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

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

Background Report Reference

AP-42 Section Number: 12.8

Background Chapter: 4

Reference Number: 7

Title: State Metal Industries, Inc., September 1990

US EPA

US EPA

September 1990

EVALUATOR CMC EVALUATION DATE 7/2

A

7/17

METHOD 5: SECONDARY EMISSIONS TEST REPORT EVALUATION

STATE: NJ FACILITY: State Metal Industries, Inc. Gaudem 941 S. 2nd St. TEST DATE: 9/25/90

PROCESS(ES) TESTED: aluminum smelting furnaces 304003 xx (reverb)

SAMPLING DURATION 3
must have at least 3 runs, each ≥ 1 hour duration, with sampling ≥ 2 minutes at each traverse point, and total sampling volume ≥ 30 dscf

PRODUCTION RATE 3
is process or production rate during testing representative of normal rates

CONTROL DEVICE(S) 3
are devices described, and their efficiencies given

baghouse on smelters

METHOD 1 3
are calculations accurate, and is figure provided

METHODS 2,3 3
are data and calculations included for gas velocity, cyclonic flow, and molecular weight determination, and is source of barometric pressure noted

METHOD 4 3
are data and calculations included for moisture content determination, and is moisture content realistic [< saturation]

FIELD DATA is field data on standard forms, and does raw data correspond with printout 3

BOILER TESTS N/A
calculation of F_0 from Orsat accurate

SAMPLING TEMPERATURE 3
both probe and filter must be maintained at 248 ± 25°F or other temperature specified in NSPS

baghouse 140°F, stack temp 139°F ✓
furnaces: 280+ ✓

BACK-HALF 3
if any, what method was used to catch and recover condensible matter

NJ-1 (H_2O)

EQUIPMENT were a borosilicate glass probe liner and a glass fiber filter used 3

CALIBRATION were both pre- and post-test calibrations performed for

meter box 3

pitot tube 3

temperature sensor 3

nozzle (3 #) 2

no doc.

LEAK CHECKS both pre- and post-test 3

BLANKS were filter and reagent blanks analyzed, and were any problems addressed 3

SAMPLE PREP 3
filter desiccation and tare weights documented

ISOKINETICS within 100±10% for all runs 3

6879 lb/hr.

smelting furnaces

1.93 lb/hr Cl

0.561 lb/ton Cl

~~.058~~ .759 lb/hr PM

0.221 lb/ton PM

"A"

---

combustion flues:

7000, 8250, 20000 ft³/hr.

.045 lb PM/hr, .495 lb PM/hr, 1.48 lb PM/hr

.2, .5, 7.3 lb VOC/hr

.05, .24, .29 lb CO/hr

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State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF ENVIRONMENTAL QUALITY
Bureau of Technical Services
CN 411
Trenton, N.J. 08625-0411
(609) 530-4041

December 12, 1990

MEMORANDUM

TO: Chief, Bureau of Enforcement Operations

THROUGH: Edward Choromanski

FROM: Michael Pratt M.P.

SUBJECT: State Metal Industries, Inc.
APC Plant ID No. 50539
NJ Stack No. 006
P/CT No. 91282
Log No. 89-2887

Emission tests were conducted at the above referenced facility on:

1) 3 ("Plibrico", "North American", and "United") aluminum smelting furnaces controlled by a common baghouse.

2) Combustion flues of the above described furnaces.

The purpose these tests was to determine:

1) Particulate and chlorine emissions from the baghouse.

2) Particulate, THC, No_x, and CO (combustion products) emissions from the 3 combustion flues.

3) Compare the emission results for each (above described) air contaminant to the P/CT No. 91282 allowables.

Leonard Sobolewski reviewed the submitted test report. His review indicated the following:

1) Aluminum production rates during all test runs were in the following ranges/average % of P/CT No.91282 submitted information:

a) Plibrico Furnace	99.7% to 100.5%/100.1%
Plibrico Furnace Combustion Flue	98.8% to 99.6%/99.3%
b) North American Furnace	99.7% to 100.3%/100%
North American Furnace Combustion Flue	99.5% to 100%/99.7%
c) United Furnace	99.8% to 100.3%/100.1%
United Furnace Combustion Flue	98.9% to 99.1%/99%

2) Baghouse Emissions:

a) Particulate emissions were within P/CT No. 91282 allowables during test run No. 3 and exceeded its allowables during test runs No. 1 and 2.

b) Chlorine emissions were not detected.

3) Furnaces (combustion products) combustion flues emissions:

a) "Plibrico" combustion flue emissions:

1) NO_x third test run emissions were within P/CT No. 91282 allowables. NO_x was not detected during the first and second test runs.

2) CO emissions during all test runs were within P/CT No. 91282 allowables.

3) Particulate and THC emissions exceeded P/CT No. 91282 allowables during all test runs.

b) "North American" combustion flue emissions:

1) CO emission were within P/CT No. 91282 allowables during all test runs.

2) NO_x emissions were not detected.

3) Particulate and THC emissions exceeded P/CT No. 91282 allowables during all test runs.

c) "United" combustion flue emissions:

1) NO_x emissions were not detected during all test runs.

2) Particulate, THC, and CO emissions exceeded P/CT No. 91282 allowables.

CONCLUSIONS:

1) Compliance:

Air Contaminant	Source	Test Run No.
Particulate	Furnaces (Baghouse)	3
NO_x	"Plibrico" Combustion Flue	3
CO	"Plibrico" Combustion Flue	1, 2, and 3
CO	"North American" Combustion Flue	1, 2, and 3

2) Not detected:

Air Contaminant	Source	Test Run No.
Chlorine	Furnaces (Baghouse)	1, 2, and 3
NO_x	"Plibrico" Combustion Flue	1 and 2
NO_x	"North American" Combustion Flue	1, 2, and 3
NO_x	"United" Combustion Flue	1, 2, and 3

3) Non-Compliance:

Air Contaminant	Source	Test Run No.
Particulate	Furnaces (Baghouse)	1 and 2
Particulate	"Plibrico" Combustion Flue	1, 2, and 3
Particulate	"North American" Combustion Flue	1, 2, and 3
Particulate	"United" Combustion Flue	1, 2, and 3
THC	"Plibrico" Combustion Flue	1, 2, and 3
THC	"North American" Combustion Flue	1, 2, and 3
THC	"United" Combustion Flue	1, 2, and 3
CO	"United" Combustion Flue	1, 2, and 3

RECOMMENDATIONS:

Appropriate enforcement Action.

c: Milton Polakovic
Lou Mikolajczyk
Harry Hornikel
Leonard Sobolewski

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DIVISION OF ENVIRONMENTAL QUALITY
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(609) 530-4041

December 6, 1990

MEMORANDUM

TO: Mike Pratt

FROM: Len Sobolewski

SUBJECT: State Metal Industries, Inc.
Camden City, New Jersey
APC ID No. 50539
Permit/Certificate No. 091282
Log Number 892887A
NJ Stack No. 006

Emission tests were conducted for particulates, chlorine (as hydrochloric acid), total hydrocarbons (as hexane), carbon monoxide, and nitrogen oxide at the above subject facility on September 17, 18, 24, and 25, 1990. The testing project was completed and reported by Ambient Engineering Incorporated of Parlin New Jersey.

The purpose of the testing project was to determine compliance/non-compliance of the air contaminants being discharged from the Baghouse Exhaust, the Plibrico Aluminum Furnace, the North American Furnace and the United Aluminum Furnace as prescribed by the New Jersey Administrative Code 7:27-8 "Permits".

The results of the aforementioned tests utilizing the raw field data and laboratory analysis submitted to the Bureau of Technical Services for review and evaluation is as follows:

BAGHOUSE EMISSIONS

CONTAMINANT	RUN No. 1	RUN No. 2	RUN No. 3	ALLOWABLE
PARTICULATE LBS/HR	1.58	0.504	0.192	0.383
CHLORINE (AS HCl) (AS Cl_2)	N/D	N/D	N/D	<0.15

PLIBRICO ALUMINUM COMBUSTION FLUE EMISSIONS

CONTAMINANT	RUN No. 1	RUN No. 2	RUN No. 3	ALLOWABLE
PARTICULATE LBS/HR	3.91	0.306	0.234	0.059
NITROGEN OXIDES LBS/HR	N/D	N/D	2.31	2.74
TOTAL HYDROCARBON LBS/HR	5.2	8.1	8.5	0.059
CARBON MONOXIDE LBS/HR	0.12	0.32	0.44	0.68

NORTH AMERICAN FURNACE COMBUSTION FLUE EMISSIONS

CONTAMINANT	RUN No. 1	RUN No. 2	RUN No. 3	ALLOWABLE
PARTICULATE LBS/HR	0.052	0.039	0.044	0.021
NITROGEN OXIDES LBS/HR	N/D	N/D	N/D	0.686
TOTAL HYDROCARBON LBS/HR	0.2	0.2	0.2	0.021
CARBON MONOXIDE LBS/HR	0.04	0.05	0.06	0.137

UNITED ALUMINUM FURNACE COMBUSTION FLUE EMISSIONS

CONTAMINANT	RUN No. 1	RUN No. 2	RUN No. 3	ALLOWABLE
PARTICULATE LBS/HR	0.838	0.254	0.393	0.0041
NITROGEN OXIDES LBS/HR	N/D	N/D	N/D	0.137
TOTAL HYDROCARBON LBS/HR	0.42	0.55	0.54	0.0041
CARBON MONOXIDE LBS/HR	0.32	0.19	0.20	0.027

Each of the aforementioned gas fired aluminum furnaces is vented to a fabric filter baghouse in addition each furnace has a separate combustion flue which has permit allowables independent from the baghouse allowables. The three furnaces; the Plibrico Aluminum Furnace, the North American Furnace, and the United Aluminum Furnace are designed to have maximum production rates of 5600, 650, and 1600 pounds per hour respectively as stated on the Permit/Certificate. For the testing project this source was operating as follows:

SUMMARY OF SOURCE OPERATING CONDITIONS

ALUMINUM PRODUCTION RATE, LBS/HR

SOURCE TESTED	RUN No. 1	RUN No. 2	RUN No. 3
BAGHOUSE			
PLIBRICO ALUMINUM FURNACE	4622	4607	4588
NORTH AMERICAN FURNACE	652	648	651
UNITED ALUMINUM FURNACE	1605	1602	1596
COMBUSTION FLUES			
PLIBRICO ALUMINUM FURNACE	4581	4545	4575
NORTH AMERICAN FURNACE	650	647	648
UNITED ALUMINUM FURNACE	1583	1586	1586

Technical Service calculations of the raw data supplied, indicate substantially the same results. The test results indicate that baghouse particulate emissions during run numbers 1 and 2 exceeded the standards and during run number 3 was within the standards stated on the Permit/Certificate. The tests conducted for chloride concluded that none was detected during the test period.

The Plibrico Aluminum Furnace Combustion Flue emission tests indicated that the particulate and total hydrocarbon emissions exceeded the standards stated on the Permit/Certificate during all test runs. The test results for carbon monoxide and nitrogen oxides were within the standards stated on the Permit/Certificate during all test runs.

The North American Furnace Combustion Flue Emission tests indicate that the particulate and total hydrocarbons emissions exceeded the Permit/Certificate allowable during all test runs. The test results also indicated that the emissions of nitrogen oxides and carbon monoxide were within the standards stated on the Permit/Certificate during all test runs.

The United Aluminum Furnace Combustion Flue Emission tests indicate that the particulate, total hydrocarbons, and carbon monoxide exceeded the standards on the Permit/Certificate during all test runs. The test results also indicated that nitrogen oxide was not detected during all test runs.

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October 30, 1990

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Mr. Ed Choromanski
Chief, Bureau of Technical Services
New Jersey Dept. of Environmental Protection
CN-401
380 Scotch Road
Trenton, New Jersey 08625

REF: AE #858(30)
Stack Testing Results at State Metal Industries, Inc.
Baghouse Stack 006 and Three Combustion Flues
APC Plant I.D. No. 50539

Dear Mr. Choromanski:

On behalf of our client, State Metal Industries, Inc., Ambient Engineering is submitting two copies of the report on the stack test results for your review.

Please contact Ambient if there are any questions.

Very truly yours,
AMBIENT ENGINEERING, INC.,

John Yavorsky

John Yavorsky, Ph.D., P.E.

JY:ew

cc: R. Kuhl, State Metal Industries, Inc.

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COMPLIANCE

STACK SAMPLING REPORT

FOR

STATE METAL INDUSTRIES, INC.

941 SOUTH SECOND STREET

CAMDEN, NEW JERSEY 08862

Sources Tested:

Wheelabrator Baghouse Stack

Stack No. 006

and

Plibrico, North American and United Furnaces

Combustion Flues

APC Plant I.D. No. 50539

Ambient Engineering Project No. 858

TEST DATE: September 17, 18, 24 and 25, 1990

REPORT DATE: October 19, 1990

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STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 19, 1990

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TEST PERSONNEL AND CERTIFICATIONS
Overall Project supervision by John Yavorsky, Ph.D.,P.E.

Field sampling on this project was performed by:
Timothy M. Harvey; Field Service Manager, N.E.T.
David Nonemaker; Environmental Technician, N.E.T.

Laboratory work on this project was performed by:
Robert Maxfield; Laboratory Manager, N.E.T.
Carbon Monoxide analyses by Recon Systems Inc.

Other Project Personnel:
Jaclynn N. Fiorile; Office Manager, N.E.T.
The testing was observed by: NJDEP Representatives:

Frank Papp	NJDEP, Bureau of Technical Services
Harry Hornikel	NJDEP, Bureau of Enforcement Operations
Vincent Garbarino	NJDEP Bureau of Enforcement Operations

This Report is submitted by:

John Yavorsky, V.P. Engineering
Professional Engineer Certification

I am in responsible charge of Ambient Engineering's Stack Test Work, and have discussed and reviewed the procedures and results of this set of tests with the relevant field and laboratory personnel.

John Yavorsky

John Yavorsky, Ph.D., PE
NJ License: 28675

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INTRODUCTION/SUMMARY

Stack emission testing was conducted at the State Metal Industries, Inc. facility in Camden, New Jersey, on September 17, 18, 24 and 25, 1990 to determine particulate and chlorine emission rates of the Wheelabrator baghouse serving three aluminum smelting furnaces; Plibrico, North American and United. Also, the three furnace combustion flue stacks were tested for particulates, total hydrocarbons, nitrogen oxides and carbon monoxide.

John Yavorsky, Ph.D.,P.E. from Ambient Engineering, Inc. provided overall project supervision and documented all production and operating conditions during the test program. New Jersey Department of Environmental Protection representatives witnessed testing and production activities.

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SOURCE DESCRIPTION/TEST OPERATING CONDITIONS

A maximum flow of 48,000 ACFM of combined exhaust gases at a maximum 325°F, are emitted from three furnaces melting aluminum scrap. Each furnace is vented to the baghouse (fabric filter) and each has a combustion flue. The three furnaces; Plibrico, North American and United, have maximum production rates of 4600, 650 and 1600 lbs/hr, respectively.

The baghouse treating the gases uses 1,158 felt bags having a total area of 23,000 ft^2. Maximum bag temperature capability is 450°.

The stack gases exit the baghouse and are discharged to the atmosphere through a 40 ft high, 84 inch diameter steel stack.

INCORRECT DIAMETER
SEE APPENDIX III

Table 1 summarizes the furnace production rates for all test periods.

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TABLE 1

SUMMARY OF SOURCE OPERATING CONDITIONS

	Production Rate, lb/hr		
Source Tested	Run #1	Run #2	Run #3
Baghouse			
Plibrico	4622	4607	4588
North American	652	648	651
United	1605	1602	1596
	6879	6857	6835
Combustion Flues			
Plibrico	4581	4545	4575
North American	650	647	648
United	1583	1586	1586

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TEST METHODS

Particulate emission testing was conducted in accordance with NJDEP Title 7, Chapter 27 B-1, Air Test Method 1. Isokinetic samples were collected in triplicate using the sampling train shown in Figure 1. The sampling locations and number of traverse points were determined by EPA method 1, 40 CFR60 App. and are shown in Appendix II. Each sample consisted of particulate matter collected on a glass fiber filter and in the sampling probe assembly. The filter catch and probe rinse residues were alternately desiccated and weighed until final weights were achieved. Sample blanks received identical analyses, and final results were adjusted to reflect blank values.

Pretest cyclonic flow determinations indicated that each test site was suitable for particulate testing. A sketch of each test location along with field data from the cyclonic flow determination can be found in Appendix II.

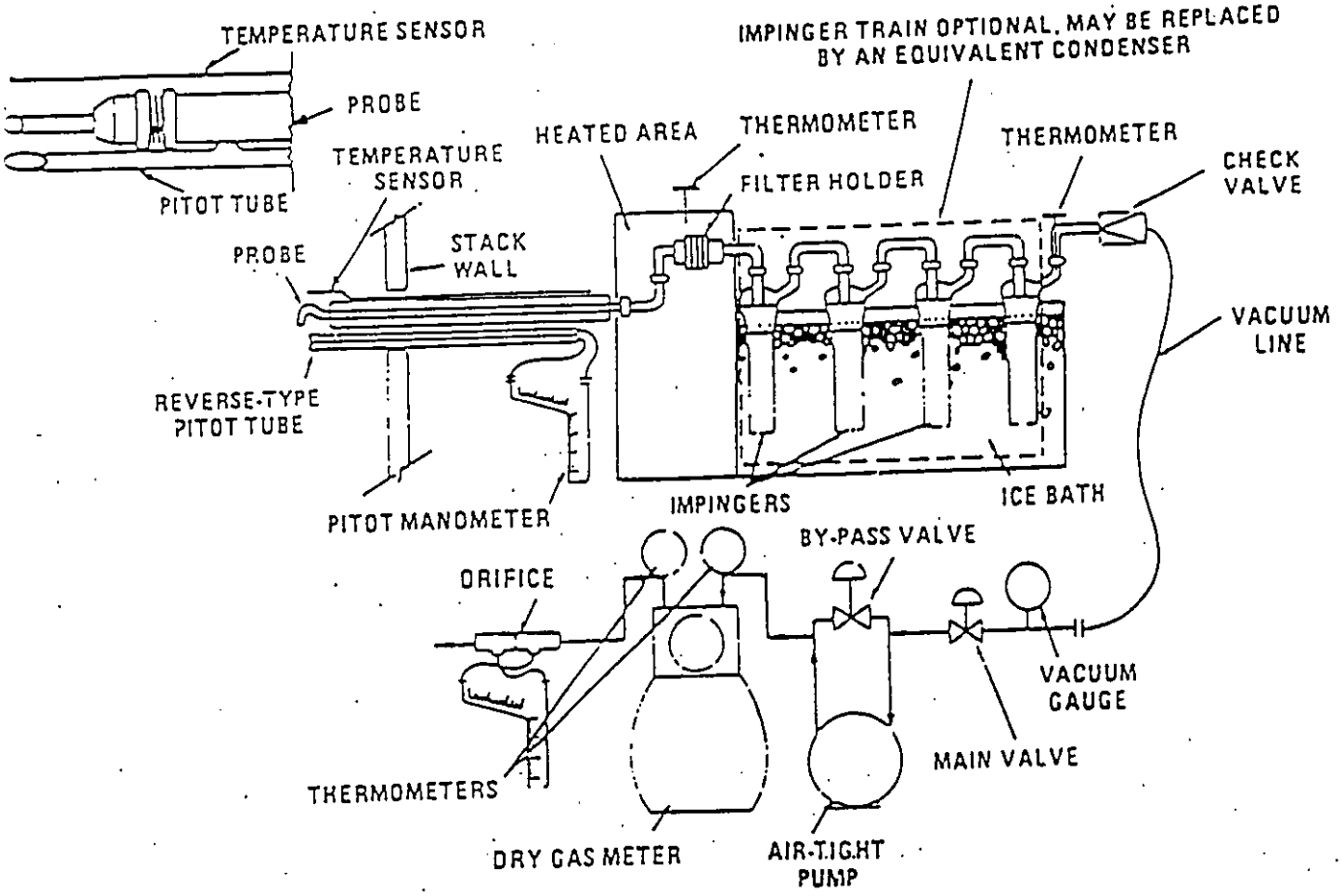

Fig. 1. Particulate-sampling train

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Flue gas molecular weight was determined in accordance with EPA Method 3. An integrated gas sample was collected during each test period at both sites. Gas samples were analyzed for percent CO_2, O_2, and CO utilizing an Orsat Apparatus.

Carbon monoxide samples were collected in 80 liter Tedlar bags at a rate of .5-.8 lpm, subsequent to and for the duration of each run. Analysis was conducted utilizing Non-disperse Infra-red techniques. The instrument was calibrated with EPA Protocol-1 CO standards. Standard gas certifications are located in Appendix V.

Total hydrocarbon samples were collected and analyzed according to the principles of NJ Air Test Method 3, Section 3-9. Integrated samples were collected in Tedlar gas bags over the duration of each run. Samples were promptly transported to the laboratory for analysis by flame ionization detector. Concentrations were determined by comparing detector response to know methane standards.

Nitrogen oxides were measured by EPA Reference Method 7D, 40CFR60 Appendix A. An integrated gas sample was extracted from the stack and collected in alkaline-potassium permanganate solution which is analyzed by ion chromatography. A diagram of the sampling train is shown in Figure 2.

Pre-test and Post-test calibration data for all sampling train components can be found in Appendix V.

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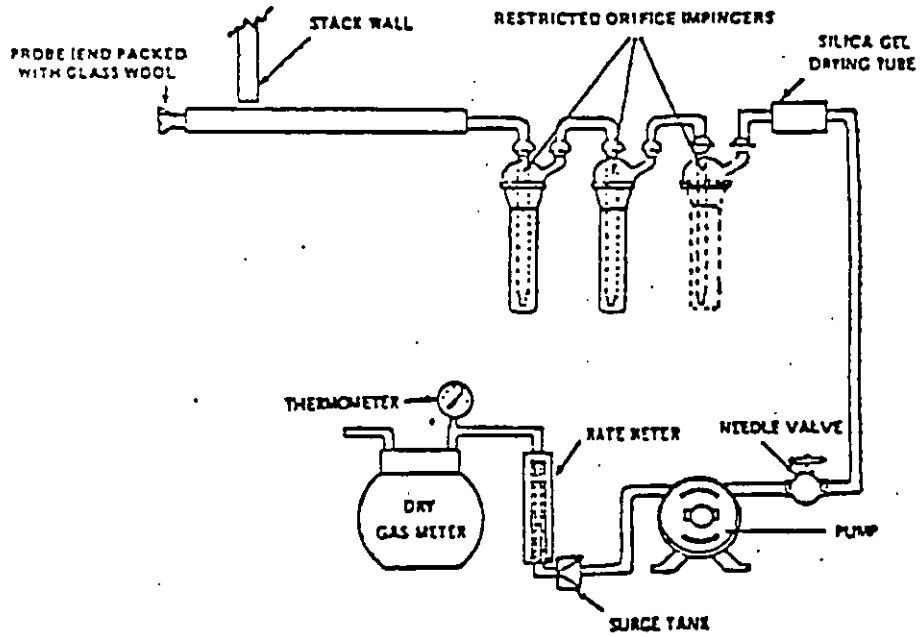

Figure 2 NO_x sampling train

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RESULTS AND DISCUSSION

Emissions test results are summarized in the following tables. Table 2 shows particulate emissions for the baghouse and the three flue stacks. Tables 3, 4 and 5 summarize the results of the flue stack tests for nitrogen oxides, total hydrocarbons and carbon monoxide, respectively. All field data and calculations can be found in Appendix II; supporting laboratory data is located in Appendix IV.

No test equipment failure or component changes were experienced during any of the tests reported. Inlet and outlet simultaneous test times compared to within ten minutes of start and stop. Isokinetic sampling rates were maintained within the 100+ 10% for all tests. Post-test leak checks of the isokinetic sampling trains were acceptable for all runs reported, and the post-test calibrations for all components validates our field data.

The Plibrico flue particulate Run #1 stands out as being substantially higher than the other two runs. An examination of the filter at the time of collection indicated a ball of particulate material. The inside of the Plibrico Flue had an accumulation of adhering particulate material. We believe that a ball of this adhering particulate was loosened during this first test run and was captured by the nozzle, resulting in an erroneously high particulate reading for that test. We recommend using the average of Plibrico particulate Runs #2 and 3 to be more representative of actual operating conditions.

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TABLE 2

PARTICULATES			
SOURCE	**RUN #**	**CONCENTRATION (gr/dscf)**	**EMISSION RATE (lbs/hr)**
BAGHOUSE	1	0.0044	1.58
	2	0.0014	0.504
	3	0.0005	0.192
PLIBRICO FLUE	1	0.0668	3.91
	2	0.0051	0.306
	3	0.0040	0.234
NORTH AMERICAN FLUE	1	0.0026	0.053
	2	0.0023	0.039
	3	0.0024	0.044
UNITED FLUE	1	0.0523	0.838
	2	0.0157	0.254
	3	0.0249	0.393

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TABLE 3

NITROGEN OXIDES			
SOURCE	RUN #	CONCENTRATION (ppm)	EMISSION RATE (lbs/hr)
PLIBRICO FLUE	1	ND	ND
	2	ND	ND
	3	91	2.3
NORTH AMERICAN FLUE	1	ND	ND
	2	ND	ND
	3	ND	ND
UNITED FLUE	1	ND	ND
	2	ND	ND
	3	ND	ND

ND - NOT DETECTABLE

DETECTION LEVEL = 1.4 mg/sample

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Report Date: October 19, 1990

TABLE 4

TOTAL HYDROCARBONS			
SOURCE	RUN #	CONCENTRATION (ppm)	EMISSION RATE (lbs/hr)
PLIBRICO FLUE	1	57	5.2
	2	87	8.1
	3	94	8.5
NORTH AMERICAN FLUE	1	6	0.2
	2	7	0.2
	3	7	0.2
UNITED FLUE	1	17	0.4
	2	22	0.6
	3	22	0.5

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Report Date: October 19, 1990

TABLE 5

CARBON MONOXIDE			
SOURCE	RUN #	CONCENTRATION (ppm)	EMISSION RATE (lbs/hr)
PLIBRICO FLUE	1	4	0.12
	2	10	0.32
	3	14	0.44
NORTH AMERICAN FLUE	1	4	0.04
	2	6	0.05
	3	6	0.06
UNITED FLUE	1	37	0.32
	2	22	0.19
	3	24	0.20

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Report/Stack Sampling Compliance

Report Date: October 19, 1990

TABLE 6

		HCL		CHLORINE	
SOURCE	RUN #	CONCENTRATION (mg/dscm)	EMISSION RATE (lbs/hr)	CONCENTRATION	EMISSION RATE
BAGHOUSE	1	1.14	0.18	ND	ND
	2	20.5	3.12	ND	ND
	3	16.2	2.48	ND	ND

ND - NOT DETECTABLE

Ambient Engineering Inc.
1145 Bordentown Avenue
Parlin, New Jersey 08859
(201) 727-8333

AIR
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WASTE
NOISE
ENERGY
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ENVIRONMENTAL ENGINEERING/SYSTEMS

STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 19, 1990

APPENDIX I

SOURCE OPERATING DATA

EMISSION TEST PRODUCTION REPORT FORM

I. Company Name State Metal Industries, Inc. APC Plant ID# 50539
Plant Location 941 South 2nd Street, Camden, New Jersey
Certificate Number 081309
Designation of Equipment Baghouse on 3 aluminum furnaces

II. Emission Test Date(s) September 25, 1990
Tests Conducted By:
Name of Firm Ambient Engineering, Inc
Business Address 1145 Bordentown Avenue, Parlin, NJ 08859
Phone Number 908-727-8333
Test Team Representatives John Yavorsky, Ambient Engineering
Tim Harvey, NET
Dave Nonemaker, NET

Length of Test 3 of 1 hour each

	Run #1	Run #2	Run #3
Test Time (Start/Finish)	11:45/12:50	3:10/4:15	5:11/6:16

III. Certificate Operating Conditions

A. List Conditions — Achieved (Yes or No)

None

B. Log of Certificate Conditions During Stack Test
(Record at least every 15 minutes)

Condition	Run #	Readout	Time of Recording

EMISSION TEST PRODUCTION REPORT FORM

I. Company Name State Metal Industries, Inc. APC Plant ID# 50539
Plant Location 941 South 2nd Street, Camden, New Jersey
Certificate Number 081309
Designation of Equipment Baghouse on 3 aluminum furnaces

II. Emission Test Date(s) September 25, 1990
Tests Conducted By:
Name of Firm Ambient Engineering, Inc.

Business Address 1145 Bordentown Avenue, Parlin, NJ 08859
Phone Number 908-727-8333
Test Team Representatives John Yavorsky, Ambient Engineering
Tim Harvey, NET
Dave Nonemaker, NET

Length of Test 3 of 1 hour each

	Run #1	Run #2	Run #3
Test Time (Start/Finish)	11:45/12:50	3:10/4:15	5:11/6:16

III. Certificate Operating Conditions

A. List Conditions — Achieved (Yes or No)

None

B. Log of Certificate Conditions During Stack Test
(Record at least every 15 minutes)

Condition	Run #	Readout	Time of Recording

IV. Equipment Operation/Process Parameters

Number of Sources Connected 3

Number of Sources Operating 3

Production Rate: Normal ✓

Maximum ✓

A. Raw Materials:

	Furnace	Test Run #1	Test Run #2	Test Run #3
Usage Rate (lb/hr)*				
North American		652	648	651
United		1605	1602	1596
Plibrico		4622	4607	4588
Breakdown (% by wt.)				
Aluminum Scrap		100%	100%	100%
Note: 17 to 33 #/hr chlorine to Plibrico furnace.				

*See Attachment #1 for calculations

B. Surface Coating:

Material Being Coated _____

Type of Coating _____

Coating Rate (Gals/Hr) _____

Is Coating altered (Yes or No) _____

With _____

Distance From Coating Head to Exhaust Duct _____

C. Fuel Burning - Incineration:

Type of Fuel natural gas

Fuel Burning Rate See below (lbs/hr), (gals/hr), (ft/hr)

Fuel Additives _____ % _____

Meter Reading (if available)	Time
Furnace	Fuel Burning rate (ft^3/hr)
North American	7000
United	8250
Plibrico	20,000

Type of Waste Constituents
Auxiliary Fuel
Burning Rate

D. Other:
Description of Operation and Process Rate
Three furnaces with process rates of 4,600, 1,600 and 650 lbs/hr of aluminum metals have hoods which capture fugitive emissions and lead to the baghouse. Each furnace also has a separate combustion flue

V. Control Equipment Parameters
CEMs Required (Yes/No) No
Contaminant?

STACK TEST CEM READING

Parameter Cont/Read	Parameter Cont/Read	Parameter Cont/Read	Time	Test Run #

A. Control Equipment performance Parameter

Parameter	Reading	Time	Run #

B. Additional Observations

Fugitive Emissions (Yes/No) Yes, but captured by baghouse system

Equipment Location Rear yard

Visible Emissions From Stack (Yes/No) No

Odors Noticeable No

Vicinity of Equipment (Yes/No) No

Near Exhaust Stack (Yes/No) No

Off Property (Yes/No) No

VI. Samples

Type of Sample

Time of Sampling

Sampled by

Sample Taken From

To Be Analyzed For

Analyzed by

Form Information Supplied by: Name/Title (Please Print)

John Yavorsky/Vice President, Engineering

Steve Pascucci/Engineer

Signature(s)/Date John Yavorsky 10/29/90

DEP Usage Only

Rec'd by

Sample Rec'd Date/Time

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EMISSION TEST PRODUCTION REPORT FORM

I. Company Name State Metal Industries, Inc. APC Plant ID# 50539
Plant Location 941 South 2nd Street, Camden, New Jersey
Certificate Number 081309
Designation of Equipment Plibrico Furnace

III. Emission Test Date(s) September 17, 1990
Tests Conducted By:
Name of Firm Ambient Engineering, Inc
Business Address 1145 Bordentown Avenue, Parlin, NJ 08859
Phone Number 908-727-8333
Test Team Representatives John Yavorsky, Ambient Engineering
Tim Harvey, NET
Dave Nonemaker, NET
Steve Pascucci, Ambient Engineering

Length of Test 3 of 1 hour each

	Run #1	Run #2	Run #3
Test Time (Start/Finish)	11:16/12:18	1:40/2:42	3:40/4:42

III. Certificate Operating Conditions

A. List Conditions — Achieved (Yes or No)

None

B. Log of Certificate Conditions During Stack Test
(Record at least every 15 minutes)

Condition	Run #	Readout	Time of Recording

IV. Equipment Operation/Process Parameters

Number of Sources Connected 3

Number of Sources Operating 3

Production Rate: Normal ✓

Maximum ✓

A. Raw Materials:

	Furnace	Test Run #1	Test Run #2	Test Run #3
Usage Rate (lb/hr)*				
		4581	4545	4575
Breakdown (% by wt.)				
Aluminum Scrap		100%	100%	100%

*See Attachment #1 for calculations

B. Surface Coating:

Material Being Coated

Type of Coating

Coating Rate (Gals/Hr)

Is Coating altered (Yes or No)

With

Distance From Coating Head to Exhaust Duct

C. Fuel Burning - Incineration:

Type of Fuel natural gas

Fuel Burning Rate 20,000 ft³/hr (lbs/hr), (gals/hr), (ft/hr)

Fuel Additives , %

Meter Reading (if available)	Time

Type of Waste Constituents
Auxiliary Fuel
Burning Rate

D. Other:
Description of Operation and Process Rate
Scrap aluminum refining process - 4,600 lbs/hr of aluminum scrap metal is dumped into furnace and melted at 1,350°F. The liquid aluminum is solidified into ingots.

V. Control Equipment Parameters
CEMs Required (Yes/No) No
Contaminant?

STACK TEST CEM READING

Parameter Cont/Read	Parameter Cont/Read	Parameter Cont/Read	Time	Test Run #

A. Control Equipment performance Parameter

Parameter	Reading	Time	Run #

B. Additional Observations

Fugitive Emissions (Yes/No) Yes, but captured by baghouse system
Equipment Location Rear yard

Visible Emissions From Stack (Yes/No) No

Odors Noticeable No

Vicinity of Equipment (Yes/No) No
Near Exhaust Stack (Yes/No) No
Off Property (Yes/No) No

VI. Samples

Type of Sample
Time of Sampling
Sampled by
Sample Taken From

To Be Analyzed For
Analyzed by

Form Information Supplied by: Name/Title (Please Print)
John Yavorsky/Vice President, Engineering
Steve Pascucci/Engineer

Signature(s)/Date John Yavorsky 10/29/90

DEP Usage Only
Rec'd by Sample Rec'd Date/Time Rev'd by

EMISSION TEST PRODUCTION REPORT FORM

I. Company Name State Metal Industries, Inc. APC Plant ID# 50539
Plant Location 941 South 2nd Street, Camden, New Jersey
Certificate Number 081309
Designation of Equipment North American Furnace

IIII. Emission Test Date(s) September 18, 1990
Tests Conducted By:
Name of Firm Ambient Engineering, Inc
Business Address 1145 Bordentown Avenue, Parlin, NJ 08859
Phone Number 908-727-8333
Test Team Representatives Steve Pascucci, Ambient Engineering
Tim Harvey, NET
Dave Nonemaker, NET

Length of Test 3 of 1 hour each

	Run #1	Run #2	Run #3
Test Time (Start/Finish)	9:50/10:58	11:51/12:55	1:55/2:58

III. Certificate Operating Conditions

A. List Conditions — Achieved (Yes or No)

None

B. Log of Certificate Conditions During Stack Test
(Record at least every 15 minutes)

Condition	Run #	Readout	Time of Recording

IV. Equipment Operation/Process Parameters

Number of Sources Connected 3

Number of Sources Operating 3

Production Rate: Normal ✓

Maximum ✓

A. Raw Materials:

	Furnace	Test Run #1	Test Run #2	Test Run #3
Usage Rate (lb/hr)*				
		650	647	648
Breakdown (% by wt.)				
Aluminum Scrap		100%	100%	100%

B. Surface Coating:

Material Being Coated

Type of Coating

Coating Rate (Gals/Hr)

Is Coating altered (Yes or No)

With

Distance From Coating Head to Exhaust Duct

C. Fuel Burning - Incineration:

Type of Fuel natural gas

Fuel Burning Rate 7,000 ft³/hr (lbs/hr), (gals/hr), (ft/hr)

Fuel Additives %

Meter Reading (if available)	Time

Type of Waste Constituents _____
Auxiliary Fuel _____
Burning Rate _____

D. Other:
Description of Operation and Process Rate
Iron and aluminum refining process, 650 lbs/hr of raw junk parts are dumped into furnace. Aluminum melts before the iron, which is skimmed off the top and collected. The aluminum is drained and solidified into sows.

V. Control Equipment Parameters
CEMs Required (Yes/No) No _____
Contaminant? _____

STACK TEST CEM READING

Parameter Cont/Read	Parameter Cont/Read	Parameter Cont/Read	Time	Test Run #

A. Control Equipment performance Parameter

Parameter	Reading	Time	Run #

B. Additional Observations

Fugitive Emissions (Yes/No) Yes, but captured by baghouse system

Equipment Location Rear yard

Visible Emissions From Stack (Yes/No) No

Odors Noticeable No

Vicinity of Equipment (Yes/No) No

Near Exhaust Stack (Yes/No) No

Off Property (Yes/No) No

VI. Samples

Type of Sample _____

Time of Sampling _____

Sampled by _____

Sample Taken From _____

To Be Analyzed For _____

Analyzed by _____

Form Information Supplied by: Name/Title (Please Print)

John Yavorsky/Vice President, Engineering

Steve Pascucci/Engineer

Signature(s)/Date John Yavorsky 10/29/90

DEP Usage Only

Rec'd by

Sample Rec'd Date/Time

Rev'd by

EMISSION TEST PRODUCTION REPORT FORM

I. Company Name State Metal Industries, Inc. APC Plant ID# 50539
Plant Location 941 South 2nd Street, Camden, New Jersey
Certificate Number 081309
Designation of Equipment United Furnace

IIV. Emission Test Date(s) September 24, 1990
Tests Conducted By:
Name of Firm Ambient Engineering, Inc.
Business Address 1145 Bordentown Avenue, Parlin, NJ 08859
Phone Number 908-727-8333
Test Team Representatives Steve Pascucci, Ambient Engineering
Tim Harvey, NET
Dave Nonemaker, NET

Length of Test 3 of 1 hour each

	Run #1	Run #2	Run #3
Test Time (Start/Finish)	9:20/10:24	11:35/12:37	1:30/2:32

III. Certificate Operating Conditions

A. List Conditions — Achieved (Yes or No)

None

B. Log of Certificate Conditions During Stack Test
(Record at least every 15 minutes)

Condition	Run #	Readout	Time of Recording

IV. Equipment Operation/Process Parameters

Number of Sources Connected 3

Number of Sources Operating 3

Production Rate: Normal ✓

Maximum ✓

A. Raw Materials:

	Furnace	Test Run #1	Test Run #2	Test Run #3
Usage Rate (tons/hr)*				
		1583	1586	1586
Breakdown (% by wt.)				
Aluminum Scrap		100%	100%	100%

B. Surface Coating:

Material Being Coated

Type of Coating

Coating Rate (Gals/Hr)

Is Coating altered (Yes or No)

With

Distance From Coating Head to Exhaust Duct

C. Fuel Burning - Incineration:

Type of Fuel natural gas

Fuel Burning Rate 8,250 ft^3/hr (lbs/hr), (gals/hr), (ft/hr)

Fuel Additives %

Meter Reading (if available)	Time

Type of Waste Constituents _____
Auxiliary Fuel _____
Burning Rate _____

D. Other:
Description of Operation and Process Rate
Aluminum refining process - 1,600 lbs/hr of total aluminum metal is dumped into the furnace and is melted at 1,350°F. The furnace has two feeds; 1,200 lbs/hr of aluminum bulk and 400 lbs/hr of aluminum scrap metal

V. Control Equipment Parameters
CEMs Required (Yes/No) No _____
Contaminant? _____

STACK TEST CEM READING

Parameter Cont/Read	Parameter Cont/Read	Parameter Cont/Read	Time	Test Run #

A. Control Equipment performance Parameter

Parameter	Reading	Time	Run #

B. Additional Observations

Fugitive Emissions (Yes/No) Yes, but captured by baghouse system

Equipment Location Rear yard

Visible Emissions From Stack (Yes/No) No

Odors Noticeable No

Vicinity of Equipment (Yes/No) No

Near Exhaust Stack (Yes/No) No

Off Property (Yes/No) No

VI. Samples

Type of Sample _____

Time of Sampling _____

Sampled by _____

Sample Taken From _____

To Be Analyzed For _____

Analyzed by _____

Form Information Supplied by: Name/Title (Please Print)

John Yavorsky/Vice President, Engineering

Steve Pascucci/Engineer

Signature(s)/Date John Yavorsky 10/29/90

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STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 18, 1990

ATTACHMENT 1

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STATE METAL INDUSTRIES - BAGHOUSE

9/25/90

		PLIBRICO	UNITED		NORTH AMERICAN
NOMINAL RATE		4600#/hr	1200#/hr	400#/hr	650#/hr
TIME					
08:36					1286
O8:56			1742	1480	
09:35		4652			
Start Test	09:44				
09:50		Cl_2 at 15% of 217 #/hr			
10:30			1272		
10:35					1510
10:37		4474			
11:29			1748		
Start Test #2	11:45	Cl_2 at 13% of 217 #/hr			
11:35		4778			
12:37		4694			
12:37		Cl_2 at 11% of 217 #/hr			
12:38				956	
End #2	12:50				
12:54					1260

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		PLIBRICO	UNITED		NORTH AMERICAN
NOMINAL RATE		4600#/hr	1200#/hr	400#/hr	650#/hr
TIME					
12:56			1528		
12:56		Cl_2 at 11% of 217 #/hr			
1:38		4918			
2:12			2228		
2:43		4866			
2:50					1620
3:01				1246	
3:01		Cl_2 at 15% of 217 #/hr			
Start #3	3:10				
3:46		4420			
4:03			2194		
4:03		Cl_2 at 13% of 217 #/hr			
End #3	4:15				
4:15		Cl_2 at 12% of 217 #/hr			
4:44		4994			
Start #4	5:11				
5:11		Cl_2 at 10% of 217 #/h			

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	PLIBRICO	UNITED		NORTH AMERICAN
NOMINAL RATE	4600#/hr	1200#/hr	400#/hr	650#/hr
TIME				
5:20				1748 (TO 8:01)
5:49	3720			
6:08			550	
Test Ends 6:16				
6:16	Cl_2 at 8% of 217 #/h			
6:17			Full	
6:30	New charge			

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ATTACHMENT 1

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Report/Stack Sampling Compliance

Report Date: October 18, 1990

BAGHOUSE

Test #1
11:45 - 12:50

Test #2
3:10 - 4:15

Test #3
5:11 - 6:16

Plibrico:
4778 lb x 52 min/62 min = 4007 lb
4694 lb x 13 min/61 min = 1000 lb
5007 lb/hr x 60 min/65 min = 4622 lb/hr

4866 lb x 36 min/63 min = 2781 lb
4420 lb x 29 min/58 min = 2210 lb
4991 lb/hr x 60 min/65 min = 4607 lb/hr

4994 lb x 38 min/65 min = 2920 lb
3720 lb x 27 min/49 min = 2050 lb
4970 lb/hr x 60 min/65 min = 4588 lb/hr

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ENVIRONMENTAL ENGINEERING/SYSTEMS

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<u>North American:</u>
1510 lb x 65 min/139 min = 706 lb
706 lb hr x 60 min/65 min = 652 lb/hr

1620 lb x 65 min/150 min = 702 lb
702 lb hr x 60 min/65 min = 648 lb/hr

1748 lb x 56 min/161 min = 608
1620 lb x 9 min/150 min = 97 lb
705 lb hr x 60 min/65 min = 651 lb/hr

<u>United:</u>
1480 lb x 53 min/222 min = 353
956 lb x 12 min/143 min = 80 lb
1748 x 65 min/87 min = 1306 lb
1739 lb hr x 60 min/65 min = 1605 lb/hr

2228 lb x 53 min/111 min = 1064 lb
2194 lb x 12 min/110 min = 239 lb
1246 lb x 65 min/187 min = 433 lb
1736 lb hr x 60 min/65 min = 1602 lb/hr

2194 lb x 65 min/110 min = 1296 lb
1246 lb x 57 min/187 min = 380 lb
550 lb x 8 min/83 min = 53 lb
1729 lb hr x 60 min/65 min = 1596 lb/hr

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ENVIRONMENTAL ENGINEERING/SYSTEMS

STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 19, 1990

ATTACHMENT 2

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Report/Stack Sampling Compliance

Report Date: October 18, 1990

PRODUCTION RATE CALCULATION

Plibrico:	9/17/90
11:01	3724
11:50	3916
12:41	3672
1:29	3940
2:21	4088
3:15	4106
4:09	3746
4:58	New charge

Test #1: 11:16 - 12:18
3724 lb x 34 min/49 min = 2584 lb
3916 lb x 28 min/51 min = 2150 lb
4734 lb hr x 60 min/62 min = 4581 lb/hr

Test #2
1:40 - 2:42
3940 lbs x 41 min/52 min = 3107 lb
4088 lb x 21 min/54 min = 1590 lb
4697 lb/hrx 60 min/62 min = 4545 lb/hr

Test #3
3:40 - 4:42
4106 lb x 29 min/54 min = 2205 lb
3746 lb x 33 min/49 min = 2523 lb
4728 lb/hr x 60 min/62 min = 4575 lb/hr

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Report/Stack Sampling Compliance

Report Date: October 18, 1990

North American:	9/18/90
9:50	1202
11:41	1014
1:15	11:56
3:02	New charge
Test #1	9:50 - 10:58
Test #2	11:51 - 12:55
Test #3	1:55 - 2:58

1202 lb x 68 min/111 min = 736 lb
736 lb/hr x 68 min x 60 min = 650 lb/hr

1014 lb x 64/min/94 min = 690 lb
690 lb/hr x 64 min/60 min = 647 lb/hr

1156 lb x 63 min/107 min = 681 lb
681 lb/hr x 63 min/60 min = 648 lb/hr

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Report Date: October 18, 1990

United: 9/24/90

Time	Sweat	Well
8:15	788	804
8:55	724	
9:31	688	
10:06	766	
10:16		606
10:45	808	
11:26	868	
11:47		784
12:10	856	
12:53	7:52	
1:31	850	
1:45		546
2:14	850	
2:57	New	
3:07		New

Test #1
9:20 - 10:24
724 lb x 11 min/36 min = 221 lb
688 lb x 35 min/35 min = 688 lb
804 lb x 56 min/121 min = 372 lb
606 lb x 8 min/91 min = 53 lb
766 x 18 min/39 min = 354 lb
1688 lb/hr x 64 min/60 min = 1583 lb/hr

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AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 18, 1990

Test #2
11:35 - 12:37
868 lb x 35 min/44 min = 690 lb
856 lb x 27 min/43 min = 537 lb
606 lb x 12 min/91 min = 80 lb
784 lb x 50 min/118 min = 332 lb
1639 lb x 60 min/62 min = 1586 lb/hr

Test #3
752 lb x 1 min/38 min = 20 lb
850 lb x 43 min/43 min = 850 lb
850 lb x 18 min/43 min = 356 lb
784 lb x 15 min/118 min = 100 lb
546 lb x 47 min/82 min = 313 lb
1639 lb x 60 min/62 min = 1586 lb/hr

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(201) 727-8333
ENVIRONMENTAL ENGINEERING/SYSTEMS

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STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 19, 1990

APPENDIX II

STACK CONFIGURATION/SAMPLE PORT LOCATION

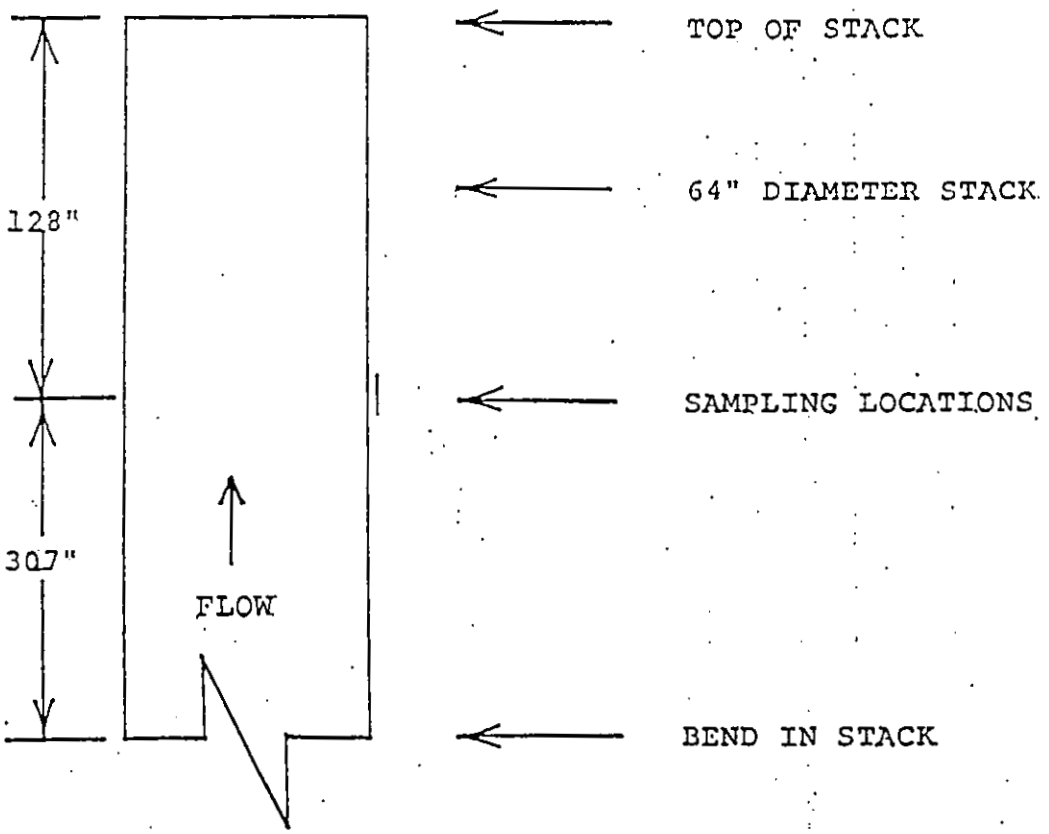
Ambient Engineering Inc.

00016

DATE

JOB NO.

BAGHOUSE OUTLET



EPA DISTANCE "A": 2.00

EPA DISTANCE "B": 4.8

TRAVERSE POINTS: 24

METHOD 2 GAS VELOCITY AND VOLUME DATA FORM

CC047

Plant and city	Run date
State Metals - Camden, N.J.	0 6 2 2 9 0

1 of 2

Sampling location	Clock time
Baghouse	

Run number	Operator	Amb. temp., °F	Bar. press., in. Hg	Static press., in. H_2O

Molecular wt.	Stack inside dimension, in. Diam. of side 1	side 2	Pitot tube (C_p)
	64	64	.84

Field data

Traverse point number	Position, in.	Velocity head (Δp_s), in. H_2O	Stack temp., °F	Cyclonic flow determination: Δp_s at 0° reference	Angle (α) which yields a null Δp
A 1		.20		~~20~~	6
2		.23		~~20~~	5
3		.26			0
4		.28			0
5		.32			0
6		.36			0
7		.34	170		0
8		.36			0
9		.38			0
10		.40			0
11		.45			~~2~~
12		.40			~~6~~

Average angle (α)[a]

[a] Average of 5 must be ±10 degrees to be acceptable

METHOD 2 GAS VELOCITY AND VOLUME DATA FORM 00018

Plant and city	Run date
State Metals, Camden, N.J.	0 6 2 2 9 0

2 of 2

Sampling location	Clock time
Baghouse	

Run number	Operator	Amb. temp., °F	Bar. press., in. Hg	Static press., in. H_2O

Molecular wt.	Stack inside dimension, in. Diam. of side 1	side 2	Pitot tube (C_p)
	64	64	.84

Field data

Traverse point number	Position, in.	Velocity head (Δp_s), in. H_2O	Stack temp., °F	Cyclonic flow determination: Δp_s at 0° reference	Cyclonic flow determination: Angle (α) which yields a null Δp
6 1	1.3	.23			6
2	~~2.4~~ 4.3	.20			3
3	7.6	.26			0
4	11.3	.28			4
5	16	.32			0
6	22.8	.34			0
7	41.2	.36			2
8	48	.34	170		0
9	52.7	.36			0
10	56.4	.40			3
11	59.7	.45			4
12	62.7	.40			5

Average angle (α)[a]

[a] Average of α must be ≤10 degrees to be acceptable.

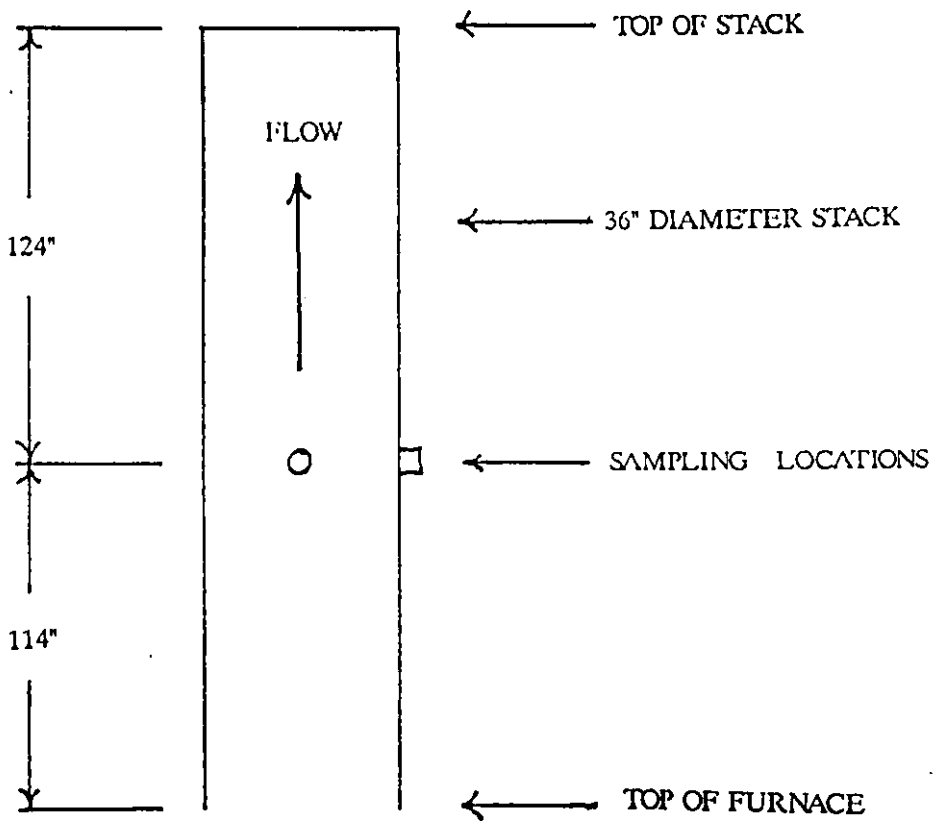
Ambient Engineering Inc.

DATE 000 19

JOB NO.

SUBJECT

PLIBRICO FURNACE COMBUSTION FLUE



EPA DISTANCE "A": 3.44

EPA DISTANCE "B": 3.17

TRAVERSE POINTS: 24

METHOD 2 GAS VELOCITY AND VOLUME DATA FORM

00050

Plant and city	Run date
State Metals, Camden, NJ	0 6 2 2 9 0

1 of 2

Sampling location	Clock time
~~United~~ Furnace Plibrico	

Run number	Operator	Amb. temp., °F	Bar. press., in. Hg	Static press., in. H_2O

Molecular wt.	Stack inside dimension, in. Diam. of side 1	side 2	Pitot tube (C_p)
	36	36	.84

Field data

Traverse point number	Position, in.	Velocity head (Δp_s), in. H_2O	Stack temp., °F	Cyclonic flow determination: Δp_s at 0° reference	Cyclonic flow determination: Angle (α) which yields a null Δp
A 1	.75	.16			0
2	2.4	.16			0
3	4.2	.165			0
4	6.4	.18			0
5	9	.200	600		0
6	12.8	.210			0
7	23.2	.240			0
8	27	.22			0
9	29.6	.215			3
10	31.8	.20			3
11	33.6	.195			6
12	35.25	.17			9

Average angle (α)[a]

[a] Average of α must be <10 degrees to be acceptable

METHOD 2 GAS VELOCITY AND VOLUME DATA FORM

00051

Plant and city	Run date
State Metals, Camden, N.J.	0 6 2 2 9 0

2 of 2

Sampling location	Clock time
Plibrico Furnace	

Run number	Operator	Amb. temp., °F	Bar. press., in. Hg	Static press., in. H_2O

Molecular wt.	Stack inside dimension, in. Diam. of side 1	side 2	Pitot tube (C_p)
	36	36	.84

Field data

Traverse point number	Position, in.	Velocity head (Δp_s), in. H_2O	Stack temp., °F	Cyclonic flow determination: Δp_s at 0° reference	Cyclonic flow determination: Angle (α) which yields a null Δp
B1		.245			4
2		.25			4
3		.26			0
4		.26			2
5		.26			0
6		.25			0
7		.22			0
8		.22			0
9		.21			0
10		.20			0
11		.20			2
12		.180			4

Average angle (α)[a]

[a] Average of α must be ≤10 degrees to be acceptable.

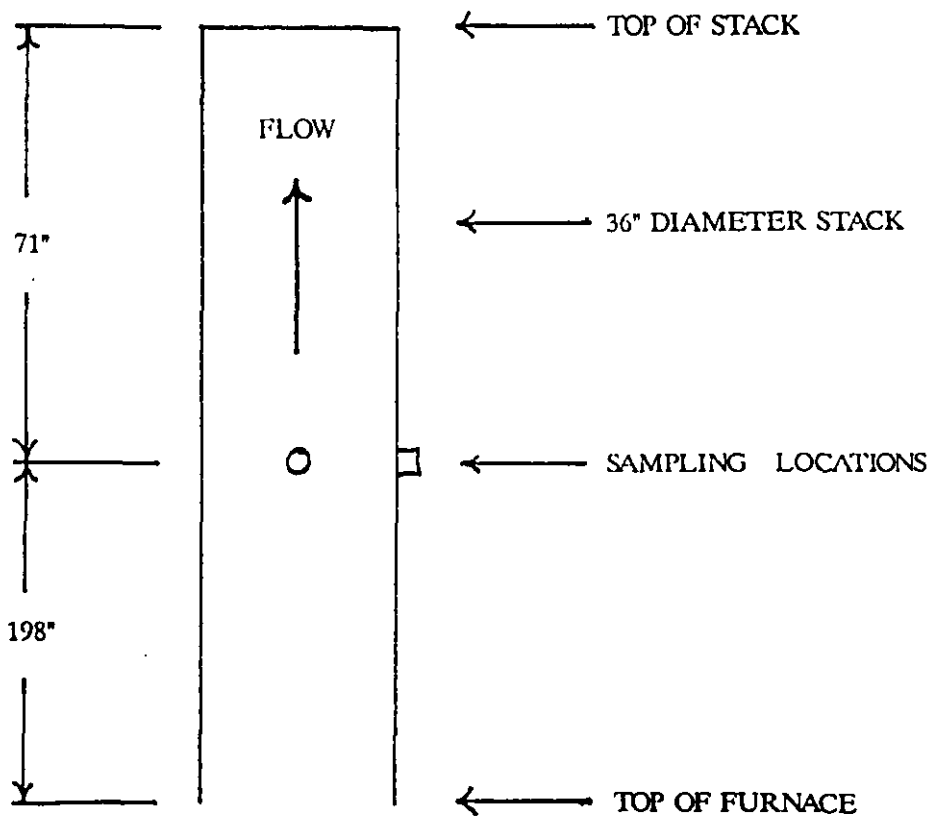
Ambient Engineering Inc.

DATE

JOB NO.

SUBJECT

NORTH AMERICAN FURNACE COMBUSTION FLUE



EPA DISTANCE "A": 1.97

EPA DISTANCE "B": 5.5

TRAVERSE POINTS: 20

METHOD 2 GAS VELOCITY AND VOLUME DATA FORM

0005

Plant and city	Run date
State Metals, Camden, N.J.	0 6 2 2 9 0

Sampling location	Clock time
N. American Furnace	

1 of 2

Run number	Operator	Amb. temp., °F	Bar. press., in. Hg	Static press., in. H_2O

Molecular wt.	Stack inside dimension, in. Diam. of side 1	side 2	Pitot tube (C_p)
	36	36	.84

Field data

Traverse point number	Position, in.	Velocity head (Δp_s), in. H_2O	Stack temp., °F	Cyclonic flow determination: Δp_s at 0° reference	Cyclonic flow determination: Angle (α) which yields a null Δp
A 1	.9	.020			0
2	3	.025			0
3	5.3	.025			0
4	8.1	.022			0
5	12.3	.025			0
6	23.7	.025	115		0
7	27.9	.025			0
8	30.7	.022			0
9	33	.018			0
10	35.1	.015			0
				Average angle (α)[a]	

[a] Average of α must be ≤10 degrees to be acceptable.

METHOD 2 GAS VELOCITY AND VOLUME DATA FORM

0005

Plant and city	Run date
State Metals, Camden, N.J.	0 6 2 2 9 0

2 of 2

Sampling location	Clock time
N. American Furnace	

Run number	Operator	Amb. temp., °F	Bar. press., in. Hg	Static press., in. H_2O

Molecular wt.	Stack inside dimension, in. Diam. of side 1	side 2	Pitot tube (C_p)
	36	36	.84

Field data

Traverse point number	Position, in.	Velocity head (Δp_s), in. H_2O	Stack temp., °F	Cyclonic flow determination: Δp_s at 0° reference	Cyclonic flow determination: Angle (α) which yields a null Δp
B1		.025			3
2		.028			0
3		.035	115		0
4		.025			0
5		.035			0
6		.025			0
7		.030			0
8		.035			0
9		.030			0
10		.035			0

Average angle (α)[a]

[a] Average of α must be <10 degrees to be acceptable

Ambient Engineering Inc.

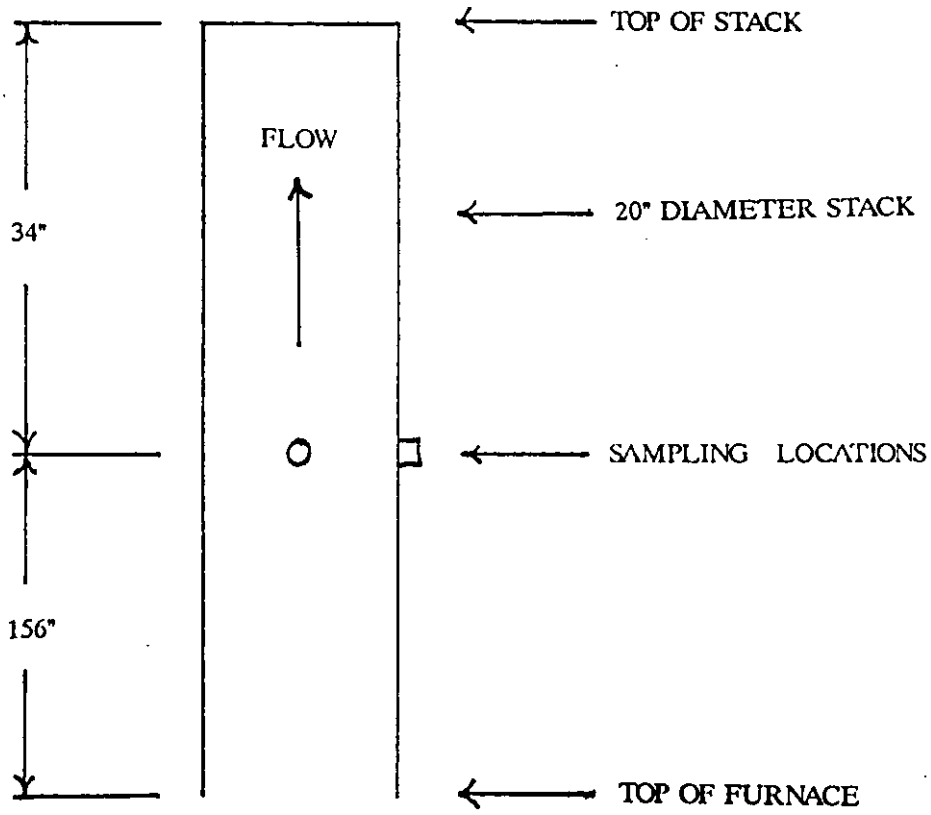
00035

DATE

JOB NO.

SUBJECT

UNITED FURNACE COMBUSTION FLUE



EPA DISTANCE "A": 1.7

EPA DISTANCE "B": 7.8

TRAVERSE POINTS: 12

METHOD 2 GAS VELOCITY AND VOLUME DATA FORM

Plant and city	Run date
State Metals, Camden	06 22 90

Sampling location	Clock time
United Furnace	

Run number	Operator	Amb. temp., °F	Bar. press., in. Hg	Static press., in. H_2O

Molecular wt.	Stack inside dimension, in. Diam. of side 1	Stack inside dimension, in. side 2	Pitot tube (C_p)
	20	20	.84

Field data

Traverse point number	Position, in.	Velocity head (Δp_s), in. H_2O	Stack temp., °F	Cyclonic flow determination: Δp_s at 0° reference	Cyclonic flow determination: Angle (α) which yields a null Δp
A 1		.15			5
2		.14			4
3		.13	650		0
4		.11			0
5		.10			0
6		.10			0
B 1		.16			6
2		.16	680		4
3		.14			0
4		.12			2
5		.10			2
6		.08			0
				Average angle (α)[a]	2

[a] Average of α must be <20 degrees to be acceptable.

Ambient Engineering Inc.
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Parlin, New Jersey 08859
(201) 727-8333
ENVIRONMENTAL ENGINEERING/SYSTEMS

AIR
WATER
WASTE
NOISE
ENERGY
O.S.H.A.

STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 19, 1990

APPENDIX III

FIELD DATA AND CALCULATIONS

SUMMARY OF STACK TEST DATA - CALCULATIONS

SOURCE: State Metals, Baghouse

REPORT DATE: 9-25-90

	RUN#		
	2	3	4
Stack Abs. Pressure (Ps) in. Hg	30.04	30.03	30.04
Sample Vol. Standard (Vmstd) scf.	43.172	41.725	42.165
Water Vapor Vol. (Vwstd) scf.	0.53	0.54	0.63
Stack Gas Moisture (Bws) %	1.2	1.3	1.5
Stack Gas Velocity (Vs) ft/sec	36.11	35.57	35.55
Stack Gas Flow Rate (Q) dscfh	2518288	2444910	2443389
dscfm	41971	40749	40723
acfm	48402	47678	47651
Total Particulate Collected (mn) gm	0.0122	0.0039	0.0015
Particulate Conc. Actual (cs) grains/dscf	0.0044	0.0014	0.0005
Emission Rate Actual (E) lbs/hr	1.58	0.504	0.192

SUMMARY OF STACK TEST DATA - FIELD

SOURCE: State Metals, Baghouse

REPORT DATE: 9-25-90

	RUN#		
	2 *	3 *	4 *
Stack Cross-sectional Area (A) sq.ft.	22.34	22.34	22.34
Avg. Stack Gas Temp (Ts) deg. R	604	612	611
Stack Static Pressure (Pbar) in. H2O	-0.20	-0.25	-0.20
Avg. Stack Velocity Pressure (sqrt. dP)	0.601	0.588	0.588
Barometric Pressure (Pbar) in. Hg	30.05	30.05	30.05
Pitot Tube Coef. (Cp)	0.84	0.84	0.84
Dry Gas Meter Coef. (Y)	1.000	1.000	1.000
Avg. Dry Gas Meter Temp. (Tm) deg. R	548	552	546
Sample Volume Metered (Vm) cu. ft.	44.480	43.310	43.290
Volume Water Collected (V/c) ml.	13.1	13.2	15.5
Test Time (O) min.	60	60	60
Sampling Nozzle Diameter (Dn) inches	0.269	0.269	0.269
Avg. Orifice Pres. Drop (dlt H),in.H2O	1.39	1.32	1.33
% CO2	0.2	0.2	0.2
% O2	20.7	20.7	20.6
% CO	0.0	0.0	0.0
Isokinetic Sampling Rate (%)	97	97	98

Actual Run #1 was redone as Run #2; in the summary these runs are referred to as Run 1, 2 and 3, rather than 2, 3 and 4.

SUMMARY OF STACK TEST DATE - CALCULATIONS

SOURCE : State Metals Baghouse

DATE : 9-25-90

CHLORINE EMISSIONS

	RUN#		
	2	3	4
Chloride collected , mg, as HCl	1.4	24.2	19.4
as Cl_2	ND	ND	ND
Chloride concentration, mg/dscm as HCl	1.14	20.48	16.25
$\frac{\text{mg HCl x 35.31}}{\text{std sample vol, ft}^3}$			
HCl Emission Rate, lb/hr	0.18	3.12	2.48
$\frac{\text{mg/dscm x Q}}{\text{454000 x 35.31}}$			

STACK GAS MOLECULAR WEIGHT CALCULATION

SOURCE: State Metals Baghouse DATE: 9-25-90

	RUN 2	RUN 3	RUN 4
% CO2	0.2	0.2	0.2
% O2	20.7	20.7	20.6
% CO	0.0	0.0	0.0
% N2	79.1	79.1	79.2
B ws	1.2	1.3	1.5
M d *	28.86	28.86	28.86
M s **	28.73	28.72	28.70

* M d = 0.44 (% CO2) + 0.32 (% O2) + 0.28 (% N2 + % CO)

** M s = M d (1 - B ws) + 18.0 (B ws)

STACK TEST ISOKINETIC RATE CALCULATION

SOURCE: State Metals Baghouse DATE: 9-25-90

	RUN 2	RUN 3	RUN 4
T s, deg. R.	604	612	611
P s, in. Hg.	30.04	30.03	30.04
B ws	1.2	1.3	1.5
Vm std, ft3.	43.17	41.72	42.16
v s, ft/sec.	36.11	35.57	35.55
A n, ft2.	0.000395	0.000395	0.000395
0, min.	60	60	60
I, %	97	97	98

$$I = \frac{T\ s \times Vm\ std \times P\ std \times 100}{T\ std \times v\ s \times A\ n \times 0 \times 60(1-B\ ws)}$$

PARTICULATE FIELD DATA FORM

Plant State Metals
City Camden
Location Baghouse
Operator T.H.
Date 9-25-90
Run number 2
Stack diam, mm (in.) 64

Sample box number 01
Meter box number 01
Meter ΔH@ 1.45

Meter calibration (Y) 1.00
Pitot tube (C_p)
Probe length
Probe liner material
Probe heater setting
Ambient temperature
Barometric pressure (P_b) 30.05 mm (in.) Hg
Assumed moisture
Static pressure (P_s) -.20 mm (in.) H_2O
C Factor
Reference ΔP mm (in.) H_2O

Sheet 1 of 2
Nozzle identification number
Nozzle diameter .269 mm (in.)
Thermometer number
Final leak rate m^3/min (cfm)
Vacuum during leak check
mm (in.) Hg
Filter number
Remarks

Traverse point number	Sampling time, (θ), min (1145)	Clock time, (24 h) (1145)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) (775.22)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
B1	2.5		4	137	.30	1.10		74	76	72	140F
2	5				.35	1.35					
3	7.5		5	142	.37	1.40		84	78	70	150F
4	10		5		.36	1.38		—	—	—	
5	12.5		5	143	.36	1.38		88	79	68	150
6	15		5		.38	1.45					
7	17.5		6	141	.42	1.60		93	80	68	149
8	20		6		.42	1.60					
9	22.5		6	142	.40	1.55		95	82	68	147
10	25		6		.44	1.70					
11	27.5		5	140	.38	1.45		98	84	68	153
12	30	1215	5		.30	1.15	817.68				
	Total		Max	Avg			Total	Avg	Avg	Max	

0003

PARTICULATE FIELD DATA FORM

Plant State Metals
City
Location Bayhouse
Operator
Date 9-25-90
Run number 2
Stack diam, mm (in.)

Sample box number
Meter box number
Meter ΔH@

Meter calibration (Y)
Pitot tube (C_p)
Probe length
Probe liner material
Probe heater setting
Ambient temperature
Barometric pressure (P_b) mm (in.) Hg
Assumed moisture
Static pressure (P_s) mm (in.) H_2O
C Factor
Reference ΔP mm (in.) H_2O

Sheet 2 of 2
Nozzle identification number
Nozzle diameter .269 mm (in.)
Thermometer number
Final leak rate m^3/min (cfm)
Vacuum during leak check
mm (in.) Hg
Filter number
Remarks

Traverse point number	Sampling time, (θ), min (2.5/pt)	Clock time, (24 h) (1200)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
A 1	2.5		4	145	.25	.95		88	84	70	190
2	5		4		.25	.95					
3	7.5		4	145	.20	.77		90	85	68	185
4	10		5		.26	1.00					
5	12.5		5	146	.26	1.00		93	86	68	185
6	15		5		.28	1.05					
7	17.5		6	149	.45	1.60		96	86	70	185
8	20		7		.50	1.90					
9	22.5		7	152	.50	1.90		100	88		167
10	25		7		.48	1.85		102	88	70	155
11	27.5		7	146	.48	1.85					
12	30		6		.40	1.50	834.70	105	90		
	Total		Max	Avg	.601		Total	Avg	Avg	Max	

final leak rate = dead at 7" Hg

Orsat se # 003

PARTICULATE FIELD DATA FORM

Plant: State Metals
City:
Location: Boghouse
Operator:
Date: 9-25-93
Run number: 3
Stack diam, mm (in.):
Sample box number:
Meter box number:
Meter ΔH@:

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b) ____ mm (in.) Hg
Assumed moisture:
Static pressure (P_s) +.250 mm (in.) H_2O
C Factor:
Reference ΔP ____ mm (in.) H_2O

Sheet 1 of 2
Nozzle identification number:
Nozzle diameter .269 mm (in.)
Thermometer number:
Final leak rate ____ m^3/min (cfm)
Vacuum during leak check ____ mm (in.) Hg
Filter number:
Remarks:

Traverse point number	Sampling time, (θ), min	Clock time, (24 h) 3:10P	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) 641.92	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
A 1	2.5		4	135	.29	.80				70	
2	5		4		.22	.80		84	82		150F
3	7.5		4	142	.20	.77		86	83	70	
4	10		4		.20	.77					
5	12.5		4	145	.22	.80		91	84	70	155
6	15		5		.30	1.15					
7	17.5		6	142	.45	1.70		95	85	70	156
8	20		7		.50	1.90					153
9	22.5		7	145	.50	1.90		100	86	70	154
10	25		7		.50	1.90					
11	27.5		6	142	.48	1.80					160
12	30		6		.42	1.60		102	88	70	
	Total		Max	Avg			Total	Avg	Avg	Max	

PARTICULATE FIELD DATA FORM

Plant _____
City _____
Location _____
Operator _____
Date 9-25-94
Run number 3
Stack diam, mm (in.) _____
Sample box number _____
Meter box number _____
Meter ΔH@ _____

Meter calibration (Y) _____
Pitot tube (C_p) _____
Probe length _____
Probe liner material _____
Probe heater setting _____
Ambient temperature _____
Barometric pressure (P_b) _____ mm (in.) Hg
Assumed moisture _____
Static pressure (P_s) _____ mm (in.) H_2O
C Factor _____
Reference ΔP _____ mm (in.) H_2O

Sheet 2 of 2
Nozzle identification number _____
Nozzle diameter .269 mm (in.)
Thermometer number _____
Final leak rate _____ m^3/min (cfm)
Vacuum during leak check _____ mm (in.) Hg
Filter number _____
Remarks _____

Traverse point number	Sampling time, (θ), min	Clock time, (24 h) 3:45P	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) 863.385	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
B1	2.5		5	158	.30	1.10		93	88	70	160
2	5		5		.32	1.20					
3	7.5		5	169	.32	1.20		96	90	68	
4	10		6		.35	1.30					160
5	12.5		6	164	.35	1.30		94	90	68	185
6	15		6		.37	1.40					
7	17.5		6	160	.40	1.50		100	91	68	180
8	20		6		.40	1.50					
9	22.5		6	164	.42	1.55		102	92	68	165
10	25				.38	1.40					
11	27.5		6	161	.35	1.30		102	93	68	175
12	30	4:15 pm	5		.28	1.05	885.23				
	Total 60		Max	Avg			Total	Avg	Avg	Max	

final leak rate = < 0.005 at 7" Hg vac

00169

PARTICULATE FIELD DATA FORM

Plant Stak Metals
City
Location
Operator
Date 9-25-90
Run number 4
Stack diam, mm (in.)

Sample box number 01
Meter box number 01
Meter ΔH@ 1.43

Meter calibration (Y) 1.00
Pitot tube (C_p) .84
Probe length
Probe liner material
Probe heater setting
Ambient temperature
Barometric pressure (P_b) mm (in.) Hg
Assumed moisture
Static pressure (P_s) mm (in.) H_2O
C Factor
Reference ΔP mm (in.) H_2O

Sheet 1 of 2
Nozzle identification number
Nozzle diameter .249 mm (in.)
Thermometer number
Final leak rate m^3/min (cfm)
Vacuum during leak check
mm (in.) Hg
Filter number
Remarks

Traverse point number	Sampling time, (θ), min (2.5/pt)	Clock time, (24 h) (5:12 pm)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) (885.400)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
B1	2.5		5	157	.30	1.15		77	80	60	180
2	5		5		.30	1.15					
3	7.5		5	157	.32	1.20		83	81	60	180 F
4	10		6		.35	1.35					
5	12.5		6	157	.35	1.35		87	81	60	185
6	15		7		.41	1.50					
7	17.5		7	145	.42	1.60		93	83	60	190
8	20		7		.42	1.60					
9	22.5		7	145	.45	1.70		95	84	60	190
10	25		7		.40	1.50					
11	27.5		7	147	.35	1.30					
12	30				.32	1.20		96	85	60	198
	Total		Max	Avg			Total	Avg	Avg	Max	

PARTICULATE FIELD DATA FORM

Plant: State Metals
City:
Location:
Operator:
Date: 9-25-90
Run number: 4
Stack diam, mm (in.):
Sample box number:
Meter box number:
Meter ΔH@:

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b): mm (in.) Hg
Assumed moisture:
Static pressure (P_s): -.20 mm (in.) H_2O
C Factor:
Reference ΔP: mm (in.) H_2O

Sheet 2 of 2
Nozzle identification number:
Nozzle diameter: .269 mm (in.)
Thermometer number:
Final leak rate: m^3/min (cfm)
Vacuum during leak check: mm (in.) Hg
Filter number:
Remarks:

Traverse point number	Sampling time, (θ), min	Clock time, (24 h) 5:46pm	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
A1	2.5		5	145	.20	.77		84	84	70	200
2	5		5		.20	.77					
3	7.5		5	145	.22	.84		86	85	70	190
4	10		5		.22	.84					
5	12.5		5	153	.24	.90		87	84	68	195
6	15		5		.27	1.00					
7	17.5		7	155	.44	1.65		90	85	68	220
8	20		8		.50	1.90					
9	22.5		8	153	.50	1.90		95	85	66	225
10	25		8		.50	1.80					
11	27.5		7	154	.42	1.60		96	86	65	220
12	30		6		.36	1.35	928.69				
	Total		Max	Avg			Total	Avg	Avg	Max	

00008

SUMMARY OF STACK TEST DATA - FIELD

SOURCE: State Metals Plibrico Furnace

REPORT DATE: 9-21-90

	RUN#		
	1	2	3
Stack Cross-sectional Area (A) sq.ft.	7.07	7.07	7.07
Avg. Stack Gas Temp (Ts) deg. R	978	1109	1162
Stack Static Pressure (Pbar) in. H2O	0.17	0.17	0.17
Avg. Stack Velocity Pressure (sqrt. dP)	0.401	0.442	0.443
Barometric Pressure (Pbar) in. Hg	30.08	30.08	30.08
Pitot Tube Coef. (Cp)	0.84	0.84	0.84
Dry Gas Meter Coef. (Y)	1.000	1.000	1.000
Avg. Dry Gas Meter Temp. (Tm) deg. R	532	531	532
Sample Volume Metered (Vm) cu. ft.	44.250	44.450	45.010
Volume Water Collected (V/c) ml.	35.2	50.8	58.0
Test Time (0) min.	60	60	60
Sampling Nozzle Diameter (Dn) inches	0.375	0.375	0.375
Avg. Orifice Pres. Drop (dlt H) in.H2O	1.39	1.42	1.44
% CO2	1.8	2.0	3.0
% O2	18.6	17.7	16.6
% CO	0.0	0.0	0.0
Isokinetic Sampling Rate (%)	99	98	102

SUMMARY OF STACK TEST DATA - CALCULATIONS

SOURCE: State Metals Plibrico Furnace REPORT DATE: 9-21-90

	RUN#		
	1	2	3
Stack Abs. Pressure (Ps) in. Hg	30.09	30.09	30.09
Sample Vol. Standard (Vmstd) scf.	44.284	44.572	45.051
Water Vapor Vol. (Vwstd) scf.	1.43	2.07	2.36
Stack Gas Moisture (Bws) %	3.1	4.4	5.0
Stack Gas Velocity (Vs) ft/sec	30.65	36.07	36.98
Stack Gas Flow Rate (Q) dscfh	410423	420232	408602
dscfm	6840	7004	6810
acfm	13002	15301	15687
Total Particulate Collected (mn) gm	0.1916	0.0146	0.0118
Particulate Conc. Actual (cs) grains/dscf	0.0668	0.0051	0.0040
Emission Rate Actual (E) lbs/hr	3.91	0.306	0.234

SUMMARY OF STACK TEST DATA - CALCULATIONS

SOURCE : State Metals Plibrico Furnace DATE : 9-10-90

NITROGEN OXIDES EMISSIONS

	RUN #		
	1	2	3
mg collected, as NO_2	ND	ND	2.9
Sample Vol, ft^3	1.13	1.13	1.13
Contaminant concentration, mg/dscm	ND	ND	90.62
Actual Emission Rate, lbs/hr	ND	ND	2.31

$$\frac{\text{mg collected} \times 35.31}{\text{sample vol, ft 3}}$$

$$\frac{\text{mg/dscm} \times Q}{454000 \times 35.31}$$

SUMMARY OF STACK TEST DATE - CALCULATIONS

SOURCE : State Metals Plibrico Furnace

DATE : 9-21-90

HYDROCARBON EMISSIONS

	RUN#		
	1	2	3
Sample concentration, ppm, condensible, as hexane	ND	ND	ND
Sample concentration, ppm, gas bag, as hexane	57	87	94
Hydrocarbon Emission Rate, lb/hr	5.2	8.1	8.5

$$\frac{\text{conc.} \times Q \times MW}{387 \times 10^{6}}$$

SUMMARY OF STACK TEST DATA - CALCULATIONS

SOURCE : State Metals Plibrico Furnace DATE : 9-21-90

CARBON MONOXIDE EMISSIONS

	RUN # 1	2	3
Concentration CO by NDIR, ppmv	4	10	14
Concentration CO_2 (FCO_2) by Orsat, %	1.8	2.0	3.0
Concentration CO in Stack, ppmv*	4	10	14
CO Emission Rate, lb/hr	0.12	0.32	0.44

$$\frac{\text{CO Stack} \times \text{MW} \times \text{acfm} \times 60}{387 \times 1\text{E}6} \times \frac{530}{T_s} \times \frac{P_s}{29.92}$$

* 40CFR60 Appendix A, EPA Method 10, equation 10-1, where :

$$\text{CO stack} = \text{CO NDIR} \; (1 - FCO_2)$$

STACK GAS MOLECULAR WEIGHT CALCULATION

SOURCE: State Metals Plibrico Furnace DATE: 9-21-90

	RUN 1	RUN 2	RUN 3
% CO2	1.8	2.0	3.0
% O2	18.6	17.7	16.6
% CO	0.0	0.0	0.0
% N2	79.6	80.3	80.4
B ws	3.1	4.4	5.0
M d *	29.03	29.03	29.14
M s **	28.69	28.54	28.58

* M d = 0.44 (% CO2) + 0.32 (% O2) + 0.28 (% N2 + % CO)

** M s = M d (1 - B ws) + 18.0 (B ws)

STACK TEST ISOKINETIC RATE CALCULATION

SOURCE: State Metals Plibrico Furnace DATE: 9-21-90

	RUN 1	RUN 2	RUN 3
T s, deg. R.	978	1109	1162
P s, in. Hg.	30.09	30.09	30.09
B ws	3.1	4.4	5.0
Vm std, ft3.	44.28	44.57	45.05
v s, ft/sec.	30.65	36.07	36.98
A n, ft2.	0.000767	0.000767	0.000767
0, min.	60	60	60
I, %	99	98	102

$$I = \frac{T\ s \times Vm\ std \times P\ std \times 100}{T\ std \times v\ s \times A\ n \times 0 \times 60(1-B\ ws)}$$

PARTICULATE FIELD DATA FORM

Plant State Metals
City Camden
Location PLI BRI CO
Operator T.H. / O.N.
Date 9-12-90
Run number 1
Stack diam, mm (in.) _____

Sample box number _____
Meter box number RAC-01
Meter ΔH@ 1.43

Meter calibration (Y) _____
Pitot tube (C_p) .84
Probe length 5'
Probe liner material Glass
Probe heater setting _____
Ambient temperature 63
Barometric pressure (P_b) 30.08 mm (in.) Hg
Assumed moisture 6%
Static pressure (P_a) _____ mm (in.) H_2O
C Factor _____
Reference ΔP _____ mm (in.) H_2O

Sheet 1 of 2
Nozzle identification number _____
Nozzle diameter .375 mm (in.)
Thermometer number _____
Final leak rate _____ m^3/min (cfm)
Vacuum during leak check _____ mm (in.) Hg
Filter number _____
Remarks _____

A

Traverse point number	Sampling time, (θ), min (11:16 start)	Clock time, (24 h)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) (377.10)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
1	2.5		3	385	.12	1.20		63	63	50	220
2	5		4	350	.14	1.40		67	65	50	220
3	7.5		4	350	.14	1.40		68	65	50	220
4	10		5	360	~~.15~~ .15	1.50		73	66	50	225
5	12.5		5	370	.17	1.70		76	67	50	228
6	15		5	375	.19	1.90		78	67	50	230
7	17.5		4	450	.17	1.80		80	69	55	235
8	20		5	480	.19	1.70		80	69	55	230
9	22.5		5	500	.19 ~~1.19~~	1.6		81	70	55	225
10	25		4	500	.15	1.25		81	71	62	220
11	27.5		4	520	.15 ~~1.5~~	1.25		79	71	62	215
12	30		4	600	.12	.96	399.64	77	71	63	225
	Total		Max 5	Avg 437	.39	~~1.20~~ 1.45	Total 22.54	Avg	Avg 71	Max 63	

PARTICULATE FIELD DATA FORM

Plant: State Metals
City: Camden
Location: PLI BRI CO
Operator: TH. / D.N.
Date: 9-17-90
Run number: 1
Stack diam, mm (in.):

Sample box number:
Meter box number:
Meter ΔH@:

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b) ___ mm (in.) Hg
Assumed moisture:
Static pressure (P_s) ___ mm (in.) H_2O
C Factor:
Reference ΔP ___ mm (in.) H_2O

Sheet 2 of 2
Nozzle identification number:
Nozzle diameter .375 mm (in.)
Thermometer number:
Final leak rate ___ m^3/min (cfm) — >.005
Vacuum during leak check ___ mm (in.) Hg
Filter number:
Remarks:

B

Traverse point number	Sampling time, (θ), min	Clock time, (24 h)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) 399.64	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
1	2.5		4	600	.13	1.05		70	70	62	221
2	5		4	630	.13	1.05		71	70	62	230
3	7.5		6	695	.19	1.35		71	70	60	235
4	10		7	680	.21	1.50		77	70	60	230
5	12.5		7	650	.22	1.70		79	71	60	230
6	15		7	600	.21	1.70		80	71	60	235
7	17.5		6	500	.16	1.35		81	71	66	230
8	20		6	400	.15	1.45		81	71	66	230
9	22.5		6	500	.15	1.25		80	72	68	225
10	25		6	600	.18	1.45		80	71	66	220
11	27.5		6	650	.17	1.30		80	72	66	220
12	30			700	.12	.85	421.35	77	72	66	215
	Total		Max 7	Avg 600	.41	~~1.15~~ 1.33	Total 21.71	Avg	Avg 74	Max 68	

PARTICULATE FIELD DATA FORM

Plant: State Metals
City:
Location: Pilbrico
Operator:
Date: 9-17-90
Run number: 2
Stack diam, mm (in.):
Sample box number:
Meter box number:
Meter ΔH@:

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b): mm (in.) Hg
Assumed moisture:
Static pressure (P_s): mm (in.) H_2O
C Factor:
Reference ΔP: mm (in.) H_2O

Sheet 1 of 2
Nozzle identification number:
Nozzle diameter: mm (in.)
Thermometer number:
Final leak rate: m^3/min (cfm)
Vacuum during leak check: mm (in.) Hg
Filter number:
Remarks:

B

Traverse point number	Sampling time, (θ), min	Clock time, (24 h) 1:40	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) 421.63	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
1	2.5		6	700	.17	1.20		65	62	58	235
2	5		6	740	.17	1.20		65	62	58	235
3	7.5		9	760	.23	1.60		69	63	60	235
4	10		10	800	.25	1.70		72	63	60	235
5	12.5		11	735	.25	1.75		75	65	60	235
6	15		11	700	.24	1.70		78	66	60	230
7	17.5		11	600	.21	1.70		78	67	65	230
8	20		10	600	.19	1.5		77	67	68	230
9	22.5		10	625	.20	1.6		76	68	68	230
10	25		9	680	.19	1.35		76	68	64	230
11	27.5		9	730	.18	1.30		75	68	67	230
12	30		9	712	.18	1.30	444.39	75	68	62	230
	Total		Max 11	Avg 698	.41	~~1.22~~	Total 22.76	Avg	Avg 69	Max 68	

.452 ~~.452~~ 1.49

.442

PARTICULATE FIELD DATA FORM

Plant: State Metals
City:
Location: Pilbrico
Operator:
Date: 9-17-90
Run number: 2
Stack diam, mm (in.):

Sample box number:
Meter box number:
Meter ΔH@:

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b) ____ mm (in.) Hg
Assumed moisture:
Static pressure (P_s) ____ mm (in.) H_2O
C Factor:
Reference ΔP ____ mm (in.) H_2O

Sheet 2 of 2
Nozzle identification number:
Nozzle diameter ____ mm (in.)
Thermometer number:
Final leak rate ____ m^3/min (cfm) .007/min
Vacuum during leak check 12 mm (in.) Hg
Filter number:
Remarks:

A

Traverse point number	Sampling time, (θ), min	Clock time, (24 h)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) 444.39	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
1	2.5		9	600	.18	1.45		71	68	60	220
2	5		10	550	.2	1.65		75	69	60	220
3	7.5		10	500	.19	1.60		78	69	60	215
4	10		9	500	.21	1.25		79	69	60	220
5	12.5		9	485	.21	1.25		79	70	60	220
6	15		9	520	.21	1.25		78	70	60	220
7	17.5		11	700	.22	1.55		79	71	60	225
P	20		12	750	.24	1.65		79	71	60	230
9	22.5		10	750	.19	1.30		78	71	60	230
10	25		10	745	.19	1.30		77	71	60	225
11	27.5		9 ~~10~~	700	.15	1.05		77	71	60	225
12	30		7	400	.09	.88	466.08	77	70	60	230
	Total		Max 11	Avg 600	.36	~~1.16~~	Total 21.69	Avg ~~[illegible]~~	Avg 74	Max 60	

.433 .442 1.35

PARTICULATE FIELD DATA FORM

Plant State Metals
City
Location Plibrico
Operator
Date 9-17-90
Run number 3
Stack diam, mm (in.)

Sample box number
Meter box number
Meter ΔH@

Meter calibration (Y)
Pitot tube (C_p)
Probe length
Probe liner material
Probe heater setting
Ambient temperature
Barometric pressure (P_b) mm (in.) Hg
Assumed moisture
Static pressure (P_s) + .17 mm (in.) H_2O
C Factor
Reference ΔP mm (in.) H_2O

Sheet 1 of 2
Nozzle identification number
Nozzle diameter mm (in.)
Thermometer number
Final leak rate m^3/min (cfm)
Vacuum during leak check mm (in.) Hg
Filter number
Remarks

A

Traverse point number	Sampling time, (θ), min	Clock time, (24 h) 3:40	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) 466.21	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
1	2.5		6	500	.15	1.25		65	65	60	220
2	5		7	450	~~.16~~ .16	1.45		68	65	60	215
3	7.5		8	430	.18	1.60		70	66	60	215
4	10		8	460	.18	1.60		74	67	60	220
5	12.5		9	500	.19	1.60		74	67	60	~~225~~
6	15		9	550	.21	1.70		75	67	62	230
7	17.5		9	660	.21	1.55		75	67	62	230
8	20		9	820	.22	1.50		75	67	63	235
9	22.5		10	830	.24	1.65		76	68	63	235
10	25		9	875	.21	1.45		75	67	63	230
11	27.5		9	900	.20	1.35		75	67	63	230
12	30		9	800	.16	1.10	~~489.~~ 488.99	75	68	63	225
	Total		Max 10	Avg 648	.44	~~1.22~~ 1.48	Total 22.78	Avg	Avg 70	Max 63	

.443

1.41

PARTICULATE FIELD DATA FORM

Plant: State Metals
City:
Location: Pitbrico
Operator:
Date: 9-17-90
Run number: 3
Stack diam, mm (in.):

Sample box number:
Meter box number:
Meter ΔH@:

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b) ____ mm (in.) Hg
Assumed moisture:
Static pressure (P_s) ____ mm (in.) H_2O
C Factor:
Reference ΔP ____ mm (in.) H_2O

Sheet 2 of 2
Nozzle identification number:
Nozzle diameter ____ mm (in.)
Thermometer number:
Final leak rate 0 m^3/min (cfm)
Vacuum during leak check ____ mm (in.) Hg
Filter number:
Remarks:

B

Traverse point number	Sampling time, (θ), min	Clock time, (24 h)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	488.99 Gas sample volume (V_m), m^3 (ft^3)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
1	2.5		6	860	.15	1.05				60	225
2	5		9	880	.19	1.30		73	68	60	235
3	7.5		10	850	.24	1.65				60	235
4	10		11	810	.26	1.75		77	69	62	230
5	12.5		~~790~~ 10	790	.24	1.65					
6	15		11	750	.25	1.75		80	70	~~63~~ 66	230
7	17.5		11	680	.24	1.70					
8	20		10	670	.21	1.50		80	71	67	225
9	22.5		8	690	.17	1.20					
10	25		8	700	.19	1.35		79	71	68	230
11	27.5		6	695	.15	1.05					
12	30		6	700	.14	1.00	511.22	77	71	68	225
	Total		Max 11	Avg 756	.41	1.18	Total 22.23	Avg	Avg 74	Max 68	

SAMPLING FIELD DATA

DATE : 9-17-90

SOURCE : State Metals / Plibrico

BARO. PRES. :

Pre-test Calibration		Run 1	Run 2	Run 3
calibration volume, liters		.250	.250	.250
time, sec.	(a)	~~30.51~~ 28.50	28.03	28.16
	(b)	~~30.12~~ 28.22	27.88	28.24
	(c)	28.28	28.09	28.13
pre-test sampling rate, lpm				

Post-test Calibration				
calibration volume, liters		.250	.250	.250
time, sec.	(a)	27.90	28.22	28.16
	(b)	28.19	27.86	27.94
	(c)	28.09	28.15	28.33
post-test sampling rate, lpm				
Average Sampling Rate, lpm		0.532	.535	.533

NOTES test 1 on 1116 Test 2 on 1340 Test 3 on 1540

sample vol = 31.92 l. 32.10 l. 31.96 l.
1.13 ft³

calibration vol
---------- x 60 = sampling rate (lpm)
calibration time

SUMMARY OF STACK TEST DATA - FIELD

SOURCE: State Metals North American Furnace REPORT DATE: 9-21-90

	RUN#		
	1	2	3
Stack Cross-sectional Area (A) sq.ft.	7.07	7.07	7.07
Avg. Stack Gas Temp (Ts) deg. R	535	537	541
Stack Static Pressure (Pbar) in. H2O	0.01	0.01	0.01
Avg. Stack Velocity Pressure (sqrt. dP)	0.100	0.083	0.090
Barometric Pressure (Pbar) in. Hg	30.26	30.26	30.26
Pitot Tube Coef. (Cp)	0.84	0.84	0.84
Dry Gas Meter Coef. (Y)	1.000	1.000	1.000
Avg. Dry Gas Meter Temp. (Tm) deg. R	533	531	539
Sample Volume Metered (Vm) cu. ft.	43.280	35.730	38.840
Volume Water Collected (V/c) ml.	10.8	5.2	6.0
Test Time (0) min.	60	60	60
Sampling Nozzle Diameter (Dn) inches	0.624	0.624	0.624
Avg. Orifice Pres. Drop (dlt H) in.H2O	1.36	0.96	1.09
% CO2	0.0	0.0	0.1
% O2	20.6	20.9	20.7
% CO	0.0	0.0	0.0
Isokinetic Sampling Rate (%)	102	102	101

SUMMARY OF STACK TEST DATA - CALCULATIONS

SOURCE: State Metals North American Furnace REPORT DATE: 9-21-90

	RUN#		
	1	2	3
Stack Abs. Pressure (Ps) in. Hg	30.26	30.26	30.26
Sample Vol. Standard (Vmstd) scf.	43.487	36.001	38.566
Water Vapor Vol. (Vwstd) scf.	0.44	0.21	0.24
Stack Gas Moisture (Bws) %	1.0	0.6	0.6
Stack Gas Velocity (Vs) ft/sec	5.64	4.68	5.09
Stack Gas Flow Rate (Q) dscfh	141848	117739	127107
dscfm	2364	1962	2118
acfm	2392	1985	2159
Total Particulate Collected (mn) gm	0.0073	0.0054	0.0059
Particulate Conc. Actual (cs) grains/dscf	0.0026	0.0023	0.0024
Emission Rate Actual (E) lbs/hr	0.053	0.039	0.044

SUMMARY OF STACK TEST DATA - CALCULATIONS

SOURCE : State Metals N. American Furnace DATE : 9-21-90

NITROGEN OXIDES EMISSIONS

	RUN # 1	2	3
mg collected, as NO_2	ND	ND	ND
Sample Vol, ft^3	1.12	1.12	1.13
Contaminant concentration, mg/dscm	ND	ND	ND
Actual Emission Rate, lbs/hr	ND	ND	ND

$$\frac{\text{mg collected} \times 35.31}{\text{sample vol, ft 3}}$$

$$\frac{\text{mg/dscm} \times Q}{454000 \times 35.31}$$

SUMMARY OF STACK TEST DATE - CALCULATIONS

SOURCE : State Metals N. American Furnace DATE : 9-21-90

HYDROCARBON EMISSIONS

	RUN#		
	1	2	3
Sample concentration, ppm, condensible, as hexane	ND	ND	ND
Sample concentration, ppm, gas bag, as hexane	6	7	7
Hydrocarbon Emission Rate, lb/hr	0.2	0.2	0.2

$$\frac{\text{conc.} \times Q \times MW}{387 \times 10^{6}}$$

SUMMARY OF STACK TEST DATA - CALCULATIONS

SOURCE : State Metals N. American Furnace DATE : 9-21-90

CARBON MONOXIDE EMISSIONS

	RUN #		
	1	2	3
Concentration CO by NDIR, ppmv	4	6	6
Concentration CO_2 (FCO_2) by Orsat, %	0.0	0.0	0.1
Concentration CO in Stack, ppmv*	4	6	6
CO Emission Rate, lb/hr	0.04	0.05	0.06

$$\frac{\text{CO Stack} \times \text{MW} \times \text{acfm} \times 60}{387 \times 1\text{E}6} \times \frac{530}{T_s} \times \frac{P_s}{29.92}$$

* 40CFR60 Appendix A, EPA Method 10, equation 10-1, where :

$$\text{CO stack} = \text{CO NDIR} \left(1 - FCO_2 \right)$$

STACK GAS MOLECULAR WEIGHT CALCULATION

SOURCE: State Metals N. American Furnace DATE: 9-21-90

	RUN 1	RUN 2	RUN 3
% CO2	0.0	0.0	0.1
% O2	20.6	20.9	20.7
% CO	0.0	0.0	0.0
% N2	79.4	79.1	79.2
B ws	1.0	0.6	0.6
M d *	28.82	28.84	28.80
M s **	28.71	28.77	28.74

* M d = 0.44 (% CO2) + 0.32 (% O2) + 0.28 (% N2 + % CO)

** M s = M d (1 - B ws) + 18.0 (B ws)

STACK TEST ISOKINETIC RATE CALCULATION

SOURCE: State Metals N. American Furnace DATE: 9-21-90

	RUN 1	RUN 2	RUN 3
T s, deg. R.	535	537	541
P s, in. Hg.	30.26	30.26	30.26
B ws	1.0	0.6	0.6
Vm std, ft3.	43.49	36.00	38.57
v s, ft/sec.	5.64	4.68	5.09
A n, ft2.	0.002124	0.002124	0.002124
0, min.	60	60	60
I, %	102	102	101

$$I = \frac{T\ s \times Vm\ std \times P\ std \times 100}{T\ std \times v\ s \times A\ n \times 0 \times 60(1-B\ ws)}$$

PARTICULATE FIELD DATA FORM

Plant: State Metals
City: Camden
Location: North American
Operator: T.H. / D.N.
Date: 9-18-96
Run number: 1
Stack diam, mm (in.):
Sample box number:
Meter box number: RAC-01
Meter ΔH@: 1.43

Meter calibration (Y):
Pitot tube (C_p): .84
Probe length: 5
Probe liner material: glass
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b): 30.26 mm (in.) Hg
Assumed moisture: 2%
Static pressure (P_s): mm (in.) H_2O
C Factor: .014
Reference ΔP: mm (in.) H_2O

Sheet 1 of 2
Nozzle identification number:
Nozzle diameter: .624 mm (in.)
Thermometer number:
Final leak rate: m^3/min (cfm)
Vacuum during leak check: mm (in.) Hg
Filter number: 0036
Remarks:

Traverse point number	Sampling time, (θ), min	Clock time, (24 h)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
		Start 9:50 ~~9:45~~					511.33				
A 1	3		6	~~60~~ 70	.010	1.30				60	220
2	6		7	~~5~~ 77	.012	1.60		65	60		
3	9		10	~~6~~ 74	.017	2.25				60	220
4	12		9	~~75~~ 65	.015	2.0		75	61		
5	15		8	~~75~~ 65	.013	1.70				60	225
6	18		9	~~6~~ 5	.015	2.0		81	65		
7	21		7	~~8~~ 2	.011	1.45				61	225
8	24		6	~~6~~ 3	.010	1.30		82	67		
9	27		7	77	.012	1.60				60	220
10	30		6	76	.010	1.30	534.86	81	70		
										60	220
	Total		Max 10	Avg 74	~~.011~~	~~1.28~~ 1.65	Total 23.53	Avg	Avg 71	Max 61	

PARTICULATE FIELD DATA FORM

Plant: State Metals
City:
Location: North American
Operator:
Date: 9-18-90
Run number: 1
Stack diam, mm (in.):
Sample box number:
Meter box number:
Meter ΔH@:

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b): mm (in.) Hg
Assumed moisture:
Static pressure (P_s): mm (in.) H_2O
C Factor:
Reference ΔP: mm (in.) H_2O

Sheet 2 of 2
Nozzle identification number:
Nozzle diameter: mm (in.)
Thermometer number:
Final leak rate .005 m^3/min (cfm)
Vacuum during leak check 10 mm (in.) Hg
Filter number:
Remarks:

Traverse point number	Sampling time, (θ), min	Start 10:28 Clock time, (24 h)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	534.86 Gas sample volume (V_m), m^3 (ft^3)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
1	3		8	78	.014	1.85				60	220
2	6		7	80	.012	1.60		77	71		230
3	9		5	79	.008	1.05				54	235
4	12		6	78	.010	1.30		80	72		
5	15		6	75	.009	1.20				55	220
6	18		4	76	.005	0.68		79	73		
7	21		4	77	.006	0.79				55	220
8	24		6	79	.009	1.20		78	73		
9	27		4	75	.006	0.79				55	220
10	30		2	76	.003	0.39	554.11	78	74		
	Total		Max 8	Avg 77	~~.064~~	~~7.02~~ 1.08	Total 19.25	Avg	Avg 75	Max 60	

B

(1+2) Final Impinger Volume = 99 ml

$\sqrt{\Delta P}$. 100

PARTICULATE FIELD DATA FORM

Plant: State Metals
City:
Location: North American
Operator:
Date: 9-18-90
Run number: 2
Stack diam, mm (in.):
Sample box number:
Meter box number: RAC-01
Meter ΔH@: 1.43

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b) ____ mm (in.) Hg
Assumed moisture:
Static pressure (P_s) ____ mm (in.) H_2O
C Factor:
Reference ΔP ____ mm (in.) H_2O

Sheet 1 of 2
Nozzle identification number:
Nozzle diameter ____ mm (in.)
Thermometer number:
Final leak rate ____ m^3/min (cfm)
Vacuum during leak check ____ mm (in.) Hg
Filter number: 0034
Remarks:

B

Traverse point number	Sampling time, (θ), min	Clock time, (24 h) (Start 11:51)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) (554.22)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
1	3		6	76	.009	1.20				60	220
2	6		5	78	.008	1.05		67	65		
3	9		10	78	.016	2.10				60	220
4	12		6	77	.010	1.30		78	67		
5	15		5	76	.006	0.79				58	220
6	18		9	75	.013	1.70		82	70		
7	21		5	78	.006	0.79				55	225
8	24		5	77	.006	0.79		81	72		
9	27		6	77	.010	1.30				50	225
10	30	12:22	5	77	.005	0.66	574.04	79	73		
										50	230
	Total		Max 10	Avg 77	~~.009~~	~~1.06~~	Total 19.82	Avg	Avg 66	Max 60	

$\bar{N}D_p$ = .083 1.17

PARTICULATE FIELD DATA FORM

Plant: State Metals
City:
Location: North American
Operator:
Date: 9-18-90
Run number: 2
Stack diam, mm (in.):

Sample box number:
Meter box number:
Meter ΔH@:

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b): mm (in.) Hg
Assumed moisture:
Static pressure (P_s) ~~+.005~~ - 0 mm (in.) H_2O POSITIVE
C Factor:
Reference ΔP: mm (in.) H_2O

Sheet 2 of 2
Nozzle identification number:
Nozzle diameter: mm (in.)
Thermometer number:
Final leak rate 0 m^3/min (cfm)
Vacuum during leak check 10 mm (in.) Hg
Filter number:
Remarks:

A

Traverse point number	Sampling time, (θ), min	Start 12:25 Clock time, (24 h)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	574.04 ~~554.22~~ Gas sample volume (V_m), m^3 (ft^3)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
1	3		5	75	.005	0.66				50	220
2	6		9	78	.013	1.70		78	72	50	225
3	9		6	77	.007	0.92					
4	12		4	77	.004	0.53		79	73	50	225
5	15		5	77	.007	0.92					
6	18		4	76	.004	0.53		80	74	50	220
7	21		2	77	.002	0.26					
8	24		6	79	.008	1.05		81	75	50	220
9	27		5	79	.005	0.66					
10	30	12:55 End	2	79	.002	0.26	589.95				
							15.91				
	Total		Max 9	Avg 77	~~.008~~ .75	~~.835~~	Total ~~35.73~~	Avg	Avg 76	Max 50	

(1+2) Final Impinger Volume 98 ml

PARTICULATE FIELD DATA FORM

Plant: State Metals
City:
Location: North American
Operator:
Date: 9-18-90
Run number: 3
Stack diam, mm (in.):

Sample box number:
Meter box number:
Meter ΔH@:

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b): mm (in.) Hg
Assumed moisture:
Static pressure (P_s): mm (in.) H_2O
C Factor:
Reference ΔP: mm (in.) H_2O

Sheet 1 of 2
Nozzle identification number:
Nozzle diameter: mm (in.)
Thermometer number:
Final leak rate: m^3/min (cfm)
Vacuum during leak check: mm (in.) Hg
Filter number:
Remarks:

Traverse point number	Sampling time, (θ), min	Clock time, (24 h) (start 1:55)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) (590.07)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
A 1	3		4	80	.005	0.66				55	215
2	6		5	81	.006	0.79		69	68		
3	9		6	80	.010	1.30				55	220
4	12		6	80	.009	1.20		77	69		
5	15		6	83	.010	1.30				55	220
6	18		6	82	.010	1.30		83	71		
7	21		5	82	.007	~~1.0~~ 0.92				55	225
8	24		5	80	.006	0.79		85	73		
9	27		5	81	.007	0.92				55	225
10	30	2:25	4	84	.005	0.66	608.44	86	75		
	Total		Max 6	Avg 81	.086	.984	Total 18.37	Avg	Avg 76	Max 55	

PARTICULATE FIELD DATA FORM

Plant: State Metals
City:
Location: North American
Operator:
Date: 9-18-90
Run number: 3
Stack diam, mm (in.):
Sample box number:
Meter box number:
Meter ΔH@:

Meter calibration (Y):
Pitot tube (C_p):
Probe length:
Probe liner material:
Probe heater setting:
Ambient temperature:
Barometric pressure (P_b): mm (in.) Hg
Assumed moisture:
Static pressure (P_s) +.012 mm (in.) H_2O
C Factor:
Reference ΔP: mm (in.) H_2O

Sheet 2 of 2
Nozzle identification number:
Nozzle diameter: mm (in.)
Thermometer number:
Final leak rate 0 m^3/min (cfm)
Vacuum during leak check 7 mm (in.) Hg
Filter number 0031
Remarks:

Traverse point number	Sampling time, (θ), min	Start 2:28 Clock time, (24 h)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	608.44 Gas sample volume (V_m), m^3 (ft^3)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
B 1	3		7	78	.012	1.60				58	220
2	6		6	82	.010	1.30		83	77		
3	9		7	82	.012	1.60				58	225
4	12		7	82	.012	1.60		86	77		
5	15		6	81	.009	1.20				58	225
6	18		6	80	.011	1.45		88	79		
7	21		4	80	.005	0.66				60	230
8	24		5	80	.006	0.79		85	79		
9	27		5	80	.006	0.79				60	235
10	30	2:58 End	5	81	.008	1.05	628.91	87	80		
	Total		Max 7	Avg 81	.094	~~1.08~~ 1.20	Total 20.47	Avg	Avg 82	Max 60	

(1+2) - Final Impinger Volume 97 ml

SAMPLING FIELD DATA

DATE : 9-18-90

SOURCE : North Amer. Furnace
Stat Metals

BARO. PRES. : 30.26

Pre-test Calibration		Run 1	Run 2	Run 3
calibration volume, liters		.250	→	→
time, sec.	(a)	28.41	28.69	28.00
	(b)	28.40.	28.47	27.91
	(c)	28.32	28.47	27.91
pre-test sampling rate, lpm				

Post-test Calibration				
calibration volume, liters		.250	→	→
time, sec.	(a)	28.50	27.75	28.03
	(b)	28.47	28.16	28.20
	(c)	28.25	28.09	28.19
post-test sampling rate, lpm				
Average Sampling Rate, lpm		.528	.537	.535

NOTES start run 1 0950 start run 2 1151 start run 3 1355
end 1050 end 1251

31.70 liters 31.83 l. 32.10

calibration vol
---------- x 60 = sampling rate (lpm)
calibration time

SUMMARY OF STACK TEST DATA - FIELD

SOURCE: State Metals, United Furnace

REPORT DATE: 9-24-90

	RUN#		
	1	2	3
Stack Cross-sectional Area (A) sq.ft.	2.18	2.18	2.18
Avg. Stack Gas Temp (Ts) deg. R	1140	1172	1172
Stack Static Pressure (Pbar) in. H2O	-0.07	-0.07	-0.09
Avg. Stack Velocity Pressure (sqrt. dP)	0.392	0.404	0.393
Barometric Pressure (Pbar) in. Hg	30.04	30.04	30.04
Pitot Tube Coef. (Cp)	0.84	0.84	0.84
Dry Gas Meter Coef. (Y)	1.000	1.000	1.000
Avg. Dry Gas Meter Temp. (Tm) deg. R	533	531	533
Sample Volume Metered (Vm) cu. ft.	38.220	42.030	39.640
Volume Water Collected (V/c) ml.	53.4	65.6	60.8
Test Time (O) min.	60	60	60
Sampling Nozzle Diameter (Dn) inches	0.375	0.375	0.375
Avg. Orifice Pres. Drop (dlt H),in.H2O	1.05	1.31	1.19
% CO2	2.8	2.9	2.8
% O2	16.0	16.0	16.0
% CO	0.0	0.0	0.0
Isokinetic Sampling Rate (%)	97	105	102

SUMMARY OF STACK TEST DATA - CALCULATIONS

SOURCE: State Metals, United Furnace

REPORT DATE: 9-24-90

	RUN#		
	1	2	3
Stack Abs. Pressure (Ps) in. Hg	30.03	30.03	30.03
Sample Vol. Standard (Vmstd) scf.	38.096	42.078	39.525
Water Vapor Vol. (Vwstd) scf.	2.17	2.67	2.48
Stack Gas Moisture (Bws) %	5.4	6.0	5.9
Stack Gas Velocity (Vs) ft/sec	32.49	33.99	33.06
Stack Gas Flow Rate (Q) dscfh	112130	113380	110396
dscfm	1869	1890	1840
acfm	4250	4446	4324
Total Particulate Collected (mn) gm	0.1291	0.0429	0.0638
Particulate Conc. Actual (cs) grains/dscf	0.0523	0.0157	0.0249
Emission Rate Actual (E) lbs/hr	0.838	0.254	0.393

SUMMARY OF STACK TEST DATA - CALCULATIONS

SOURCE : State Metals United Furnace

DATE : 9-24-90

NITROGEN OXIDES EMISSIONS

	RUN # 1	2	3
mg collected, as NO_2	ND	ND	ND
Sample Vol, ft^3	1.11	1.11	1.12
Contaminant concentration, mg/dscm	ND	ND	ND
Actual Emission Rate, lbs/hr	ND	ND	ND

$$\frac{\text{mg collected} \times 35.31}{\text{sample vol, ft 3}}$$

$$\frac{\text{mg/dscm} \times Q}{454000 \times 35.31}$$

SUMMARY OF STACK TEST DATE - CALCULATIONS

SOURCE : State Metals United Furnace DATE : 9-24-90

HYDROCARBON EMISSIONS

	RUN#		
	1	2	3
Sample concentration, ppm, condensible, as hexane	ND	ND	ND
Sample concentration, ppm, gas bag, as hexane	17	22	22
Hydrocarbon Emission Rate, lb/hr	0.42	0.55	0.54

$$\frac{\text{conc.} \times Q \times MW}{387 \times 10^{6}}$$

SUMMARY OF STACK TEST DATA - CALCULATIONS

SOURCE : State Metals United Furnace DATE : 9-24-90

CARBON MONOXIDE EMISSIONS

	RUN #		
	1	2	3
Concentration CO by NDIR, ppmv	38	23	25
Concentration CO_2 (FCO_2) by Orsat, %	2.8	2.9	2.8
Concentration CO in Stack, ppmv*	37	22	24
CO Emission Rate, lb/hr	0.32	0.19	0.20

$$\frac{\text{CO Stack} \times \text{MW} \times \text{acfm} \times 60}{387 \times 1\text{E}6} \times \frac{530}{T_s} \times \frac{P_s}{29.92}$$

* 40CFR60 Appendix A, EPA Method 10, equation 10-1, where :

$$\text{CO stack} = \text{CO NDIR} \left(1 - FCO_2 \right)$$

STACK GAS MOLECULAR WEIGHT CALCULATION

SOURCE: State Metals United Furnace DATE: 9-24-90

	RUN 1	RUN 2	RUN 3
% CO2	2.8	2.9	2.8
% O2	16.0	16.0	16.0
% CO	0.0	0.0	0.0
% N2	81.2	81.1	81.2
B ws	5.4	6.0	5.9
M d *	29.09	29.10	29.09
M s **	28.49	28.43	28.44

* M d = 0.44 (% CO2) + 0.32 (% O2) + 0.28 (% N2 + % CO)

** M s = M d (1 - B ws) + 18.0 (B ws)

STACK TEST ISOKINETIC RATE CALCULATION

SOURCE: State Metals United Furnace DATE: 9-24-90

	RUN 1	RUN 2	RUN 3
T s, deg. R.	1140	1172	1172
P s, in. Hg.	30.03	30.03	30.03
B ws	5.4	6.0	5.9
Vm std, ft3.	38.10	42.08	39.52
v s, ft/sec.	32.49	33.99	33.06
A n, ft2.	0.000767	0.000767	0.000767
0, min.	60	60	60
I, %	97	105	102

$$I = \frac{T\ s \times Vm\ std \times P\ std \times 100}{T\ std \times v\ s \times A\ n \times 0 \times 60(1-B\ ws)}$$

PARTICULATE FIELD DATA FORM

Plant: State Metals
City: Camden
Location: United
Operator: T.H. / O.N.
Date: 9-24-90
Run number: 1
Stack diam, mm (in.):
Sample box number:
Meter box number: RAC-01
Meter ΔH@: 1.43

Meter calibration (Y): 1.00
Pitot tube (C_p): .84
Probe length: 3'
Probe liner material: glass
Probe heater setting:
Ambient temperature: 60°F
Barometric pressure (P_b): 30.04 mm (in.) Hg
Assumed moisture: 6%
Static pressure (P_s): mm (in.) H_2O
C Factor: .23
Reference ΔP: mm (in.) H_2O

Sheet 1 of 1
Nozzle identification number:
Nozzle diameter: .375 mm (in.)
Thermometer number:
Final leak rate: .014 m^3/min (cfm) .010 cf/45 sec.
Vacuum during leak check: 22 mm (in.) Hg
Filter number: 0028
Remarks:

Traverse point number	9:20 start Sampling time, (θ), min	Clock time, (24 h)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	629.23 Gas sample volume (V_m), m^3 (ft^3)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
A 1	5		5	713	.15	1.20				50	220
2	10		7	740	.16	1.30		67	61		
3	15		8	710	.15	1.20				50	235
4	20		8	665	.12	.96		77	66		
5	25		9	625	.11	.88				50	235
6	30		8	500	.09	.72	648.24	78	69		
Start	9:54										
B 1	5		14	655	.15	1.20				50	235
2	10		22	720	.18	1.40		79	71		
3	15		22	708	.17	1.30				50	235
4	20		19	730	.14	1.10		84	72		
5	25		16	720	.10	.80				50	230
6	30		14	670	.07	.56	667.45	81	72		
	Total 60		Max	Avg 680			Total 38.22	Avg	Avg	Max	

End 10:24

134 - Final Impinger Volume

PARTICULATE FIELD DATA FORM

Plant State Metals
City
Location United
Operator T.H./D.N.
Date 9-24-90
Run number 2
Stack diam, mm (in.)

Sample box number
Meter box number
Meter ΔH@

Meter calibration (Y)
Pitot tube (C_p)
Probe length
Probe liner material
Probe heater setting
Ambient temperature
Barometric pressure (P_b) mm (in.) Hg
Assumed moisture
Static pressure (P_s) -.07 mm (in.) H_2O
C Factor
Reference ΔP mm (in.) H_2O

Sheet 1 of 1
Nozzle identification number
Nozzle diameter mm (in.)
Thermometer number
Final leak rate .013 m^3/min (cfm)
Vacuum during leak check 15 mm (in.) Hg
Filter number 0025
Remarks

	Traverse point number	Sampling time, (θ), min (11:35)	Clock time, (24 h)	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) (668.15)	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
B	1	5		4	700	.15	1.20				~~50~~ 60	215
	2	10		7	733	.19	1.50		69	64		
	3	15		9	728	.20	1.60				60	235
	4	20		10	773	.16	1.30		73	65		
	5	25		11	733	.15	1.20				60	235
	6	30		11	713	.13	1.05	689.01	75	67		
	Start	12:07										
A	1			11	695	.18	1.45				60	225
	2			14	728	.19	1.50		76	68		
	3			15	745	.19	1.50				65	225
	4			14	700	.16	1.30		79	69		
	5			14	715	.15	1.20				65	230
	6			12	585	.12	.96	710.18	76	67		
		Total		Max	Avg			Total	Avg	Avg	Max	

End 12:37 1172 R 531 R

146 - Final Impinger Volume

PARTICULATE FIELD DATA FORM

Plant State Metals
City
Location United
Operator T.H./D.N.
Date 9-24-90
Run number 3
Stack diam, mm (in.)

Sample box number
Meter box number
Meter ΔH@

Meter calibration (Y)
Pitot tube (C_p)
Probe length
Probe liner material
Probe heater setting
Ambient temperature
Barometric pressure (P_b) mm (in.) Hg
Assumed moisture
Static pressure (P_s) -.09 mm (in.) H_2O
C Factor
Reference ΔP mm (in.) H_2O

Sheet 1 of 1
Nozzle identification number
Nozzle diameter mm (in.)
Thermometer number
Final leak rate m^3/min (cfm)
Vacuum during leak check 23 mm (in.) Hg
Filter number 0033
Remarks

	Traverse point number	Sampling time, (θ), min	Clock time, (24 h) 1:30	Vacuum, mm (in.) Hg	Stack temperature (T_s), °C(°F)	Velocity head (ΔP_s), mm (in.) H_2O	Pressure differential across orifice meter (ΔH), mm (in.) H_2O	Gas sample volume (V_m), m^3 (ft^3) 710.33	Gas sample temperature at dry gas meter: Inlet, °C(°F)	Gas sample temperature at dry gas meter: Outlet, °C(°F)	Temperature of gas leaving condenser or last impinger, °C (°F)	Filter temp, °C(°F)
A	1	5		6	740	~~.018~~ .18	1.45				65	225
	2	10		8	740	.20	1.60		67	64		
	3	15		13	734	.19	1.50				65	225
	4	20		15	720	.16	1.30		78	67		
	5	25		17	690	.15	1.20				65	235
	6	30		16	640	.12	.96	731.27	83	70		
				~~22~~	~~6~~	~~.16~~	~~1.30~~					
B	1	5		22	670	.16	1.30		78	71	65	230
	2	10		23	717	.17	1.20					
	3	15		23	733	.17	1.05		77	71		
	4	20		23	730	.15	.99				65	225
	5	25		23	694	.12	.88		79	71		
	6	30	2:32	23	735	.10	.80	749.97				
		Total		Max	Avg 712			Total	Avg	Avg	Max	

B- Point #2 Meter Box Pegged
#3- Desired ΔH 1.35

138- Final Impinger Volume

SAMPLING FIELD DATA

DATE : 9-24-90

SOURCE : State Metals - United Furnace

BARO. PRES. : 30.04

Pre-test Calibration		Run 1	Run 2	Run 3
calibration volume, liters		.250	.250	.250
time, sec.	(a)	28.75	28.55	28.39
	(b)	28.75	28.49	28.43
	(c)	28.84	28.47	28.40
pre-test sampling rate, lpm				

Post-test Calibration				
calibration volume, liters		.250	.250	.250
time, sec.	(a)	28.47	28.49	28.49
	(b)	28.53	28.53	28.45
	(c)	28.56	28.50	28.41
post-test sampling rate, lpm				
Average Sampling Rate, lpm		.524	.526	.528

NOTES Test1 on 0920 off 1020 — 31.41 l

Test 2 on 1135 off 1235 — 31.57 l

Test 3 on 1330 — 31.66 l

$$\frac{\text{calibration vol}}{\text{calibration time}} \times 60 = \text{sampling rate (lpm)}$$

Ambient Engineering Inc.

1145 Bordentown Avenue
Parlin, New Jersey 08859
(201) 727-8333

ENVIRONMENTAL ENGINEERING/SYSTEMS

AIR
WATER
WASTE
NOISE
ENERGY
O.S.H.A.

STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 19, 1990

APPENDIX IV

ANALYTICAL DATA

Ambient Engineering Inc.

1145 Bordentown Avenue
Parlin, New Jersey 08859
(201) 727-8333

ENVIRONMENTAL ENGINEERING/SYSTEMS

AIR
WATER
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STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 19, 1990

PARTICULATE ANALYSIS

Analytical Report

Client: Ambient Engineering / State Metals
Sample Date: 9-17,18,24,25-90
Matrix: Stack
Analayte: Particulate - Acetone Residue

Test #	Sample #	Final Wt(gm)	Tare Wt(gm)	Net Wt	Blank Adj Net
Plibrico 1	47684	100.1965	100.1496	0.0469	0.0458
Plibrico 2	47685	101.6856	101.6780	0.0076	0.0065
Plibrico 3	47686	97.7868	97.7780	0.0088	0.0077
N. Amer. 1	47687	105.5017	105.4951	0.0066	0.0055
N. Amer. 2	47688	104.4987	104.4931	0.0056	0.0045
N. Amer. 3	47689	106.1552	106.1490	0.0062	0.0051
United 1	48135	100.5191	100.4661	0.0530	0.0519
United 2	48136	105.5034	105.4916	0.0118	0.0107
United 3	48137	106.1685	106.1456	0.0229	0.0218
Blank	47690	100.4709	100.4698	0.0011	NA
Baghouse 2	48138	104.4953	104.4893	0.0060	0.0055
Baghouse 3	48139	97.7780	97.7755	0.0025	0.0020
Baghouse 4	48140	100.1488	100.1470	0.0018	0.0013
Blank	48141	96.5324	96.5319	0.0005	NA

Approved: Timothy M. Harvey
Date: 10/2/90

Analytical Report

Client: Ambient Engineering/ State Metals
Sample Date: 9-17,18,24,25-90
Matrix: Stack
Analayte: Particulate - Filter

Test #	Sample #	Final Wt(gm)	Tare Wt(gm)	Net Wt	Blank Adj.Net
Plibrico 1	47684	0.3551	0.2096	0.1455	0.1458
Plibrico 2	47685	0.2067	0.1989	0.0078	0.0081
Plibrico 3	47686	0.2033	0.1995	0.0038	0.0041
N. Amer. 1	47687	0.1985	0.1970	0.0015	0.0018
N. Amer. 2	47688	0.1979	0.1973	0.0006	0.0009
N. Amer. 3	47689	0.1961	0.1956	0.0005	0.0008
United 1	48135	0.2864	0.2095	0.0769	0.0772
United 2	48136	0.2400	0.2081	0.0319	0.0322
United 3	48137	0.2429	0.2012	0.0417	0.0420
Blank	47690	0.2035	0.2038	-0.0003	NA
Baghouse 2	48138	0.5155	0.5088	0.0067	0.0067
Baghouse 3	48139	0.5100	0.5081	0.0019	0.0019
Baghouse 4	48140	0.5192	0.5190	0.0002	0.0002
Blank	48141	0.5059	0.5059	0.0000	NA

Approved: Timothy M. Harvey
Date: 10/2/90

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AIR
WATER
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ENVIRONMENTAL ENGINEERING/SYSTEMS

STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 19, 1990

NITROGEN OXIDES ANALYSIS

PROJECT 10-8-90 NO_x from Stack Testing

	Sample	RT	Area	mg/L
	Blank	—	—	
.45 mg	2ppm NO_3-N	4.03	5479248	cf 999
1.129	5ppm NO_3-N	3.91	14656063	
2.258	10ppm NO_3-N	3.73	30380108	
4.516	20ppm NO_3-N	3.56	62642619	
	Blank	—	—	
2659	48684 Lib Amer 1	4.47	410462	<0.5
	48685 Lib Amer 2	4.46	384121	<0.5
	48686 Lib Amer 3	3.87	19600555	1.47
	48686d	3.85	19680468	1.48
	48687 N Amer 1	4.44	28609	<0.5
	48688 N Amer 2	4.42	7647	<0.5
	48689 N Amer 3	4.46	116162	<0.5
	48690 Blank	4.49	75724	<0.5
2751	48135 Stat Met 1	4.39	408523	<0.5
	48136 Stat Met 2	4.44	306224	<0.5
	48137 Stat Met 3	4.44	219651	<0.5
.45	2ppm NO_3-N	4.10	5713514	0.48 105%
	Blank	—	—	<0.5

Final vol

48685	600+151 = 751		
48684	600+160 = 760		
48686	600+150 = 750	48136	600+186 = 786
48685	600+160 = 760	48135	600+150 = 750
48686	600+176 = 776	48137	600+160 = 760
48687	600+170 = 770		
476			

Continued on Page

Read and Understood By

Signed Date Signed Date

Calculation NOx Stack Testing

$$m = (S - B)\ 250 \times \frac{V}{50} \times \frac{46.01}{62.01}$$

V = final vol of KMnO4 sol
S = ug/ml of NO3 sample
B = " NO3 blank.

		V	S	ug of NOx as NO2	
Libbico 1	47654	760	<0.5	<1410	
Libbico 2	47655	760	<0.5	<1410	
Libbico 3	47656	776	1.97	~~<1430~~ 2	2580
N Amer 1	47657	770	<0.5	<1430	
N Amer 2	47658	751	<0.5	<1390	
N Amer 3	47659	750	<0.5	<1390	
State Met 1	45135	~~756~~ 750	<0.5	<1390	
State Met 2	45132	756	<0.5	<1460	
State Met 3	45131	760	<0.5	<1410	
Blank	47640	600	<0.5	<2030	

Continued on Page

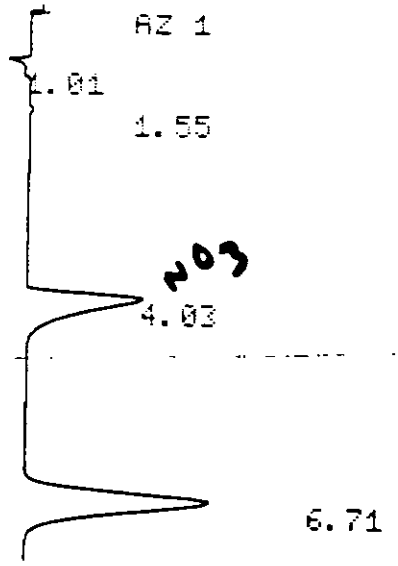
Read and Understood By

Janet Lazym
Signed

Date

Signed

Date



2ppm NO3

INPUT OVERRANGE AT RT= 0.87

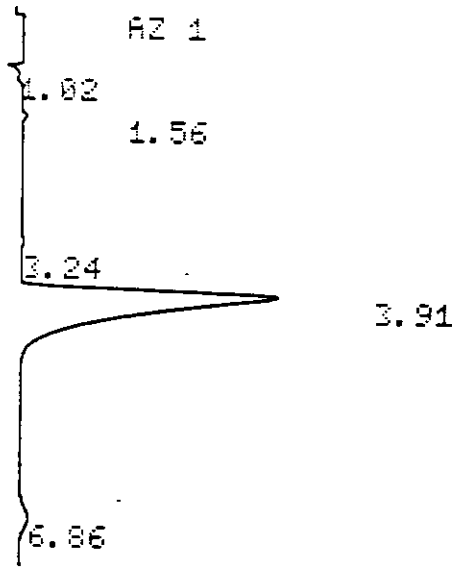
ANIONS 08023017 13:36:21 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 4 INDEX 3

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
CL	4189363.637	1.01	143604	03	0.034
2	0.	1.55	52702	01	
NO3	5491026.781	4.03	5479298	01	0.998
4	0.	6.71	9568119	01	
TOTALS	9680390.43		15243723		

CHANNEL A INJECT 08023017 13:56:14



5ppm

INPUT OVERRANGE AT RT= 0.89

PUT OVERRANGE AT RT= 0.87

IONS 08023017 13:36:21 CH= "A" PS= 1.

LE 2. METHOD 5. RUN 4 INDEX 3

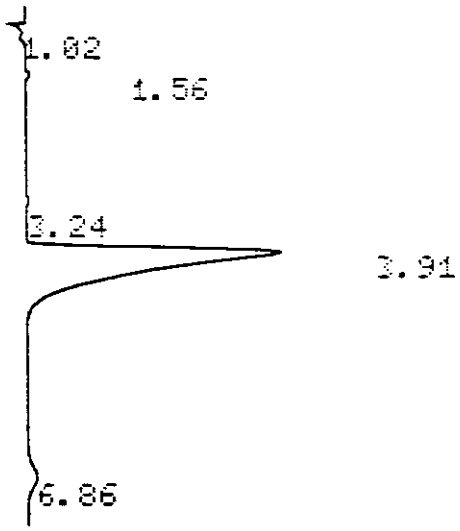
ALYST: JLL

ME	PPM	RT	AREA	BC	RF
	4189363.637	1.01	143604	03	0.034
2	0.	1.55	52702	01	
3	5491026.781	4.03	5479298	01	0.998
4	0.	6.71	9568119	01	
TALS	9680390.43		15243723		

ANNEL A INJECT 08023017 13:56:14

AZ 1

5ppm NO3



NPUT OVERRANGE AT RT= 0.89

NIONS 08023017 13:56:14 CH= "A" PS= 1.

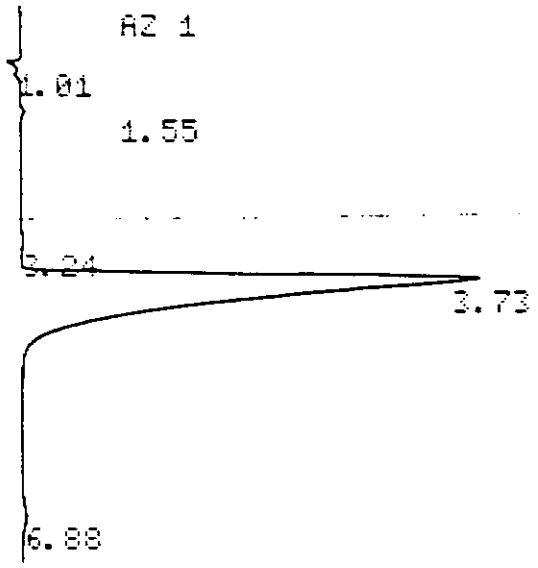
I' 2. METHOD 5. RUN 5 INDEX 4

NALYST: JLL

AME	PPM	RT	AREA	BC	RF
	2712362.359	1.02	92975	03	0.034

RT(3)=4.00

CHANNEL A INJECT 08023017 14:04:27



10 ppm NO3

INPUT OVERRANGE AT RT= 0.89

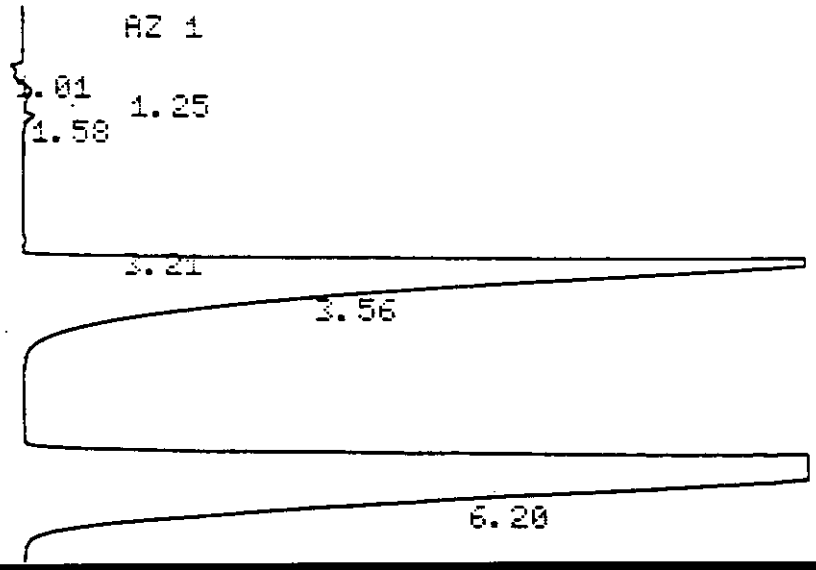
ANIONS 08023017 14:04:27 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 6 INDEX 5

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
CL	2761518.914	1.01	94660	03	0.034
2	0.	1.55	45753	01	
3	0.	3.24	22806	01	
NO3	30445138.531	3.73	30380108	01	0.998
5	0.	6.88	179426	01	
TOTALS	33206657.469		30722753		

CHANNEL A INJECT 08023017 14:14:50



20 ppm

UT OVERRANGE AT RT= 0.89

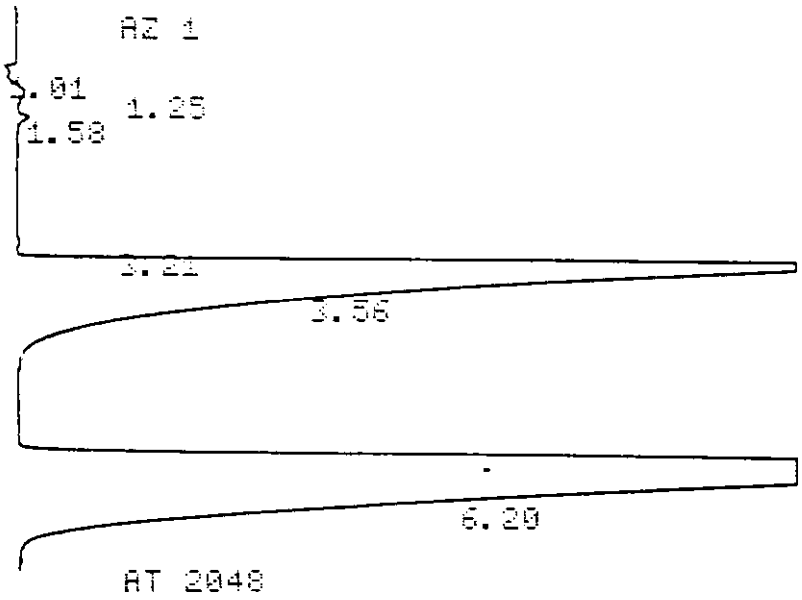
ONS 08023017 14:04:27 CH= "A" PS= 1.

E 7. METHOD 5. RUN 6 INDEX 5

LYST: JLL

E	PPM	RT	AREA	BC	RF
	2761518.914	1.01	94660	03	0.034
	0.	1.55	45753	01	
	0.	3.24	22806	01	
	30445138.531	3.73	30380108	01	0.998
	0.	6.88	179426	01	
ALS	33206657.469		30722753		

NNEL A INJECT 08023017 14:14:50



20 PPM NO3

UT OVERRANGE AT RT= 0.91

ONS 08023017 14:14:50 CH= "A" PS= 1.

E 2. METHOD 5. RUN 7 INDEX 6

LYST: JLL

E	PPM	RT	AREA	BC	RF
	1677128.258	1.01	57489	02	0.034
	0.	1.25	745408	02	
	0.	1.58	453717	03	
	0.	3.21	19923	02	
	0.	3.56	62642619	03	
	0.	6.2	89068742	01	

022

	0.	3.21	19923 02
	0.	3.56	62642619 03
	0.	6.2	89068742 01

TALS 1677128.259 152987898

Blank 10-8

ANNEL A INJECT 08027017 11:37:38

AZ 1

1.02

1.56

48

6.83

NPUT OVERRANGE AT RT= 0.91

NIONS 08027017 11:37:38 CH= "A" PS= 1.

ILE 2. METHOD 5. RUN 8 INDEX 7

NALYST: JLL

AME	PPM	RT	AREA BC	RF
L	1394062.357	1.02	47786 03	0.034
2	0.	1.56	6866 01	
03	0.	4.48	354287 01	
	0.	6.83	1883731 01	
OTALS	1394062.359		2292670	

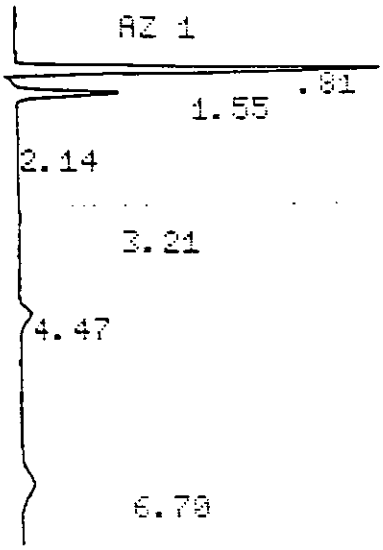
HANNEL A INJECT 08027017 12:03:20

AZ 1

	0.	1.56	6866 01
	0.	4.48	354287 01
	0.	6.83	1883731 01

TALS 1394062.359 2292670

ANNEL A INJECT 08027017 12:03:20



476684

023

PUT OVERRANGE AT RT= 1.33

IL 08027017 12:03:20 CH= "A" PS= 1.

LE 2. METHOD 5. RUN 9 INDEX 8

ALYST: JLL

ME	PPM	RT	AREA BC	RF
1	0.	0.81	5338918 01	
2	0.	1.55	1670797 01	
3	0.	2.14	17589 01	
4	0.	3.21	55060 01	
3	0.	4.47	410462 01	
6	0.	6.7	653617 01	
TALS	0.		8146443	

(3)=4.00

6.52

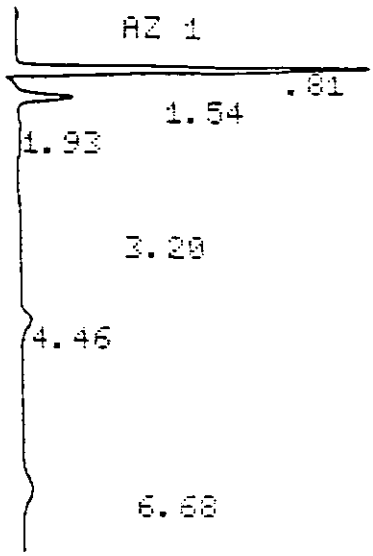
OVERRANGE AT

CH= "A" PS= 1.

	0.	3.21	55060	01
	0.	4.47	410462	01
	0.	6.7	653617	01
ALS	0.		8146443	

3: .00

NNEL A INJECT 08027017 12:16:07



47685

PUT OVERRANGE AT RT= 1.28

IDN.S 08027017 12:16:07 CH= "A" PS= 1.

LE 2. METHOD 5. RUN 10 INDEX 9

ALYST: JLL

ME	PPM	RT	AREA	BC	RF
1	0.	0.81	5119471	01	
2	0.	1.54	1113497	01	
3	0.	1.93	30859	01	
4	0.	3.2	23027	01	
3	0.	4.46	389121	01	
5	0.	6.68	537764	01	
TALS	0.		7213739		

024

ANNEL A INJECT 08027017 12:25:19

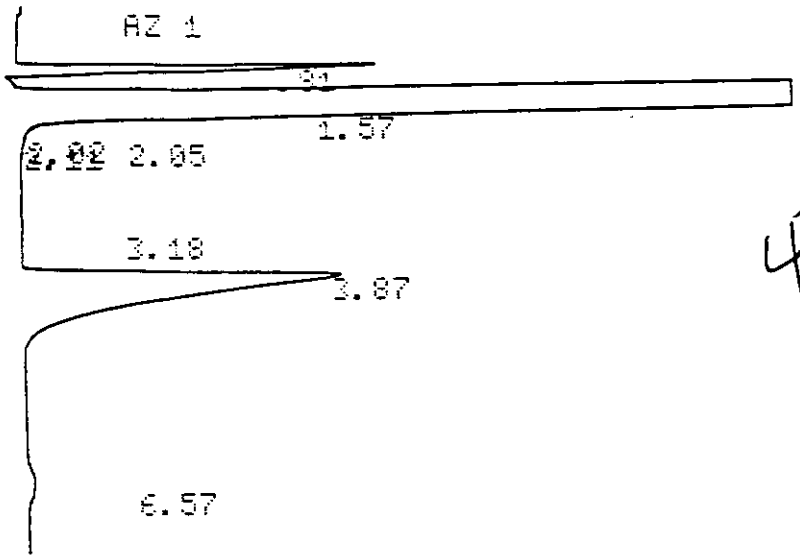
AZ 1

[redacted]

	0.	1.54	1113497	01
	0.	1.93	30859	01
	0.	3.2	23027	01
	0.	4.46	389121	01
	0.	6.68	537764	01
TALS	0.		7213739	

. 00122

ANNEL A INJECT 08027017 12:25:19



47686

IPUT OVERRANGE AT RT= 1.23

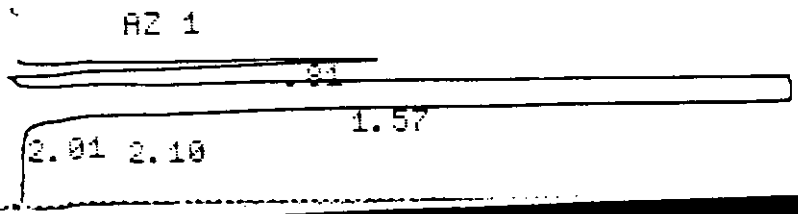
IIONS 08027017 12:25:19 CH= "A" PS= 1.

ILE 2. METHOD 5. RUN 11 INDEX 10

NALYST: JLL

AME	PPM	RT	AREA	BC	RF
1	0.	0.81	5241829	01	
2	0.	1.57	49815591	02	
3	0.	2.02	57730	02	
4	0.	2.05	60089	02	
5	0.	2.11	617840	03	
6	0.	3.18	28301	01	
03	19642511.188	3.87	19600555	01	0.998
8	0.	6.57	476492	01	
OTALS	19642511.219		75898427		

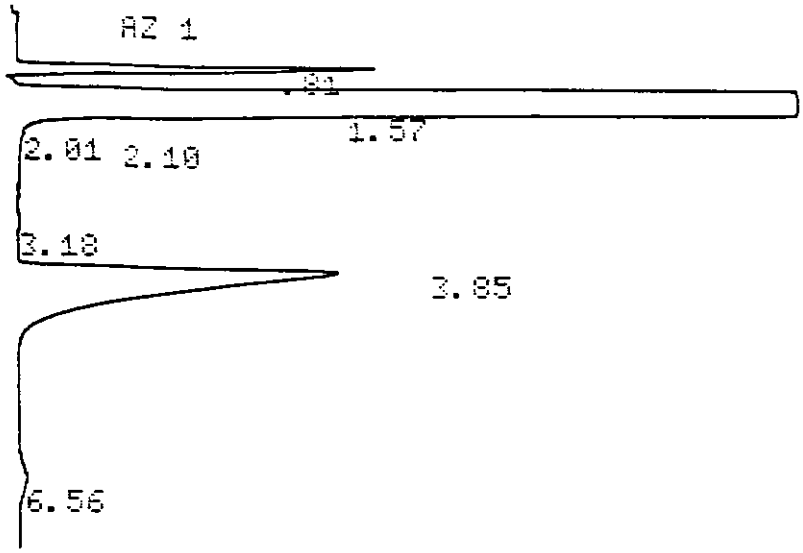
HANNEL A INJECT 08027017 13:09:02



47686 e.

5	0.	3.16	28301	01	
03	19642511.188	3.87	19600555	01	0.998
8	0.	6.57	476492	01	
OTALS	19642511.219		75898427		

HANNEL A INJECT 08027017 13:09:02



476686 e.

025

NPUT OVERRANGE AT RT= 1.24

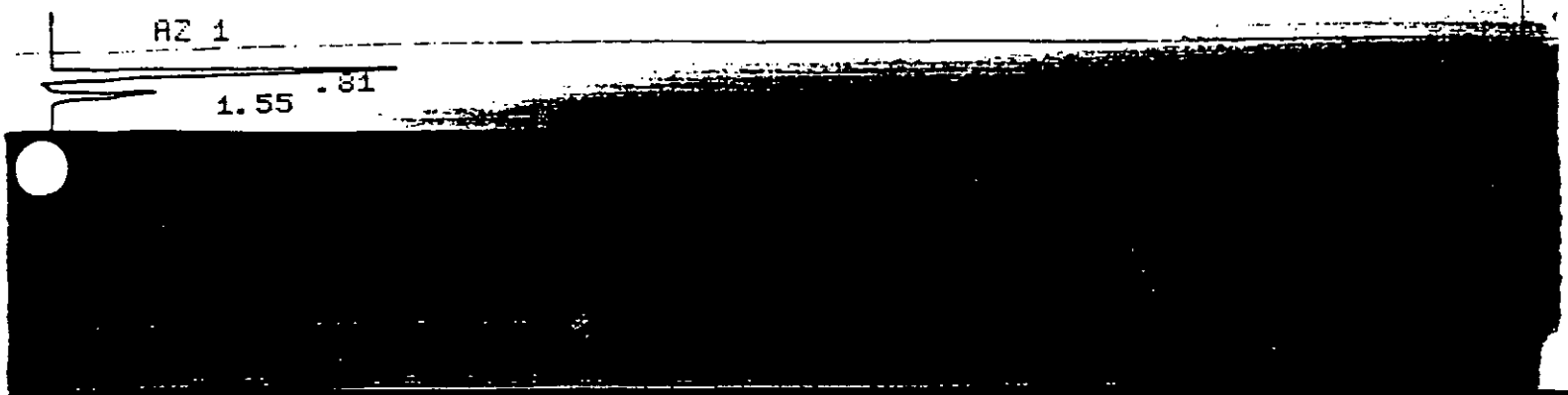
NT 'S 08027017 13:09:02 CH= "A" PS= 1.

ILE 2. METHOD 5. RUN 12 INDEX 11

NALYST: JLL

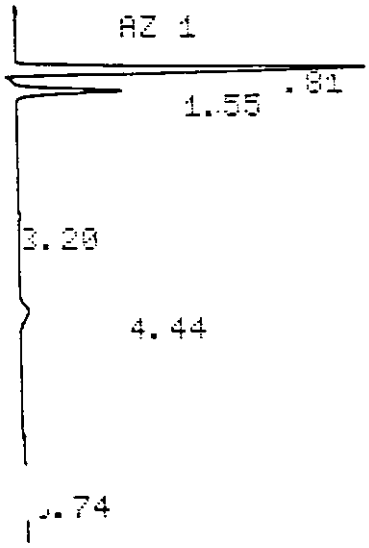
AME	PPM	RT	AREA	BC	RF
1	0.	0.81	5242112	01	
2	0.	1.57	49772237	02	
3	0.	2.01	115607	02	
4	0.	2.1	485968	03	
5	0.	3.18	30353	01	
03	19722595.25	3.85	19680468	01	0.998
7	0.	6.56	464183	01	
OTALS	19722595.281		75790928		

HANNEL A INJECT 08027017 13:24:00



ME	PPM	RT	AREA	BC	RF
1	0.	0.81	5242112	01	
2	0.	1.57	49772237	02	
3	0.	2.01	115607	02	
4	0.	2.1	485968	03	
5	0.	3.18	30353	01	
03	19722595.25	3.85	19680468	01	0.998
7	0.	6.56	464183	01	
TALS	19722595.281		75790928		

HANNEL A INJECT 08027017 13:24:00



687

NPUT OVERRANGE AT RT= 1.37

NIONS 08027017 13:24:00 CH= "A" PS= 1.

ILE 2. METHOD 5. RUN 13 INDEX 12

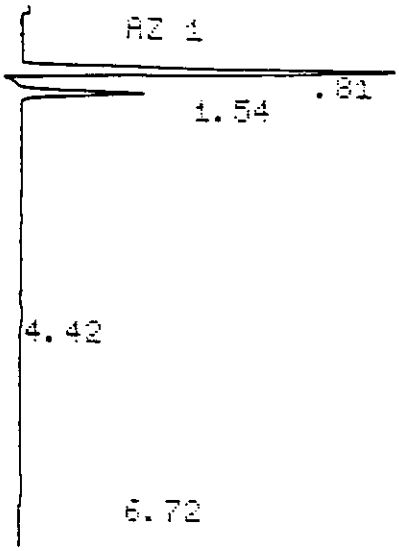
NALYST: JLL

AME	PPM	RT	AREA	BC	RF
1	0.	0.81	5064260	01	
2	0.	1.55	1448281	01	
3	0.	3.2	16906	01	
03	0.	4.44	288609	01	
5	0.	6.74	178629	01	

026

2	0.	1.55	1448281	01
3	0.	3.2	16906	01
3	0.	4.44	288609	01
5	0.	6.74	478629	01
TA' ^	0.		7296685	

ANNEL A INJECT 08027017 13:36:44



476884

PUT OVERRANGE AT RT= 1.34

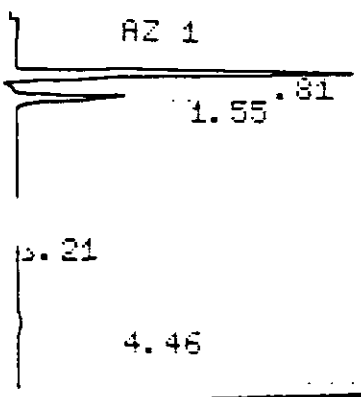
IOn3 08027017 13:36:44 CH= "A" PS= 1.

LE 2. METHOD 5. RUN 14 INDEX 13

ALYST: JLL

ME	PPM	RT	AREA	BC	RF
1	0.	0.81	5645505	01	
2	0.	1.54	1711310	01	
3	0.	4.42	76971	01	
4	0.	6.72	114448	01	
TALS	0.		7548234		

ANNEL A INJECT 08027017 13:50:17

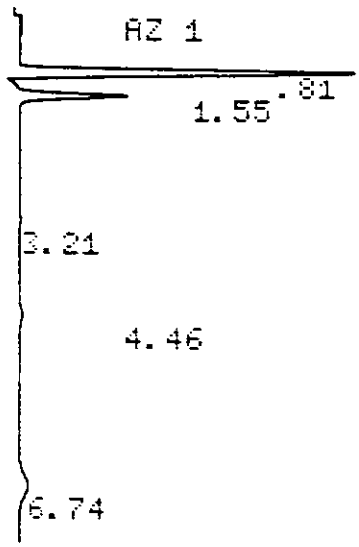


6869

3.18

TOTALS	0.	7548234

CHANNEL A INJECT 08027017 13:50:17



689

INPUT OVERRANGE AT RT= 1.33

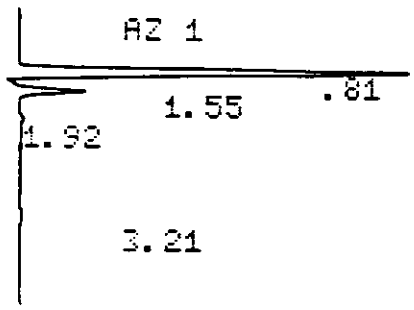
ANIONS 08027017 13:50:17 CH= "A" PS= 2

FILE 2. METHOD 5. RUN 15 INDEX 14

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.81	4793995	01	
2	0.	1.55	1560017	01	
3	0.	3.21	21082	01	
NO3	0.	4.46	116162	01	
5	0.	6.74	463269	01	
TOTALS	0.		6954525		

CHANNEL A INJECT 08027017 14:00:35



690

6.74

INPUT OVERRANGE AT RT= 1.33

ANIONS

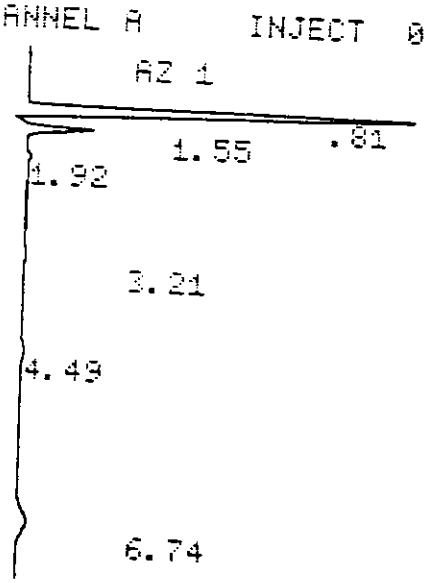
08027017 13:50:17 CH= "A" PS=

FILE 2. METHOD 5. RUN 15 INDEX 14

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.81	4793995	01	
2	0.	1.55	1560017	01	
3	0.	3.21	21082	01	
NO3	0.	4.46	116162	01	
5	0.	6.74	463269	01	
TOTALS	0.		6954525		

CHANNEL A INJECT 08027017 14:00:35



7640

INPUT OVERRANGE AT RT= 1.4

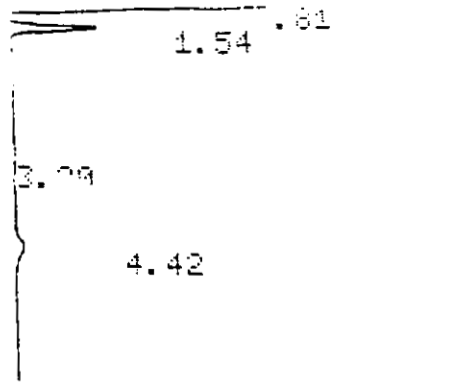
ANIONS

08027017 14:00:35 CH= "A" PS= 1.

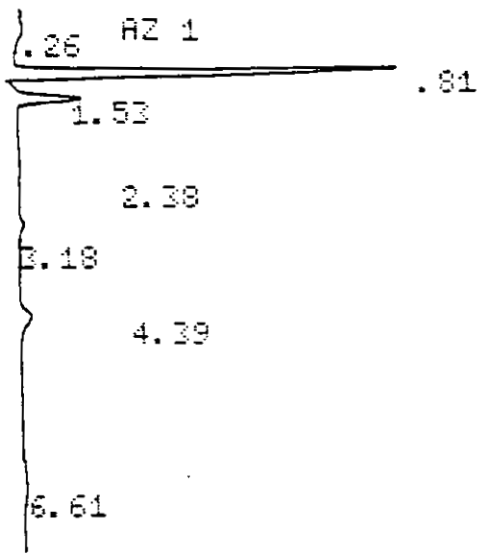
FILE 2. METHOD 5. RUN 16 INDEX 15

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.81	5754650	01	
2					



NNEL A INJECT 08027017 17:30:48



48136

PUT OVERRANGE AT RT= 1.29

IONS 08027017 17:30:48 CH= "A" PS= 1.

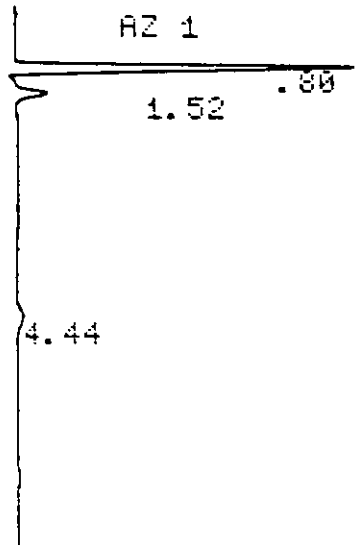
LE 2. METHOD 5. RUN 17 INDEX 16

ALYST: JLL

AME	PPM	RT	AREA	BC	RF
1	0.	0.26	365788	01	
2	0.	0.81	5783489	01	
3	0.	1.53	1342020	01	
4	0.	2.38	155955	02	
5	0.	3.18	126209	03	
03	409397.47	4.39	408523	01	0.998
7	0.	6.61	194080	01	
OTALS	409397.47		8376064		

TOTALS

CHANNEL A INJECT 08027017 18:01:24



4873X

INPUT OVERRANGE AT RT= 1.28

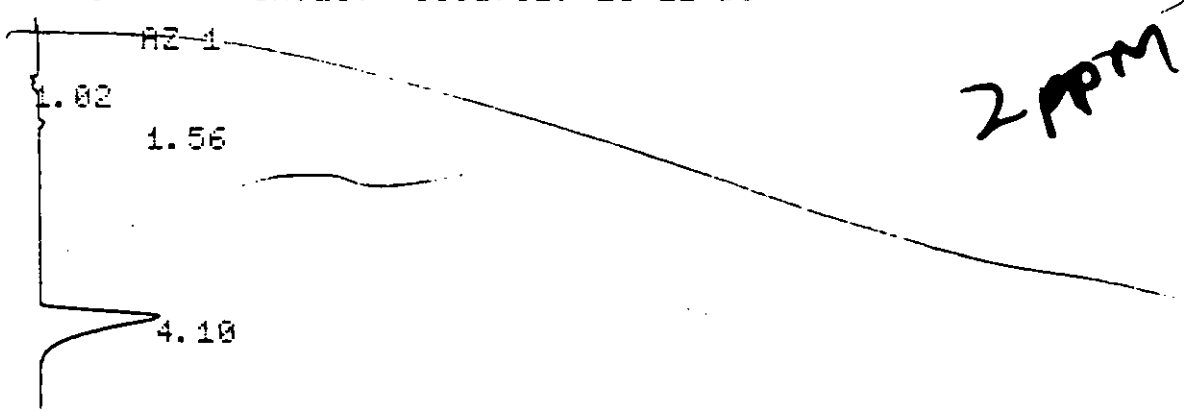
ANIONS 08027017 18:01:24 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 19 INDEX 18

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.8	4778481	01	
2	0.	1.52	683321	01	
NO3	0.	4.44	219651	01	
TOTALS	0.		5681453		

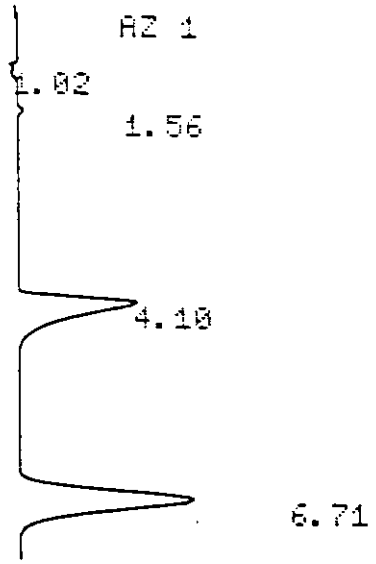
CHANNEL A INJECT 08027017 18:11:30



2PPM

NAME	PPM	RT	AREA	BC	RF
1	0.	0.8	4778481	01	
2	0.	1.52	683321	01	
NO3	0.	4.44	219651	01	
TOTALS	0.		5681453		

CHANNEL A INJECT 08027017 18:11:30



2 PPM NO3

INPUT OVERRANGE AT RT= 0.95

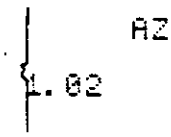
ANIONS 08027017 18:11:30 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 20 INDEX 19

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
CL	994537.729	1.02	34091	03	0.034
2	0.	1.56	80561	01	
NO3	5728049.055	4.1	5715814	01	0.998
4	0.	6.71	8846892	01	
TOTALS	6722586.789		14677358		

CHANNEL A INJECT 08027017 18:19:29



Ambient Engineering Inc.

1145 Bordentown Avenue
Parlin, New Jersey 08859
(201) 727-8333

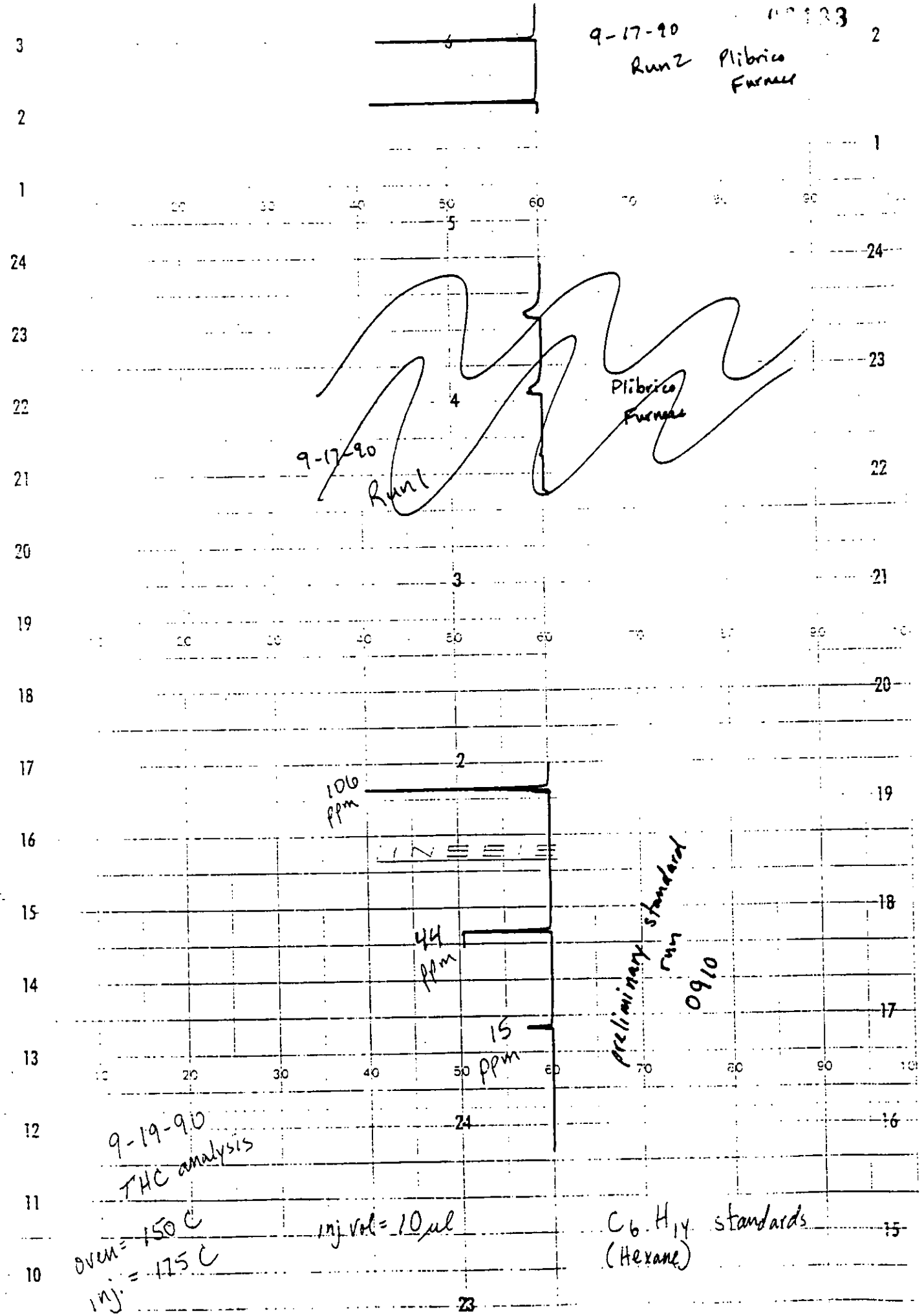
ENVIRONMENTAL ENGINEERING/SYSTEMS

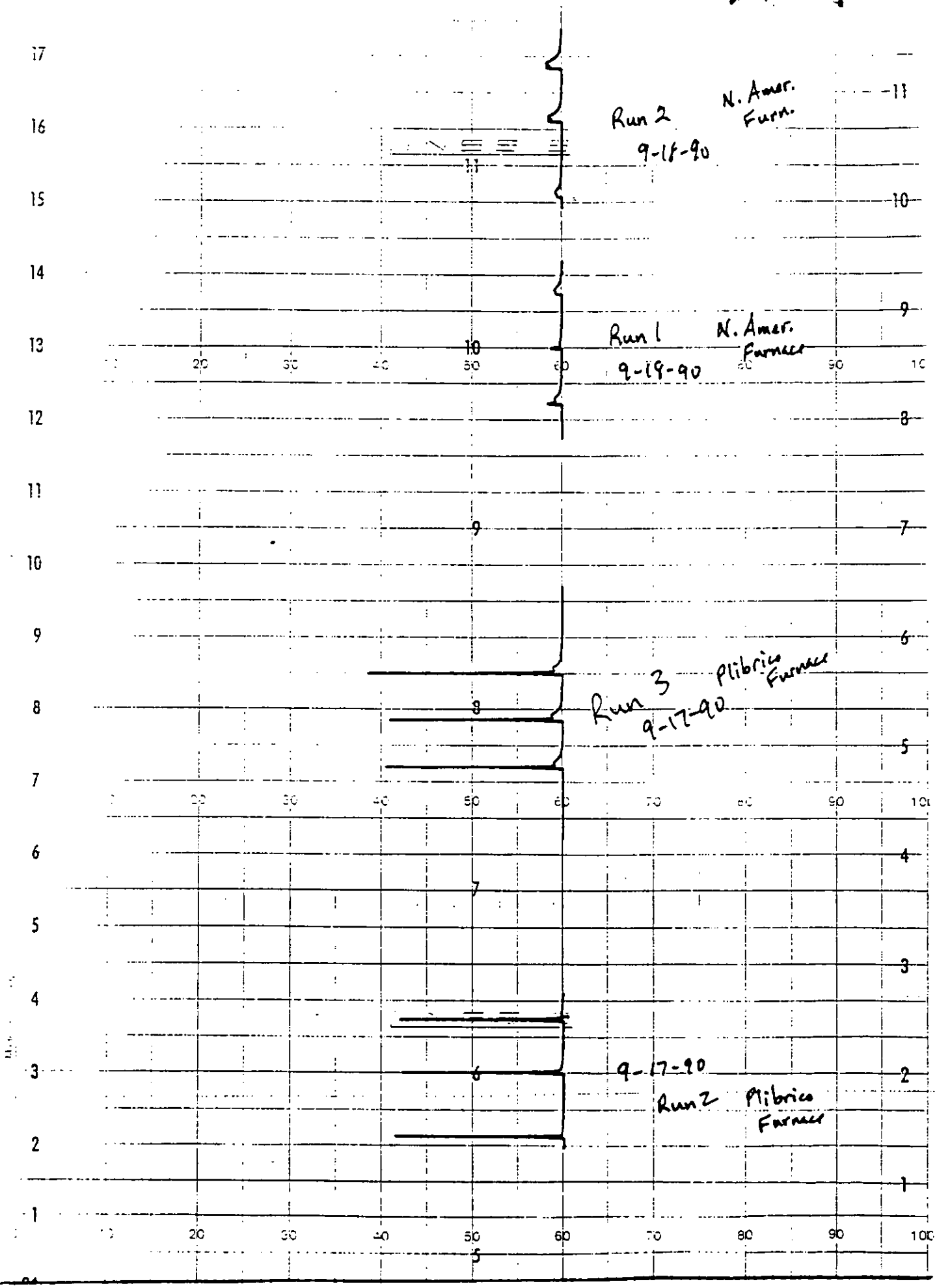
AIR
WATER
WASTE
NOISE
ENERGY
O.S.H.A.

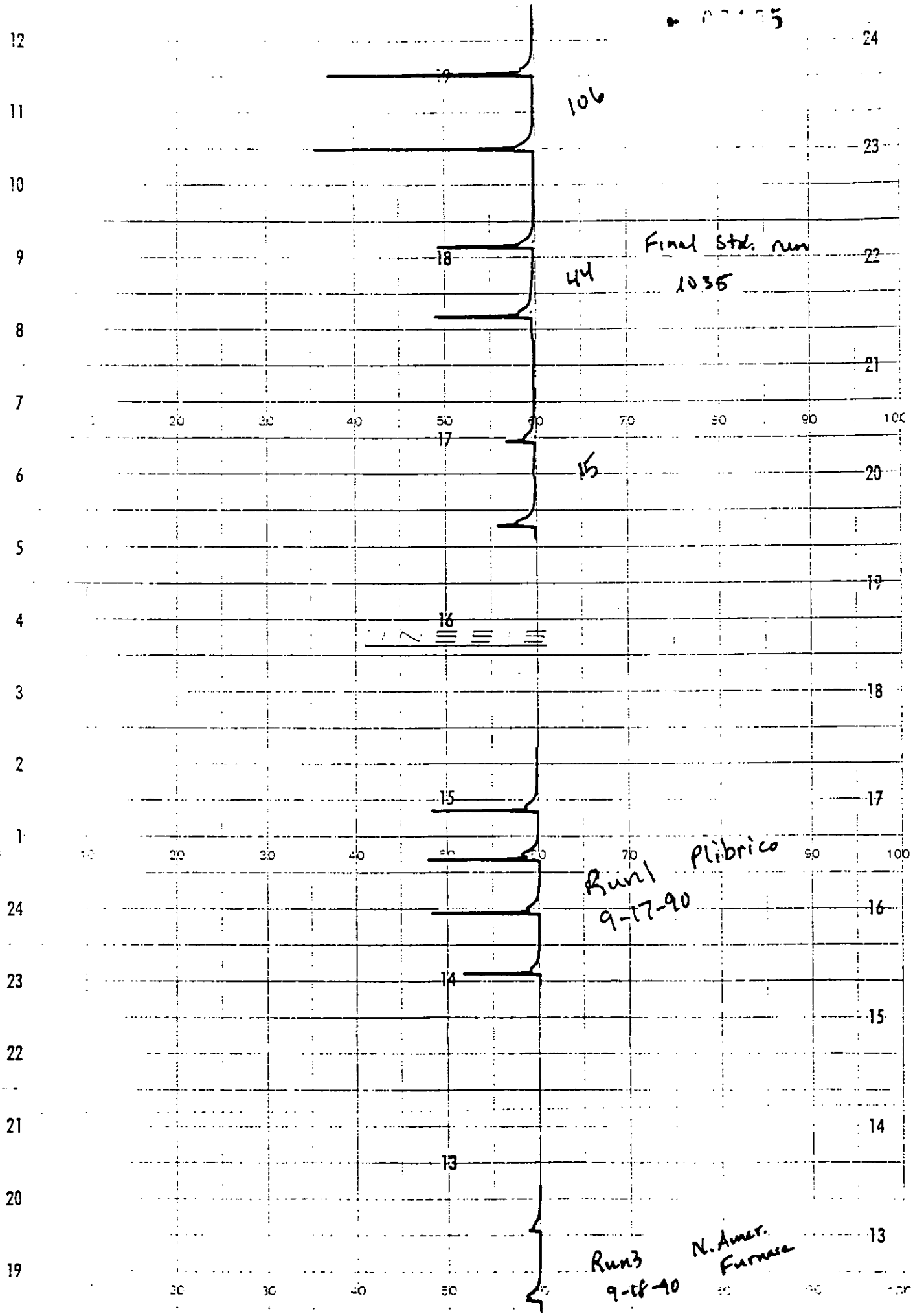
STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

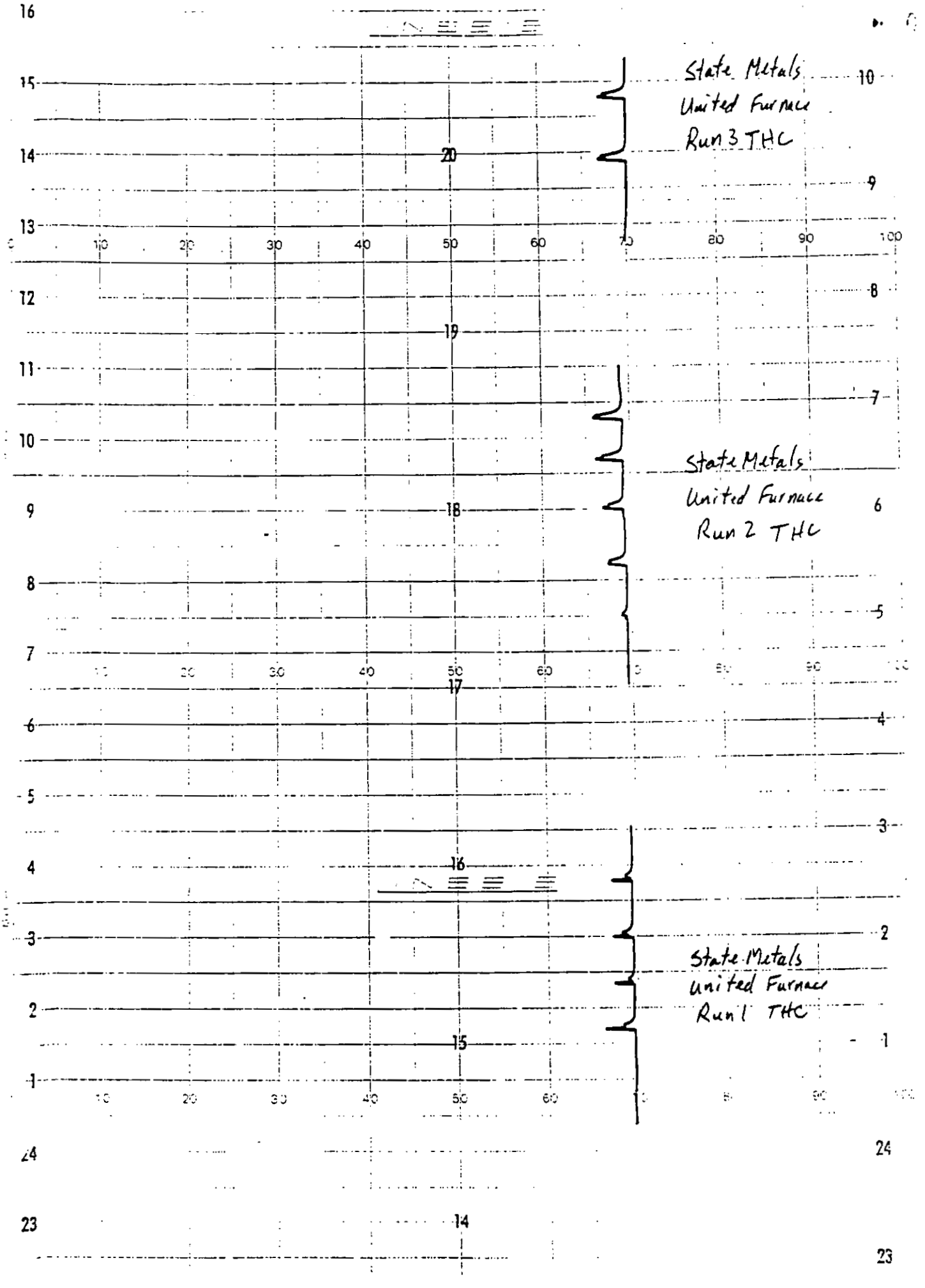
Report Date: October 19, 1990

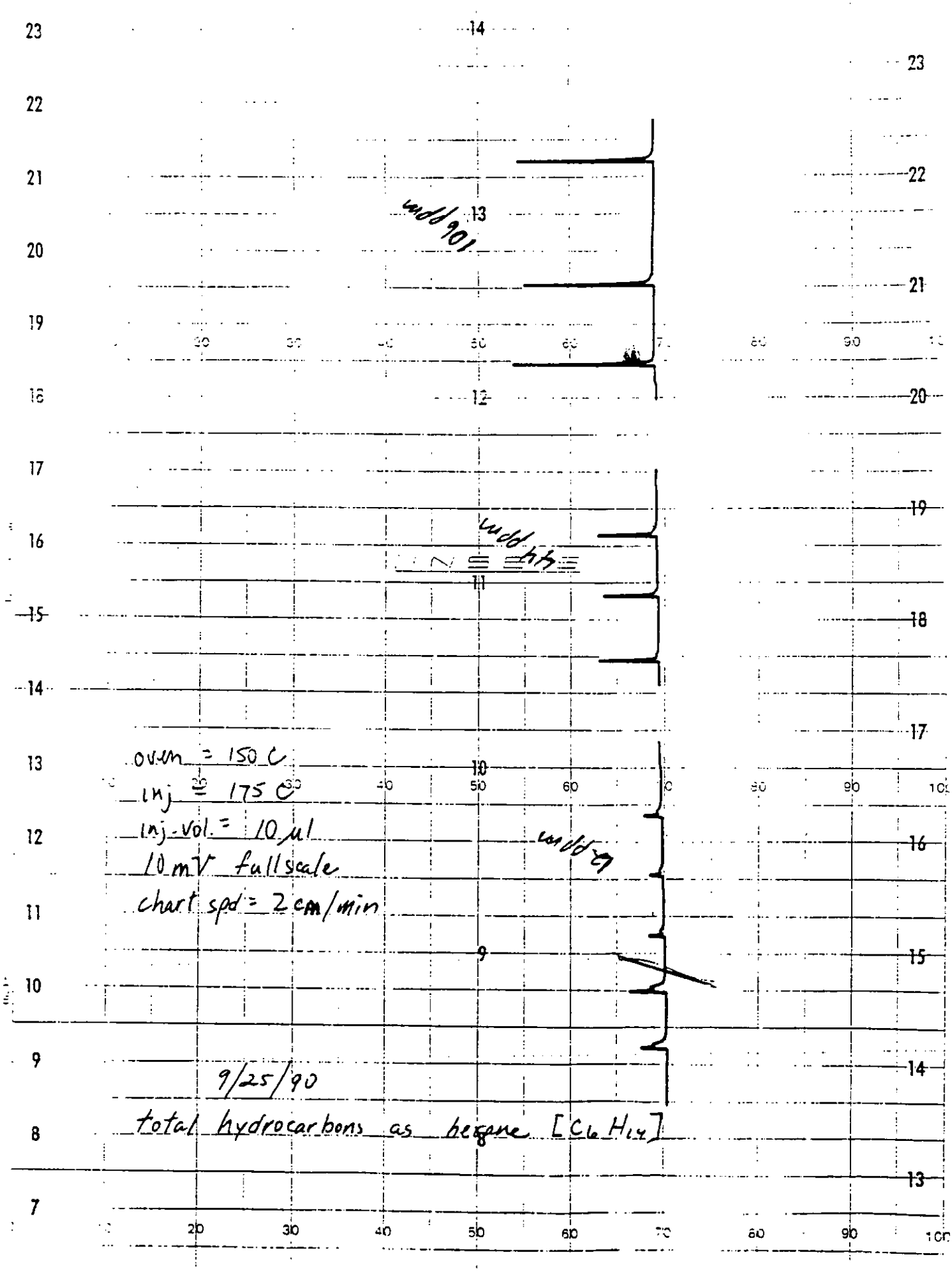
TOTAL HYDROCARBONS ANALYSIS


9-17-90
Run2 Plibrico Furnace
Plibrico Furnace
9-17-90
Run1
106 ppm
44 ppm
15 ppm
preliminary standard run 0910
9-19-90
THC analysis
oven = 150 C
inj = 175 C
inj vol = 10 µl
C6H14 standards
(Hexane)


Run 2
N. Amer. Furn.
9-18-90
Run 1
N. Amer. Furnace
9-18-90
Run 3
Plibrico Furnace
9-17-90
9-17-90
Run 2
Plibrico Furnace


106
44
Final Std. run
1035
15
Run1
9-17-90
Plibrico
Run3
9-18-90
N. Amer.
Furnace


State Metals
United Furnace
Run 3 THC
State Metals
United Furnace
Run 2 THC
State Metals
United Furnace
Run 1 THC


oven = 150 C
inj = 175 C
inj. vol. = 10 µl
10 mV fullscale
chart spd = 2 cm/min
9/25/90
total hydrocarbons as hexane [C6H14]

HEXANE Analysis

Client Ambient Engineers
N. American Furnace

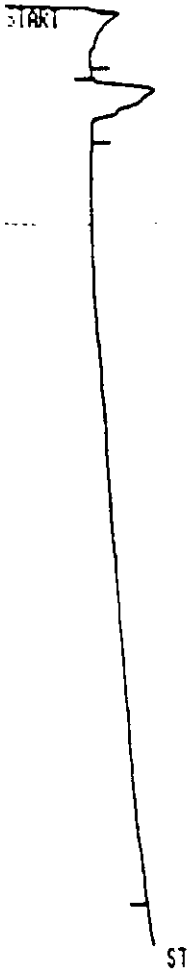
Lab I.D. 962651-47687

Client I.D.

Scan # 1487

Parametre	M.D.L.	Results (mg/l)
Hexane	1.0 mg/l	U

902659-47687



Amount Purged: 5 ml

Column: 1% SP-1000 on Carpaack 1

Date: 10-01-90

Instrument ID: HPFID

Analyst Initials: ds

RUN # 1487 SEP/28/90 17:25:52
WORKFILE ID: C
WORKFILE NAME:
ID: 0
NO RUN PEAKS STORED

HEXANE Analysis

Client Ambient Engineers

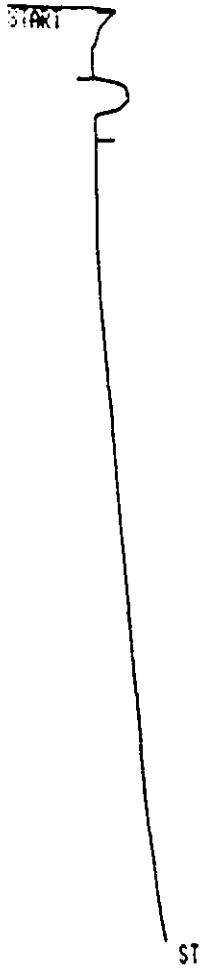
Lab I.D. 902659-4768

Client I.D.

Scan # 1488

Parameter	MDL	Results (mg/l)
Hexane	1.0 mg/l	U

902659-47688



Amount Purged: 5 ml

Column: 1% SP1000 on Carbopack B

Date: 10-01-90

Instrument ID: HPFID

Analyst Initials: Db

RUN # 1488 SEP/28/90 18:32:09
WORKFILE ID: C
WORKFILE NAME:
ID: 0
NO RUN PEAKS STORED

HEXANE Analysis

Client Ambient Engineers

Lab I.D. 902659-4768

Client I.D.

Scan # 1489

Parametre	M.D.L.	Results (mg/l)
Hexane	1.0 mg/l	U

902659-47689

Amount Purged: 5 ml

Column: 1% SP1000 on Carbopak B

Date: 10-01-90

Instrument ID: HPE18

Analyst Initials: B

RUN # 1489 SEP/28/90 19:54:58
WORKFILE ID: C
WORKFILE NAME:
ID: 0
NO RUN PEAKS STORED

HEXANE Analysis

Client Ambient Engineers
Plibrico Furnace

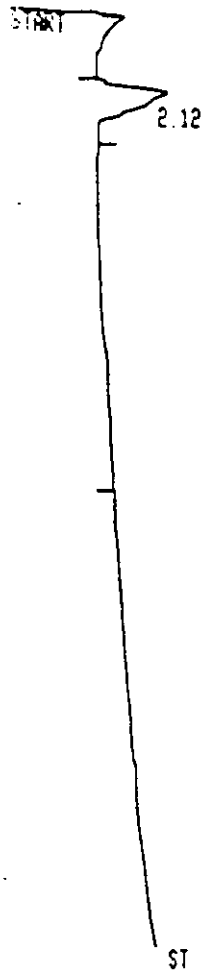
Lab I.D. 912659-47684

Client I.D.

Scan # 1486

Parameter	MDL	Results (mg/l)
Hexane	1.0 mg/l	U

902659-47684



Amount Purged: 5 ml

Column: 1% SP1000 on Carbopak B

Date: 10-01-90

Instrument ID: HPFID

Analyst Initials: B

RUN # 1486 SEP/28/90 16:41:10
WORKFILE ID: C
WORKFILE NAME:
ID: 0

AREA%

RT	AREA	TYPE	AR/HT	AREA%
2.12	327250	BB	0.623	100.000

TOTAL AREA= 327250
MUL FACTOR= 1.0000E+00

HEXANE Analysis

Client Ambient Engineers

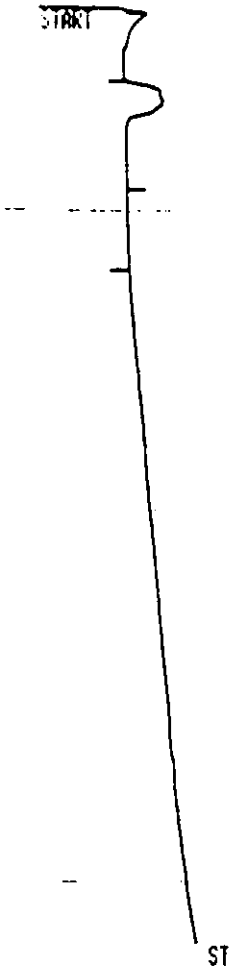
Lab I.D. 912651-4768

Client I.D.

Scan # 1495

Parametre	M.D.L.	Results (mg/l)
Hexane	1.0 mg/l	U

902659-47685



Amount Purged: 5 ml

Column: 1% SP1000 on Carbopak B

Date: 10-01-90

Instrument ID: HPFID

Analyst Initials: PD

RUN # 1485 SEP/28/90 15:51:33
WORKFILE ID: C
WORKFILE NAME:
ID: 0
NO RUN PEAKS STORED

HEXANE Analysis

Client Ambient Engineers

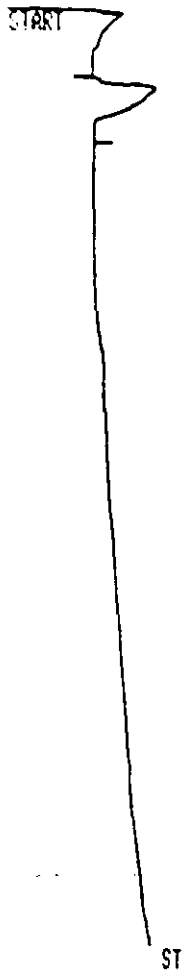
Lab I.D. 9026 59-4768.

Client I.D.

Scan # 1484

Parameter	M.D.L.	Results (mg/l)
Hexane	1.0 mg/l	U

902659-47686



Amount Purged: 5 ml

Column: 1% SP1000 on Carbopak B

Date: 10-01-90

Instrument ID: HPFID

Analyst Initials: B

RUN # 1484 SEP/28/90 13:54:52
WORKFILE ID: C
WORKFILE NAME:
ID: 0
NO RUN PEAKS STORED

HEXANE Analysis

Client: Ambient Engineers
United Furnace

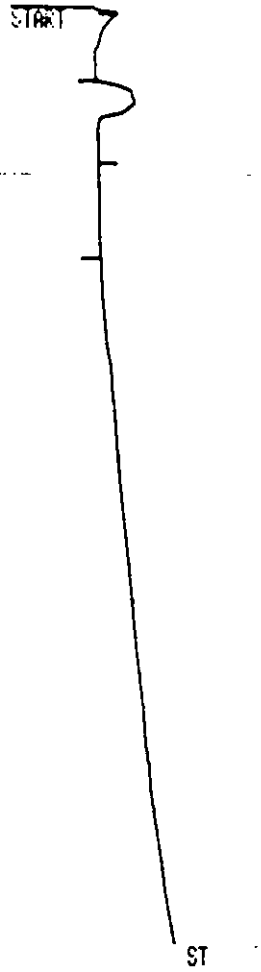
Lab I.D. 902751-48135

Client I.D.

Scan # 1490

Parameter	M.D.L.	Results (mg/l)
Hexane	1.0 mg/l	U

902751-48135



Amount Purged: 5ml

Column: 1% SP1000 on Carbopak B

Date: 10-01-90

Instrument ID: HPEID

Analyst Initials: B

RUN # 1490 SEP/28/90 20:52:18
WORKFILE ID: C
WORKFILE NAME:
ID: 0
NO RUN PEAKS STORED

HEXANE Analysis

Client Ambient Engineers

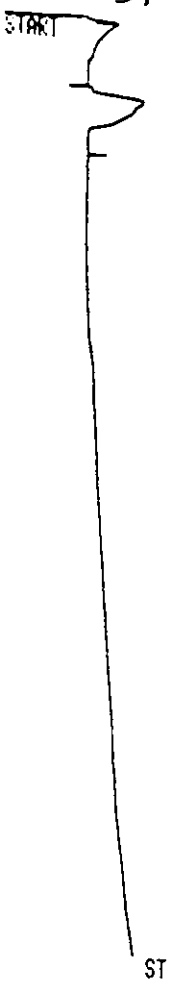
Lab I.D. 9027051-4813

Client I.D.

Scan # 1491

Parameter	M.D.L.	Results (mg/l)
Hexane	1.0 mg/l	U

902751-48136



Analysis Performed: 5ml
Column: 1% SP-1000 on Carbopak B
Date: 10-01-90
Instrument ID: HPFID
Analyst Initials: B

RUN # 1491 SEP/28/90 22:02:14
WORKFILE ID: C
WORKFILE NAME:
ID: 0
NO RUN PEAKS STORED

HEXANE Analysis

Client Ambient Engineers

Lab I.D. 902751-48137

Client I.D.

Scan # 1492

Parameter	M.D.L.	Results (mg/l)
Hexane	1.0 mg/l	U

902751-48137

Amount Purged: 5 ml

Column: 1% GP1000 on Carbopak B

Date: 10-01-90

Instrument ID: HPFID

Analyst Initials: B

RUN # 1492 SEP/28/90 22:53:53
WORKFILE ID: C
WORKFILE NAME:
ID: 0
NO RUN PEAKS STORED

Report of Equations

Method hexane Initial Calibration

Instrument ID: hpfid
Column:
Standard:

Compound	Equation	DATE OF INIT. CAL.
Hexane	Amount in NG = 0.0001555 x Area + -1.3022	9-28-90

Date: 032890
Instrument ID:hpfid

Report of Results

Column:
Standard:

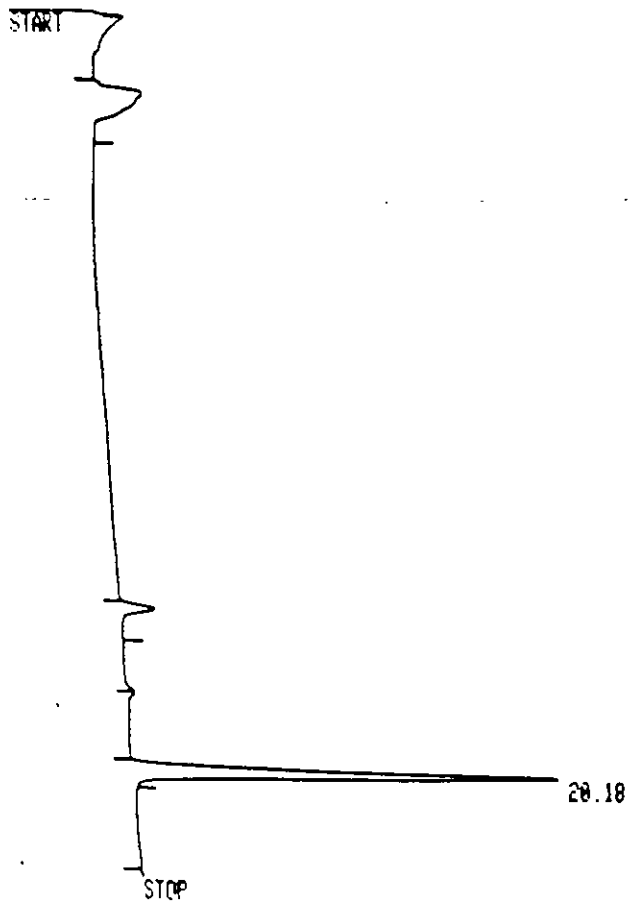
Method hexane Initial Calibration

Compound	Load #1	Load #2	Load #3	Area #1	Area #2	Area #3	Slope	Y-int	Cor.Co.
Hexane	100	50	20	662670	309200	158060	0.0001555	-1.9022	0.9965

For all Pesticide/PCB calibrations Load is always in units of pgs

For all other GC analysis Load is always in units of ngs

100 ppm Hexane



Amount Purged: 5 ml / 100 ppm

Column: 1% SP1000 on Carbopak B

Date: 10-01-90

Instrument ID: HPFID

Analyst Initials: JB

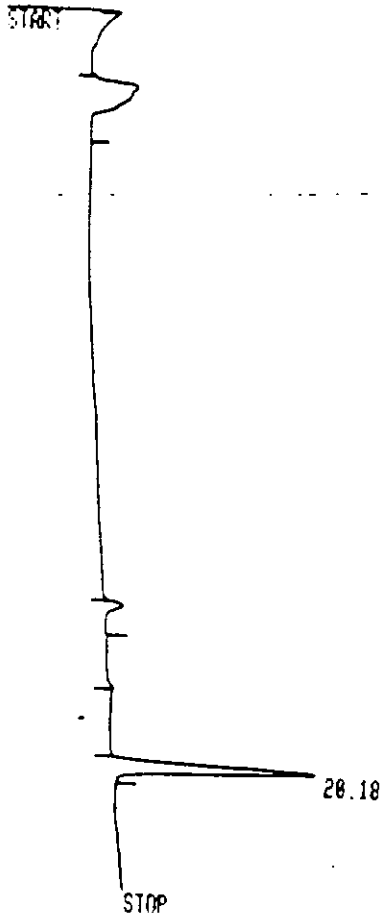
RUN # 1480 SEP/28/90 10:35:17
WORKFILE ID: C
WORKFILE NAME:
ID: 0

AREA%

RT	AREA	TYPE	AR/HT	AREA%
20.18	662670	PB	0.219	100.000

TOTAL AREA= 662670
MUL FACTOR= 1.0000E+00

50 ppm Hexane



Amount Purged: 5 ml / 50 ppm

Column: 1% SP1000 on Carbopak B

Date: 10-01-90

Instrument ID: HPELD

Analyst Initials: PS

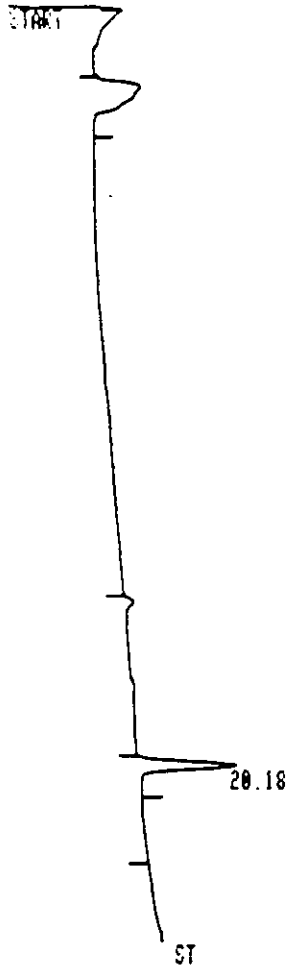
RUN # 1481 SEP/28/90 11:20:55
WORKFILE ID: C
WORKFILE NAME:
ID: 0

AREA%

RT	AREA	TYPE	AR/HT	AREA%
20.18	309200	PB	0.218	100.000

TOTAL AREA= 309200
MUL FACTOR= 1.0000E+00

20 ppm Hexane



Amount Purged: 5 ml / 20 ppm

Column: 1% SP1000 on Carbopak B

Date: 10-01-90

Instrument ID: HPFID

Analyst Initials: DL

RUN # 1482 SEP/28/90 12:06:11
WORKFILE ID: C
WORKFILE NAME:
ID: 6

AREA%

RT	AREA	TYPE	AR/HT	AREA%
20.18	158060	PB	0.224	100.000

TOTAL AREA= 158060
MUL FACTOR= 1.0000E+00

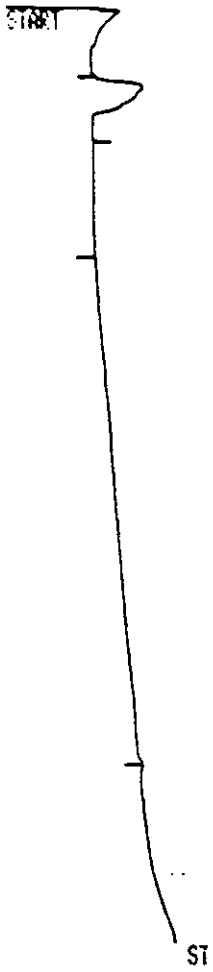
Specific Target or Method: Hexane

METHOD BLANK SUMMARY

CLIENT _____ REPORT # _____

FILE ID	DATE OF ANALYSIS	FRACTION	MATRIX	LEVEL	COMPOUND (HSL, TIC, OR UNKNOWN)	CONC	UNITS	CRDL	% Recovery
1483	9/28/90	VOA	AQ		no targets				
					SURROGATE RECOVERY				

Method Blank



Aliquot Volume: 5 ml
Column: 1% SP1000 on Carbopak B
Date: 10-01-90
Instrument ID: HPE,D
Analyst Initials: Ob

RUN # 1483 SEP/28/90 13:05:28
WORKFILE ID: C
WORKFILE NAME:
ID: 0
NO RUN PEAKS STORED

Ambient Engineering Inc.

1145 Bordentown Avenue
Parlin, New Jersey 08859
(201) 727-8333

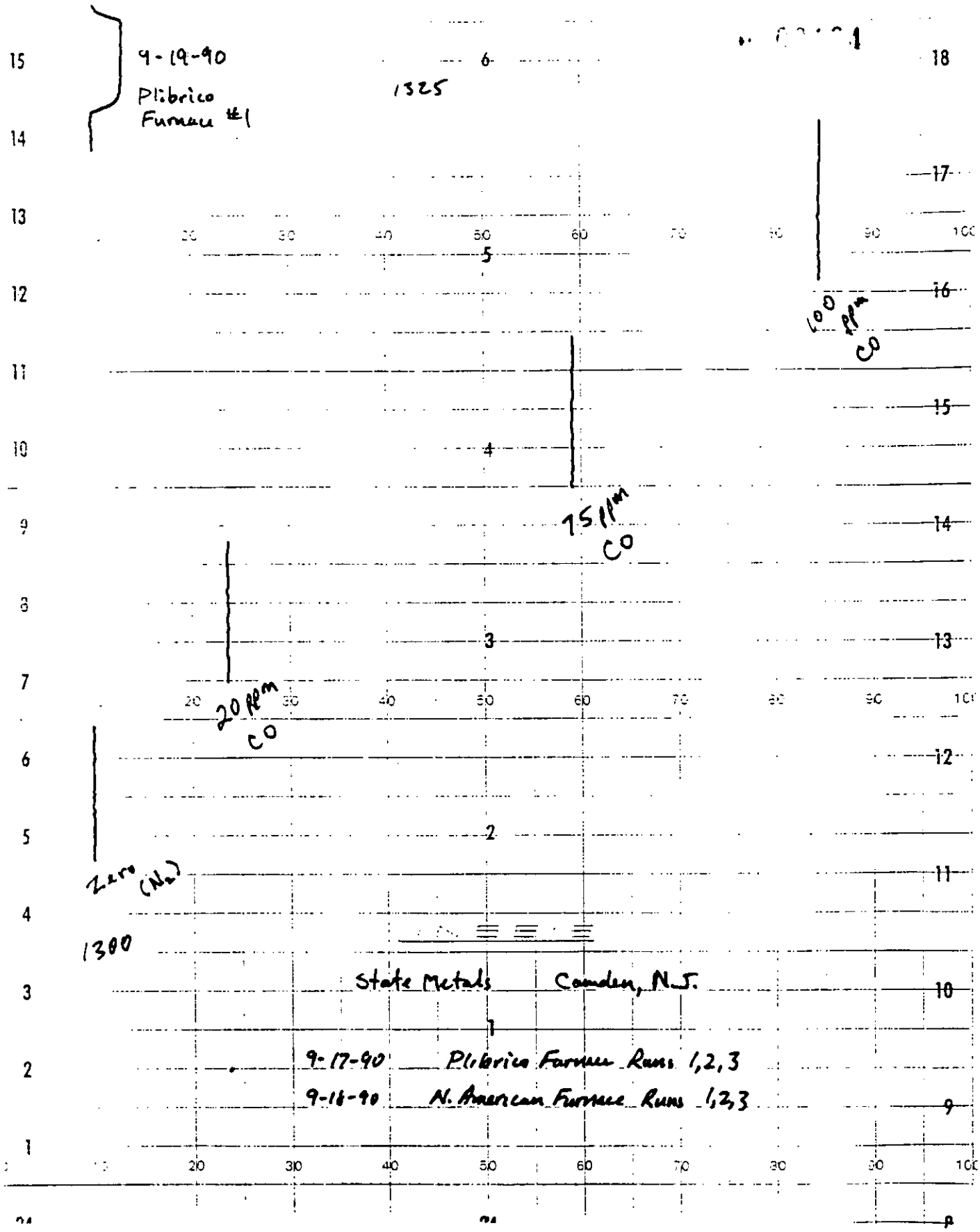
ENVIRONMENTAL ENGINEERING/SYSTEMS

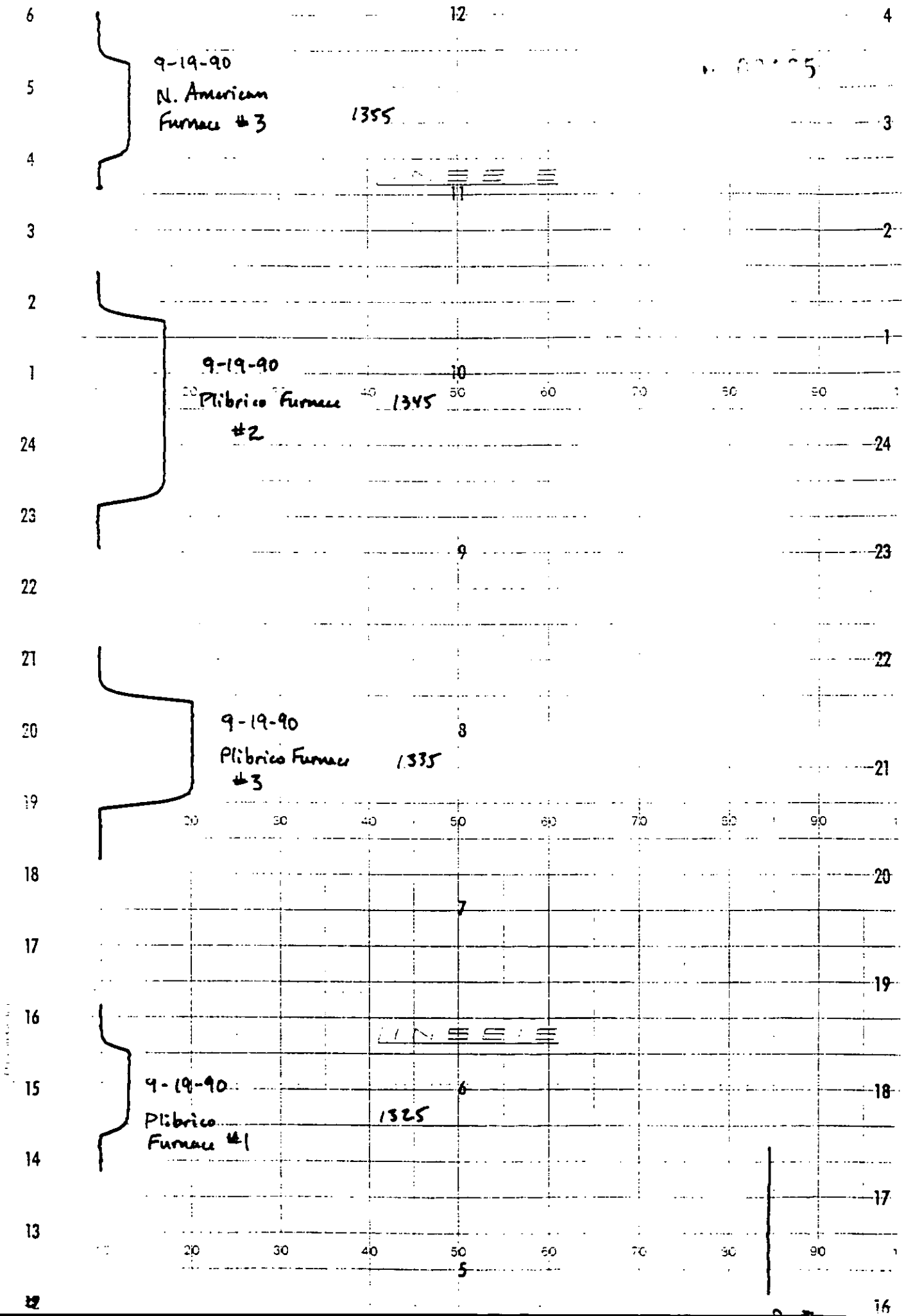
AIR
WATER
WASTE
NOISE
ENERGY
O.S.H.A.

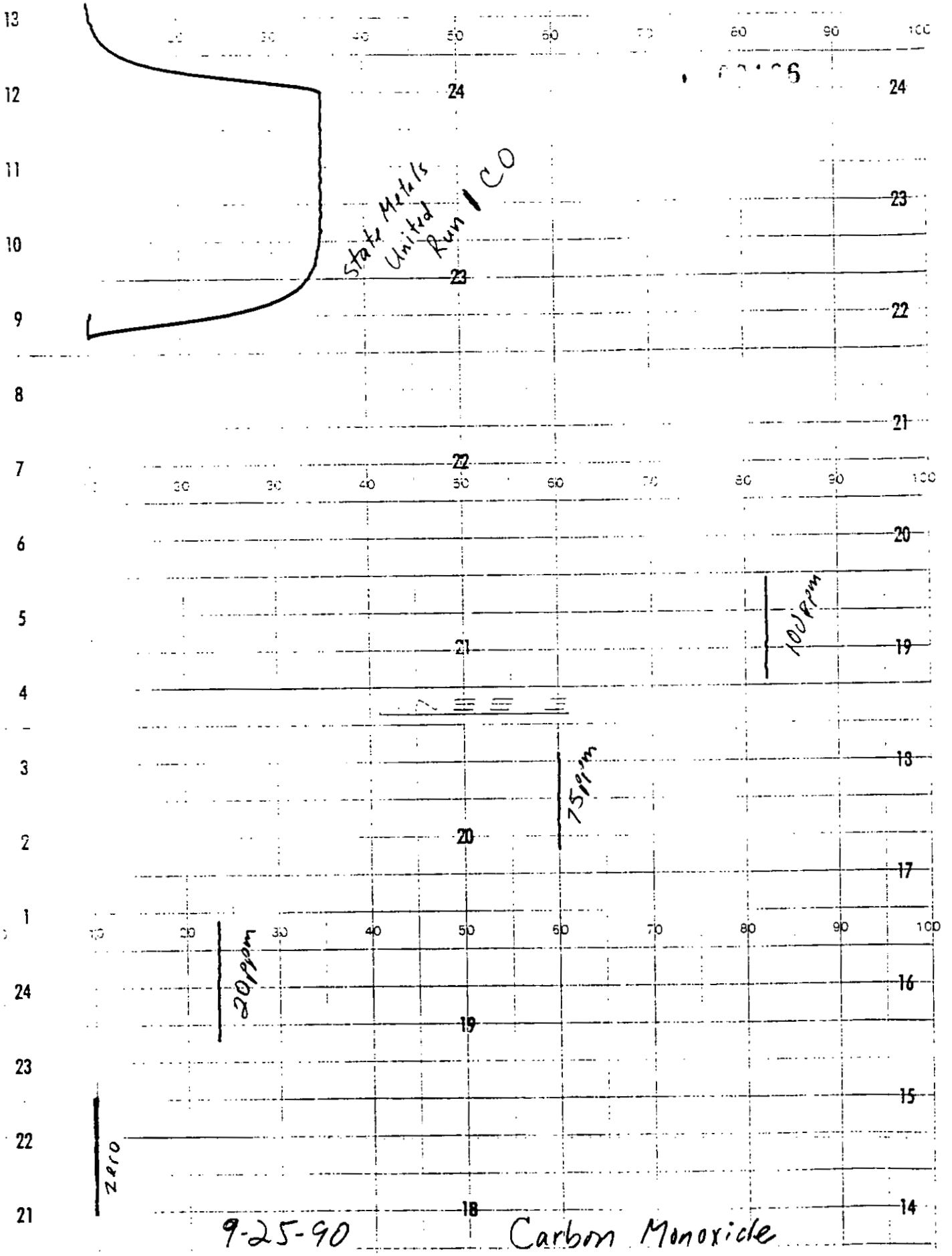
STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

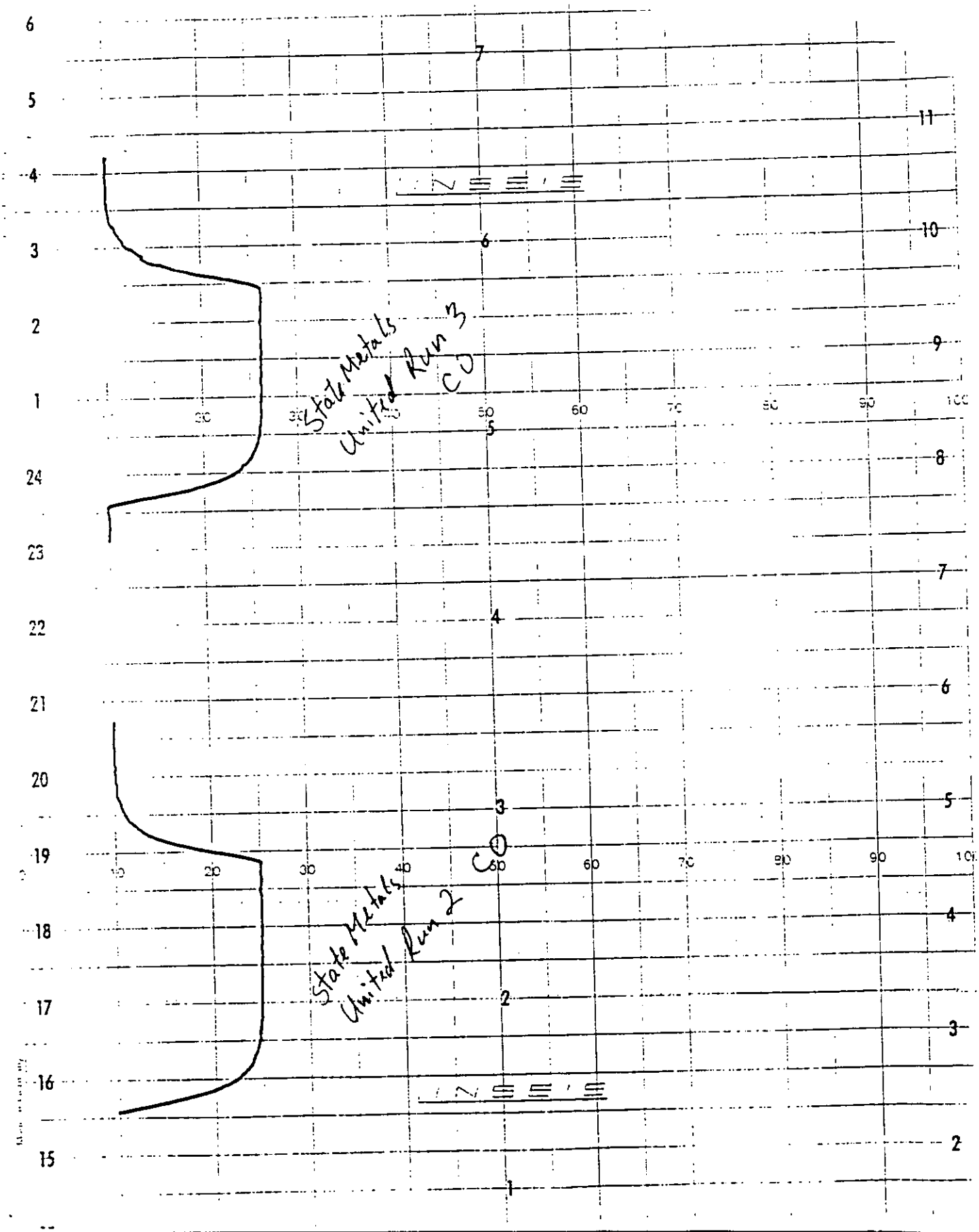
Report Date: October 19, 1990

CARBON MONOXIDE ANALYSIS


9-19-90
Plibrico
Furnace #1
1325
100 ppm CO
75 ppm CO
20 ppm CO
Zero (N2)
1300
State Metals Camden, N.J.
9-17-90 Plibrico Furnace Runs 1,2,3
9-18-90 N. American Furnace Runs 1,2,3


9-19-90
N. American
Furnace #3
1355
9-19-90
Plibrico Furnace
#2
1345
9-19-90
Plibrico Furnace
#3
1335
9-19-90
Plibrico
Furnace #1
1325


State Metals
United
Run 1 CO
100 ppm
75 ppm
20 ppm
ZERO
9-25-90
Carbon Monoxide


State Metals
United Run 3
CJ
State Metals
United Run 2
CJ

Ambient Engineering Inc.

1145 Bordentown Avenue
Parlin, New Jersey 08859
(201) 727-8333

ENVIRONMENTAL ENGINEERING/SYSTEMS

AIR
WATER
WASTE
NOISE
ENERGY
O.S.H.A.

STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 19, 1990

CHLORIDES ANALYSIS

inal volumes

	.1N H_2SO_4	1 N NaOH
Run2	202	200
Run 3	200	199
Run 4	200	200
Blank	200	200

$m = (S-B)\,N\,(36.46)/35.45$

S = Conc of sample ug Cl^-/ml

B = " of Blank ug Cl^-/ml

Vol = vol of sample.

NaOH

48138	Run 2	< 208 ug	HCl					
48139	Run 3	< 205 ug	HCl	48138	Run2	(1.35 mg/L)	1410 ug	H
48140	Run 4	< 205 ug	HCl	48139	Run3	(118 mg/L)	24,200 ug	H
"	Blank	< 205 ug	HCl	48140	Run4	(94.5 mg/L)	19,400 ug	H
				48141	Blank	<10	< 205 ug	H

ug of HCl as Cl_2 in Sol

$m_{Cl_2} = (S-B) \times V_S \times 70.90/35.45$

NaOH

48138	~~< 400~~	<404 ug	Cl_2
48139		<400 ug	Cl_2
48140		<400 ug	Cl_2
48141		<400 ug	Cl_2

Continued on Page

Read and Understood By

Janet Langon

Signed Date Signed Date

10-9-90 Cl⁻ from Stack Testing

Continued From Page

Cl⁻ in NaOH

Sample	RT	Area	mg/L
Blank	—	—	
1 ppm	1.56	1332166	
2 ppm	1.56	2481773	CR = .999
5 ppm	1.56	6312895	
10 ppm	1.56	11578654	
48138 (Run 2)	1.53	84369	<1.0
48139 (Run 3)	1.51	365570	<1.0
48140 (Run 4)	1.51	729569	<1.0
48141 Blank	—	—	~~5.3~~ <1.0 ~~100%~~
5 ppm	1.55	6355118	5.3 100%
Blank	—	—	<1.0

Cl⁻ in H_2SO_4

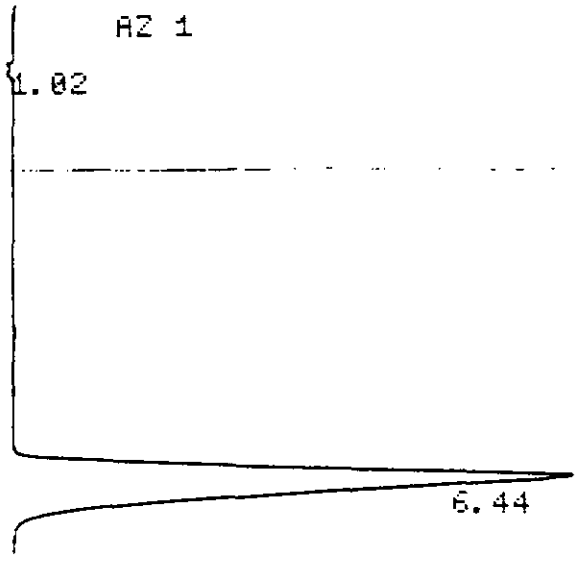
Blank	—	—		
1 ppm	1.63	1152251		
2 ppm	1.63	1305009	CR .993	
5 ppm	1.63	4541716		
10 ppm	1.65	11240697		
48138	1.63	14181392		16.85
48138 (10x)	1.61	1932587	(22.0)	22.6
48139 (10x)	1.65	13209455	(11.5)	118
48139 (100x)	1.56	604157	(1.13)	113
48140 Same Dilution	1.57	2616018	(2.5)	94.5
48141 —	—	—		<1.0
10 ppm	1.64	1146743		10.3
Blank	—	—		

Continued on Page

Janet Langan

7	0.	6.71	8846892	01
TOTALS	6722586.789		14677358	

CHANNEL A INJECT 08027017 18:19:29



Blank

INPUT OVERRANGE AT RT= 0.95

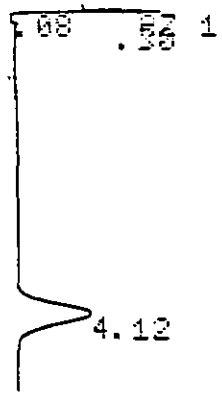
ANIONS 08027017 18:19:29 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 21 INDEX 20

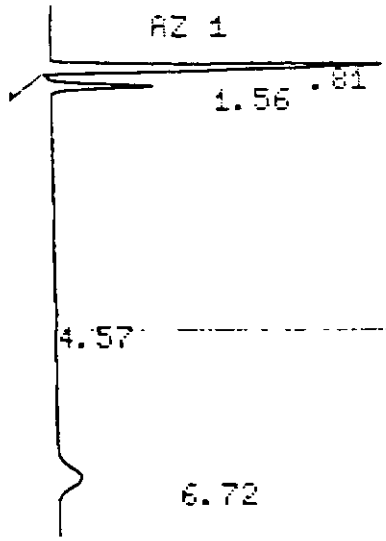
ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
CL	878458.246	1.02	30112	03	0.034
2	0.	6.44	35585855	01	
TOTALS	878458.247		35615967		

CHANNEL A INJECT 08028017 10:34:41



CHANNEL A INJECT 08028017 11:16:37



1 ppm Cl
NaOH

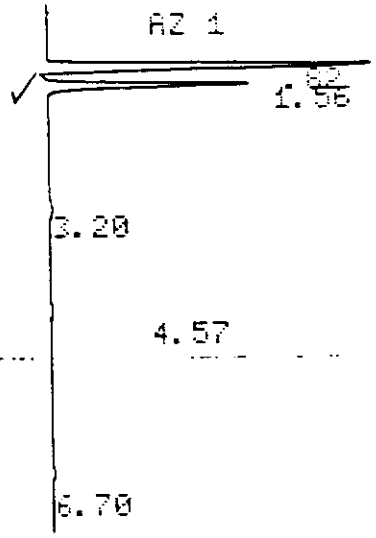
INPUT OVERRANGE AT RT= 1.41

ANIONS 08028017 11:16:37 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 24 INDEX 23

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.81	4881890	01	
2	0.	1.56	1332166	01	
NO3	0.	4.57	49594	01	
4	0.	6.72	1303037	01	
TOTALS	0.		7566687		



2ppm Cl⁻ in NaOH

INPUT OVERRANGE AT RT= 1.41

ANIONS 08028017 12:23:20 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 25 INDEX 24

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	4727843	01	
2	0.	1.56	2481773	01	
3	0.	3.2	54788	01	
NO3	0.	4.57	38902	01	
5	0.	6.7	47724	01	
TOTALS	0.		7351030		

RT(1)=1.56

Blank

017 18:19:29 CH= "A" PS= 1.

INDEX 20

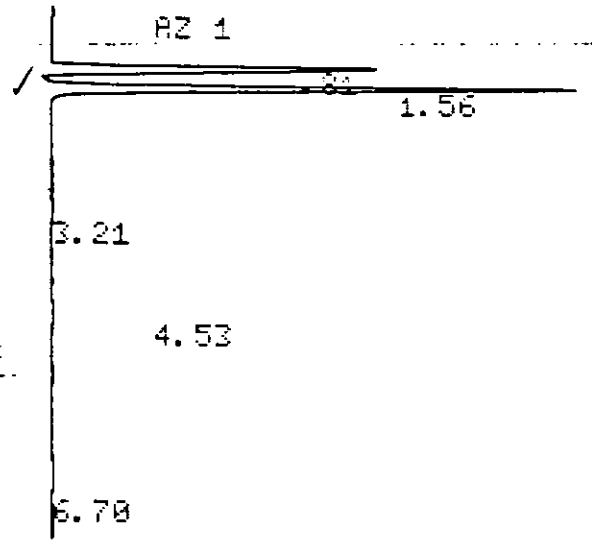
AREA	BC	RF
30112	03	0.034
585855	01	
615967		

:41

4	0.	1.56	2481773	01
3	0.	3.2	54788	01
NO3	0.	4.57	38902	01
5	0.	6.7	47724	01
TOTALS	0.		7351030	

.T(1)=1.56

CHANNEL A INJECT 08028017 13:19:44



5 PPM Cl in NaOH

INPUT OVERRANGE AT RT= 1.39

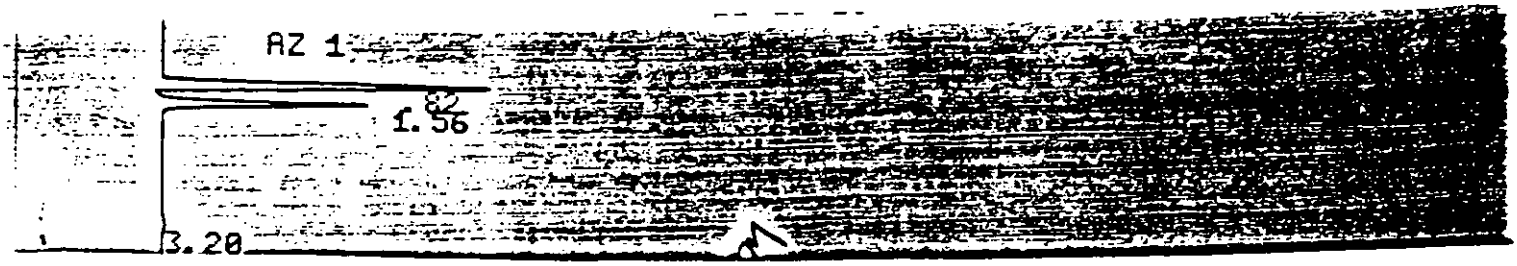
ANIONS 08028017 13:19:44 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 26 INDEX 25

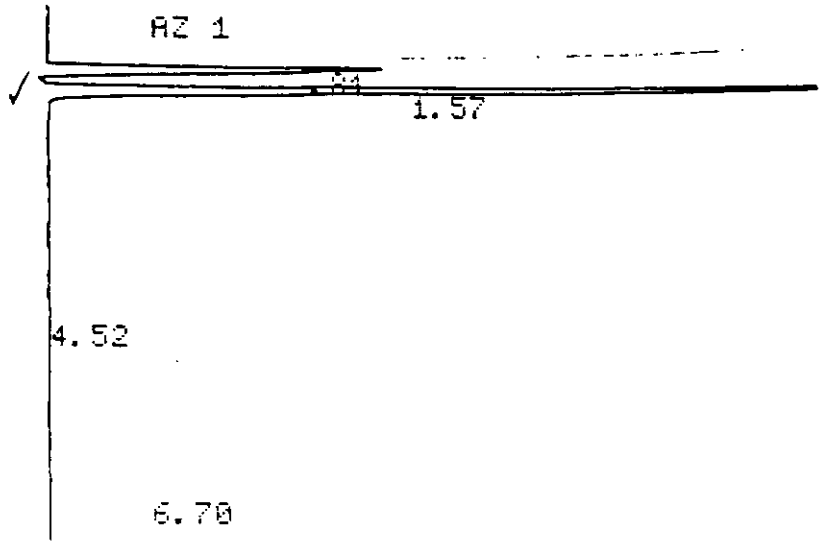
ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.81	4804198	01	
CL	184166268.25	1.56	6312895	01	0.034
3	0.	3.21	31698	01	
NO3	0.	4.53	34186	01	
5	0.	6.7	40202	01	
TOTALS	**********		11223179		

CHANNEL A INJECT 08028017 13:22:35



CHANNEL A INJECT 08028017 13:27:35



10 ppm Cl^- in NaCH

INPUT OVERRANGE AT RT= 1.39

ANIONS 08028017 13:27:35 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 27 INDEX 26

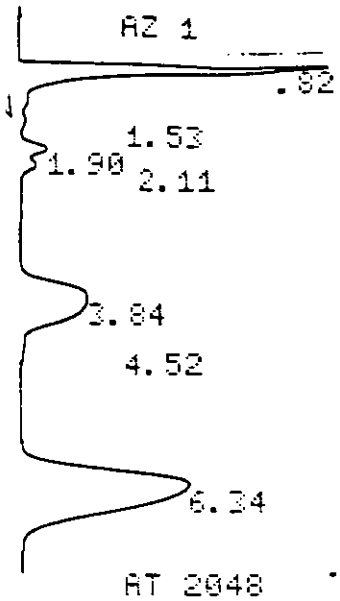
ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.81	4891104	01	
CL	337784407.5	1.57	11578654	01	0.034
NO3	0.	4.52	49736	01	
4	0.	6.7	57386	01	

CL [illegible]
NO3 0.
4 0.

TOTALS **********

CHANNEL A INJECT 08028017 13:38:17



481386
NaOH

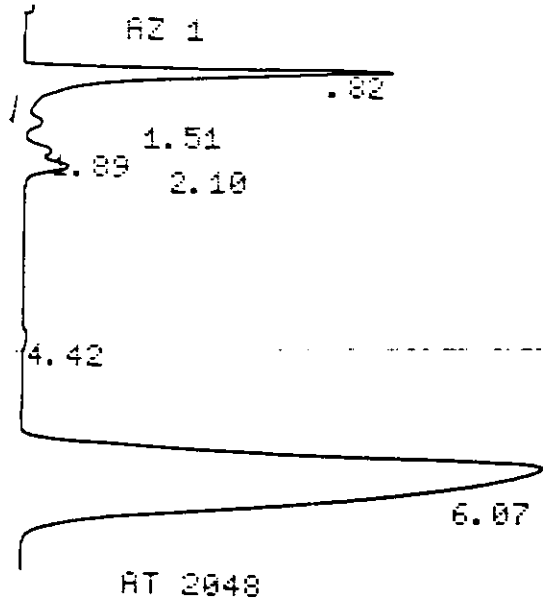
ANIONS 08028017 13:38:17 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 28 INDEX 27

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	7140897	01	
CL	2461299.273	1.53	84369	01	0.034
3	0.	1.9	729051	02	
4	0.	2.11	440127	03	
NO3	6391086.297	3.84	6377435	02	0.998
NO3	0.	4.52	58422	03	
7	0.	6.34	16613366	01	
TOTALS	8852385.578		31443667		

CHANNEL B [illegible]



40139 NaOH

ANIONS 08028017 13:49:24 CH= "A" PS= 1.

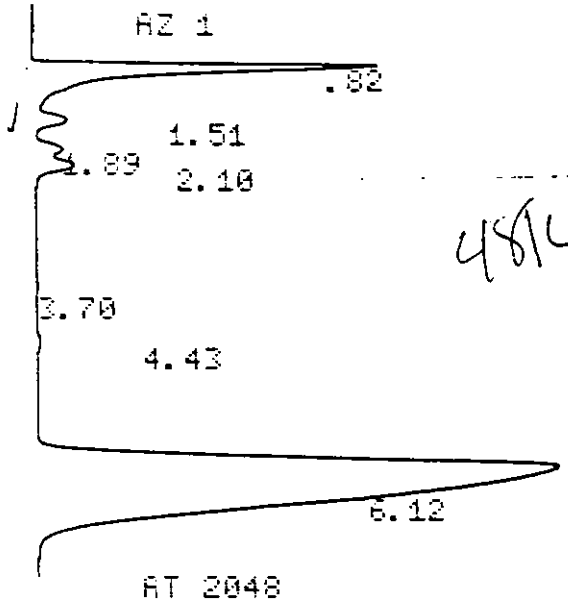
FILE 2. METHOD 5. RUN 29 INDEX 28

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	10169531	08	
CL	10664784.172	1.51	365570	06	0.034
3	0.	1.89	724959	06	
4	0.	2.1	1398437	07	
NO3	0.	4.42	195673	01	
6	0.	6.07	60648960	01	
TOTALS	10664784.18		73503130		

TOTALS 10664784.18 73503130

CHANNEL A INJECT 08028017 14:05:40



48140 NaOH

ANIONS 08028017 14:05:40 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 30 INDEX 29

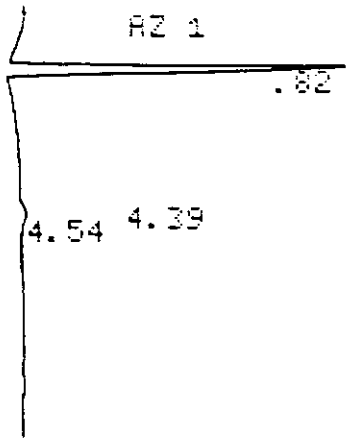
ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	9532348	08	
CL	21292489.406	1.51	729869	05	0.034
3	0.	1.89	720970	06	
4	0.	2.1	1166104	07	
NO3	43477.898	3.7	43385	01	0.998
NO3	0.	4.43	134737	01	
7	0.	6.12	55481657	01	

TOTALS 21335967.297 67809070

NAME	PPM	RT	AREA	BC
80	0.	5.95	16265	06
81	0.	6.	14780	06
82	0.	6.04	15360	06
83	0.	6.08	13441	06
84	0.	6.12	23299	06
85	0.	6.22	23144	06
86	0.	6.3	9620	06
87	0.	6.34	10087	06
88	0.	6.39	6310	06
89	0.	6.43	8363	06
90	0.	6.48	7237	06
91	0.	6.53	6488	06
92	0.	6.92	725869	06
93	0.	7.31	257	06
94	0.	7.32	378	06
95	0.	7.36	391	06
96	0.	7.4	509	06

CHANNEL A INJECT 08028017 14:22:00



48141 NaOH

INPUT OVERRANGE AT RT= 2.75

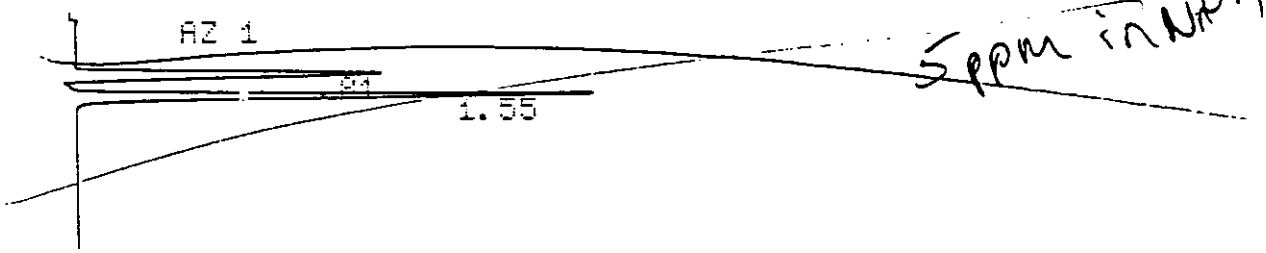
ANIONS 08028017 14:22:00 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 31 INDEX 30

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	5108348	01	
NO3	1008519.188	4.39	1006365	02	0.998
NO3	0.	4.54	270369	03	
TOTALS	1008519.188		6385082		

CHANNEL A INJECT 08028017 14:29:55

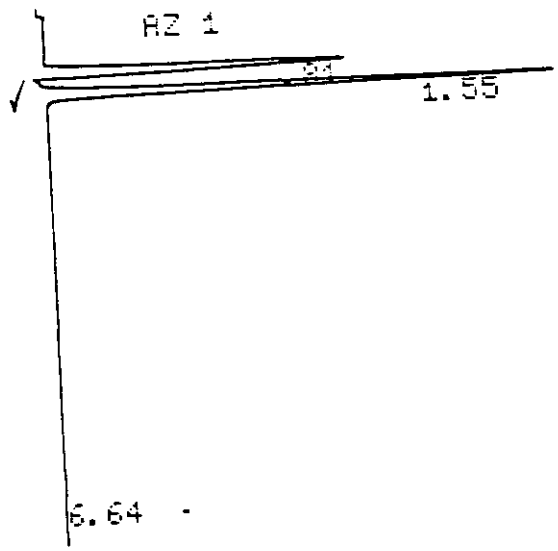


5ppm in NaOH

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	5108348	01	0.998
NO3	1008519.188	4.39	1006365	02	
NO3	0.	4.54	270369	03	
TOTALS	1008519.188		6385082		

CHANNEL A INJECT 08028017 14:29:55

5ppm in NaOH



INPUT OVERRANGE AT RT= 1.37

08028017 14:29:55 CH= "A" PS= 1.

ANIONS

FILE 2. METHOD 5. RUN 32 INDEX 31

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.81	4682619	01	0.034
CL	185398041.	1.55	6355118	01	
3	0.	6.64	42272	01	
TOTALS	**********		11080009		

NAME	PPM	RT	AREA	BC	RF
1	0.	0.81	4682619	01	0.034
CL	185398041.	1.55	6355118	01	
3	0.	6.64	42272	01	
TOTALS	**********		11080009		

CHANNEL A INJECT 08028017 14:49:13

Blank

.09 AZ 1

08028017 14:49:13 CH= "A" PS=

ANIONS

FILE 2. METHOD 5. RUN 33 INDEX 32

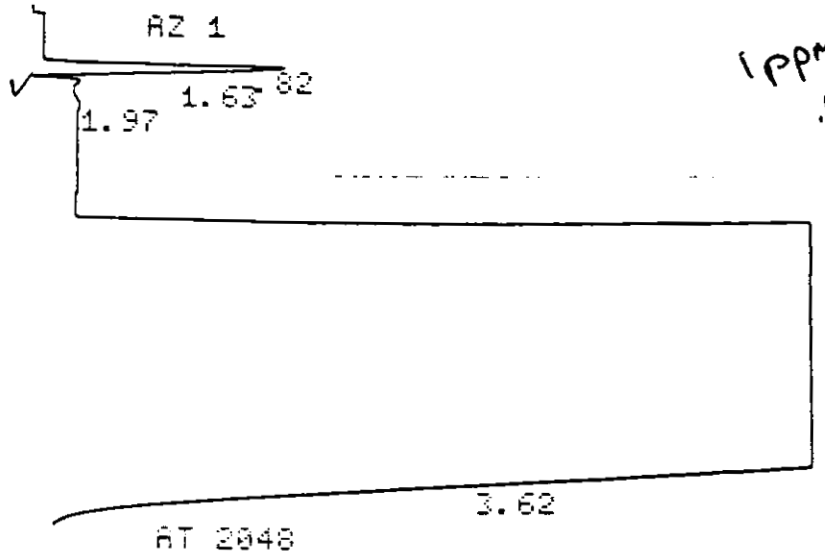
ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.09	219080	01	
TOTALS	0.		219080		

4	0.	0.05	219080 01
TOTALS	0.		219080

CHANNEL A INJECT 08028017 15:02:19

1ppm in H_2SO_4



INPUT OVERRANGE AT RT= 1.56

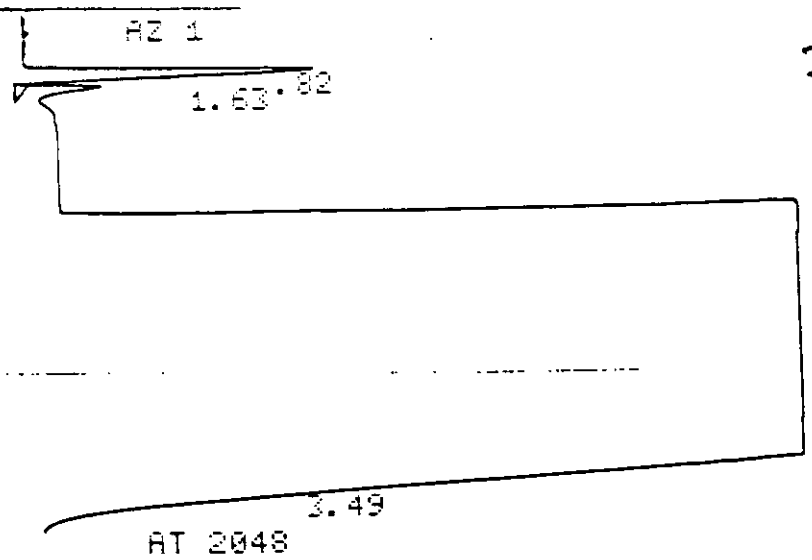
ANIONS 08028017 15:02:19 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 34 INDEX 33

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	4763573	01	
CL	33556305.625	1.63	1150251	02	0.034
3	0.	1.97	1950344	03	
NO3	451986971.	3.62	451021531	01	0.998
TOTALS	**********		458885699		

CHANNEL A INJECT 08028017 15:30:53



2ppm Cl⁻ in H_2SO_4

INPUT OVERRANGE AT RT= 1.59

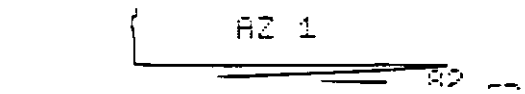
ANIONS 08028017 15:30:53 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 35 INDEX 34

ANALYST: JLL

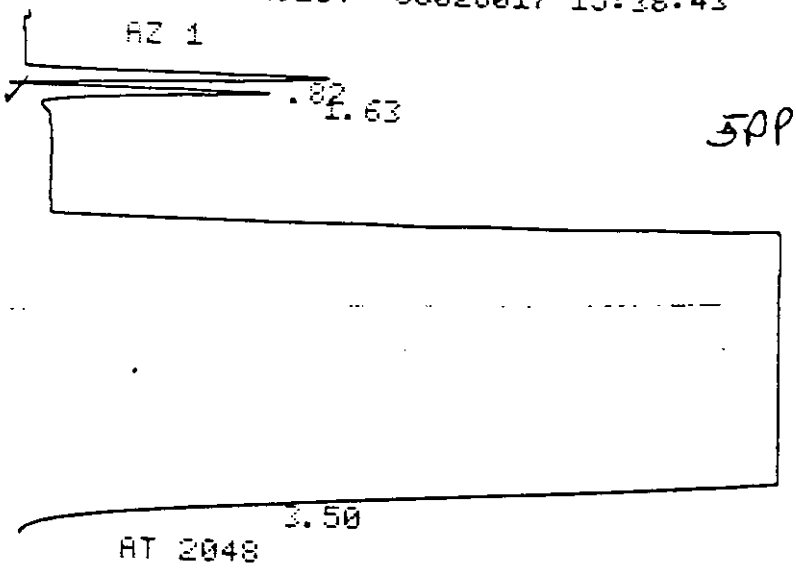
NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	5833972	01	
CL	38071065.25	1.63	1305009	03	0.034
3	0.	3.49	464334215	01	
TOTALS	38071065.281		471473196		

CHANNEL A INJECT 08028017 15:38:43



40ppm Cl^- in H_2SO_4

CHANNEL A INJECT 08028017 15:38:43



5ppm Cl^- in H_2SO_4

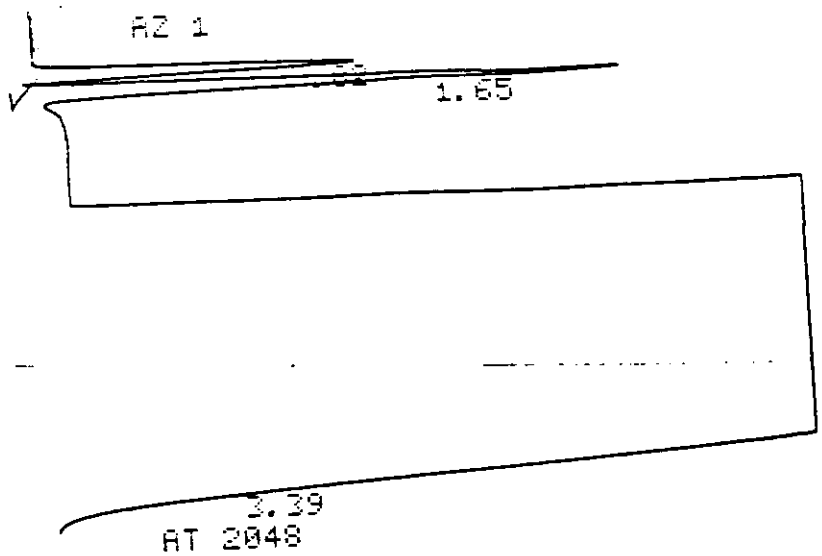
INPUT OVERRANGE AT RT= 1.57

ANIONS 08028017 15:38:43 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 36 INDEX 35

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	6223245	01	
CL	133955138.625	1.63	4591746	03	0.034
3	0.	3.5	461125454	01	
TOTALS	**********		471940445		



10ppm
Cl-
H_2SO_4

INPUT OVERRANGE AT RT= 1.58

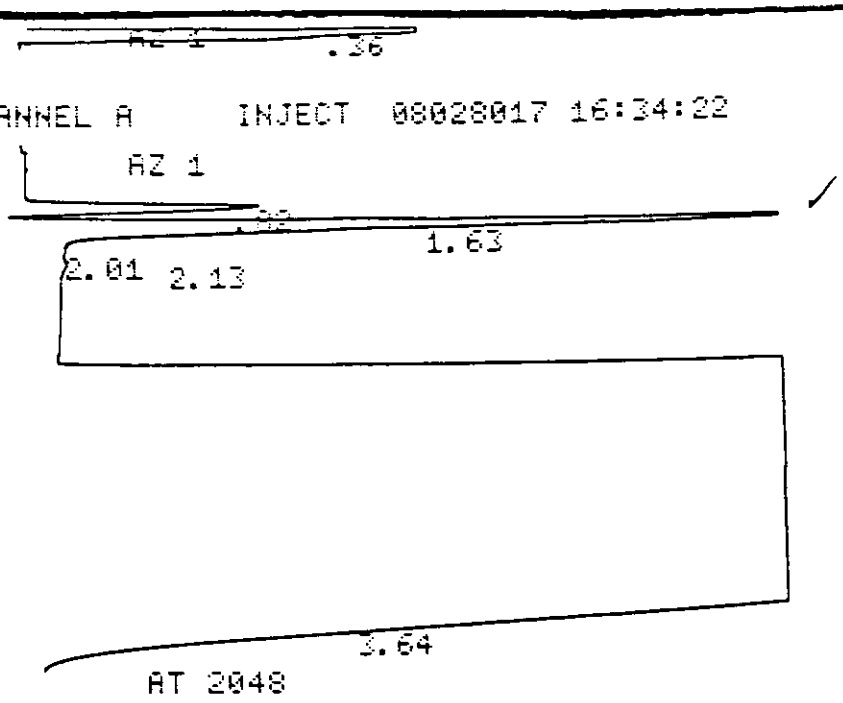
08028017 15:52:01 CH= "A" PS= 1.

ANIONS

FILE 2. METHOD 5. RUN 37 INDEX 36

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	6678586	01	0.034
CL	329383829.5	1.65	11290697	03	
3	0.	3.39	467544698	01	
TOTALS	**********		485513981		



48136 H_2SO_4

INPUT OVERRANGE AT RT= 1.53

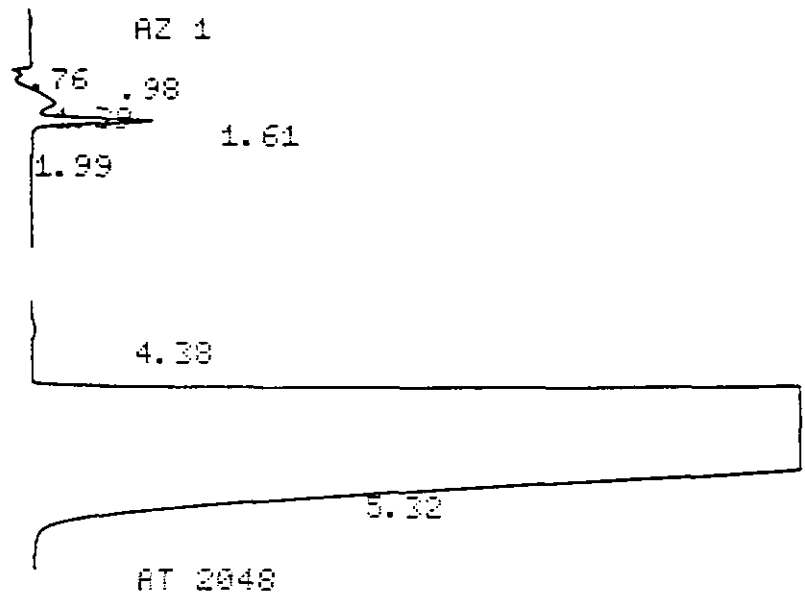
ANIONS 08028017 16:34:22 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 41 INDEX 40

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	4785813	01	
CL	559579302.	1.63	19181392	02	0.034
3	0.	2.01	300346	02	
4	0.	2.13	667371	03	
NO3	444760755.5	3.64	443810750	01	0.998
TOTALS	**********		468745672		

ANNEL A INJECT 08028017 17:19:57



138 10x

046

NPUT OVERRANGE AT RT= 0.91

NIONS 08028017 17:19:57 CH= "A" PS= 1.

ILE 2. METHOD 5. RUN 46 INDEX 45

NALYST: JLL

AME	PPM	RT	AREA	BC	RF
1	0.	0.76	101660	01	
	0.	0.98	85660	02	
3	0.	1.39	1510680	02	
L	56379416.375	1.61	1932587	03	0.034
5	0.	1.99	16335	01	
03	76229.856	4.38	76067	01	0.998
7	0.	5.32	182454607	01	

[redacted]

ANIONS 08028017 16:34:22 CH= A PS= 1.

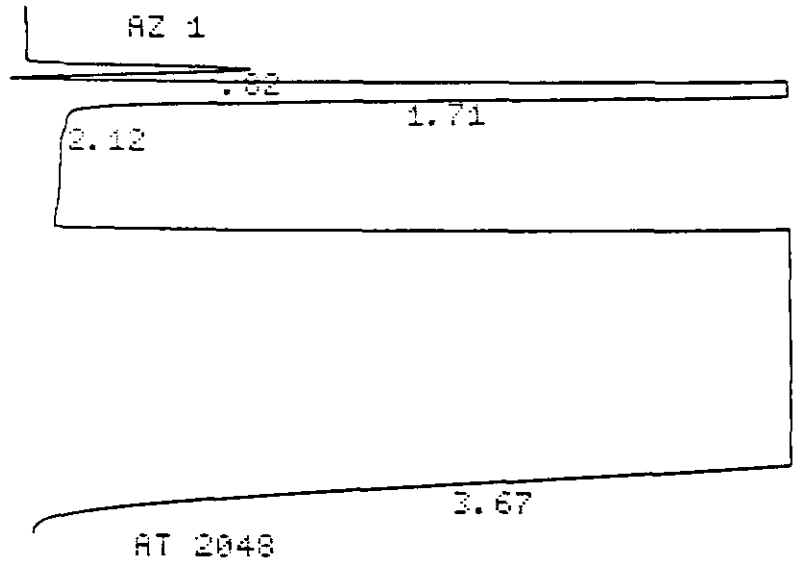
FILE 2. METHOD 5. RUN 41 INDEX 40

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	4785813	01	
CL	559579302.	1.63	19181392	02	0.034
3	0.	2.01	300346	02	
4	0.	2.13	667371	03	
NO3	444760755.5	3.64	443810750	01	0.998

TOTALS ********** 468745672

CHANNEL A INJECT 08028017 16:45:58



48139 H_2SO_4

INPUT OVERRANGE AT RT= 1.51

ANIONS 08028017 16:45:58 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 42 INDEX 41

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	4565544	01	
CL	**********	1.71	36667545	02	0.034
3	0.	2.12	2964854	03	
NO3	434802762.	3.67	433874027	01	0.998

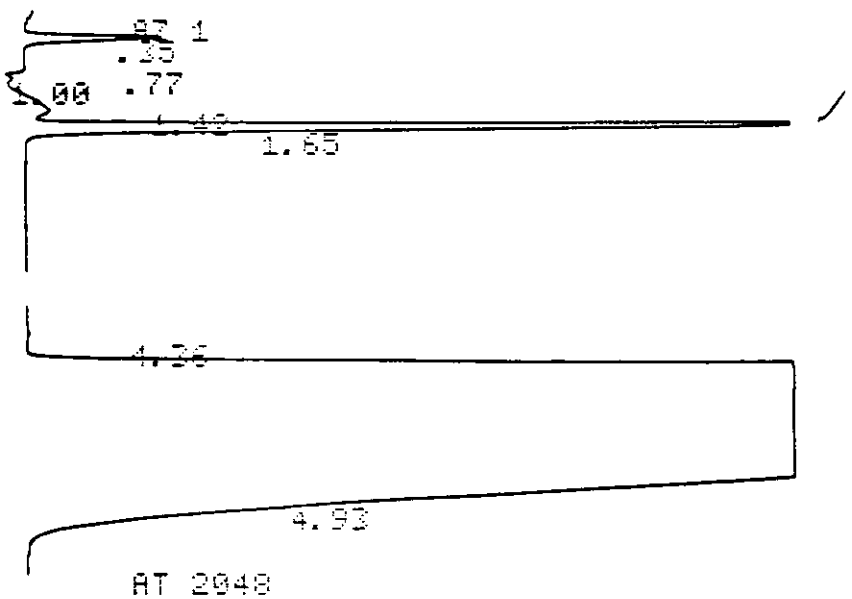
TOTALS ********** 478071970

CHANNEL A INJECT 08028017 16:55:15

[redacted]

TALS ********** 478146007

NNEL A INJECT 08028017 17:03:06



139 H_2SO_4 1/10

PUT OVERRANGE AT RT= 0.93

IONS 08028017 17:03:06 CH= "A" PS= 1.

LE 2. METHOD 5. RUN 44 INDEX 43

ALYST: JLL

045

ME	PPM	RT	AREA	BC	RF
1	0.	0.35	1846639	01	
2	0.	0.77	128503	01	
3	0.	1.	91287	02	
4	0.	1.42	1595347	02	
	385359812.	1.65	13209455	03	0.034
3	57104.472	4.36	56982	02	0.998
7	0.	4.93	239556693	03	

TALS ********** 256484906

LS ********** 256484906

NEL A INJECT 08028017 17:11:44

AZ 1

131 100x

.01 1.21
1.56

4.48

6.23

UT OVERRANGE AT RT= 0.89

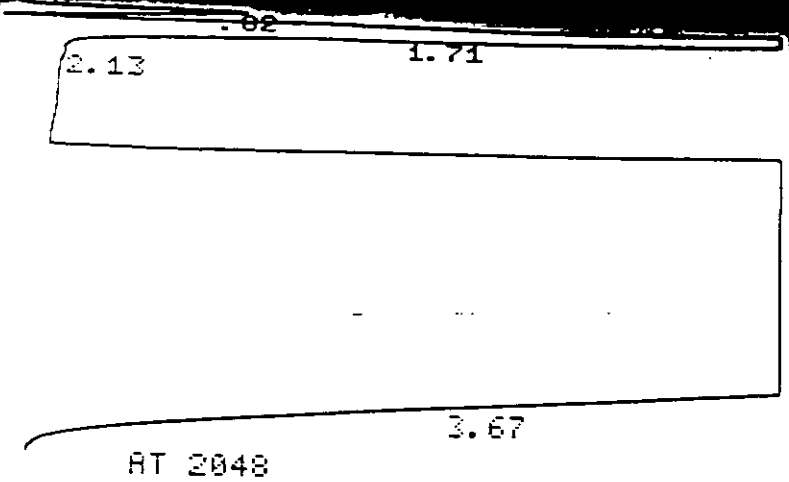
ONS 08028017 17:11:44 CH= "A" PS= 1.

E 2. METHOD 5. RUN 45 INDEX 44

LYST: JLL

E	PPM	RT	AREA	BC	RF
	0.	1.01	157289	02	
	0.	1.21	196115	03	
	17625089.594	1.56	604157	01	0.034
	0.	4.48	22525	01	
	0.	6.23	39257591	01	

40237677



48 1-PH2 SO4
straight

INPUT OVERRANGE AT RT= 1.5

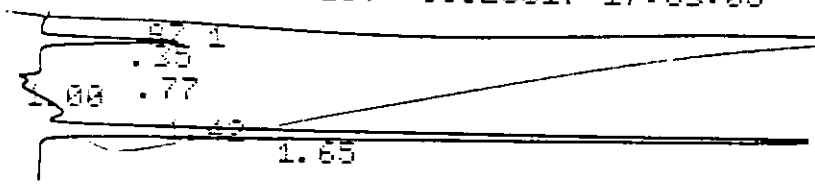
ANIONS 08028017 16:55:15 CH= "A" PS= 1.

FILE 2. METHOD 5. RUN 43 INDEX 42

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	4464889	01	
CL	**********	1.71	37740699	02	0.034
3	0.	2.13	3020416	03	
NO3	433846696.5	3.67	432920003	01	0.998
TOTALS	**********		478146007		

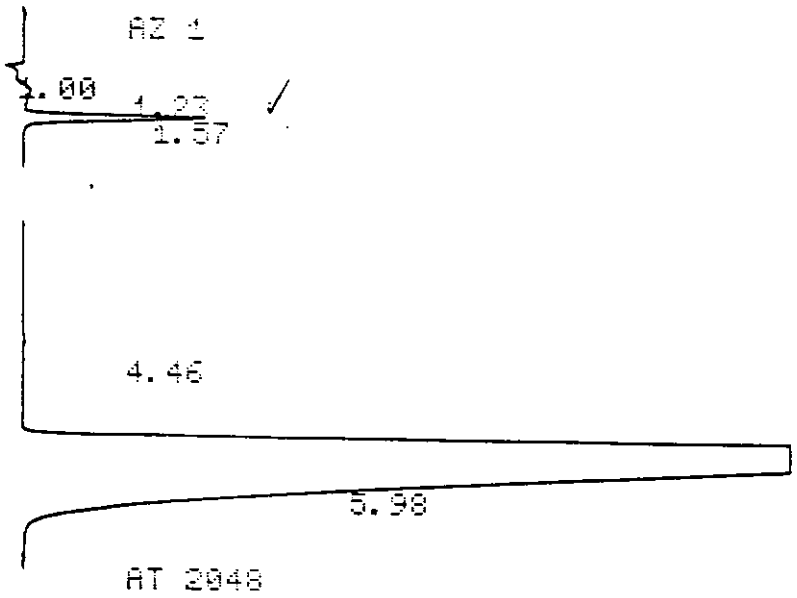
CHANNEL A INJECT 08028017 17:03:06



139 H2SO4 1/10

		1.99	16335 01	0.034
	76229.856	4.38	76067 01	0.998
7	0.	5.32	182454607 01	
TALS	56455646.219		186177596	

HANNEL A INJECT 08028017 17:27:51



140 3 /100

PUT OVERRANGE AT RT= 0.89

IONS 08028017 17:27:51 CH= "A" PS= 1.

LE 2. METHOD 5. RUN 47 INDEX 46

ALYST: JLL

AME	PPM	RT	AREA	BC	RF
1	0.	1.	184709	02	
2	0.	1.23	820782	02	
	76317168.625	1.57	2616018	03	0.034
3	0.	4.46	29228	01	
5	0.	5.98	89616679	01	

H_2SO_4

047

E	PPM	RT	AREA	BC	RF
	0.	1.	184709	02	
	0.	1.23	820782	02	
	76317168.625	1.57	2616018	03	0.034
	0.	4.46	29228	01	
	0.	5.98	89616679	01	
ALS	76317168.75		93267416		

.141 str H_2SO_4

NNEL A INJECT 08028017 17:35:43

AZ 1

.82

6.02

3.40

AT 2048

PUT OVERRANGE AT RT= 1.79

IONS 08028017 17:35:43 CH= "A" PS= 1.

LE 2. METHOD 5. RUN 48 INDEX 47

ALYST: JLL

ME	PPM	RT	AREA	BC	RF
1	0.	0.82	6512847	01	
2	0.	3.4	463136777	01	
TALS	0.		469649624		

→ ppm in H_2SO_4

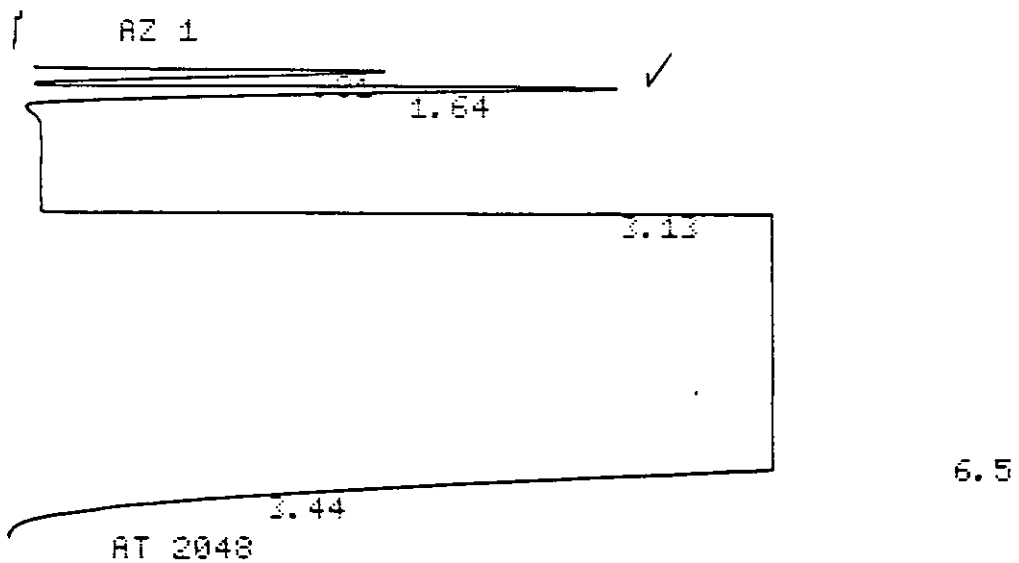
ILE 2. METHOD 5. RUN 48 INDEX 47

NALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.82	6512847	01	
2	0.	3.4	463136777	01	
TOTALS	0.		469649624		

10 ppm in H_2SO_4

CHANNEL A INJECT 08028017 17:43:32



INPUT OVERRANGE AT RT= 1.57

ANIONS 08028017 17:43:32 CH= "A" PS= 1.

ILE 2. METHOD 5. RUN 49 INDEX 48

ANALYST: JLL

NAME	PPM	RT	AREA	BC	RF
1	0.	0.81	7545670	01	
	334344586.	1.64	11460743	03	0.034
3	0.	3.13	41595	02	

048

ME	PPM	RT	AREA	BC	RF
1	0.	0.81	7545670	01	
	334344586.	1.64	11460743	03	0.034
3	0.	3.13	41595	02	
4	0.	3.44	458559634	03	
TALS	**********		477607642		

Blank

ANNEL A INJECT 08028017 17:51:21

AZ 1

.02

1.56

6.56

NPUT OVERRANGE AT RT= 0.89

NIONS 08028017 17:51:21 CH= "A" PS= 1.

ILE 2. METHOD 5. RUN 50 INDEX 49

N. /ST: JLL

AME	PPM	RT	AREA	BC	RF
1	0.	1.02	76091	03	
L	413586.031	1.56	14177	01	0.034

Ambient Engineering Inc.

1145 Bordentown Avenue
Parlin, New Jersey 08859
(201) 727-8333

ENVIRONMENTAL ENGINEERING/SYSTEMS

AIR
WATER
WASTE
NOISE
ENERGY
O.S.H.A.

STATE METAL INDUSTRIES, INC.
AE #858(30)
Report/Stack Sampling Compliance

Report Date: October 19, 1990

APPENDIX V

CALIBRATION DATA

TYPE S PITOT TUBE INSPECTION DATA FORM

Pitot tube assembly level? ✓ yes ____ no

Pitot tube openings damaged? ____ yes (explain below) ✓ no

α_1 = 0 ° (<10°), α_2 = 2 ° (<10°), β_1 = 2 ° (<5°),
β_2 = 3 ° (<5°)

γ = 2 °, θ = 1 °, A = 0.975 cm (in.)

z = A sin γ = .034 cm (in.); <0.32 cm (<1/8 in.),
w = A sin θ = .017 cm (in.); <.08 cm (<1/32 in.)

P_A 0.488 cm (in.) P_b 0.489 cm (in.)

D_t = .375 cm (in.)

Comments: geometric verification, Cp = 0.84

Calibration required? ____ yes ✓ no

Pitot id	Date
P-60-01	1-29-90

METER BOX CALIBRATION DATA AND CALCULATION FORM

Date 8-28-90 Meter box number RAC-01

Barometric pressure, P_b = 29.78 in. Hg Calibrated by T.H Timothy Harvey

Orifice manometer setting (ΔH), in. H_2O	Gas volume: Wet test meter (V_w), ft^3	Gas volume: Dry gas meter (V_d), ft^3	Temperatures: Wet test meter (t_w), °F	Temperatures: Dry gas meter: Inlet (t_{d_i}), °F	Temperatures: Dry gas meter: Outlet (t_{d_o}), °F	Temperatures: Dry gas meter: Avg[a] (t_d), °F	Time (θ), min	Y_i	$\Delta H@_i$ in. H_2O
0.5	4.48	4.58	70 520	97	84	93 55	10	.997	1.41
1.0	6.12	6.42	70	100	93	96	10	.998	1.44
1.5									
2.0	8.64	9.06	70	106	95	100	10	1.00	1.43
3.0	10.52	11.03	70	110	97	104	10	1.01	1.44
4.0	12.15	12.70	70	111	97	104	10	1.01	1.44
							Avg	1.00	1.43

ΔH, in. H_2O	$\frac{\Delta H}{13.6}$	$Y_i = \frac{V_w P_b (t_d + 460)}{V_d (P_b + \frac{\Delta H}{13.6})(t_w + 460)}$	$\Delta H@_i = \frac{0.0317\ \Delta H}{P_b\ (t_d + 460)} \left[\frac{(t_w + 460)\ \theta}{V_w}\right]^2$
0.5	0.0368		
1.0	0.0737		
1.5	0.110		
2.0	0.147		
3.0	0.221		
4.0	0.294		

[a] If there is only one thermometer on the dry gas meter, record the temperature under t_d.

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 8-28-90 Thermocouple number DGM-01-in

Ambient temperature 70 °F Barometric pressure 29.78 in. Hg

Calibrator T.H. Reference: mercury-in-glass ASTM 8F

other _____

Reference point number	Source[a] (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Temperature difference,[b] %
	Ice	33	33	0.0
	Ambient	70	71	0.2%
	Boiling Water	212	213	0.1%

[a] Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 8-28-90 Thermocouple number DGM-01-out

Ambient temperature 70 °F Barometric pressure 29.78 in. Hg

Calibrator T.H. Reference: mercury-in-glass ASTM 8F

other _____

Reference point number	Source[a] (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Temperature difference,[b] %
	ice	33	33	0.0%
	Ambient	70	71	0.2%
	Boiling Water	212	210	0.3%

[a]Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 8-28-90 Thermocouple number Bi-metal Imp-out-01

Ambient temperature 70 °F Barometric pressure 29.78 in. Hg

Calibrator TH Reference: mercury-in-glass ASTM 8F

other

Reference point number	Source[a] (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Temperature difference,[b] %
	ice	33	32	0.2%
	Ambient	70	70	0.0%
	Boiling Water	212	213	0.1%

[a] Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 8-28-90 Thermocouple number TC-72-01

Ambient temperature 70 °F Barometric pressure 29.78 in. Hg

Calibrator T.H. Reference: mercury-in-glass ASTM 8F

other

Reference point number	Source[a] (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Temperature difference,[b] %
	ICE	33	32	0.2%
	Ambient	70	70	0.0%
	Furnace	495	502	0.7%

[a]Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

Date 8-28-90 Thermocouple number TC-12-1

Ambient temperature 70 °F Barometric pressure 29.78 in. Hg

Calibrator TH Reference: mercury-in-glass ASTM 8F

other _____

Reference point number	Source[a] (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Temperature difference,[b] %
	ICe	33	35	.4%
	Ambient	70	72	.4%
		495	490	.5%

[a] Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.

STACK TEMPERATURE SENSOR CALIBRATION DATA FORM

1

Date 8-28-90 Thermocouple number OVEN-03

Ambient temperature 70 °F Barometric pressure 29.78 in. Hg

Calibrator _____ Reference: mercury-in-glass ASTM 8F

other _____

Reference point number	Source[a] (specify)	Reference thermometer temperature, °F	Thermocouple potentiometer temperature, °F	Temperature difference,[b] %
	ice	33	32	0.2
	Ambient	70	71	0.2%
	Boiling water	212	211	0.1%

[a]Type of calibration system used.

[b] $\left[\frac{(\text{ref temp, °C} + 273) - (\text{test thermom temp, °C} + 273)}{\text{ref temp, °C} + 273}\right] 100 \leq 1.5\%$.