 Run: 2		Filter No:	6762
Log No: -66F		Filter Type:	4"GF
Comments:		Filter Tare Wt:	0.9500 g
		Filter + Sample Wt:	0.9508 g
		Sample Wt:	0.0008 g
Test: 9 Run: 3		Filter No:	7070
Log No: -67F		Filter Type:	4"GF.
Comments:		Filter Tare Wt:	0.9417 g
		Filter + Sample Wt:	0.9420 g
		Sample Wt:	0.0003 g
Test: Run:		Filter No.	
Log No:		Filter Type:	
Comments:		Filter Tare Wt:	g
		Filter + Sample Wt.	g
		Sample Wt:	g
Test: Run:		Filter No:	
Log No:		Filter Type:	
Comments:		Filter Tare Wt:	g
		Filter + Sample Wt:	g
		Sample Wt:	g

Results:

Field Blank	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0018	0.0008	0.0003		

Field Blk.	Run 1	Run 2	Run 3	Run 4	Run 5
	0.0152	0.0116	0.0063		

0.0116 SAB 1/20

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EPA Method 6 Sulfur Dioxide Calculation Data Sheet[1]

Job	Cyprus Northshore Mining	Source	No. 1205 waste Gas
Team Leader	J.S.	Test Site	Stack
Date Submitted	1-16-95	Date Of Test	1-11-95
Test No.	4	No. Of Runs Completed	3
Date Of Analysis	1-17-95	Technician	B. Duda

MEQ Calculation:

$$MEQ = \frac{DF\ N\ (V_t - V_b)\ V_{soln}}{V_a}$$

DF = Dilution Factor
N = Normality Of Titrant
V_t = Volume Of Titrant Used in Sample (ml)
V_b = Volume Of Titrant Used in Blank (ml)
V_{soln} = Total Volume Of Sample (ml)
V_a = Volume Of Aliquot (ml)

Water Catch:

Test 4 Run 1 MEQ = (1.0)(0.0100)(0.40 - 0.15)(510) / (20.0) = 0.064 MEQ

Test 4 Run 2 MEQ = (1.0)(0.0100)(0.40 - 0.15)(510) / (20.0) = 0.064 MEQ

Test 4 Run 3 MEQ = (1.0)(0.0100)(0.60 - 0.15)(510) / (20.0) = 0.115 MEQ

3% Peroxide Catch:

Test 4 Run 1 MEQ = (1.0)(0.0100)(0.40 - 0.15)(500) / (20.0) = 0.063 MEQ

Test 4 Run 2 MEQ = (1.0)(0.0100)(0.30 - 0.15)(500) / (20.0) = 0.038 MEQ

Test 4 Run 3 MEQ = (1.0)(0.0100)(0.30 - 0.15)(500) / (20.0) = 0.038 MEQ

Total MEQ Per Run:

Test 4 Run 1 = 0.127 MEQ

Test 4 Run 2 = 0.102 MEQ

Test 4 Run 3 = 0.153 MEQ

Comments _____

1 Form to be used in conjunction with combination method 5 and 6 train.

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EPA Method 7A Recovery and Analysis Data Sheet (1)

**********SOURCE**********	**********RECOVERY**********	**********ANALYTICAL**********
Job Cyprus Northshore Mining	Date of Recovery 1-18-95	Date of Analysis 2/8/95
Source No. 1205 Waste Gas Stack	Recovered by B. Dirlam	Analyst TPW
Date of Sampling 1-11-95	Recovery volume 500 ml	Eluent AS4A
Test No(s) 4	Barometric at time 29.24 IN.HG.	Chromatograph: Dionex System 4000i

Samples collected in accordance with EPA Method 7, CFR Title 40, Part 60, Appendix A. Samples analyzed in accordance with EPA Method 7A by ion chromatography. Mercury manometers used to measure flask pressures/vacuums in sampling and in recovery. Thommen Model TX 19 jewel barometer calibrated against laboratory mercury in glass barometer used to measure field barometric pressure. Three field blanks are prepared and the average used to correct measured nitrate concentrations. All samples are analyzed as a batch using a Dionex Model 4270 Chromatograph Data Intergrator. The integrator is programmed to give the actual concentration of the 500 ml recovered sample even if a subsequent dilution was made. The dilution is indicated here as well as on the chromatogram.

$$C_{RS} = DF(C_{DS}) \qquad M_{NO_3} = (C_{RS} - \overline{C}_B)V_R \qquad \overline{C}_B = (C_{B1} + C_{B2} + C_{B3})/3$$

where:

C_{RS} = concentration of nitrate in 500 ml recovered sample in ug/ml

DF = dilution factor

C_{DS} = concentration of nitrate of a 500 ml recovered sample which has been diluted by a factor of DF to bring it into the proper range for the ion chromatograph. This value is an intermediate number and is not outputted by the electronic integrator which is programmed to output the concentration of the original undiluted 500 ml recovered sample.

M_{NO_3} = total mass of nitrate in micrograms in the 500 ml recovered sample and/or in the 2L flask.

C_B = average conc. of nitrate in 500 ml recovered samples from the three field blanks (ug/ml)

C_{B1}, C_{B2}, C_{B3} = conc. of nitrate in 500 ml recovered samples from the three field blanks (ug/ml)

V_R = recovery volume for samples and field blanks in ml

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Sample Chain of Custody

Job Cyprus Source BIN STORAGE Site STACK Log No. 1664
Field Engineer E. TOWLBRIDGE Date of Test 1-10-95 Test No. 1 No. of Runs 3

No. Items	Sample Type		Analysis		Sequence No.	Comments
4	**Probe Wash:** ☒ Acetone ☐ $MeCl_2$	☐ DI Water ☐ _____	☒ EPA M-5 ☐ EPA M-29	☐ EPA M-201A ☐ _____		
4	**Filter:** ☒ 4" Glass ☐ SS Thimble	☐ Pallflex ☐ 2.5" Glass	☒ EPA M-5 ☐ EPA M-29 ☐ EPA M-201A	☐ EPA M-17		
4	**Impingers:** ☒ DI Water ☐ 3% H_2O_2 ☐ 1N NaOH ☐ 2,4-DNPH	☐ H_2SO_4 ☐ HNO_3/H_2O_2 ☐ $KMnO_4/H_2SO_4$ ☐ _____	☒ MN Protocol ☐ WI Protocol ☐ EPA M-202 ☐ EPA M6,8 ☐ Acid Gases	☐ IA Protocol ☐ Formaldehyde ☐ EPA M-29 ☐ EPA M-26 ☐ _____		
(1)	**Integrated Gas:** ☐ Tedlar Bag	☐ _____	☐ EPA M-3 ☐ _____	☐ EPA M-10		
	Oxides of Nitrogen:		☐ EPA M-7A ☐ _____			
	Fuel Lab: ☐ Fuel Sample	☐ Aggregate	☐ Per S-0163			
	Particle Sizing:		☐ X-Ray Sdgraph ☐ _____	☐ Cascade Imp		
	Miscellaneous:	☐ _____	☐ _____			

Fuel Type: Coal: ☐ Bituminous ☐ Anthracite ☐ Lignite Wood: ☐ Wood Waste ☐ Dust ☐ Bark Oil: ☐ Waste Oil ☐ No. 2 ☐ No. 6 Misc: ☐ Natural Gas ☐ RDF ☐ _____

Relinquished by/Affiliation	Accepted by/Affiliation	Date
E. Towlbridge - Interpoll Labs	Interpoll	1/10/95 0830

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Sample Chain of Custody

Job: Cyprus N. Shore — Source: 1104 PELLMZER — Site: STACK — Log No.: 4664
Field Engineer: G HOYE — Date of Test: 1-9-95 — Test No.: 3 — No. of Runs: 3

No. Items	Sample Type		Analysis		Sequence No.	Comments
4	**Probe Wash:** ☒ Acetone ☐ $MeCl_2$	☐DI Water ☐_____	☒EPA M-5 ☐EPA M-29	☐EPA M-201A ☐_____		
4	**Filter:** ☒ 4" Glass ☐ SS Thimble	☐Palliflex ☐2.5" Glass	☒EPA M-5 ☐EPA M-29 ☐EPA M-201A	☐EPA M-17		
4	**Impingers:** ☒DI Water ☐3% H_2O_2 ☐1N NaOH ☐2,4-DNPH	☐H_2SO_4 ☐HNO_3/H_2O_2 ☐$KMnO_4/H_2SO_4$ ☐_____	☒MN Protocol ☐WI Protocol ☐EPA M-202 ☐EPA M6,8 ☐Acid Gases	☐IA Protocol ☐Formaldehyde ☐EPA M-29 ☐EPA M-26 ☐_____		
3	**Integrated Gas:** ☒Tedlar Bag	☐_____	☒EPA M-3 ☐_____	☐EPA M-10		
0	**Oxides of Nitrogen:**		☐EPA M-7A ☐_____			
0	**Fuel Lab:** ☐Fuel Sample	☐Aggregate	☐Per S-0163			
0	**Particle Sizing:**		☐X-Ray Sdgraph ☐_____	☐Cascade Imp		
	Miscellaneous:	☐_____	☐_____			

Fuel Type: Coal: ☐Bituminous ☐Anthracite ☐Lignite — Wood: ☐Wood Waste ☐Dust ☐Bark — Oil: ☐Waste Oil ☐No. 2 ☐No. 6 — Misc: ☐Natural Gas ☐RDF ☐_____

Relinquished by/Affiliation	Accepted by/Affiliation	Date
Gary Hoye / Stack	Carl / Interpoll	1/16/95 0830

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Sample Chain of Custody

Job CYPRUS N SHORE Source _____ Site NO 12 FERTILIZER Log No. 4664
Field Engineer G-H Date of Test _____ Test No. ROTOCAKE STACK No. of Runs 3

No. Items	Sample Type		Analysis		Sequence No.	Comments
3	Probe Wash: ☒ Acetone ☐ $MeCl_2$	☐DI Water ☐_____	☒EPA M-5 ☐EPA M-29	☐EPA M-201A ☐_____		
3	Filter: ☒ 4" Glass ☐ SS Thimble	☐Pallflex ☐2.5" Glass	☒EPA M-5 ☐EPA M-29 ☐EPA M-201A	☐EPA M-17		
3	Impingers: ☒DI Water ☐3%H_2O_2 ☐1N NaOH ☐2,4-DNPH	☐H_2SO_4 ☐HNO_3/H_2O_2 ☐$KMnO_4/H_2SO_4$ ☐_____	☒MN Protocol ☐WI Protocol ☐EPA M-202 ☐EPA M6,8 ☐Acid Gases	☐IA Protocol ☐Formaldehyde ☐EPA M-29 ☐EPA M-26 ☐_____		
3	Integrated Gas: ☒Tedlar Bag	☐_____	☒EPA M-3 ☐_____	☐EPA M-10		
0	Oxides of Nitrogen:		☐EPA M-7A ☐_____			
0	Fuel Lab: ☐Fuel Sample	☐Aggregate	☐Per S-0163			
0	Particle Sizing:		☐X-Ray Sdgraph ☐_____	☐Cascade Imp		
0	Miscellaneous:	☐_____	☐_____			

Fuel Type: Coal: ☐Bituminous ☐Anthracite ☐Lignite Wood: ☐Wood Waste ☐Dust ☐Bark Oil: ☐Waste Oil ☐No. 2 ☐No. 6 Misc: ☐Natural Gas ☐RDF ☐_____

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Jerry Howe/Stack	Interpoll	1/16/95 0830

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Sample Chain of Custody

Job: Cyprus Northshore Source: No 2 Boiler Stack Site: Stack Log No.: 4664
Field Engineer: J.S. Date of Test: 1/12/95 Test No.: 7 No. of Runs: 3

No. Items	Sample Type		Analysis		Sequence No.	Comments
4	**Probe Wash:** ☑ Acetone ☐ $MeCl_2$	☐DI Water ☐_____	☑EPA M-5 ☐EPA M-29	☐EPA M-201A ☐_____		
4	**Filter:** ☑ 4" Glass ☐ SS Thimble	☐Pallflex ☐2.5" Glass	☑EPA M-5 ☐EPA M-29 ☐EPA M-201A	☐EPA M-17		
4	**Impingers:** ☑DI Water ☑3%H_2O_2 ☐1N NaOH ☐2,4-DNPH	☐H_2SO_4 ☐HNO_3/H_2O_2 ☐$KMnO_4/H_2SO_4$ ☐_____	☑MN Protocol ☐WI Protocol ☐EPA M-202 ☑EPA M6,8 ☐Acid Gases	☐IA Protocol ☐Formaldehyde ☐EPA M-29 ☐EPA M-26 ☐_____		
3	**Integrated Gas:** ☐Tedlar Bag	☐_____	☐EPA M-3 ☐_____	☐EPA M-10		
	Oxides of Nitrogen:		☐EPA M-7A ☐_____			
	Fuel Lab: ☐Fuel Sample	☐Aggregate	☐Per S-0163			
	Particle Sizing:		☐X-Ray Sdgraph ☐_____	☐Cascade Imp		
	Miscellaneous:	☐_____	☐_____			

Fuel Type: Coal: ☐Bituminous ☐Anthracite ☐Lignite Wood: ☐Wood Waste ☐Dust ☐Bark Oil: ☐Waste Oil ☐No. 2 ☐No. 6 Misc: ☐Natural Gas ☐RDF ☐_____

Relinquished by/Affiliation	Accepted by/Affiliation	Date
Jeff Scripter		1/12/95
	SCal Interpoll	1/16/95 0830

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Sample Chain of Custody

Job Cyprus North Shore Source DRY COBBER Site STACK Log No. 4664
Field Engineer Dust Date of Test 1/13/95 Test No. 9 No. of Runs 3

No. Items	Sample Type		Analysis		Sequence No.	Comments
4	**Probe Wash:** ☒ Acetone ☐ $MeCl_2$	☐ DI Water ☐ _____	☒ EPA M-5 ☐ EPA M-29	☐ EPA M-201A ☐ _____		
1	**Filter:** ☒ 4" Glass ☐ SS Thimble	☐ Pallflex ☐ 2.5" Glass	☒ EPA M-5 ☐ EPA M-29 ☐ EPA M-201A	☐ EPA M-17		
1	**Impingers:** ☒ DI Water ☐ 3% H_2O_2 ☐ 1N NaOH ☐ 2,4-DNPH	☐ H_2SO_4 ☐ HNO_3/H_2O_2 ☐ $KMnO_4/H_2SO_4$ ☐ _____	☒ MN Protocol ☐ WI Protocol ☐ EPA M-202 ☐ EPA M6,8 ☐ Acid Gases	☐ IA Protocol ☐ Formaldehyde ☐ EPA M-29 ☐ EPA M-26 ☐ _____		
0	**Integrated Gas:** ☐ Tedlar Bag	☐ _____	☐ EPA M-3 ☐ _____	☐ EPA M-10		
	Oxides of Nitrogen:		☐ EPA M-7A ☐ _____			
	Fuel Lab: ☐ Fuel Sample	☐ Aggregate	☐ Per S-0163			
	Particle Sizing:		☐ X-Ray Sdgraph ☐ _____	☐ Cascade Imp		
	Miscellaneous:	☐ _____	☐ _____			

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Fuel Type: Coal: ☐ Bituminous ☐ Anthracite ☐ Lignite
Wood: ☐ Wood Waste ☐ Dust ☐ Bark
Oil: ☐ Waste Oil ☐ No. 2 ☐ No. 6
Misc: ☐ Natural Gas ☐ RDF ☐ _____

Relinquished by/Affiliation	Accepted by/Affiliation	Date
Diane Van Hoewer		1/13/95
	CW / interpoll	1/14/95 0830

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APPENDIX E

REQUIRED DATA FOR COMBUSTION SOURCES

(Not Available at Time of Report Publication)

APPENDIX F

OPERATIONAL DATA

(Not Available at Time of Report Publication)

APPENDIX G

PROCEDURES

Particulate Loading and Emission Rates

The particulate emission rates were determined per EPA Methods 1 - 5, CFR Title 40, Part 60, Appendix A (revised July 1, 1992). 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 glass-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. The sampling module also houses the impinger case and a Drierite filled column. The sampling module is connected by means of an umbilical cord to the control module. The control module houses the dry test gas meter, the calibrated orifice, a leakless pump, two inclined manometers, and all controls required for operating the sampling train.

Particulate samples are collected as follows: The sample gas is drawn through the sampling probe isokinetically and passed through a 4-inch diameter Gelman Type A/E glass fiber filter where particulates are removed. The sample gas is then passed through an ice-cooled impinger train and a desiccant-packed column which absorbs remaining moisture. The sample gas then passes through a vacuum pump followed by a dry test gas meter. The gas meter integrates the sample gas flow throughout the course of the test. A calibrated orifice attached to the outlet of the gasmeter provides real time 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 test point maintaining isokinetic sampling conditions. Nomographs are used for rapid determination of the sampling rate.

Particulate Loading and Emission Rates

After sampling is complete, the filter is removed and placed in a clean container. The nozzle and inlet side of the filter holder are quantitatively washed with acetone and the washings are stored in a second container. A brush is often used in the cleaning step to help dislodge deposits. The samples are returned to the laboratory where they are logged in and analyzed. The volume of the acetone rinse ("probe wash") is noted and then the rinse is quantitatively transferred to a tared 120 cc porcelain evaporating dish and the acetone evaporated off at 97-105 °F. This temperature is used to prevent condensation of atmospheric moisture due to the cooling effect induced by the evaporation of acetone. The acetone-free sample is then transferred to an oven and dried at 105 °C for 30 minutes, cooled in a desiccator over Drierite, and then weighed to the nearest .01 mg. The filter sample is quantitatively transferred to a 6-inch watch glass and dried in an oven at 105 °C for two hours. The filter and watch glass are then cooled in a desiccator and the filter weighed to the nearest .01 mg. All weighings are performed in a balance room where the relative humidity is hydrostatted to less than 50% relative humidity. Microscopic examination of the samples is performed if any unusual characteristics are observed. The weight of the acetone rinse is corrected for the acetone blank. The Drierite column is weighed on-site and the water collected by Drierite is added to the condensate so that the total amount of absorbed water may be ascertained.

Integrated flue gas samples for Orsat analysis were collected simultaneously with each pollutant sample. The samples were collected in 15-liter gas sampling bags at a constant flow rate throughout each particulate run. The bags were at a constant flow rate throughout each particulate run. The bags were then returned to the laboratory and analyzed by Orsat analysis. Standard commercially prepared solutions were used in the Orsat analyzer (sat. KOH for carbon dioxide and reduced methylene blue for oxygen).

Condensible Organic Compounds Analysis

(State of Minnesota - MPCA Exhibit C)

Method II-8672-MN

Equipment: Separatory funnel - 500 cc with Teflon stopcock

Powder funnel - 75 mm ID with a 17 mm stem

Evaporating dish(es) - 200 cc or 250 cc beaker

Reagents: Diethyl ether - reagent grade

Chloroform - reagent grade

Sodium sulfate - (ACS) granular anhydrous

Toluene - (if 3% hydrogen peroxide is used to collect the samples)

Glass wool (Pyrex microfiber)

PREPARATION

1. Place 1 kg of granular anhydrous sodium sulfate in a shallow tray and heat to 200°C for at least four hours. Store in a tightly sealed glass container.

2. Place a plug of clean glass wool in the stem of the powder funnel. The plug must be of sufficient size so that it is held snugly in place by its own pressure. Add a one-inch layer of dry sodium sulfate.

SAMPLING

An all-glass impinger assembly is used in the back half of the EPA Method 5 sampling train when an organic wet catch is to be collected. The impinger assembly consists of a modified impinger, a Greenburg Smith impinger followed by another modified impinger. The third impinger should have a temperature measuring device at the outlet upstream of a final impinger or desiccant column to monitor the temperature of the outlet gas stream. Prior to the start of the test, each of the first two impingers should be charged with 100 g of Class I water. The Method 5 train should be operated as provided for in EPA Method 5. Ice should be added to the impinger bath to keep the temperature of the gas at the outlet at or less than 68°F. After the post test leak check, the impinger train is removed and impinger contents poured into a tared all-glass sample bottle and closed with a Teflon-lined cap. The sample bottle is then weighed and the total condensate calculated by subtraction of the bottle tare weight and the weight of initial water added to the impingers (200 g). A label is affixed and the sample is returned to the laboratory for analysis. The sample should be stored at 4°C if the analysis is not conducted within 48 hours.

I. ORGANICS

Caution! Work in vented hood!!!

A. Organic Blank Determination

1. Pour 125 ml of ethyl ether and 125 ml of chloroform into a tared beaker.

2. Evaporate solvent in hood at 70°F or less until no solvent remains.

3. Desiccate the sample in dish for two hours.

4. Weigh the sample to nearest 0.1 mg, record and report on Form LSC-03C.

B. Organic Sample Determination

1. Test for peroxide in sample ether using KI strips. (If KI strip shows positive, contact your supervisor before proceeding.)

2. Transfer the sample solution quantitatively to a 500 ml separatory funnel. Use the first of three 25 ml chloroform aliquots to rinse the sample container.

3. Extract with three 25 ml portions of chloroform. (Shake and vent to release pressure about 4 to 5 times each.) Allow the phases to separate. (Bottom layer is chloroform.) Draw off the bottom layer, transferring the solvent with a funnel containing a plug of sodium sulfate into a tared beaker. (Do not draw off any of the aqueous layer.)

4. After the three chloroform extractions, use two 25 ml portions of chloroform to rinse the sodium sulfate, collecting the rinses in the same tared beaker as the extracts.

5. Next extract the sample three times with 25 ml aliquots of ethyl ether. (Shake and vent to release pressure about 4 to 5 times each.) Allow the phases to separate. (Top layer is ethyl ether.) Draw off the bottom layer (aqueous) into another separatory funnel taking less than 1 ml of the ethyl ether layer with. Decant the ethyl ether, passing it through sodium sulfate and collecting the ethyl ether in the same tared dish as the chloroform.

6. After the three ethyl ether extractions, take two 25 ml portions of ethyl ether and rinse the sodium sulfate collecting the rinses in the same tared beaker as the extracts.

7. Evaporate the solvents (chloroform and ethyl ether) in the tared beaker in the hood at 70°F or less until no solvent remains. (Use no heat and have no sources of ignition in the hood when doing this procedure.) Do not evaporate so quickly as to allow evaporative cooling to lower the temperature of the container below the dew point of water, otherwise, water will be condensed out in the container.

8. Desiccate to constant weight (two hours). Record and report the final weight to the nearest 0.1 mg on Form LSC-03G.

II. INORGANICS

If inorganic residue information is required, the following procedure should be conducted:

A. Inorganic Blank Determination

1. Vent the remaining aqueous phase from the organic extraction in the hood to remove residual organic solvents (usually overnight).

2. Decant the impinger catch into a tared evaporating dish.

3. Evaporate all of the water in the sample in an oven at 100°C. Take care not to boil to prevent bumping and loss of sample.

4. Cool the dried sample in the desiccator and desiccate until a constant weight is obtained.

5. Report the results to the nearest 0.1 mg on Form LSC-03G.

B. Inorganic Sample Determination

Follow steps 1-5 in Section A above.

NOTES

1. For the organics determination, in the rare event that the impinger catch resulted from a Modified Method 6 determination (SO_2), whereby the solution contains dilute hydrogen peroxide ($\geq$ 3%), do not use ether as an extraction solvent. Substitute toluene for ethyl ether in Section I. (Ether in the presence of peroxide forms explosive hydroperoxide.)

2. In the organics determination, more than three extractions may be required to extract all of the organics. Additional extractions should be performed if the aqueous phase is still cloudy.

3. Special state requirements:
   Michigan - Total sample evaporated in tared evaporating dish on steam bath.
   Iowa - Organics and inorganics separately, as required.
   Wisconsin - Use Method II-8672-WI.
   Rest of states - Organics only.

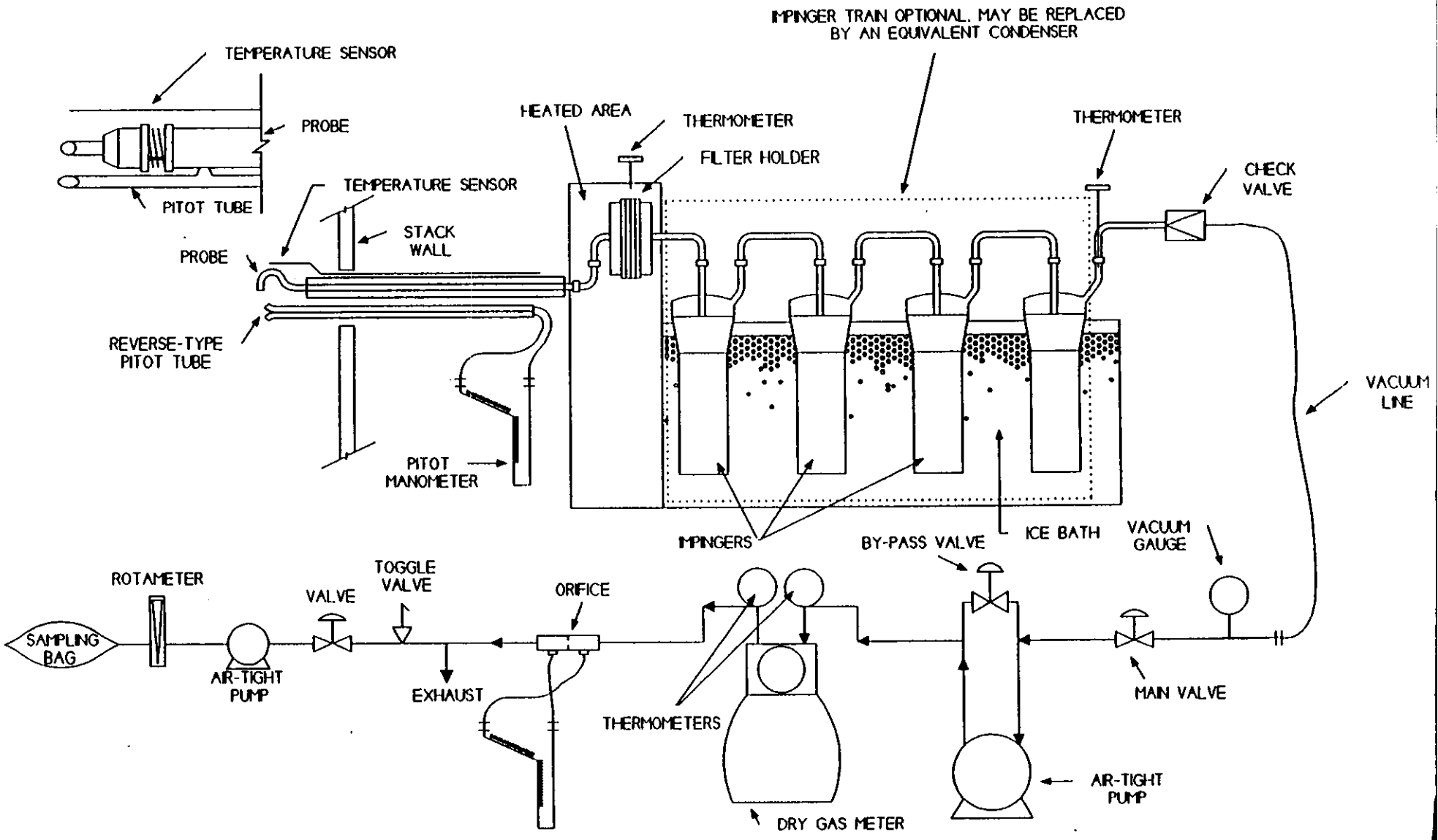
REFERENCES

Proposed standards of Performance for New Stationary Sources, Federal Register 36(159) Part II, August 1, 1979.

Minnesota Pollution Control Agency, Exhibit C.

Interpoll Laboratories
(612) 786-6020

PARTICULATE SAMPLING TRAIN



Flow

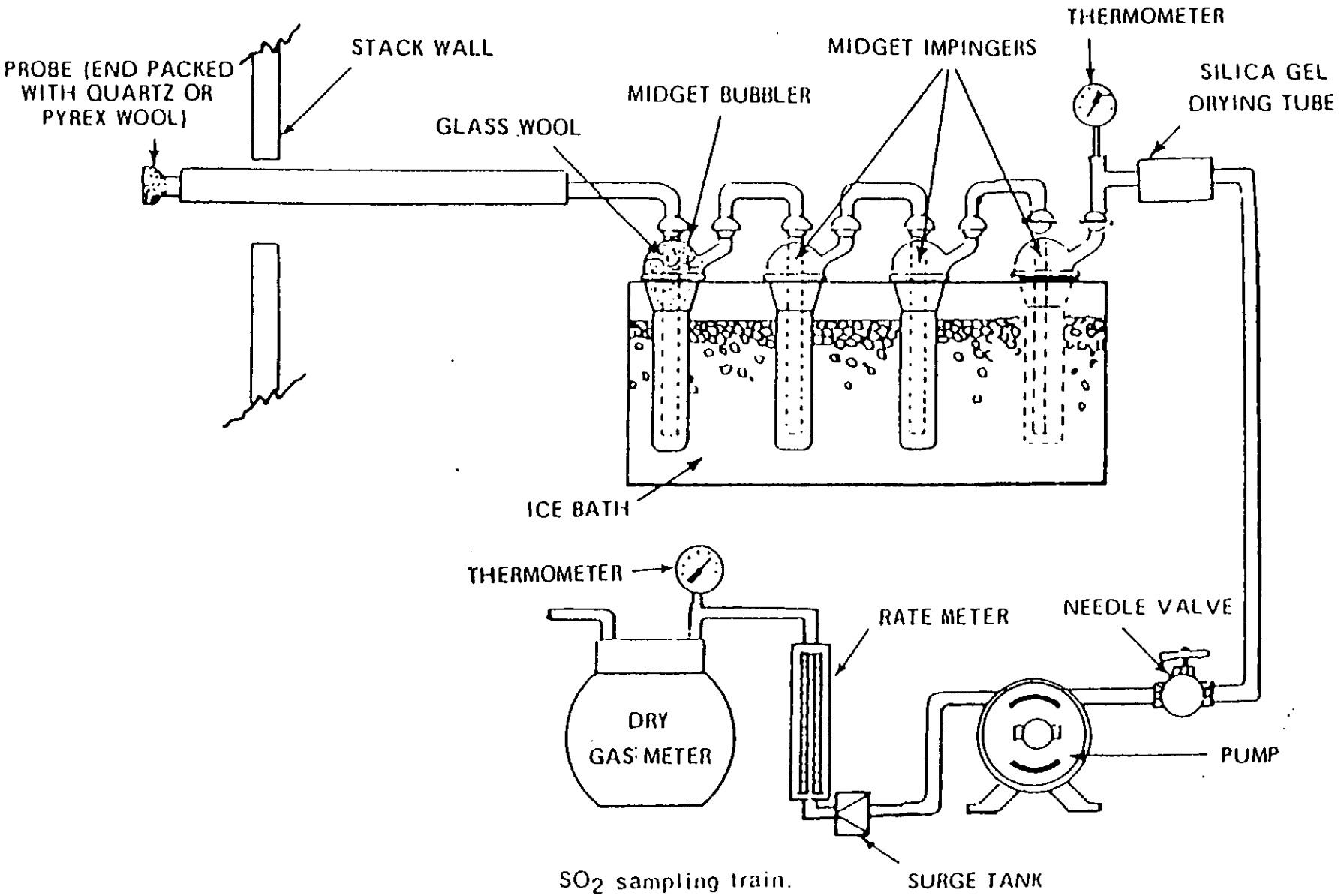
Flow determinations were carried out in accordance with EPA Method 2, CFR Title 40, Part 60, Appendix A (Revised July 1, 1992). A Type S pitot was used to sense velocity pressure and an expanded scale inclined manometer was used to measure pressure. A 24" long bimetallic gauge thermometer was used to measure dry bulb temperatures Wet bulb temperatures were measured with a mercury thermometer equipped with a cloth wick which was wetted in distilled water immediately prior to taking the reading.

Gas Density and Molecular Weight

Gas compositions were determined as per Method 3 by Orsat analysis of an integrated gas sample collected from the stack during the sulfur dioxide determinations. Standard commercially prepared solutions were used in the Orsat analyzer (sat. KOH carbon dioxide and reduced methylene blue for oxygen).

Sulfur Dioxide Emissions

The sulfur dioxide concentrations were determined per Method 6, CFR Title 40, Part 60, Appendix A (Revised July 1, 1992). In this procedure a gas sample is extracted from the stack with a heated glass-lined probe through a plug of glass wool to remove any flyash. The remaining particulate sulfate, acid mist and sulfur trioxide are separated in an all-glass collection train and the sulfur dioxide fraction collected in a 3% peroxide solution and the resulting sulfate measured by barium-thorin titration method.



SO_2 sampling train.

Flow

Flow determinations were carried out in accordance with EPA Method 2, CFR Title 40, Part 60, Appendix A (Revised July 1, 1987). A type S pitot was used to sense velocity pressure and an inclined manometer was used to measure velocity pressures. Gas temperatures were measured using a calibrated Type K thermocouple and digital temperature meter. Gas density (i.e. molecular weight) was calculated from the composition of the gas which was determined by Orsat.

Gas Flow Density

Gas compositions were determined as per Method 3 by Orsat analysis of an integrated gas sample collected from the stack during the oxides of nitrogen determinations. Standard commercially prepared solutions were used in the Orsat analyzer (sat. KOH for carbon dioxide and reduced methylene blue for oxygen).

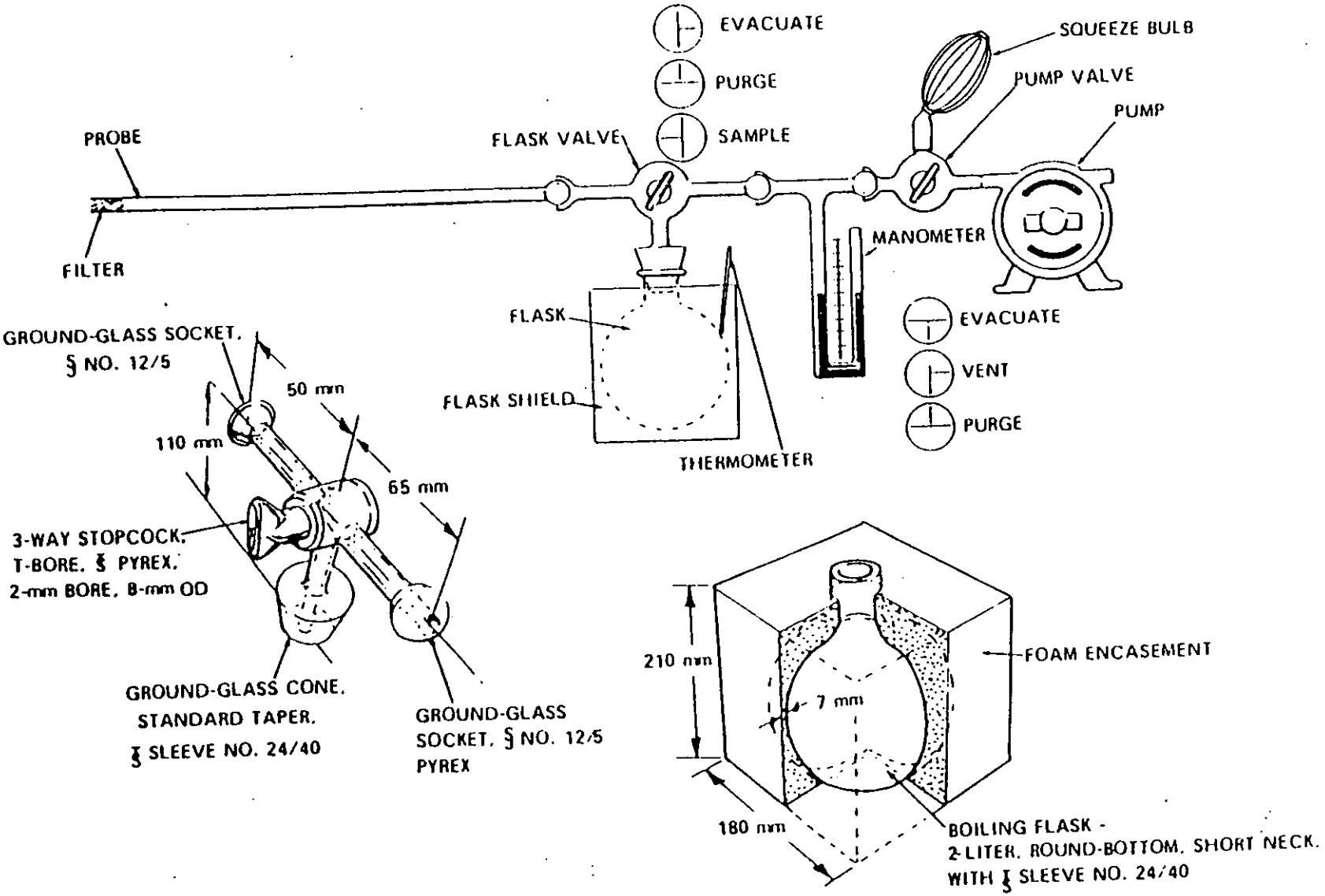
Oxides of Nitrogen

Oxides of nitrogen concentrations were collected in accordance with EPA Method 7 (see above-cited reference) with a specially designed all glass manifold and valving assembly and a heated stainless steel-lined probe. Samples were collected in two-liter evacuated insulated flasks which contained 25 cc of acidified peroxide solution (Method 7 reagent). Nine sets or more of three samples each were collected over a period of 4.5 to 5 hours.

The sampling train was leak checked through the probe at the beginning and end of the test and, in addition, the system leak checked at the time of evacuation of each flask. Before the samples were collected, the probe was purged to eliminate dead volume effects and to raise the temperature of the probe outlet and manifold assembly to minimize condensation of moisture. A plug of microfiber glass wool inserted in the probe inlet was used to prevent particulate material from entering into the flask. The temperature of the flask, vacuum in the

flask and barometric pressure at the time of sampling was recorded for each flask. After sampling was complete, as evidenced by the in-line vacuum gauge, the flask valve was closed, the flask assembly disconnected from the manifold/valve assembly and the flask shook for several minutes to promote oxidation and absorption. The recovered oxides of nitrogen samples were returned to the laboratory and analyzed immediately by ion chromatography as per EPA 7A.

The internal volume of each numbered flask assembly has been measured prior to initial use by filling with water, weighing before and after and then converting the weight of water to volume by means of the density of water at room temperature. Flask volumes are stored in the computer and recalled automatically in the computer calculation.



Sampling train, flask valve, and flask.

APPENDIX H

CALCULATION EQUATIONS

METHOD 2
CALCULATION EQUATIONS

$$\overline{V_s} = 85.49\ C_p\ (\sqrt{\Delta p})_{avg}\ \sqrt{\frac{T_{s(avg)}}{P_s\ M_s}}$$

$$Q_{s,\,d} = 60\ (1\ -B_{ws})\ \overline{V_s}\ A\ (\frac{528}{T_{s\ (avg)}})\ (\frac{P_s}{29.92})$$

$$Q_a = 60\ \overline{V_s}\ A$$

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

$$RH^* = 100\ (vp_{rwb}\ -\ 0.0003641\ P_s\ (T_{db}\ -\ T_{wb}))/vp_{tdb}$$

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

$$\rho = \frac{4.585\ x\ 10^{-2}\ P_s M_s}{T_s\ (avg)}$$

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

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.
m_g	=	Mass flow of wet flue gas, LB/HR
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. WC.
P_s	=	Absolute pressure of stack gas, IN. HG.
P_{std}	=	Standard absolute pressure, 29.92 IN. HG.
A_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. °F
T_{wb}	=	Wet bulb temperature of stack gas. °F
$T_{m(avg)}$	=	Absolute average dry gas meter temperature, °R
$T_{s(avg)}$	=	Absolute average stack temperature, °R
T_{std}	=	Standard absolute temperature. 528 °R (68 °F)
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, CF
$V_{m(std)}$	=	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
$\bar{V}_s$	=	Average actual stack gas velocity, FT/SEC
vp_{tdb}	=	Vapor pressure at T_{db}, IN. HG.
vp_{twb}	=	Vapor pressure at T_{wb}, IN. HG.
$\overline{\Delta H}$	=	Average pressure differential across the orifice meter, IN. WC.
ΔP	=	Velocity pressure of stack gas, IN. WC.
γ	=	Dry test meter correction coefficient, dimensionless
ρ	=	Actual gas density, LB/ACF

METHOD 3
CALCULATION EQUATIONS

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

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

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

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

METHOD 5
CALCULATION EQUATIONS

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

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

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

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

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

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

$$(\dot{m}_p)_1 = 8.5714\ x\ 10^{-3}\ C_s\ Q_{s,d}$$

$$(\dot{m}_p)_2 = \frac{1.3228 \times 10^{-1} M_p A}{\theta A_n}$$

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

CALCULATION EQUATIONS

METHOD 6

$$V_{std} = 17.64 \frac{V_m P_b \gamma}{T_m} \quad (MIDGET\ IMPINGER\ VERSION)$$

$$V_{std} = \frac{17.64\ V_m\ (P_b + \frac{\overline{\Delta H}}{13.6})\gamma}{T_m} \quad (LARGE\ IMPINGER\ VERSION)$$

$$MEQ = (V_t - V_{tb})\ N\ (\frac{V_{soln}}{V_a})\ DF$$

$$C_s = \frac{7.06\ x\ 10^{-5}\ MEQ}{V_{std}}$$

$$E = \frac{20.90\ C_s F_d}{20.90 - \overline{B}'_{O_2}} = \frac{F_c C_s}{\overline{B}'_{CO_2}}$$

$$C_s\ (MG/DSCM) = 1.60186\ x\ 10^7\ C_s$$

$$C_s\ (GR/DSCF) = 7000\ C_s$$

$$C_s\ (ppm,\ dry) = 6.02119\ x\ 10^6\ C_s$$

$$C_s\ (ppm,\ wet) = 6.02119\ x\ 10^6\ C_s\ (1 - \frac{MC}{100})$$

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SYMBOLS

$\bar{B}\ O_2$	=	Average oxygen content in flue gas, % v/v, dry
$\bar{B}\ CO_2$	=	Average carbon dioxide content in flue gas, % v/v, dry
C_s	=	Concentration of sulfur dioxide in flue gas, dry basis, corrected to standard conditions, LB/DSCF
C_s (GR/DSCF)	=	Concentration of sulfur dioxide in flue gas, dry basis, corrected to standard conditions, GR/DSCF
C_s (MG/DSCM)	=	Concentration of sulfur dioxide in flue gas, dry basis, corrected to standard conditions, MG/DSCM
DF	=	Dilution Factor
E	=	Emission factor, LB of $SO_2/10^6$BTU
Fd	=	Dry oxygen F-Factor for given fuel type, DSCF/10^6BTU
Fc	=	Carbon dioxide F-Factor for given fuel type, DSCF/10^6BTU
ΔH	=	Average pressure drop across calibrated orifice, IN. W.C.
Υ	=	Dry test meter correction factor, dimensionless
MC	=	Moisture content of flue gas, % v/v
MEQ	=	Total milliequivalents of SO_2 in gas sample
N	=	Normality of barium perchlorate titrant
P_b	=	Barometric pressure at the dry gas meter, IN. HG.
C_s (ppm-dry)	=	Concentration of sulfur dioxide in flue gas, dry basis, (v/v), ppm
C_s (ppm-wet)	=	Concentration of sulfur dioxide in flue gas, wet basis, (v/v), ppm
T_m	=	Absolute average dry gas meter temperature, °R
V_a	=	Volume of sample aliquot titrated, cc
V_m	=	Dry gas volume as measured by the dry gas meter, DCF
V_{std}	=	Dry gas volume as measured by the dry gas meter, corrected to standard conditions (at 68 °F and 1 atmosphere), DSCF

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V_{soln} = Total volume of the solution in which the sulfur dioxide sample is contained, cc

V_t = Volume of barium perchlorate titrant used for the sample, cc (average of replicate titrations)

V_{tb} = Volume of barium perchlorate titrant used for the blank, cc

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CALCULATION EQUATIONS

METHOD 7

$$V_{m(std)} = 17.64\ (V_f - 25)\ [\frac{P_f}{T_f} - \frac{P_i}{T_i}]$$

$$C_s = 6.243\ x\ 10^{-5}\ \frac{M}{V_{m(std)}}$$

$$E = \frac{2090\ C_s F}{20.9 - \overline{B}'_{O_2}}$$

$$C_s\ (GR/DSCF) = 7000\ C_s$$

$$C_s\ (MG/DSCM) = 1.60186\ x\ 10^7\ C_s$$

$$C_s\ (ppm\text{-}dry) = 8.37552\ x\ 10^6\ C_s$$

$$C_s\ (ppm\text{-}3\%\ O_2) = 8.37552\ x\ 10^6\ C_s\ \{1 + [\frac{\overline{B}'_{O_2} - 3}{20.9 - B'_{O_2}}]\}$$

$$C_s\ (ppm\text{-}wet) = 8.37552\ x\ 10^6\ C_s\ (1 - \frac{MC}{100})$$

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SYMBOLS

$\bar{B}\ O_2$	=	Average oxygen content in flue gas, % v/v
C_s	=	Concentration of nitrogen oxides in flue gas, dry basis, corrected to standard conditions, *LB/DSCF*
C_s (GR/DSCF)	=	Concentration of nitrogen oxides in flue gas, dry basis, corrected to standard conditions, GR/DSCF
C_s (MG/DSCM)	=	Concentration of nitrogen oxides in flue gas, dry basis, corrected to standard conditions, MG/DSCM
E	=	Emission factor, LB/10^6BTU
F	=	F-Factor for given fuel type, DSCF/10^4BTU
M	=	Mass of nitrogen oxides as nitrogen dioxide in gas sample, ug
MC	=	Moisture content of flue gas, %
P_f	=	Final absolute pressure in flask, IN. HG
P_i	=	Initial absolute pressure in flask, IN. HG
C_s (ppm-dry)	=	Concentration of nitrogen oxides in flue gas, dry basis, (v/v), ppm
C_s (ppm-3% O_2)	=	Concentration of nitrogen oxides in flue gas, dry basis, corrected to 3% O_2, (v/v) ppm
C_s (ppm-wet)	=	Concentration of nitrogen oxides in flue gas, wet basis, (v/v), ppm
T_f	=	Final absolute temperature in flask, °R
T_i	=	Initial absolute temperature in flask, °R
V_f	=	Volume of flask and valve, cc
$V_{m(std)}$	=	Sample volume at standard conditions, dry basis, cc

APPENDIX I

SAMPLING TRAIN CALIBRATION DATA

INTERPOLL LABORATORIES
EPA Method 5 Gas Metering System
Quality Control Check Data Sheet

Job NORTHSHORE REFINING Date 1-9-95

Operator E Turbeville Module No. 3

Instructions: Operate the control module at a flow rate equal to ^H@ for 10 minutes before attaching the umbilical. Record the following data:

Bar press 29.58 in. Hg. γ = 1.0004 ^H@ 1.73 in. W.C.

Time (min)	Volume (CF)	Meter Temp. (°F)	
		Inlet	Outlet
[redacted]	(755.50)	[redacted]	
2.5	757.57	51	40
5.0	759.25	54	40
7.5	761.13	55	41
10	763.00	57	42
[redacted]	V_m= 7.50	Avg(t_m)= 49.5	°F

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{\gamma V_m}\left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

$$Y_{cn} = \frac{1.786}{(1.0004)(7.50)}\left[\frac{(49.5) + 460}{(29.55)}\right]^{0.5} \quad 0.9924$$

$$Y_{cn} = .9959$$

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

S-432

INTERPOLL LABORATORIES
EPA Method 5 Gas Metering System
Quality Control Check Data Sheet

Job Cyprus Northshore Dry Cobberstack Date 1/12/95

Operator J.S Module No. 3

Instructions: Operate the control module at a flow rate equal to ^H@ for 10 minutes before attaching the umbilical. Record the following data:

Bar press 28.94 in. Hg. Y = 1.0004 ^H@ 1.73 in. W.C.

Time (min)	Volume (CF)	Meter Temp. (°F)	
		Inlet	Outlet
[redacted]	(882.00)	[redacted]	
2.5	884.95	61	59
5.0	886.85	68	61
7.5	888.78	68	61
10	890.77	70	62
[redacted]	V_m= 7.77	Avg(t_m)=	63.8 °F

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{Y V_m}\left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

$$Y_{cn} = \frac{1.786}{(1.0004)(7.77)}\left[\frac{(63.8) + 460}{(28.94)}\right]^{0.5}$$

$$Y_{cn} = .98$$

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

S-432

INTERPOLL LABORATORIES
EPA Method 5 Gas Metering System
Quality Control Check Data Sheet

Job NORTH SHORE Date 1/10/95

Operator SF Module No. 15

Instructions: Operate the control module at a flow rate equal to ^H@ for 10 minutes before attaching the umbilical. Record the following data:

Bar press 29.38 in. Hg. γ = 1.0015 ^H@ 1.85 in. W.C.

Time (min)	Volume (CF)	Meter Temp. (°F)	
		Inlet	Outlet
[redacted]	(977.40)	[redacted]	
2.5	979.263	66	73
5.0	981.068	68	77
7.5	982.922	66	77
10	984.784	66	79
[redacted]	V_m= 7.384	Avg(t_m)= 71.5	°F

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{\gamma\ V_m}\left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

$$Y_{cn} = \frac{1.786}{(1.0015)(7.384)}\left[\frac{(71.5) + 460}{(29.38)}\right]^{0.5}$$

Y_{cn} = 1.027

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

S-432

INTERPOLL LABORATORIES
EPA Method 5 Gas Metering System
Quality Control Check Data Sheet

Job CYPRUS SILVER BAY Date 1-10-95

Operator GH Module No. 17

Instructions: Operate the control module at a flow rate equal to ^H@ for 10 minutes before attaching the umbilical. Record the following data:

Bar press 29.38 in. Hg. Y_T = .9932 ^H@ 1.73 in. W.C.

Time (min)	Volume (CF)	Meter Temp. (°F)	
		Inlet	Outlet
[redacted]	(095.40)	[redacted]	
2.5	97.225	63	68
5.0	98.703	63	70
7.5	100.932	63	71
10	102.760	63	72
[redacted]	V_m = 7.36	Avg(t_m) = 66.63 °F	

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{Y_T V_m}\left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

1.23

$$Y_{cn} = \frac{1.786}{(.9932)(7.36)}\left[\frac{(66.63) + 460}{(29.38)}\right]^{0.5}$$

Y_{cn} = 1.034

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

S-432

INTERPOLL LABORATORIES
EPA Method 5 Gas Metering System
Quality Control Check Data Sheet

Job CYPRUS SILVER BAY Date 1-11-95

Operator GH Module No. 17

Instructions: Operate the control module at a flow rate equal to ^H@ for 10 minutes before attaching the umbilical. Record the following data:

Bar press 29.38 in. Hg. Y_T = .9932 ^H@ 1.73 in. W.C.

Time (min)	Volume (CF)	Meter Temp. (°F)	
		Inlet	Outlet
[redacted]	(095.40)	[redacted]	
2.5	97.225	63	68
5.0	98.703	63	70
7.5	100.932	63	71
10	102.760	63	72
[redacted]	V_m= 7.36	Avg(t_m)= 66.63 °F	

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{Y_T V_m}\left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

4.23

$$Y_{cn} = \frac{1.786}{(.9932)(7.36)}\left[\frac{(66.63) + 460}{(34.38)}\right]^{0.5}$$

Y_{cn} = 1.034

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

S-432

INTERPOLL LABORATORIES
EPA Method 5 Gas Metering System
Quality Control Check Data Sheet

Job CYPRUS SILVER BAY Date 1-12-95

Operator GH Module No. 17

Instructions: Operate the control module at a flow rate equal to ^H@ for 10 minutes before attaching the umbilical. Record the following data:

Bar press 29.38 in. Hg. ΔH = .9932 ^H@ 1.73 in. W.C.

Time (min)	Volume (CF)	Meter Temp. (°F)	
		Inlet	Outlet
[redacted]	(695.40)	[redacted]	
2.5	97.225	63	68
5.0	98.703	63	70
7.5	100.932	63	71
10	102.760	63	72
[redacted]	V_m = 7.36	Avg(t_m) = 66.63 °F	

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{\Delta H \, V_m}\left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

4.23

$$Y_{cn} = \frac{1.786}{(.9932)(7.36)}\left[\frac{(66.63) + 460}{(29.38)}\right]^{0.5}$$

Y_{cn} = 1.034

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

S-432

INTERPOLL LABORATORIES
EPA Method 5 Gas Metering System
Quality Control Check Data Sheet

Job CYRUS N. SHORE Date 1-13-94

Operator GH Module No. 17

Instructions: Operate the control module at a flow rate equal to ^H@ for 10 minutes before attaching the umbilical. Record the following data:

Bar press 29.02 in. Hg. $_T$ = .9932 ^H@ 1.73 in. W.C.

Time (min)	Volume (CF)	Meter Temp. (°F)	
		Inlet	Outlet
[redacted]	526.50)	[redacted]	
2.5	528.355	60	52
5.0	530.215	60	52
7.5	532.075	61	52
10	533.940	62	52
[redacted]	V_m= 7.44	Avg(t_m)= 56.375 °F	

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{T\ V_m}\left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

$$Y_{cn} = \frac{1.786}{(.9932)(7.44)}\left[\frac{(56.375) + 460}{(29.02)}\right]^{0.5}$$

Y_{cn} = 1.02

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

S-432

INTERPOLL LABORATORIES
EPA Method 5 Gas Metering System
Quality Control Check Data Sheet

Job Northshore U-2 Boiler Stack Date 1/11/95

Operator J.S Module No. 18

Instructions: Operate the control module at a flow rate equal to ^H@ for 10 minutes before attaching the umbilical. Record the following data:

Bar press 29.02 in. Hg. $_T$ = 1.0026 ^H@ 1.84 in. W.C.

Time (min)	Volume (CF)	Meter Temp. (°F)	
		Inlet	Outlet
[redacted]	(115.80)	[redacted]	
2.5	117.69	44	42
5.0	119.55	45	43
7.5	121.43	48	44
10	123.29	50	44
[redacted]	V_m= 7.49	Avg(t_m)= 45	°F

Calculate Y_{cn} as follows:

$$Y_{cn} = \frac{1.786}{T\ V_m}\left[\frac{(t_m + 460)}{P_b}\right]^{0.5}$$

$$Y_{cn} = \frac{1.786}{(1.0026)(7.49)}\left[\frac{(45) + 460}{(29.02)}\right]^{0.5}$$

Y_{cn} = .99

If Y_{cn} is not within the range of 0.97 to 1.03, "the volume metering system should be investigated before beginning."

CFR Title 40, Part 60, Appendix A, Method 5, Section 4.4.1

S-432

Interpoll Laboratories, Inc.
(612) 786-6020

Meter Box Calibration and Usage Status

Date of Report: January 16, 1995

Meter Box No. : 3 (Rockwell Dry Test Meter Serial No. 949231)

Date of Last Calibration: October 31, 1994
Calibration Technician: E. Trowbridge
Wet Test Meter No.: American Meter AL-20

Date of Use	Report No.	Initial Meter Reading	Final Meter Reading	Volume/Job (cu. ft.)	Total Volume* (cu. ft.)
November 03, 1994	4-4252	104.00	207.53	103.53	103.53
November 15, 1994	4-4323	225.00	258.73	33.73	137.26
November 29, 1994	4-4436	269.60	480.93	211.33	348.59
December 01, 1994	4-4439	492.60	597.27	104.67	453.26
December 15, 1994	4-4528	598.35	746.40	148.05	601.31
January 10, 1995	5-4664	763.20	1002.16	238.96	840.27

* Total volume through meter since last calibration.

Interpoll Laboratories, Inc.
(612) 786-6020

Meter Box Calibration and Usage Status

Date of Report: January 16, 1995

Meter Box No. : 15 (Rockwell Dry Test Meter Serial No. 1334122)

Date of Last Calibration: October 11, 1994
Calibration Technician: D. Van Hoever
Wet Test Meter No.: American Meter AL-20

Date of Use	Report No.	Initial Meter Reading	Final Meter Reading	Volume/Job (cu. ft.)	Total Volume* (cu. ft.)
November 29, 1994	4-4437	545.60	775.13	229.53	229.53
January 10, 1995	5-4664	813.90	1130.02	316.12	545.65

* Total volume through meter since last calibration.

Interpoll Laboratories, Inc.
(612) 786-6020

Meter Box Calibration and Usage Status

Date of Report: January 16, 1995

Meter Box No. : 17 (Rockwell Dry Test Meter Serial No. 1334113)

Date of Last Calibration: October 31, 1994
Calibration Technician: E. Trowbridge
Wet Test Meter No.: American Meter AL-20

Date of Use	Report No.	Initial Meter Reading	Final Meter Reading	Volume/Job (cu. ft.)	Total Volume* (cu. ft.)
January 10, 1995	5-4664	932.80	1525.47	592.67	592.67

* Total volume through meter since last calibration.

Interpoll Laboratories, Inc.
(612) 786-6020

Meter Box Calibration and Usage Status

Date of Report: January 16, 1995

Meter Box No. : 18 (Rockwell Dry Test Meter Serial No. 1334117)

Date of Last Calibration: October 31, 1994
Calibration Technician: E. Trowbridge
Wet Test Meter No.: American Meter AL-20

Date of Use	Report No.	Initial Meter Reading	Final Meter Reading	Volume/Job (cu. ft.)	Total Volume* (cu. ft.)
December 06, 1994	4-4505	666.33	897.50	231.17	231.17
December 12, 1994	4-4524	915.40	1115.15	199.75	430.92
January 12, 1995	5-4664	1123.70	1299.88	176.18	607.10

* Total volume through meter since last calibration.

INTERPOLL LABORATORIES, INC.
(612) 786-6020

Meter Calibration Sheet EPA/Method 5

Date 10-31-94
Bar. Press. 29.11 IN.HG
Wet Test Meter No. AL-20

Control Module No. 3
Serial No. DTM 949231
Technician T. Townsend

ΔH (IN.WC)		Gas Volume Wet Test Meter	• Cal. Index φ	• Diff. Wet Test Meter ΔP_w	Gas Volume Dry Test Meter (ft^3)		Gas Temperatures			Time θ	Meter Coeff.	Orifice Const.	C_f
							Wet Test t_w (°F)	Dry Test					
Nominal	Actual	(ft^3)	(%)	(IN.WC.)	V_{di}	V_{df}		t_{di} (°F)	t_{do} (°F)	(Min/Sec)	Y	ΔH@	
0.5	.5	2	99.85	0.01	69.000	71.038	67	82	76	4/52	1.0009	1.67	
1.2	1.2	3	99.91	0.025	65.500	68.552	67	81	76	4/18	1.0031	1.72	
2.0	2.0	3	99.93	0.055	71.500	74.566	67	86	77	3/44	.9995	1.73	
3.3	3.3	5	100.00	0.09	75.000	80.115	67	90	79	4/53	1.0014	1.75	
4.7	4.7	5	100.02	0.12	80.500	85.629	67	91	80	4/09	.9971	1.79	
2	3	4	5	6	7	8	9	10		mm:ss Avg	1.0004	1.73	

Positive leak check performed by GT
Meter was in tolerance ☒
Approved by Daniel L. Dey

Meter was not in tolerance ☐: readjusted linkage
Meter was not in tolerance ☐: changed dry test meter
Date 11/1/94

*Based on AL-20 wet test meter calibration in Nov. 1991 against Bell Prover (NBS Traceable) - Carl Poe Co.

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Meter Calibration Sheet EPA/Method 5

Date 10/11/94
Bar. Press. 29.24 IN.HG
Wet Test Meter No. AL-20

Control Module No. 15
Serial No. DTM 1334122
Technician D. VAN Hoever

ΔH (IN.WC)		Gas Volume Wet Test Meter	* Cal. Index	* Diff. Wet Test Meter ΔP_w	Gas Volume Dry Test Meter (ft^3)		Gas Temperatures			Time	Meter Coeff.	Orifice Const.	C_f
							Wet Test	Dry Test					
Nominal	Actual	(ft^3)	(%)	(IN.WC.)	V_{di}	V_{df}	t_w (°F)	t_{di} (°F)	t_{do} (°F)	θ (Min/Sec)	Y	ΔH@	
0.5	.5	~~3~~ 3	99.85	0.01	542.165	545.185	68	80	68	7:32	1.0018	1.79	
1.2	1.2	~~2.5~~ 2.5	99.91	0.025	539.14	541.66	68	83	67	4:06	1.0012	1.82	
2.0	2.0	3	99.93	0.055	520.675	523.665	68.1	74	64	3:50	.9992	1.87	
3.3	3.3	~~6.5~~ 6.5	100.00	0.09	525.16	531.645	68.0	80	64	6:34	1.0013	1.91	
4.7	4.7	5	100.02	0.12	~~532.64~~ 532.64	537.63	68.0	85	66	4:14	1.0042	1.90	
1	2	3	4	5	6	7	8	9	10	11/12 Avg	1.0015	1.86	

Positive leak check performed by DH
Meter was in tolerance ☒
Approved by Daniel L. Poe

Meter was not in tolerance ☐: readjusted linkage
Meter was not in tolerance ☐: changed dry test meter
Date 10/12/94

*Based on AL-20 wet test meter calibration in Nov 1991 against Bell Prover (NBS Traceable) - Carl Poe Co.

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Meter Calibration Sheet EPA/Method 5

Date 10-31-94
Bar. Press. 29.11 IN.HG
Wet Test Meter No. AL-20

Control Module No. 17
Serial No. DTM 1334113
Technician [signature]

ΔH (IN.WC)		Gas Volume Wet Test Meter	* Cal. Index φ	* Diff. Wet Test Meter ΔP_w	Gas Volume Dry Test Meter (ft^3)		Gas Temperatures			Time θ	Meter Coeff.	Orifice Const.	C_f
							Wet Test	Dry Test					
Nominal	Actual	(ft^3)	(%)	(IN.WC.)	V_{di}	V_{df}	t_w (°F)	t_{di} (°F)	t_{do} (°F)	(Min/ Sec)	Y	ΔH@	
0.5	.5	2	99.85	0.01	916.000	918.048	67.5	51	72	4/48	.9904	1.63	
1.2	1.2	3	99.91	0.025	912.600	915.660	67.5	80	71	4/47	.9912	1.73	
2.0	2.0	3	99.93	0.055	918.500	921.566	67.5	87	73	3/46	.9957	1.77	
3.3	3.3	5	100.00	0.09	922.000	927.122	67.0	90	74	4/52	.9954	1.74	
4.7	4.7	5	100.02	0.12	927.500	932.624	67.0	92	75	4/08	.9954	1.79	
1	2	3	4	5	6	7	8	9	10	11/12 Avg	.9932	1.73	

Positive leak check performed by [signature]
Meter was in tolerance
Approved by [signature]

Meter was not in tolerance ☐: readjusted linkage
Meter was not in tolerance ☐: changed dry test meter
Date 11/1/94

*Based on AL-20 wet test meter calibration in Nov. 1991 against Bell Prover (NBS Traceable) - Carl Poe Co.

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INTERPOLL LABORATORIES, INC.
(612) 786-6020

Meter Calibration Sheet EPA/Method 5

Date 10-31-94
Bar. Press. 29.11 IN.HG
Wet Test Meter No. AL-20

Control Module No. 15
Serial No. DTM 1334117
Technician E Thorbeck

ΔH (IN.WC)		Gas Volume Wet Test Meter	* Cal. Index	* Diff. Wet Test Meter	Gas Volume Dry Test Meter (ft³)		Gas Temperatures			Time	Meter Coeff.	Orifice Const.	C_f
				ΔP_w			Wet Test	Dry Test					
Nominal	Actual	(ft³)	(%)	(IN.WC.)	V_{di}	V_{df}	t_w (°F)	t_{di} (°F)	t_{df} (°F)	θ (Min/Sec)	Y	ΔH@	
0.5	.5	2	99.85	0.01	580.000	582.014	68	81	70	5/02	1.0017	1.80	
1.2	1.2	3	99.91	0.025	576.500	579.512	68	79	69	4/52	1.0033	1.80	
2.0	2.0	3	99.93	0.055	582.500	585.531	68	86	71	3/50	1.0035	1.84	
3.3	3.3	5	100.00	0.09	586.000	591.071	68	90	73	5/01	1.0026	1.86	
4.7	4.7	5	100.02	0.12	591.500	596.577	68	93	74	4/14	1.0017	1.88	
		3	3	4	5	6	7	8	9	10	11/12 Avg	1.0026	1.84	

Positive leak check performed by
Meter was in tolerance ☒
Approved by

Meter was not in tolerance ☐: readjusted linkage
Meter was not in tolerance ☐: changed dry test meter
Date 11/15/94

*Based on AL-20 wet test meter calibration in Nov. 1991 against Bell Prover (NBS Traceable) - Carl Poe Co.

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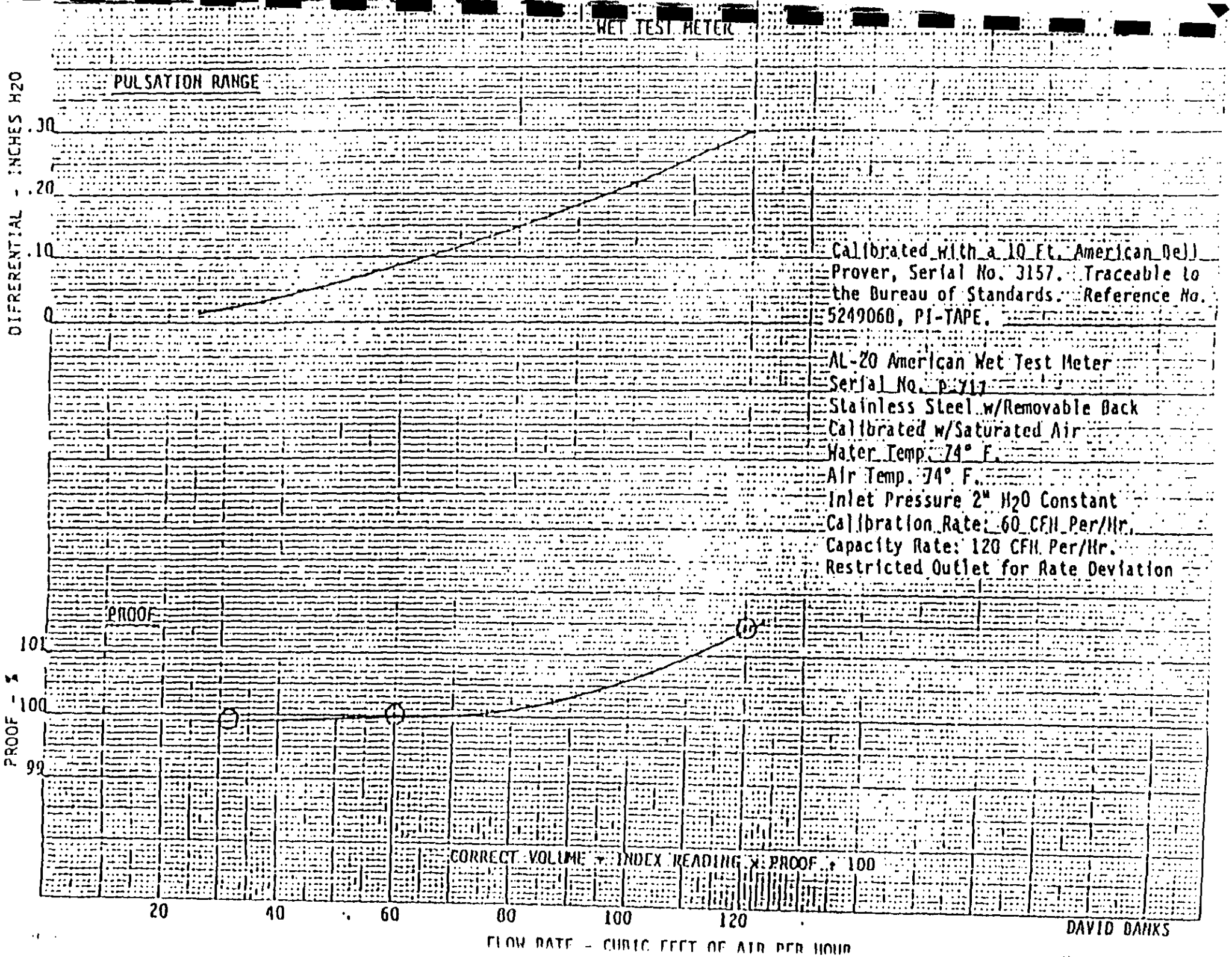
WET TEST METER
PULSATION RANGE
DIFFERENTIAL - INCHES H2O
.30
.20
.10
0
Calibrated With a 10 Ft. American Dell Prover, Serial No. 3157. Traceable to the Bureau of Standards. Reference No. 5249060, PI-TAPE.
AL-20 American Wet Test Meter
Serial No. P 711
Stainless Steel w/Removable Back
Calibrated w/Saturated Air
Water Temp. 74° F.
Air Temp. 74° F.
Inlet Pressure 2" H2O Constant
Calibration Rate: 60 CFH Per/Hr.
Capacity Rate: 120 CFH Per/Hr.
Restricted Outlet for Rate Deviation
PROOF
101
100
99
PROOF - %
CORRECT VOLUME = INDEX READING X PROOF ÷ 100
20
40
60
80
100
120
DAVID BANKS
FLOW RATE - CUBIC FEET OF AIR PER HOUR

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 01-10-95 Nozzle Number 3-3
Technician: Ed Trowbridge

The nozzle is rotated in 60 degree increments and the diameter at each point is measured to the nearest 0.001 inch. The observed readings and average are shown below.

Position	Diameter (inches)
1	.185
2	.187
3	.186
Average:	.186

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 01-10-95 Nozzle Number 7-4

Technician: Duane Van Hoever

The nozzle is rotated in 60 degree increments and the diameter at each point is measured to the nearest 0.001 inch. The observed readings and average are shown below.

Position	Diameter (inches)
1	.247
2	.247
3	.246
Average:	.247

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 01-10-95 Nozzle Number 1-4
Technician: Gary Hove

The nozzle is rotated in 60 degree increments and the diameter at each point is measured to the nearest 0.001 inch. The observed readings and average are shown below.

Position	Diameter (inches)
1	.249
2	.251
3	.250
Average:	.250

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 01-12-95 Nozzle Number 1-3

Technician: Gary Hove

The nozzle is rotated in 60 degree increments and the diameter at each point is measured to the nearest 0.001 inch. The observed readings and average are shown below.

Position	Diameter (inches)
1	.185
2	.184
3	.185
Average:	.185

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 01-13-95 Nozzle Number 1-4
Technician: Gary Hove

The nozzle is rotated in 60 degree increments and the diameter at each point is measured to the nearest 0.001 inch. The observed readings and average are shown below.

Position	Diameter (inches)
1	.250
2	.250
3	.249
Average:	.250

Interpoll Laboratories, Inc.
(612) 786-6020

Nozzle Calibration
Data Sheet

Date of Calibration: 01-13-95 Nozzle Number 3-3
Technician: Jeff Scripter

The nozzle is rotated in 60 degree increments and the diameter at each point is measured to the nearest 0.001 inch. The observed readings and average are shown below.

Position	Diameter (inches)
1	.182
2	.182
3	.181
Average:	.182

Interpoll Laboratories, Inc.

Temperature Measurement Device Calibration Sheet

Unit under test:

Vendor BECKMAN INDUSTRIAL

Model HD 110T Serial Number PDT #18

Range 0 – 2000 °F Thermocouple Type K

Date of Calibration 11/2/94 Technician D. VAN HOEVER

Method of Calibration:

☐ Comparison against ASTM mercury in glass thermometer using a thermostatted and insulated aluminum block designed to provide uniform temperature. The temperature is adjusted by adjusting the voltage on the block heater cartridge.

☒ Omega Model CL-300 Type K Thermocouple Simulator which provides 22 precise temperature equivalent millivolt signals. The CL-300 is cold junction compensated. Calibration accuracy is ± 0.1% of span (2100 °F) ± 1 degree (for negative temperatures add ± 2 degrees. The CL-300 simulates exactly the millivoltage of a Type K thermocouple at the indicated temperature.

Desired Temp (°F) Nominal	Temperature of Standard or Simulated Temp (°F)	Response of Unit Under Test (°F)	Deviation Δt (°F)	Deviation (%)
0		-2	-2	.43
100		94	6	1.07
200		198	2	.50
300		296	4	.53
400		393	7	.81
500		493	7	.73
600		596	4	.38
700		696	4	.34
800		802	2	.16
900		904	4	.29
1000		1009	9	.58
1100		1113	13	.83
1200		1219	15	1.14
1300		1320	20	1.161
1400		1424	24	1.27
1500		1522	22	1.13
1600		1624	24	1.17
1700		1719	19	.88
1800		1818	18	.80
1900		1910	10	.42
2000				
2100				
		Averages:		.72

OF = off scale response by unit under test (°F)

% dev = 100 Δt / (460 + t)

☒ Unit in tolerance

☐ Unit was not in tolerance: recalibrated – See new calibration sheet.

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Interboll Laboratories. Inc.

Temperature Measurement Device
Calibration Sheet

NO 25

Unit under test:

Vendor BECKMAN

Model HOIIOT — Serial Number 25

Range ____ °F — Thermocouple Type K

Date of Calibration 10-28-94 — Technician GH

Method of Calibration:

☐ Comparison against ASTM mercury in glass thermometer using a thermostatted and insulated aluminum block designed to provide uniform temperature. The temperature is adjusted by adjusting the voltage on the block heater cartridge.

☐ Omega Model CL-300 Type K Thermocouple Simulator which provides 22 precise temperature equivalent millivolt signals. The CL-300 is cold junction compensated. Calibration accuracy is ± 0.1% of span (2100 °F) ± 1 degree (for negative temperatures add ± 2 degrees. The CL-300 simulates exactly the millivoltage of a Type K thermocouple at the indicated temperature.

Desired Temp (°F) Nominal	Temperature of Standard or Simulated Temp (°F)	Response of Unit Under Test (°F)	Deviation Δt (°F)	Deviation (%)
0	0	0	0	0
100	100	91	9	1.61
200	200	194	6	.909
300	300	291	9	1.84
400	400	390	10	1.16
500	500	489	11	1.04
600	600	592	8	.75
700	700	693	7	.67
800	800	798	2	.15
900	900	900	0	0
1000	1000	1005	5	.34
1100	1100	1108	8	.47
1200	1200	1191	9	.57
1300	1300	1315	15	.95
1400	1400	1397	3	.17
1500	1500	1498	2	.10
1600	1600	1602	2	.009
1700	1700	1697	3	.139
1800	1800	1796	4	.185
1900	1900	1889	11	.468
2000	2000	1984	16	.650
2100				
		Averages:	7.14	.0096

OF = off scale response by unit under test (°F)

% dev = 100 Δt / (460 + t)

☐ Unit in tolerance.

☐ Unit was not in tolerance: recalibrated - See new calibration sheet.

S-433

Interpoll Laboratories, Inc.

Temperature Measurement Device
Calibration Sheet

Unit under test: #34

Vendor OMEGA

Model HH81 Serial Number 74TX0343

Range 0-2000 °F Thermocouple Type K

Date of Calibration 1-11-95 Technician E TRAUBRIDGE

Method of Calibration:

☐ Comparison against ASTM mercury in glass thermometer using a thermostatted and insulated aluminum block designed to provide uniform temperature. The temperature is adjusted by adjusting the voltage on the block heater cartridge.

☒ Omega Model CL-300 Type K Thermocouple Simulator which provides 22 precise temperature equivalent millivolt signals. The CL-300 is cold junction compensated. Calibration accuracy is ± 0.1% of span (2100 °F) ± 1 degree (for negative temperatures add ± 2 degrees. The CL-300 simulates exactly the millivoltage of a Type K thermocouple at the indicated temperature.

Desired Temp (°F) Nominal	Temperature of Standard or Simulated Temp (°F)	Response of Unit Under Test (°F)	Deviation	
			Δt (°F)	(%)
0	0	-3	-3	.65
100	100	98	2	.35
200	200	201	1	.15
300	300	299	1	.13
400	400	398	2	.23
500	500	499	1	.10
600	600	600	0	0
700	700	699	1	.08
800	800	802	2	.15
900	900	901	1	.07
1000	1000	1001	1	.06
1100	1100	1100	0	0
1200	1200	1202	2	.01
1300	1300	1301	1	.05
1400	1400	1403	3	.16
1500	1500	1501	1	.03
1600	1600	1604	4	.19
1700	1700	1703	3	.13
1800	1800	1804	4	.17
1900	1900	1902	2	.08
2000	2000	2003	3	.12
2100	2100	2100	0	0
		Averages:	1.77	.227

OF = off scale response by unit under test (°F)

% dev = 100 Δt / (460 + t)

☒ Unit in tolerance

☐ Unit was not in tolerance; recalibrated - See new calibration sheet.

Interpoll Laboratories, Inc.

Temperature Measurement Device
Calibration Sheet

Unit under test:

Vendor OMEGA

Model HH 81 Serial Number PDT #35

Range ____ °F Thermocouple Type K

Date of Calibration 11/2/84 Technician D. VanHoever

Method of Calibration:

☐ Comparison against ASTM mercury in glass thermometer using a thermostatted and insulated aluminum block designed to provide uniform temperature. The temperature is adjusted by adjusting the voltage on the block heater cartridge.

☒ Omega Model CL-300 Type K Thermocouple Simulator which provides 22 precise temperature equivalent millivolt signals. The CL-300 is cold junction compensated. Calibration accuracy is ± 0.1% of span (2100 °F) ± 1 degree (for negative temperatures add ± 2 degrees. The CL-300 simulates exactly the millivoltage of a Type K thermocouple at the indicated temperature.

Desired Temp (°F) Nominal	Temperature of Standard or Simulated Temp (°F)	Response of Unit Under Test (°F)	Deviation Δt (°F)	Deviation (%)
0		-6	6	1.3
100		95	5	.89
200		197	3	.145
300		295	5	.166
400		395	5	.58
500		496	4	.42
600		598	2	.19
700		697	3	.26
800		800	—	0
900		898	2	.15
1000		999	1	.07
1100		1098	2	.13
1200		1194	1	.06
1300		1298	2	.11
1400		1400	—	0
1500		1500	—	0
1600		1602	2	.10
1700		1701	1	.05
1800		1802	2	.09
1900		1901	1	.04
2000		2001	1	.04
2100		2099	1	.04
		Averages:		.26

OF = off scale response by unit under test (°F)

% dev = 100 Δt / (460 + t)

☒ Unit in tolerance

☐ Unit was not in tolerance: recalibrated - See new calibration sheet.

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Interpoll Laboratories, Inc.

Temperature Measurement Device Calibration Sheet

Unit under test:

Vendor OMEGA

Model HH81 Serial Number 74JX1119

Range -160 – 1,372°C ☒ Thermocouple Type K

Date of Calibration 10/10/94 Technician EJ

40

Method of Calibration:

☐ Comparison against ASTM mercury in glass thermometer using a thermostatted and insulated aluminum block designed to provide uniform temperature. The temperature is adjusted by adjusting the voltage on the block heater cartridge.

☒ Omega Model CL-300 Type K Thermocouple Simulator which provides 22 precise temperature equivalent millivolt signals. The CL-300 is cold junction compensated. Calibration accuracy is ± 0.1% of span (2100 °F) ± 1 degree (for negative temperatures add ± 2 degrees. The CL-300 simulates exactly the millivoltage of a Type K thermocouple at the indicated temperature.

Desired Temp (°F) Nominal	Temperature of Standard or Simulated Temp (°F)	Response of Unit Under Test (°F)	Deviation Δt (°F)	Deviation (%)
0	0	-3.0	3	.65
100	100	98	2	.36
200	200	200	0	0
300	300	298	2	.26
400	400	398	2	.23
500	500	499	1	.10
600	600	600	0	0
700	700	699	1	.08
800	800	801	1	.08
900	900	900	0	0
1000	1000	1001	1	.07
1100	1100	1099	1	.06
1200	1200	1201	1	.106
1300	1300	1299	1	.06
1400	1400	1402	2	.11
1500	1500	1500	0	0
1600	1600	1602	2	.09
1700	1700	1700	0	0
1800	1800	1802	2	.09
1900	1900	1901	1	.04
2000	2000	2001	1	.04
2100	2100	2099	1	.04
		Averages:	1.1	.11

OF = off scale response by unit under test (°F)

% dev = 100 Δt / (460 + t)

☒ Unit in tolerance

☐ Unit was not in tolerance: recalibrated - See new calibration sheet.

S-433

INTERPOLL LABORATORIES
(612)786-6020

Stack Sampling Department - QA
Aneroid Barometer Calibration Sheet

Date 7-20-94

Technician GH

Mercury Column Barometer No. NO 1

Aneroid Barometer No. GARY HOVE 1636235

Actual Mercury Barometer Read	Ambient Temp.	Temperature Correction Factor	Adjsted Mercury Barometer Read	Initial Aneriod Barometer Read	Difference (P_{ba}-P_{bm})
29.05	75	-.124 T=00	28.925	28.940	-.015 -.01

Has this barometer shown any consistent problems with calibration? Yes/No. If yes, explain. YES DID ADJUSTED IT

Has problem been alleviated? Yes/No. How? YES

*Note

Aneroid barometers will be calibrated periodically against a mercury column barometer. The aneroid barometer to be calibrated should be placed in close proximity to the mercury barometer and left to equilibrate for 20-30 minutes before calibrating. Aneriod barometer will be calibrated to the adjusted mercury barometer readings.

S-312

ET's

INTERPOLL LABORATORIES
(612)786-6020

Stack Sampling Department - QA
Aneroid Barometer Calibration Sheet

Date 1-11-95

Technician E Trowbridge

Mercury Column Barometer No. ALTimeter model 12

Aneroid Barometer No. SN -01002005

Actual Mercury Barometer Read	Ambient Temp.	Temperature Correction Factor	Adjsted Mercury Barometer Read	Initial Aneriod Barometer Read	Difference (P_{ba}-P_{bm})
28.86	72	.113	28.747	28.68	.067

Has this barometer shown any consistent problems with calibration? Yes/(No) If yes, explain. No

Has problem been alleviated? (Yes)/No. How?

*Note

Aneroid barometers will be calibrated periodically against a mercury column barometer. The aneroid barometer to be calibrated should be placed in close proximity to the mercury barometer and left to equilibrate for 20-30 minutes before calibrating. Aneriod barometer will be calibrated to the adjusted mercury barometer readings.

S-312

INTERPOLL LABORATORIES
(612)786-6020

Stack Sampling Department - QA
Aneroid Barometer Calibration Sheet

Date 11/2/94
Technician D. VanHoeven
Mercury Column Barometer No. LAB
Aneroid Barometer No. ~~Dott~~

Actual Mercury Barometer Read	Ambient Temp.	Temperature Correction Factor	Adjsted Mercury Barometer Read	Initial Aneriod Barometer Read	Difference (P_{ba}-P_{bm})
28.81	76	.134	28.67	28.66	.01

Has this barometer shown any consistent problems with calibration? Yes (No.) If yes, explain. _____

Has problem been alleviated? Yes/No. How? _____

*Note

Aneroid barometers will be calibrated periodically against a mercury column barometer. The aneroid barometer to be calibrated should be placed in close proximity to the mercury barometer and left to equilibrate for 20-30 minutes before calibrating. Aneriod barometer will be calibrated to the adjusted mercury barometer readings.

S-312

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No 23-5

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" .02
9. W <.0625" .01

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .760 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .760 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection: 2/-8-94

Inspected by: [signature]

CFR Title 40 Part 60 Appenidix A Method 2

S-348

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No. 23-6

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" .02
9. W <.0625" .025

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .750 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .760 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection:

4-8-94

Inspected by:

CFR Title 40 Part 60 Appenidix A Method 2

S-348

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No. 23-10

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" .032
9. W <.0625" .025

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .750 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .760 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection: 4-8-94

Inspected by: [signature]

CFR Title 40 Part 60 Appenidix A Method 2

S-348

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No. 24-2 1/2

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" .0
9. W <.0625" .02

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .750 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .760 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection:

1-8-94

Inspected by:

CFR Title 40 Part 60 Appenidix A Method 2

S-348

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No. 24-4

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" .02
9. W <.0625" .01

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .750 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .760 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection: 1-8-94

Inspected by: [signature]

CFR Title 40 Part 60 Appenidix A Method 2

S-348

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No. 24-6

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" .02
9. W <.0625" 0

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .750 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .750 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection:

4-5-94

Inspected by:

CFR Title 40 Part 60 Appenidix A Method 2

S-348

Interpoll Laboratories, Inc.
(612) 786-6020

S-Type Pitot Tube Inspection Sheet

Pitot Tube No. 29-4

Pitot tube dimensions:

1. External tubing diameter (D_t) .316 IN.
2. Base to Side A opening plane (P_A) .460 IN.
3. Base to Side B opening plane (P_B) .460 IN.

Alignment:

4. α_1 < 10° 0
5. α_2 < 10° 0

6. B_1 < 5° 0
7. B_2 < 5° 0

8. Z <.125" .02
9. W <.0625" .02

Distance from Pitot to Probe Components:

10. Pitot to 0.500 IN. nozzle .750 IN.
11. Pitot to probe sheath 3.0 IN.
12. Pitot to thermocouple (parallel to probe) 3.0 IN.
13. Pitot to thermocouple (perpendicular to probe) .760 IN.

☒ Meets all EPA design criteria thus C_p = 0.84
☐ Does not meet EPA design criteria - thus calibrate in wind tunnel.
C_p = _____

Date of Inspection: 4-7-94

Inspected by: [signature]

CFR Title 40 Part 60 Appenidix A Method 2

S-348

APPENDIX J

TEST PLAN

CYPRUS NORTHSHORE MINING
E.W. Davis Works
Compliance and Re-test Plan

PART I. GENERAL INFORMATION

Test Plan Date:	December 3, 1994
Test Date:	Week of January 9, 1995
Name & Address of Emission Facility:	Northshore Mining Company 10 Outer Drive Silver Bay, MN 55614
Permittee Contact:	Dennis M. Wagner (218/226-6056)
Permit File No.:	27A-89-OT-1
Independent Testing Company:	Interpoll Laboratories
Contact Person:	Kathy Eickstadt (612/786-7854)
Sources to be tested:	
Emission source 11:	Fine Crusher bag house.
Emission source 76:	Pelletizing furnace discharge rotoclone.
Emission source 104-105:	Pelletizer furnace 11 waste gas WWESP.
Emission source 106-107:	Pelletizer furnace 12 waste gas WWESP.
Reason for testing:	Compliance tests and compliance test re-test.

Physical descriptions of emission points: Drawings of emission control points are attached for Agency review.

PART II TESTING REQUIREMENTS

Emission Source	Pollutant	Emission Limit	Applicable MN Rule	Method	Run Length
11 Fine Crusher	Particulate Matter	0.002 Gr/DSCFM	7005.0010-7005.0080	5	60 Min
76 Pelletizer Rotoclone	Particulate Matter	0.03 Gr/DSCFM	7005.0010-7005.0080	5	60 Min
	Opacity	20%	7005.0470 Subp. 1.B.	9	60 Min
104, 105 & 106 Pelletizer Waste Gas	Particulate Matter	0.01 Gr/DSCFM	7005.0010-7005.0080	5	60 Min
	Amphiboles Fibers (1)		—	MDH	1-60 Min
107 Pelletizer Waste Gas	Particulate Matter	0.01 Gr/DSCFM	7005.0010-7005.0080	5	60 Min
	So_2	—	—	6C	60 Min
	No_x	—	—	7E	60 Min

PART III. OPERATING CONDITIONS

Emission Source 11:

Process Equipment:	Crude ore crushing.
Process Operating Rate During Test:	Normal 400-600 TPH.
Control Equipment:	Bag house.
Control Equipment Operating Parameters:	Pressure drop.
Rationale for Worst Case:	None
Normal Operating Range:	15,000 ACEM @ 77° F rated.
Air Pollution Control and Process Monitoring:	Tons crushed during test period will be recorded.

Emission Source 76:

Process Equipment:	Pelletizer furnace discharge rotoclone.
Process Operating Rate During Test Period:	Normal 230-250 TPH.
Control Equipment:	Rotoclone.
Control Equipment Operating Parameters:	None.
Rationale for Worst Case:	None.
Normal Operating Range:	32,000 ACFM @ 750° F.
Air Pollution Control & Process Monitoring:	Tons processed during test period will be recorded.

Emission Sources 104-107:

Process Equipment:	Pelletizing furnace waste gas.
Process Operating Rate During Test:	Normal 230-250 TPH.
Control Equipment:	Wet wall electrostatic precipitators.
Control Equipment Operating Parameters:	Secondary volts, primary amperes, spark rates and water flow.
Rationale for Worst Case:	None.
Normal Operating Range:	93,000 ACFM @ 150° F.
Air Pollution Control & Process Monitoring:	Fuel usage and tons processed during test period will be recorded as will the operating parameters for the WWESP.

PART IV TEST METHODS

A. EPA Method 1 for the location of sampling ports and points. Location of the sampling ports must be approved before the test.

B. EPA Method 2 for velocity and volumetric flow rate. Three determinations: one measurement concurrently with each test run for pollutant.

C. EPA Method 3. Three determinations; one measurement on an integrated sample taken concurrently with each test run for pollutant.

D. EPA Method 4 for the determination of moisture in the flue gases. Three determinations: one measurement concurrently with each test for pollutant.

E. EPA Method 5 for the determination of particulate matter. Three one-hour determinations will be performed. Condensible compounds will be collected during each determination and analyzed as per MN Rules Part 7005.0500. Results will be reported both as total particulate matter containing condensibles and total particulate matter excluding condensibles.

F. EPA Method 6C for the determination of sulfur dioxide. Three one-hour monitors will be performed.

G. EPA Method 7E for the determination of nitrogen oxides. Three one-hour monitorings will be performed.

H. EPA Method 9 as amended by Minnesota Rules Part 7006.1860 for the Determination of Opacity. Two hundred forty (240) observations during a one-hour period concurrent with one of the test runs by a certified reader.

PART V. CEMS RELATIVE ACCURACY

NA

PART VI OTHER

A. Pollutants will be reported as GR/DSCF and LB/HR.

B. Description and date of last maintenance work done before the test. This information will be supplied as a part of the test report.

C. One complete test report will be submitted within 45 days after the date of the test.

D. One microfiche copy of the report will be submitted within 105 days after the date of the test.