GULF COAST RECYCLING, INC.

AFTER-THE-FACT CONSTRUCTION PERMIT APPLICATION

SIXTY TON BLAST FURNACE

SUBMITTED BY:

GULF COAST RECYCLING, INC.
1901 N. 66TH STREET
TAMPA, FLORIDA 33619
(813) 626-6151 (FAX) (813) 622-8388

PREPARED BY:

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.
5119 N. FLORIDA AVENUE
TAMPA, FLORIDA 33603
(813) 237-3781 (FAX) (813) 238-0036

SUBMITTAL DATE: FEBRUARY 10, 1992

PAID
E.P.C. OF H.C.

2/18/92 400-00

RECEIVED

FEB 13

E.P.C. OF H.C.
AIR PROGRAM

GULF COAST RECYCLING, INC.

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0510057

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AC 29-184883

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1901 NORTH 66th STREET • TAMPA, FLORIDA 33619
PHONE: (813) 626-6151 FAX: (813) 622-8388

February 13, 1992

Roger P. Stewart, Director
Environmental Protection Commission
of Hillsborough County
1900 - 9th Avenue
Tampa, Florida 33605

RE: Consent Order, Case No. 00809KLS057

Dear Mr. Stewart:

Pursuant to paragraph 8 of the referenced Consent Order, enclosed is an after-the-fact construction permit application for the blast furnace in operation at Gulf Coast Recycling, Inc. in Tampa.

The application is submitted in quadruplicate with original P.E. seals and signatures on DER form 17-1.202(1), as required.

A check for $400.00, payable to the Hillsborough County Board of County Commissioners, is enclosed. Also enclosed is a check, payable to the Florida Department of Environmental Regulation for $1000.00. The FDER permit fee is based on an increase of potential emissions of 15.89 tons/year (NOx).

If you have any questions, please do not hesitate to call.

Sincerely,

GULF COAST RECYCLING, INC.

Joyce Morales-Caramella

Joyce Morales-Caramella
Environmental & Health Manager

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ATTACHMENTS

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form # ____
Form Title ____
Effective Date ____
DER Application No. ____ (Filled in by DER)

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Secondary Lead Smelter [ ] New[1] [X] Existing[1]

APPLICATION TYPE: [X] Construction [ ] Operation [ ] Modification

COMPANY NAME: Gulf Coast Recycling, Inc. COUNTY: Hillsborough

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) One 60 Ton Blast Furnace

SOURCE LOCATION: Street 1901 N. 66th Street City Tampa

UTM: East 364.048 North 3093.548

Latitude 27 ° 57 ' 43 "N Longitude 82 ° 22 ' 49 "W

APPLICANT NAME AND TITLE: Willis M. Kitchen, President

APPLICANT ADDRESS: 1901 N. 66th Street; Tampa, Florida 33619

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Gulf Coast Recycling, Inc.

I certify that the statements made in this application for an after-the-fact constructi permit are true, correct and complete to the best of my knowledge and belief. Furthe I agree to maintain and operate the pollution control source and pollution contr facilities in such a manner as to comply with the provision of Chapter 403, Flori Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferab and I will promptly notify the department upon sale or legal transfer of the permitt establishment.

*Attach letter of authorization

Signed: Willis M. Kitchen

Willis M. Kitchen, President
Name and Title (Please Type)

Date: 2-13-92 Telephone No. (813) 626-6151

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project ha been ~~designed~~/examined by me and found to be in conformity with modern engineeri principles applicable to the treatment and disposal of pollutants characterized in th permit application. There is reasonable assurance, in my professional judgment, tha

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

Northwest District, 160 Governmental Center, Pensacola, Florida 32501-5794, 904-436-8300
Northeast District, 3426 Bills Rd., Jacksonville, Florida 32207, 904-798-4200
Central District, 3319 Maguire Blvd. Suite 232, Orlando, Florida 32803-3767, 407-894-7555
Southwest District, 4520 Oak Fair Blvd., Tampa, Florida 33610-7347, 813-623-5561
South District, 2269 Bay St., Fort Myers, Florida 33901-2896, 813-332-2667
Southeast District, 1900 S. Congress Ave., Suite A, West Palm Beach, Florida 33406, 407-964-9668

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

ROBERT E. WALLACE III CERTIFICATE No. 21608 STATE OF FLORIDA

Signed ____________

Robert E. Wallace III, P.E.
Name (Please Type)

Environmental Engineering Consultants, Inc.
Company Name (Please Type)

P.O. Box 7854; Tampa, Florida 33673
Mailing Address (Please Type)

Florida Registration No. 21608 Date: 2/12/92 Telephone No. (813) 237-3781

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

After the fact construction permit application for a 60 ton design capacity blast furnace replacing two existing blast furnaces equipped with baghouses. This project will be in full compliance with Chapter 17-2, F.A.C.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction Within 120 days of issuance Completion of Construction Within one year of issuance

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

Ten baghouses, blower motors, stacks, ductwork, hoods, engineering and installation: $400,000.00 for entire furance operation. Afterburner: Waiting design specification for bids.

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

See permit history.

E. Requested permitted equipment operating time: hrs/day_____; days/wk_____; wks/yr_____;

if power plant, hrs/yr_____; if seasonal, describe: This source operates total of 7629 hours per year.

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? Yes

   a. If yes, has "offset" been applied? No

   b. If yes, has "Lowest Achievable Emission Rate" been applied? No

   c. If yes, list non-attainment pollutants. Ozone, Particulate and Lead

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. No

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. No

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? Yes

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? NO

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? Yes

   a. If yes, for what pollutants?_____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		
Lead Scrap	Particulate	100	8550	Attachment C
Coke	Particulate	100	1145	1-8
Limestone	Particulate	100	280	
Cast Iron	Particulate	100	400	
Rerun Slag	Particulate	100	1600	

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 11,975

2. Product Weight (lbs/hr): 6000

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

SEE TABLE 3

Name of Contaminant	Emission[1]		Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/yr	T/yr	

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Baghouse - Wheelabrator	Particulate	99+%	1 micron	Manufacturer
Frye Model 126 or				
Equivalent (Patterned				
after the Model 126 but				
were fabricated by GCR).				
Afterburner	CO	90%	N/A	Calculations & Literature

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Coke	1145	1500	19.5

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis:

Percent Sulfur: 0.58 Percent Ash: 5.4.

Density: N/A lbs/gal Typical Percent Nitrogen: N/A

Heat Capacity: 13,000 BTU/lb N/A BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating. N/A

Annual Average ______ Maximum ______

G. Indicate liquid or solid wastes generated and method of disposal.

Slag is disposed of in an approved and permitted landfill. K069-Returned to blast furnace.

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack): See Attachment

Stack Height: ______ ft. Stack Diameter: ______ ft.

Gas Flow Rate: ______ ACFM ______ DSCFM Gas Exit Temperature: ______ °F.

Water Vapor Content: ______ % Velocity: ______ FPS

SECTION IV: INCINERATOR INFORMATION

FINAL AFTERBURNER DESIGN PENDING PERMIT APPROVAL

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste ______

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation ~~per day~~ ______ ~~day/wk~~ ______ ~~wks/yr~~ 7629 hrs/yr

Manufacturer to be determined

Date Constructed N/A Model No. N/A

To be provided at a later data

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel		Temperature (°F)
			Type	BTU/hr	
Primary Chamber			Natural Gas		1400°F
Secondary Chamber					

Same as Section III H.

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [X] Afterburner

[X] Other (specify) Baghouse

Brief description of operating characteristics of control devices:

Final afterburner design pending permit approval. Criteria, 90% destruction of CO at 1400°F and 0.5 second.

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

N/A

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY N/A

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable, use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device; install in available space, and operate within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION N/A

A. Company Monitored Data

1. ________no. sites ________ TSP ________( ) SO^2* ________ Wind spd/dir

Period of Monitoring ____/____/____ to ____/____/____
month day year month day year

Other data recorded ______________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)________________________________

3. Upper air (mixing height) data obtained from (location)________________________

4. Stability wind rose (STAR) data obtained from (location)________________________

C. Computer Models Used

1. ________________________________ Modified? If yes, attach description.

2. ________________________________ Modified? If yes, attach description.

3. ________________________________ Modified? If yes, attach description.

4. ________________________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	________________	grams/sec
SO^2	________________	grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

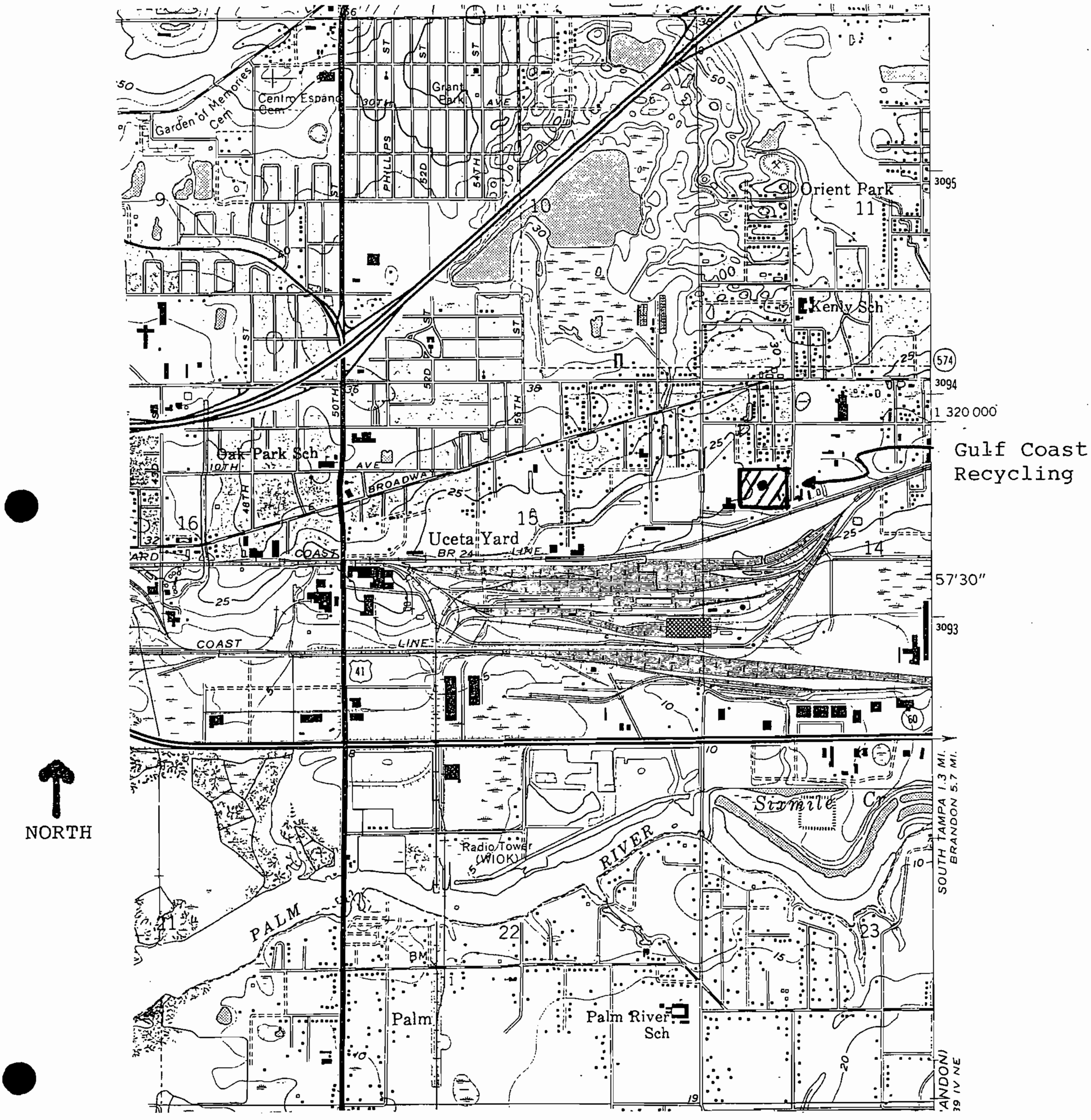
H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

SECTION III H

Stack Height:	150 ft.	
Stack Diameter:	2 ft.	
Gas Flow Rate:	24,354 ACFM	20,246 dscfm
Gas Exit Temperature:	154°F	
Water Vapor Content:	3.5 %	
Velocity:	57 FPS	

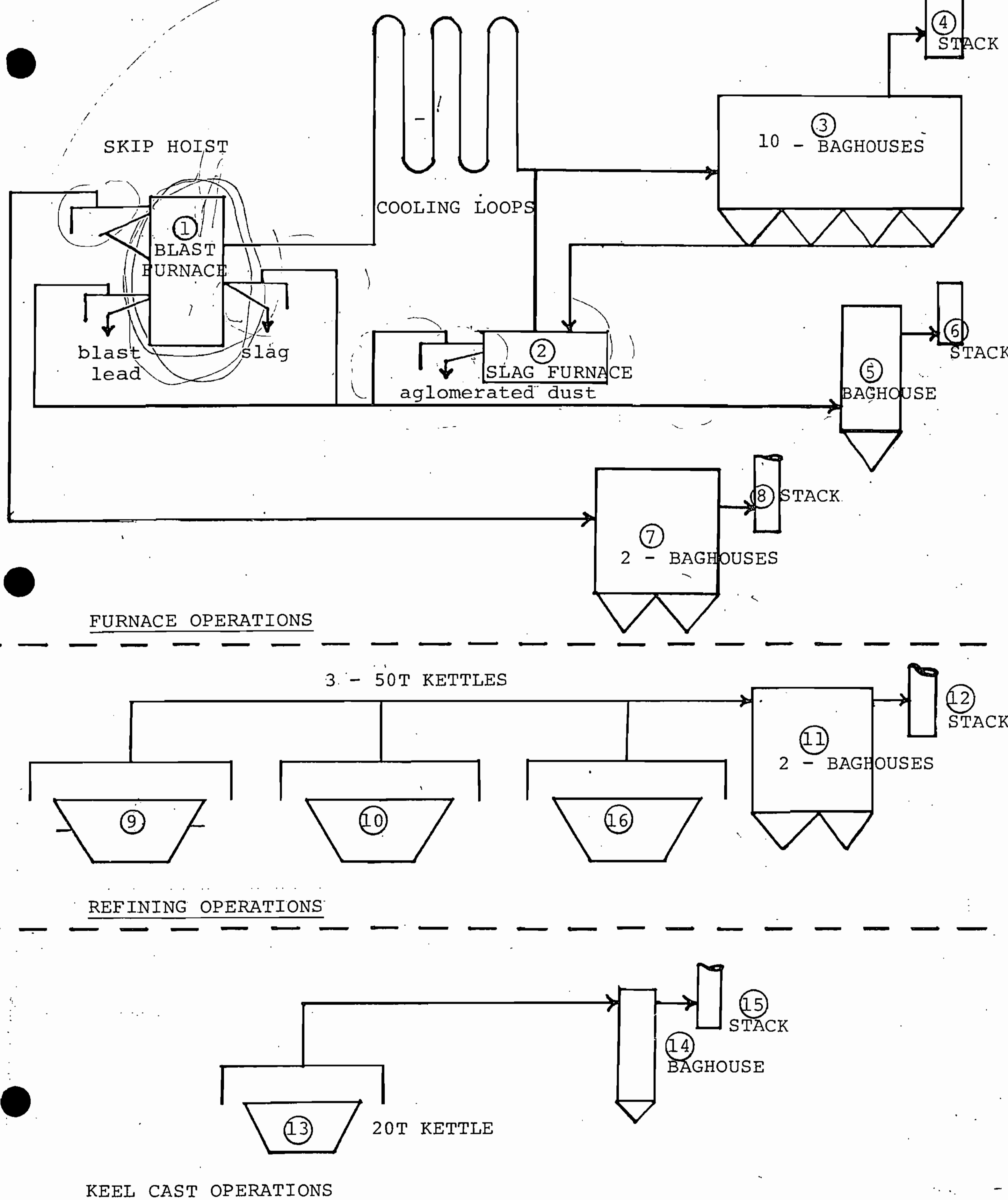
Based on the October 22, 1991 blast furnace stack test for particulate and lead.

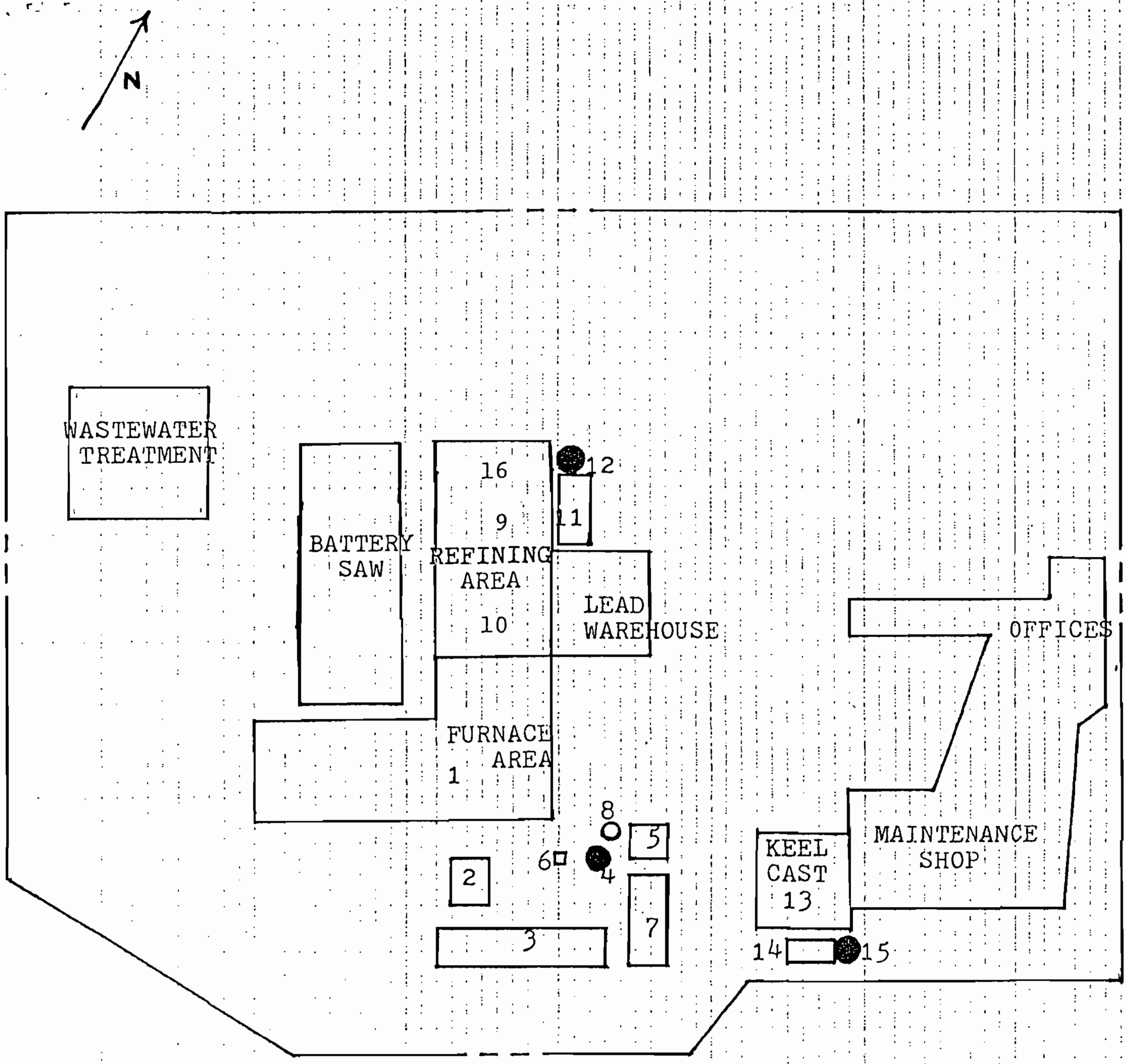
LOCATION - GULF COAST RECYCLING, INC.



GULF COAST RECYCLING, INC.

FLOW DIAGRAM





GULF COAST RECYCLING, INC.

SITE PLAN

GULF COAST RECYCLING, INC.

After-the-Fact Construction Permit Application

PERMITTING HISTORY

AC-406 - Issued February 2, 1972 for the modification of the dust collection system to include an additional bag collector to serve the lead reclaiming area.

AO-29-399 - Issued May 17, 1972 for operation of dust collector for secondary lead smelting and refining. Expiration date on permit: November 30, 1974.

AO29-2113 - Issued March 27, 1973 for operation of "dust house stack serving lead furnace". Expiration date on permit: July 1, 1975.

AO29-2113 - Reissued October 27, 1975 for the operation of a blast furnace with a baghouse. Expiration date on permit: October 27, 1977.

AO29-12482 - Issued October 20, 1978 for the operation of two blast furnaces with associated hooding, using a baghouse. Expiration date on permit: September 15, 1983. This permit was revised on January 30, 1981 to include the operation of the slagging furnace (See Attachment I).

AC29-18438 - Issued July 6, 1979 for the construction of two baghouses and slagging furnace (This is the flash agglomeration furnace referred to by EPA as a reverbatory furnace). The permit was modified November 1, 1979. Construction was to have taken place between October 31, 1979 and February 28, 1980.

AC29-35694 - Issued January 6, 1981 for construction of a dust collector for the exhaust hoods of the slag and lead tap enclosures of the blast furnace and the slag tap enclosure for the slagging furnace and for a stack for same.

AO29-41831 - Issued August 17, 1981 and modified October 27, 1981, for the operation of the enclosure hoods for the blast and slagging furnaces, all exhausting through a baghouse to a stack. Expiration date on permit: April 20, 1986.

AO29-78246 - Issued January 26, 1984 for the operation of two lead and one slag furnace. Expiration date on permit: January 6, 1989.

AO29-95366 - Issued January 28, 1985 for the operation of all furnace operations. Expiration date on permit: January 9, 1990. This permit and the supporting documentation allowed for the installation of the 60 ton blast furnace provided that there would not be a significant increase in hourly SO_2 emissions over the baseline to be established.

AO29-173310 - Permit issued July 17, 1990, permit amended November 16, 1990, for the operation of all furnace operations. Expiration date on permit: November 16, 1995.

Letter from Hillsborough County Environmental Protection Commission dated April 9, 1991 requiring a construction permit for the blast furnace (See Attachment II).

Consent Order dated October 15, 1991 requiring a after-the-fact construction permit to be submitted in 120 days (See Attachment III).

BASELINE SULFUR DIOXIDE EMISSION RATE

The baseline SO2 emission rate for the 40 ton blast furnace was established during 1983 with full knowledge and consent of both the Florida Department of Environmental Regulation and the Environmental Protection Commission of Hillsborough County.

In a meeting held on September 21, 1983, representatives from Gulf Coast Lead met with the FDER's air permitting staff and the EPC's air permitting staff to discuss the proposed installation of a 60 ton design capacity blast furnace to be built in order to reduce worker exposure levels for OSHA purposes. (See the Memorandum dated September 21, 1983 and November 4, 1983 from Joyce D. Morales-Caramella of Gulf Coast Lead to the file enclosed as Attachment IV).

FDER had concerns over the actual emission levels from the 40 ton blast furnace. The latest available test showed an emission rate of 74 pounds of SO2 per hour. The previous application submitted on the 40 ton blast furnace estimated the SO2 emissions to be 99 pounds per hour. FDER assumed that the increase in production capacity may have result in a significant increase in SO2 emission rates which might trigger PSD permitting. No action was taken as a result of this meeting. Gulf Coast Recycling requested time to review the testing history of the SO2 emissions and would request another meeting with FDER and EPC to discuss the SO2 emissions and the proposed 60 ton furnace.

A meeting was held on November 4, 1983 at FDER with their air permitting staff and two representatives from Gulf Coast Recycling (See Attachment IV and V). At the meeting Gulf Coast Recycling reviewed the stack testing history for SO2 which is summarized in Table 1. The emissions per twenty (20) minute run ranged from 35 lbs per hour to 380 lbs per hour. This significant variably on the SO2 emission rates per run concerned both Gulf Coast Recycling and FDER. Gulf Coast Recycling explained to FDER that the likely cause of the noted variability was due to the cyclic nature of the blast furnace operation. Gulf Coast Recycling went on to explain that once every hour the slag was tapped and during this time the smelting process is halted. The standard EPA Method 6 test for sulfur dioxide requires a twenty (20) minute run. Since the process takes approximately one (1) hour to complete it was felt that one (1) hour runs was more appropriate in determining the SO2 emissions than the previously conducted twenty (20) minute runs. FDER further concluded that the twenty (20) minute SO2 runs were not representative of the process and therefore the previously conducted test should not be the basis for determining the SO2 baseline emission. Gulf Coast Recycling proposed to conduct 10-12 one hour runs to determine the baseline emissions from the existing 40 tons blast furnace. FDER agreed at that time that the results would be used to determine Gulf Coast Recycling's SO2 emission cap.

In a letter dated December 5, 1983 to Mr. Jerry Campbell of the Environmental Protection Commission of Hillsborough County, the dates for this baseline testing were established to be December 7, 8, and 9, 1983. This letter went on to explain that the twenty (20) minute test runs previously conducted were not representative due to the cyclic nature of the blast furnace and that the blast furnace was charged at least 5 times each hour and the slag was tapped once each hour. While the slag was being tapped, the smelting process essentially comes to a halt. In order to determine the sulfur dioxide emissions during the entire cycle the emission test will be conducted for one hour each. Gulf Coast Lead requested a representative from EPC and FDER come out to witness the test and that these test results would be used as a basis for the sulfur dioxide emission cap (A copy of this letter is included as Attachment VI).

On December 5, 1983 Mr. Jerry Campbell of the Environmental Protection Commission of Hillsborough County inspected the blast furnace in regard to the current renewal application in-house (See Attachment VII).

On December 7, 1983, Jerry Campbell of Environmental Protection Commission provided FDER with the County's permitting recommendations on the blast furnace renewal application (See Attachment VIII).

On December 7, 8, and 9, 1983 Environmental Engineering Consultants, Inc. conducted a series of sulfur dioxide tests for Gulf Coast Lead. The propose of the test was to establish the average sulfur dioxide emission rate from the 40 ton blast furnace. A complete copy of the test report is included as Attachment IX. The following is a summary of the test results:

One-Hour Run Number	Sulfur Dioxide Pounds Per Hour
1	114
2	375
3	518
4	33
5	399
6	330
7	398
8	466
9	490
10	618
Average	374

On January 13, 1984 in an FDER internal memorandum from Jim Estler through Bill Thomas, P.E. and Dan Williams, P.E. to the file, the staff recommendation on a draft operating permit for the two existing lead furnaces was submitted for approval. This approved memo stated the baseline SO2 emission rate was to be determined by stack testing the existing lead furnace for 9 runs. Each test period is to be representative of the batch/smelt cycle. Reference was also made to the replacement of the 40 ton furnace with the 60 ton furnace. Gulf Coast Recycling was to provide FDER with the information on the proposed furnace replacement and provide an explanation that there would not be an increase in emissions. Once this was received, the proposed operating permit would be amended to reflect the change (Copy of this memo is enclosed as Attachment X).

On January 26, 1984 FDER issued an operating permit AO29-78246 to Gulf Coast Lead for the operation of the two lead blast furnaces and one slag furnace (Copy of Permit is enclosed at Attachment XI). Specific Condition No. 5 of said permit required Gulf Coast Lead to conduct SO2 emission testing by methods approved by both EPCHC and FDER to establish the actual emission of the source. The test was to be conducted within sixty (60) days of receipt of permit and clearly stated that at the time that the report was received, EPCHC and FDER would set the SO2 emission standards which would become part of the permit. This condition read as follows:

> "5. Within 60 days of receipt of this operating permit, the applicant will have conducted SO2 emission testing by methods approved by the Hillsborough County Environmental Protection Commission (HCEPC) and the Florida Department of Environmental Regulation (FDER) to establish the actual emissions from this source. The results of these test shall be reported to the regulatory agencies listed above in this same period. At that time the HCEPC and FDER will set an SO2 emission standard which shall become a part of this permit."

In a letter from Gulf Coast Lead to Jim Estler of FDER on February 20, 1984, Gulf Coast Lead notified FDER that they were planning on rebuilding the older of the two blast furnaces. The letter stated that once the new blast furnace was completed it would be placed into operation and the old furnace would be partially dismantled and used only as a reserve. The letter stated that the two remaining blast furnaces would never be operated simultaneously. The new furnace would have a greater capacity but would be operated fewer days per year. This letter stated that the following pollution control features for the new furnace and its operation were to be as follows:

> (1) Groups will be aged in the storage pile prior to being fed into the blast furnace thus decreasing the amount of sulfates fed to the furnace.
>
> (2) The air velocity in the furnace will be lower, reducing the particulate loading going into the baghouses.
>
> (3) The new furnace will have an oval configuration rather than the present round configuration. Charges will then not tend to build up unevenly in the furnace thus eliminating hot spots which reduce efficiency and increase emissions.
>
> (4) Due to the configuration of the new furnace, charges will also have a longer resonance time allowing greater quantities of sulfates to become fixed in the slag.
>
> Because of the aforementioned features and operation modifications and others, it is estimated that operation of the new blast furnace will not result in increased sulfur dioxide emissions and any increase in particulate emissions will be negligible.

Enclosed with this letter was a copy of the stack test report on the 10 test runs conducted on December 7, 8, and 9, 1983 for SO2. A copy of this letter is enclosed as Attachment XII.

In a Hillsborough County Environmental Protection Commission's conversation record dated March 4, 1984, representatives from Gulf Coast Recycling and FDER met with Jerry Campbell and agreed that the December 7 - 9, 1983 test results for SO2 on the existing blast furnace would be used to establish the baseline at 374 pounds of SO2 per hour. Gulf Coast Lead stated that they now intend to use the 40 ton blast furnace as a backup to the 60 ton furnace. The new 60 ton furnace will be tested within a reasonable period after it comes on line. It was clearly stated that if the SO2 emissions were greater than 374 pounds per hour and the significant levels for SO2 in Table 500-2 were triggered, then Gulf Coast Lead would be subject to PSD for SO2. The current backup furnace for the 40 ton unit would be retired and only two furnaces would remain on site. A copy of this conversation records is enclosed as Attachment XIII.

In a meeting held on November 1, 1984, representatives from Gulf Coast Lead discussed with Jerry Campbell EPCHC some issues regarding the blast furnaces and its permitting requirements. Mr. Campbell's records indicated that the blast furnace would be subject to NSPS's particulate and opacity regulations (See Attachment XIV).

In a November 7, 1984 memorandum to file from Joyce D. Morales further details of the November 1, 1984 meeting were discussed (See Attachment XV). Paragraph 2 states that Jerry Campbell had spoken to the Brian Beals of EPA and was told that the blast furnace would be considered a new source and while in the meeting Mr. Campbell called FDER and confirmed that the blast furnace was indeed a new source. In Paragraph 3 Mr. Campbell states that this new source would not trigger new source review or PSD requirements.

In a letter from Gulf Coast Recycling to Mr. Jerry Campbell of EPCHC dated November 6, 1984 the highlights of the November 1st meeting was confirmed See

Attachment XVI. The blast furnace would be considered a new source and subject to NSPS but the facility would not be subject to new source review. This letter stating that the blast furnace SO2 emission cap was 374 pounds per hour and 1459 tons per year.

In an inspection memo dated November 1984 Jerry Campbell of EPCHC inspected the furnace and established that the 40 ton furnace was still operating and the new 60 ton furnace was still not operating (See Attachment 17).

On December 4, 1984 the EPCHC made recommendations to FDER for issuance of an operating permit for the blast furnace and its associated operation (See Attachment XVIII). In recommended Condition No. 5, under the heading covering blast furnace operation, EPC stated that:

> "If the sulfur oxides compliance test for January, 1985, indicates that SO2 emission have increased significantly over the 374 pounds per hour baseline established in 12/83, then the permittee shall reapply under the provision of FAC 17-2.500. A significant increase here shall be defined as 10.2 pounds per hour over the baseline of 374. That works out to 40 tons per year over 7800 hours."

On January 28, 1985 FDER issued a comprehensive permit (AO29-95366) for the blast furnace operation (See Attachment XIX). The project description on Page 1 allowed for the operation of two secondary lead blast furnaces and 1 flue dust agglomeration furnace. The 60 ton capacity furnace installed in 1984 was designated as the primary furnace and the 40 ton capacity furnace was designated as the backup furnace. Under Specific Condition No. I.E. the sulfur oxide emissions were limited as follows:

> "If the sulfur oxides compliance test for January, 1985 indicates that SO2 emissions have increased significantly over the 374 pounds per hour baseline established in 12/83, then the permittee shall reapply under the provisions of F.A.C. 17-2.500. A significant increase here shall be defined as 10.2 pound per hour over the baseline of 374. That works out to 40 tons per year over 7800 hours."

On July 17, 1990 FDER issued permit no. AO29-173310 which covered the operation of the blast furnace and the agglomeration furnace (See Attachment XX). Specific Condition No. 8 again address the SO2 emissions and stated:

> "8. Sulfur dioxide (SO2) emissions shall not exceed 384.2 pounds per hour. If testing indicates that SO2 emissions exceed 384.2 (374 lbs/hr base line + 40 tons/yr., 12/83) then the permittee shall immediately reapply for a new permit under the provisions of Section 17-2.500, F.A.C."

Condition No. 10 established the method for sulfur oxide testing to be the same as the methods used in the December 1983 test.

On November 19, 1990, Gulf Coast Recycling received an amended permit No. AO29-173310 (See Attachment XXI), Specific Condition 9 and 11, were basically the same as Condition 8 and 10 of the previous permit.

Gulf Coast Recycling has complied with the direction from both EPCHC and FDER during the entire course of the permitting of the 60 ton blast furnace and have remained in compliance with the permit limitations associated with permit AO29-173310. The attached table summarizes Gulf Coast Recycling emissions of SO2 for the years 1978 through 1990. A review of this table indicates that the hourly emission rates established by the respective permits were maintained.

AFTERBURNER DESIGN AND CARBON MONOXIDE EMISSION CALCULATIONS

The Orsat method was used to test for CO. Air flow to afterburner from baghouse (data based on October 24, 1991 stack test for particulate):

20,246 dscfm at 3.56% moisture and 154.55°F

Dry gas	=	20,246 dscfm x 60 min/hr x (29/385) lb/ft^3
	=	91,501 lb/hr
Moisture	=	[20,246 dscfm/(1-0.0356)] x 0.0356
		x 60 min/hr x (18/385) lb/ft^3
	=	2096.5 lbs/hr

Heat in Gas Stream at 150°F

Dry Gas	=	91,501 lb/hr x 16.82 BTU/lb
	=	1.539 MMBTU/hr
Moisture	=	2096.5 lb/hr x 1071.91 BTU/lb
	=	2.247 MMBTU/hr
Total	=	3.79 MMBTU/hr

Heat in Gas Stream at 1400°F (90% destruction combuster Eff.*)

Dry gas	=	91,501 lbs/hr x 337.06 BTU/hr
	=	30.841 MMBTU
Moisture	=	2096.5 lb/hr x 1699.81 BTU/hr
	=	3.564 MMBTU
Heat Losses	=	6.0 MMBTU/hr (estimated shell loses at approximately 15%)
Total	=	40.41 MMBTU/hr

Heat Required in Afterburner:

= 40.41 - 3.79 = 36.62 MMBTU/hr

Afterburner Fuel Requirements:

Natural gas at 1050 BTU/cf

= (36.62 MMBTU/hr) / 1050 BTU/cf

= 34,876 cf/hr (max)

266 MMCF/yr @7629
272 MMCF/yr @7800

Assumes no heat generated by oxidation of VOC or CO in gas stream.

Emissions from the products of combustion:

POLLUTANT	EMISSION FACTOR (lbs/MMCF)	lbs/hr	TONS/YR (7629 hrs/yr)	7800
TSP	5	0.17	0.67	.68
SO2	0.6	0.02	0.08	.08
NOx	140	4.88	18.62	19.04
CO	35	1.22	4.66	4.76
VOC (nonmethane)	2.8	0.10	0.37	.38

Emission factors from AP-42 Table 1.4-1 for Industrial Boilers

* Design criteria based on "Incineration Systems Selection and Design", Calvin R Brunner, P.E.

DISCUSSION ON PSD APPLICABILITY

In order to determine baseline emission rates Gulf Coast Recycling proposed to run a series of stack tests to determine the emission rates for nitrogen dioxide, carbon monoxide, volatile organic compounds and sulfuric acid mists. Testing methodology was developed by Stevenson and Associates and the protocol for testing dated October 10, 1991 was submitted to EPC and FDER for approval (See Attachment XXII). On October 21-25, 1991 and November 4, 1991 having received no indication that the methods proposed were not acceptable to either EPC, FDER or EPA, the testing was conducted on the blast furnace (See Attachment XXIII and XXIV). A summary of the test results were as follows:

Pollutant	Emission Rate (pounds per hr)
Nitrogen Oxide	1.98
Volatile Organic Compounds	33.1
Carbon Monoxide	683.32
Lead	.006
Sulfur Dioxide	260
Sulfuric Acid Mist	0.0
Total Suspended Particulate	0.798
Visible Emissions	0%

The actual emission rates for the 40 ton blast furnace were established by taking the projected annual emissions based on 7629 hours per year and factoring the emission rates by the ratio of the actual production capacity of 2.1 TPH (based on 1983 and 1984) -vs- 3.0 TPH (based on 1990 production rate) to reflect the increase in capacity of the furnace or existing test data was used. The SO2 actual emission rate was previously established using criteria acceptable to both FDER and EPCHC at 374 pounds per hour in December 1983. FDER and EPC have clearly acknowledged and concluded that in their professional judgement previous data on hourly SO2 emission rates prior to the December 1983 tests were not representative of the actual emissions from the furnace. Therefore after extensive discussions and review of the existing data, FDER and EPCHC concluded and still concludes that one hour runs vs twenty (20) minute runs gave a more representative indication of the hourly emissions from this source. In order to determine a representative annual emission rate for the 40 ton furnace, a review of the annual operating reports was made (Table 4). As allowed under FDER's PSD regulations, the most representative year of data can be used to determine actual emissions. Actual emissions are defined by Section 17-2.100(3), Florida Administrative Code (FAC) as the following:

> "(3) "Actual Emissions" - The actual rate of emission of a pollutant form a source as determined in accordance with the following provisions:
>
> (a) In general, actual emission as of a particular date shall equal the average rate, in tons per year, at which the source actually emitted the pollutant during a two year period which proceeds the particular date and which is representative of the normal operation of the source. The Department may allow the use of a different time period upon a determination that it is more representative of the normal operation of the source. Actual emission shall be calculated using the source's actual operating hours, production rates and types of materials processed, stored, or combusted during the selected time period.
>
> (b) The Department may presume that source specific allowable emission for a source are equivalent to the actual emissions of the source provided that, for any air pollutant that is specifically regulated by the EPA under the Clean Air Act, such source specific allowable emissions limits are federally enforceable.
>
> (c) For a source which has not completed start-up and testing on a particular date, actual emission shall equal the potential emissions of the source of that date."

Since the new 60 ton furnace was not brought on line until late in 1984 (See Attachment XVII), Gulf Coast Recycling requests FDER in their PSD applicability determination look at the years 1983 and 1984 as a representative year in order to determine actual annual emissions. Copies of the 1983 and 1984 AORs are enclosed as Attachment XXV and XXVI. We feel this request is in line with FDER's current regulations and with the recent WEPCO* case and EPA's draft New Source Review Workshop Manual dated October 1990.

The applicant is proposing to install an afterburner on the blast furnace to reduce the CO emissions. This will reduce the carbon monoxide emissions rates below the significant emission rate set forth under Table 500-1 (i.e. 100 tons per year). Thus the significance level for CO under PSD will not be triggered. Tables 2 and 3 establishes the estimated emissions, including the product of combustion from the proposed afterburner. The other pollutants listed are either not emitted or are not expected to be admitted in quantities to trigger PSD new source review.

Gulf Coast Recycling is requesting under this after-the-fact permit application that a federally enforceable permit condition be established to limit the hours of operation of this blast furnace to 7629 hours per year. This is the level at which an increase in SO2 above this proposed federally enforceable baseline would trigger future PSD review.

*Wisconsin Electric Power Company -vs- USEPA, United States Court of Appeals, Seventh Circuit Nos. 88-3264, 89-1339.

It should be noted that two existing permitted 40 ton blast furnaces were on site prior to the installation of the new 60 ton blast furnace (See Attachment 1). Both furnaces were fully operational and vented to the baghouse and at times would operate alternately. To date we have not included the actual emissions for the second unit but here in reserve the right to do so should FDER and/or EPA not approved the baseline determination proposed by the applicant.

NONATTAINMENT NEW SOURCE REVIEW

The area in which this facility is located is classified nonattainment for ozone and is unclassified for particulate and lead. The VOC emissions from the existing 40 ton furnace are estimated to be 85.91 tons per year using the same factors as previously indicated. With the installation of the after burner to control CO emissions, the projected VOC emission rate is 13.00 tons per year. Since the existing blast furnace was less than 100 TPY it is not major as defined in Section 17-2.510(2)(d)2.(a), FAC. which states:

> "a. For the affected pollutant, except lead, the sum of the quantifiable fugitive emissions and the potential emissions of all sources at the facility which have the same "Major Group" Standard Industrial Classification (SIC) Code would be equal to or greater than 100 tons per year."

The increase of 40.35 tons per year without the after burner and a negative 72.92 tons per year with the after burner would not increase the emissions over a hundred tons per year and thus the modification to a minor facility would not be considered major in accordance with the new source review procedures established in Section 17-2.510(2)(d)3, FAC. This provision states:

> "3. Modification to Minor Facilities. Unless exempted under Rule 17-2.510(2)(a), (b) or (c), a proposed modification to a minor facility shall be subject to the provisions of Rule 17-2.510(4) only if the modification would be a physical change which in and of itself would constitute a new major facility subject to the provisions of Rule 17-2.510(4) pursuant to Rule 17-2.510(2)(d)2."

A review of the particulate data over the life of the facility has basically indicated a decrease in emissions due to improvements in controls and operation/maintenance procedures. Since there is no increase in emissions on an annual basis from the existing 40 ton to the new 60 ton furnace, nonattainable new source review for particulate would not be required.

NEW SOURCE PERFORMANCE STANDARDS

As previously determined by FDER and EPCHC, (See Attachments XIV and XV), this source is subject to the new source performance standards contained in 40 CFR 60 Subpart L entitled Standards for Performance Secondary Lead Smelters since the new 60 ton furnace was constructed after the applicability date of June 11, 1973. Pursuant to 40 CFR 60.122 (1) blast furnace shall not discharge to the atmosphere any gases which contain particulate matter in excess of 0.022 gr/dscf and (2) exhibit 20% capacity or greater. Gulf Coast Recycling has always complied with these emission regulations since startup of this operation whether they have been specifically incorporated as a permit condition or not.

FEDERAL IMPLEMENTATION PLAN FOR LEAD

Pursuant to 40 CFR 52.535(C)(1)(i) and (iv) the emissions from the blast furnace shall not exceed 1.810 pounds of lead per hour and the visible emissions should not exceed 5%. Gulf Coast Recycling has and will comply with these emission regulations for both the existing 40 ton blast furnace and the new 60 ton blast furnace.

RULE APPLICABILITY REVIEW REQUIREMENTS

As indicated above, this new furnace will not trigger either PSD or nonattainment new source review requirements, therefore, the applicable permit regulation should be Section 17-2.520 entitled Source Not Subject To Prevention of Significant Deterioration or Nonattainment Requirements.

In order to make the provisions of the after-the-fact construction permit federally enforceable, Gulf Coast Recycling requests that the following Specific Conditions be placed in the after-the-fact construction permit:

(1) The hours of operation of the blast furnace shall not exceed 7629 hrs/yr.

(2) The sulfur dioxide emission shall not exceed 374 lbs/hr and 1426.62 tons per year. Testing is to be conducted using EPA Method 6 or 8 with one hour run time.

(3) Gulf Coast Recycling will install an afterburner which will be fired on natural gas. A temperature of 1400°F will be maintained for a 0.5 second retention time.

U. S. EPA's CONCERNS EXPRESSED IN THEIR JUNE 19, 1991 MEMO

In EPA's memo of June 19, 1991 from Brian L. Beals, Chief Evalaution Unit, to Mark A. Armentrout, Chief Northern Compliance Unit, Subject, PSD Determination on Gulf Coast Recycling Inc. (See Attachment XXVII) we offer the following comments.

Gulf Coast Recycling was a major facility prior to the construction of the new 60 ton blast furnace. We disagree with the fact that the installation of the furnace triggered modification as defined in FDER's PSD regulations. The emission sampling reviewed by EPA does not reflect the extensive evaluation and determination by FDER and EPC that the SO2 emissions prior to the December 1983 test were not representative. A review of the record indicates that the baseline emissions for the 40 ton unit were established at 374 pounds per hour and based on the 1983 and 1984 operating hours, the tons per year baseline level is established at 1368.8 tons per year. With a federally enforceable limitation on the hours placed as a condition of the permit (i.e. 7629 hours per year), the SO2 emission cap of 1426.62 tons per year would not trigger the significant level of 40 tons per year.

(2) Gulf Coast Recycling relied on the expertise, judgement, and guidance of FDER and EPCHC in determining the need for construction permitting associated with the installation of the new blast furnace. Approval was given by both agencies to install the 60 ton furnace as a permit amendment of the existing operating permit if the baseline emission rates set forth in the permit were not exceeded. Gulf Coast Recycling is hereby submitting an after-the-fact construction permit in order to satisfy this requirement for construction permitting and federal enforceability as required by EPA.

(3) We have reviewed the PSD applicability for particulate matter, lead, carbon monoxide, sulfur dioxide, sulfuric acid mist, and nitrogen oxide and have found that PSD

review is not necessary. Emissions of hydrogen sulfide have not been tested, calculated or evaluated since we have been unable to find test data on the subject matter. Further AP-42 is silent with respect to emission factors for this pollutant.

(4) Best Available Control Technology (BACT) is not required since PSD review has not been triggered.

(5) The emission rates for volatile organic compounds were estimated to be 86 tons per year for the existing 40 ton furnace and thus this source was not considered major. The increase, with or without the afterburner, are both less than 100 tons per year and therefore according to Section 17-2.510, FAC the increase in emissions in and of itself are less than 100 tons per year. Therefore nonattainment review would not be triggered.

(6) EPA's concern about the 50 ton refining kettle has been addressed in the after-the-fact construction permit submitted in 1991 for refining kettle No. 3. An Intent to Issue was signed on February 5, 1992.

TABLE 1

GULF COAST RECYCLING, INC.
SO2 EMISSION TEST SUMMARY DISCUSSED
WITH FDER ON NOVEMBER 4, 1983

TEST DATE	PROCESS RATE	SO2 EMISSION RATES Per 20 Minute Run
March 4, 1976	2.60 T/hr	121.04 130.28 98.47 96.47 36.10
November 2, 1976	2.60 T/hr	37.27 33.39 31.48 23.78
January 19, 1979	3.2 T/hr	176 172 175 177
March 26, 1980	4.33 T/hr	255 384 317.67 314
January 8, 1981	3.77 T/hr	152 295 211.67 188
December 3, 1981	3.10 T/hr	152 89 110.33 90
December 13, 1983 82	3.29 T/hr	96 55 74.33 72

TABLE 2

GULF COAST RECYCLING, INC
AFTER-THE-FACT APPLICATION
NET INCREASE IN EMISSIONS COMPARED
TO THE PSD EMISSION RATES

POLLUTANT	EXISTING EMISSIONS (TPY)	POTENTIAL EMISSIONS (TPY) With Afterburner	NET EMISSION INCREASE (TPY)	PSD SIGNIFICANT EMISSION RATE (TPY)	PSD
Sulfur dioxide	1386.79	1426.62	39.91	40	N
Particulate Matter (TSP)	9.25	3.71	-5.54	25	N
Particulate Matter (PM10)	9.25	3.74	-5.54	15	N
Nitrogen dioxide	5.14	21.28	15.89	40	N
Carbon monoxide	1773.63	265.31	-1508.31	100	N
Volatile organic compounds	85.91	13.00	-72.92	40	N
Lead	6.69	0.0229	-6.67	0.6	N
Sulfuric acid mist	0.0	0.0	0.0	7	N
Total fluorides	N/A	N/A	N/A	3	N
Total reduced sulfur	N/A	N/A	N/A	10	N
Reduced sulfur compounds	N/A	N/A	N/A	10	N
Hydrogen sulfide	No Data	No Data	No Data	10	
Asbestos	N/A	N/A	N/A	0.007	N
Beryllium	N/A	N/A	N/A	0.0004	N
Mercury	N/A	N/A	N/A	0.1	N
Vinyl chloride	N/A	N/A	N/A	1	N
Benzene	N/A	N/A	N/A	0	N
Radionuclides	N/A	N/A	N/A	0	N
Inorganic arsenic	0.0463	0.0152	-0.0310	0	N

TABLE 3
GULF COAST RECYCLING
PSD APPLICABILITY REVIEW WITH AND WITHOUT AFTERBURNER

POLLUTANT	1991 TESTED EMISSION RATE LBS/HR	POTENTIAL EMISSION RATE TONS/YR (7629 HRS/YR	40 TONS FURNACE EMISSION RATE TONS/YR (7416 HRS/YR)	NET EMISSION INCREASE TONS/YR	AFTERBURNER EMISSIONS TONS/YR	NET EMISSION INCREASE W/AFTERBRNER TONS/YR	PSD SIGNIFICANT EMISSION RATE TONS/YR	PSD REVIEW REQUIRED (YES/NO)
Particulate Matter(TSP)	0.798	3.04	9.25*	-6.21	3.71	-5.54	25	No
Particulate Matter(PM10)	0.798	3.04	9.25*	-6.21	3.71	-5.54	15	No
SulfurDioxide	374** 260	1,426.62	1,386.79	39.83	1,426.70	39.91	40	No
Nitrogen Dioxide	1.98	7.55	5.14	2.41	21.03	15.89	40	No
Carbon Monoxide	683.32	2,606.52	1,773.63	832.90	265.31	-1,508.31	100	No
Volatile Organic Compounds	33.1 ~~42~~ 22	126.26 160.97	97.9 85.91 23.17 lb/hr	40.35 63.1	13.00	-72.92	40	No
Lead	0.0060	0.0229	6.69***	-6.6671	0.0229	-6.67	0.6	No
SulfuricAcid Mist	0	0	0	0	0		7	No
Arsenic	0.0040	0.0152	0.0463	-0.0310	0.0152	-0.0310	0	No

* Based on Average TPY emission rate of 1983 and 1984 (See Table 4).
** SO_2 Baseline Emission Rate per December 1983 Tests.
*** Based on 1984 AOR.
**** Assume 0.5% of particulate emission per EPA-600/2-79-116 dated June 1979 entitled Evaluation of Stationary Source Particulate Measurement Methods Volume V, Secondary Lead Smelters (Attachment XXIX).

TABLE 4

GULF COAST RECYCLING
ANNUAL OPERATING REPORT SUMMARY

YEAR	HOUR/YR	PRODUCTION TPY	COKE TPY	TSP LBS/HR	TSP TPY	LEAD LBS/HR	LEAD TPY	SO2 LBS/HR	SO2 TPY
1978	6,000	8,750	1,800	2.462	7.386			175	525
1979	No AOR								
1980	5,208	11,636	1,600	1.260	3.30			318	800
1981	6,384	12,500	2,065	1.192	3.80			110	351
1982	6,600	12,380	2,500	0.557	1.84			74	244
1983	7,272	14,995		2.559	9.30			374	1,360
1984	7,560	15,750	2,395	2.559	9.72	1.7600	6.6900	374	1,421
1985	7,476	No Data	No Data	2.076	7.76	1.1584	4.3300	312	1,168
1986	7,610	16,658	2,690	0.450	1.71	0.0800	0.0304	92	350
1987	7,795	24,079	3,941	0.590	2.30	0.0094	0.0370	353	1,377
1988	7,795	21,489	3,487	1.000	3.90	0.0900	0.3500	377	1,470
1989	7,795	23,350	3,428	0.681	2.65	0.0421	0.1600	339	1,377
1990	7,795	23,494	3,370	0.709	2.77	0.0790	0.0800	326	1,271

GULF COAST RECYCLING, INC

AFTER-THE-FACT CONSTRUCTION PERMIT APPLICATION

SUMMARY OF ATTACHMENTS

ATTACHMENT I	Permit AO29-12482 to Operate Two Blast Furnaces Dated October 20, 1978
ATTACHMENT II	April 9, 1991 Letter from Hillsborough County Environmental Protection Commission to Gulf Coast Recycling Requiring a Construction Permit for the Blast Furnace
ATTACHMENT III	Consent Order Dated October 15, 1991 Requiring an After-the-fact Construction Permit For the Blast Furnace to be Submitted
ATTACHMENT IV	Memorandum of September 21, 1983/November 4, 1983 from Joyce Morales-Carmella to the File Subject: 60 Ton Blast Furnace Permit and Baseline SO2 Emission Rate
ATTACHMENT V	FDER's Meeting Notes of November 4, 1983
ATTACHMENT VI	Letter of December 5, 1983 from Gulf Coast Lead to Environmental Protection Commission Subject: SO2 Baseline Testing
ATTACHMENT VII	Environmental Protection Commission Inspection Report of December 5, 1983
ATTACHMENT VIII	Memorandum from Jerry Campbell of EPC to FDER Subject: Recommended Conditions for the Blast Furnace Permit
ATTACHMENT IX	Emissions Test Report - 1983 Establishing Baseline SO2 Emission Rates for the 40 Ton Blast Furnace
ATTACHMENT X	Memorandum from Jim Estler of FDER to File Subject: Blast Furnace Renewal Permit

GULF COAST RECYCLING, INC

AFTER-THE-FACT CONSTRUCTION PERMIT APPLICATION

SUMMARY OF ATTACHMENTS (Continued)

ATTACHMENT XI	AO29-78246 Operating Permit for Two Lead Blast Furnace and One Slag Furnace
ATTACHMENT XII	Letter from Gulf Coast Lead Dated February 20, 1984 Notifying FDER of their intent to rebuild blast furnace
ATTACHMENT XIII	EPC Conversation Record dated March 9, 1984 Subject: SO2 Emission Baseline
ATTACHMENT XIV	EPC Conversation Record dated November 1, 1984 Subject: NSPS Applicability
ATTACHMENT XV	Memorandum from Joyce D. Morales dated November 7, 1984 Subject: EPC Meeting of November 1, 1984
ATTACHMENT XVI	Letter of November 6, 1984 from Gulf Coast Lead to Jerry Campbell of Environmental Protection Commission Re: Highlights of Meeting of November 1, 1984
ATTACHMENT XVII	Environmental Protection Commission Inspection Report of November 1984
ATTACHMENT XVIII	Memorandum from Jerry Campbell of Environmental Protection Commission to Jim Estler of FDER Dated December 4, 1984 Subject: Recommended Conditions for Gulf Coast Lead's New Operating Permit
ATTACHMENT XIX	Operating Permit AO29-95366 Date January 28, 1985 for the Blast Furnace Operation
ATTACHMENT XX	Permit No. A029-173310 Dated July 17, 1990 For the Operation of the Blast Furnace and the Agglomeration Furnace
ATTACHMENT XXI	Amended Operating Permit A029-173310 Dated November 19, 1990 For The Blast Furnace And Agglomeration Furnace

GULF COAST RECYCLING, INC

AFTER-THE-FACT CONSTRUCTION PERMIT APPLICATION

SUMMARY OF ATTACHMENTS (Continued)

ATTACHMENT XXII	Letter dated October 10, 1991 from Stevenson and Associates To EPC Subject: Testing Protocol - Compliance/PSD Determination
ATTACHMENT XXIII	Stack Sampling Emission Report and Visible Emission Tests Prepared By Stevenson & Associates
ATTACHMENT XXIV	Source Test Report for Oxides of Nitrogen, Volatile Organic Compounds and Carbon Monoxide Prepared By Air Consulting & Engineering, Inc.
ATTACHMENT XXV	Air Pollutant Emission Report (AOR) For 1983
ATTACHMENT XXVI	Annual Operating Report - For 1984
ATTACHMENT XXVII	EPA Memorandum Dated June 19, 1991 Subject: PSD Determination of Gulf Coast Recycling, Inc.
ATTACHMENT XXVIII	Reference pages of Incinerator Systems Selection and Design by Calvin R. Brunner, P.E.
ATTACHMENT XXIX	EPA's "Evaluation of Stationary Source Particulate Measurement Methods Volume V, Secondary Lead Smelters.

ATTACHMENT I

Permit AO29-12482 to Operate Two Blast Furnaces
Dated October 20, 1978

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT
7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610

REUBIN O'D. ASKEW
GOVERNOR

JOSEPH W. LANDERS, JR.
SECRETARY

October 20, 1978

Hillsborough County - A.P.
Gulf Coast Lead Company

P. David Puchaty
District Manager

Mr. John F. Ames, President
Gulf Coast Lead Company
1901 N. 66th Street
Tampa, Florida 33619

Dear Mr. Ames:

Pursuant to Section 403.061(16), Florida Statutes, your application has been approved by the Department and, therefore, we are issuing to you the enclosed permit no. A029-12482 which will expire on September 15, 1983

This permit is not effective unless you accept it, including any and all of the conditions contained therein. If you do not choose to accept it, you must file an appropriate petition for a hearing pursuant to the provisions of Section 120.57, Florida Statutes.

A petition for a hearing must comply with the requirements of Florida Administrative Code, Section 28-5.15 and be filed (postmarked) with the Secretary of the Department of Environmental Regulation at Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32301, with a copy to this office within fourteen (14) days from receipt of this letter. Petitions which are not filed in accordance with the above provisions may be subject to dismissal.

Any time limits imposed in the permit are a condition to this permit and are enforceable under Section 403.061, Florida Statutes. You are hereby placed on notice that the Department will review this permit to check for compliance and will initiate enforcement action for violations of the conditions and requirements of this permit.

Your continued cooperation in this matter is appreciated. Please refer to your assigned permit number in all future communications.

Sincerely,

P. David Puchaty
District Manager

cc: Record Center
HCEPC
Edwin V. Bishop, P.E.
Enclosures

RULES OF THE ADMINISTRATION COMMISSION
MODEL RULES OF PROCEDURE
CHAPTER 28-5
DECISIONS DETERMINING SUBSTANTIAL INTERESTS

28-5.15 Requests for Formal and Informal Proceedings

(1) Requests for proceedings shall be made by petition to the agency involved. Each petition shall be printed, typewritten or otherwise duplicated in legible form on white paper of standard legal size. Unless printed, the impression shall be on one side of the paper only and lines shall be double spaced and indented.

(2) All petitions filed under these rules should contain:

(a) The name and address of each agency affected and each agency's file or identification number, if known;

(b) The name and address of the petitioner or petitioners;

(c) All disputed issues of material fact. If there are none, the petition must so indicate;

(d) A concise statement of the ultimate facts alleged, and the rules, regulations and constitutional provisions which entitle the petitioner to relief;

(e) A statement summarizing any informal action taken to resolve the issues, and the results of that action;

(f) A demand for the relief to which the petitioner deems himself entitled; and,

(g) Such other information which the petitioner contends is material.

NOTE: At a formal hearing all parties shall have an opportunity to present evidence and argument on all issues involved, to conduct cross-examination and submit rebuttal evidence, to submit proposed findings of fact and orders, to file exceptions to any order or hearing officer's recommended order, and to be represented by counsel.

SERIAL No. 03642

STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL REGULATION

HILLSBOROUGH COUNTY

OPERATION PERMIT

FOR Gulf Coast Lead Company
1901 N. 66th Street
Tampa, Florida 33619

PERMIT NO. A029-12482 DATE OF ISSUE October 20, 1978

PURSUANT TO THE PROVISIONS OF SECTIONS 403.061 (16) AND 403.707 OF CHAPTER 403 FLORIDA STATUTES AND CHAPTERS 17–4 AND 17–7 FLORIDA ADMINISTRATIVE CODE, THIS PERMIT IS ISSUED TO:

Mr. John F. Ames, President

FOR THE OPERATION OF THE FOLLOWING:

Two (2) lead blast furnaces which operate with associated hooding using a baghouse. Subject to attached conditions of Approval Nos.: 1, 2, 3, 5, 6, and 7.

LOCATED AT: 1901 N. 66th Street, Tampa, Hillsborough County,
UTM: 17-363.9E 3093.8N

IN ACCORDANCE WITH THE APPLICATION DATED August 16, 1978

ANY CONDITIONS OR PROVISOS WHICH ARE ATTACHED HERETO ARE INCORPORATED INTO AND MADE A PART OF THIS PERMIT AS THOUGH FULLY SET FORTH HEREIN. FAILURE TO COMPLY WITH SAID CONDITIONS OR PROVISOS SHALL CONSTITUTE A VIOLATION OF THIS PERMIT AND SHALL SUBJECT THE APPLICANT TO SUCH CIVIL AND CRIMINAL PENALTIES AS PROVIDED BY LAW.

THIS PERMIT SHALL BE EFFECTIVE FROM THE DATE OF ISSUE UNTIL September 15, 1983

OR UNLESS REVOKED OR SURRENDERED AND SHALL BE SUBJECT TO ALL LAWS OF THE STATE AND THE RULES AND REGULATIONS OF THE DEPARTMENT.

DISTRICT ENGINEER	JOSEPH W. LANDERS, JR. SECRETARY
Roger P. Stewart, Director Hills. Cty. Env. Protection Comm.	DISTRICT MANAGER

J.C. Replaces A029-2113 101800052005701

DER Form PERM 11–3 (Mar. 76)

State of Florida
Department of Environmental Regulation

OPERATION PERMIT CONDITIONS
FOR AIR POLLUTION SOURCES

Permit No.: A029-12482 Date: October 20, 1978

An (X) indicates applicable conditions

(X) 1. The permit holder must comply with Florida Statute, Chapter 403 and the applicable Chapters of the Department of Environmental Regulation in addition to the conditions of this permit (Chapter 403.161(1)(b), Florida Statutes).

(X) 2. Test the emissions for the following pollutant(s) at intervals of Twelve Months from the date December 15, 1977 and submit a copy of test data to the District Engineer of this agency within fifteen days of such testing (Chapter 17-2.07(1), Florida Administrative Code (F.A.C.)).

(X) Particulates	(X) Sulfur Oxides
( ) Fluorides	( ) Nitrogen Oxides
(X) Plume Density	( ) Hydrocarbons
	( ) Total Reduced Sulfur

(X) 3. Testing of emissions must be accomplished at approximately the rates as stated in the application. Failure to submit the input rates or operation at conditions which do not reflect actual operating conditions may invalidate the data (Chapter 403.161(1)(c), Florida Statutes).

( ) 4. Submit for this source quarterly reports showing the type and monthly quantities of fuels used in the operation of this source. Also state the sulfur content of each fuel (Chapter 17-4.14, F.A.C.).

(X) 5. Submit for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Chapter 17-4.14, F.A.C.

(A) Annual amount of materials and/or fuels utilized.
(B) Annual emissions (note calculation basis).
(C) Any changes in the information contained in the permit application.

State of Florida
Department of Environmental Regulation

OPERATION PERMIT CONDITIONS
FOR AIR POLLUTION SOURCES

Permit No.: A029-12482 Date: October 20, 1978

An (X) indicates applicable conditions

(X) 1. The permit holder must comply with Florida Statute, Chapter 403 and the applicable Chapters of the Department of Environmental Regulation in addition to the conditions of this permit (Chapter 403.161(1)(b), Florida Statutes).

(X) 2. Test the emissions for the following pollutant(s) at intervals of Twelve Months from the date December 15, 1977 and submit a copy of test data to the District Engineer of this agency within fifteen days of such testing (Chapter 17-2.07(1), Florida Administrative Code (F.A.C.)).

(X) Particulates	(X) Sulfur Oxides
( ) Fluorides	( ) Nitrogen Oxides
(X) Plume Density	( ) Hydrocarbons
	( ) Total Reduced Sulfur

(X) 3. Testing of emissions must be accomplished at approximately the rates as stated in the application. Failure to submit the input rates or operation at conditions which do not reflect actual operating conditions may invalidate the data (Chapter 403.161(1)(c), Florida Statutes).

( ) 4. Submit for this source quarterly reports showing the type and monthly quantities of fuels used in the operation of this source. Also state the sulfur content of each fuel (Chapter 17-4.14, F.A.C.).

(X) 5. Submit for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Chapter 17-4.14, F.A.C.

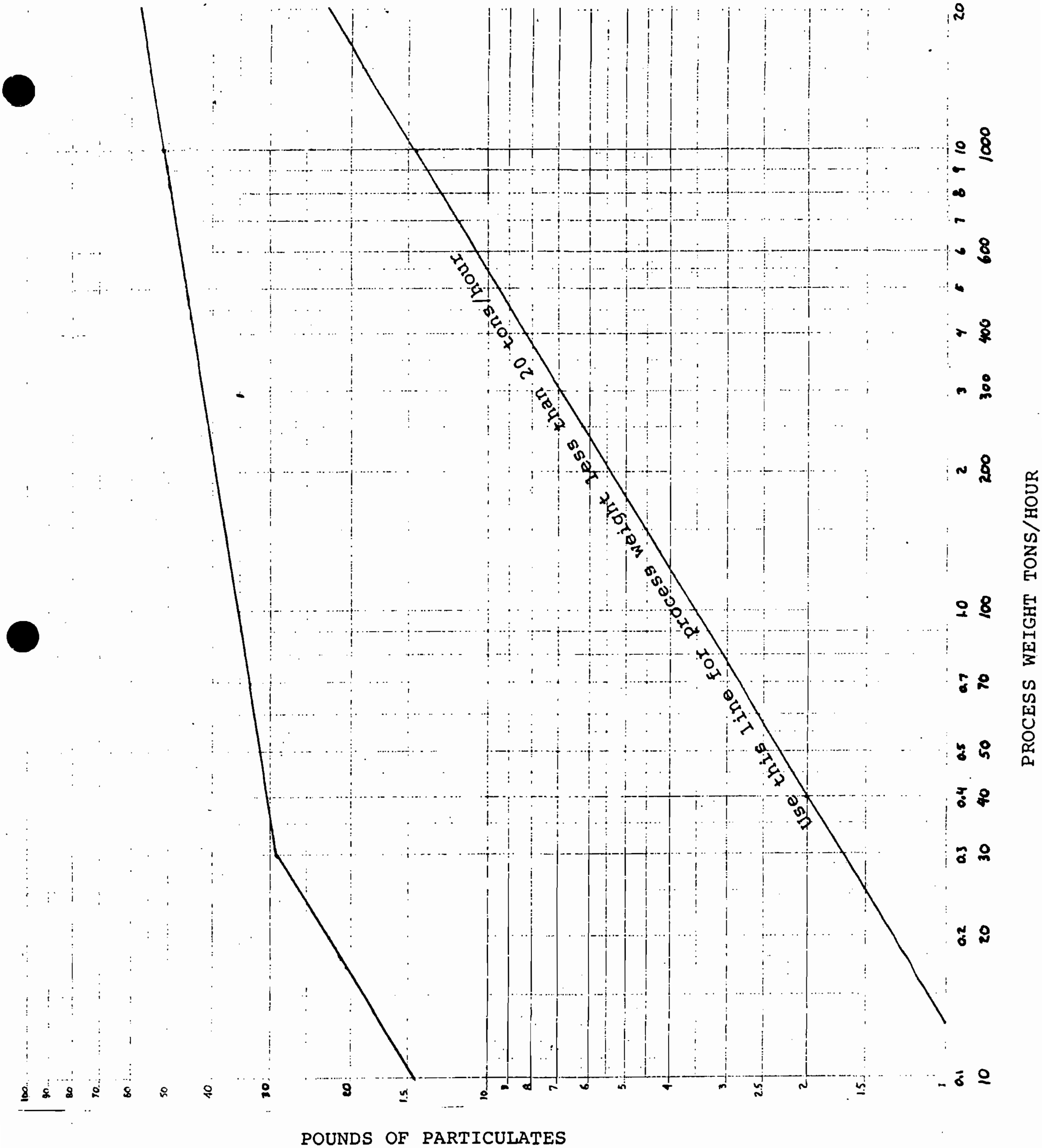
(A) Annual amount of materials and/or fuels utilized.
(B) Annual emissions (note calculation basis).
(C) Any changes in the information contained in the permit application.

(X) 6. In the event the permittee is temporarily unable to comply with any of the conditions of the permit, the permittee shall immediately notify the District Office of the D.E.R. as per Chapter 17-4.13, F.A.C. The permittee shall be responsible for any and all damages which may result and may be subject to enforcement actions by the Department.

(X) 7. According to the Process Weight Table within Chapter 17-2.04(2), F.A.C., the maximum allowable emission rate of particulate matter for a process rate of 2.65 tons/hour is 6.5 pounds/hour. At lesser process rates, the allowable emission rates can be determined from the graph.

( ) 8. This permit is associated with a Development of Regional Impact (D.R.I.). It does not waive any other permits that may be required from this or any other state, federal, or local agency.

PROCESS WEIGHT TABLE



ATTACHMENT II

April 9, 1991 Letter from Hillsborough County
Environmental Protection Commission to
Gulf Coast Recycling
Requiring a Construction Permit for the Blast Furnace

COMMISSION
PHYLLIS BUSANSKY
JOE CHILLURA
PAM IORIO
SYLVIA KIMBELL
JAN KAMINIS PLATT
JAMES D. SELVEY
ED TURANCHIK

FAX (813) 272-5157

ENVIRONMENTAL PROTECTION COMMISSION
HILLSBOROUGH COUNTY

ROGER P. STEWART
EXECUTIVE DIRECTOR
MAIN OFFICES
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960

AIR PROGRAM
TELEPHONE (813) 272-5530

WASTE MANAGEMENT PROGRAM
TELEPHONE (813) 272-5788

ECOSYSTEMS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

April 9, 1991

Mr. Willis M. Kitchen
Vice President
Gulf Coast Recycling, Inc.
1901 N. 66th Street
Tampa, FL 33619

Dear Mr. Kitchen:

As you may be aware, your existing blast furnace does not have a construction permit. This fact was made very clear to us during the recent EPA inspection of your facility and their subsequent review of our files. As a result, you are requested to submit an application (3 copies) to the Florida Department of Environmental Regulation's office in Tallahassee for an after-the-fact construction permit for the blast furnace as soon as possible. This was requested by EPA.

In addition to submitting three (3) applications to Tallahassee, please provide a fourth copy to our office along with a fee in the amount of $400.00. If you have any questions please feel free to call me at 272-5530.

Sincerely,

Darrel Graziani

Darrel Graziani
Chief, Air Permitting Section

bm

cc: J. Harry Kerns, P.E., FDER, SW District
Barry Andrews, P.E.

ATTACHMENT III

Consent Order Dated October 15, 1991 Requiring an
After-the-fact Construction Permit
For the Blast Furnace
to be Submitted

FAX (813) 272-5157

ENVIRONMENTAL PROTECTION COMMISSION
HILLSBOROUGH COUNTY

ROGER P. STEWART
EXECUTIVE DIRECTOR

ADMINISTRATIVE OFFICES
AND
WATER MANAGEMENT DIVISION
1900 - 9TH AVENUE
TAMPA, FLORIDA 33605
TELEPHONE (813) 272-5960

AIR MANAGEMENT DIVISION
TELEPHONE (813) 272-5530

WASTE MANAGEMENT DIVISION
TELEPHONE (813) 272-5788

ECOSYSTEMS MANAGEMENT DIVISION
TELEPHONE (813) 272-7104

October 17, 1991

CERTIFIED MAIL NO. P 648 748 373

Ms. Joyce Morales
Environmental and Health Manager
Gulf Coast Recycling, Inc.
1901 N. 66th St.
Tampa, FL 33619

RE: Case No. 00809KLS057
Consent Order

Dear Ms. Morales:

Enclosed please find your signed copy of the Consent Order pertaining to referenced enforcement case. Please note that the date of the Executive Director's signature is the effective date of the Order. All interim and final requirements under the Order are tracked from this date.

Paragraphs nine (9) and (10) ten of the Consent Order require submittal of two checks on or before October 30, 1991. One check in the amount of $5,800.00 should be made payable to the Pollution Recovery Fund of Hillsborough County. The second check in the amount of $142.50 should be made payable to the Environmental Protection Commission of Hillsborough County. The checks may be mailed to my attention at the Air Management Division, EPC, 1410 N. 21st Street, Tampa, FL 33605.

As required in paragraph seven (7), a compliance plan addressing air emissions from the blast furnace is due in this office no later than November 15, 1991. Additionally, paragraph eight (8) requires submittal of a construction permit application by February 13, 1992.

If you have any questions regarding your responsibilities as respondent in this matter, please contact me at (813) 272-5530 for additional assistance.

Thank you for your cooperation.

Sincerely,

Kay Strother

Kay Strother
Enforcement Coordinator
Air Management Division

Enclosure

cc: C. S. Lee, FDER
Sara Fotopulos; Chief Counsel, EPC

RECEIVED

OCT 29 1991

E.P.C. OF H.C.
AIR PROGRAM

LETTER OF TRANSMITTAL

TO: Kay Strother, Environmental Protection Commission

FROM: Joyce Morales-Caramella, Gulf Coast Recycling, Inc.

DATE: October 28, 1991

SUBJECT: Consent Order, Case No. 00809KLS057

MESSAGE:

Enclosed, as per paragraphs nine (9) and ten (10) of the referenced Consent Order, are two checks. One check is made out to the Pollution Recovery Fund of Hillsborough County in the amount of $5800.00. The second check is made out to the Environmental Protection Commission of Hillsborough County in the amount of $142.50.

GULF COAST RECYCLING, INC.
1901 NORTH 66th STREET
TAMPA, FLORIDA 33619
(813) 626-6151

GCR

First Florida Bank
Tampa, Florida
63-26
631

016312

DATE	CHECK NO.	CHECK AMOUNT
10/28/91	16312	$5800.00

PAY TO THE ORDER OF

POLLUTION RECOVERY FUND OF
HILLSBOROUGH COUNTY

Willis M. Kitchen

[redacted]

GULF COAST RECYCLING, INC.

VENDOR NO.

VENDOR NAME

TRANSACTION DATE	REFERENCE	GROSS AMOUNT	DEDUCTION	NET AMOUNT
	EPC CONSENT ORDER-AIR #00809KLS057			
CHECK DATE	CHECK NO.	TOTAL GROSS	TOTAL DEDUCTION	CHECK AMOUNT

GULF COAST RECYCLING, INC.
1901 NORTH 66th STREET
TAMPA, FLORIDA 33619
(813) 626-6151

GCR

First Florida Bank
Tampa, Florida
63-26
631

016313

DATE	CHECK NO.	CHECK AMOUNT
10/28/91	16313	$142.50

PAY TO THE ORDER OF

ENVIRONMENTAL PROTECTION COMMISSION
OF HILLSBOROUGH COUNTY.

Willis M. Kitchen

[redacted]

GULF COAST RECYCLING, INC.

VENDOR NO.

VENDOR NAME

TRANSACTION DATE	REFERENCE	GROSS AMOUNT	DEDUCTION	NET AMOUNT
	EPC CONSENT ORDER - AIR, #00809KLS057.			
CHECK DATE	CHECK NO.	TOTAL GROSS	TOTAL DEDUCTION	CHECK AMOUNT

BEFORE THE
ENVIRONMENTAL PROTECTION COMMISSION
OF HILLSBOROUGH COUNTY

ENVIRONMENTAL PROTECTION COMMISSION
OF HILLSBOROUGH COUNTY
Complainant,

vs. Case No. 00809KLS057

GULF COAST RECYCLING, INC.
Respondent.

CONSENT ORDER

This Consent Order is made and entered into between the Environmental Protection Commission of Hillsborough County ("Commission") and Gulf Coast Recycling, Inc. ("GCR"), pursuant to Chapter 84-446, Laws of Florida and interagency agreement with the Florida Department of Environmental Regulation ("DER").

The Commission alleges the following and nothing herein shall be construed to be an admission of wrong doing by GCR. This document may not be used as evidence in any proceeding, except to enforce the terms thereof.

1. GCR is a corporation duly authorized to conduct business in the State of Florida. GCR owns and operates a facility located at 1901 North 66th Street, Tampa, in Hillsborough County, Florida.

2. GCR's business activities include the recovery of lead from damaged or spent lead-acid batteries. The operation of the secondary lead blast furnace is subject to the requirements of DER Permit No. AO29-173310; the New Source Performance Standards of 40 CFR 60, Subpart L; Federal and State Regulations regarding Prevention of Significant Deterioration ("PSD"); the Federal Implementation Plan ("FIP") contained in 40 CFR 52.535; the Florida Administrative Code and the Rules of the Commission. The three refining kettles are subject to the requirements of DER Permit No. AO29-95365, the New Source Performance Standards, the FIP contained in 40 CFR 52.535, the Florida Administrative Code, and the Rules of the Commission.

3. On August 9, 1990, representatives of PEI Associates, Inc., the United States Environmental Protection Agency ("EPA"), and the DER inspected the GCR's facility at the aforementioned location. For a period of thirty seconds, there was an opacity of 80 percent at the blast furnace slag tap, in violation of the 5 percent opacity standard in 40 CFR 52.535(c)(1)(ii).

4. GCR's number 3 refining kettle was constructed without a DER construction permit. This was in violation of Section 17-2.210, F.A.C., and Section 1-3.21, Rules of the Commission. However, GCR operated the number 3 refining kettle under permit # A029-95365, issued January 28, 1985, with the approval of the Commission and the DER.

5. GCR constructed a blast furnace without a DER construction permit. Prior to the construction of the blast furnace, representatives of GCR, the Commission and DER met to determine whether or not a construction permit was going to be needed. At those meetings, joint decisions were made that the blast furnace could be constructed without a construction permit and that further testing would be needed to decide whether PSD for SO_2 would be triggered. Since previous SO_2 test results on the old furnace were extremely varied and a single SO_2 run did not cover a complete charging cycle, a testing protocol for the old furnace was agreed upon to establish a baseline for SO_2. It was agreed that ten - one hour SO_2 runs would be performed on the furnace and the results from the ten tests would be averaged. This testing protocol was carried out in December 1983. After a comparison of this test data and test results taken subsequently from the newer furnace, it was decided by Agency representatives that PSD was not applicable for SO_2. However, subsequent to this determination, EPA has determined that a construction permit was required at the time in question and has directed the Commission staff to require GCR to submit an after-the-fact construction permit and address PSD for a number of pollutants including SO_2.

6. GCR submitted an after-the-fact permit application, August 2, 1990, for construction of its number 3 refining kettle. Issuance of the final permit is pending.

WHEREFORE, GCR and the Commission mutually agree and it is ORDERED:

7. Within thirty (30) days of the effective date of this Consent Order, GCR shall submit a plan to address air emissions from the blast furnace. The plan shall describe all measures GCR has taken and intends to take to ensure compliance with all applicable opacity regulations.

8. Within one hundred and twenty (120) days of the effective date of this Consent Order, GCR shall submit an after-the-fact construction permit application for the blast furnace. The following items are necessary for the fulfillment of this requirement:

A. The application shall be submitted on DER form 17-1.202(1).

B. Pursuant to Section 17-4.05(3), F.A.C., the application shall be submitted in quadruplicate with original P.E. seals and signatures.

C. The review fee of $400.00, payable to the Hillsborough County Board of County Commissioners, shall be submitted with the application.

D. GCR shall contact the DER to determine the permit review fee and shall submit same, payable to the Florida Department of Environmental Regulation, with the application.

9. Within fifteen (15) days of the effective date of this Consent Order, GCR shall deliver to the Director a check payable to the Pollution Recovery Fund of Hillsborough County in the amount of five thousand eight hundred dollars ($5,800.00). This amount constitutes a reasonable settlement amount ascribed to the above violations.

10. Within fifteen (15) days of the effective date of this Consent Order, GCR shall deliver to the Director a check payable to the Environmental Protection Commission of Hillsborough County in the amount of one hundred forty-two dollars and fifty cents ($142.50). This amount constitutes the reasonable expenses of the Commission for 4.75 hours at $30 each in investigating and resolving this matter.

11. The Commission, for and in consideration of the complete and timely performance by GCR of the obligations agreed to in this Consent Order, hereby waives its right to seek judicial imposition of damages or civil penalties for violations outlined in this Order. GCR waives its right to a hearing or judicial review of this Order.

12. Entry into this Consent Order does not relieve GCR of the need to comply with other applicable federal, state, or local laws, regulations or ordinances. The entry of this Consent Order does not abrogate the rights of substantially affected persons who are not parties to this Consent Order.

13. The Commission hereby expressly reserves the right to initiate appropriate legal action to prevent or prohibit the future violation of applicable statutes, or the rules promulgated thereunder.

14. The terms and conditions set forth in this Consent Order may be enforced in a court of competent jurisdiction. Failure to comply with the terms of this Consent Order is a violation of Chapter 403, Florida Statutes and of Chapter 84-446, Laws of Florida.

15. GCR is fully aware that a violation of the terms of this Consent Order may subject GCR to judicial imposition of damages, civil penalties of up to $10,000 per violation, criminal penalties and costs and expenses incurred in litigating this matter.

16. This Consent Order shall take effect upon the date of execution by the Director of the Commission and shall constitute final agency action by the Commission.

FOR THE RESPONDENT

Witness

Willis M. Kitchen
President

AFFIDAVIT

State of Florida
County of Hillsborough

Before me this day personally appeared Willis M. Kitchen, who being duly sworn, deposes and says that he, Willis M. Kitchen, as president of Gulf Coast Recycling, Inc., ("GCR") at 1901 N. 66th Street, Tampa, Florida, is the authorized representative of GCR, that he is duly authorized under the articles of incorporation and by-laws of GCR to bind GCR by his signature to this Consent Order and that it is his signature which first appears above on behalf of GCR.

Sworn to and subscribed before me this 15th day of October, 1991.

Notary Public
My commission expires

NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP. OCT. 4, 1995
BONDED THRU GENERAL INS. UND.

DONE AND ORDERED this 15 of Oct, 1991 in Tampa, Florida.

Roger P. Stewart, Executive Director
Environmental Protection Commission
of Hillsborough County
1900 Ninth Avenue
Tampa, Florida 33605
(813) 272-5960

tb/gcr.nco
09/24/91

ATTACHMENT IV

Memorandum of September 21, 1983/November 4, 1983
from Joyce Morales-Carmella to the File
Subject: 60 Ton Blast Furnace Permit and Baseline SO2 Emission Rate

MEMORANDUM

To: File

From: Joyce D. Morales-Caramella DMC

Subject: Blast Furnace Permit

Date: September 21, 1983 / November 4, 1983

On September 16, 1983 I discovered that FDER permit #AO29-12482 for the operation of the blast furnaces and slagging furnace at GCL had expired the previous day.

I called Dan Williams at DER and asked for a meeting at DER since we were preparing an application for a new blast furnace and weren't sure what information DER required.

A meeting was held September 21, 1983 and was attended by Jim Essler and Bill Thomas, DER, Jerry Campbell, EPC, Jack Fross, EEC and me.

I explained to the agency people present that GCL wanted to build a 25% larger blast furnace so that we could operate fewer days each year in order to reduce personal exposure levels for OSHA purposes. I also explained that we wanted to incorporate all emission points dealing with blast furnace operations into one permit and that one of these emission points, skip-hoist enclosure ventilation, had never been permited previously.

After much discussion it was decided that since particulate emissions from the blast furnace ventilation were far below the standards, even a 25% increase in emissions would be insignificant and would not trigger PSD. Therefore, neither a construction permit nor a modification permit would be required by DER for the installation of the new furnace. And therefore, we would not have to publish a public notice.

Jim Essler then began questioning what SO_2 emission would be expected and it was decided a 25% increase in SO_2 emissions would be significant and would trigger PSD. I explained that SO_2 emissions have appeared to be dropping and gave some reasons (ie: wetting groups, increase in iron feed, etc.) why this might be happening.

Jim stated that since our last stack test showed 74#/hour SO_2 emissions, this was our actual emissions. However, since a former DER permit application estimated emissions at 99#/hour,they would be willing to use this figure as a cap. We would have to assure them the new blast furnace would not exceed 99#/hour and then we could proceed with aquisition of a permit through the easiest course.

I told them we would have to look at this carefully before making a committment and I would get back with them.

Since our permit was expired, DER and EPC asked that I write a letter explaining that an application was forthcoming.

The skip-hoist enclosure ventilation was discussed and it was decided that an emission test on this source was needed before it could be permitted or incorporated into the blast furnace permit. We agreed to schedule the stack test immediately and submit the results with the permit renewal.

A letter was sent to Jerry Campbell, September 29, 1983, as requested.

Richard Bowman and I reviewed all of the available SO_2 data on GCL for the last five years and decided it was impossible to committ to a 99#/hour cap with either the existing furnace or a new one. Emission test results ranged from 35#/hour to 380#/hour.

I called Dan Williams and requested a second meeting with DER and asked that he attend the meeting also.

Richard Bowman and I met with Dan Williams, Jim Essler, and Bill Thomas on November 4, 1983. Jerry Campbell could not attend the meeting because he was in Atlanta.

The SO_2 data was presented to them in the meeting and the significant variation in results was stressed. After much discussion it was agreed by all present that the actual SO_2 emissions at GCL were unknown. It was also brought out that since the operation of the blast furnace was cyclic, in that once every hour slag is tapped and the smelting process is halted, a twenty minute SO_2 test isn't representative.

We agreed to perform ten to twelve, one hour SO_2 tests and DER agreed these results would determine GCL's SO_2 cap. It was also decided that GCL would apply for a permit renewal on the expired blast furnace permit and that once the new furnace was constructed, we would amend the permit to include the new blast furnace and the skip-hoist ventilation and the slag and lead tap ventilation.

The permit renewal application was submitted to DER and EPC November 7, 1983. SO_2 tests were conducted December 7,8, and 9, 1983. Jerry Campbell inspected the facility, with regard to the permit application, December 5, 1983.

ATTACHMENT V

FDER's Meeting Notes of November 4, 1983

1

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610-9544

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WILLIAM K. HENNESSEY
DISTRICT MANAGER

DATE: 11-4-83

TIME: 2:00 PM

SUBJECT: Gulf Coast Lead Co.

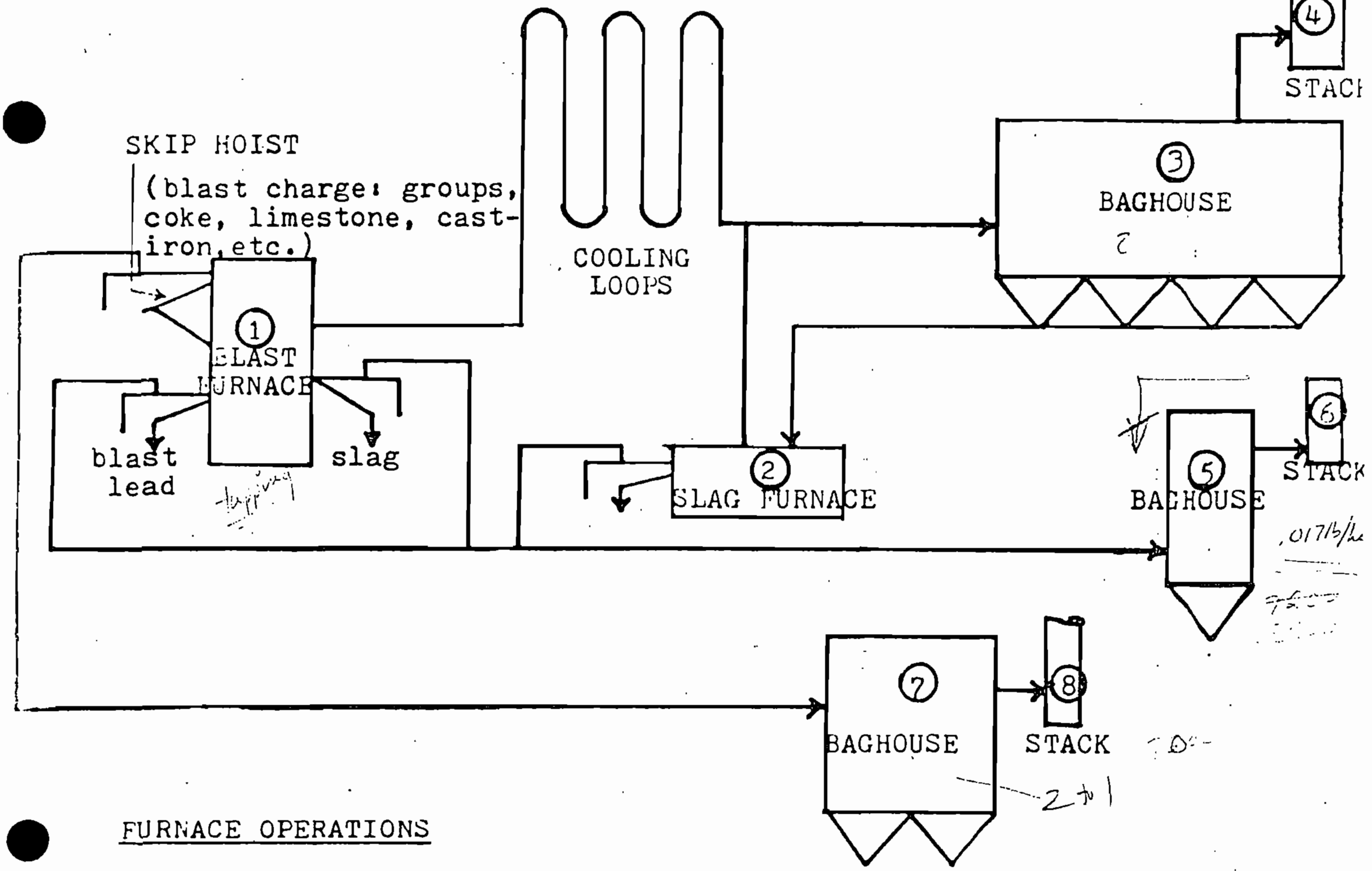
ATTENDEES

Name	Affiliation	Telephone
Dan A. Williams	FDER	985-7402
Richard D Bowman Jr.	Gulf Coast Lead Co	813 626 6151
Joyce D Morales-Casamella	Gulf Coast Lead	"
Jim Estler	FDER	985-7402
Bill Thomas	✓	✓

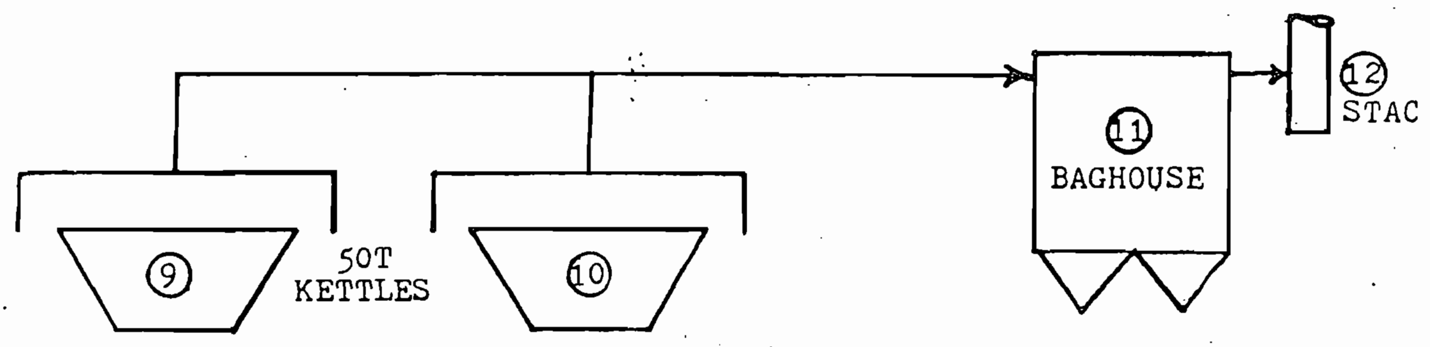
Test Date	Report Date	Process Rate	SO_2	
EPC 3-4-76	3-4-76	2.60T/hr	121.04 130.28 98.47 36.10	
1-2-76	—	2.60T/hr.	37.27 33.39 23.78	
1-19-79	1-29-79	3.2 T/hr	176 172 177	
3-26-80	5-7-80	433 T/hr	255 384 – 314 1	SO_2 max
1-8-81	2-10-81	3.77T/hr.	152 295 188	
12-3-81	12-23-81	3.10T/hr.	152 89 90	
2-[illegible]-83	2-7-83	3.29T/hr	96 55 72	

GULF COAST LEAD COMPANY

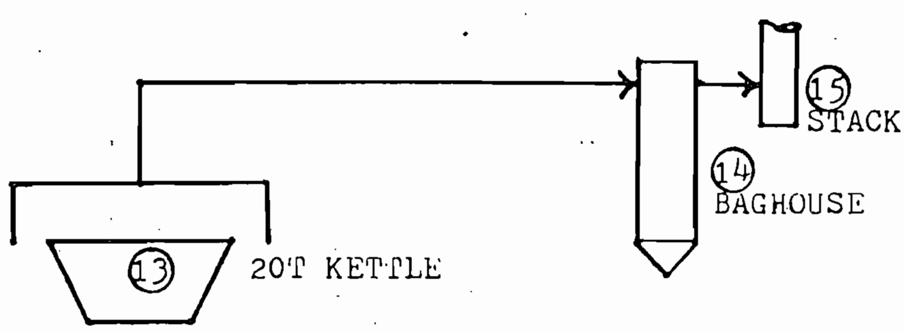
FLOW DIAGRAM



FURNACE OPERATIONS



REFINING OPERATIONS



[illegible] CAST OPERATIONS

ATTACHMENT VI

Letter of December 5, 1983
from Gulf Coast Lead to Environmental Protection Commission
Subject: SO2 Baseline Testing

GULF COAST LEAD CO.
LEAD PRODUCTS -- WHOLESALE ONLY
OFFICE AND PLANT
1901 NORTH 66TH STREET • TAMPA, FLORIDA 33619
PHONE: 626-0303—626-6151

December 5, 1983

Mr. Jerry Campbell
Hillsborough County Environmental
Protection Commission
1900 - 9th Avenue
Tampa, Florida 33605

Dear Mr. Campbell:

As discussed with you by phone, December 1, 1983, Environmental Engineering Consultants will be conducting emission tests for sulfur dioxide at Gulf Coast Lead Company on December 7, 8, and 9, 1983.

In the past, sulfur dioxide emission tests were always conducted over a twenty minute period for the furnaces. While discussing the wide variance in sulfur dioxide results during the past five years, it was decided that a twenty minute test was not representative since the operation of the blast furnace is cyclic. The blast furnace is charged approximately five times each hour and slag is tapped once each hour. While the slag is being tapped the smelting process essentially comes to a hault. In order to determine sulfur dioxide emissions during an entire cycle, the emission tests will be conducted for one hour each. Flow rates will be adjusted accordingly.

We respectfully request that a representative from the EPC and a representative from DER come out to Gulf Coast Lead Company to monitor the emissions tests since the results will be the basis for our sulfur dioxide cap.

If you have any questions please don't hesitate to call.

Sincerely,

GULF COAST LEAD COMPANY

Joyce D. Morales-Caramella

Joyce D. Morales-Caramella
Safety & Environmental Director

ATTACHMENT VII

Environmental Protection Commission
Inspection Report of
December 5, 1983

HILLSBOROUGH COUNTY ENVIRONMENTAL
PROTECTION COMMISSION

INSPECTION REPORT
EXECUTIVE SUMMARY

COMPANY NAME: Gulf Coast Lead NEDS: 57 DATE/TIME: Dec 5 83 AM

PLANT LOCATION: Tampa # OF POINTS: 1

PROCESS DESCRIPTION: 0057 · 01

TYPE OF INSPECTION:

COMPLIANCE VERIFICATION ( ) PERMIT REVIEW (✓)
EMISSIONS INVENTORY ( ) OTHER ( )

PERSONS CONTACTED/TITLE: Joyce Morales + Richard Bowman

OF POINTS CHECKED: 1 # IN COMPLIANCE: 1 # IN VIOLATION:

SUMMARY OF FINDINGS: Looked at blast furnace operation with regard to permit renewal for baghouse on A029-12482. Confirmed that screw conveyor which precipitated a NOAV in 11/82 was replaced as Gulf Coast committed too. Richard pointed out damper on cooling coils which controls the draw of makeup air before the contaminated air is drawn through the baghouse. The damper is set in response to the temperature of the air entering the baghouse which should be 180-220°F.

RECOMMENDATIONS, IF ANY:

REFFERED TO:

INSPECTOR'S SIGNATURE: Terry Campbell

ATTACHMENT VIII

Memorandum from Jerry Campbell of EPC to FDER
Subject: Recommended Conditions for the Blast Furnace Permit

COUNTY OF HILLSBOROUGH

MEMORANDUM

Date Dec. 7, 1983

To Jim Estler through Bill Thomas JC

From Jerry Campbell, E.P.C.

Subject: RENEWAL OF A029-12482 FOR GULF COAST LEAD'S BLAST FURNACE

Having reviewed their application, I recommend approval for this source to be issued an operating permit. I further recommend that the following specific conditions apply to the new permit:

1) The maximum allowable particulate emission shall be 2.0 pounds per hour and 8.16 tpy as requested by the applicant to exempt the facility from F.A.C. 17-2-650.

2) The opacity from the baghouse shall not exceed 20 percent (HCEPC Chapter 1-3.031.).

3) Within 60 days of receipt of this operating permit, the applicant will have conducted SO_2 emission testing by methods approved by the Hillsborough County EPC and the Florida DER to establish the actual emissions from this source. The results of these test shall be reported to the regulatory agencies listed above in this same period. At that time the EPC and the DER will set an SO_2 emission limiting standard which shall become a part of this permit.

4) The compliance test shall consist of an annual test for particulates, lead particulate, SO_2 and opacity. The lead particulate emissions shall be determined by analysis of the probe wash, the filter wash and the filter. This analysis does not require a method #12 test as per 40CFR60 Appendix A, but the method shall be subject to the approval of the Hillsborough County EPC. The opacity test shall be conducted during the stack testing and it shall be at least 30 minutes in duration (H.C.E.P.A. Chapter 67-1504 Section 12).

5) The Hillsborough County EPC shall be notified 30 days in advance of any compliance test to be conducted on this source.

6) The compliance test shall be conducted at -/+ 10 percent of the maximum permitted process rate of 4.67 tons of raw materials input per hour.

7) Only one of the two blast furnaces covered under this permit may be operated at one time.

8) A fuel analysis from the supplier shall be submitted with the annual compliance test.

9) The annual operating report for this source shall be submitted to the Hillsborough County EPC on or before March 1 of each year of this permit.

10) The combined total hours of operation for the 2 blast furnaces shall not exceed 8160 hours per year as requested by the applicant to exempt the facility from F.A.C. 17-2.650.

JC/b

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610-9544

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

RICHARD D. GARRITY, PH.D.
DISTRICT MANAGER

PERMITTEE	PERMIT/CERTIFICATION
Name	Permit No.:
Company	County:
Address	Expiration Date:
	Project:

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 & 17.4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

Description: For the operation of two secondary lead dust furnace ([illegible]) and one flue dust agglomeration furnace. The 60 ton [illegible] furnace installed in 1984 shall be designated the primary furnace with the 40 ton capacity [illegible] designated the backup furnace. The dust furnace operation is controlled by three sets of baghouses. The main baghouse controls the furnace exhaust (point 01) while the other units control the tapping (point 04) and the charging (point 06).

Location:

1901 N. 66th Street
Tampa, Fl 33619

UTM: 17- 364.049 E 3092.543 N   NEDS NO: 57   Point ID: 01 (Furnace Operation)
04 (Tapping Operation)
06 (Charging Operation)

Replaces Permit No.
A029-78246 (Furnace Operation)
A029-41831 (Tapping Operation)

[illegible] (cont.)

with [illegible] is [illegible] to [illegible] (for [illegible]). Kettle #[illegible] [illegible] kettle and [illegible] to [illegible]. Kettle #[illegible] is used exclusively to [illegible] [illegible] Kettle #1. Kettle #2 is [illegible] [illegible]. Kettle #2 was [illegible] as a result of 130-150 charges of [illegible] when it functioned as Kettle #1. The [illegible] cast malt kettle is charged with [illegible] lead and scrap to [illegible] (4-6 [illegible]).

ATTACHMENT IX

Emissions Test Report - 1983
Establishing Baseline SO2
Emission Rates for the 40 Ton Blast Furnace

EMISSIONS TEST REPORT - 1983

GULF COAST LEAD COMPANY

BLAST FURNACE SULFUR DIOXIDE

Prepared For:

GULF COAST LEAD COMPANY
1901 66TH STREET NORTH
TAMPA, FLORIDA

Prepared By:

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.
5119 NORTH FLORIDA AVENUE
TAMPA, FLORIDA

January 4, 198~~3~~4

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I. SUMMARY

II. SOURCE DESCRIPTION

III. METHODS AND PROCEDURES

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APPENDIX B - Process Weight Statement

APPENDIX C - Calibration Data

APPENDIX D - Chain of Custody

I. SUMMARY

On December 7, 8, and 9, 1983 Environmental Engineering Consultants, Inc. conducted a series of sulfur dioxide emissions tests on the blast furnace stack at Gulf Coast Lead Company in Tampa, Florida. These tests were performed to establish an average sulfur dioxide emissions rate for the blast furnace.

The tests were conducted by Carl Fink and Bob Soich of Environmental Engineering Consultants, Inc. with the assistance and cooperation of Richard Bowman and the employees of Gulf Coast Lead Company.

A summary of the test results is shown in Table 1. The average sulfur dioxide emission rate was 374 pounds per hour at an average production rate of 2.30 tons per hour of lead.

I hereby certify that these results are true and correct and were obtained by the procedures and methods described herein.

Respectfully Submitted;

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

Carl F. Fink

Carl F. Fink
Test Team Leader
Associate Engineer

Jack R. Fross

Jack R. Fross
Principal

TABLE 1

TEST SUMMATION

PLANT: Gulf Coast Lead

SOURCE: Blast Furnace

DATE: December 7, 8, 9, 1983

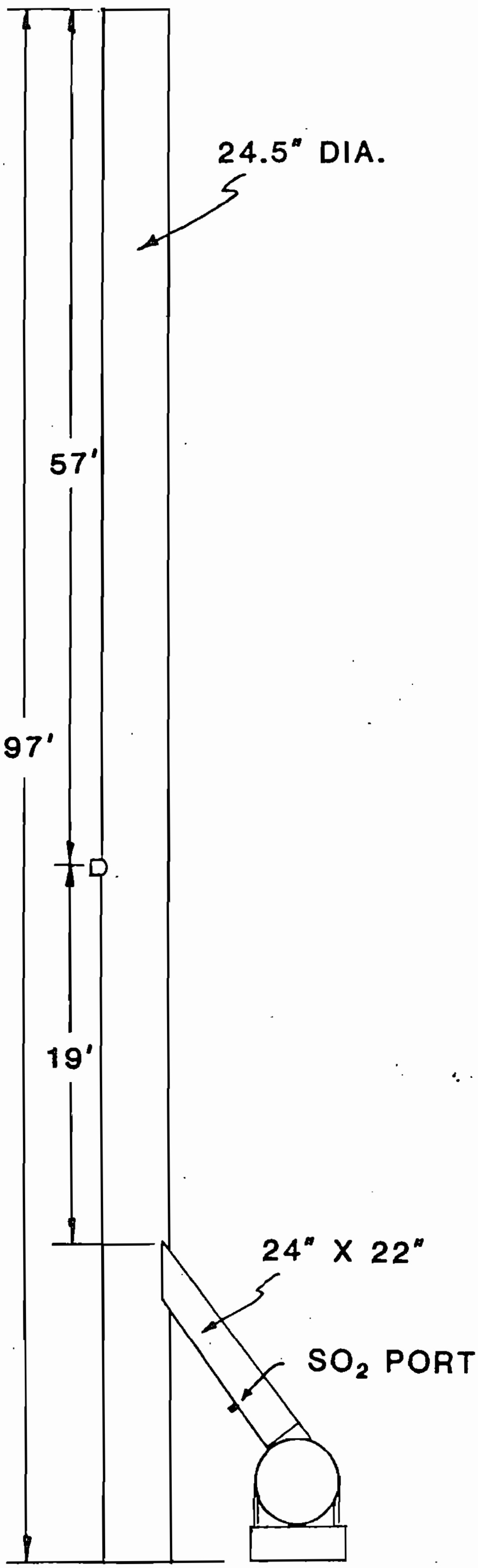
RUN	DSCF	SCFM	SULFUR DIOXIDE lbs/hr
1	.850	12,838	114
2	.852	12,838	375
3	.838	13,734	518
4	.839	13,734	33
5	.865	13,734	399
6	.848	13,734	330
7	.844	13,308	398
8	.846	13,308	466
9	.842	13,308	490
10	.836	13,308	618
		Average	374

II. SOURCE DESCRIPTION

Gulf Coast Lead Company recovers lead from damaged or spent lead-acid storage batteries. Battery groups and posts are removed from the batteries and resmelted in a blast furnace. The blast lead is poured into 4,200 pound "buttons". These buttons are then resmelted and cast into boat keels or the lead is refined or alloyed to customer specifications.

Dust and fume from the blast furnace and the slagging furnace are collected, routed through a series of cooling loops and forced through a fabric baghouse collector prior to discharge through a stack. The stack is 24.5 inches in diameter, 97 feet high with one sample port, facing north, located at 40 feet. The sampling port is located 24 stack diameters upstream and 9 diameters downstream of any flow disturbances.

For the sulfur dioxide tests, a sample port was installed in the 22 in. x 24 in. rectangular duct leading from the fan to the exhaust stack. (See Figure 1)



PT. NO.	DIST.(IN.)
1	1.00 *
2	1.64
3	2.89
4	4.34
5	6.13
6	8.70
7	15.80
8	17.25
9	20.16
10	21.61
11	22.86
12	23.50 *

* Points adjusted to 1 inch from stack wall.

SAMPLING POINTS
GULF COAST LEAD - BLAST STACK

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.
CONSULTING ENGINEERS & ENVIRONMENTAL SCIENTISTS

Figure 1

III. METHODS AND PROCEDURES

FDER Methods 1 and 2 were used to obtain the sampling port locations and determine stack velocity and volumetric flow rate, respectively. EPA Method 6 (with modifications discussed below) was used for sampling and analysis of sulfur dioxide.

SAMPLING

The sulfur dioxide emission rates were measured using EPA Method 6 with the following exceptions:

1. The sampling time was increased to 60 minutes to avoid unrepresentative values due to charging and drossing operations. In conjunction with the increased sampling time, the sampling rate was reduced to 400 cc/min to keep the total sample at an appropriate level for the analytical procedure.
2. The volume of gas sampled was determined with a mass flowmeter calibrated with NBS traceable standards.

The Method 6 sampling train was assembled as shown in Figure 2 for each sulfur dioxide test. A 1/4 inch diameter stainless steel probe, 18 inches long, with a glass wool plug was inserted about 12 inches into the duct. The probe was connected to the impingers with a teflon union fitting.

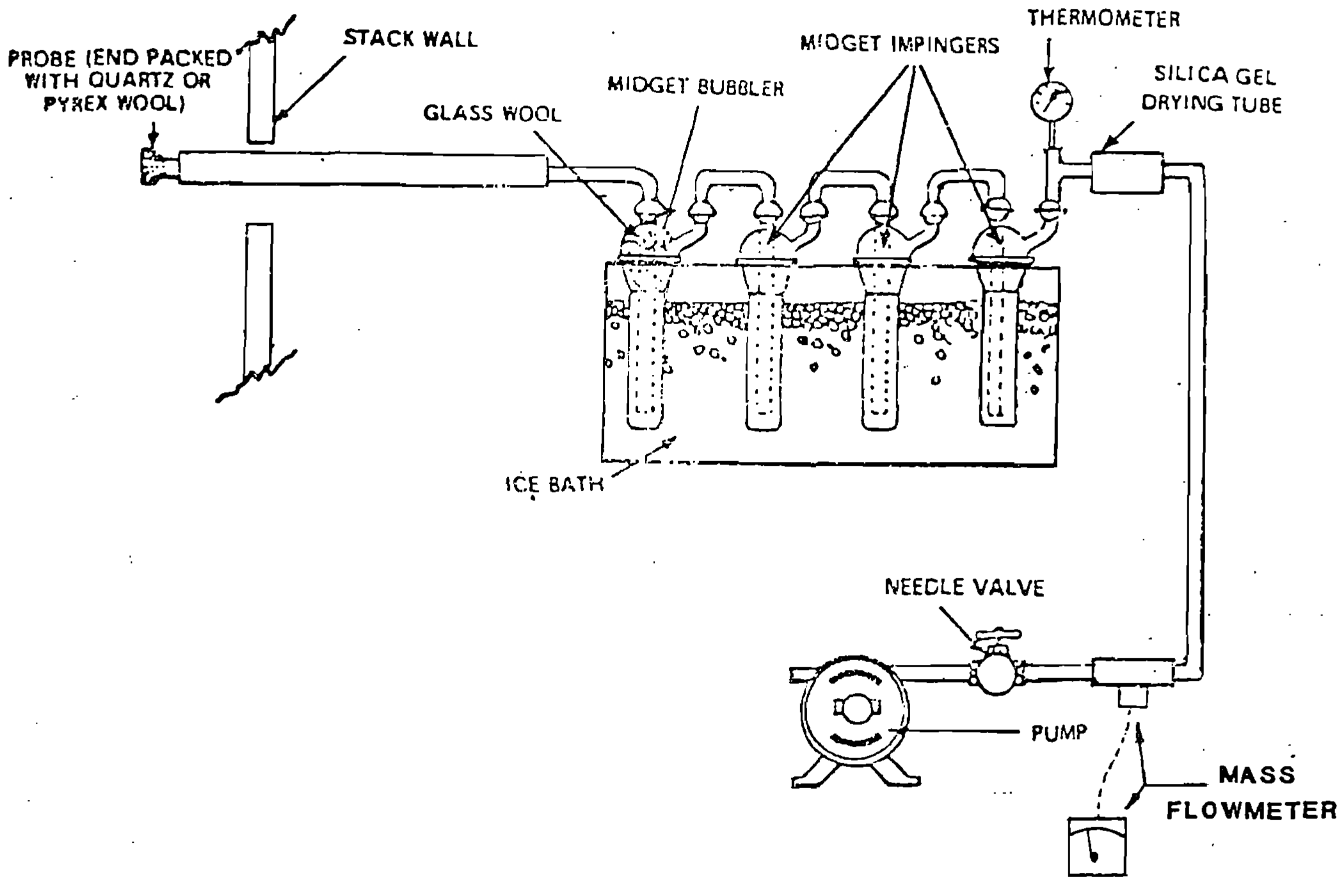
The first midget impinger was charged with 15 ml of 2-propanol; the second and third were charged each with 15 ml of 6% hydrogen peroxide; and the fourth was dry. The entire sampling train was immersed in an ice bath to maintain the temperature of the gas leaving the last impinger below 68 ^{o}F. This temperature was monitored throughout the test with a thermocouple in the outlet line from the final impinger.

The sampling flowrate was adjusted to approximately 400 cubic centimeters per minute as indicated by an in-line mass flow meter. At the end of each sixty minute sampling period, a leak check was performed by pulling a vacuum of 10 in. Hg. at the inlet of the first impinger, plugging the outlet of the flow meter, turning off the pump, and observing a stable vacuum reading for 30 seconds. The ice bath was then drained and the sampling system purged with ambient air for 20 minutes at the rate of approximately one liter per minute.

At the end of each purge period, the 2-propanol was discarded and the contents of the other three midget impingers transferred quantitatively to a polyethylene container for laboratory analysis. Distilled water rinses of the midget impingers and connecting glassware were added to the sampler container. The train was then charged and reassembled for the next run. A reagent sample blank was prepared from the peroxide solution used for charging the impingers.

ANALYSIS

Sulfur dioxide concentrations were obtained using the barium-thorin procedure as described in 40 CFR 60 Method 6. The analyses were performed by Interscience, Inc. under the direction of Dr. Thomas A. Jackman.



METHOD 6 SAMPLING TRAIN

Figure 2

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

CONSULTING ENGINEERS, ENVIRONMENTAL SCIENTISTS

APPENDIX A

Test Data and Calculations

SOURCE TESTING NOMENCLATURE AND DIMENSIONS

An:	Cross sectional area of nozzle, ft^2
As:	Cross sectional area of stack, ft^2
Bws:	Water vapor in the gas stream, proportion by volume
Cs:	Concentration of particulate matter in stack gas at standard conditions, gr/dscf
Cp:	Pitot tube coefficient
E:	Source emission rate, lbs/hr
I:	Percent of isokinetic sampling
Md:	Molecular weight of stack gas, dry basis, lb/lb-mole
Ms:	Molecular weight of stack gas, wet basis, lb/lb-mole
Mn:	Total particulate collected, less acetone blank correction; grams
Pb:	Barometric pressure at test site, in. Hg
Ps:	Absolute stack gas pressure, in. Hg
Qs:	Volumetric flow rate, dry at standard conditons, SCFM
Tm:	Absolute average dry gas meter temperature, ^{o}R
Ts:	Absolute average stack gas temperature, ^{o}R
Vlc:	Total volume of liquid collected in impingers and silica gel, ml
Vm:	Volume of gas sampled under actual conditons, DCF
Vm(std):	Volume of gas sampled corrected to standard conditions, DSCF

Vs: Stack gas velocity, ft/sec

Vw: Volume of water in sample corrected to standard conditions, DSCF

Y: Dry gas meter calibration factor

θ: Total sampling time, min.

^P: Velocity head, in H2O

^H: Averge pressure differential across orifice meter, in. H2O

SUMMARY OF TEST DATA

Plant: Gulf Coast Lead   Source: Blast Furnace

Date: December 7, 8, 9, 1983   Parameter: Velocity Traverse

Date:	12-7-83	12-8-83	12-9-83
Time:	1345	1335	1300
Stack Area, sq. ft.:	3.274	3.274	3.274
Barometric Pressure, in. Hg.:	30.20	30.24	30.24
Absolute Stack Pressure, in. Hg:	30.16	30.20	30.20
Assumed Moisture, %:	2.34	2.34	2.34
Stack Temperature, $^{\circ}$F:	167	161	171
Gas Velocity, FPS:	78.894	83.481	82.197
Gas Flowrate, SCFM:	12,838	13,734	13,308

SUMMARY OF TEST DATA

Plant: Gulf Coast Lead

Source: Blast Furnace

Date: December 7, 8, and 9, 1983

Emission: Sulfur Dioxide

Date:	12-7-83	12-7-83	12-8-83	12-8-83	12-8-83
Start Time:	1421	1552	1054	1203	1312
Sample Vol., Liters:	24.08	24.13	23.74	23.76	24.48
Sample Vol., DSCF:	.850	.852	.838	.839	.865
Gas Flowrate, SCFM:	12,838	12,838	13,734	13,734	13,734
Sulfur Dioxide, meq:	1.78	5.87	7.46	0.48	5.93
Emission Rate, lb/hr:	113.9	374.7	518.0	33.3	398.9

Date:	12-8-83	12-9-83	12-9-83	12-9-83	12-9-83
Start Time:	1435	0818	0926	1035	1142
Sample Vol., Liters:	24.02	23.90	23.97	23.84	23.66
Sample Vol., DSCF:	.848	.844	.846	.842	.836
Gas Flowrate, SCFM:	13,734	13,308	13,308	13,308	13,308
Sulfur Dioxide, meq.:	4.81	5.95	6.99	7.31	9.17
Emission Rate, lb/hr:	330.0	397.5	465.8	489.5	618.4

PLANT Gulf Coast Lead Co.

SOURCE Blast Furnace

DATE 12-7-83

RUN NO. 1

SAMPLE CALCULATION

CALIBRATION

C_p 0.84

Y —

D_n — in.

A_n — ft^2

NEW DATA

P_b 30.20 in. Hg.

P_s 30.16 in. Hg.

A_s 3.274 ft^2

θ 60 min.

V_m 24.08 liters

ΔH — in. H_2O

T_m — °R

T_s 627 °R

V_{lc} — ml

$(\sqrt{\Delta P})_{avg.}$ 1.2918

M_n — g.

SO_2 1.78 meq.

SAMPLE CALCULATION

$$V_{m(std)} = \frac{17.64\, V_m Y\, (P_b + \Delta H/13.6)}{T_m} = (24.08)(.0353)$$

liters ft^3/liter

$$\frac{17.64(\quad)(\quad)(\quad + \frac{\quad}{13.6})}{(\quad)} = \underline{0.850}\ \text{DSCF}$$

$$V_w = 0.0471\, V_{lc} = 0.0471(\quad) = \underline{\quad —\quad}\ \text{SCF}$$

$$B_{ws} = \frac{V_w}{V_w + V_{m(std)}} = \frac{(\ —\ )}{(\ —\ )+(\ —\ )} = \underline{.0234}$$

Assumed from previous tests

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

$$0.44(\quad) + 0.32(\quad) + 0.28(\quad) = \text{Assume } 29.0$$

$$M_s = M_d(1-B_{ws}) + 18\,B_{ws} = (29.0)(.9766) + 18(.0234) = \underline{28.7426}$$

$$V_s = 85.49\, C_p\, (\sqrt{\Delta P})_{avg.}\, (T_s / P_s M_s)^{1/2} =$$

$$85.49(.84)(1.2918)\left[\frac{(627)}{(30.16)(28.7426)}\right]^{1/2} = \underline{78.8942}\ \text{FPS}$$

$$Q_s = 1058\,(1-B_{ws})\, V_s\, A_s\, (P_s/T_s) =$$

$$1058\,(.9766)(78.8942)(3.274)\frac{(30.16)}{(627)} = \underline{12,838}\ \text{SCFM}$$

$$I = \frac{100\, V_{m(std)}\, A_s}{\theta\, Q_s\, A_n} = \frac{100(\quad)(\quad)}{(\quad)(\quad)(\quad)} = \underline{\qquad}\ \%$$

$$C_{SO_2} = \frac{(7.061 \times 10^{-5})(\text{meq. } SO_2)}{V_{m(std)}} = \underline{1.4787 \times 10^{-4}}\ \text{lb/DSCF}$$

$$E = 60\, C_{SO_2}\, Q_s = \underline{113.9}\ \text{lb/hr } SO_2$$

SOURCE SAMPLING CALCULATION SHEET

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

CONSULTING ENGINEERS, ENVIRONMENTAL SCIENTISTS

INTERSCIENCE, INC.

December 22, 1983

Environmental Engineering Consultants
P.O. Box 7854
Tampa, Florida 33673

Attn: Mr. Carl Fink

Re: Project Number: 83040-20
Analysis of Samples for SO_2 Gulf Coast Lead
Sample Numbers: 12-075 through 12-085

METHODOLOGY

These samples were analyzed using the analytical protocol cited in USEPA Method 6 - Determination of Sulfur Dioxide Emissions from Stationary Sources.

RESULTS

Sample Description			SO_2, milliequivalents
12-075	Blank H_2O_2		0
12-076	GCL-1	12/7/83	1.78
12-077	GCL-2	12/7/83	5.87
12-078	GCL-3	12/8/83	7.46
12-079	GCL-4	12/8/83	0.48
12-080	GCL-5	12/8/83	5.93
12-081	GCL-6	12/8/83	4.81
12-082	GCL-7	12/8/83	5.95
12-083	GCL-8	12/8/83	6.99
12-084	GCL-9	12/8/83	7.31
12-085	GCL-10	12/8/83	9.17

The remaining samples will be discarded December 31, 1983 unless we are otherwise notified.

Interscience, Inc. operates as an independent contractor and does not guarantee any particular results other than its best efforts.

Respectfully submitted,

INTERSCIENCE, INC.

Michael Jackman / By CAO

Michael C. Jackman
Analyst

Approved by,

Jackman

Thomas A. Jackman, Ph.D.
Laboratory Director

MCJ:cao

FIELD DATA LOG

PLANT: GULF COAST LEAD SOURCE: BLAST FURNACE

NOZZLE I.D. NO.	
DIA 1	
DIA 2	
DIA 3	
AVERAGE	

FINAL VOLUME ______
INITIAL VOLUME ______
NET VOLUME ______

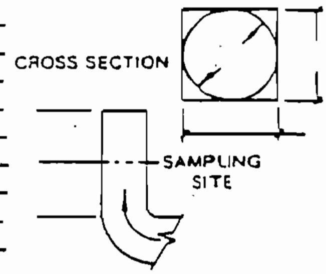
RUN NO: VELOCITY TRAVERSE
DATE: 12-7-83
OPERATORS ______
METER BOX NO ______
FILTER NO ______

NOMOGRAPH VALUES

ΔH@ ______ C FACTOR ______
Tm ______ AVG ΔP ______
%H2O ______ T_s ______
REFERENCE ______

BAROMETRIC PRESSURE: 30.20
STATIC PRESSURE ______
AMBIENT TEMPERATURE ______
PROBE LENGTH ______
PROBE LINER ______
PORT LENGTH ______
PORT DIAMETER ______
METER SYSTEM LEAK-CHECK ______
ORSAT LEAK-CHECK ______
SAMPLE BAG LEAK-CHECK ______

SCHEMATIC OF STACK



TRAVERSE POINT NUMBER	SAMPLING TIME CLOCK	SAMPLING TIME SAMPLE	STACK TEMP (T_s) °F	VELOCITY HEAD (ΔPs)	VELOCITY HEAD (√ΔPs)	ORIFICE METER (ΔH)	GAS SAMPLE VOLUME (Vm) ft³	DRY GAS METER TEMP (Tm) °F	PROBE TEMP °F	SAMPLE BOX TEMP °F	TEMP OF GAS LEAVING LAST IMPINGER °F	PUMP VACUUM GAUGE in. Hg
	1:45											
1			153	1.20								
2			163	1.28								
3			165	1.55								
4			167	1.75								
5			169	1.90		SP =	-.55					
6			169	1.95								
7			170	2.05								
8			170	2.05								
9			171	2.00								
10			171	1.85								
11			170	1.55								
12			169	1.10								
TOTAL												
AVERAGE												

STATIC PITOT LEAK-CHECK @ 15 sec	✓
IMPACT PITOT LEAK-CHECK @ 15 sec	✓
TRAIN LEAK RATE @ 60 sec	cf @ in

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

VOLUME OF LIQUID WATER COLLECTED	IMPINGER WEIGHT (g) OR VOLUME (ml) 1	2	3	4
FINAL				
INITIAL				
LIQUID COLL.				
TOTAL VOLUME				

GAS MEASUREMENTS

	TIME	CO_2	O_2	CO	N_2
1					
2					
3					
4					

SIGNATURE: [signature]
TEST TEAM CHIEF

FIELD DATA LOG

PLANT: GULF COAST LEAD   SOURCE: BLAST FURNACE

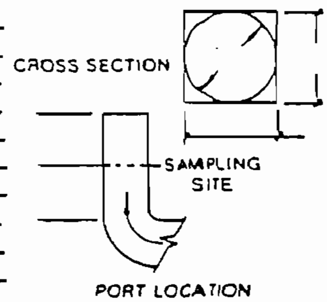
NOZZLE I.D. NO.	
DIA 1	
DIA 2	
DIA 3	
AVERAGE	

RUN NO: VELOCITY TRAVERSE
DATE: 12-8-83
OPERATORS:
METER BOX NO:
FILTER NO:

NOMOGRAPH VALUES	
ΔH@	C FACTOR
Tm	AVG ΔP
%H2O	T_s
REFERENCE	

BAROMETRIC PRESSURE: 30.24
STATIC PRESSURE:
AMBIENT TEMPERATURE:
PROBE LENGTH:
PROBE LINER:
PORT LENGTH:
PORT DIAMETER:
METER SYSTEM LEAK-CHECK:
ORSAT LEAK-CHECK:
SAMPLE BAG LEAK-CHECK:

SCHEMATIC OF STACK



FINAL VOLUME												
INITIAL VOLUME												
NET VOLUME												

TRAVERSE POINT NUMBER	SAMPLING TIME CLOCK	SAMPLING TIME SAMPLE	STACK TEMP. (T_s) °F	VELOCITY HEAD (ΔPs)	VELOCITY HEAD ($\sqrt{\Delta Ps}$)	ORIFICE METER (ΔH)	GAS SAMPLE VOLUME (Vm) ft³	DRY GAS METER TEMP (Tm) °F	PROBE TEMP °F	SAMPLE BOX TEMP °F	TEMP OF GAS LEAVING LAST IMPINGER °F	PUMP VACUUM GAUGE in. Hg
12-8-83	1:35											
1			156	1.45								
2			158	1.55								
3			159	1.90								
4			161	2.05		P_B =	30.24					
5			161	2.30								
6			161	2.20		Static press =						
7			162	2.20								
8			162	2.38								
9			163	2.18								
10			163	2.05								
11			162	1.45								
12			162	1.20								
12-9-83	[illegible]		T_s	ΔP								
1	1:00		166	1.08								
2			171	1.55								
3			171	1.55			P_B =	30.24				
4			172	1.80		~~SP~~						
5			172	2.00								
6			171	2.20								
7			172	2.30		SP =	−0.55					
8			172	2.40								
9			172	2.25								
10			171	1.45								
11			171	1.75								
12			171	1.30								
TOTAL												
AVERAGE												

STATIC PITOT LEAK-CHECK @ 15 sec	✓
IMPACT PITOT LEAK-CHECK @ 15 sec	✓
TRAIN LEAK RATE @ 60 sec	cf @ in

VOLUME OF LIQUID WATER COLLECTED	IMPINGER WEIGHT (g) OR VOLUME (ml) 1	2	3	4
FINAL				
INITIAL				
LIQUID COLL.				
TOTAL VOLUME				

GAS MEASUREMENTS

	TIME	CO_2	O_2	CO	N_2
1					
2					
3					
4					

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

SIGNATURE: Carl Fal
TEST TEAM CHIEF

FIELD DATA LOG

PLANT: Gulf Coast Lead   SOURCE: Blast Furnace

NOZZLE I.D. NO.	
DIA 1	
DIA 2	
DIA 3	
AVERAGE	

FINAL VOLUME	
INITIAL VOLUME	
NET VOLUME	

RUN NO: SO_2
DATE: 12-7-83
OPERATORS: Fink
METER BOX NO:
FILTER NO:

NOMOGRAPH VALUES			
ΔH@		C FACTOR	
Tm		AVG ΔP	
%H2O		T_s	
REFERENCE			

BAROMETRIC PRESSURE:
STATIC PRESSURE:
AMBIENT TEMPERATURE:
PROBE LENGTH:
PROBE LINER:
PORT LENGTH:
PORT DIAMETER:
METER SYSTEM LEAK-CHECK:
ORSAT LEAK-CHECK:
SAMPLE BAG LEAK-CHECK:

SCHEMATIC OF STACK

CROSS SECTION

SAMPLING SITE

PORT LOCATION

TRAVERSE POINT NUMBER	SAMPLING TIME CLOCK	SAMPLING TIME SAMPLE	STACK TEMP (T_s) °F VOLTS	VELOCITY HEAD ~~ΔP~~ Flowrate	VELOCITY HEAD ~~√ΔP~~ Outlet Temp	ORIFICE METER (ΔH)	GAS SAMPLE VOLUME (V_m) ft³	DRY GAS METER TEMP (T_m) °F	PROBE TEMP °F	SAMPLE BOX TEMP °F	TEMP OF GAS LEAVING LAST IMPINGER °F	PUMP VACUUM GAUGE in. Hg
	2:21	0	~~200~~	~~[illegible]~~ 400	~~[illegible]~~ 55							
SO_2 #1	[illegible]	5	.200	400 cu	55							
		10	.202	404 cu	55							
		15	.204	408 cu	54							
		20	.202	404 cu	55							
		25	.199	396	55							
		30	.200	400	55							
		35	.198	396	55							
		40	.198	396	55							
		45	.198	396	55							
		50	.198	396	55							
		55	.209	418	55							
		60	.200	400	56							
				24.0[illegible]								
SO_2 #2	3:52	0	.200	400 cu	54							
		5	.201	402	54							
		10	.198	396	54							
		15	.203	406	54							
		20	.202	404	52							
		25	.202	404	52							
		30	.202	404	53							
		35	.202	404	52							
		40	.202	404	53							
		45	.200	400	53							
		50	.200	400	53							
		55	.201	402	53							
		60	.200	400	53							
				24.[illegible]	[illegible]							
TOTAL												
AVERAGE												

STATIC PITOT LEAK-CHECK @ 15 sec	
IMPACT PITOT LEAK-CHECK @ 15 sec	
TRAIN LEAK RATE @ 60 sec	cf @ in

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

VOLUME OF LIQUID WATER COLLECTED	IMPINGER WEIGHT (g) OR VOLUME (ml) 1	2	3	4
FINAL				
INITIAL				
LIQUID COLL.				
TOTAL VOLUME				

GAS MEASUREMENTS

	TIME	CO_2	O_2	CO	N_2
1					
2					
3					
4					

SIGNATURE: Carl Fink
TEST TEAM CHIEF

FIELD DATA LOG

PLANT: GULF COAST LEAD

SOURCE: BLAST FURNACE

NOZZLE I.D. NO.	
DIA 1	
DIA 2	
DIA 3	
AVERAGE	

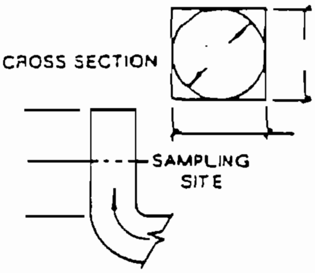
FINAL VOLUME	
INITIAL VOLUME	
NET VOLUME	

RUN NO: SO_2
DATE: 12-8-83
OPERATORS: FINK
METER BOX NO:
FILTER NO:

NOMOGRAPH VALUES	
ΔH@	C FACTOR
Tm	AVG ΔP
%H2O	T_s
REFERENCE	

BAROMETRIC PRESSURE:
STATIC PRESSURE:
AMBIENT TEMPERATURE: 65°F
PROBE LENGTH:
PROBE LINER:
PORT LENGTH:
PORT DIAMETER:
METER SYSTEM LEAK-CHECK:
ORSAT LEAK-CHECK:
SAMPLE BAG LEAK-CHECK:

SCHEMATIC OF STACK



TRAVERSE POINT NUMBER	SAMPLING TIME CLOCK	SAMPLING TIME SAMPLE	STACK TEMP (T_s) °F	VELOCITY HEAD (ΔPs)	VELOCITY HEAD ($\sqrt{\Delta Ps}$)	ORIFICE METER (ΔH)	GAS SAMPLE VOLUME (V_m) ft³	DRY GAS METER TEMP (T_m) °F	PROBE TEMP °F	SAMPLE BOX TEMP °F	TEMP OF GAS LEAVING LAST IMPINGER °F	PUMP VACUUM GAUGE in. Hg
			VELO	FLOW RATE	CUT TIME							
	10:54	0	.199	398	49							
SO_2 #3		5	.200	400	48							
		10	.192	384	50							
		15	.199	398	51							
		20	.196	392	52							
		25	.196	392	53							
		30	.190	380	53							
		35	.200	400	53							
		40	.203	406	53							
		45	.203	406	54							
		50	.198	396	54							
		55	.196	392	54							
		60	.202	404	55							
	12:03	0	.201	402	51							
SO_2		5	.199	398	51							
#4		10	.202	404	50							
		15	.204	408	50							
		20	.199	398	50							
		25	.201	402	51							
		30	.196	392	51							
		35	.198	396	50							
		40	.196	392	51							
		45	.190	380	51							
		50	.196	392	50							
		55	.194	388	50							
		60	.201	402	51							
TOTAL												
AVERAGE												

STATIC PITOT LEAK-CHECK @ 15 sec	
IMPACT PITOT LEAK-CHECK @ 15 sec	
TRAIN LEAK RATE @ 60 sec	cf @ in

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

VOLUME OF LIQUID WATER COLLECTED	IMPINGER WEIGHT (g) OR VOLUME (ml) 1	2	3	4
FINAL				
INITIAL				
LIQUID COLL.				
TOTAL VOLUME				

GAS MEASUREMENTS	TIME	CO_2	O_2	CO	N_2
1					
2					
3					
4					

SIGNATURE: Carl Fink
TEST TEAM CHIEF

FIELD DATA LOG

PLANT: GULF COAST LEAD   SOURCE: BLAST FURNACE

NOZZLE I.D. NO	
DIA 1	
DIA 2	
DIA 3	
AVERAGE	

FINAL VOLUME	
INITIAL VOLUME	
NET VOLUME	

RUN NO: SO_2
DATE: 12-8-83
OPERATORS: FINK
METER BOX NO:
FILTER NO:

NOMOGRAPH VALUES

ΔH@		C FACTOR	
Tm		AVG. ΔP	
%H_2O		C_p	
REFERENCE			

BAROMETRIC PRESSURE:
STATIC PRESSURE:
AMBIENT TEMPERATURE: 70°F
PROBE LENGTH:
PROBE LINER:
PORT LENGTH:
PORT DIAMETER:
METER SYSTEM LEAK CHECK:
ORSAT LEAK CHECK:
SAMPLE BAG LEAK CHECK:

SCHEMATIC OF STACK

CROSS SECTION

SAMPLING SITE

PORT LOCATION

TRAVERSE POINT NUMBER	SAMPLING TIME CLOCK	SAMPLING TIME SAMPLE	STACK TEMP ~~(Ts) °F~~ VOLTS	VELOCITY HEAD FLOWRATE CFM	VELOCITY HEAD OUTLET TEMP	ORIFICE METER (ΔH)	GAS SAMPLE VOLUME (Vm) ft³	DRY GAS METER TEMP (Tm) °F	PROBE TEMP °F	SAMPLE BOX TEMP °F	TEMP OF GAS LEAVING LAST IMPINGER °F	PUMP VACUUM GAUGE in. Hg
	1:12	0	.205	410	54							
SO_2		5	.201	402	49							
#5		10	.202	404	50							
		15	.205	410	51							
		20	.203	406	50							
		25	.203	406	51							
		30	.202	404	51							
		35	.205	410	52							
		40	.202	404	51							
		45	.204	408	51							
		50	.207	414	52							
		55	.207	414	53							
		60	.209	418	52							
				2443 lbs								
	2:35	0	.199	398	60							
SO_2		5	.202	404	59							
#6		10	.200	400	56							
		15	.199	398	55							
		20	.198	396	55							
		25	.200	400	55							
		30	.201	402	55							
		35	.200	400	55							
		40	.199	398	55							
		45	.199	398	55							
		50	.202	404	54							
		55	.201	402	54							
		60	.203	406	54							
				[illegible] lbs								
TOTAL												
AVERAGE												

STATIC PITOT LEAK-CHECK @ 15 sec	
IMPACT PITOT LEAK-CHECK @ 15 sec	
TRAIN LEAK RATE @ 60 sec	cf@ in

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

VOLUME OF LIQUID WATER COLLECTED	IMPINGER WEIGHT (g) OR VOLUME (ml) 1	2	3	4
FINAL				
INITIAL				
LIQUID COLL.				
TOTAL VOLUME				

GAS MEASUREMENTS

	TIME	CO_2	O_2	CO	N_2
1					
2					
3					
4					

SIGNATURE: [signature]
TEST TEAM CHIEF

FIELD DATA LOG

PLANT: GULF COAST LEAD SOURCE: BLAST FURNACE

NOZZLE I.D. NO.	
DIA 1	
DIA 2	
DIA 3	
AVERAGE	

RUN NO: SO2
DATE: 11-9-83
OPERATORS:
METER BOX NO:
FILTER NO:

BAROMETRIC PRESSURE:
STATIC PRESSURE:
AMBIENT TEMPERATURE:
PROBE LENGTH:
PROBE LINER:
PORT LENGTH:
PORT DIAMETER:
METER SYSTEM LEAK-CHECK:
ORSAT LEAK-CHECK:
SAMPLE BAG LEAK-CHECK:

SCHEMATIC OF STACK

CROSS SECTION

SAMPLING SITE

PORT LOCATION

FINAL VOLUME:
INITIAL VOLUME:
NET VOLUME:

NOMOGRAPH VALUES

ΔH@: C FACTOR:
Tm: AVG ΔP:
%H2O: T_s:
REFERENCE:

TRAVERSE POINT NUMBER	SAMPLING TIME CLOCK	SAMPLING TIME SAMPLE	~~STACK TEMP~~ VOLTS	VELOCITY HEAD Fuel ~~(ΔP)~~ 2000	VELOCITY HEAD Outlet ~~(√ΔP)~~ 100	ORIFICE METER (ΔH)	GAS SAMPLE VOLUME (Vm) ft³	DRY GAS METER TEMP (Tm) °F	PROBE TEMP °F	SAMPLE BOX TEMP °F	TEMP OF GAS LEAVING LAST IMPINGER °F	PUMP VACUUM GAUGE in. Hg
	8:18											
		0	.200	400	42							
SO2		5	.200	400	41							
#7		10	.199	398	42							
		15	.200	400	43							
		20	.197	394	43							
		25	.199	398	44							
		30	.199	398	45							
		35	.201	402	45							
		40	.199	398	45							
		45	.197	394	46							
		50	.200	400	46							
		55	.199	398	47							
		60	.199	398	47							
				[illegible]								
SO2	9:26	0	.190	380	49							
#8		5	.197	394	48							
		10	.201	402	47							
		15	.195	390	47							
		20	.200	400	48							
		25	.201	402	48							
		30	.200	400	50							
		35	.201	402	50							
		40	.203	406	50							
		45	.199	398	50							
		50	.203	406	52							
		55	.200	400	53							
		60	.203	406	54							
TOTAL				23.165								
AVERAGE												

STATIC PITOT LEAK-CHECK @ 15 sec	
IMPACT PITOT LEAK-CHECK @ 15 sec	
TRAIN LEAK RATE @ 60 sec	cf @ in

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

VOLUME OF LIQUID WATER COLLECTED	IMPINGER WEIGHT (g) OR VOLUME (ml) 1	2	3	4
FINAL				
INITIAL				
LIQUID COLL.				
TOTAL VOLUME				

GAS MEASUREMENTS

	TIME	CO_2	O_2	CO	N_2
1					
2					
3					
4					

SIGNATURE: [illegible]
TEST TEAM CHIEF

FIELD DATA LOG

PLANT: GULF COAST LEAD SOURCE: BLAST FURNACE

NOZZLE I.D. NO.	
DIA 1	
DIA 2	
DIA 3	
AVERAGE	

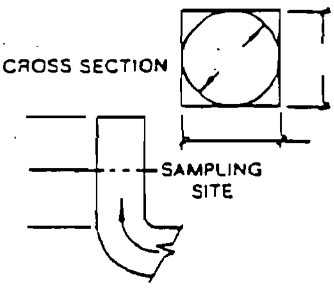
FINAL VOLUME	
INITIAL VOLUME	
NET VOLUME	

RUN NO: SO2
DATE: 12-4-83
OPERATORS: FINK
METER BOX NO:
FILTER NO:

NOMOGRAPH VALUES	
ΔH@	C FACTOR
Tm	AVG ΔP
%H_2O	Y_1
REFERENCE	

BAROMETRIC PRESSURE:
STATIC PRESSURE:
AMBIENT TEMPERATURE:
PROBE LENGTH:
PROBE LINER:
PORT LENGTH:
PORT DIAMETER:
METER SYSTEM LEAK-CHECK:
ORSAT LEAK-CHECK:
SAMPLE BAG LEAK-CHECK:

SCHEMATIC OF STACK



TRAVERSE POINT NUMBER	SAMPLING TIME CLOCK	SAMPLING TIME SAMPLE	STACK TEMP ~~°F~~ VOLTS	VELOCITY HEAD FLOW (~~ΔP~~) CC/Min	VELOCITY HEAD [illegible] (~~√ΔP~~) [illegible]	ORIFICE METER (ΔH)	GAS SAMPLE VOLUME (Vm) ft³	DRY GAS METER TEMP (Tm) °F	PROBE TEMP °F	SAMPLE BOX TEMP °F	TEMP OF GAS LEAVING LAST IMPINGER °F	PUMP VACUUM GAUGE in. Hg
	10:35	0	.205	410	54							
SO2		5	.200	400	53							
#9		10	.203	406	53							
		15	.195	390	53							
		20	.203	406	54							
		25	.197	394	55							
		30	.200	400	55							
		35	.200	400	54							
		40	.196	392	55							
		45	.199	398	55							
		50	.196	392	55							
		55	.195	390	54							
		60	.195	390	55							
				[illegible]								
SO2	11:42	0	.196	392	57							
#10		5	.197	394	56							
		10	.198	396	55							
		15	.195	390	56							
		20	.199	398	56							
		25	.201	402	57							
		30	.196	392	57							
		35	.195	390	57							
		40	.198	396	59							
		45	.196	392	58							
		50	.198	396	57							
		55	.197	394	59							
		60	.196	392	59							
				[illegible]								
TOTAL												
AVERAGE												

STATIC PITOT LEAK-CHECK @ 15 sec	
IMPACT PITOT LEAK-CHECK @ 15 sec	
TRAIN LEAK RATE @ 60 sec	cf @ in

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

VOLUME OF LIQUID WATER COLLECTED	IMPINGER WEIGHT (g) OR VOLUME (ml) 1	2	3	4
FINAL				
INITIAL				
LIQUID COLL.				
TOTAL VOLUME				

GAS MEASUREMENTS	TIME	CO_2	O_2	CO	N_2
1					
2					
3					
4					

SIGNATURE: [illegible signature]
TEST TEAM CHIEF

APPENDIX B

Process Weight Statement

STATEMENT OF PROCESS WEIGHT

COMPANY NAME: Gulf Coast Lead Company

MAILING ADDRESS: 1901 North 66th Street, Tampa, Florida 33619

SOURCE IDENTIFICATION: Blast Furnace

SOURCE LOCATION:

DATE: December 7, 1983

OPERATION TIME	SAMPLING TIME
START: 0000	START: 1421
END: 2400	END: 1752

ELAPSED TIME: 24 Hours

IDLE TIME DURING CYCLE: None

DATA ON ACTUAL PROCESS RATE DURING OPERATION CYCLE

MATERIAL: Lead Scrap	RATE: 6673 lb/hr
MATERIAL: Coke	RATE: 893 lb/hr
MATERIAL: Limerock	RATE: 165 lb/hr
MATERIAL: Cast Iron	RATE: 165 lb/hr
MATERIAL: Re-run Slag	RATE: 199 lb/hr

TOTAL PROCESS WEIGHT RATE: 4.04 tons/hour

PRODUCT: Blast Lead (26 buttons) RATE: 111,800 lbs total

2.33 tons/hour

REMARKS:

SIGNATURE ______________________ DATE:

TITLE:

STATEMENT OF PROCESS WEIGHT

COMPANY NAME: Gulf Coast Lead Company

MAILING ADDRESS: 1901 North 66th Street, Tampa, Florida 33619

SOURCE IDENTIFICATION: Blast Furnace

SOURCE LOCATION:

DATE: December 8, 1983

OPERATION TIME		SAMPLING TIME	
START:	0000	START:	1054
END:	2400	END:	1535

ELAPSED TIME: 24 Hours

IDLE TIME DURING CYCLE: None

DATA ON ACTUAL PROCESS RATE DURING OPERATION CYCLE

MATERIAL:	Lead Scrap	RATE:	6673 lb/hr
MATERIAL:	Coke	RATE:	893 lb/hr
MATERIAL:	Limerock	RATE:	165 lb/hr
MATERIAL:	Cast Iron	RATE:	165 lb/hr
MATERIAL:	Re-run Slag	RATE:	199 lb/hr

TOTAL PROCESS WEIGHT RATE: 4.04 tons/hour

PRODUCT: Blast Lead (26 buttons) RATE: 111,800 lbs total
2.33 tons/hour

REMARKS:

SIGNATURE ______________________ DATE:

TITLE:

STATEMENT OF PROCESS WEIGHT

COMPANY NAME: Gulf Coast Lead Company

MAILING ADDRESS: 1901 North 66th Street, Tampa, Florida 33619

SOURCE IDENTIFICATION: Blast Furnace

SOURCE LOCATION:

DATE: December 9, 1983

OPERATION TIME	SAMPLING TIME
START: 0000	START: 0818
END: 2400	END: 1242

ELAPSED TIME: 24 Hours

IDLE TIME DURING CYCLE: None

DATA ON ACTUAL PROCESS RATE DURING OPERATION CYCLE

MATERIAL: Lead Scrap	RATE: 6013 lb/hr
MATERIAL: Coke	RATE: 803 lb/hr
MATERIAL: Limerock	RATE: 148 lb/hr
MATERIAL: Cast Iron	RATE: 148 lb/hr
MATERIAL: Re-run Slag	RATE: 179 lb/hr

TOTAL PROCESS WEIGHT RATE: 3.65 tons/hour

PRODUCT: Blast Lead (25 buttons) RATE: 107,500 lbs total
2.24 tons/hour

REMARKS:

SIGNATURE ______________________ DATE:

TITLE:

APPENDIX C

Calibration Data

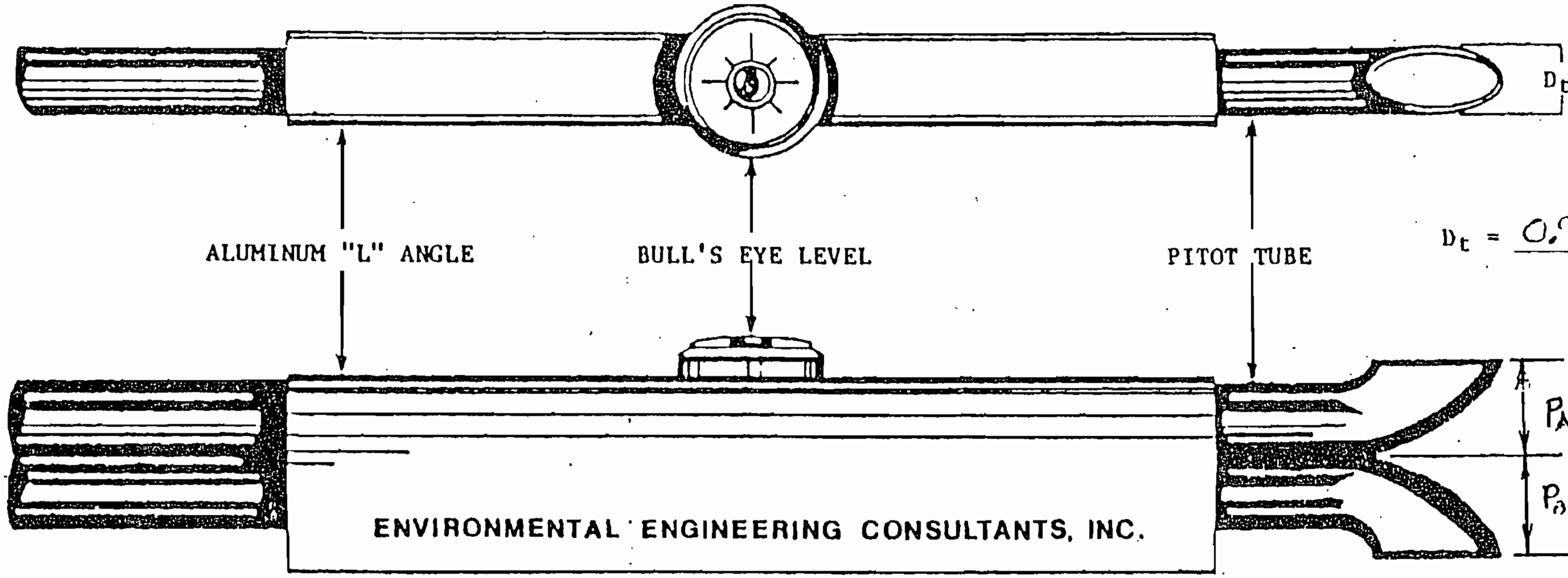
SUMMARY OF EQUIPMENT CALIBRATION

Equipment	Calib. Date	Place	Method	Results
Pitot Tube	04-25-83	EEC, Inc.	EPA Alt. Method	Cp=0.84
Thermocouples & Dial Thermometer	06-20-83	EEC, Inc.	Comparison to ASTM Thermometer	Correct to $\pm 2^{\circ}F$
Mass Flowmeter	05-03-83	EEC, Inc.	NBS traceable soap bubble buret.	Avg. deviation + 0.5%

SERIAL NO. P-1

CALIBRATED BY: [illegible]

DATE 4-25-83

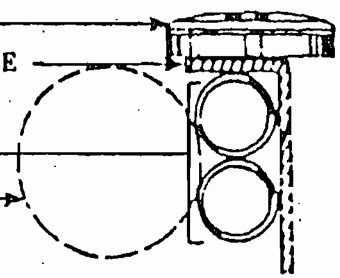


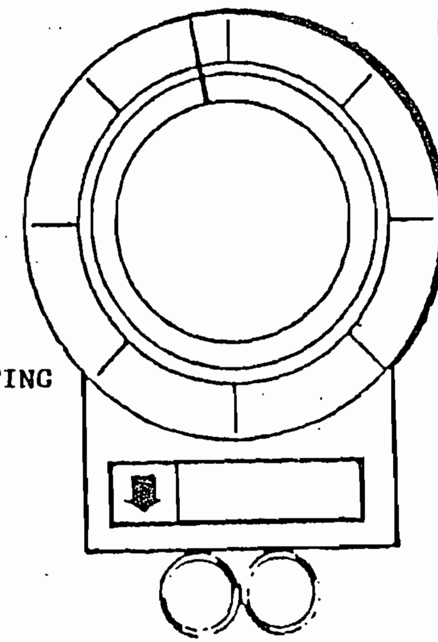
D_t = 0.78 cm.

$P_A + P_B = 2.72$ cm

$1.05\, D_t \leq P \leq 1.50\, D_t$

END VIEW





PITOT TUBE OPENINGS DAMAGED? NO

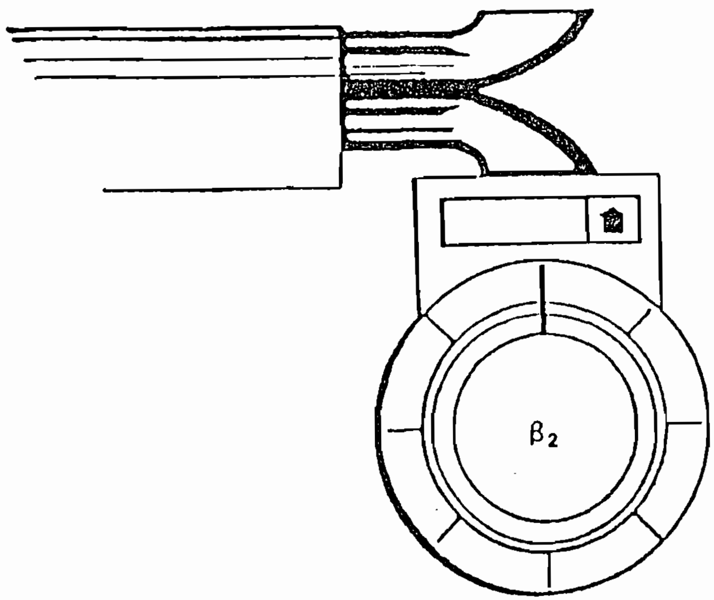
COMMENTS: Pitot tube meets all specifications

C_p (assigned) = 0.84

SERIAL NO. -1

CALIBRATED BY Carl [illegible]

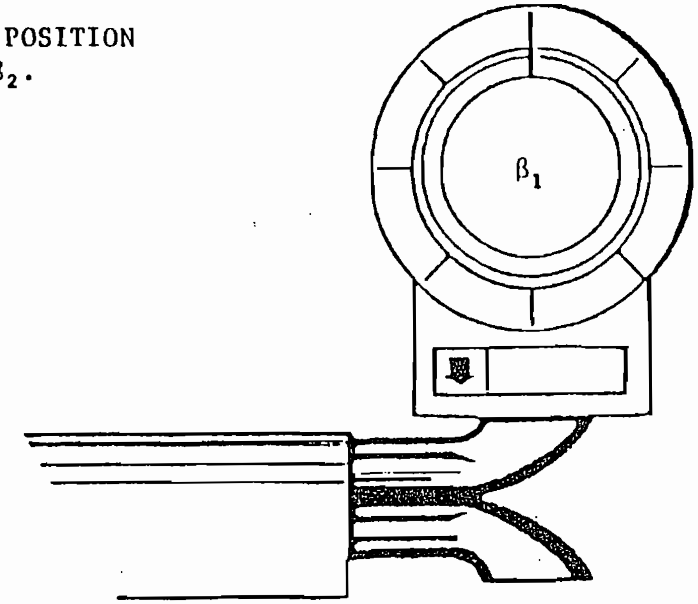
DATE 4-25-83

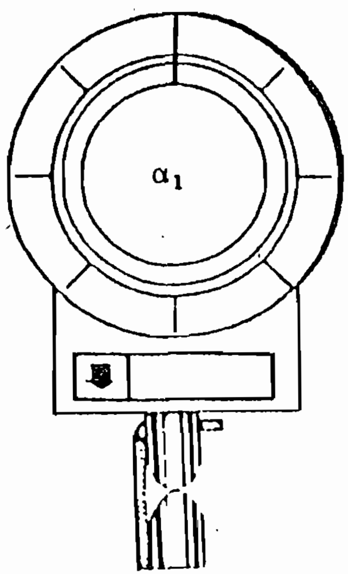


DEGREE INDICATING LEVEL POSITION FOR DETERMINING β_1 and β_2.

β_1 = 1.5 °(<5°)

β_2 = 0.5 °(<5°)

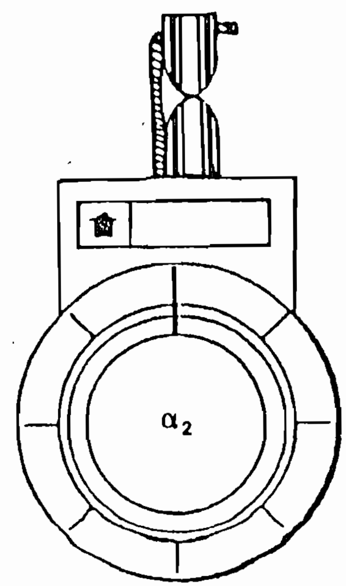




DEGREE INDICATING LEVEL POSITION FOR DETERMINING α_1 and α_2.

α_1 = 2.0 °(<10°)

α_2 = 1.5 °(<10°)

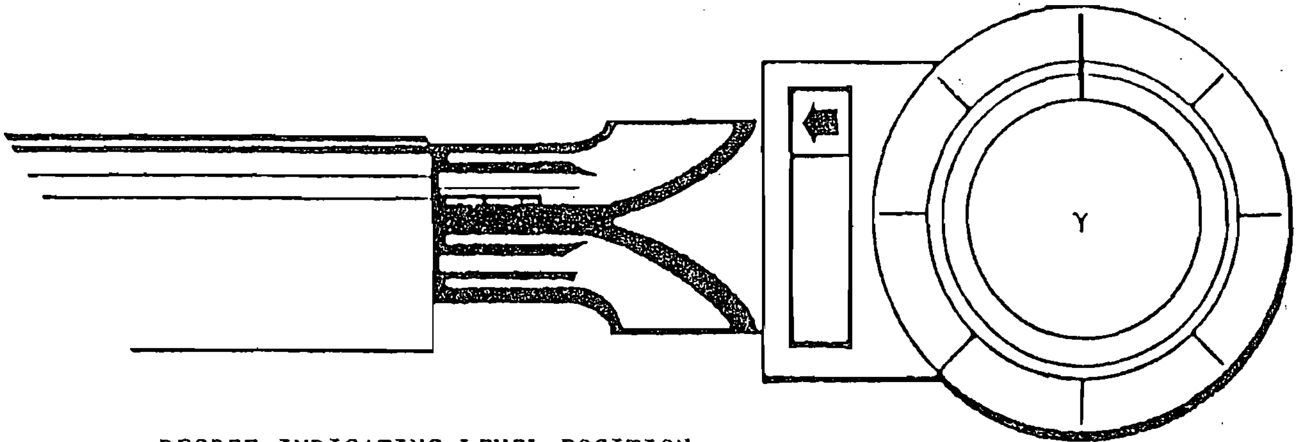


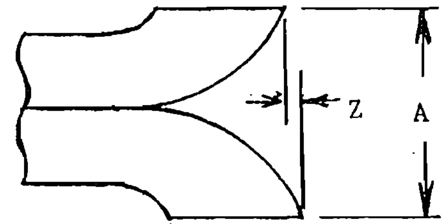
PITOT TUBE CALIBRATION; α and β DETERMINATION

SERIAL NO. 1

CALIBRATED BY Carl Fuh

DATE 4-25-83



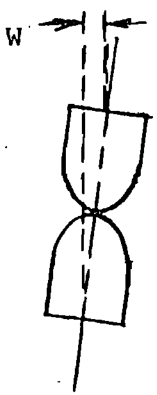


DEGREE INDICATING LEVEL POSITION
FOR DETERMINING γ, THEN CALCULATING Z.

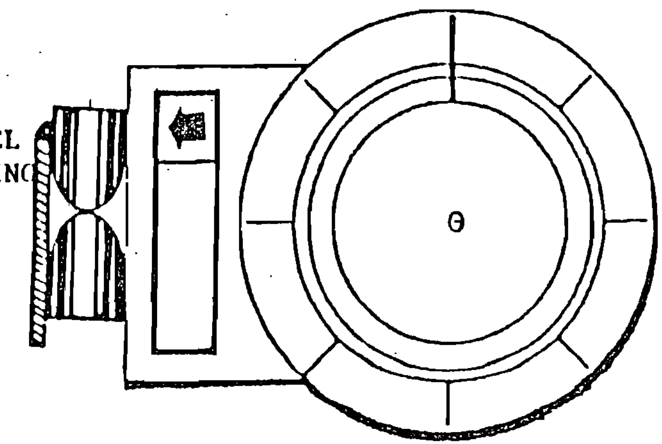
γ = 88.5°

A = DISTANCE BETWEEN TIPS, ($P_a + P_b$), cm. = 2.72 cm.

Z = A cos γ = 0.07 cm; (<0.32 cm).



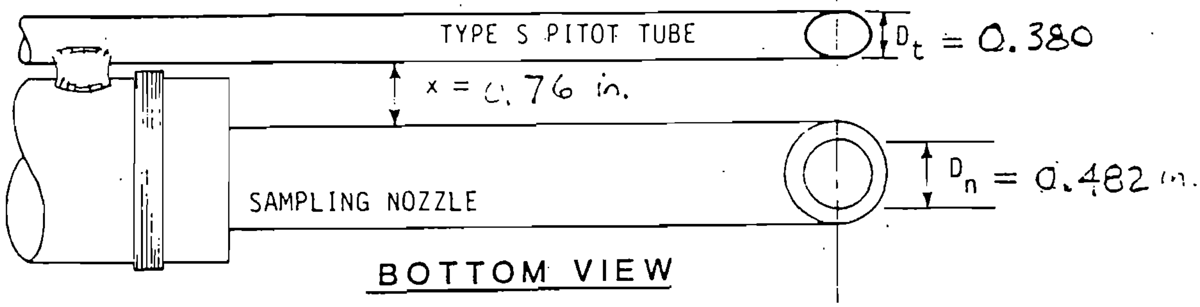
DEGREE INDICATING LEVEL
POSITION FOR DETERMINING
Θ, THEN CALCULATING W.

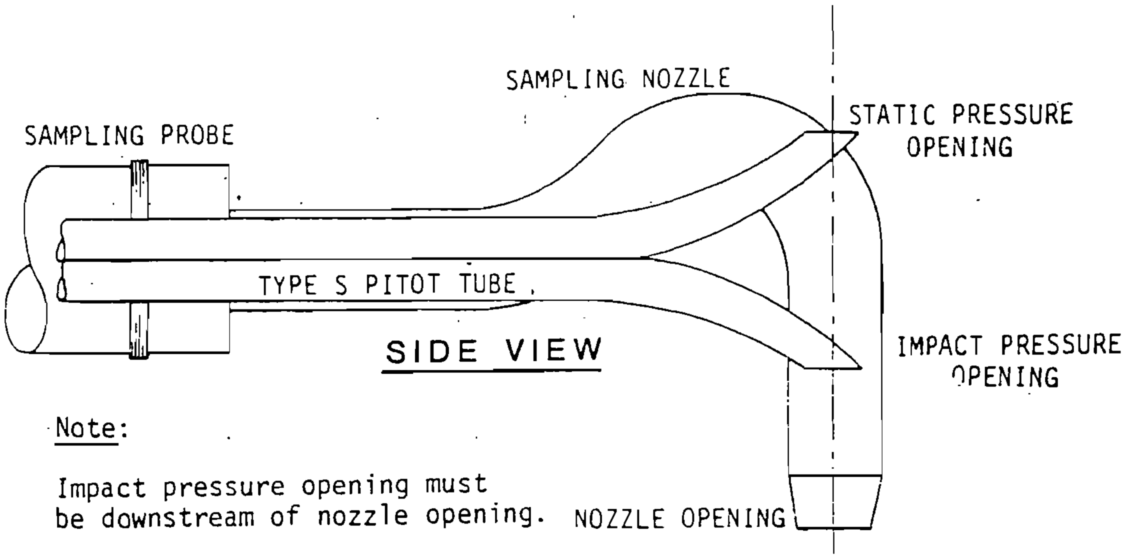


θ = 89.0 °

W = A cos Θ = 0.05 cm; (<0.08 cm).

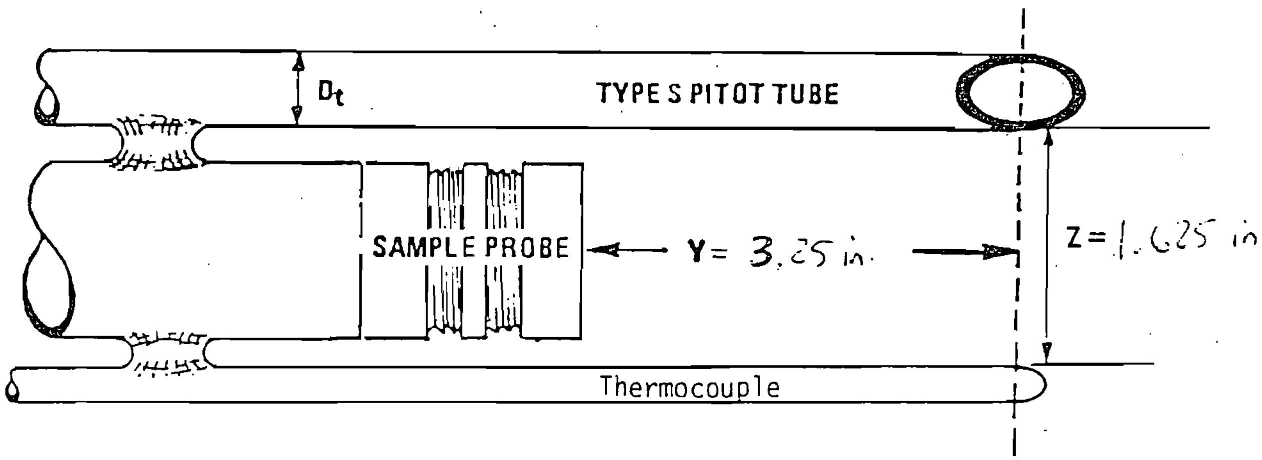
PITOT TUBE CALIBRATION: A, W, γ, Θ and Z DETERMINATION





Note:

Impact pressure opening must be downstream of nozzle opening.



Serial No: P-1
Date : 10-4-83
Calibrated By: Carl Fink

PROBE ASSEMBLY CONFIGURATION

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

CONSULTING ENGINEERS, ENVIRONMENTAL SCIENTISTS

PYROMETER/THERMOMETER CALIBRATION

IDENTIFICATION	DATE	REFERENCE TEMP. °F (ASTM-Hg)	INDICATION TEMP. °F	REFERENCE MEDIUM	CORRECTION
CONSOLE T.C. READOUT	6-20-83	37	37	ICE WATER	
		84	83	AMBIENT WATER	+1
		145	144	HOT OIL	+1
		176	176	"	0
		229	228	"	+1
		249	250	"	-1
		328	330	"	-2
		420	419	"	+1
		468	468	"	0
DIAL THERMOMETER GAS METER	6-20-83	84	84	AMBIENT AIR	0
		[illegible]			

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

Mass Flowmeter Calibration

Location E.E.C. INC.

Date 5-3-83

Signature Robert Frick

Instrument

Manufacture Hastings

Model All 10KP

Serial No. 5379

Transducer S/N 8113

Range 0 - 10,000 sccm

Voltage Range 0 - 5 V.

Calibration Instrument

Manufacture Bubble Buret

Model Southern Scientific

Serial No. N/A

Volume 3017 c.c / 502.3 c.c.

UNADJUSTED CALIBRATION

Test Point	R.T. °C	B.P. mmHg	C.F.	Obs. Flow	Meter Reading	Actual Flowrate	% D.
1	25.5	764.75	1.0046	9051	4.56 9000	9093	-1.[illegible]
2	25.5	764.75	1.0046	6936	3.44 6980	6969	+[illegible]
3	25.5	764.75	1.0046	4932	2.48 4960	4955	+0.1
4	25.5	764.75	1.0046	3032	1.52 2000	3[illegible]	-1.5
5	25.5	764.75	1.0046	1025	.49 998	1030	-3.1

ADJUSTED CALIBRATION

Test Point	R.T. °C	B.P. mmHg	C.F.	Obs. Flow	Meter Reading	Actual Flowrate	% D.
1	25.5	764.35	1.0040	9006	4.55 9100	9[illegible]2	+0.6
2	25.5	764.35	1.0040	6936	3.50 7000	6963	+0.5
3	25.5	764.35	1.0040	4892	2.49 4980	4912	+1.4
4	25.5	764.35	1.0040	2977	1.49 2980	2989	-0.3
5	25.5	764.35	1.0040	982	.449 998	986	+1.2

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.

Mass Flowmeter Calibration Worksheet

UNADJUSTED CALIBRATION					
Parameter / Point	1	2	3	~~4~~ 4	5
Time (sec)	20.1	[illegible]	[illegible]	59.6	[illegible]
Time (sec)	20.0	[illegible]	[illegible]	59.7	[illegible]
Time (sec)	20.0	[illegible]	[illegible]	59.7	29.4
Average	20.0	[illegible]	[illegible]	59.7	29.4
Volume (cc)	3017.0	[illegible]	[illegible]	3017.0	502.3
Flowrate cc/min	9051	[illegible]	4932	3032	1025

ADJUSTED CALIBRATION					
Parameter / Point	1	2	3	4	5
Time (sec)	20.1	26.1	37.0	60.6	[illegible]
Time (sec)	[illegible]	26.1	37.0	60.8	[illegible]
Time (sec)	20.2	26.1	36.9	60.9	[illegible]
Average	20.1	26.1	37.0	60.8	30.7
Volume (cc)	3017.0	3017.0	3017.0	3017.0	502.3
Flowrate cc/min	9005	6936	4892	2977	982

APPENDIX D

Chain of Custody

Environmental Engineering Consultants, Inc.

Sample Chain of Custody

Plant: GULF COAST LEAD

Source Sampled: BLAST FURNACE — Date Sampled: 12 - 7, 8, 9 - 83

Sample Recovery

Sample Code and Description	Recovery Location	Date and Time of Recovery
GCL-1 GCL-2	GULF COAST LEAD ~~TEST~~ SITE	12-7
GCL-3 GCL-4	TEST SITE	12-8
GCL-5 GCL-6	TEST SITE	12-8
GCL-7 GCL-8	TEST SITE	12-9
GCL-9 GCL-10	TEST SITE	12-9
H_2O_2 BLANK	TEST SITE	12-9

Sample Recovery By: Carl Fink — Title: TEST TEAM LEADER

Sample Received By: Carl Fink — Title: ASSOCIATE ENGINEER
(Upon Recovery)

Date & Time of Recept. 12-7, 12-8, 12-9 — Sample Storage: REFRIGERATION

Sample Received By: M.C. Jackman — Title: LABORATORY DIRECTOR
(For Analysis)

Date & Time of Recept. 9 DEC 83 — Sample Storage: REFRIGERATION

Analysis

Sample Code	Method of Analysis	Date & Time of Analysis	Signature of Analyst
GCL 1	EPA Method 6	12-15-83 1:00 pm	M.C. Jackman
GCL 2	EPA Method 6	12-15-83 1:30 pm	M.C. Jackman
GCL 3	EPA Method 6	12-15-83 2:00 pm	M.C. Jackman
GCL 4	EPA Method 6	12-15-83 2:30 pm	M.C. Jackman
GCL 5	EPA Method 6	12-15-83 3:00 pm	M.C. Jackman
GCL 6	EPA Method 6	12-15-83 3:30 pm	M.C. Jackman
GCL 7	EPA Method 6	12-15-83 4:00 pm	M.C. Jackman
GCL 8	EPA Method 6	12-15-83 4:30 pm	M.C. Jackman
GCL 9	EPA Method 6	12-16-83 10:00 AM	M.C. Jackman
GCL 10	EPA Method 6	12-16-83 10:30 AM	M.C. Jackman
H_2O_2 BLANK			

ATTACHMENT X

Memorandum from Jim Estler of FDER to File
Subject: Blast Furnace Renewal Permit

TO: The File

THROUGH: Bill Thomas

FROM: Jim Estler

DATE: January 13, 1984

SUBJECT: Hillsborough County - AP
Gulf Coast Lead Company
A029-78246

Attached is a permit for the renewal of the operating permits for the existing two lead furnaces and one slag furnace at Gulf Coast Lead Company. This source, as permitted, qualifies for the exemption from the particulate RACT requirements of Chapter 17-2, F.A.C.

The Company is considering replacing one of the furnaces with a unit with a greater production capacity. We have advised them that if there is no increase in emissions over the existing system, the Department would handle this as an amended permit, not a permit modification.

The baseline SO_2 emission rate will be determined by stack testing the existing lead furnace for 9 runs. Each test period is to be representative of the batch/smelt cycle. This testing should occur during the next month.

If Gulf Coast Lead elects to proceed with the replacement, they will provide a letter to DER advising us of the proposed replacement and explaining why there will be no increase in emissions. This permit will be amended when work is completed and satisfactory test results are received.

I recommend this pemit be issued as conditioned.

JWE/scm

ATTACHMENT XI

AO29-78246
Operating Permit for Two Lead Blast Furnace and One Slag Furnace

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610-9544

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WILLIAM K. HENNESSEY
DISTRICT MANAGER

Mr. Lonnie A. Payne, President
Gulf Coast Lead Company
1901 North 66th Street
Tampa, FL 33619

Dear Mr. Payne:

2nd (Copy)

Re: Hillsborough County - AP
Two Lead & One Slag Furnace

Enclosed is Permit Number A029-78246 dated Jan. 26, 1984, to operate the subject pollution source, issued pursuant to Section 403.061(14), Florida Statutes.

Should you object to this permit, including any and all of the conditions contained therein, you may file an appropriate petition for administrative hearing. This petition must be filed within fourteen (14) days of the receipt of this letter. Further, the petition must conform to the requirements of Florida Administrative Code Rule 28-5.201, (copy enclosed). The petition must be filed with the Office of General Counsel, Department of Environmental Regulation, Twin Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32301.

If no petition is filed within the prescribed time, you will be deemed to have accepted this permit and waived your right to request an administrative hearing on this matter.

Acceptance of the permit constitutes notice and agreement that the department may periodically review this permit for compliance, including site inspections where applicable, and may initiate enforcement action for violation of the conditions and requirements thereof.

Sincerely,

Dan A. Williams

Dan A. Williams
Acting District Manager

WKH/scm
Enclosures
cc: HCEPC

DER Form 17-1.201(7)

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610-9544

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

WILLIAM K. HENNESSEY
DISTRICT MANAGER

PERMITTEE:
Mr. Lonnie A. Payne, President
Gulf Coast Lead Company
1901 North 66th Street
Tampa, FL 33619

PERMIT/CERTIFICATION
Permit No.: A029-78246
County: Hillsborough
Expiration Date: 1/6/89
Project: Two Lead & One Slag Furnace

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 & 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the operation of the two lead blast furnaces and one slag furnace using a Wheelabrator-Frye dust collector (Size No. 1217, Model 126, Series 55).

Location: 1901 North 66th Street, Tampa

UTM: 17-363.9E 3093.8N NEDS NO: 0057 Point ID: 01

Replaces Permit No.: A029-12482

PERMITTEE:
Gulf Coast Lead Company

Permit/Certification No.: A029-78246
Project: Two Lead & One Slag Furnace

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate the enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.712(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by any order from the department.

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as maybe required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purposes of;

a. Having access to and copying any records that must be kept under the conditions of the permit:

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

(a) a description of and cause of non-compliance; and

(b) the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)

( ) Determination of Prevention of Significant Deterioration (PSD)

( ) Certification of Compliance with State Water Quality Standards (Section 401. PL 92-500)

( ) Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

14. (con't)

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

1. Test the emissions for the following pollutant(s) at intervals of 12 months from the date January 13, 1983 and submit a copy of test data to the Air Section of the Southwest District Office and Hillsborough County Environmental Protection Commission within forty five days of such testing (Section 17-2.700 (2), Florida Administrative Code (F.A.C.)).

(X) Particulates
( ) Fluorides
(X) Opacity
(X) Sulfur Oxides
( ) Nitrogen Oxides
( ) Hydrocarbons
( ) Total Reduced Sulfur

*The opacity test shall be conducted during the particulate stack test and shall be at least 30 minutes in duration.

SPECIFIC CONDITIONS (con't):

2. The compliance test shall be conducted at ±10% of the maximum permitted process rate of 4.67 tons of raw materials input per hour. A test submitted at a lower process rate showing compliance will be acceptable and will automatically modify the permit to list the process rate during testing as the maximum process rate.

3. Submit for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Section17-4.14, F.A.C.

(A) Annual amount of materials and/or fuels utilized.
(B) Annual emissions (note calculation basis).
(C) Any changes in the information contained in the permit application.

Submit copies of this report to the Department and Hillsborough County Environmental Protection Commission.

4. In order to qualify for the particulate RACT exemption in Section 17-2.650(2)(b)1., F.A.C., the maximum allowable particulate emission rate as requested by the Permittee is 2.5 lbs/hr. and 9.75 tons per year.

5. Within 60 days of receipt of this operating permit, the applicant will have conducted SO_2 emission testing by methods approved by the Hillsborough County Environmental Protection Commission (HCEPC) the Florida Department of Environmental Regulation (FDER) to establish the actual emissions from this source. The results of these tests shall be reported to the regulatory agencies listed above in this same period. At that time the HCEPC and FDER will set an SO_2 emission standard which shall become a part of this permit.

6. Visible emissions shall not be equal to or greater than 20% opacity in accordance with Subsection 17-2.610(2)(b), F.A.C.

7. Compliance with the emission limitations of Specific Conditions Nos. 4, 5 & 6 shall be determined using EPA Methods 1,2,3,4,5,6 and 9 contained in 40 CFR 60, Appendix A and adopted by reference in Section 17-2.700, F.A.C. The minimum requirements for stack sampling facilities, source sampling and reporting, shall be in accordance with Section 17-2.700, F.A.C. and 40 CFR 60, Appendix A.

* 8. The HCEPC shall be notified 30 days in advance of any compliance test to be conducted on this source.

9. All reasonable precautions shall be taken to prevent and control generation of unconfined emissions of particulate matter in accordance with the provision in Section 17-2.610 (3), F.A.C.. These provisions are applicable to any source, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrial related activities such as loading, unloading, storing and handling.

PERMITTEE:
Guld Coast Lead Company

Permit/Certification No.: AO29-78246
Project: Two Lead & One Slag Furnace

SPECIFIC CONDITIONS (con't):

10. Only one of the two blast furnaces covered under this permit may be operated at one time.

11. A fuel analysis from the supplier shall be submitted with the annual compliance test.

12. A compliance test shall be conducted for lead particulate on a yearly basis from the date of January 13, 1983. The emissions shall be determined by analysis of the probe wash, the filter wash and the filter. This analysis does not require a Method #12 test as per 40 CFR 60 Appendix A, but the method shall be subject to prior approval of the HCEPC (H.C.E.P.A. Chapter 67-1504 Section 12).

13. The combined total hours of operation for the two blast furnaces shall not exceed 7800 hours/yr. as requested by the applicant to exempt the facility from Section 17-2.650, F.A.C.

Issued this 26th day of January, 1984.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

Dan A Williams

Dan A. Williams
Acting District Manager

ATTACHMENT XII

Letter from Gulf Coast Lead Dated February 20, 1984
Notifying FDER of their intent to rebuild blast furnace

F - GCL Corresp

GULF COAST LEAD CO.

LEAD PRODUCTS -- WHOLESALE ONLY

OFFICE AND PLANT
1901 NORTH 66TH STREET • TAMPA, FLORIDA 33619
PHONE: 626-0303—626-6151

February 20, 1984

Mr. Jim Essler
Fl. Dept. of Environmental Regulation
7601 Highway 301 North
Tampa, Florida 33610

Dear Mr. Essler:

Gulf Coast Lead Company, by this letter, hereby notifies you that we are preparing to rebuid the older of our two blast furnaces. Once the new blast furnace is completed it will be put into operation and the existing furnace will be partially dismantled and kept only as a reserve. The two blast furnaces will never be operated simultaneously.

The new furnace will have twenty-five percent greater capacity but will be operated fewer days each year in order to allow the operators more time off.

Some pollution control features of the new furnace and its operation follows:

(1) Groups will be aged in the storage pile prior to being fed into the blast furnace. Thorough rinsing and draining of the groups will take place, removing sulfuric acid and thus decreasing the amount of sulfates fed to the furnace.

(2) The air velocity in the furnace will be lower, reducing the particulate loading going into the baghouses.

(3) The new furnace will have an oval configuration rather than the present round configuration. Charges will then not tend to build up unevenly in the furnace thus eliminating hot spots which reduce efficiency and increase emissions.

(4) Due to the configuration of the new furnace, charges will also have a longer resonance time allowing greater quantities of sulfates to become fixed in the slag.

Because of the aforementioned features and operation modifications and others, it is estimated that operation of the new blast furnace will not result in increased sulfur dioxide emissions and any increase in particulate emissions will be negligable.

Once the new furnace is completed we will submit all the necessary information to supplement Operation Permit # AO29-78246. At that time, we will also request that the furnaces, the slag and lead tap ventilation (Operation Permit # AO29-41831), and the skip-hoist enclosure all be incorporated into one permit since they are all directly related to the blast furnace operation.

Attached, as agreed, is a report of ten tests run by Environmental Engineering Consultants, Inc. for sulfur dioxide emissions from the blast furnace at Gulf Coast Lead Company. The tests were conducted December 7, 8 and 9, 1983 and each test was run for a period of one hour to cover a complete cycle of the smelting operation.

If you have any questions or I can be of assistance, please do not hesitate to call.

Sincerely,

GULF COAST LEAD COMPANY

Joyce D. Morales-Caramella

Joyce D. Morales-Caramella,
Safety & Environmental Director

cc: Lonnie A. Payne, GCL
Richard D. Bowman, GCL
Jerry Campbell, HCEPC

ATTACHMENT XIII

EPC Conversation Record dated March 9, 1984
Subject: SO_2 Emission Baseline

HILLSBOROUGH COUNTY

ENVIRONMENTAL PROTECTION COMMISSION

CONVERSATION RECORD

Date March 9, 1984

Time PM

Subject SO_2 Emissions

Permit No.

Department

M Joyce Morales/ Richard Bowman

Telephone No.

Representing Gulf Coast Lead

[ ] Telephoned Me [ ] Was Called [X] Scheduled Meeting [ ] Unscheduled Meeting

Other Individuals Involved in Conversation/Meeting

Jim Estler

Summary of Conversation/Meeting

All agreed that the 12/7-9/83 test results for SO_2 on the blast furnace would establish the sources baseline at 374 pounds of SO_2 per hour. The test procedures and the purpose were discussed at a meeting in fall of 1982. Gulf Coast Lead now intends to use this 40 ton blast furnace as a backup to a new 60 ton furnace. The 60 ton furnace will be tested within a reasonable period after it comes on line. If the SO_2 emissions are greater than 374 #/hour and are significant based on Table 500-2, then Gulf Coast Lead will be subject to PSD for SO_2. The current backup furnace for the 40 ton unit will be retired so that only two furnaces will be on site.

(continue on another sheet, if necessary)

Signature Jerry Campbell

Title

ATTACHMENT XIV

EPC Conversation Record dated November 1, 1984
Subject: NSPS Applicability

HILLSBOROUGH COUNTY

ENVIRONMENTAL PROTECTION COMMISSION

CONVERSATION RECORD

Date 11/1/84

Subject Lead SIP

Time PM

Permit No.

Department

M Joyce Morales/Richard Bowman

Telephone No.

Representing Gulf Coast Lead

[ ] Telephoned Me [ ] Was Called [X] Scheduled Meeting [ ] Unscheduled Meeting

Other Individuals Involved in Conversation/Meeting

Summary of Conversation/Meeting

Discussed lead allocations for each point and no problems were incurred. Gulf Coast Lead submitted applications and will be issued three permits. One permit will cover the blast and slag furnaces, one will cover the three 50 ton melt kettles and one will cover the 20 ton reel cast. The blast furnace will be subject to NSPS particulate and opacity regulations.

(continue on another sheet, if necessary)

Signature Jerry Campbell

Title

ATTACHMENT XV

Memorandum from Joyce D. Morales
dated November 7, 1984
Subject: EPC Meeting of November 1, 1984

November 7, 1984

MEMORANDUM

TO: File

FROM: Joyce D. Morales

SUBJECT: EPC Meeting

Richard Bowman and I met with Jerry Campbell, Thursday, November 1, 1984 at approximately 4:00 to discuss the new permit applications Gulf Coast Lead Company was submitting for the blast furnace operations, refining operations and keel cast operations.

Jerry had told me the day before that construction of the new blast furnace would constitue reconstruction and would not be considered a new source. He apologized prior to the meeting but stated that he had spoken earlier with Brian Beals from EPA and was told that the new blast furnace would be considered a new source. Jerry called an official at FDER while Richard and I were in his office and the DER official agreed with EPA's determination that the new blast furnace was indeed a new source. Being classified as a new source means the furnace must meet a particulate standard of 0.022gr/DSCF instead of 0.030gr/DSCF. 0.022gr/DSCF is the NSPS standard. Jerry said there would be no other significance to the blast furnace being classified as a new source other than it would be the 26th new source in the county and would require a Type 2 inspection which means an annual inspection would be required. Gulf Coast Lead Company is already inspected annually anyway.

Jerry stated that being classified a new source would not trigger new source review nor PSD requirements.

Stack test requirements included in the three permits will be as follows:

1. Blast Furnace Operations: Annual method 12 and 5 on the furnaces. One time method 12 on the tap points and skip-hoist and then annual VEs.

2. Refining Kettles: Annual method 12.

3. Keel Cast Kettle: One time method 12 and then annual VE.

I expressed concern that all of Gulf Coast Lead Company's existing emissions and proposed emissions were based on a modified method 5 test and that now method 12 test was going to be used to determine compliance. Jerry said that he understood our concerns but still insisted on method 12 testing. If problems arise they will be addressed later.

The fact that compliance testing is soon due was discussed and it was agreed that the annual stack tests could be delayed until after the issuance of the new permits to prevent duplication of the tests.

ATTACHMENT XVI

Letter of November 6, 1984 from Gulf Coast Lead to Jerry Campbell
of Environmental Protection Commission
Re: Highlights of Meeting of November 1, 1984

1.68

GULF COAST LEAD CO., INC.

LEAD PRODUCTS – WHOLESALE ONLY

OFFICE AND PLANT
1901 NORTH 66TH STREET • TAMPA, FLORIDA 33619
PHONE: 626-0303—626-6151

NOV 6 1984

November 6, 1984

Mr. Jerry Campbell
Hillsborough County Environmental
Protection Commission
1900 - 9th Avenue
Tampa, Florida 33605

Dear Jerry:

This letter will confirm the Company's understanding regarding the permit application for operation of the blast furnaces at Gulf Coast Lead Company. As explained to Richard Bowman and me at a meeting November 1, 1984, the blast furnace is being considered a new source rather than reconstruction and is therefore subject to NSPS. However, the facility is not subject to new source review.

Also, as discussed in the aforementioned meeting, information regarding sulfur dioxide emissions from the blast furnace were inadvertently omitted from the permit application. Sulfur dioxide emissions for the blast furnace are 374 pounds/hour, 1459 tons/year.

Presently, emissions test on the blast furnace are due annually, by January 13. It was agreed at the meeting that Gulf Coast Lead Company may delay the annual emissions test until such time as the new permits are issued. Delaying the emissions test would prevent the Company from having to perform duplicate tests should the new permits not be issued prior to January 13, 1985.

Sincerely,

GULF COAST LEAD COMPANY

Joyce D. Morales-Caramella

Joyce D. Morales-Caramella
Safety & Environmental Director

ATTACHMENT XVII

Environmental Protection Commission
Inspection Report of
November 1984

ATTACHMENT XVII

Environmental Protection Commission
Inspection Report of
November 1984

HILLSBOROUGH COUNTY ENVIRONMENTAL
PROTECTION COMMISSION

INSPECTION REPORT
EXECUTIVE SUMMARY

1184

NT NAME [illegible] NEDS [illegible] DATE/TIME [illegible] 72 [illegible]

LANT LOCATION ______ # OF NEDS POINTS 5

ROCESS DESCRIPTION [illegible] is melted down in the blast furnace to produce [illegible]. This is then [illegible] in [illegible] kettles with [illegible] to [illegible] lead ([illegible]) & with calcium to form calcium lead for [illegible]

OMPLIANCE VERIFICATION ( )
NFORCEMENT ( )
PERMIT REVIEW (X)
OTHER Type III ( )

[illegible]

ERSONS CONTACTED-TITLE Joyce Morales / Richard Bowman

EDS POINTS CHECKED 01/02/04/05/06 NEDS POINTS IN COMPLIANCE 01/02/04/05/06 NEDS POINTS IN VIOLATION ______

UMMARY OF FINDINGS

The new 60 ton blast furnace was installed but not functional yet. The 40 ton furnace was operating and no opacity or odors were observed. The refining kettles and the 22 ton melt [illegible] was not in operation. The grounds [illegible] being watered [illegible]

NSPECTION COMMENTS FOR APIS (LIMIT 50 SPACES) ______

ECTOR'S SIGNATURE Jerry Campbell

ATTACHMENT XVIII

Memorandum from Jerry Campbell of
Environmental Protection Commission
to Jim Estler of FDER
Dated December 4, 1984
Subject: Recommended Conditions for
Gulf Coast Lead's New Operating Permit

COUNTY OF HILLSBOROUGH

SEAL OF HILLSBOROUGH COUNTY FLORIDA 1834

MEMORANDUM

Date December 4, 1984

To Jim Estler

From Jerry Campbell JC

Subject: Gulf Coast Lead's New Operating Permits

Having reviewed the applications and related correspondence, I recommend that two new and one amended operating permits be issued. I further recommend that the following specific conditions apply:

Blast Furnace Operations (Points 01, 04, 06)
Point 01

1. Test the emissions from the main baghouse at intervals of 12 months from January, 1984, and submit a copy of test data to the Air Section of the Southwest District Office within forty five days of such testing (Section 17-2.700(2), Florida Administrative Code (F.A.C.).

(X) Particulates	(X) Sulfur Oxides
( ) Fluorides	( ) Nitrogen Oxides
(X) Opacity	( ) Hydrocarbons
(X) Lead	( ) Total Reduced Sulfur

*Fuel analysis may be submitted for required sulfur dioxide emission test.

2. Maximum allowable emissions from the (emissions unit) shall be:

Pollutant	Emissions Limitation	Regulation
Particulates	2.50 #/hr	As requested by the permittee to exempt the facility from particulate RACT
Opacity	5%	As requested by the permittee to exempt the facility from particulate RACT
Lead	1.81 #/hr	Lead SIP

3. Compliance with the emission limitations of Specific Conditions Nos. 2 shall be determined using EPA Methods 1, 2, 3, 4, 6, 9, & 12 contained in 40 CFR 60, Appendix A and adopted by reference in Section 17-2.700, F.A.C. with the exception of the January, 1985, sulfur oxides test. The minimum requirements for stack sampling facilities, source sampling and reporting, shall be in accordance with Section 17-2.700, F.A.C. and 40 CFR 60, Appendix A.

4. The January, 1985, sulfur oxide test will be conducted by the same method used in the December, 1983, test.

5. If the sulfur oxides compliance test for January, 1985, indicates that S02 emissions have increased significantly over the 374 pounds per hour baseline established in 12/83, then the permittee shall reapply under the provisions of FAC 17-2.500. A significant increase here shall be defined as 10.2 pounds per hour over the baseline of 374. That works out to 40 tons per year over 7800 hours.

6. The visible emission test shall be 30 minutes in duration and it shall be conducted concurrent with one of the method #12 runs.

7. Testing of emissions must be accomplished within 10 percent of the rates as stated in this permit. Failure to submit the input rates or operation at conditions which do not reflect actual operating conditions may invalidate the data (Section 403.161(1)(c), Florida Statutes).

8. The maximum process weight rate shall be 4.58 tons per hour of raw material input.

9. The total hours of operation of both blast furnaces shall not exceed 7800 hours per year.

10. Any changes to the physical stack characteristics or flow parameters listed in this application which could affect the maximum modelled impact of 0.293 ug of Pb/m3, shall be considered a modification of the permit. As a modification, the permittee would be required to submit an application for prior approval.

11. The Hillsborough County Environmental Protection Commision shall be notified in writing 15 days in advance of any compliance test to be conducted on this source.

12. Submit to the Hillsborough County Environemntal Protection Commission for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Section 17-4.14, F.A.C.

    (A) Annual amount of materials and/or fuels utilized.
    (B) Annual emissions (note calculation basis).
    (C) Any changes in the information contained in the permit application.

Point 04

1. Test the emissions from the baghouse controlling the tapping operation for the following pollutant(s) at intervals of 12 months from the date of January 1984 and submit a copy of test data to the Air Section of the Southwest District Office within forty five days of such testing (Section 17-2.700(2), Florida Administrative Code (F.A.C.).

(.)	Particulates	( )	Sulfur Oxides
( )	Fluorides	( )	Nitrogen Oxides
(X)	Opacity	( )	Hydrocarbons
		( )	Total Reduced Sulfur

*Fuel analysis may be submitted for required sulfur dioxide emission test.

2. In January, 1985, the permittee will test the baghouse by EPA method #12 for particulate and lead. If the test results are favorable, then the permittee will not be required to retest for these parameters until the permit is renewed.

3. Maximum allowable emissions from the (emissions unit) shall be:

Pollutant	Emissions Limitation	Regulation
Particulates	0.15 #/hour	As requested by the permittee to exempt the facility from particulate RACT.
Opacity	5%	As requested by the permittee to exempt the facility from particulate RACT.
Lead	0.06 #/hour	Lead SIP

4. The visible emission test shall be 30 minutes in duration and it shall be read only while tapping is occurring.

5. The total hours of operation of both blast furnaces shall not exceed 7800 hours per year.

6. Any changes to the physical stack characteristics or flow parameters listed in this application which could affect the maximum modelled impact of 0.088 ug of Pb per cubic meter, shall be considered a modification of this permit. As a modification, the permittee would be required to submit an application for prior approval.

7. The Hillsborough County Environmental Protection Commision shall be notified in writing 15 days in advance of any compliance test to be conducted on this source.

8. Submit to the Hillsborough County Environmental Protection Commission for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Section 17-4.14, F.A.C.

   (A) Annual amount of materials and/or fuels utilized.
   (B) Annual emissions (note calculation basis).
   (C) Any changes in the information contained in the permit application.

Point 06

1. Test the emissions from the baghouse controlling the charging operation for the following pollutant(s) at intervals of 12 months from the date of January 1984 and submit a copy of test data to the Air Section of the Southwest District Office within forty five days of such testing (Section 17-2.700(2), Florida Administrative Code (F.A.C.).

( ) Particulates	( ) Sulfur Oxides
( ) Fluorides	( ) Nitrogen Oxides
(X) Opacity	( ) Hydrocarbons
	( ) Total Reduced Sulfur

*Fuel analysis may be submitted for required sulfur dioxide emission test.

2. In January, 1985, the permittee will test the baghouse by EPA method #12 for particulate and lead. If the test results are favorable, then the permittee will not be required to retest for these parameters until the permit is renewed.

3. Maximum allowable emissions from the (emissions unit) shall be:

Pollutant	Emissions Limitation	Regulation
Particulates	0.55 #/hour	As requested by the permittee to exempt the facility from particulate RACT
Opacity	5%	As requested by the permittee to exempt the facility from particulate RACT
Lead	0.22 #/hour	Lead SIP

4. The visible emission test shall be 30 minutes in duration and it shall be read only while charging is occurring.

5. The total hours of operation of both blast furnaces shall not exceed 7800 hours per year.

6. Any changes to the physical stack characteristics or flow parameters listed in this application which could affect the maximum modelled impact of 0.118 ug of Pb per cubic meter, shall be considered a modification of this permit. As a modification, the permittee would be required to submit an application for prior approval.

7. The Hillsborough County Environmental Protection Commision shall be notified in writing 15 days in advance of any compliance test to be conducted on this source.

8. Submit to the Hillsborough County Environmental Protection Commission for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Section 17-4.14, F.A.C.

Lead Refining Operation (Point 02)

1. Test the emissions for the following pollutant(s) at intervals of 12 months from January 1984 and submit a copy of test data to the Air Section of the Southwest District Office within forty five days of such testing (Section 17-2.700(2), Florida Administrative Code (F.A.C.).

(X) Particulates	( ) Sulfur Oxides
( ) Fluorides	( ) Nitrogen Oxides
(X) Opacity	( ) Hydrocarbons
(X) Lead	( ) Total Reduced Sulfur

*Fuel analysis may be submitted for required sulfur dioxide emission test.

2. Maximum allowable emissions from the <u>(emissions unit)</u> shall be:

Pollutant	Emissions Limitation	Regulation
Particulates	1.0 #/hour	As requested by the permittee to exempt the facility from particulate RACT
Opacity	5%	As requested by the permittee to exempt the facility from particulate RACT
Lead	0.4 #/hour	Lead SIP

3. Compliance with the emission limitations of Specific Conditions Nos. 2 shall be determined using EPA Methods 1, 2, 3, 4, 9 and 12 contained in 40 CFR 60, Appendix A and adopted by reference in Section 17-2.700, F.A.C. The minimum requirements for stack sampling facilities, source sampling and reporting, shall be in accordance with Section 17-2.700, F.A.C. and 40 CFR 60, Appendix A.

4. The visible emission test shall be 30 minutes in duration and it shall be concurrent with one of the method #12 runs.

5. Testing shall be conducted while 2 of the kettles are in operation and they are to be identified in the test report. The kettles operating during the test shall be alternated from year to year so that over a 2 year period all 3 will have been tested.

6. The hours of operation for the refining area covered under this permit shall not exceed 4368 per year.

7. The periodic replacement of a kettle liner due to the abuse of the soft lead refining process will be considered maintenance and will not require a construction application.

8. Any changes to the physical stack characteristics or flow parameters listed in this application which could affect the maximum modelled impact of 0.294 ug of Pb per cubic meter, shall be considered a modification of this permit. As a modification, the permittee would be required to submit an application for prior approval.

9. The Hillsborough County Environmental Protection Commission shall be notified in writing 15 days in advance of any compliance test to be conducted on this source.

10. Submit to the Hillsborough County Environmental Protection Commission for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Section 17-4.14, F.A.C.

    (A) Annual amount of materials and/or fuels utilized.
    (B) Annual emissions (note calculation basis).
    (C) Any changes in the information contained in the permit application.

Keel Casting Operation (Point 05)

1. Test the emissions for the following pollutant(s) at intervals of 12 months from January 1984 and submit a copy of test data to the Air Section of the Southwest District Office within forty five days of such testing (Section 17-2.700(2), Florida Administrative Code (F.A.C.).

( ) Particulates	( ) Sulfur Oxides
( ) Fluorides	( ) Nitrogen Oxides
(X) Opacity	( ) Hydrocarbons
	( ) Total Reduced Sulfur

*Fuel analysis may be submitted for required sulfur dioxide emission test.

2. Maximum allowable emissions from the (emissions unit) shall be:

Pollutant	Emissions Limitation	Regulation
Particulates	0.20	As requested by the permittee to exempt the facility from particulate RACT
Opacity	5%	As requested by the permittee to exempt the facility from particulate RACT
Lead	0.08	Lead SIP

3. In January, 1985, the permittee will test this source by EPA Method #12 for particulate and lead. If the test results are favorable, then the permittee will not be required to retest for these parameters until the permit is renewed.

4. The visible emission test shall be 30 minutes in duration.

5. Testing of emissions must be accomplished within 10 per cent of the rates as stated in this permit. Failure to submit the input rates or operation at conditions which do not reflect actual operating conditions may invalidate the data (Section 403.161(1)(c), Florida Statutes).

6. The maximum process weight rate shall be 2.33 tons per hour.

7. The hours of operation of this source shall not exceed 2400 per year.

8. Any changes to the physical stack characteristics or flow parameters listed in this application which could affect the maximum modelled impact of 0.118 ug of Pb per cubic meter, shall be considered a modification of this permit. As a modification, the permittee would be required to submit an application for piror approval.

9. The Hillsborough County Environmental Protection Commission shall be notified in writing 15 days in advance of any compliance test to be conducted on this source.

10. Submit to the Hillsborough County Environmental Protection Commission for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Section 17-4.14, F.A.C.

    (A) Annual amount of materials and/or fuels utilized.
    (B) Annual emissions (note calculation basis).
    (C) Any changes in the information contained in the permit application.

If you have any questions or comments concerning the above items, please contact me.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610-9544

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

RICHARD D. GARRITY, PH.D.
DISTRICT MANAGER

PERMITTEE	PERMIT/CERTIFICATION
Name	Permit No.:
Company	County:
Address	Expiration Date:
	Project:

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 & 17.4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

Description: For the operation of two secondary lead blast furnaces (only one to operate at a time) and one flue dust agglomeration furnace. The 60 ton capacity furnace installed in 1984 shall be designated the primary furnace and the 40 ton capacity furnace shall be designated the backup furnace. The blast furnace operation is controlled by three separate baghouses. The main baghouse controls the furnace exhaust (point 01) while the [illegible] units control the tapping (point 04) and the charging (point 06).

Location:

1901 N. 66th Street
Tampa, FL 33619

UTM: 17- 364.048 E 3092.548 N

NEDS NO: 57

Point ID: 01 (Furnace Operation)
04 (Tapping Operation)
06 (Charging Operation)

Replaces Permit No.
A029-78246 (Furnace Operation)
A029-41831 (Tapping Operation)

Protecting Florida and Your Quality of Life

ATTACHMENT XIX

Operating Permit AO29-95366
Date January 28, 1985
for the Blast Furnace Operation

Furnace Operations

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT

7601 HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

DR. RICHARD D. GARRITY
DISTRICT MANAGER

January 28, 1985

Mr. Willis M. Kitchen
Vice President
Gulf Coast Lead Company, Inc
1901 North 66th Street
Tampa, FL 33619

Dear Mr. Kitchen:

Re: Hillsborough County - AP
Blast Furnace Operation

Attached is Permit No. A029-95366. Should you object to the issuance of this permit or the specific conditions of the permit, you have a right to petition for a hearing pursuant to the provisions of Section 120.57, Florida Statutes. The petition must be filed within fourteen (14) days from receipt of this letter. The petition must comply with the requirements of Section 17-103.155 and Rule 28-5.201, Florida Administrative Code, (copies attached) and be filed pursuant to Rule 17-103.155(1) in the Office of General Counsel of the Department of Environmental Regulation at 2600 Blair Stone Road, Tallahassee, Florida 32301. Petitions which are not filed in accordance with the above provisions are subject to dismissal by the Department.

In the event a formal hearing is conducted pursuant to Section 120.57(1), all parties shall have an opportunity to respond, to present evidence and argument on all issues involved, to conduct cross-examination of witnesses and submit rebuttal evidence, to submit proposed findings of facts and orders, to file exceptions to any order or hearing officer's recommended order, and to be represented by counsel.

If an informal hearing is requested, the agency, in accordance with its rules of procedure, will provide affected persons or parties or their counsel an opportunity, at a convenient time and place, to present to the agency or hearing officer, written or oral evidence in opposition to the agency's action or refusal to act, or a written statement challenging the grounds upon which the agency has chosen to justify its action or inaction, pursuant to Section 120.57(2), Florida Statutes.

Sincerely,

Richard D. Garrity

Richard D. Garrity, Ph.D.
District Manager

JWE/scm

Attachment: as stated

cc: HCEPC
Robert E. Wallace, III, Jr.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

SOUTHWEST DISTRICT
[illegible] HIGHWAY 301 NORTH
TAMPA, FLORIDA 33610

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

DR. RICHARD D. GARRITY
DISTRICT MANAGER

PERMITTEE:
Mr. Willis M. Kitchen
Vice President
Gulf Coast Lead Company, Inc.
1901 North 66th Street
Tampa, FL 33619

PERMIT/CERTIFICATION
Permit No.: A029-95366
County: Hillsborough
Expiration Date: 1/9/90
Project: Blast Furnace Operation

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 & 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the operation of two secondary lead blast furnaces (only one to operate at a time) and one flue dust agglomeration furnace. The 60 ton capacity furnace installed in 1984 shall be designated the primary furnace and the 40 ton capacity furnace shall be designated the backup furnace. The blast furnace operation is controlled by three sets of baghouses. The main baghouse controls the furnace exhaust (Point 01) while the other units control the tapping (Point 04) and the charging (Point 06).

Location: 1901 North 66th Street, Tampa, Hillsborough County

UTM: 17-364.0E 3093.6N NEDS NO: 0057 Point ID: 01, 04 & 06

Replaces Permit No.: A029-78246 (Furnace Operations)
A029-41831 (Tapping Operations)

PERMITTEE:
Gulf Coast Lead Company,
Inc.

Permit/Certification No.: A029-95366
Project: Blast Furnace Operation

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth herein are "Permit Conditions" and as such are binding upon the permittee and enforceable pursuant to the authority of Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is hereby placed on notice that the department will review this permit periodically and may initiate the enforcement action for any violation of the "Permit Conditions" by the permittee, its agents, employees, servants or representatives.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the department.

3. As provided in Subsections 403.087(6) and 403.712(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Nor does it authorize any injury to public or private property or any invasion of personal rights, nor infringement of federal, state or local laws or regulations. This permit does not constitute a waiver of or approval of any other department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute state recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the state. Only the Trustees of the Internal Improvement Trust Fund may express state opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, plant or aquatic life or property and penalties therefore caused by the construction or operation of this permitted source, nor does it allow the permittee to cause pollution in contravention of Florida Statutes and department rules, unless specifically authorized by any order from the department.

6. The permittee shall at all times properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized department personnel, upon presentation of credentials or other documents as maybe required by law, access to the premises, at reasonable times, where the permitted activity is located or conducted for the purposes of;

a. Having access to and copying any records that must be kept under the conditions of the permit:

b. Inspecting the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sampling or monitoring any substances or parameters at any location reasonably necessary to assure compliance with this permit or department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately notify and provide the department with the following information:

(a) a description of and cause of non-compliance; and

(b) the period of non-compliance, including exact dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the department for penalties or revocation of this permit.

PERMITTEE:
Gulf Coast Lead Company, Inc.

Permit/Certification No.: A029-95366
Project: Blast Furnace Operation

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source, which are submitted to the department, may be used by the department as evidence in any enforcement case arising under the Florida Statutes or department rules, except where such use is proscribed by Section 403.73 and 403.111, Florida Statutes.

10. The permittee agrees to comply with changes in department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or department rules.

11. This permit is transferable only upon department approval in accordance with Florida Administrative Code Rules 17-4.12 and 17-30.30, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the department.

12. This permit is required to be kept at the work site of the permitted activity during the entire period of construction or operation.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)

( ) Determination of Prevention of Significant Deterioration (PSD)

( ) Certification of Compliance with State Water Quality Standards (Section 401. PL 92-500)

( ) Compliance with New Source Performance Standards

14. The permittee shall comply with the following monitoring and record keeping requirements:

a. Upon request, the permittee shall furnish all records and plans required under department rules. The retention period for all records will be extended automatically, unless otherwise stipulated by the department, during the course of any unresolved enforcement action.

14. (con't)

b. The permittee shall retain at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation), copies of all reports required by this permit, and records of all data used to complete the application for this permit. The time period of retention shall be at least three years from the date of the sample, measurement, report or application unless otherwise specified by department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the date(s) analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the department, such facts or information shall be submitted or corrected promptly.

SPECIFIC CONDITIONS:

I. **FURNACE OPERATIONS**

A. Test the emissions for the following pollutant(s) at intervals of 12 months from January 18, 1984 and submit 2 copies of test data to the Air Section of the Hillsborough County Environmental Protection Commission Office within forty-five days of such testing (Section 17-2.700 (2), Florida Administrative Code (F.A.C.)).

(X) Particulates	(X) Sulfur Oxides
( ) Fluorides	( ) Nitrogen Oxides
(X) Opacity	( ) Hydrocarbons
(X) Lead	( ) Total Reduced Sulfur

*Fuel analysis may be submitted for required sulfur dioxide emission test.

PERMITTEE:
Gulf Coast Lead Company, Inc.

Permit/Certification No.: A029-95366
Project: Blast Furnace Operation

B. Maximum allowable emissions from the blast furnace shall be:

Pollutant	Emissions Limitation	Regulation
Particulates	2.50 #/hr.	As requested by the permittee to exempt the facility from particulate RACT
Opacity	5%	As requested by the permittee to exempt the facility from particulate RACT
Lead	1.81 #/hr.	Lead SIP

C. Compliance with the emission limitations of Specific Condition No. I.B. shall be determined using EPA Methods 1,2,3,4,6 and 12 contained in 40 CFR 60, Appendix A and adopted by reference in Section 17-2.700, F.A.C. with the exception of the January, 1985, sulfur oxides test. The minimum requirements for stack sampling facilities, source sampling and reporting, shall be in accordance with Section 17-2.700, F.A.C. and 40 CFR 60, Appendix A.

D. The January, 1985, sulfur oxide test will be conducted by the same method used in the December, 1983 test.

E. If the sulfur oxides compliance test for January, 1985 indicates that SO_2 emissions have increased significantly over the 374 pounds per hour baseline established in 12/83, then the permittee shall reapply under the provisions of F.A.C. 17-2.500. A significant increase here shall be defined as 10.2 pounds per hour over the baseline of 374. That works out to 40 tons per year over 7800 hours.

F. The visible emission test shall be 30 minutes in duration and it shall be conducted concurrent with one of the Method #12 runs.

G. Testing of emissions must be accomplished with 10 percent of the rates as stated in this permit. Failure to submit the input rates or operation at conditions whcih do not reflect actual operating conditions may invalidate the data (Section 403.161(1)(c), Florida Statutes).

H. The maximum process weight rate shall be 4.58 tons per hour of raw material input.

PERMITTEE: Gulf Coast Lead Company, Inc.

Permit/Certification No.: A029-95366
Project: Blast Furnace Operation

I. Any changes to the physical stack characteristics or flow parameters listed in this application which could affect the maximum modeled impact of 0.293 ug of Pb/m^3, shall be considered a modification of the permit. As a modification, the permittee would be required to submit an application for prior approval.

II. TAPPING OPERATION

A. Test the emissions for the baghouse controlling the tapping operation for the following pollutant(s) at intervals of 12 months from the date of January 18, 1984 and submit a copy of test data to the Air Section of the Southwest District Office within forty-five day of such testing (Section 17-2.700(2), Florida Administrative Code (F.A.C.).

( ) Particulates
( ) Fluorides
(X) Opacity
( ) Sulfur Oxides
( ) Nitrogen Oxides
( ) Hydrocarbons
( ) Total Reduced Sulfur

*Fuel analysis may be submitted for required sulfur dioxide emission test.

B. In January, 1985, the permittee will test the baghouse by EPA Method #12 for particulate and lead. If the test results are favorable, then the permittee will not be required to retest for these parameters until the permit is renewed.

C. Maximum allowable emissions from the tapping baghouse shall be:

Pollutant	Emissions Limitation	Regulation
Particulates	0.15 #/hour	As requested by the permittee to exempt the facility from particulate RACT
Opacity	5%	As requested by the permittee to exempt the facility from particulate RACT.
Lead	0.06 #/hour	Lead SIP

D. The visible emission test shall be 30 minutes in duration and it shall be read only while tapping is occurring.

PERMITTEE: Gulf Coast Lead Company, Inc.

Permit/Certification No.: A029-95366
Project: Blast Furnace Operation

E. Any changes to the physical stack characteristics or flow parameters listed in this application which could affect the maximum modeled impact of 0.088 ug of Pb per cubic meter, shall be considered a modification of this permit. As a modification, the permittee would be required to submit an application for prior approval.

III. **Charging Operation**

A. Test the emissions from the baghouse controlling the charging operation for the following pollutant(s) at intervals of 12 months from the date of January 18, 1984 and submit 2 copies of test data to the Air Section of the Hillsborough County Environmental Protection Commission Office within forty five days of such testing (Section 17-2.700 (2), Florida Administrative Code (F.A.C.)).

( ) Particulates
( ) Fluorides
(X) Opacity
( ) Sulfur Oxides
( ) Nitrogen Oxides
( ) Hydrocarbons
( ) Total Reduced Sulfur

*Fuel analysis may be submitted for required sulfur dioxide emission test.

B. In January, 1985, the permittee will test the baghouse by EPA Method #12 for particulate and lead. If the test results are favorable, then the permittee will not be required to retest for these parameters until the permit is renewed.

C. Maxmum allowable emissions from the charging operation shall be:

Pollutant	Emission Limitation	Regulation
Particulates	0.55 #/hr.	As requested by the permittee to exempt the facility from particulate RACT
Opacity	5%	As requested by the permittee to exempt the facility from particulate RACT
Lead	0.22 #/hr.	Lead SIP

D. The visible emission test shall be 30 minutes in duration and it shall be read only while charging is occurring.

E. Any changes to the physical stack characteristics or flow parameter listed in this application which could affect the maximum modeled impact of 0.118 ug of Pb per cubic meters, shall be considered a modification of this permit. As a modification, the permittee would be required to submit an application for prior approval.

PERMITTEE:
Gulf Coast Lead Company, Inc.

Permit/Certification No.: A029-95366
Project: Blast Furnace Operation

SPECIFIC CONDITIONS (con't):

IV. **ALL SOURCES**

A. The Hillsborough County Environmental Protection Commission shall be notified in writing 15 days prior to compliance testing.

B. Submit for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information as per Section 17-4.14, F.A.C.

(A) Annual amount of materials and/or fuels utilized.
(B) Annual emissions (note calculation basis).
(C) Any changes in the information contained in the permit application.

Duplicate copies of all reports shall be submitted to the Hillsborough County Environmental Protection Commission.

C. An application to renew this operating permit shall be submitted to the Department 60 days prior to the expiration date of this permit.

D. The total hours of operation of both blast furnaces shall not exceed 7800 hours per year.

E. All reasonable precautions shall be taken to prevent and control generation of unconfined emissions of particulate matter in accordance with the provision in Section 17-2.610 (3), F.A.C.. These provisions are applicable to any source, including, but not limited to, vehicular movement, transportation of materials, construction, alteration, demolition or wrecking, or industrial related activities such as loading, unloading, storing and handling.

Issued this 28 day of January 1985.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

Richard D. Garrity

Richard D. Garrity, ~~Ph.D.~~
District Manager

ATTACHMENT XX

Permit No. A029-173310 Dated July 17, 1990
For the Operation of the Blast Furnace and the Agglomeration Furnace

JUL 18 1990

Florida Department of Environmental Regulation

Southwest District • 4520 Oak Fair Boulevard • Tampa, Florida 33610-7347 • 813-623-5561

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary
Dr. Richard Garrity, Deputy Assistant Secretary

July 17, 1990

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT ISSUANCE

Mr. Willis M. Kitchen
Vice President
Gulf Coast Lead Company, Inc.
1901 North 66th Street
Tampa, FL 33619

DER File No.: AO29-173310
County: Hillsborough

Enclosed is Permit Number AO29-173310 to operate a blast furnace and a flue dust agglomeration furnace, issued pursuant to Section 403.087, Florida Statutes.

A person whose substantial interests are affected by this permit may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee 32399-2400, within fourteen (14) days of receipt of this permit. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's subsequent interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends required reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this permit. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice, in the Office of General Counsel at the above address of the Department. Failure to petition within the allotted time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Final Order is filed with the Clerk of the Department.

Executed in Tampa, Florida

Sincerely,

W. C. Thomas

W. C. Thomas, P.E.
District Air Program Administrator

JHK/DJG/bb

Attachment:

cc: Environmental Protection Commission
of Hillsborough County
Robert E. Wallace III, P.E.

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT and all copies were mailed before the close of business on JUL 17 1990 to the listed persons.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to Section 120.52(10), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Marilyn Quispe
Clerk

JUL 17 1990
Date

Florida Department of Environmental Regulation

Southwest District • 4520 Oak Fair Boulevard • Tampa, Florida 33610-7347 • 813-623-5561

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary | Dr. Richard Garrity, Deputy Assistant Secretary

PERMITTEE:
Gulf Coast Lead Company, Inc.
1901 North 66th Street
Tampa, FL 33619

PERMIT/CERTIFICATION
Permit No: A029-173310
County: Hillsborough
Expiration Date: 06/22/95
Project: Blast Furnace and Agglomeration Furnace

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 & 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the operation of a secondary lead blast furnace and a flue dust agglomeration furnace. At the facility leadbearing scrap materials (LSM's), coke, lime rock, cast iron and slag are loaded into a skid-hoist and charged into the blast furnace (60 ton capacity). Lead in the liquid form collects at the base of the blast furnace. In this process lime rock is added to displace the lead in any lead silicate which might have been formed, while cast iron (iron oxide) binds with any sulfur to produce iron sulfide thus reducing sulfur dioxide emissions. The lead is tapped from the blast furnace and cast into buttons. Emissions generated by the charging (Point 06), the blast furnace exhaust (Point 01) and the tapping (Point 04) are controlled by three (3) sets of baghouses which vent separately. Flue dust collected by the baghouses is conveyed to an agglomeration furnace fired on natural gas. The blast furnace is subject to the New Source Performance Standards of 40 CFR 60, Subpart L, Standards of Performance for Secondary Lead Smelters and the Federal Implementation Plan contained in 40 CFR 62.535.

Location: 1401 North 66th Street, Tampa

UTM: 17-364.0 E 3093.6 N NEDS NO: 0057 Point ID: 01 - Furnace Exhaust
04 - Tapping
06 - Charging

Replaces Permit No.: A029-95366

PERMITTEE:
Gulf Coast Lead Company, Inc.

PERMIT/CERTIFICATION NO.: AO29-173310
PROJECT: Blast Furnace and Agglomeration Furnace

SPECIFIC CONDITIONS:

1. A part of this permit is the attached 15 General Conditions.

2. Pursuant to Rule 17-2.650(2)(b)1., F.A.C., this facility qualifies for an exemption of the Reasonably Available Control Technology (RACT) requirements since, at the request of the permittee, the total allowable emissions of the facility shall not exceed 4.4 pounds per hour and 14.9 tons per year.

3. In order to insure compliance with Specific Condition No. 2, the maximum allowable particulate matter emissions and hours of operation of the sources authorized to operate under this permit shall be:

Source	Emission Limitations	Hours of Operation
Blast Furnace Charging	0.65 lbs./hr. (2.54 TPY)	7800
Blast Furnace	2.15 lbs./hr. (8.38 TPY)	7800
Blast Furnace Tapping	0.40 lbs./hr. (1.56 TPY)	7800

4. Pursuant to 40 CFR 52.535(c)(1)(i), the maximum allowable lead emissions from the sources authorized to operate under this permit shall be:

Source	Emissions Limitations
Blast Furnace Charging	0.22 lbs./hr. (0.86 TPY)
Blast Furnace	1.81 lbs./hr. (7.06 TPY)
Blast Furnace Tapping	0.06 lbs./hr. (0.23 TPY)

5. Pursuant to 40 CFR 52.535(c)(1)(ii), visible emissions from the closed charge doors on the blast furnace shall not exceed five (5) percent opacity during furnace operation.

6. Pursuant to 40 CFR 52.535(c)(1)(iii), visible emissions from the charge doors on the blast furnace shall not exceed ten (10) percent opacity during charging operations.

7. Pursuant to 40 CFR 52.535(c)(1)(iv), visible emissions from all other sources authorized to operate under this permit shall not exceed five (5) percent opacity.

PERMITTEE:
Gulf Coast Lead Company, Inc.

PERMIT/CERTIFICATION NO.: AO29-173310
PROJECT: Blast Furnace and Agglomeration Furnace

SPECIFIC CONDITIONS: (continued)

8. Sulfur dioxide (SO_2) emissions shall not exceed 384.2 pounds per hour. If testing indicates that SO_2 emissions exceed 384.2 (374 lbs./hr. base line + 40 tons/yr., 12/83) then the permittee shall immediately reapply for a new permit under the provisions of Section 17-2.500, F.A.C.

9. Test emissions from the blast furnace charging, blast furnace, and blast furnace tapping operations for the following pollutants at intervals of twelve (12) months from February 14, 1990 and submit 2 copies of test data to the Environmental Protection Commission of Hillsborough County within forty-five (45) days of such testing pursuant to Section 17-2.700, F.A.C.:

(X) Particulates	(X) Sulfur Oxides*
(X) Opacity	(X) Lead

* Applies only to the blast furnace emissions.

10. Compliance with the emission limitations of Specific Conditions Nos. 3, 4, 5, 6, 7 and 8 shall be determined using EPA Methods 1, 2, 3, 4, 6, 9 and 12 contained in 40 CFR 60, Appendix A and adopted by reference in Section 17-2.700, F.A.C. In the case of the Method 9, Section 2.5 shall be excluded, pursuant to 40 CFR 52.535(b)(5).; thus waiving the six minute averaging period and establishing an instantaneous standard. The annual sulfur oxide test will be conducted by the same method used in the December, 1983 test. The minimum requirements for stack sampling facilities, source sampling and reporting, shall be in accordance with Section 17-2.700, F.A.C. and 40 CFR 60, Appendix A.

11. The visible emission test on the blast furnace shall be thirty (30) minutes in duration pursuant to Section 17-2.700, F.A.C., and shall be conducted concurrent with one of the Method 12 runs.

12. The visible emission tests on the blast furnace charging operation shall each be thirty (30) minutes in duration, pursuant to Rule 17-2.700(1)(d)1.b.i., F.A.C. Readings shall be taken on the:

A) Charge doors on the blast furnace only during charging.
B) Closed charge doors on the blast furnace only during furnace operation.
C) Baghouse exhaust only during blast furnace charging.

SPECIFIC CONDITIONS: (continued)

13. The visible emission test on the blast furnace tapping shall be thirty (30) minutes in duration pursuant to Rule 1702.700(1)(d)1.b.i., F.A.C. Readings shall be taken only during product tapping.

14. The maximum process input rate shall be 4.58 tons per hour of raw materials. Raw material charging rates on a daily basis shall be consistent with the following percentages based on the February, 1990 test.

Raw Material	Percentage
Lead Scrap and Re-Run Slag	88%
Coke	7%
Lime Rock	2.5%
Cast Iron	2.5%

15. Testing of emissions must be accomplished at approximately the maximum process weight rate of 4.58 tons per hour of raw materials. The actual charging rate and type of materials charged during the test shall be specified in each test result. Failure to include the actual process or production rate in the results may invalidate the test [Rule 17-4.070(3), F.A.C.].

16. Pursuant to 40 CFR 52.535(b)(2), non-process fugitive emissions (road dust, stockpiles, plant grounds, etc.) shall be minimized. Minimization efforts shall include such fugitive dust suppression activities as chemical stabilization, water spraying with appropriate runoff collection, resurfacing, sweeping, revegetation, and other EPA approved methods.

17. Pursuant to 40 CFR 52.535(b)(4), the permittee shall maintain continuous records of plant process and emission control operations as necessary to determine continuous compliance. Such records shall include reports of all process operations and control equipment operating parameters. Such records shall also include reports of all types of process upsets and emission control equipment malfunction, detailing the nature and duration of the upset or malfunction, the expected effects on emissions, and the corrective actions taken or planned to avoid recurrences. Such records shall be available at the plant site for inspection for a period of at least two (2) years.

18. Pursuant to Rule 1-1.04.1 of the Rules of the Environmental Protection Commission of Hillsborough County and consistent with Specific Condition No. 14, the permittee shall maintain daily records on the charging rates and type of materials charged (pounds per hour) into the blast furnace.

PERMITTEE:
Gulf Coast Lead Company, Inc.

PERMIT/CERTIFICATION NO.: A029-173310
PROJECT: Blast Furnace and Agglomeration Furnace

SPECIFIC CONDITIONS: (continued)

19. Pursuant to Chapter 1-3.22(3) of the Rules of the Environmental Protection Commission of Hillsborough County, the permittee shall not allow the discharge of air pollutants which contribute to an objectionable odor.

20. The Environmental Protection Commission of Hillsborough County shall be notified in writing 15 days in advance of any compliance test to be conducted on this source.

21. Submit for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information pursuant to Section 403.061(13), Florida Statutes:

(A) Annual amount of materials and/or fuels utilized.
(B) Annual emissions (note calculation basis).
(C) Any changes in the information contained in the permit application.

Duplicate copies of all reports shall be submitted to the Environmental Protection Commission of Hillsborough County.

22. Pursuant to Section 17-4.090, F.A.C., an application for renewal of permit to operate this source, completed in quadruplicate, shall be submitted to the Environmental Protection Commission of Hillsborough County at least 60 days prior to its expiration date.

Issued this 17 day of July 1990

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

For Richard Garrity, Ph.D.
Deputy Assistant Secretary

(c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

(a) A description of and cause of noncompliance; and

(b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Rule 17-4.120 and 17-730.300, Florida Administrative Code, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)

( ) Determination of Prevention of Significant Deterioration (PSD)

( ) Certification of compliance with State Water Quality Standards (Section 401, PL 92-500)

( ) Compliance with New Source Performance Standards

ATTACHMENT - GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, State, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, are required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:

(a) Have access to and copy any records that must be kept under conditions of the permit;

(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

14. The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

(c) Records of monitoring information shall include:

1. the date, exact place, and time of sampling or measurements;
2. the person responsible for performing the sampling or measurements;
3. the dates analyses were performed;
4. the person responsible for performing the analyses;
5. the analytical techniques or methods used;
6. the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

ATTACHMENT XXI

Amended Operating Permit A029-173310 Dated
November 19, 1990
For The Blast Furnace And Agglomeration Furnace

Florida Department of Environmental Regulation

Southwest District • 4520 Oak Fair Boulevard • Tampa, Florida 33610-7347 • 813-623-5561

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary | Dr. Richard Garrity, Deputy Assistant Secretary

November 16, 1990

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT AMENDMENT

Mr. Willis M. Kitchen
Vice President
Gulf Coast Recycling, Inc.
1901 North 66th Street
Tampa, FL 33619

DER File No.: A029-173310
County: Hillsborough

Enclosed is amended Permit Number A029-173310 to operate a blast furnace and a flue dust agglomeration furnace, issued pursuant to Section 403.087, Florida Statutes.

A person whose substantial interests are affected by this amended permit may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee 32399-2400, within fourteen (14) days of receipt of this permit. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's subtantial interests are affected by the Department's action or proposed action;
(d) A statement of the material facts disputed by petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends required reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this permit. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of receipt of this notice, in the Office of General Counsel at the above address of the Department. Failure to petition within the allotted time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

This amended permit is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with the above paragraphs or unless a request for extension of time in which to file a petition is filed within the time specified for filing a petition and conforms to Rule 17-103.070, F.A.C. Upon timely filing of a petition or a request for an extension of time this permit will not be effective until further Order of the Department.

When the Order (Permit) is final, any party to the Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date the Final Order is filed with the Clerk of the Department.

Mr. Willis M. Kitchen
Tampa, FL 33619

Executed in Tampa, Florida

Sincerely,

J. Harry Kerns

J. Harry Kerns, P.E.
District Air Engineer

JHK/DJG/bb

Attachment:

cc: Environmental Protection Commission
of Hillsborough County

CERTIFICATE OF SERVICE

This is to certify that this NOTICE OF PERMIT AMENDMENT and all copies were mailed before the close of business on NOV 19 1990 to the listed persons.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to Section 120.52(10), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Marilyn Quispe
Clerk

NOV 19 1990
Date

Florida Department of Environmental Regulation

Southwest District • 4520 Oak Fair Boulevard • Tampa, Florida 33610-7347 • 813-623-5561

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary
Dr. Richard Garrity, Deputy Assistant Secretary

PERMITTEE:
Gulf Coast Recycling, Inc.
1901 North 66th Street
Tampa, FL 33619

PERMIT/CERTIFICATION
Permit No: A029-173310
County: Hillsborough
Amendment Date: 11/19/90
Expiration Date: 11/15/95
Project: Blast Furnace and Agglomeration Furnace

This amended permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Rules 17-2 & 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans and other documents, attached hereto or on file with the department and made a part hereof and specifically described as follows:

For the operation of a secondary lead blast furnace and a flue dust agglomeration furnace. At the facility leadbearing scrap materials (LSM's), coke, lime rock, cast iron and slag are loaded into a skip-hoist and charged into the blast furnace (60 ton capacity). Lead in the liquid form collects at the base of the blast furnace. In this process lime rock is added to displace the lead in any lead silicate which might have been formed, while cast iron (iron oxide) binds with any sulfur to produce iron sulfide thus reducing sulfur dioxide emissions. The lead is tapped from the blast furnace and cast into buttons. Emissions generated by the charging (Point 06), the blast furnace exhaust (Point 01) and the tapping (Point 04) are controlled by three (3) sets of baghouses which vent separately. Flue dust collected by the baghouses is conveyed to an agglomeration furnace fired on natural gas. The blast furnace is subject to the New Source Performance Standards of 40 CFR 60, Subpart L, Standards of Performance for Secondary Lead Smelters and the Federal Implementation Plan contained in 40 CFR 52.535.

Location: 1901 North 66th Street, Tampa

UTM: 17-364.0 E 3093.6 N NEDS NO: 0057 Point ID: 01 - Furnace Exhaust
04 - Tapping
06 - Charging

Replaces Permit No.: A029-95366

PERMITTEE: Gulf Coast Recycling, Inc.	PERMIT/CERTIFICATION NO.: A029-173310 PROJECT: Blast Furnace and Agglomeration Furnace

SPECIFIC CONDITIONS:

1. A part of this permit is the attached 15 General Conditions.

2. Pursuant to Rule 17-2.650(2)(b)1., F.A.C., this facility qualifies for an exemption of the Reasonably Available Control Technology (RACT) requirements since, at the request of the permittee, the total allowable emissions of the facility shall not exceed 4.4 pounds per hour and 14.9 tons per year.

3. Pursuant to 40 CFR 60.122(a)(1), the permittee shall not discharge from the baghouses particulate emissions greater than 0.022 grains per dry standard cubic foot.

4. In order to insure compliance with Specific Condition No. 2, the maximum allowable particulate matter emissions* and hours of operation of the sources authorized to operate under this permit shall be:

Source	Emission Limitations	Hours of Operation
Blast Furnace Charging	0.65 lbs./hr. (2.54 TPY)	7800
Blast Furnace	2.15 lbs./hr. (8.38 TPY)	7800
Blast Furnace Tapping	0.40 lbs./hr. (1.56 TPY)	7800

* Prior to initiating any actions to increase the capture efficiency of the system, the permittee shall request written authorization from the Environmental Protection Commission of Hillsborough County.

5. Pursuant to 40 CFR 52.535(c)(1)(i), the maximum allowable lead emissions from the sources authorized to operate under this permit shall be:

Source	Emissions Limitations
Blast Furnace Charging	0.22 lbs./hr. (0.86 TPY)
Blast Furnace	1.81 lbs./hr. (7.06 TPY)
Blast Furnace Tapping	0.06 lbs./hr. (0.23 TPY)

6. Pursuant to 40 CFR 52.535(c)(1)(ii), visible emissions from the closed charge doors on the blast furnace shall not exceed five (5) percent opacity during furnace operation.

7. Pursuant to 40 CFR 52.535(c)(1)(iii), visible emissions from the charge doors on the blast furnace shall not exceed ten (10) percent opacity during charging operations.

PERMITTEE: Gulf Coast Recycling, Inc.

PERMIT/CERTIFICATION NO.: A029-173310
PROJECT: Blast Furnace and Agglomeration Furnace

SPECIFIC CONDITIONS: (continued)

8. Pursuant to 40 CFR 52.535(c)(1)(iv), visible emissions from all other sources authorized to operate under this permit shall not exceed five (5) percent opacity.

9. Sulfur dioxide (SO_2) emissions shall not exceed 384.2 pounds per hour. If testing indicates that SO_2 emissions exceed 384.2 (374 lbs./hr. base line + 40 tons/yr., 12/83) than the permittee shall immediately reapply for a new permit under the provisions of Section 17-2.500, F.A.C.

10. Test emissions from the blast furnace charging, blast furnace, and blast furnace tapping operations for the following pollutants at intervals of twelve (12) months from February 14, 1990 and submit 2 copies of test data to the Environmental Protection Commission of Hillsborough County within forty-five (45) days of such testing pursuant to Section 17-2.700, F.A.C.:

(X) Particulates	(X) Sulfur Oxides*
(X) Opacity	(X) Lead

* Applies only to the blast furnace emissions.

11. Compliance with the emission limitations of Specific Conditions Nos. 3, 4, 5, 6, 7 and 8 shall be determined using EPA Methods 1, 2, 3, 4, 6, 9 and 12 contained in 40 CFR 60, Appendix A and adopted by reference in Section 17-2.700, F.A.C. In the case of the Method 9, Section 2.5 shall be excluded, pursuant to 40 CFR 52.535(b)(5).; thus waiving the six minute averaging period and establishing an instantaneous standard. The annual sulfur oxide test will be conducted by the same method used in the December, 1983 test. The minimum requirements for stack sampling facilities, source sampling and reporting, shall be in accordance with Section 17-2.700, F.A.C. and 40 CFR 60, Appendix A.

12. The visible emission test on the blast furnace shall be sixty (60) minutes in duration pursuant to Section 17-2.700, F.A.C., and shall be conducted concurrent with one of the Method 12 runs.

13. The visible emission tests on the blast furnace charging operation shall each be sixty (60) minutes in duration, pursuant to Rule 17-2.700(1)(d)1.b.i., F.A.C. Readings shall be taken on the :

A) Charge doors on the blast furnace during charging (closest potential emission point).
B) Closed charge doors on the blast furnace during furnace operation (closest potential emission point).
C) Baghouse exhaust during blast furnace operation.

PERMITTEE:
Gulf Coast Recycling, Inc.

PERMIT/CERTIFICATION NO.: A029-173310
PROJECT: Blast Furnace and Agglomeration Furnace

SPECIFIC CONDITIONS: (continued)

14. The visible emission test on the blast furnace tapping shall be sixty (60) minutes in duration pursuant to Rule 1702.700(1)(d)1.b.i., F.A.C. Readings shall be taken only during product tapping.

15. The maximum process input rate shall be 4.58 tons per hour of raw materials. Raw material charging rates on a daily basis shall be consistent with the following percentages based on the February, 1990 test.

Raw Material	Percentage
Lead Scrap and Re-Run Slag	88% - 4.03
Coke	7% - 0.32
Lime Rock	2.5% - 0.115
Cast Iron	2.5% - 0.115

16. Testing of emissions must be accomplished at approximately the maximum process weight rate of 4.58 tons per hour of raw materials. The actual charging rate and type of materials charged during the test shall be specified in each test result. Failure to include the actual process or production rate in the results may invalidate the test [Rule 17-4.070(3), F.A.C.].

17. Pursuant to 40 CFR 52.535(b)(2), non-process fugitive emissions (road dust, stockpiles, plant grounds, etc.) shall be minimized. Minimization efforts shall include such fugitive dust suppression activities as chemical stabilization, water spraying with appropriate runoff collection, resurfacing, sweeping, revegetation, and other EPA approved methods.

18. Pursuant to 40 CFR 52.535(b)(4), the permittee shall maintain continuous records of plant process and emission control operations as necessary to determine continuous compliance. Such records shall include reports of all process operations and control equipment operating parameters. Such records shall also include reports of all types of process upsets and emission control equipment malfunction, detailing the nature and duration of the upset or malfunction, the expected effects on emissions, and the corrective actions taken or planned to avoid recurrences. Such records shall be available at the plant site for inspection for a period of at least two (2) years.

PERMITTEE:
Gulf Coast Recycling, Inc.

PERMIT/CERTIFICATION NO.: A029-173310
PROJECT: Blast Furnace and Agglomeration Furnace

SPECIFIC CONDITIONS: (continued)

19. Pursuant to Rule 1-1.04.1 of the Rules of the Environmental Protection Commission of Hillsborough County and consistent with Specific Condition No. 15, the permittee shall maintain daily records on the number of charges to the blast furnace and the make-up of each charge (i.e., groups, coke, limerock, etc.). The permittee shall also maintain monthly inventory records showing types and quantities of materials charged to the furnace during the month.

20. Pursuant to Chapter 1-3.22(3) of the Rules of the Environmental Protection Commission of Hillsborough County, the permittee shall not allow the discharge of air pollutants which contribute to an objectionable odor.

21. The Environmental Protection Commission of Hillsborough County shall be notified in writing 15 days in advance of any compliance test to be conducted on this source.

22. Submit for this facility, each calendar year, on or before March 1, an emission report for the preceding calendar year containing the following information pursuant to Subsection 403.061(13), Florida Statutes:

(A) Annual amount of materials and/or fuels utilized.
(B) Annual emissions (note calculation basis).
(C) Any changes in the information contained in the permit application.

Duplicate copies of all reports shall be submitted to the Environmental Protection Commission of Hillsborough County.

23. Pursuant to Section 17-4.090, F.A.C., an application for renewal of permit to operate this source, completed in quadruplicate, shall be submitted to the Environmental Protection Commission of Hillsborough County at least 60 days prior to its expiration date.

Originally Issued: July 17, 1990
Amended this 19 day of 19Nov.

STATE OF FLORIDA DEPARTMENT OF
ENVIRONMENTAL REGULATION

(c) Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

(a) A description of and cause of noncompliance; and

(b) The period of noncompliance, including dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the noncompliance.

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.111 and 403.73, F.S. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance; provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Rule 17-4.120 and 17-730.300, Florida Administrative Code, as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes:

( ) Determination of Best Available Control Technology (BACT)

( ) Determination of Prevention of Significant Deterioration (PSD)

( ) Certification of compliance with State Water Quality Standards (Section 401, PL 92-500)

( ) Compliance with New Source Performance Standards

ATTACHMENT - GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations and restrictions set forth in this permit, are "permit conditions" and are binding and enforceable pursuant to Sections 403.141, 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in subsections 403.087(6) and 403.722(5), F.S., the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, State, or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in this permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed and used by the permittee to achieve compliance with the conditions of this permit, are required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at reasonable times, access to the premises where the permitted activity is located or conducted to:

(a) Have access to and copy any records that must be kept under conditions of the permit;

(b) Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

14. The permittee shall comply with the following:

(a) Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

(b) The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

(c) Records of monitoring information shall include:

1. the date, exact place, and time of sampling or measurements;
2. the person responsible for performing the sampling or measurements;
3. the dates analyses were performed;
4. the person responsible for performing the analyses;
5. the analytical techniques or methods used;
6. the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware the relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

ATTACHMENT XXII

Letter dated October 10, 1991
from Stevenson and Associates To EPC
Subject: Testing Protocol - Compliance/PSD Determination

STEVENSON AND ASSOCIATES

October 10, 1991

Mr. Bill Schroeder
Hillsborough County Environmental
Protection Commission
1410 North 21st Street
Tampa, Florida 33605

RE: Gulf Coast Recycling
Testing Protocol - Compliance/PSD Determination

Dear Bill:

Testing will be conducted at Gulf Coast Recycling during the period October 21 - 25, 1991, on the Blast Furnace using the following methods:

October 21

Method 10	(Carbon Monoxide)	- No Deviation
Method 7E	(Oxides of Nitrogen	- No Deviation
Method 25A	(Volatile Organic Compounds)	- No Deviation

October 22 - 25

Method 1-5 (Particulate) *
Method 12 (Lead) *

* The deviation of the method will result in the concurrent running of particulate and lead, replacing the HOH in the Method 5 train with 100ml of .1 $NHNO_3$ (Nitric Acid) in the first two (2) impingers. The front half of the train will be analyzed for particulate using an acetone probe rinse. Upon completion of the particulate analysis, the filter and probe wash residue will be added to the HNO_3 for Pb (Lead) analysis.

Method 8 (SO_2) - Option will be run.

Sincerely,

Lynne Stevenson
President

cc: Joyce Morales - Gulf Coast Recycling
George Townsend - Gulf Coast Recycling
C. S. Lee - Department of Environmental Regulation (DER)
Jim Pennington, DER Bureau of Air Quality Management
Environmental Protection Agency (EPA) Region IV

ATTACHMENT XXIII

Stack Sampling Emission Report
and
Visible Emission Tests
Prepared By
Stevenson & Associates

STACK SAMPLING EMISSION REPORT
and
VISIBLE EMISSION TESTS

GULF COAST RECYCLING
Tampa, Florida
October 21 - 25, 1991

STEVENSON & ASSOCIATES
333 Falkenburg Road, Suite B-214
Tampa, Florida 33619

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1.0 INTRODUCTION

1.0 INTRODUCTION

On October 21, 22, 23, 24 & 25, 1991, Stevenson & Associates, represented by Lynne Stevenson, Ron Oliver and Tim Capelle, conducted emission sampling (EPA Methods 1, 2, 4, 5, 6, and 12) and visible emission (EPA Method 9) tests for Gulf Coast Recycling, 1901 North 66th Street, Tampa, Florida.

These tests were performed to meet compliance test specifications of Permits Nos.: AO29-130736/Keel Cast Baghouse; AO29-173310/Furnace Tapping, Furnace Charging and Blast Furnace; and, AC29-184883/Refining Baghouse; and, to determine if these sources were operating within the limits of said permits as per requirements of the Hillsborough County Environmental Protection Commission and the State of Florida Department of Environmental Regulation.

2.0 SOURCE DESCRIPTION

2.0 SOURCE DESCRIPTION

Gulf Coast Recycling recovers lead from damaged or spent lead-acid batteries. Battery groups and posts are removed from the batteries and resmelted in a blast furnace. The blast lead is cast into 3,700 pound "buttons". These buttons are then remelted and cast into boat keels or the lead is refined or alloyed to customer specifications. These operations are controlled with five (5) separate collection and discharge systems.

Dust and fumes from the blast furnace and the slagging furnace are collected, routed through a series of cooling loops and forced through a fabric baghouse collector system (10 modules) prior to discharge through a stack. The stack is 36 inches in diameter, 150 feet high with two (2) sample ports located at 45 feet. The sampling ports are located 8 stack diameters upstream and 28 diameters downstream of any flow disturbances. The sulfur dioxide sampling port is located at the same sampling ports.

The blast furnace charging operation is vented through a double module baghouse.

Exhaust hoods covering the blast furnace, lead and slag taps and the slag tap from the slag furnace are vented through a single module baghouse collector and exhausted through a 13-inch square stack that is 45 feet tall. This process is called blast furnace tapping.

The refining kettle ventilation system consists of exhaust hoods enclosing each of three (3) melting kettles and lead drossing bins. The exhaust from these hoods is routed through a two module baghouse and vented through a 22-inch diameter stack that is 25 feet tall.

The keel cast melt kettle is enclosed with a hood that is exhausted to a single module baghouse and vented through a 14.5 inch diameter stack that is 25 feet tall.

3.0 SUMMARY OF RESULTS

3.0 SUMMARY OF RESULTS

The results of the emission testing are presented in the following Tables. The average emission rates for all parameters for all sources were below the allowable rates as specified in the current operating permits. Therefore, these sources wer oeprating within the limits of compliance during the testing on October 21 through October 25, 1991.

The visible emission highest six minute average for all sources was 0%.

No problems were encountered in accomplishing this assignment.

TABLE I

TEST SUMMARY - PARTICULATE

GULF COAST RECYCLING - CHARGING

October 21, 1991

RUN NO.	PARTCLT. (LBS/HR)	CONCNTRTN (GR/DSCF)	GAS FLOW (ACFM)	GAS FLOW (DSCFM)	VOLM. AIR (VMSTD)	ISOKENET. (%)
1	0.637	.0091027	8,735	8,163	42.38	98.70%
2	0.326	.0047016	8,671	8,083	41.68	98.04%
3	0.109	.0016317	8,348	7,804	40.66	99.06%
AVG.	0.357	0.005145	8,585	8,017	41.57	98.60%

TABLE II

TEST SUMMARY - LEAD

GULF COAST RECYCLING - CHARGING

October 21, 1991

RUN NO.	LEAD (LBS/HR)	CONCNTRTN (GR/DSCF)	GAS FLOW (ACFM)	GAS FLOW (DSCFM)	VOLM. AIR (VMSTD)	ISOKENET. (%)
1	0.009	.0001274	8,735	8,163	42.38	98.70%
2	0.010	.0001480	8,671	8,083	41.68	98.04%
3	0.009	.0001328	8,348	7,804	40.66	99.06%
AVG.	0.009	0.000136	8,585	8,017	41.57	98.60%

TABLE I

TEST SUMMARY - PARTICULATE

GULF COAST RECYCLING - TAPPING

October 22, 1991

RUN NO.	PARTCLT. (LBS/HR)	CONCNTRTN (GR/DSCF)	GAS FLOW (ACFM)	GAS FLOW (DSCFM)	VOLM. AIR (VMSTD)	ISOKENET. (%)
1	0.093	.0030796	3,844	3,508	35.07	100.09%
2	0.031	.0010435	3,845	3,508	35.49	101.28%
3	0.021	.0006968	3,845	3,507	35.43	101.13%
AVG.	0.048	0.001607	3,845	3,508	35.33	100.84%

TABLE II

TEST SUMMARY - LEAD

GULF COAST RECYCLING - TAPPING

October 22, 1991

RUN NO.	LEAD (LBS/HR)	CONCNTRTN (GR/DSCF)	GAS FLOW (ACFM)	GAS FLOW (DSCFM)	VOLM. AIR (VMSTD)	ISOKENET. (%)
1	0.001	0.000035	3,844	3,508	35.07	100.09%
2	0.001	0.000035	3,845	3,508	35.49	101.28%
3	0.001	0.000022	3,845	3,507	35.43	101.13%
AVG.	0.001	0.000031	3,845	3,508	35.33	100.84%

TABLE I

TEST SUMMARY - PARTICULATE

GULF COAST RECYCLING - REFINING

October 22, 1991

RUN NO.	PARTICLT. (LBS/HR)	CONCNTRTN (GR/DSCF)	GAS FLOW (ACFM)	GAS FLOW (DSCFM)	VOLM. AIR (VMSTD)	ISOKENET. (%)
1	0.164	.0013949	14,443	13,721	40.93	101.47%
2	0.197	.0016712	14,440	13,743	40.62	100.56%
3	0.535	.0045839	14,572	13,617	40.39	100.92%
AVG.	0.299	0.002550	14,485	13,694	40.65	100.98%

TABLE II

TEST SUMMARY - LEAD

GULF COAST RECYCLING - REFINING

October 22, 1991

RUN NO.	LEAD (LBS/HR)	CONCNTRTN (GR/DSCF)	GAS FLOW (ACFM)	GAS FLOW (DSCFM)	VOLM. AIR (VMSTD)	ISOKENET. (%)
1	0.006	.0000490	14,443	13,721	40.93	101.47%
2	0.004	.0000303	14,440	13,743	40.62	100.56%
3	0.004	.0000305	14,572	13,617	40.39	100.92%
AVG.	0.004	0.000037	14,485	13,694	40.65	100.98%

TABLE I

TEST SUMMARY - PARTICULATE

GULF COAST RECYCLING - KEEL CASTING

October 23, 1991

RUN NO.	PARTICLT. (LBS/HR)	CONCNTRTN (GR/DSCF)	GAS FLOW (ACFM)	GAS FLOW (DSCFM)	VOLM. AIR (VMSTD)	ISOKENET. (%)
1	0.071	.0028168	3,077	2,924	38.34	100.98%
2	0.119	.0047347	3,080	2,921	38.13	100.50%
3	0.099	.0039632	3,080	2,918	38.54	101.69%
AVG.	0.096	0.003838	3,079	2,921	38.34	101.06%

TABLE II

TEST SUMMARY - LEAD

GULF COAST RECYCLING - KEEL CASTING

October 23, 1991

RUN NO.	LEAD (LBS/HR)	CONCNTRTN (GR/DSCF)	GAS FLOW (ACFM)	GAS FLOW (DSCFM)	VOLM. AIR (VMSTD)	ISOKENET. (%)
1	0.001	0.000032	3,077	2,924	38.34	100.98%
2	0.001	0.000032	3,080	2,921	38.13	100.50%
3	0.001	0.000032	3,080	2,918	38.54	101.69%
AVG.	0.001	0.000032	3,079	2,921	38.34	101.06%

TABLE I

TEST SUMMARY - PARTICULATE

GULF COAST RECYCLING - BLAST FURNACE

October 24, 1991

RUN NO.	PARTICLT. (LBS/HR)	CONCNTRTN (GR/DSCF)	GAS FLOW (ACFM)	GAS FLOW (DSCFM)	VOLM. AIR (VMSTD)	ISOKENET. (%)
1	1.254	.0072035	24,335	20,308	40.06	100.41%
2	0.679	.0038992	24,485	20,321	39.57	99.14%
3	0.462	.0026788	24,243	20,108	39.17	99.17%
AVG.	0.798	0.004594	24,354	20,246	39.60	99.57%

TABLE II

TEST SUMMARY - LEAD

GULF COAST RECYCLING - BLAST FURNACE

October 24, 1991

RUN NO.	LEAD (LBS/HR)	CONCNTRTN (GR/DSCF)	GAS FLOW (ACFM)	GAS FLOW (DSCFM)	VOLM. AIR (VMSTD)	ISOKENET. (%)
1	0.007	0.000039	24,335	20,308	40.06	100.41%
2	0.005	0.000031	24,485	20,321	39.57	99.14%
3	0.007	0.000039	24,243	20,108	39.17	99.17%
AVG.	0.006	0.000036	24,354	20,246	39.60	99.57%

BLAST FURNACE SULFUR DIOXIDE TEST SUMMARY

Permit No. A029-173310

October 25, 1991

RUN #	SO2 LB/SCFM	SULFUR DIOXIDE-LBS/HR
1	0.000166	203
2	0.000152	184
3	0.000232	394
AVG.	**0.000183**	**260**

4.0 SUMMARY OF TEST DATA

SUMMARY OF TEST DATA

PLANT: GULF COAST RECYCLING   UNIT: CHARGING   RUN NUMBER(S): 1 - 3

TEST DATE :10-21-91	#1	#2	#3
DATE	10-21-91	10-21-91	10-21-91
START TIME	10:47	12:35	14:05
END TIME	11:47	13:35	15:05
STACK DIAMETER (INCHES)	22	22	22
NOZZLE DIAMETER (INCHES)	.206	.206	.206
TEST TIME (MINUTES)	60	60	60
NUMBER OF TEST POINTS PER RUN	12	12	12
STACK GAS TEMPERATURE (FAHRENHEIT)	95.00	95.00	95.00
STACK GAS MOISTURE CONTENT (%)	1.96%	2.21%	1.93%
STACK GAS MOLECULAR WEIGHT	28.78	28.76	28.79
STACK GAS VOLUME SAMPLED (CUBIC FEET)	42.84	42.835	42.02
VOLUME SAMPLED (SCF @ 68 DEG F)	42.377	41.679	40.660
STACK GAS VELOCITY (FEET PER SECOND)	55.15	54.75	52.71
STACK GAS FLOWRATE (ACFM)	8735.122	8671.008	8348.348
STACK GAS FLOWRATE (DSCFM @ 68 DEG F)	8163.372	8082.888	7804.314
PARTICULATE COLLECTED (GRAMS)	.025	.0127	.0043
PARTICULATE CONCENTRATION (GRAINS/DSCF)	0.0091	0.0047	0.0016
POLLUTANT MASS RATE - PARTIC. (LB/HOUR)	0.637	0.326	0.109
LEAD COLLECTED (GRAMS)	0.000350	0.000400	0.000350
LEAD CONCENTRATION (GRAINS/DSCF)	0.000127	0.000148	0.000133
POLLUTANT MASS RATE - LEAD (LB/HOUR)	0.0089	0.0103	0.0089
PERCENT ISOKINETIC OF TEST	98.70%	98.04%	99.06%

FIELD DATA AND SAMPLES UNDER THE CONTROL OF: R Olum

LABORATORY ANALYSIS UNDER THE CONTROL OF: Lee Barrera

SUMMARY OF TEST DATA

PLANT: GULF COAST RECYCLING UNIT: REFINING RUN NUMBER(S): 1 - 3

TEST DATE :10-22-91	#1	#2	#3
DATE	10-22-91	10-22-91	10-22-91
START TIME	07:49	09:15	10:41
END TIME	08:52	10:17	11:42
STACK DIAMETER (INCHES)	26	26	26
NOZZLE DIAMETER (INCHES)	.182	.182	.182
TEST TIME (MINUTES)	60	60	60
NUMBER OF TEST POINTS PER RUN	12	12	12
STACK GAS TEMPERATURE (FAHRENHEIT)	100.83	101.00	111.33
STACK GAS MOISTURE CONTENT (%)	1.92%	1.71%	1.72%
STACK GAS MOLECULAR WEIGHT	28.79	28.81	28.81
STACK GAS VOLUME SAMPLED (CUBIC FEET)	40.795	40.885	41.025
VOLUME SAMPLED (SCF @ 68 DEG F)	40.928	40.623	40.393
STACK GAS VELOCITY (FEET PER SECOND)	65.29	65.27	65.87
STACK GAS FLOWRATE (ACFM)	14443.13	14439.50	14572.14
STACK GAS FLOWRATE (DSCFM @ 68 DEG F)	13721.33	13743.08	13617.16
PARTICULATE COLLECTED (GRAMS)	.0037	.0044	.012
PARTICULATE CONCENTRATION (GRAINS/DSCF)	0.0014	0.0017	0.0046
POLLUTANT MASS RATE - PARTIC. (LB/HOUR)	0.16	0.20	0.53
LEAD COLLECTED (GRAMS)	0.00013	0.00008	0.00008
LEAD CONCENTRATION (GRAINS/DSCF)	.000049	.000030	.000031
POLLUTANT MASS RATE - LEAD (LB/HOUR)	.005763	.003579	.003566
PERCENT ISOKINETIC OF TEST	101.47%	100.56%	100.92%

FIELD DATA AND SAMPLES UNDER THE CONTROL OF: R Oliver

LABORATORY ANALYSIS UNDER THE CONTROL OF: Lee Barreiro

SUMMARY OF TEST DATA

PLANT: GULF COAST RECYCLING   UNIT: TAPPING   RUN NUMBER(S): 1 - 3

TEST DATE :10-22-91	#1	#2	#3
DATE	10-22-91	10-22-91	10-22-91
START TIME	12:59	14:26	15:48
END TIME	14:00	15:28	16:51
STACK DIMENSIONS (INCHES)	12.5x12.5	12.5x12.5	12.5x12.5
NOZZLE DIAMETER (INCHES)	.182	.182	.182
TEST TIME (MINUTES)	60	60	60
NUMBER OF TEST POINTS PER RUN	12	12	12
STACK GAS TEMPERATURE (FAHRENHEIT)	113.67	113.83	114.00
STACK GAS MOISTURE CONTENT (%)	1.33%	1.31%	1.31%
STACK GAS MOLECULAR WEIGHT	28.85	28.86	28.86
STACK GAS VOLUME SAMPLED (CUBIC FEET)	36.01	36.58	36.51
VOLUME SAMPLED (SCF @ 68 DEG F)	35.073	35.486	35.429
STACK GAS VELOCITY (FEET PER SECOND)	59.04	59.05	59.06
STACK GAS FLOWRATE (ACFM)	3843.993	3844.675	3845.248
STACK GAS FLOWRATE (DSCFM @ 68 DEG F)	3508.186	3507.901	3507.332
PARTICULATE COLLECTED (GRAMS)	.007	.0024	.0016
PARTICULATE CONCENTRATION (GRAINS/DSCF)	0.0031	0.0010	0.0007
POLLUTANT MASS RATE - PARTIC. (LB/HOUR)	0.093	0.031	0.021
LEAD COLLECTED (GRAMS)	0.000080	0.000080	0.000050
LEAD CONCENTRATION (GRAINS/DSCF)	0.000035	0.000035	0.000022
POLLUTANT MASS RATE - LEAD (LB/HOUR)	0.0011	0.0010	0.0007
PERCENT ISOKINETIC OF TEST	100.09%	101.28%	101.13%

FIELD DATA AND SAMPLES UNDER THE CONTROL OF: ______________________

LABORATORY ANALYSIS UNDER THE CONTROL OF: ______________________

SUMMARY OF TEST DATA

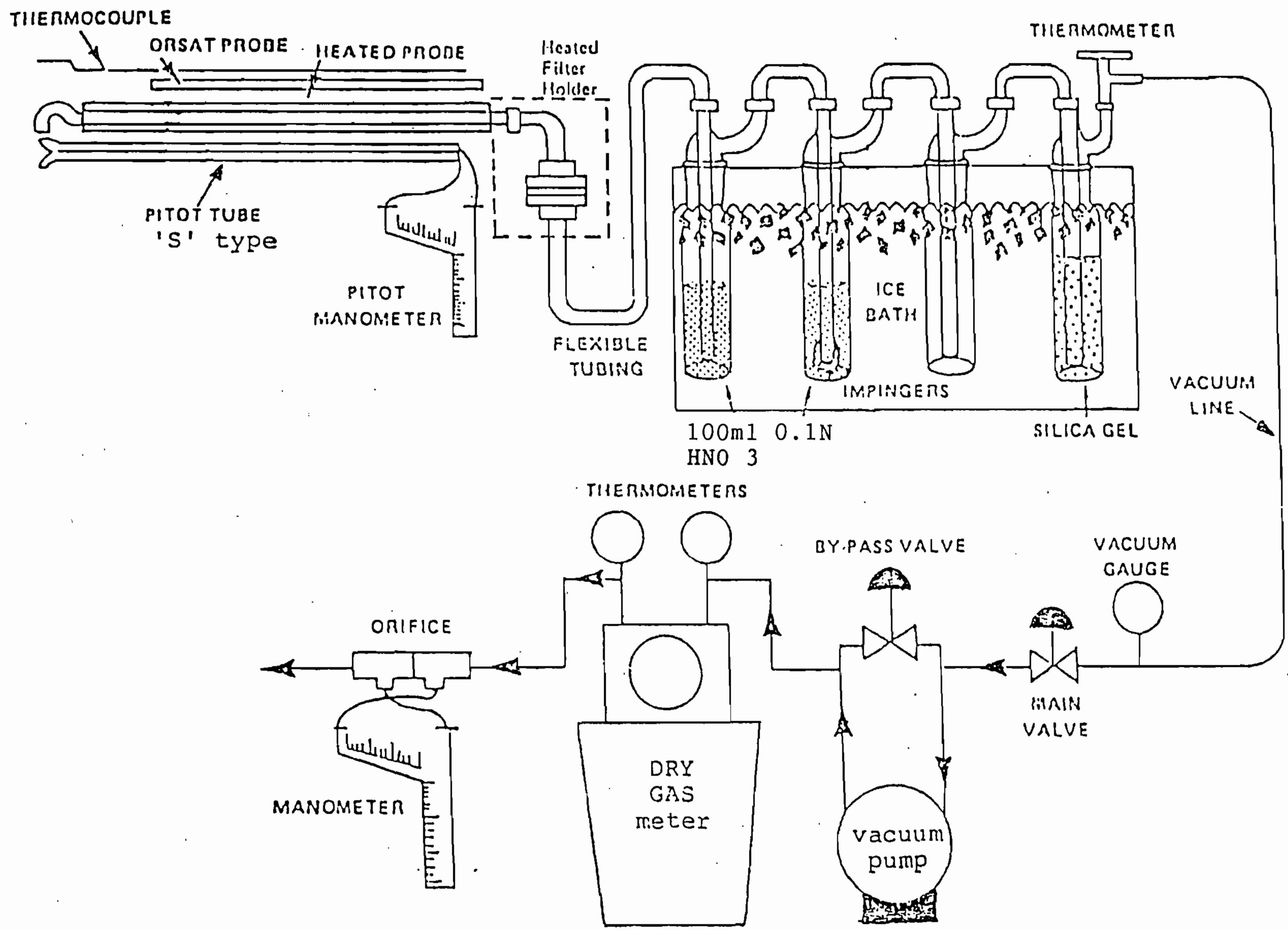
PLANT:GULF COAST RECYCLING   UNIT:BLAST FURNACE   RUN NUMBER(S): 1 - 3

TEST DATE :10-24-91	#1	#2	#3
DATE	10-24-91	10-24-91	10-24-91
START TIME	08:00	09:38	11:10
END TIME	09:02	10:40	12:12
STACK DIAMETER (INCHES)	36	36	36
NOZZLE DIAMETER (INCHES)	.206	.206	.206
TEST TIME (MINUTES)	60	60	60
NUMBER OF TEST POINTS PER RUN	12	12	12
STACK GAS TEMPERATURE (FAHRENHEIT)	153.83	154.83	155.00
STACK GAS MOISTURE CONTENT (%)	3.30%	3.67%	3.71%
STACK GAS MOLECULAR WEIGHT	28.64	28.60	28.59
STACK GAS VOLUME SAMPLED (CUBIC FEET)	39.86999	39.96499	39.79
VOLUME SAMPLED (SCF @ 68 DEG F)	40.055	39.572	39.168
STACK GAS VELOCITY (FEET PER SECOND)	57.38	57.73	57.16
STACK GAS FLOWRATE (ACFM)	24334.76	24484.57	24242.56
STACK GAS FLOWRATE (DSCFM @ 68 DEG F)	20308.03	20321.47	20107.53
PARTICULATE COLLECTED (GRAMS)	.0187	.01	.0068
PARTICULATE CONCENTRATION (GRAINS/DSCF)	0.0072	0.0039	0.0027
POLLUTANT MASS RATE - PARTIC. (LB/HOUR)	1.254	0.679	0.462
LEAD COLLECTED (GRAMS)	0.000100	0.000080	0.000100
LEAD CONCENTRATION (GRAINS/DSCF)	0.000039	0.000031	0.000039
POLLUTANT MASS RATE - LEAD (LB/HOUR)	0.007	0.005	0.007
PERCENT ISOKINETIC OF TEST	100.41%	99.14%	99.17%

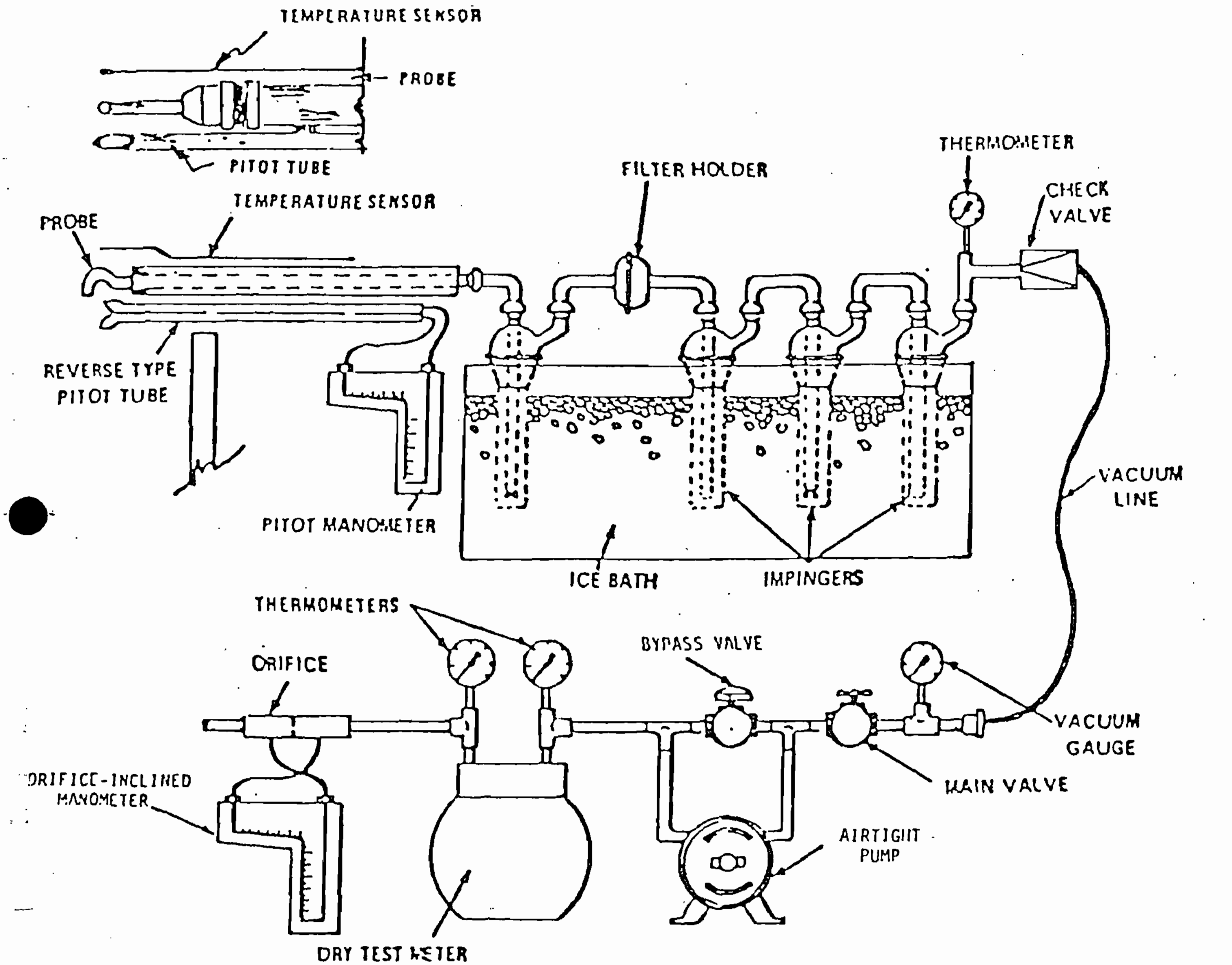
FIELD DATA AND SAMPLES UNDER THE CONTROL OF: ______________________

LABORATORY ANALYSIS UNDER THE CONTROL OF: ______________________

5.0 SAMPLING EQUIPMENT SKETCHES



PARTICULATE/LEAD SAMPLING TRAIN



Schematic of Method 8 sampling train.

6.0 PARTICULATE/LEAD SAMPLING & ANALYTICAL PROCEDURES

PARTICULATE AND LEAD SAMPLING AND ANALYTICAL PROCEDURES

SAMPLING

PARTICULATE MATTER AND LEAD

Particulate matter and lead were determined simultaneously using EPA Method 12 with the particulate option as detailed in the Method. The Method 12 sampling train was assembled as shown in sketch for each particulate/lead test. A six foot probe with a heated stainless liner was used for all test runs.

The first and second impingers were each charged with 100 ml of 0.1N nitric acid; the third was dry; the fourth was filled with known weight of indicator grade silica gel. Crushed ice was placed around the impingers during sampling to maintain the temperature of the gas leaving the last impinger below 68 F.

A pre-weighed borosilicate glass fiber filter (maintained at a temperature of 248 25 F was used for particulate matter collection. The filter temperature was monitored throughout the test.

Leak tests were performed on the sampling train before and after each sampling run. No leakages were observed at vacuum levels at or exceeding those experienced during sampling.

At the end of each 60 minute run, the volume of liquid collected in the first three impingers was measured and the silica gell in the fourth impinger was weighed to the nearest 0.5 gram to determine the volume of water collected. The contents of the first three impingers plus 0.1N HNO3 rinses of all glassware following the filter was collected in a sample bottle for subsequent lead analysis.

The filter holder was removed and sealed for return to the laboratory for filter removal and glassware rinsing. The sampling nozzle, connecting fitting with the probe liner were brushed and rinsed with acetone into a storage container; a new loaded filter holder was installed and the sampling train re-assembled for the next run.

ANALYSIS

PARTICULATE MATTER

In the laboratory, the filters and any loose particulate matter were removed from the filter holders and placed in glass petri dishes. The front half of each filter holder was rinsed with acetone into the corresponding probe wash and the rear half was rinsed with 0.1N HNO3 into the corresponding impinger sample bottle.

The filters were oven dried at 105 C for two hours, cooled in a desiccator and weighed to constant weight. The acetone wash volumes were measured and contents transferred to tared beakers and evaporated to dryness a low heat (40 C) and ambient pressure. The beakers were then cooled in a desiccator and weighed to constant weight. A portion of the acetone used for componant washing was analyzed by the same procedure to determine blank residue.

LEAD

The particulate filters and acetone wash residues, after weighing, were delivered, along with the collected impinger solutions, to Legion Laboratories, Inc. for lead analysis as described in EPA Method 12. Two blank filters and a 0.1N HNO_3 blank were included in the analysis.

7.0 SO_2 SAMPLING & ANALYTICAL PROCEDURES

SO2 SAMPLING AND ANALYTICAL PROCEDURES

SAMPLING

SO2 was determined using EPA Method 8 sampling train and analytical procedures as specified in EPA Method 6. The Method 8 sampling train was assembled as shown in the sketch for each SO2 run. A six foot heated stainless steel probe was used for all test runs.

The first impinger was charged with 100 mls. of 80% isopropanol; the second and third were charged with 100 mls. each of 3% hydrogen proxide, the forth was filled with 200 grams of silica gel. Crushed ice was placed around the impingers during sampling to maintain the temperature of the gas leaving the last impinger below 68 degrees F.

A heated filter was placed between the probe and isopropanol impinger and glass wool was placed in the end of the probe.

Leak tests were performed on the sampling train by plugging the inlet to the probe, before and after each sampling run. No leakages were observed at vacuum levels at or exceeding those observed during sampling.

At the end of each 60 minute run, the system was purged for 20 minutes by drawing clean air through the system at the sampling rate. The first impinger contents were measured and placed in a clean container for transport to the lab. The second and third impingers were measured and put in another clean container for transport to the lab. The fourth impinger was weighed to the nearest 0.5 grams to determine the volume of water collected.

The probe, first impinger and connecting glass ware were rinsed with 80% isopropanal and placed in the first sample bottle. The second and third impingers and connecting glass ware were rinsed with deionized water and placed in the second sample bottles.

ANALYSIS

Samples were taken to Legion Laboratories, Inc. for analysis.

APPENDICES

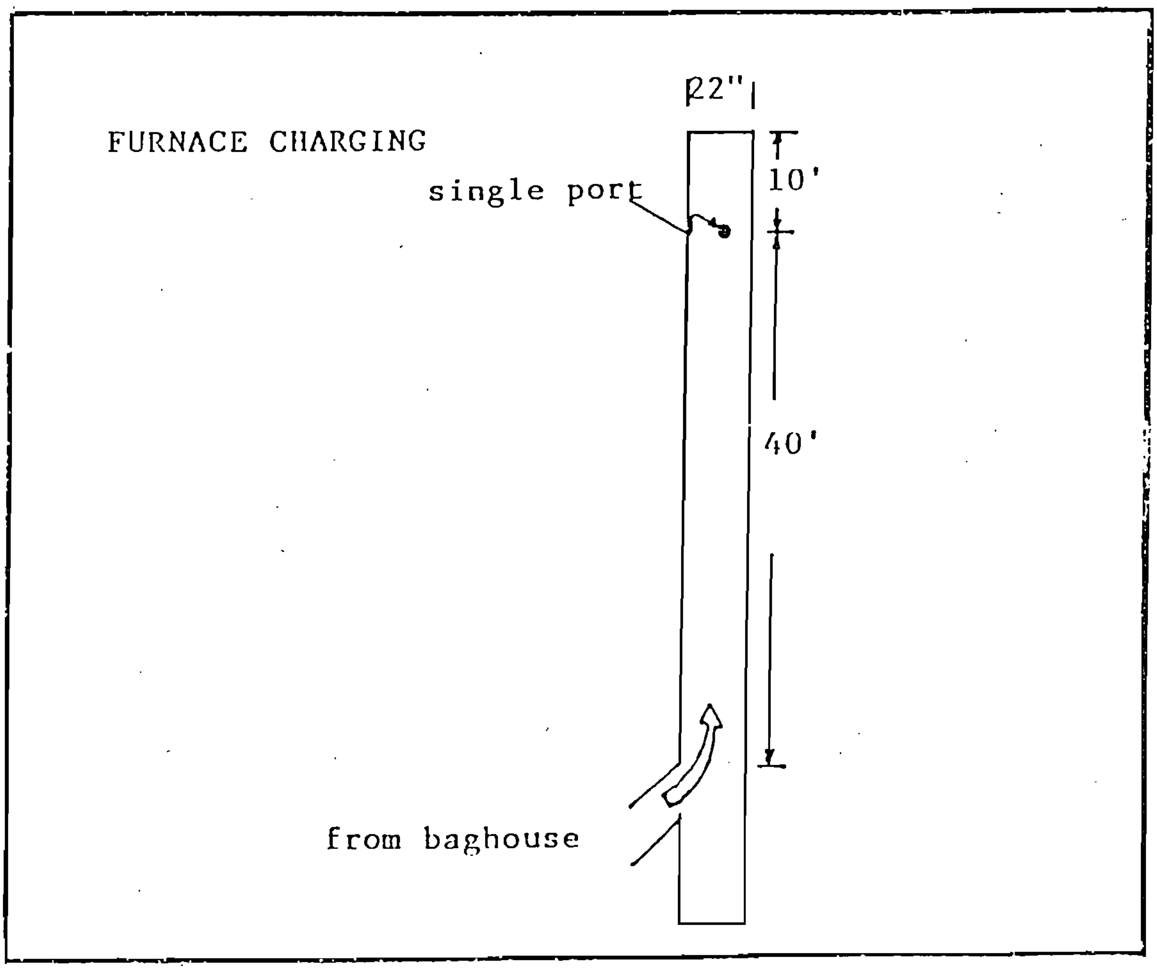
8.0 STACK SKETCHES & TRAVERSE POINT LOCATIONS

GULF COAST

FURNACE CHARGING STACK

The furnace charging stack was tested at one port which is located 21.9 stack diameters down stream and 5.5 stack diameters up stream from any obstruction or opening. The port was tested at 12 points for five minutes per point for a total of 60 minutes per test run. In order to test one inch from the stack wall, points 1 & 12 were moved to one inch. The location of the test points in relation to the stack wall is listed below.

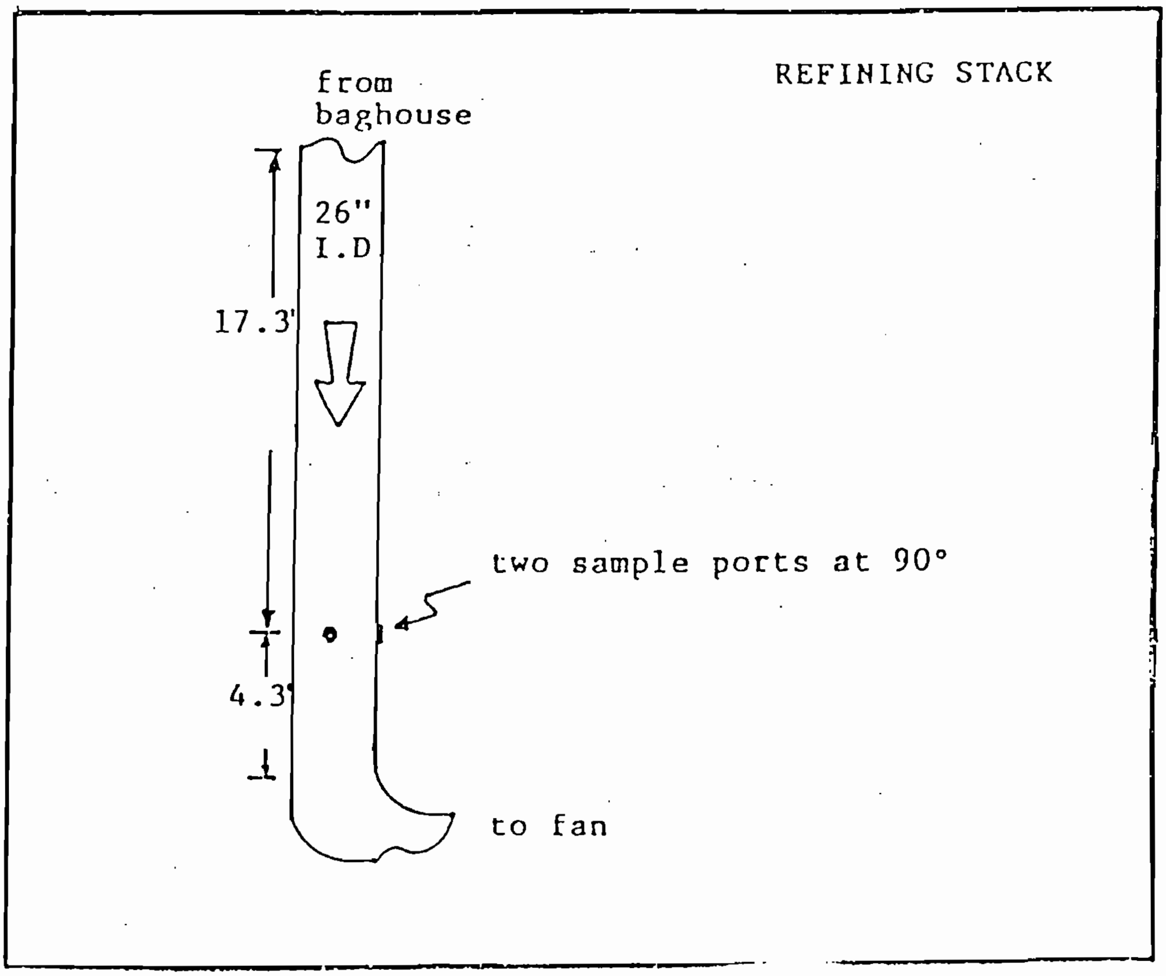
point	distance	point	distance
1	0.5"	7	14.2"
2	1.5"	8	16.5"
3	2.6"	9	18.1"
4	3.9"	10	19.4"
5	5.5"	11	20.5"
6	7.8"	12	21.5"



GULF COAST
REFINING STACK

The refining stack was sampled at two ports which are located at 90 degrees to each other. The ports are located 8 stack diameters down stream and 2 stack diameters up stream to any obstruction or opening. Each port was tested at 6 points for a total of 5 minutes for a total of 60 minutes per test run. The location of the test points in relation to the stack wall is listed below.

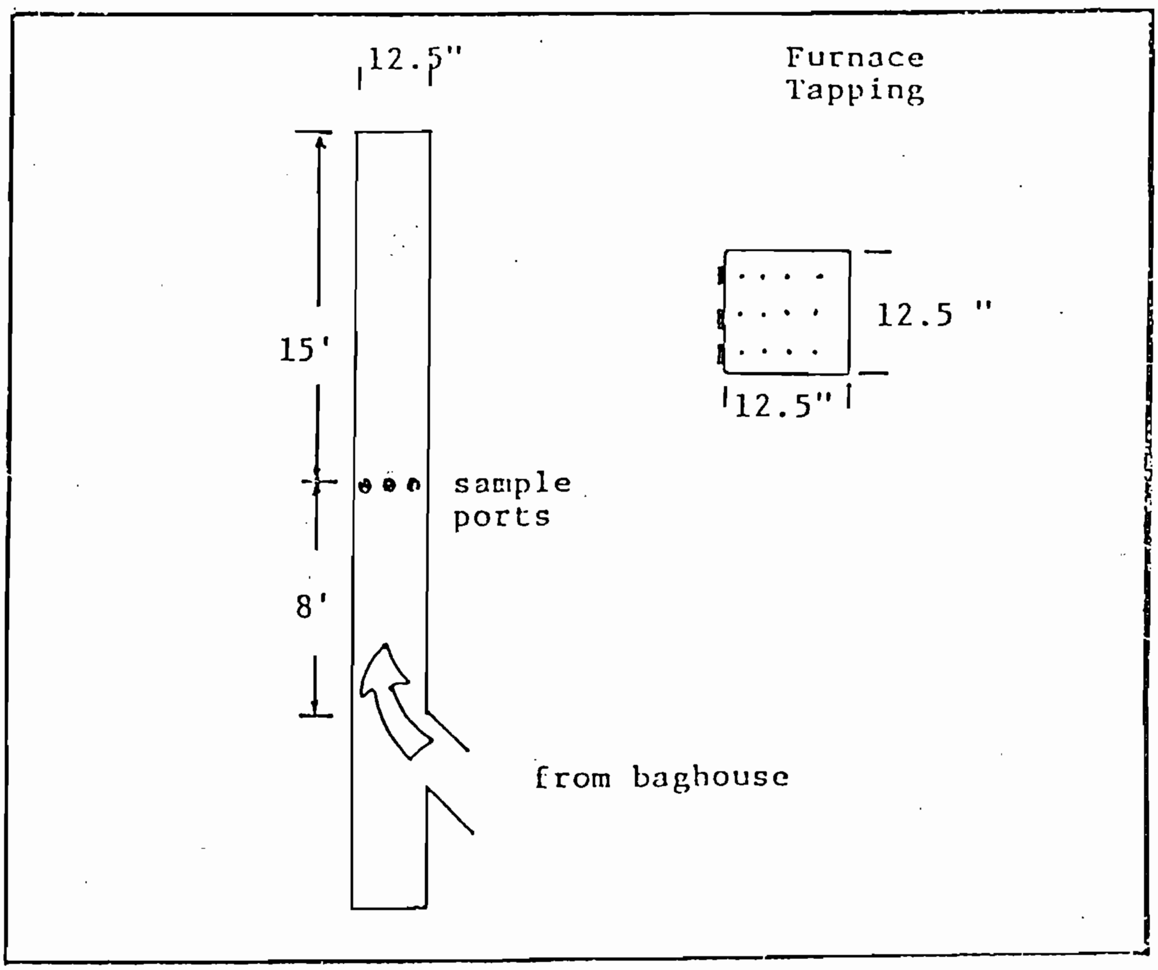
point	distance
1	1.1"
2	3.8"
3	7.7"
4	18.3"
5	22.2"
6	24.9"



GULF COAST
FURNACE TAPPING

The furnace tapping stack was tested at three ports which are located on one side of the square stack 13 stack diameters down stream and 25 stack diameters up stream from any obstruction or opening. During a test run, each of the sample ports was tested at four points for a total of 12 points. Each point was tested for 5 minutes for a total of 60 minutes per test run. The location of the sample points in relation to the stack wall is listed below.

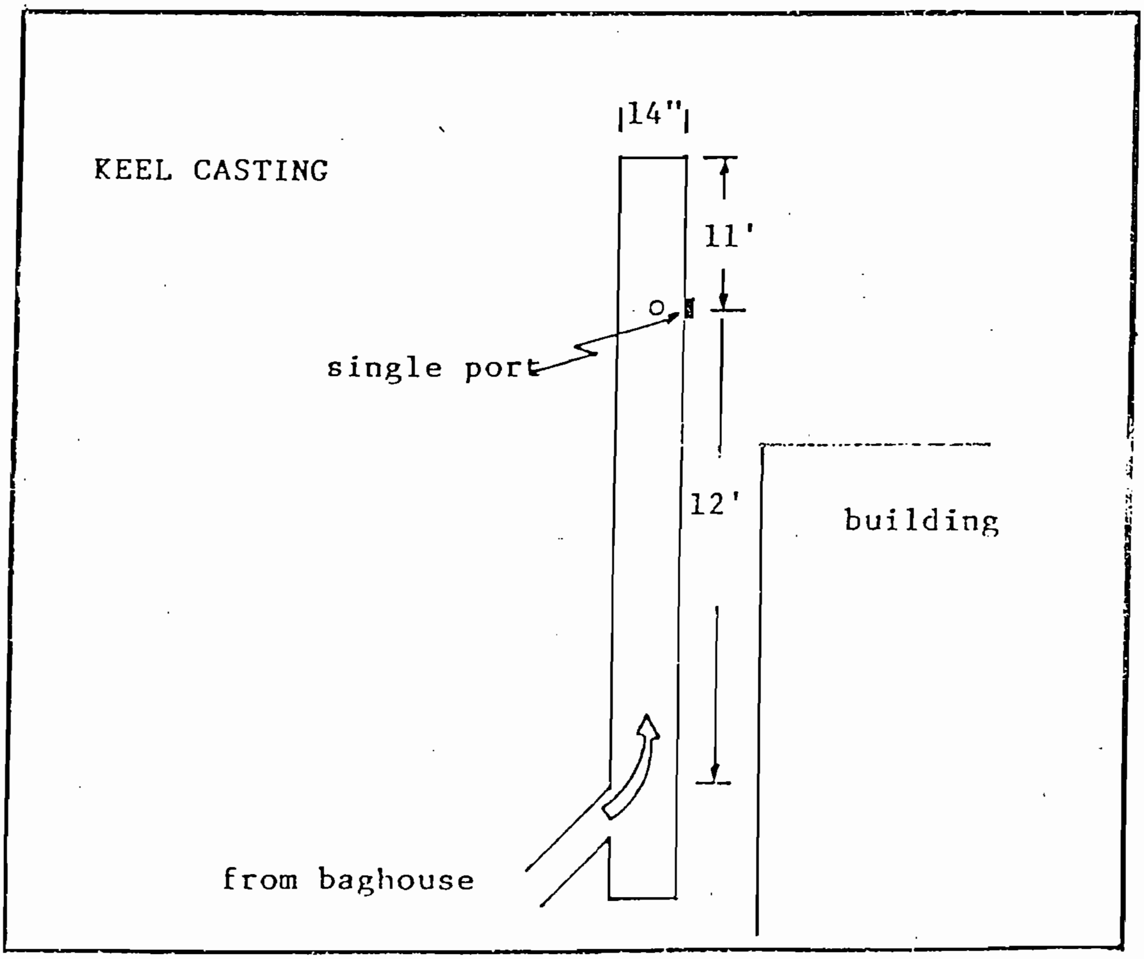
point	distance
1	1.6"
2	4.7"
3.	7.8"
4.	10.9"



GULF COAST
KEEL CASTING

The keel casting stack was sampled at one port which is located 10.3 stack diameters down stream and 9.4 stack diameters up stream from any obstruction or opening. The port was tested at 12 points for 5 minutes per point for a total of 60 minutes per run. The location of the sample points to the stack wall is listed below. Because of the small stack diameter, points 1 & 2 and points 11 & 12 were combined to move the test point one inch from the stack wall.

point	distance	point	distance
1	0.50"	7	9.0"
2	0.94"	8	10.5"
3	1.7"	9	11.5"
4	2.5"	10	12.4"
5	3.5"	11	13.1"
6	5.0"	12	13.5"

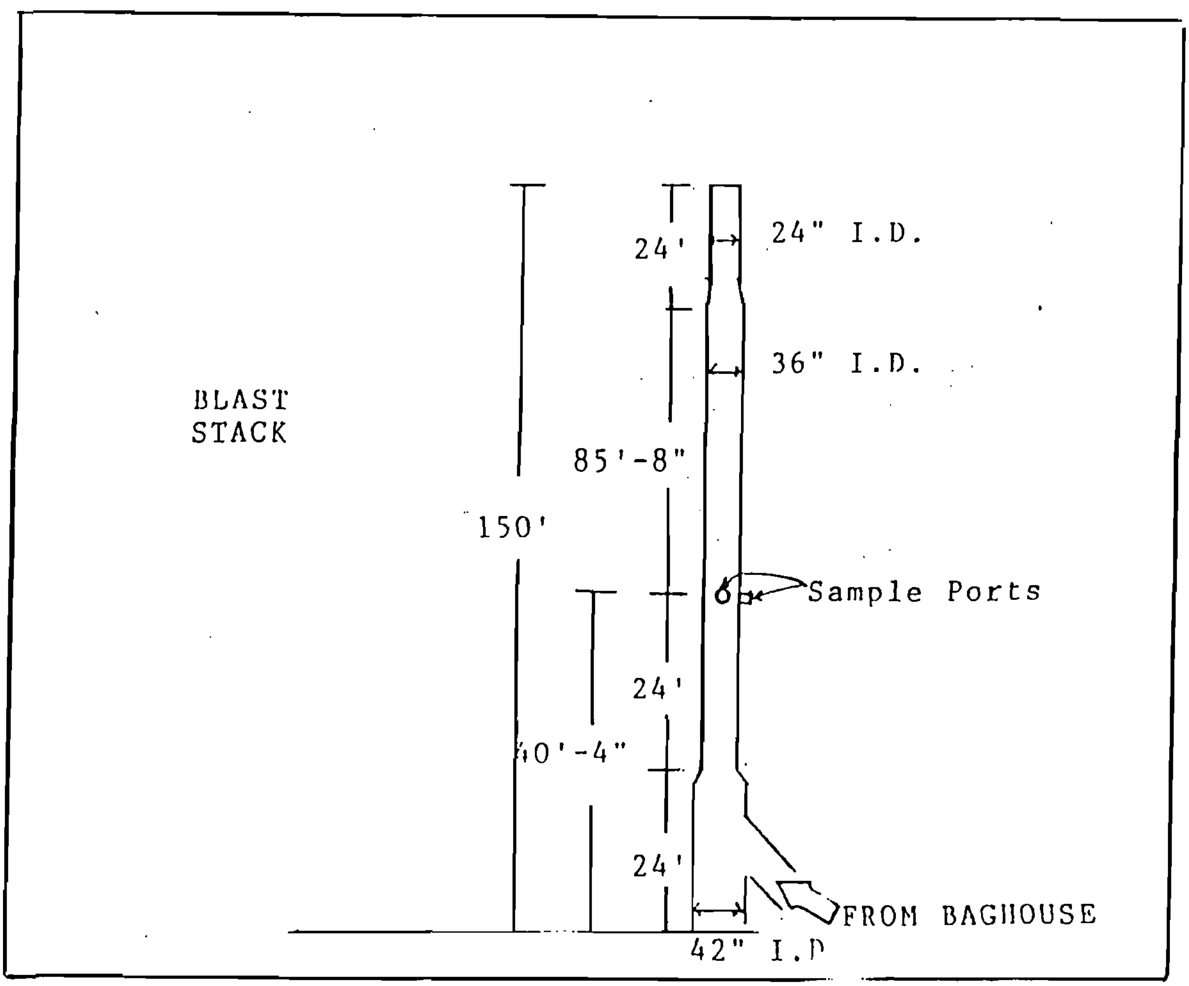


GULF COAST

BLAST FURNACE

The blast furnace stack was tested at 2 ports which are located 9 stack diameters downstream and 35 stack diameters upstream from any obstruction or opening. Each port was tested at 6 points for 5 minutes per point for a total of 60 minutes per test run. The location of the test points in relation to the stack wall is listed below.

POINT NO.	DISTANCE
1	1.6 inches
2	5.3 inches
3	10.7 inches
4	25.3 inches
5	30.7 inches
6	34.4 inches



9.0 PRODUCTION DATA

STATEMENT OF PROCESS WEIGHT RATE

Gulf Coast Recycling, Inc.

1901 North 66th Street, Tampa, FL 33619

Operation: Blast Furnace - Charging Stack Test Date: 10/21/91

Operation	Sampling Time
Start: 0700	Start:
End: 0700	End:

Elapsed Time: 24 Hours Idle Time During Cycle: 0 Hours

Data On Actual Process Rate During Operation Cycle

Material	Rate
Material: Lead Scrap	Rate: 8,000 Lbs/Hr.
Material: Coke	Rate: 650 Lbs/Hr.
Material: Limestone	Rate: 250 Lbs/Hr.
Material: Cast Iron	Rate: 275 Lbs/Hr.
Material: Re-Run Slag	Rate: 230 Lbs/Hr.
Material:	Rate: Lbs/Hr.

Total Process Weight Rate: 4.70 Tons/Hour

Product: Blast Lead

Product Rate: 135,300 Lbs Total 2.82 Tons/Hr.

Signature: Neil N. Oakes Date: 11-12-91

Title: Plant Engineer

STATEMENT OF PROCESS WEIGHT RATE

Gulf Coast Recycling, Inc.

1901 North 66th Street, Tampa, FL 33619

Operation: Refining Kettle No. 1 Test Date: 10/22/91

Operation		Sampling Time	
Start:	2000	Start:	
End:	1100	End:	

Elapsed Time: 15 Hours Idle Time During Cycle: 0 Hours

Data On Actual Process Rate During Operation Cycle

Material:	Blast Lead	Rate:	106,600 Lbs/Hr.
Material:	Antimony	Rate:	1,980 Lbs/Hr.
Material:	Arsenic	Rate:	110 Lbs/Hr.
Material:	Red Phosphorous	Rate:	12 Lbs/Hr.
Material:		Rate:	Lbs/Hr.
Material:		Rate:	Lbs/Hr.

Total Process Weight Rate: 108,702 Lbs 4.01 * Tons/Hour

Product: Hard Lead

Product Rate: 92,910 Lbs Total 3.33 * Tons/Hr.

* Two Kettles - combined rates and hours

Remarks:

Signature: Neil N. Oakes Date: 11-12-91

Title: Plant Engineer

STATEMENT OF PROCESS WEIGHT RATE

Gulf Coast Recycling, Inc.

1901 North 66th Street, Tampa, FL 33619

Operation: Refining Kettle No. 2 Test Date: 10/22/91

Operation		Sampling Time	
Start:	0300	Start:	
End:	1300	End:	

Elapsed Time: 12 Hours Idle Time During Cycle: 0 Hours

Data On Actual Process Rate During Operation Cycle

Material:	Blast Lead	Rate:	106,600 Lbs/Hr.
Material:	Aluminium	Rate:	35 Lbs/Hr.
Material:	Nitrate Of Soda	Rate:	820 Lbs/Hr.
Material:	Sulfur	Rate:	100 Lbs/Hr.
Material:	Calcium	Rate:	125 Lbs/Hr.
Material:	Red Phosphorous	Rate:	20 Lbs/Hr.

Total Process Rate: 107,700 Lbs 4.01 * Tons/Hour

Product: Calcium Lead

Remarks:

Product Rate: 86,780 Lbs Total 3.33 * Tons/Hr.

Signature: Neil N. Oakes Date: 11-12-91

Title: Plant Engineer

STATEMENT OF PROCESS WEIGHT RATE

Gulf Coast Recycling, Inc.

1901 North 66th Street, Tampa, FL 33619

Operation: Blast Furnace - Tapping Stack   Test Date: 10/22/91

Operation		Sampling Time	
Start:	0700	Start:	
End:	0700	End:	

Elapsed Time: 24 Hours   Idle Time During Cycle: 0 Hours

Data On Actual Process Rate During Operation Cycle

Material:	Lead Scrap	Rate:	8,100 Lbs/Hr.
Material:	Coke	Rate:	650 Lbs/Hr.
Material:	Limestone	Rate:	215 Lbs/Hr.
Material:	Cast Iron	Rate:	280 Lbs/Hr.
Material:	Re-Run Slag	Rate:	480 Lbs/Hr.
Material:		Rate:	Lbs/Hr.

Total Process Weight Rate: 4.86 Tons/Hour

Product: Blast Lead

Product Rate: 139,400 Lbs Total   2.90 Tons/Hr.

Signature: Neil N. Oakes   Date: 11-12-91

Title: Plant Engineer

STATEMENT OF PROCESS WEIGHT RATE

Gulf Coast Recycling, Inc.

1901 North 66th Street, Tampa, FL 33619

Operation: Keel Cast Stack   Test Date: 10/23/91

Operation

Start: 2400

End: 1700

Sampling Time

Start: ____

End: ____

Elapsed Time: 17 Hours   Idle Time During Cycle: 6 Hours

Data On Actual Process Rate During Operation Cycle

Material: Blast Lead & Scrap Lead   Rate: 42,000 Total Lbs

Material: ____   Rate: ____ Lbs/Hr.

Material: ____   Rate: ____ Lbs/Hr.

Material: ____   Rate: ____ Lbs/Hr.

Material: ____   Rate: ____ Lbs/Hr.

Material: ____   Rate: ____ Lbs/Hr.

Total Process Weight Rate: 1.91 Tons/Hour

Product: Lead Keels

Product Rate: 38,650 Lbs Total   1.76 Tons/Hr.

Signature: Neil N. Oakes   Date: 11-12-91

Title: Plant Engineer

File:FORM6

STATEMENT OF PROCESS WEIGHT RATE

Gulf Coast Recycling, Inc.

1901 North 66th Street, Tampa, FL 33619

Operation: Blast Furnace Stack   Test Date: 10/24/91

Operation		Sampling Time	
Start:	0700	Start:	
End:	0700	End:	

Elapsed Time: 24 Hours   Idle Time During Cycle: 0 Hours

Data On Actual Process Rate During Operation Cycle

Material:	Lead Scrap	Rate:	8,000 Lbs/Hr.
Material:	Coke	Rate:	640 Lbs/Hr.
Material:	Limestone	Rate:	200 Lbs/Hr.
Material:	Cast Iron	Rate:	275 Lbs/Hr.
Material:	Re-Run Slag	Rate:	445 Lbs/Hr.
Material:		Rate:	Lbs/Hr.

Total Process Weight Rate: 4.78 Tons/Hour

Product: Blast Lead

Product Rate: 139,400 Lbs Total   2.90 Tons/Hr.

Signature: Neil N. Oakes   Date: 11-12-91

Title: Plant Engineer

STATEMENT OF PROCESS WEIGHT RATE

Gulf Coast Recycling, Inc.

1901 North 66th Street, Tampa, FL 33619

Operation: Blast Furnace Stack - SO_2 Test Date: 10/25/91

Operation		Sampling Time	
Start:	0700	Start:	
End:	0700	End:	

Elapsed Time: 24 Hours Idle Time During Cycle: 0 Hours

Data On Actual Process Rate During Operation Cycle

Material	Rate
Material: Lead Scrap	Rate: 7,770 Lbs/Hr.
Material: Coke	Rate: 630 Lbs/Hr.
Material: Limestone	Rate: 200 Lbs/Hr.
Material: Cast Iron	Rate: 265 Lbs/Hr.
Material: Re-Run Slag	Rate: 430 Lbs/Hr.
Material:	Rate: Lbs/Hr.

Total Process Weight Rate: 4.65 Tons/Hour

Product: Blast Lead

Product Rate: 139,400 Lbs Total 2.90 Tons/Hr.

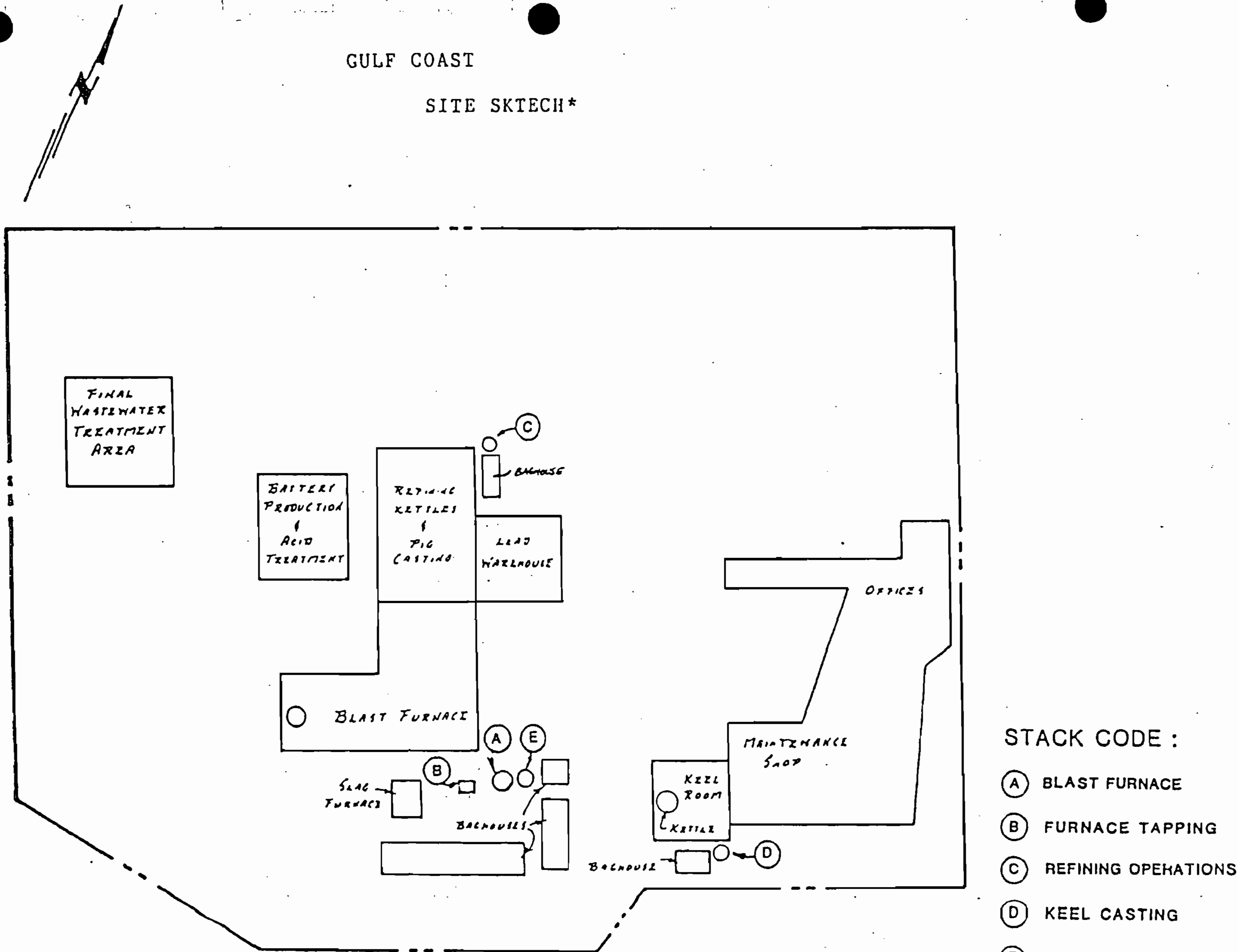
Signature: Neil N. Oaks Date: 11-12-91

Title: Plant Engineer

10.0 SITE LOCATION SKETCH

GULF COAST

SITE SKTECH*



*NOT TO SCALE

11.0 FIELD DATA

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER, CAPELLE
PRB LGTH : 3 '
ASS MSTR : 2.00%
FILTER # : 1

UNIT : CHARGING
AMB TEMP : 80's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE : 10-21-91
BAROM PRESS : 29.99
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 1
"C" FCTR/NOMOGRAPH : 1.80

RUN # : 1
STACK DIAMETER : 22 "
NOZZLE # : .206
NOZZLE DIAM : .206
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS : .02

STRT TME : 10:47
END TIME : 11:47

\- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

\- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/‾(Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm)CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	95	0.940	0.970	1.69	375.045	81	81	250	63	<3
2	5	95	1.050	1.025	1.89		81	81	250	62	<3
3	10	95	1.050	1.025	1.89		81	81	250	62	<3
4	15	95	0.860	0.927	1.56		81	81	250	62	<3
5	20	95	0.860	0.927	1.56		82	82	250	60	<3
6	25	95	0.790	0.889	1.42		82	82	250	60	<3
7	30	95	0.930	0.964	1.67		84	83	250	60	<3
8	35	95	0.930	0.964	1.67		87	84	250	60	<3
9	40	95	0.950	0.975	1.71		87	85	250	60	<3
10	45	95	0.950	0.975	1.71		87	85	250	60	<3
11	50	95	0.930	0.964	1.67		87	85	250	60	<3
12	55	95	0.790	0.889	1.42		87	85	250	60	<3
	60			0.000	0.00	417.885					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
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				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	95	AV SQ RT =.9578119		1.6565	42.840	AV TEMP =83.41666		250	60.75	<3

FIE__ DATA __ET

PLANT Gulf Coast Pb UNIT Charging DATE 10/21/91 RUN NUMBER I

Operator Oliver, Gapple Ambient temp 80'S Barometric Press. 29.99 Stack Diameter 22"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .206

Assumed Moisture 2% # of Points 12 Thermocouple # STA-1 Nozzle Dia. .206

Filter # I Pitot Corr. Factor .84 "F" factor ___/1.80 Meter Box # STA-1

___/___ Meter Box DHa 1.788

START TIME: 1047

END TIME: 1148

PITOT TUBE: Impact 4" for 15 sec. ___ Static 4" for 15 sec. ___

METER BOX Before 0 cfm @ 15" Hg. After 0 cfm @ 10" Hg.

STACK Stack Static Press(H_2O) 0.02

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum Inch. of Hg	
1	0	95	.94	.97	1.69	375.045	81	81	250	63	<3	
2	5	95	1.05	1.02	1.89	378.61	81	81	250	62	<3	
3	10	95	1.05	1.02	1.89	382.28	81	81	250	62	<3	
4	15	95	.86	.93	1.56	386.06	81	81	250	62	<3	
5	20	95	.86	.93	1.56	389.57	82	82	250	60	<3	
6	25	95	.79	.89	1.42	393.10	82	82	250	60	<3	
1	30	95	.93	.96	1.67	396.42	84	83	250	60	<3	
2	35	95	.93	.96	1.67	399.98	87	84	250	60	<3	
3	40	95	.95	.97	1.71	403.58	87	85	250	60	<3	
4	45	95	.95	.97	1.71	407.23	87	85	250	60	<3	
5	50	95	.93	.96	1.67	410.82	87	85	250	60	<3	
6	55	95	.79	.89	1.42	414.46	87	85	250	60	<3	
	60					417.885						
		(95)	(.92)	(.96)		(42.84)	(84)					

$F = 1570 \frac{A \times C}{B}$

$A = (F.D.A. \times Dn^2)^2$

$B = (F.D.A. + 1.6)Ts$

$C = (Tm \times DHa)$

Tm = 545 (85)

Ts = 560 (100)

A = .0017

B = 1445

C = 974

VWC = 18 mL

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER, CAPELLE
PRB LGTH : 3 '
ASS MSTR : 2.00%
FILTER # : 2

UNIT : CHARGING
AMB TEMP : 80's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE :10-21-91
BAROM PRESS : 29.99
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 3
"C" FCTR/NOMOGRAPH : 1.83

RUN # : 2
STACK DIAMETER : 22 "
NOZZLE # : .206
NOZZLE DIAM : .206
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS : .02

STRT TME : 12:35
END TIME : 13:35

\- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

\- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	\/‾(Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm)CU FT	GAS METER TEMPERATURE INLET	OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	95	0.850	0.922	1.56	418.300	92	91	250	68	<3
2	5	95	0.900	0.949	1.65		92	91	250	66	<3
3	10	95	0.920	0.959	1.68		92	91	250	64	<3
4	15	95	0.980	0.990	1.79		92	91	250	63	<3
5	20	95	1.050	1.025	1.92		92	91	250	61	<3
6	25	95	0.760	0.872	1.39		92	91	250	61	<3
7	30	95	0.940	0.970	1.72		92	91	250	61	<3
8	35	95	0.950	0.975	1.74		92	91	250	60	<3
9	40	95	1.000	1.000	1.83		95	93	250	60	<3
10	45	95	0.870	0.933	1.59		95	94	250	60	<3
11	50	95	0.850	0.922	1.56		95	94	250	60	<3
12	55	95	0.790	0.889	1.45		95	94	250	60	<3
	60			0.000	0.00	461.135					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	95	AV SQ RT =.9503296		1.656275	42.835	AV TEMP =92.45833		250	62	<3

FIE__ DA__ EET

PLANT Gulf Coast Pb UNIT Charging DATE 10/21/91 RUN NUMBER II

Operator Oliver, Capelle Ambient temp 80's Barometric Press. 29.99 Stack Diameter 22"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .206

Assumed Moisture 2% # of Points 12 Thermocouple # SfA-3 Nozzle Dia. .206

Filter # II Pitot Corr. Factor .84 "F" factor / 1.83 Meter Box # SfA-1

/ Meter Box DHa 1.788

START TIME: 1235
END TIME: 1335

PITOT TUBE:
Impact 4 " for 15 sec. ✓
Static 4 " for 15 sec. ✓

METER BOX
Before <.02 cfm @ 15 " Hg.
After <.02 cfm @ 10 " Hg.

STACK
Stack Static Press(H_2O) 0.02

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	Velocity Head $\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Gas Meter Temperature Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum Inch. of Hg		F = 1570 A X C / B A=(F.D.A. x $Dn^2)^2$ B=(F.D.A.+1.6)Ts C=(Tm x DHa)
1	0	95	.85	.92	1.56	418.300	92	91	250	<68	<3		Tm = 550 (90)
2	5	95	.90	.95	1.65	421.66	92	91	250	66	<3		Ts = 555 (95)
3	10	95	.92	.96	1.68	425.26	92	91	250	64	<3		
4	15	95	.98	.99	1.79	428.98	92	91	250	63	<3		
5	20	95	1.05	1.02	1.92	432.80	92	91	250	61	<3		A = .007
6	25	95	.76	.87	1.39	436.42	92	91	250	61	<3		
													B = 1432
1	30	95	.94	.97	1.72	439.87	92	91	250	61	<3		
2	35	95	.95	.98	1.73	443.37	92	91	250	60	<3		C = 983
3	40	95	1.00	1.00	1.83	446.98	95	93	250	60	<3		
4	45	95	.87	.93	1.59	450.70	95	94	250	60	<3		
5	50	95	.85	.92	1.56	454.25	95	94	250	60	<3		
6	55	95	.79	.89	1.45	457.80	95	94	250	60	<3		VWC = 20 mL
	60					461.135							
		(95)	(.91)	(.95)		(42.835)	(93)						

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER, CAPELLE
PRB LGTH : 3 '
ASS MSTR : 2.00%
FILTER # : 3

UNIT : CHARGING
AMB TEMP : 80's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE : 10-21-91
BAROM PRESS : 29.99
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 3
"C" FCTR/NOMOGRAPH : 1.85

RUN # : 3
STACK DIAMETER : 22 "
NOZZLE # : .206
NOZZLE DIAM : .206
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS : .02

STRT TME : 14:05
END TIME : 15:05

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD $\sqrt{(Dp)}$	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm) CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	95	0.840	0.917	1.55	461.200	95	95	250	68	<3
2	5	95	0.850	0.922	1.57		95	94	250	62	<3
3	10	95	0.850	0.922	1.57		95	94	250	55	<3
4	15	95	0.870	0.933	1.61		95	95	250	59	<3
5	20	95	0.850	0.922	1.57		95	95	250	59	<3
6	25	95	0.790	0.889	1.46		95	95	250	59	<3
7	30	95	0.850	0.922	1.57		96	95	250	59	<3
8	35	95	0.850	0.922	1.57		96	95	250	61	<3
9	40	95	0.840	0.917	1.55		97	95	250	61	<3
10	45	95	0.860	0.927	1.59		97	95	250	61	<3
11	50	95	0.850	0.922	1.55		97	95	250	61	<3
12	55	95	0.760	0.872	1.40		97	96	250	61	<3
	60			0.000	0.00	503.220					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	95	AV SQ RT =	.9154546	1.548333	42.020	AV TEMP =	95.375	250	60.5	<3

FIE.. DA.. ..EET

PLANT Gulf Coast Pb UNIT Charging DATE 10-21-91 RUN NUMBER III

Operator Oliver, Capelle Ambient Temp 80's Barometric Press. 29.99 Stack Diameter 22"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # ,206

Assumed Moisture 2% # of Points 12 Thermocouple # SJA-3 Nozzle Dia. .206

Filter # III Pitot Corr. Factor .84 "F" factor /1.85 Meter Box # SJA-1

/ Meter Box DHa 1.788

START TIME: 1405

END TIME: 1505

PITOT TUBE:
Impact 4" for 15 sec. ✓
Static 4" for 15 sec. ✓

METER BOX
Before <.02 cfm @ 15 " Hg.
After <.02 cfm @ 10 " Hg.

STACK
Stack Static Press(H_2O) 0.02

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	Velocity Head $\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Gas Meter Temperature Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum inch. of Hg		F = 1570 $\frac{A \times C}{B}$ A=(F.D.A. x Dn^2)2 B=(F.D.A.+1.6)Ts C=(Tm x DHa)
1	0	95	.84	.92	1.55	461.200	95	95	250	<68	<3		Ts = 555
2	5	95	.85	.92	1.57	464.60	95	94	250	62	<3		Tm = 555
3	10	95	.85	.92	1.57	468.13	95	94	250	55	<3		
4	15	98	.87	.93	1.61	471.73	95	95	250	59	<3		
5	20	95	.85	.92	1.57	475.22	95	95	250	59	<3		A = .0017
6	25	95	.79	.89	1.46	478.76	95	95	250	59	<3		
													B = 1432
1	30	95	.85	.92	1.57	482.20	96	95	250	59	<3		
2	35	95	.85	.92	1.57	485.72	96	95	250	61	<3		C = 992
3	40	95	.84	.92	1.55	489.26	97	95	250	61	<3		
4	45	95	.86	.93	1.59	493.00	97	95	250	61	<3		
5	50	95	.85	.92	1.55	496.40	97	98	250	61	<3		
6	55	95	.76	.87	1.40	499.90	97	96	250	61	<3		
	60					503.220							VWC = ~~[illegible]~~ 17 ML
		(95)				42.02							

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER, CAPELLE
PRB LGTH : 3 '
ASS MSTR : 2.00%
FILTER # : 4

UNIT : REFINING
AMB TEMP : 80's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE :10-22-91
BAROM PRESS : 30.06
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 3
"C" FCTR/NOMOGRAPH : 1.14

RUN # : 1
STACK DIAMETER : 26 "
NOZZLE # : .182
NOZZLE DIAM : .182
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS : 10

STRT TME : 07:49
END TIME : 08:52

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/‾(Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm)CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	100	1.300	1.140	1.48	504.700	75	75	250	68	<3
2	5	100	1.300	1.140	1.48		75	75	250	55	<3
3	10	100	1.300	1.140	1.48		75	75	250	55	<3
4	15	100	1.200	1.095	1.37		76	75	250	55	<3
5	20	100	1.500	1.225	1.71		76	75	250	52	<3
6	25	100	1.500	1.225	1.71		76	75	250	52	<3
7	30	102	1.300	1.140	1.48		77	77	250	52	<3
8	35	102	1.300	1.140	1.48		78	77	250	52	<3
9	40	101	1.300	1.140	1.48		79	78	250	52	<3
10	45	101	1.300	1.140	1.48		80	78	250	52	<3
11	50	102	1.200	1.095	1.37		80	78	250	52	<3
12	55	102	1.200	1.095	1.37		80	79	250	52	<3
	60			0.000	0.00	545.495					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	100.8333	AV SQ RT =1.143087		1.4915	40.795	AV TEMP =76.83333		250	54.08333	<3

FIE_ AIA ET

PLANT Gulf Coast Refycling UNIT Refining DATE 10/22/9 RUN NUMBER IV (1)

Operator Oliver Capdp Ambient temp 80' Barometric Press. 30.06 Stack Diameter 26"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .182

Assumed Moisture 2% # of Points 12 Thermocouple # S&A-3 Nozzle Dia. .182

Filter # III Pitot Corr. Factor .84 "F" factor ___/ 1.14 Meter Box # S&A-1

___/___ Meter Box DHa 1.788

START TIME: ~~0000~~ 0749

END TIME: 0852

PITOT TUBE:
Impact 4" for 15 sec. ✓
Static 4" for 15 sec. ✓

METER BOX
Before <.02 cfm @ 15" Hg.
After ___ cfm @ ___" Hg.

STACK
Stack Static Press(H_2O) > 10

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum inch. of Hg		F = 1570 $\frac{A \times C}{B}$ A=(F.D.A. x $Dn^2)^2$ B=(F.D.A.+1.6)Ts C=(Tm x DHa)
						504.700							Tm = 535 (75)
1	0	100	1.30	1.14	1.48	~~504.700~~	75	75	250	<68	<3		Ts = 560 (100)
2	5	100	1.30	1.14	1.48	508.08	75	75	250	55	<3		
3	10	100	1.30	1.14	1.48	511.42	75	75	250	55	<3		
4	15	100	1.20	1.10	1.37	514.77	76	75	250	55	<3		A = .0011
5	20	100	1.50	1.22	1.71	518.20	76	75	250	52	<3		
6	25	100	1.50	1.22	1.71	521.62	76	75	250	52	<3		B = 1445
1	30	102	1.30	1.14	1.48	525.21	77	77	250	52	<3		C = 957
2	35	102	1.30	1.14	1.48	528.60	78	77	250	52	<3		
3	40	101	1.30	1.14	1.48	531.99	79	78	250	52	<3		
4	45	101	1.30	1.14	1.48	535.38	80	78	250	52	<3		
5	50	102	1.20	1.10	1.37	538.80	80	78	250	52	<3		
6	55	102	1.20	1.10	1.37	542.10	80	79	250	52	<3		
	60					545.495							VWC = 14ml
		(101)	(1.31)	1.14		40.795	(77)						

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER, CAPELLE
PRB LGTH : 3 '
ASS MSTR : 2.00%
FILTER # : 5

UNIT : REFINING
AMB TEMP : 80's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE : 10-22-91
BAROM PRESS : 30.06
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 1
"C" FCTR/NOMOGRAPH : 1.16

RUN # : 2
STACK DIAMETER : 26 "
NOZZLE # : .182
NOZZLE DIAM : .182
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS : 10

STRT TME : 09:15
END TIME : 10:17

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD √(Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm) CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	101	1.300	1.140	1.51	545.545	80	81	250	68	<3
2	5	101	1.300	1.140	1.51		80	80	250	55	<3
3	10	101	1.300	1.140	1.51		80	80	250	55	<3
4	15	101	1.200	1.095	1.39		81	80	250	55	<3
5	20	101	1.500	1.225	1.74		82	81	250	55	<3
6	25	101	1.500	1.225	1.74		82	81	250	55	<3
7	30	101	1.300	1.140	1.51		83	81	250	56	<3
8	35	101	1.300	1.140	1.51		84	83	250	56	<3
9	40	101	1.300	1.140	1.51		84	83	250	56	<3
10	45	101	1.300	1.140	1.51		85	83	250	56	<3
11	50	101	1.200	1.095	1.39		85	83	250	57	<3
12	55	101	1.200	1.095	1.39		85	83	250	57	<3
	60			0.000	0.00	586.430					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	101	AV SQ RT =1.143087		1.517666	40.885	AV TEMP =82.08333		250	56.75	<3

FIEL ATA ET

PLANT Gulf Coast Recycling UNIT Refining DATE 10-22-91 RUN NUMBER II (2)

Operator Oliver, Capelle Ambient Temp 80'S Barometric Press. 30.06 Stack Diameter 26"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .182

Assumed Moisture 2% # of Points 12 Thermocouple # STA-1 Nozzle Dia. .182

Filter # V Pitot Corr. Factor .84 "F" factor ____/1.16 Meter Box # STA-1

____/____ Meter Box DHa 1.788

START TIME: 0915	PITOT TUBE:	METER BOX	STACK
END TIME: 1017	Impact 4" for 15 sec. ✓	Before <.02 cfm @ 15" Hg.	
	Static 4" for 15 sec. ✓	After <.02 cfm @ 10" Hg.	Stack Static Press(H_2O) > 10

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum inch. of Hg		F = 1570 A X C / B A=(F.D.A. x $Dn^2)^2$ B=(F.D.A.+1.6)Ts C=(Tm x DHa)
1	0	101	1.30	1.14	1.51	545.545	80	81	250	<68	<3		Tm = 545(85)
2	5	101	1.30	1.14	1.51	548.95	80	80	250	55	<3		Ts = 560(100)
3	10	101	1.30	1.14	1.51	552.33	80	80	250	55	<3		
4	15	101	1.20	1.10	1.39	555.90	81	80	250	55	<3		A = .0011
5	20	101	1.50	1.22	1.74	559.01	82	81	250	55	<3		
6	25	101	1.50	1.22	1.74	562.60	82	81	250	55	<3		B = 1445
1	30	101	1.30	1.14	1.51	566.17	83	81	250	56	<3		C = 974
2	35	101	1.30	1.14	1.51	569.55	84	83	250	56	<3		
3	40	101	1.30	1.14	1.51	573.10	84	83	250	56	<3		
4	45	101	1.30	1.14	1.51	576.42	85	83	250	56	<3		
5	50	101	1.20	1.10	1.39	579.71	85	83	250	57	<3		
6	55	101	1.20	1.10	1.39	583.30	85	83	250	57	<3		VWC = 15ml
	60					586.430							
		(101)	(1.31)	(1.14)		40.885	(83)						

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER,CAPELLE
PRB LGTH : 3 '
ASS MSTR : 2.00%
FILTER # : 6

UNIT : REFINING
AMB TEMP : 80's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE :10-22-91
BAROM PRESS : 30.06
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 1
"C" FCTR/NOMOGRAPH : 1.14

RUN # : 3
STACK DIAMETER : 26 "
NOZZLE # : .182
NOZZLE DIAM : .182
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS : 10

STRT TME : 10:41
END TIME : 11:42

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/ (Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm)CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	110	1.300	1.140	1.48	586.500	86	85	250	68	<3
2	5	110	1.300	1.140	1.48		86	85	250	57	<3
3	10	110	1.300	1.140	1.48		86	85	250	57	<3
4	15	110	1.200	1.095	1.37		86	85	250	57	<3
5	20	110	1.500	1.225	1.71		87	86	250	57	<3
6	25	110	1.500	1.225	1.71		87	86	250	57	<3
7	30	109	1.300	1.140	1.48		88	87	250	58	<3
8	35	111	1.300	1.140	1.48		89	87	250	59	<3
9	40	112	1.300	1.140	1.48		89	87	250	59	<3
10	45	114	1.300	1.140	1.48		89	88	250	59	<3
11	50	115	1.200	1.095	1.37		89	88	250	59	<3
12	55	115	1.200	1.095	1.37		89	88	250	59	<3
	60			0.000	0.00	627.525					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	111.3333	AV SQ RT =1.143087		1.4915	41.025	AV TEMP =	87	250	58.83333	<3

FIELD DATA SHEET

PLANT Gulf Coast Recycling UNIT Refining DATE 10-22-91 RUN NUMBER [illegible] (3)

Operator Olivier, Capello Ambient temp 80's Barometric Press. 30.06 Stack Diameter 26"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .182

Assumed Moisture 2% # of Points 12 Thermocouple # S+A-3 Nozzle Dia. .182

Filter # III Pitot Corr. Factor .84 "F" factor ___/ 1.18 Meter Box # S+A-1

___/___ Meter Box DHa 1.788

START TIME: 1041
END TIME: 1142

PITOT TUBE:
Impact 4" for 15 sec. ✓
Static 4" for 15 sec. ✓

METER BOX
Before <.02 cfm @ 15" Hg.
After <.02 cfm @ ___" Hg.

STACK
Stack Static Press(H_2O) >10

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Gas Meter Temperature Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum inch. of Hg		F = 1570 A X C / B A=(F.D.A. x Dn^2)^2 B=(F.D.A.+1.6)Ts C=(Tm x DHa) Tm = 595 (89)
1	0	110	1.30	1.14	1.48	586.500	86	85	250	<68	<3		Ts = 5[illegible] ([illegible])
2	5	110	1.30	1.14	1.48	589.89	86	85	250	57	<3		
3	10	110	1.30	1.14	1.48	593.28	86	85	250	57	<3		
4	15	110	1.20	1.10	1.37	596.72	86	85	250	57	<3		A = .0011
5	20	110	1.50	1.22	1.71	600.00	87	86	250	57	<3		
6	25	110	1.50	1.22	1.71	603.58	87	86	250	57	<3		B = 1471
1	30	109	1.30	1.14	1.48	607.21	88	87	250	58	<3		C = 979
2	35	111	1.30	1.14	1.48	610.64	89	87	250	59	<3		
3	40	112	1.30	1.14	1.48	614.07	89	87	250	59	<3		
4	45	114	1.30	1.14	1.48	617.55	89	88	250	59	<3		
5	50	115	1.20	1.10	1.37	620.93	89	88	250	59	<3		
6	55	115	1.20	1.10	1.37	624.45	89	88	250	59	<3		
	60					627.525							VWC = 15 ml
		(111)	(1.31)	(1.14)		(41.025)	(88)						

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER, CAPELLE
PRB LGTH : 3 '
ASS MSTR : 2.00%
FILTER # : 7

UNIT : TAPPING
AMB TEMP : 80's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE : 10-22-91
BAROM PRESS : 30.06
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 3
"C" FCTR/NOMOGRAPH : 1.14

RUN # : 1
TACK DIMENSIONS : 12.5x12.5"
NOZZLE # : .182
NOZZLE DIAM : .182
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS : .25

STRT TME : 12:59
END TIME : 14:00

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/ (Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm)CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	112	1.200	1.095	1.37	627.570	91	91	250	68	<3
2	5	112	1.10C	1.049	1.25		91	91	250	67	<3
3	10	112	1.200	1.095	1.37		91	91	250	66	<3
4	15	112	1.100	1.049	1.25		92	91	250	65	<3
5	20	114	1.100	1.049	1.25		92	92	250	60	<3
6	25	114	1.100	1.049	1.25		92	92	250	60	<3
7	30	114	1.100	1.049	1.25		93	93	250	60	<3
8	35	114	1.050	1.025	1.20		93	93	250	60	<3
9	40	115	0.800	0.894	0.91		94	93	250	60	<3
10	45	115	0.820	0.906	0.93		94	93	250	61	<3
11	50	115	0.860	0.927	0.98		95	94	250	61	<3
12	55	115	0.900	0.949	1.03		95	94	250	61	<3
	60			0.000	0.00	663.580					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	113.6666	AV SQ RT =1.011303		1.17135	36.010	AV TEMP =92.54166		250	62.41666	<3

FIELD DATA SHEET

PLANT Gulf Coast Lead UNIT Tapping (I) DATE 10-22-91 RUN NUMBER III (1)

Operator Oliver, Capello Ambient Temp 80's Barometric Press. ~~29.99~~ 30.06 Stack Diameter 12.5 X 12.5

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .182

Assumed Moisture 2% # of Points 12 Thermocouple # SfA-3 Nozzle Dia. .182

Filter # VII Pitot Corr. Factor .84 "F" factor ____/ 1.1?4 Meter Box # SfA-1

____/____ Meter Box DHa 1.788

START TIME: 1259
END TIME: 1400

PITOT TUBE:
Impact 4" for 15 sec. ✓
Static 4" for 15 sec. ✓

METER BOX
Before <.02 cfm @ 15 " Hg.
After <.02 cfm @ 10 " Hg.

STACK
Stack Static Press(H_2O) 0.25

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orifice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Gas Meter Temperature Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum inch. of Hg		$F = 1570 \frac{A \times C}{B}$; $A=(F.D.A. \times Dn^2)^2$; $B=(F.D.A.+1.6)Ts$; $C=(Tm \times DHa)$
													Tm = 560 (100)
N 1	0	112	1.20	1.10	1.37	627.570	91	91	250	<68	<3		Ts = 572 (112)
2	5	112	1.10	1.05	1.25	630.88	91	91	250	67	<3		
3	10	112	1.20	1.10	1.37	633.99	91	91	250	66	<3		A = .0011
4	15	112	1.10	1.05	1.25	637.21	92	91	250	65	<3		
													B = 1476
1	20	114	1.10	1.05	1.25	640.30	92	92	250	60	<3		
2	25	114	1.10	1.05	1.25	643.38	92	92	250	60	<3		C = 1001
3	30	114	1.10	1.05	1.25	646.46	93	93	250	60	<3		
4	35	114	1.05	1.02	1.20	649.43	93	93	250	60	<3		
1	40	115	.80	.89	.91	652.43	94	93	250	60	<3		
2	45	115	.82	.91	.93	655.16	94	93	250	61	<3		VINC = 10ml
3	50	115	.86	.93	.98	657.81	95	94	250	61	<3		
4	55	115	.90	.95	1.03	660.85	95	94	250	61	<3		
	60					663.580							
		(114)	(1.03)	(1.01)		(36.01)	(93)						

PLANT : GULF COAST RECYCLING	UNIT : TAPPING	DATE :10-22-91		RUN # :	2
OPERATOR : OLIVER, CAPELLE	AMB TEMP : 80's	BAROM PRESS :	30.06	TACK DIMENSIONS :	12.5x12.5"
PRB LGTH : 3 '	PROBE HTR SETTING : 250	HEATER BOX SETTING :	250	NOZZLE # :	.182
ASS MSTR : 2.00%	# POINTS : 12	THERMOCOUPLE # :	S&A - 3	NOZZLE DIAM :	.182
FILTER # : 8	PITOT CORR FACTOR : .84	"C" FCTR/NOMOGRAPH :	1.14	METER BOX # :	1.012
				METER BOX DHa :	1.788
				STATIC PRESS :	.2

STRT TME : 14:26
END TIME : 15:28

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/ (Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm)CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	113	1.200	1.095	1.37	663.640	94	94	250	68	<3
2	5	113	1.100	1.049	1.25		94	94	250	60	<3
3	10	113	1.200	1.095	1.37		94	94	250	60	<3
4	15	113	1.100	1.049	1.25		94	94	250	60	<3
5	20	114	1.100	1.049	1.25		95	94	250	60	<3
6	25	114	1.100	1.049	1.25		95	94	250	60	<3
7	30	114	1.100	1.049	1.25		95	94	250	60	<3
8	35	114	1.050	1.025	1.20		96	95	250	60	<3
9	40	114	0.800	0.894	0.91		96	95	250	60	<3
10	45	114	0.820	0.906	0.93		96	95	250	59	<3
11	50	115	0.860	0.927	0.98		96	95	250	57	<3
12	55	115	0.900	0.949	1.03		96	95	250	57	<3
	60			0.000	0.00	700.220					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	113.8333	AV SQ RT =	1.011303	1.17135	36.580	AV TEMP =	94.75	250	60.08333	<3

FIELD DATA SHEET

PLANT Gulf Coast Pb UNIT Tapping (2) DATE 10/22/91 RUN NUMBER [illegible] (2)

Operator Oliver, Capello Ambient temp 80'S Barometric Press. ~~29.99~~ 30.06 Stack Diameter 12.5 X 12.5

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # ~~.180~~ .182

Assumed Moisture 2% # of Points 12 Thermocouple # SfA-3 Nozzle Dia. ~~.180~~ .182

Filter # VIII Pitot Corr. Factor .84 "F" factor / 1.17 Meter Box # SfA-1

/ Meter Box DHa 1.788

START TIME: 1426
END TIME: 1528

PITOT TUBE:
Impact 4 " for 15 sec. ✓
Static 4 " for 15 sec. ✓

METER BOX
Before <.02 cfm @ 15 " Hg.
After <.02 cfm @ 10 " Hg.

STACK
Stack Static Press(H_2O) 0.20

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum inch. of Hg		F = 1570 A X C / B; A=(F.D.A. x $Dn^2)^2$; B=(F.D.A.+1.6)Ts; C=(Tm x DHa)
1	0	113	1.20	1.10	1.37	663.640	94	94	250	<68	<3		Tm = 560 (100)
2	5	113	1.10	1.05	1.25	666.94	94	94	250	<60	<3		Ts = 572 (112)
3	10	113	1.20	1.10	1.37	670.04	94	94	250	60	<3		
4	15	113	1.10	1.05	1.25	673.37	94	94	250	60	<3		A = .0011
1	20	114	1.10	1.05	1.25	676.52	95	94	250	60	<3		B = 1476
2	25	114	1.10	1.05	1.25	679.70	95	94	250	60	<3		
3	30	114	1.10	1.05	1.25	682.78	95	94	250	60	<3		C = 1001
4	35	114	1.05	1.02	1.20	685.92	96	95	250	60	<3		
1	40	114	.80	.89	.91	689.05	96	95	250	60	<3		
2	45	114	.82	.91	.93	691.77	96	95	250	59	<3		VWC = 10 mL
3	50	115	.86	.93	.98	694.52	96	95	250	57	<3		
4	55	115	.90	.95	1.03	697.35	96	95	250	57	<3		
	60					700.220							
		(114)	(1.02)	(1.01)		(36.58)	(95)						

PLANT : GULF COAST RECYCLING	UNIT : TAPPING	DATE :10-22-91	RUN # : 3
OPERATOR : OLIVER,CAPELLE	AMB TEMP : 80's	BAROM PRESS : 30.06	TACK DIMENSIONS :12.5x12.5"
PRB LGTH : 3 '	PROBE HTR SETTING : 250	HEATER BOX SETTING : 250	NOZZLE # : .182
ASS MSTR : 2.00%	# POINTS : 12	THERMOCOUPLE # : S&A - 3	NOZZLE DIAM : .182
FILTER # : 9	PITOT CORR FACTOR : .84	"C" FCTR/NOMOGRAPH : 1.14	METER BOX # : 1.012
			METER BOX DHa : 1.788
			STATIC PRESS : .2

STRT TME : 15:48
END TIME : 16:51

\- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

\- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/ (Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm)CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	115	1.200	1.095	1.37	700.280	95	95	250	68	<3
2	5	115	1.100	1.049	1.25		93	94	250	63	<3
3	10	115	1.200	1.095	1.37		94	94	250	60	<3
4	15	115	1.100	1.049	1.25		94	94	250	60	<3
5	20	115	1.100	1.049	1.25		94	94	250	60	<3
6	25	113	1.100	1.049	1.25		94	93	250	60	<3
7	30	113	1.100	1.049	1.25		95	94	250	59	<3
8	35	113	1.050	1.025	1.20		95	94	250	59	<3
9	40	113	0.800	0.894	0.91		96	95	250	59	<3
10	45	113	0.820	0.906	0.93		96	95	250	60	<3
11	50	114	0.860	0.927	0.98		96	95	250	60	<3
12	55	114	0.900	0.949	1.03		96	95	250	60	<3
	60			0.000	0.00	736.790					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	114	AV SQ RT =1.011303		1.17135	36.510	AV TEMP =94.58333		250	60.66666	<3

FIELD DATA SHEET

PLANT Gulf Coast Pb UNIT Tapping (3) DATE 10/22/91 RUN NUMBER ~~IX~~ (3)

Operator Oliver, Sapp Ambient temp 80' Barometric Press. ~~29.99~~ 30.06 Stack Diameter 12.5 x 12.5

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # ~~.180~~ .182

Assumed Moisture 2% # of Points 12 Thermocouple # SfA-3 Nozzle Dia. ~~.180~~ .182

Filter # IX Pitot Corr. Factor .84 "F" factor / 1.17 Meter Box # SfA-1

/ Meter Box DHa 1.788

START TIME: 1548

END TIME: 1651

PITOT TUBE:
Impact 4 " for 15 sec. ✓
Static 4 " for 15 sec. ✓

METER BOX
Before <.02 cfm @ 15 " Hg.
After <.02 cfm @ 10 " Hg.

STACK
Stack Static Press(H_2O) 0.20

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum inch. of Hg		$F = 1570 \frac{A \times C}{B}$ $A=(F.D.A. \times Dn^2)^2$ $B=(F.D.A.+1.6)Ts$ $C=(Tm \times DHa)$ Tm = 560 (100)
1	0	115	1.20	1.10	1.37	700.280	95	95	250	<68	<3		Ts = 572 (112)
2	5	115	1.10	1.05	1.25	703.52	93	94	250	63	<3		
3	10	115	1.20	1.05	1.37	706.64	94	94	250	60	<3		
4	15	115	1.10	1.05	1.25	710.00	94	94	250	60	<3		A = .0011
1	20	115	1.10	1.05	1.25	713.10	94	94	250	60	<3		B = 1476
2	25	113	1.10	1.05	1.25	716.24	94	93	250	60	<3		
3	30	113	1.10	1.05	1.25	719.38	95	94	250	59	<3		C = 1001
4	35	113	1.05	1.02	1.20	722.55	96	94	250	59	<3		
1	40	113	.80	.89	.91	725.63	96	95	250	59	<3		
2	45	113	.82	.91	.93	728.34	96	95	250	60	<3		V WC = 10 ml
3	50	114	.86	.93	.98	731.09	96	95	250	60	<3		
4	55	114	.90	.95	1.03	733.90	96	95	250	60	<3		
	60					736.790							
		(114)	(1.03)	(1.01)		(36.51)	(95)						

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER, CAPELLE
PRB LGTH : 3 '
ASS MSTR : 1.00%
FILTER # : 10

UNIT : KEEL CASTING
AMB TEMP : 70's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE : 10-23-91
BAROM PRESS : 30.05
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 3
"C" FCTR/NOMOGRAPH : 1.88

RUN # : 1
STACK DIAMETER : 14 "
NOZZLE # : .206
NOZZLE DIAM : .206
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS : .17

STRT TME : 07:39
END TIME : 08:39

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/ (Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm) CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	93	0.810	0.900	1.52	736.910	72	72	250	68	<3
2	5	93	0.810	0.900	1.52		72	72	250	54	<3
3	10	93	0.800	0.894	1.50		73	72	250	54	<3
4	15	93	0.800	0.894	1.50		74	73	250	54	<3
5	20	94	0.780	0.883	1.47		75	73	250	54	<3
6	25	94	0.750	0.866	1.41		75	74	250	54	<3
7	30	94	0.680	0.825	1.28		76	74	250	55	<3
8	35	94	0.640	0.800	1.20		77	75	250	55	<3
9	40	95	0.600	0.775	1.13		77	76	250	55	<3
10	45	95	0.590	0.768	1.11		78	76	250	55	<3
11	50	95	0.590	0.768	1.11		78	76	250	55	<3
12	55	95	0.590	0.768	1.11		78	76	250	55	<3
	60			0.000	0.00	775.010					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	94	AV SQ RT =.8368014		1.322266	38.100	AV TEMP =	74.75	250	55.66666	<3

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER,CAPELLE
PRB LGTH : 3 '
ASS MSTR : 1.00%
FILTER # : 11

UNIT : KEEL CASTING
AMB TEMP : 80's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE :10-23-91
BAROM PRESS : 30.05
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 3
"C" FCTR/NOMOGRAPH : 1.93

RUN # : 2
STACK DIAMETER : 14 "
NOZZLE # : .206
NOZZLE DIAM : .206
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS : .18

STRT TME : 09:12
END TIME : 10:12

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/ (Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm)CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	95	0.810	0.900	1.56	776.200	85	83	250	68	<3
2	5	95	0.810	0.900	1.56		86	84	250	57	<3
3	10	95	0.800	0.894	1.54		87	86	250	60	<3
4	15	95	0.800	0.894	1.54		89	88	250	60	<3
5	20	95	0.780	0.883	1.50		92	88	250	60	<3
6	25	95	0.750	0.866	1.44		93	90	250	60	<3
7	30	95	0.680	0.825	1.31		93	90	250	60	<3
8	35	95	0.640	0.800	1.23		93	90	250	60	<3
9	40	95	0.600	0.775	1.16		93	91	250	60	<3
10	45	95	0.590	0.768	1.14		94	91	250	61	<3
11	50	95	0.590	0.768	1.14		94	92	250	61	<3
12	55	95	0.590	0.768	1.14		95	92	250	61	<3
	60			0.000	0.00	815.160					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	95	AV SQ RT =.8368014		1.355925	38.960	AV TEMP =89.95833		250	60.66666	<3

PLANT Gulf Coast Recycling UNIT Keel Casting (1) DATE 10/23/91 RUN NUMBER X

Operator Oliver, Caddle Ambient temp 70's Barometric Press. 30.05 Stack Diameter 14"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .206

Assumed Moisture 1% # of Points 12 Thermocouple # SSA-3 Nozzle Dia. .206

Filter # X / KCI Pitot Corr. Factor .84 "F" factor ___/ 1.88 Meter Box # SSA-1

___/___ Meter Box DHa 1.788

START TIME: 0739
END TIME: 0839

PITOT TUBE:
Impact ✓" for 15 sec. ✓
Static ✓" for 15 sec.

METER BOX
Before <.02 cfm @ 15" Hg.
After <.02 cfm @ 10" Hg.

STACK
Stack Static Press(H_2O) 0.17

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	Velocity Head $\sqrt{(Dp_s)}$	Orifice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Gas Meter Temperature Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum Inch. of Hg		$F = 1570 \frac{A \times C}{B}$ $A = (F.D.A. \times Dn^2)^2$ $B = (F.D.A. + 1.6)Ts$ $C = (Tm \times DHa)$
1	0	93	.81	.90	1.52	736.910	72	72	250	<68	<3		Tm = 535 (75)
2	5	93	.81	.90	1.52	740.25	72	72	250	54	<3		Ts = 555 (95)
3	10	93	.80	.89	1.50	743.59	73	72	250	54	<3		
4	15	93	.80	.89	1.50	746.96	74	73	250	54	<3		A = .0018
5	20	94	.78	.88	1.47	750.35	75	73	250	54	<3		B = 1437
6	25	94	.75	.87	1.41	753.72	75	74	250	54	<3		C = 957
7	30	94	.68	.82	1.28	756.99	76	74	250	55	<3		
8	35	94	.64	.80	1.20	760.14	77	75	250	55	<3		
9	40	95	.60	.77	1.13	763.22	77	76	250	55	<3		
10	45	95	.59	.77	1.11	766.17	78	76	250	55	<3		
11	50	95	.59	.77	1.11	769.13	78	76	250	55	<3		
12	55	96	.59	.77	1.11	772.09	78	76	250	55	<3		
	60					775.010							VWC = 6 ml
		(94)	(.70)	(.84)		(38.1)	(75)						

PLANT Gulf Coast Recycling UNIT Keel Casting (2) DATE 10/23/91 RUN NUMBER X1

Operator Oliver, Capelle Ambient temp 80'S Barometric Press. 30.05 Stack Diameter 14"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .206

Assumed Moisture 1% # of Points 12 Thermocouple # S&A-3 Nozzle Dia. .206

Filter # X1 / KC-2 Pitot Corr. Factor .84 "F" factor / 1.93 Meter Box # S&A-1

/ Meter Box DHa 1.788

START TIME: 0912

END TIME:

PITOT TUBE:
Impact 4" for 15 sec. ✓
Static 4" for 15 sec. ✓

METER BOX
Before <.02 cfm @ 15" Hg.
After <.02 cfm @ 10" Hg.

STACK
Stack Static Press(H_2O) 0.18

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp$_s$)	$\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum Inch. of Hg		F = 1570 $\frac{A \times C}{B}$ A=(F.D.A. x Dn^2)^2 B=(F.D.A.+1.6)Ts C=(Tm x DHa)
1	0	95	.81	.90	1.56	776.200	85	83	250	<68	<3		Tm = 550 (90)
2	5	95	.81	.90	1.56	779.55	86	84	250	57	<3		Ts = 555 (95)
3	10	95	.80	.89	1.54	782.94	87	86	250	60	<3		
4	15	95	.80	.89	1.54	786.39	89	88	250	60	<3		A = .0018
5	20	95	.78	.88	1.50	789.82	92	88	250	60	<3		
6	25	95	.75	.87	1.44	793.31	93	90	250	60	<3		B = 1437
7	30	95	.68	.82	1.31	796.63	93	90	250	60	<3		C = 983
8	35	95	.64	.80	1.23	799.85	93	90	250	60	<3		
9	40	95	.60	.77	1.16	802.95	93	91	250	60	<3		
10	45	95	.59	.77	1.14	806.04	94	91	250	61	<3		
11	50	95	.59	.77	1.14	809.10	94	92	250	61	<3		
12	55	95	.59	.77	1.14	812.15	95	92	250	61	<3		
	60					815.160							VWC = 6ml
		(95)	(.70)	(.84)		(38.96)	(91)						

PLANT :	GULF COAST RECYCLING	UNIT :	KEEL CASTING	DATE :	10-23-91	RUN # :	3
OPERATOR :	OLIVER, CAPELLE	AMB TEMP :	80's	BAROM PRESS :	30.05	STACK DIAMETER :	14 "
PRB LGTH :	3 '	PROBE HTR SETTING :	250	HEATER BOX SETTING :	250	NOZZLE # :	.206
ASS MSTR :	1.00%	# POINTS :	12	THERMOCOUPLE # :	S&A - 3	NOZZLE DIAM :	.206
FILTER # :	12	PITOT CORR FACTOR :	.84	"C" FCTR/NOMOGRAPH :	1.95	METER BOX # :	1.012
						METER BOX DHa :	1.788
						STATIC PRESS :	.18

		- PITOT TUBE -		- METER BOX -	
STRT TME :	10:43	IMPACT :	" 15 SEC :	BEFORE :	0 cfm @ " Hg
END TIME :	11:43	STATIC :	" 15 SEC :	AFTER :	cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/ (Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm) CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	95	0.810	0.900	1.58	815.360	95	96	250	68	<3
2	5	95	0.810	0.900	1.58		96	96	250	61	<3
3	10	95	0.800	0.894	1.56		96	96	250	61	<3
4	15	95	0.800	0.894	1.56		96	96	250	61	<3
5	20	95	0.780	0.883	1.52		96	96	250	61	<3
6	25	95	0.750	0.866	1.46		97	96	250	61	<3
7	30	95	0.680	0.825	1.32		98	96	250	61	<3
8	35	95	0.640	0.800	1.25		98	97	250	61	<3
9	40	95	0.600	0.775	1.17		99	98	250	61	<3
10	45	95	0.590	0.768	1.15		99	98	250	61	<3
11	50	95	0.590	0.768	1.15		99	98	250	61	<3
12	55	95	0.590	0.768	1.15		99	98	250	61	<3
	60			0.000	0.00	855.250					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	95	AV SQ RT =.8368014		1.371	39.890	AV TEMP =97.04166		250	61.58333	<3

PLANT Gulf Coast Recycling UNIT Keel Casting (3) DATE 10/23/91 RUN NUMBER X

Operator Oliver, Capelle Ambient temp 80's Barometric Press. 30.05 Stack Diameter 14"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .206

Assumed Moisture 1% # of Points 12 Thermocouple # STA-3 Nozzle Dia. .206

Filter # X11 KC-3 Pitot Corr. Factor .84 "F" factor / 1.95 Meter Box # STA-1

/ Meter Box DHa 1.788

START TIME: 1043
END TIME: 1143

PITOT TUBE:
Impact ✓ " for 15 sec.
Static ✓ " for 15 sec.

METER BOX
Before <.02 cfm @ 15 " Hg.
After <.02 cfm @ 10 " Hg.

STACK
Stack Static Press(H_2O) 0.18

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orifice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum inch. of Hg		$F = 1570 \frac{A \times C}{B}$ $A = (F.D.A. \times Dn^2)^2$ $B = (F.D.A. + 1.6)Ts$ $C = (Tm \times DHa)$
1	0	95	.81	.90	1.58	815.360	95	96	250	<68	<3		Tm = 555
2	5	95	.81	.90	1.58	818.94	96	96	250	61	<3		Ts = 555
3	10	95	.80	.89	1.56	822.48	96	96	250	61	<3		
4	15	95	.80	.89	1.56	826.01	96	96	250	61	<3		
5	20	95	.78	.88	1.52	829.52	96	96	250	61	<3		A = .0018
6	25	95	.75	.87	1.46	833.00	97	96	250	61	<3		
7	30	95	.68	.82	1.32	836.39	98	96	250	61	<3		B = 1437
8	35	95	.64	.80	1.25	839.70	98	97	250	61	<3		
9	40	95	.60	.77	1.17	842.84	99	98	250	61	<3		C = 992
10	45	95	.59	.77	1.15	845.93	99	98	250	61	<3		
11	50	95	.59	.77	1.15	848.03	99	98	250	61	<3		
12	55	95	.59	.77	1.15	852.14	99	98	250	61	<3		
	60					855.250							VWC = 7 ml
		(95)	(.70)	(.84)		(39.89)	(97)						

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER, CAPELLE
PRB LGTH : 3 '
ASS MSTR : 2.00%
FILTER # : 13

UNIT : BLAST FURNACE
AMB TEMP : 70's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE : 10-24-91
BAROM PRESS : 30.03
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 3
"C" FCTR/NOMOGRAPH : 1.62

RUN # : 1
STACK DIAMETER : 36 "
NOZZLE # : .206
NOZZLE DIAM : .206
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS :

STRT TME : 08:00
END TIME : 09:02

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/ (Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm) CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	148	0.910	0.954	1.47	855.440	73	73	250	68	<3
2	5	150	1.000	1.000	1.62		74	74	250	52	<3
3	10	152	1.000	1.000	1.62		74	74	250	52	<3
4	15	152	0.910	0.954	1.47		74	74	250	52	<3
5	20	155	0.800	0.894	1.30		76	74	250	54	<3
6	25	155	0.800	0.894	1.30		76	75	250	56	<3
7	30	155	0.940	0.970	1.52		76	75	250	56	<3
8	35	155	0.860	0.927	1.39		77	75	250	58	<3
9	40	155	0.920	0.959	1.49		77	76	250	58	<3
10	45	157	0.970	0.985	1.57		77	77	250	58	<3
11	50	156	0.820	0.906	1.33		78	77	250	58	<3
12	55	156	0.820	0.906	1.33		79	77	250	58	<3
	60			0.000	0.00	895.310					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	153.8333	AV SQ RT =	.9457299	1.45125	39.870	AV TEMP =	75.5	250	56.66666	<3

PLANT Gulf Coast Recycling UNIT Blast Furnace DATE 10/24/91 RUN NUMBER XIII B-1

Operator Oliver, Capelle Ambient temp 70s Barometric Press. 30.03 Stack Diameter 36"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .206

Assumed Moisture 2% # of Points 12 Thermocouple # SoA-3 Nozzle Dia. .206

Filter # XIII B-1 Pitot Corr. Factor .84 "F" factor ____/1.62 Meter Box # SoA-1

____/____ Meter Box DHa 1.788

START TIME: 0800
END TIME: 0902

PITOT TUBE:
Impact 4" for 15 sec. ✓
Static 4" for 15 sec. ✓

METER BOX
Before <.02 cfm @ 15" Hg.
After <.02 cfm @ 10" Hg.

STACK
Stack Static Press(H_2O) – ~~4.0~~ 0

Traverse Point	Sampling Time min, (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orifice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Out	Sample Box Temperature	Temp of last Imp.	Pump, Vacuum Inch. of Hg		F = 1570 A X C / B; A=(F.D.A. x Dn^2)^2; B=(F.D.A.+1.6)Ts; C=(Tm x DHa)
N 1	0	148	.91	.95	1.47	855.440	73	73	250	<68	<3		Tm = 535
2	5	150	1.00	1.00	1.62	858.77	74	74	250	52	<3		Ts = 610 (150)
3	10	152	1.00	1.00	1.62	862.25	74	74	250	52	<3		
4	15	152	.91	.95	1.47	865.73	74	74	250	52	<3		
5	20	155	.80	.89	1.30	869.08	76	74	250	54	<3		A = .0017
6	25	155	.80	.89	1.30	872.25	76	75	250	56	<3		
						~~875.32~~							B = 1574
1	30	155	.94	.97	1.52	875.32	76	75	250	56	<3		
2	35	155	.86	.93	1.39	878.70	77	75	250	58	<3		C = .957
3	40	155	.92	.96	1.49	882.02	77	76	250	58	<3		
4	45	157	.97	.98	1.57	885.33	77	77	250	58	<3		
5	50	156	.82	.91	1.33	888.88	78	77	250	58	<3		
6	55	156	.82	.91	1.33	892.31	79	77	250	58	<3		29 ml
	60					895.310							VWC = ~~[illegible]~~
		(154)	(.90)	(.95)		39.87	(76)						

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER, CAPELLE
PRB LGTH : 3 '
ASS MSTR : 2.00%
FILTER # : 14

UNIT : BLAST FURNACE
AMB TEMP : 80's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE : 10-24-91
BAROM PRESS : 30.03
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 3
"C" FCTR/NOMOGRAPH : 1.64

RUN # : 2
STACK DIAMETER : 36 "
NOZZLE # : .206
NOZZLE DIAM : .206
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS :

STRT TME : 09:38
END TIME : 10:40

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	VELOCITY HEAD \/ (Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm) CU FT	GAS METER TEMPERATURE INLET	GAS METER TEMPERATURE OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	155	0.910	0.954	1.49	895.570	80	80	250	68	<3
2	5	155	1.000	1.000	1.64		80	80	250	63	<3
3	10	155	1.000	1.000	1.64		81	80	250	60	<3
4	15	155	0.910	0.954	1.49		82	81	250	60	<3
5	20	152	0.800	0.894	1.31		83	82	250	60	<3
6	25	154	0.800	0.894	1.31		84	83	250	60	<3
7	30	155	0.940	0.970	1.54		85	83	250	60	<3
8	35	156	0.960	0.980	1.57		86	85	250	60	<3
9	40	156	0.920	0.959	1.51		86	85	250	60	<3
10	45	155	0.970	0.985	1.59		86	85	250	60	<3
11	50	155	0.820	0.906	1.34		87	85	250	60	<3
12	55	155	0.820	0.906	1.34		87	85	250	60	<3
	60			0.000	0.00	935.535					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	154.8333	AV SQ RT =.9500994		1.482833	39.965	AV TEMP = 83.375		250	60.91666	<3

PLANT Gulf Coast Recycling UNIT Blast Furnace (2) DATE 10/24-91 RUN NUMBER ~~XI~~ (2)

Operator Olwier Capdle Ambient Temp 80'S Barometric Press. 30.03 Stack Diameter 36"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .206

Assumed Moisture 2% # of Points 12 Thermocouple # SBA-3 Nozzle Dia. .206

Filter # XIV B-2 Pitot Corr. Factor .84 "F" factor / 1.64 Meter Box # SBA-1

/ Meter Box DHa 1.788

START TIME: 0938

END TIME: 1040

PITOT TUBE:
Impact 4 " for 15 sec.
Static 4 " for 15 sec.

METER BOX
Before <.02 cfm @ 15 " Hg.
After <.02 cfm @ 10 " Hg.

STACK
Stack Static Press(H_2O) —

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Out	Sample Box Temperature	Temp of last Imp.	Pump. Vacuum Inch. of Hg	
1	0	155	.91	.95	1.49	895.520	80	80	250	<68	<3	
2	5	155	1.00	1.00	1.64	898.91	80	80	250	63	<3	
3	10	155	1.00	1.00	1.64	902.35	81	80	250	60	<3	
4	15	155	.91	.95	1.49	905.88	82	81	250	60	<3	
5	20	152	.80	.89	1.31	909.25	83	82	250	60	<3	
6	25	154	.80	.89	1.31	912.50	84	83	250	60	<3	
1	30	155	.94	.97	1.54	915.49	85	83	250	60	<3	
2	35	156	.96	.93	1.57	918.82	86	85	250	60	<3	
3	40	156	.92	.96	1.51	922.34	86	85	250	60	<3	
4	45	155	.97	.98	1.59	925.78	86	85	250	60	<3	
5	50	155	.82	.91	1.34	929.21	87	85	250	60	<3	
6	55	155	.82	.91	1.34	932.37	87	85	250	60	<3	
	60					935.535						
		(155)	(.90)	(.95)		39.965	(84)					

$F = 1570 \frac{A \times C}{B}$

$A=(F.D.A. \times Dn^2)^2$

$B=(F.D.A.+1.6)Ts$

$C=(Tm \times DHa)$

Tm = 545 (85)

Ts = 615 (155)

A = .0017

B = 1587

C = 974

VWC = 32 mL

PLANT : GULF COAST RECYCLING
OPERATOR : OLIVER, CAPELLE
PRB LGTH : 3 '
ASS MSTR : 3.00%
FILTER # : 15

UNIT : BLAST FURNACE
AMB TEMP : 80's
PROBE HTR SETTING : 250
POINTS : 12
PITOT CORR FACTOR : .84

DATE :10-24-91
BAROM PRESS : 30.03
HEATER BOX SETTING : 250
THERMOCOUPLE # : S&A - 3
"C" FCTR/NOMOGRAPH : 1.64

RUN # : 3
STACK DIAMETER : 36 "
NOZZLE # : .206
NOZZLE DIAM : .206
METER BOX # : 1.012
METER BOX DHa : 1.788
STATIC PRESS :

STRT TME : 11:10
END TIME : 12:12

- PITOT TUBE -
IMPACT : " 15 SEC :
STATIC : " 15 SEC :

- METER BOX -
BEFORE : 0 cfm @ " Hg
AFTER : cfm @ " Hg

TRAVERSE POINT #	SAMPLING TIME (THETA)	STACK TEMP °F (Ts)	VELOCITY HEAD (Dp)	\/ (Dp)	ORIFICE PRESS (Dh)	GAS VOLUME SAMPLED (Vm) CU FT	GAS METER TEMPERATURE INLET	OUT	SAMPLE BOX TEMP	TEMP °F LAST IMPING	PUMP VACUUM (INCHES OF Hg)
1	0	155	0.850	0.922	1.40	935.845	85	85	250	68	<3
2	5	155	0.880	0.938	1.44		85	85	250	57	<3
3	10	155	0.920	0.959	1.51		85	85	250	57	<3
4	15	154	0.920	0.959	1.51		85	85	250	58	<3
5	20	154	0.820	0.906	1.34		87	85	250	58	<3
6	25	156	0.820	0.906	1.34		87	85	250	58	<3
7	30	156	0.910	0.954	1.49		88	86	250	58	<3
8	35	155	1.000	1.000	1.64		88	87	250	58	<3
9	40	155	1.000	1.000	1.64		88	87	250	58	<3
10	45	155	0.910	0.954	1.49		88	87	250	58	<3
11	50	155	0.800	0.894	1.31		89	88	250	58	<3
12	55	155	0.800	0.894	1.31		89	88	250	58	<3
	60			0.000	0.00	975.635					
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
				0.000	0.00						
	60	155	AV SQ RT =.9405150		1.453266	39.790	AV TEMP =86.54166		250	58.66666	<3

PLANT [redacted]lf Coast Recycling UNIT Blast F[redacted]nace DATE 10/24/91 RUN NUMBER XI[redacted] B-3

Operator Olivia, Capello Ambient Temp 80's Barometric Press. 30.06 Stack Diameter 36"

Probe # 3' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .206

Assumed Moisture 3% # of Points 12 Thermocouple # StA-3 Nozzle Dia. .206

Filter # XI B-3 Pitot Corr. Factor .84 "F" factor / 1.64 Meter Box # StA-1

/ Meter Box DHa 1.788

START TIME: 1110

END TIME: 1216

PITOT TUBE:
Impact 4" for 15 sec. ✓
Static 4" for 15 sec. ✓

METER BOX
Before <.02 cfm @ 15" Hg.
After <.02 cfm @ 10" Hg.

STACK
Stack Static Press(H_2O) —

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	Velocity Head $\sqrt{(Dp_s)}$	Orifice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Gas Meter Temperature Out	Sample Box Temperature	Temp of last Imp.	Pump. Vacuum Inch. of Hg		F = 1570 A X C / B; A=(F.D.A. x $Dn^2)^2$; B=(F.D.A.+1.6)Ts; C=(Tm x DHa)
1	0	155	.85	.92	1.40	935.845	85	85	250	<68	<3		Tm = 545(85)
2	5	155	.88	.94	1.44	939.10	85	85	250	57	<3		Ts = 615
3	10	155	.92	.96	1.51	942.36	85	85	250	57	<3		
4	15	154	.92	.96	1.51	945.72	85	85	250	58	<3		
5	20	154	.82	.91	1.34	949.10	87	85	250	58	<3		A = .0017
6	25	156	.82	.91	1.34	952.29	87	85	250	58	<3		
													B = ~~1587~~ 1581
1	30	156	.91	.95	1.49	955.43	88	86	250	58	<3		
2	35	155	1.00	1.00	1.64	958.81	88	87	250	58	<3		C = 974
3	40	155	1.00	1.00	1.64	962.35	88	87	250	58	<3		
4	45	155	.91	.95	1.49	965.91	88	87	250	58	<3		
5	50	155	.80	.89	1.31	969.29	89	88	250	58	<3		
6	55	155	.80	.89	1.31	972.50	89	88	250	58	<3		
	60					975.635							VWC = 32mL
		(155)	(.89)	(.94)		39.79	(87)	(86)					

FIELD DATA SHEET

PLANT Gulf Coast Recycling UNIT Blast Furnace SO_2 DATE 10/25/91 RUN NUMBER I

Operator Oliver Ambient Temp 80's Barometric Press. 29.99 Stack Diameter 36"

Probe # 6' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .206

Assumed Moisture 3% # of Points 12 Thermocouple # StA-6G Nozzle Dia. .206

Filter # N/A Pitot Corr. Factor .84 "F" factor / 1.64 Meter Box # StA-1

/ Meter Box DHa 1.788

START TIME: 0817
END TIME: 0850

PITOT TUBE:
Impact 4 " for 15 sec. ✓
Static 4 " for 15 sec.

METER BOX
Before <.02 cfm @ 10 " Hg.
After <.02 cfm @ 10 " Hg.

STACK
Stack Static Press(H_2O) -.47

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dp_s)	$\sqrt{(Dp_s)}$	Orifice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Gas Meter Temperature Out	~~Sample Box~~ Temperature Probe	Temp of last Imp.	Pump, Vacuum Inch. of Hg		$F = 1570 \frac{A \times C}{B}$ $A=(F.D.A. \times Dn^2)^2$ $B=(F.D.A.+1.6)Ts$ $C=(Tm \times DHa)$
1	0	149	.91	.95	1.49	975.675	76	76	250	<68	<3		Tm = 540 (80)
2	5	151	1.00	1.00	1.64	978.09	77	76	250	67	<3		Ts = 610 (150)
3	10	150	1.00	1.00	1.64	982.50	77	76	250	66	<3		
4	15	150	.91	.95	1.49	985.98	77	77	250	66	<3		
5	20	150	.80	.89	1.31	989.48	77	77	250	66	<3		A = .0017
6	25	150	.80	.89	1.31	992.25	78	78	250	66	<3		
													B = 1568
1	30	150	.94	.97	1.54	995.92	80	80	250	66	<3		
2	35	150	.86	.93	1.44	999.26	82	79	250	66	<3		C = 966
3	40	151	.92	.96	1.51	002.98	82	80	250	65	<3		
4	45	152	.97	.98	1.59	005.99	82	80	250	65	<3		
5	50	152	.82	.91	1.38	009.59	83	81	250	64	<3		
6	55	152	.82	.91	1.38	013.15	83	82	250	64	<3		
	60					016.135							VWC = 30ml
		(151)	(.90)	(.95)		40.46	(80)	(79)					

FIELD DATA SHEET

PLANT Gulf Coast Recycling UNIT Blast Furnace SO_2 DATE 10/25/91 RUN NUMBER II

Operator Oliver, Capello Ambient temp 80's Barometric Press. 29.99 Stack Diameter 36"

Probe # 6' Probe Heater Level 250 Heater Box Setting ~~29.99~~ 250 Nozzle # .206

Assumed Moisture 3% # of Points 12 Thermocouple # SDA-6G Nozzle Dia. .206

Filter # N/A Pitot Corr. Factor .84 "F" factor / 1.67 Meter Box # SDA-1

/ Meter Box DHa 1.788

START TIME: 1030
END TIME: 1133

PITOT TUBE:
Impact 4" for 15 sec. ✓
Static 4" for 15 sec. ✓

METER BOX
Before <.02 cfm @ 10 " Hg.
After <.02 cfm @ 10 " Hg.

STACK
Stack Static Press(H_2O) ~~-4.0~~ -4.2

Traverse Point	Sampling Time min, (θ)	Stack Temp. (Ts), F	Velocity Head (Dp$_s$)	$\sqrt{(Dp_s)}$	Orfice Pressure (Dh)	Gas Volume Sampled (Vm) ft^3	Gas Meter Temperature Inlet	Out	~~Sample Box~~ Probe Temperature	Temp of last Imp.	Pump, Vacuum inch. of Hg		$F = 1570 \frac{A \times C}{B}$ $A=(F.D.A. \times Dn^2)^2$ $B=(F.D.A.+1.6)Ts$ $C=(Tm \times DHa)$
1	0	150	.91	.95	1.52	016.275	85	85	250	<68	<3		Tm = 550
2	5	152	1.00	1.00	1.67	019.68	85	85	250	66	<3		Ts = 610
3	10	152	1.00	1.00	1.67	023.35	84	85	250	66	<3		
4	15	152	.91	.95	1.52	026.87	83	83	250	65	<3		
5	20	154	.80	.89	1.34	030.31	85	85	250	63	<3		A = .0017
6	25	154	.80	.89	1.34	033.40	85	85	250	63	<3		
1	30	154	.94	.97	1.57	036.58	86	86	250	63	<3		B = 1568
2	35	159	.86	.93	1.48	040.00	87	86	250	63	<3		
3	40	155	.92	.96	1.54	043.29	87	87	250	63	<3		C = 983
4	45	155	.97	.98	1.62	046.25	87	87	250	63	<3		
5	50	155	.82	.91	1.37	050.24	87	87	250	63	<3		
6	55	155	.82	.91	1.37	053.60	88	87	250	63	<3		VWC = 31 ml
	60					056.725							
		(154)	(.90)	(.95)	(1.36)	40.45	(86)						

PLANT Gulf Coast Recycler's UNIT Blast Furnace SO_2 DATE 10/25/91 RUN NUMBER II

Operator Oliver, Caple Ambient Temp 80' Barometric Press. 29.99 Stack Diameter 36"

Probe # 6' Probe Heater Level 250 Heater Box Setting 250 Nozzle # .206

Assumed Moisture 3% # of Points 12 Thermocouple # S&A 6-G Nozzle Dia. .206

Filter # N/A Pitot Corr. Factor .84 "F" factor / 1.67 Meter Box # S&A-1

/ Meter Box DHa 1.788

START TIME: 1159
END TIME: 1310

PITOT TUBE:
Impact 4" for 15 sec. ✓
Static 4" for 15 sec. ✓

METER BOX
Before <.02 cfm @ 10" Hg.
After <.02 cfm @ 10" Hg.

STACK
Stack Static Press(H_2O) 4.2/13.6 = " Hg

Traverse Point	Sampling Time min. (θ)	Stack Temp. (Ts), F	Velocity Head (Dps)	√(Dps)	Orifice Pressure (Dh)	Gas Volume Sampled (Vm) ft³	Gas Meter Temperature Inlet	Out	Probe ~~Sample Box~~ Temperature	Temp of last Imp.	Pump, Vacuum Inch. of Hg		F = 1570 A X C / B; A=(F.D.A. x Dn^2)^2; B=(F.D.A.+1.6)Ts; C=(Tm x DHa)
1	0	152	.91	.95	1.52	056.890	87	86	250	<68	<3		Tm = 550
2	5	152	1.00	1.00	1.67	—	87	86	250	61	<3		Ts = 610
3	10	150	1.00	1.00	1.67	063.81	87	86	250	61	<3		
4	15	150	.91	.95	1.52	067.40	87	86	250	56	<3		
5	20	148	.90	.95	1.50	070.88	87	86	250	56	<3		
6	25	148	.90	.95	1.60	074.25	88	88	250	60	<3		
1	30	152	.94	.97	1.57	077.64	89	88	250	60	<3		
2	35	151	.86	.93	1.44	081.12	89	88	250	60	<3		
3	40	151	.92	.96	1.51	084.60	89	88	250	60	<3		
4	45	151	.97	.98	1.57	087.82	89	88	250	60	<3		
5	50	150	.86	.93	1.44	091.35	90	89	250	61	<3		
6	55	150	.86	.93	1.44	094.67	90	89	250	63	<3		
	60					098.005							vac = 30
		(150)	(.92)	(.96)		(41.115)	(88)						

12.0 LABORATORY DATA

CERTIFICATE OF ANALYSIS

+-----------+
| NO:00043 |
+-----------+

LEGION LABORATORIES INC.
333 FALKENBURG ROAD, UNIT B114
TAMPA, FL. 33619

SAMPLE SUBMISSION DATE: OCTOBER 21-24, 1991
SAMPLES SUBMITTED BY: STEVENSON AND ASSOCIATES
333 FALKENBURG ROAD
TAMPA, FL 33619

SAMPLE ANALYSIS DATE: OCTOBER 23-25, 1991
SAMPLE ANALYSIS TIME: 09:00-15:00 HRS.
SAMPLE ANALYST: LJB/JDT
SAMPLE SOURCE: GULF COAST LEAD STACK SAMPLES - PARTICULATES

RESULTS:

SAMPLE NUMBER		FILTER PARTICULATE		PROBE WASH PARTICULATE	TOTAL PART.WT.*
REFINING-	RUN #1	0.0008	+	0.0029	0.0037
	RUN #2	0.0013	+	0.0031	0.0044
	RUN #3	0.0000	+	0.0120	0.0120
KEELCAST-	RUN #1	0.0000	+	0.0070	0.0070
	RUN #2	0.0000	+	0.0117	0.0117
	RUN #3	0.0005	+	0.0094	0.0099
BLAST	RUN #1	0.0011	+	0.0176	0.0187
FURNACE	RUN #2	0.0010	+	0.0090	0.0100
	RUN #3	0.0013	+	0.0055	0.0068
CHARGING-	RUN #1	0.0002	+	0.0248	0.0250
	RUN #2	0.0016	+	0.0111	0.0127
	RUN #3	0.0005	+	0.0038	0.0043
TAPPING	RUN #1	0.0000	+	0.0077	0.0077
	RUN #2	0.0004	+	0.0020	0.0024
	RUN #3	0.0000	+	0.0016	0.0016

* ANALYTICAL RESULTS IN UNITS OF GRAMS

ANALYSIS CERTIFIED BY: Lee Barreiro

LEE BARREIRO, LEGION LABORATORIES INC.

CERTIFICATE OF ANALYSIS

| NO:00045 |

LEGION LABORATORIES INC.
33 FALKENBURG RD, U-B214
TAMPA, FL. 33619

SAMPLE SUBMISSION DATE: OCTOBER 21-24, 1991
SAMPLES SUBMITTED BY: STEVENSON & ASSOCIATES
333 FALKENBURG RD
TAMPA, FL 33619

SAMPLE ANALYSIS DATE: OCTOBER 29, 1991
SAMPLE ANALYSIS TIME: 09:00-15:00 HRS.
SAMPLE ANALYST: JDT
SAMPLE SOURCE: GULF COAST LEAD STACK SAMPLES

RESULTS:

SAMPLE DESIGNATION		ANALYSIS METHOD	ALIQUOT	ANALYSIS RESULT 1	QUALITY CONTROL
LEAD ANALYSIS BY ATOMIC ABSORPTION - FLAME METHOD					
REFINING-	RUN #1	EPA METH.12	NONE	0.13	
	RUN #2	EPA METH.12	NONE	0.08	
	RUN #3	EPA METH.12	NONE	0.08	(spike-101%)
KEELCAST-	RUN #1	EPA METH.12	NONE	0.08	
	RUN #2	EPA METH.12	NONE	0.08	
	RUN #3	EPA METH.12	NONE	0.08	
BLAST	RUN #1	EPA METH.12	NONE	0.10	
FIRN.	RUN #2	EPA METH.12	NONE	0.08	
	RUN #3	EPA METH.12	NONE	0.10	
CHARGING-	RUN #1	EPA METH.12	NONE	0.35	
	RUN #2	EPA METH.12	NONE	0.40	
	RUN #3	EPA METH.12	NONE	0.35	
TAPPING	RUN #1	EPA METH.12	NONE	0.08	
	RUN #2	EPA METH.12	NONE	0.08	
	RUN #3	EPA METH.12	NONE	0.05/0.05	(dup.)
FIELD BLANK		EPA METH.12	NONE	0.00	

1. ANALYTICAL RESULTS IN UNITS OF TOTAL MILLIGRAMS OF LEAD AS Pb/SAMPLE

ANALYSIS CERTIFIED BY: Lee Barreiro
LEE BARREIRO, LEGION LABORATORIES INC.

CERTIFICATE OF ANALYSIS

NO:00044

LEGION LABORATORIES INC.
333 FALKENBURG ROAD, UNIT B114
TAMPA, FL. 33619

SAMPLE SUBMISSION DATE: OCTOBER 25, 1991
SAMPLES SUBMITTED BY: STEVENSON AND ASSOCIATES
333 FALKENBURG ROAD
TAMPA, FL. 33619

SAMPLE ANALYSIS DATE: OCTOBER 26, 1991
SAMPLE ANALYSIS TIME: 08:00-16:00
SAMPLE ANALYST: LJB/JDT
SAMPLE SOURCE: GULF COAST LEAD STACK SAMPLES - SO2'S

Results:

Sample Designation	Analysis Method	Aliquot	Analysis Result[1]	Quality Control
FIRST IMPINGER SO_3 ANALYSIS				
Run 1 Isopropyl	EPA Method 6	1/1000	0.00	
Run 2 Isopropyl	EPA Method 6	1/1000	0.00	
Run 3 Isopropyl	EPA Method 6	1/1000	0.00	
Blank Isopropyl	EPA Method 6	1/1000	0.00	
SECOND AND THIRD IMPINGERS SO_2 ANALYSIS				
Run 1 Peroxides	EPA Method 6	1/1000	10.13	
Run 2 Peroxides	EPA Method 6	1/1000	9.14	
Run 3 Peroxides	EPA Method 6	1/1000	14.18	
Blank Peroxides	EPA Method 6	1/1000	0.00	
Audit Samples				
A01432 Peroxides	EPA Method 6	20/100	21.78/21.74	
A04684 Peroxides	EPA Method 6	20/100	3.06/3.07	
Blank Peroxides	EPA Method 6	20/100	0.00	

[1] Results in units of mls barium chloride 0.009346 N

Analysis certified by: Lee Barreiro

Lee Barreiro, Legion Laboratories Inc.

LEGION LABORATORIES INC

CHAIN-OF-CUSTODY

SAMPLE ID NUMBER(S) : Runs #1-15 Pb / 1-3 SO_2/SO_3

SAMPLING LOCATION : GULF COAST RECYCLING

SAMPLE SOURCE : CHARGING, Tapping, Blast Furnace, Keelcast and Refining

CONTAINER DESCRIPTION/PRESERVATION: N/A

ANALYSES REQUIRED : Particulate, Pb, SO_2, SO_3

ADDITIONAL INFORMATION : N/A

SAMPLE BY (print) : RON OLIVER

SIGNATURE : Ron Oliver

DATE/TIME : 10/2~~8~~-25/91

TRANSFERRED BY (print) : RON OLIVER

SIGNATURE : Ron Oliver

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SAMPLE RECEIVER : LEGION LABORATORIES
(COMPANY NAME)

RECEIVED BY (print) : LEE BARREIRO

SIGNATURE : Lee Barreiro

DATE/TIME : 10/25/91

13.0 CALCULATIONS

TERMS USED FOR CALCULATIONS

Dp - average pressure on pitot tube

Ts - average temperature of stack, degrees absolute

Tm - average temperature of dry gas meter, degrees absolute

Vm - volume of dry gas meter, actual cubic feet

Θ - total time of test run, minutes

An - area of nozzle tip, square feet

Pb - barometric pressure

Dh - average pressure on the limiting orifice

Vwc - volume of water collected from impingers and silica gel, grams

Vmstd - volume of the dry meter in standard cubic feet

Bwo - percent of moisture in flue gas

Md - molecular weight of dry flue gas

Ms - molecular weight of flue gas

Vs - velocity of flue gas

Qs - volumetric flow of flue gas, cubic feet per minute

Qs std - volumetric flow of flue gas, standard cubic feet dry

%I - percent of theoretical ideal sampling rate

Wt collected - total weight of particulate collected by sampling train, in grams

Diameter avg - average diameter of nozzle tip, inches

DERIVATION OF CALCULATIONS

A) Volume Of Water Vapor Collected

$$Vwc = (0.0471)\ (\text{gms/mls of water collected})$$

B) Volume Of Air Metered To 68 Deg.F, 29.92 "Hg,Dry

$$Vmstd = (17.64)\ (Y)\ (Vm)\ (Pm)/(Tm)$$

C) Moisture Content Of Flue Gas

$$Bwo = \frac{Vwc \times 100}{Vwc + Vmstd} = \%\ H2o$$

D) Dry Gas Molecular Weight

$$Md = 0.44\ (\%\ CO2) + 0.32\ (\%\ O2) + 0.28\ (\%\ N + \%\ CO)$$

= Assume 29 for ambient sources. 30 for combustion sources.

E) Stack Gas Molecular Weight

$$Ms = Md\ (1-Bwo) + (18)\ (Bwo)$$

F) Stack Gas Velocity

$$Vs = Kp\ \ Cp\ \sqrt{Dp}\ \ \sqrt{\frac{(Ts\ avg.)}{Ps\ \ Ms}}$$

G) Stack Gas Flowrate

$$Qs = (60\ \text{sec/min.})\ \ (As)\ (Vs)$$

$$Qs\ std = \frac{Qs\ (Tstd)\ (Ps)\ (1-Bwo)}{(Ts)\ \ (Pstd)}$$

H) Isokinetic Sampling Rate

$$\%I = 0.0945\ \frac{Ts\ \ \ (Vmstd)}{Ps\ Vs\ An\ 0\ (1-Bwo)}$$

I) Concentration

$$= (15\ \text{grains/gram})\ \ (\text{Wt collected}) / (\text{Vm std})$$

J) Emission Rate

$$= (0.00857)\ (\text{grains/dscf})\ (Qstd)$$

GULF COAST RECY. - CHARGING   CALCULATIONS - RUN #1   10-21-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 18
(Vwc) = .8478

B) VOLUME OF AIR :
(VMSTD) =42.37720

C) MOISTURE CONTNT :
% H_2O =.0196136
(1-Bwo) =.9803863

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.78424

F) VEL. FT/SC (Vs) =55.14993

G) VOL CU FT/M(Qs) =8735.122

DSCFM (Qs std) =8163.372

H) ISOKIN SMP RATE
(%I) =98.69702

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	.9578119	"H_2O
Ts	=	555	°R
Tm	=	543.4166	°R
Vm	=	42.84	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0002314	sq ft
Pb	=	29.99	in. Hg
Dh	=	1.6565	in. Hg
Cp	=	.84	
Ps	=	29.99147	in. Hg
As	=	2.639810	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.8478	grams
Partic.	=	0.02500	grams
Lead	=	0.00035	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .025
CONCENTRATION =.0091027

EMISSION RATE =.6368307

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00035
CONCENTRATION = 0.00013

EMISSION RATE =.0089156

GULF COAST RECY. - CHARGING   CALCULATIONS - RUN #2   10-21-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 20
(Vwc) = .942

B) VOLUME OF AIR :
(VMSTD) =41.67876

C) MOISTURE CONTNT :
% H_2O =.0221019
(1-Bwo) =.9778980

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.75687

F) VEL. FT/SC (Vs) =54.74514

G) VOL CU FT/M(Qs) =8671.008

DSCFM (Qs std) =8082.888

H) ISOKIN SMP RATE
(%I) =98.03690

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	.9503296	"H_2O
Ts	=	555	°R
Tm	=	552.4583	°R
Vm	=	42.835	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0002314	sq ft
Pb	=	29.99	in. Hg
Dh	=	1.656275	in. Hg
Cp	=	.84	
Ps	=	29.99147	in. Hg
As	=	2.639810	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.942	grams
Partic.	=	0.01270	grams
Lead	=	0.00040	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .0127
CONCENTRATION =.0047016

EMISSION RATE =.3256883

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00040
CONCENTRATION = 0.00015

EMISSION RATE =.0102579

GULF COAST RECY. - CHARGING CALCULATIONS - RUN #3 10-21-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 17
(Vwc) = .8007

B) VOLUME OF AIR :
(VMSTD) =40.66032

C) MOISTURE CONTNT :
% H_2O =.0193121
(1-Bwo) =.9806878

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.78756

F) VEL. FT/SC (Vs) =52.70800

G) VOL CU FT/M(Qs) =8348.348

DSCFM (Qs std) =7804.314

H) ISOKIN SMP RATE
(%I) =99.05522

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	.9154546	"H_2O
Ts	=	555	°R
Tm	=	555.375	°R
Vm	=	42.02	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0002314	sq ft
Pb	=	29.99	in. Hg
Dh	=	1.548333	in. Hg
Cp	=	.84	
Ps	=	29.99147	in. Hg
As	=	2.639810	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.8007	grams
Partic.	=	0.00430	grams
Lead	=	0.00035	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .0043
CONCENTRATION =.0016317

EMISSION RATE =.1091387

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00035
CONCENTRATION = 0.00013

EMISSION RATE =.0088833

GULF COAST RECY. - REFINING   CALCULATIONS - RUN #1   10-22-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 17
(Vwc) = .8007

B) VOLUME OF AIR :
(VMSTD) =40.92767

C) MOISTURE CONTNT :
% H_2O =.0191883
(1-Bwo) =.9808116

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.78892

F) VEL. FT/SC (Vs) =65.28842

G) VOL CU FT/M(Qs) =14443.13

DSCFM (Qs std) =13721.33

H) ISOKIN SMP RATE
(%I) =101.4740

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	1.143087	"H_2O
Ts	=	560.8333	°R
Tm	=	536.8333	°R
Vm	=	40.795	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0001806	sq ft
Pb	=	30.06	in. Hg
Dh	=	1.4915	in. Hg
Cp	=	.84	
Ps	=	30.79529	in. Hg
As	=	3.687008	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.8007	grams
Partic.	=	.0037	grams
Lead	=	.00013	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .0037
CONCENTRATION =.0013949

EMISSION RATE =.1640316

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00013
CONCENTRATION =.0000490

EMISSION RATE =.0057632

GULF COAST RECY. - REFINING   CALCULATIONS - RUN #2   10-22-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 15
(Vwc) = .7065

B) VOLUME OF AIR :
(VMSTD) =40.62330

C) MOISTURE CONTNT :
% H_2O =.0170941
(1-Bwo) =.9829058

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.81196

F) VEL. FT/SC (Vs) =65.27201

G) VOL CU FT/M(Qs) =14439.50

DSCFM (Qs std) =13743.08

H) ISOKIN SMP RATE
(%I) =100.5600

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	1.143087	"H_2O
Ts	=	561	°R
Tm	=	542.0833	°R
Vm	=	40.885	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0001806	sq ft
Pb	=	30.06	in. Hg
Dh	=	1.517666	in. Hg
Cp	=	.84	
Ps	=	30.79529	in. Hg
As	=	3.687008	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.7065	grams
Partic.	=	.0044	grams
Lead	=	.00008	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .0044
CONCENTRATION =.0016712

EMISSION RATE =.1968377

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00008
CONCENTRATION =.0000303

EMISSION RATE =.0035788

GULF COAST RECY. - REFINING CALCULATIONS - RUN #3 10-22-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 15
(Vwc) = .7065

B) VOLUME OF AIR :
(VMSTD) =40.39344

C) MOISTURE CONTNT :
% H_2O =.0171898
(1-Bwo) =.9828101

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.81091

F) VEL. FT/SC (Vs) =65.87160

G) VOL CU FT/M(Qs) =14572.14

DSCFM (Qs std) =13617.16

H) ISOKIN SMP RATE
(%I) =100.9156

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	1.143087	"H_2O
Ts	=	571.3333	°R
Tm	=	547	°R
Vm	=	41.025	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0001806	sq ft
Pb	=	30.06	in. Hg
Dh	=	1.4915	in. Hg
Cp	=	.84	
Ps	=	30.79529	in. Hg
As	=	3.687008	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.7065	grams
Partic.	=	.012	grams
Lead	=	.00008	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .012
CONCENTRATION =.0045839

EMISSION RATE =.5349383

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00008
CONCENTRATION =.0000306

EMISSION RATE =.0035662

GULF COAST RECY. - TAPPING   CALCULATIONS - RUN #1   10-22-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 10
(Vwc) = .471

B) VOLUME OF AIR :
(VMSTD) =35.07266

C) MOISTURE CONTNT :
% H_2O =.0132513
(1-Bwo) =.9867486

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.85423

F) VEL. FT/SC (Vs) =59.04373

G) VOL CU FT/M(Qs) =3843.993

DSCFM (Qs std) =3508.186

H) ISOKIN SMP RATE
(%I) =100.0930

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	1.011303	"H_2O
Ts	=	573.6666	°R
Tm	=	552.5416	°R
Vm	=	36.01	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0001806	sq ft
Pb	=	30.06	in. Hg
Dh	=	1.17135	in. Hg
Cp	=	.84	
Ps	=	30.07838	in. Hg
As	=	0	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.471	grams
Partic.	=	0.00700	grams
Lead	=	0.00008	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .007
CONCENTRATION =.0030796

EMISSION RATE =.0925888

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00008
CONCENTRATION = 0.00004

EMISSION RATE =.0010581

GULF COAST RECY. - TAPPING   CALCULATIONS - RUN #2   10-22-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 10
(Vwc) = .471

B) VOLUME OF AIR :
(VMSTD) =35.48599

C) MOISTURE CONTNT :
% H_2O =.0130989
(1-Bwo) =.9869010

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.85591

F) VEL. FT/SC (Vs) =59.05420

G) VOL CU FT/M(Qs) =3844.675

DSCFM (Qs std) =3507.901

H) ISOKIN SMP RATE
(%I) =101.2808

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	1.011303	"H_2O
Ts	=	573.8333	°R
Tm	=	554.75	°R
Vm	=	36.58	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0001806	sq ft
Pb	=	30.06	in. Hg
Dh	=	1.17135	in. Hg
Cp	=	.84	
Ps	=	30.07470	in. Hg
As	=	0	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.471	grams
Partic.	=	0.00240	grams
Lead	=	0.00008	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .0024
CONCENTRATION =.0010435

EMISSION RATE =.0313724

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00008
CONCENTRATION = 0.00003

EMISSION RATE =.0010457

GULF COAST RECY. - TAPPING   CALCULATIONS - RUN #3   10-22-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 10
(Vwc) = .471

B) VOLUME OF AIR :
(VMSTD) =35.42873

C) MOISTURE CONTNT :
% H_2O =.0131198
(1-Bwo) =.9868801

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.85568

F) VEL. FT/SC (Vs) =59.06301

G) VOL CU FT/M(Qs) =3845.248

DSCFM (Qs std) =3507.332

H) ISOKIN SMP RATE
(%I) =101.1338

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	1.011303	"H_2O
Ts	=	574	°R
Tm	=	554.5833	°R
Vm	=	36.51	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0001806	sq ft
Pb	=	30.06	in. Hg
Dh	=	1.17135	in. Hg
Cp	=	.84	
Ps	=	30.07470	in. Hg
As	=	0	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.471	grams
Partic.	=	0.00160	grams
Lead	=	0.00005	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .0016
CONCENTRATION =.0006968

EMISSION RATE =.0209453

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00005
CONCENTRATION = 0.00002

EMISSION RATE =.0006545

GULF COAST - KEEL CASTING CALCULATIONS - RUN #1 10-23-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 6
(Vwc) = .2826

B) VOLUME OF AIR :
(VMSTD) =38.34428

C) MOISTURE CONTNT :
% H_2O =.0073161
(1-Bwo) =.9926838

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.91952

F) VEL. FT/SC (Vs) =47.96934

G) VOL CU FT/M(Qs) =3076.794

DSCFM (Qs std) =2923.636

H) ISOKIN SMP RATE
(%I) =100.9785

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	.8368014	"H_2O
Ts	=	554	°R
Tm	=	534.75	°R
Vm	=	38.1	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0002314	sq ft
Pb	=	30.05	in. Hg
Dh	=	1.322266	in. Hg
Cp	=	.84	
Ps	=	30.0625	in. Hg
As	=	1.069014	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.2826	grams
Partic.	=	.007	grams
Lead	=	0.00008	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = 0.0070
CONCENTRATION =.0028168

EMISSION RATE =.0705777

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00008
CONCENTRATION = 0.00003

EMISSION RATE =.0008066

GULF COAST - KEEL CASTING CALCULATIONS - RUN #2 10-23-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 6
(Vwc) = .2826

B) VOLUME OF AIR :
(VMSTD) =38.12863

C) MOISTURE CONTNT :
% H_2O =.0073572
(1-Bwo) =.9926427

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.91907

F) VEL. FT/SC (Vs) =48.01240

G) VOL CU FT/M(Qs) =3079.556

DSCFM (Qs std) =2920.939

H) ISOKIN SMP RATE
(%I) =100.5034

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	.8368014	"H_2O
Ts	=	555	°R
Tm	=	549.9583	°R
Vm	=	38.95999	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0002314	sq ft
Pb	=	30.05	in. Hg
Dh	=	1.355925	in. Hg
Cp	=	.84	
Ps	=	30.06323	in. Hg
As	=	1.069014	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.2826	grams
Partic.	=	.0117	grams
Lead	=	0.00008	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .0117
CONCENTRATION =.0047347

EMISSION RATE =.1185233

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00008
CONCENTRATION = 0.00003

EMISSION RATE =.0008104

GULF COAST - KEEL CASTING CALCULATIONS - RUN #3 10-23-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 7
(Vwc) = .3297

B) VOLUME OF AIR :
(VMSTD) =38.54378

C) MOISTURE CONTNT :
% H_2O =.0084813
(1-Bwo) =.9915186

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.90670

F) VEL. FT/SC (Vs) =48.02267

G) VOL CU FT/M(Qs) =3080.215

DSCFM (Qs std) =2918.255

H) ISOKIN SMP RATE
(%I) =101.6911

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	.8368014	"H_2O
Ts	=	555	°R
Tm	=	557.0416	°R
Vm	=	39.89	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0002314	sq ft
Pb	=	30.05	in. Hg
Dh	=	1.371	in. Hg
Cp	=	.84	
Ps	=	30.06323	in. Hg
As	=	1.069014	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	.3297	grams
Partic.	=	.0099	grams
Lead	=	0.00008	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .0099
CONCENTRATION =.0039632

EMISSION RATE =.0991176

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00008
CONCENTRATION =.0000320

EMISSION RATE =.0008009

GULF COAST - BLAST FURNACE   CALCULATIONS - RUN #1   10-24-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 29
(Vwc) = 1.3659

B) VOLUME OF AIR :
(VMSTD) =40.05545

C) MOISTURE CONTNT :
% H_2O =.0329757
(1-Bwo) =.9670242

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.63726

F) VEL. FT/SC (Vs) =57.37775

G) VOL CU FT/M(Qs) =24334.76

DSCFM (Qs std) =20308.03

H) ISOKIN SMP RATE
(%I) =100.4140

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	.9457299	"H_2O
Ts	=	613.8333	°R
Tm	=	535.5	°R
Vm	=	39.86999	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0002314	sq ft
Pb	=	30.03	in. Hg
Dh	=	1.45125	in. Hg
Cp	=	.84	
Ps	=	30.03	in. Hg
As	=	7.068583	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	1.3659	grams
Partic.	=	0.01870	grams
Lead	=	0.00010	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = 0.0187
CONCENTRATION =.0072035

EMISSION RATE =1.253703

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00010
CONCENTRATION = 0.00004

EMISSION RATE =.0067042

GULF COAST - BLAST FURNACE CALCULATIONS - RUN #2 10-24-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 32
(Vwc) = 1.5072

B) VOLUME OF AIR :
(VMSTD) =39.57205

C) MOISTURE CONTNT :
% H_2O =.0366900
(1-Bwo) =.9633099

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.59640

F) VEL. FT/SC (Vs) =57.73098

G) VOL CU FT/M(Qs) =24484.57

DSCFM (Qs std) =20321.47

H) ISOKIN SMP RATE
(%I) =99.13667

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	.9500994	"H_2O
Ts	=	614.8333	°R
Tm	=	543.375	°R
Vm	=	39.96499	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0002314	sq ft
Pb	=	30.03	in. Hg
Dh	=	1.482833	in. Hg
Cp	=	.84	
Ps	=	30.03	in. Hg
As	=	7.068583	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	1.5072	grams
Partic.	=	0.01000	grams
Lead	=	0.00008	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = 0.0100
CONCENTRATION =.0038992

EMISSION RATE =.6790681

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00008
CONCENTRATION = 0.00003

EMISSION RATE =.0054325

GULF COAST - BLAST FURNACE CALCULATIONS - RUN #3 10-24-91

A) VOLUME OF WATER :
GRAMS COLLECTED = 32
(Vwc) = 1.5072

B) VOLUME OF AIR :
(VMSTD) =39.16766

C) MOISTURE CONTNT :
% H_2O =.0370548
(1-Bwo) =.9629451

D) DRY GAS MLC WGT :
(Md) = 29

E) STACK GAS M WGT :
(Ms) =28.59239

F) VEL. FT/SC (Vs) =57.16035

G) VOL CU FT/M(Qs) =24242.56

DSCFM (Qs std) =20107.53

H) ISOKIN SMP RATE
(%I) =99.16758

VALUES FROM TEST			
Avg $\sqrt{DP}$	=	.9405150	"H_2O
Ts	=	615	°R
Tm	=	546.5416	°R
Vm	=	39.79	cu. ft.
Y	=	1.012	
THETA	=	60	min.
An	=	.0002314	sq ft
Pb	=	30.03	in. Hg
Dh	=	1.453266	in. Hg
Cp	=	.84	
Ps	=	30.03	in. Hg
As	=	7.068583	sq ft
Md	=	29	lb/cu.ft.
Vwc	=	1.5072	grams
Partic.	=	.0068	grams
Lead	=	.0001	grams

I) CONCENTRATION : PARTICULATE
WEIGHT COLLECTED = .0068
CONCENTRATION =.0026788

EMISSION RATE =.4616224

CONCENTRATION : LEAD
WEIGHT COLLECTED = 0.00010
CONCENTRATION = 0.00004

EMISSION RATE =.0067885

Calculations: SO_2

Plant: Gulf Coast Recycling Date: 10/25/91

System: Blast Furnace SO_2

RUN#

a) Vm std = (17.65) 1.012 (40.46) $\frac{(30.09)}{(539)}$ = 40.35 stdcuft

b) SO_2 lb/SCFM = $\frac{(7.06\times10^{-5}) (.009346) (10.13) (\frac{1000}{1})}{(40.35)}$ =lb/.000166 SCFM

c) lbs/hr = 60 (.000166) (20,370) = 203 lbs/hr

RUN#

a) Vm std = (17.65) 1.012 (40.45 $\frac{(30.09)}{546}$ = 39.82 stdcuft

b) SO_2 lb/SCFM = $\frac{(7.06\times10^{-5}) (.009346) (9.14) (\frac{1000}{1})}{(39.82)}$ =lb/.000152 SCFM

c) lbs/hr = 60 (.000152) (20,161) = 184 lbs/hr

RUN#

a) Vm std = (17.65) 1.012 (41.115) $\frac{(30.09}{(548)}$ = 40.32 stdcuft

b) SO_2 lb/SCFM = $\frac{(7.06\times10^{-5}) (.009346) (14.18) (\frac{1000}{1})}{(40.32)}$ =lb/=.000232 SCFM

c) lbs/hr = 60 (.000232 (28,320) = 394 lbs/hr

AVG = 260 lbs/hr SO_2

14.0 CALIBRATION INFORMATION

Calibration Schedule
(Reference: 17-2.700(6)(a)5.f.)

Item	Minimum Calibration	Reference Instrument Frequency	Tolerance
Thermometers Liquid in glass	Annually	ASTM Hg in glass ref. thermometer or equivalent or thermometric points.	±2%
Bimetallic	Quarterly	Calib. liq. in glass thermometer	5°F
Thermocouple	Annually	ASTM Hg in glass ref. thermometer, NBS calibrated reference thermocouple and potentiometer.	5°F
Barometer	Monthly	Hg barometer, or NOAA station	±1% scale
Pitot Tube	1. When required 2. When damaged	By construction or measurements or wind tunnel D greater than 16" and standard pitot tube	See EPA Method 2 Figs. 2-2 & 2-3
Probe Nozzles	1. Before each test or 2. When nicked, dented, corroded	Micrometer	±0.001" mean of at least 3 readings. Maximum deviation between readings 0.004"
Dry Gas Meter and Orifice Meter	1. Full Scale: When received; When 5% change observed; annually 2. One Point: semiannually	Spirometer of calibrated wet test or dry gas test meter	2%
	3. Check after each test series	Comparison check	5%

CALIBRATION OF EQUIPMENT

Calibration of the stack sampling equipment was performed as directed by Chapter 17-2.700 (6)(a) 5.f. of the Florida Administrative Code and the Federal EPA handbook on Quality Assurance. While in the field the following quality assurance is performed.

A. Nozzles. Prior to starting the test, the nozzle selecteld for the test is calibrated by micrometer. This is normally found listed on the first run field data sheet in the blank after nozzle diameter. The general appearance of the pitot and probe is noted before and after the test.

B. Dry Gas Meter. Before beginning each series of tests, the back half of the sample train (in the control box) is checked for leaks.

C. Sampling Train. Before the test and after the train has been assembled, a leak check is performed from the nozzle back. A vacuum of 15" or greater is used. During the test the vacuum on the sampling train is recorded to allow a final (after the test run) leak check equal to or greater than the highest vacuum during the run.

Other calibration as required by the above listed code, was performed in the lab in a manner prescribed by the State Code.

STACK TEMPERATURE SENSOR CALIBRATION

CALIBRATION DATE: 1-4-91

THERMOCOUPLE NUMBER: 6T AMBIENT TEMPERATURE: 72

BAROMETRIC PRESSURE: 30.04 CALIBRATOR: Oliver

REFERENCE TEMPERATURE SENSOR: Fisher Scientific Hg/in Glass 0 -

REFERENCE PT. No. (a)	CAL. MEDIUM (b)	REFERENCE TEMPERATURE °F	THERMOCOUPLE TEMPERATURE °F	DIFFERENCE % DEGREES (c)
1	Water Bath	77	75	<1.5%
2	Water Bath	121	120	<1.5%
3	Water Bath	146	146	<1.5%
4	Water Bath	212	214	<1.5%

a. Every (50°F).
b. Type of calibration system used.
c. calculation of % difference. MUST BE LTEQ TO 1.5 %

$$\left(\frac{(\text{ref temp deg F} + 460) - (\text{test thermon temp. deg. F} + 460)}{\text{ref temp. deg. F} + 460}\right) 100$$

STACK TEMPERATURE SENSOR CALIBRATION

CALIBRATION DATE: 1-4-91

THERMOCOUPLE NUMBER: 3T AMBIENT TEMPERATURE: 72

BAROMETRIC PRESSURE: 30.04 CALIBRATOR: Oliver

REFERENCE TEMPERATURE SENSOR: Fisher Scientific Hg/in Glass 0 -

REFERENCE PT. No. (a)	CAL. MEDIUM (b)	REFERENCE TEMPERATURE °F	THERMOCOUPLE TEMPERATURE °F	DIFFERENCE % DEGREES (c)
1	Water Bath	77	76	< 1.5%
2	Water Bath	128	130	< 1.5%
3	Water Bath	143	144	< 1.5%
4	Water Bath	212	214	< 1.5%

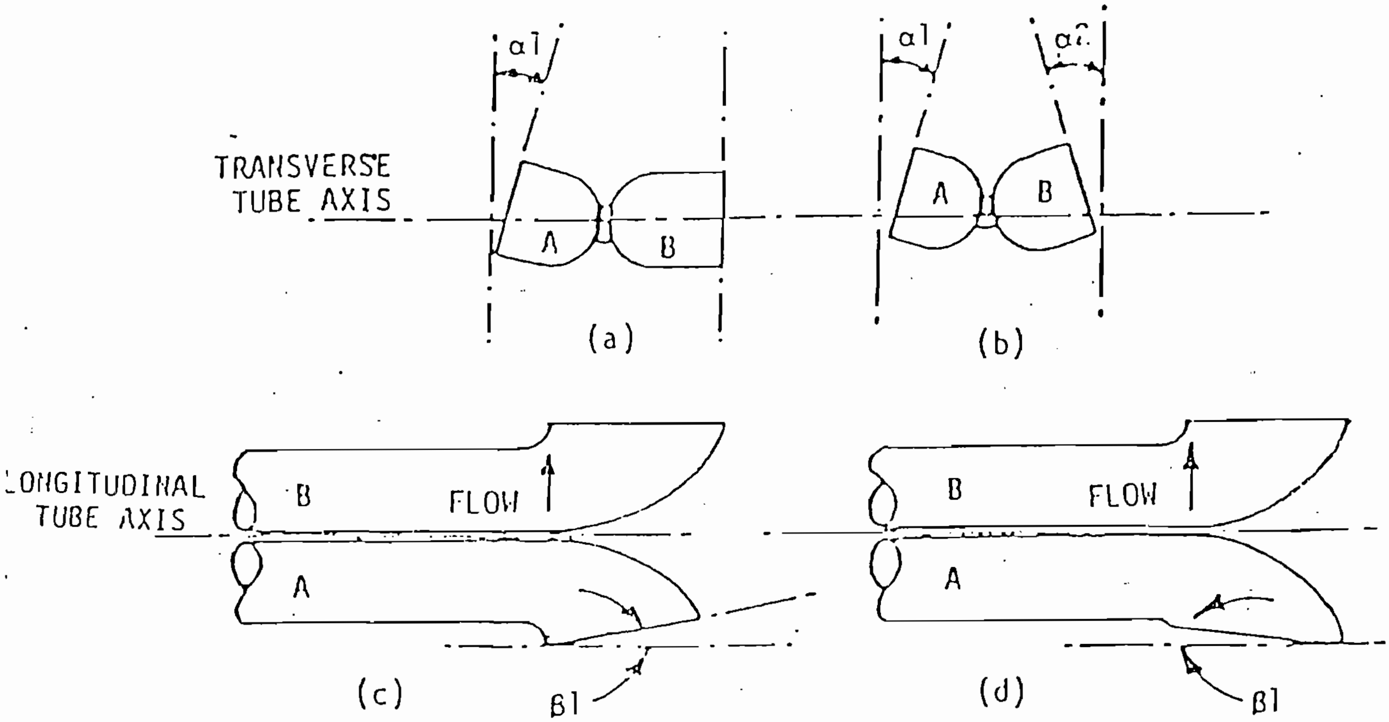
a. Every (50°F).
b. Type of calibration system used.
c. calculation of % difference. MUST BE LTEQ TO 1.5 %

$$\left(\frac{(\text{ref temp deg F} + 460) - (\text{test thermon temp. deg. F} + 460)}{\text{ref temp. deg. F} + 460}\right) 100$$

PITOT TUBE ALIGNMENT CHECK

PITOT TUBE # A0 #3 Probe

DATE: 11/14/88



a_1 = 0°

a_2 = 3°

B_2 = 1

Z = .027"

W = .003"

BY: LS

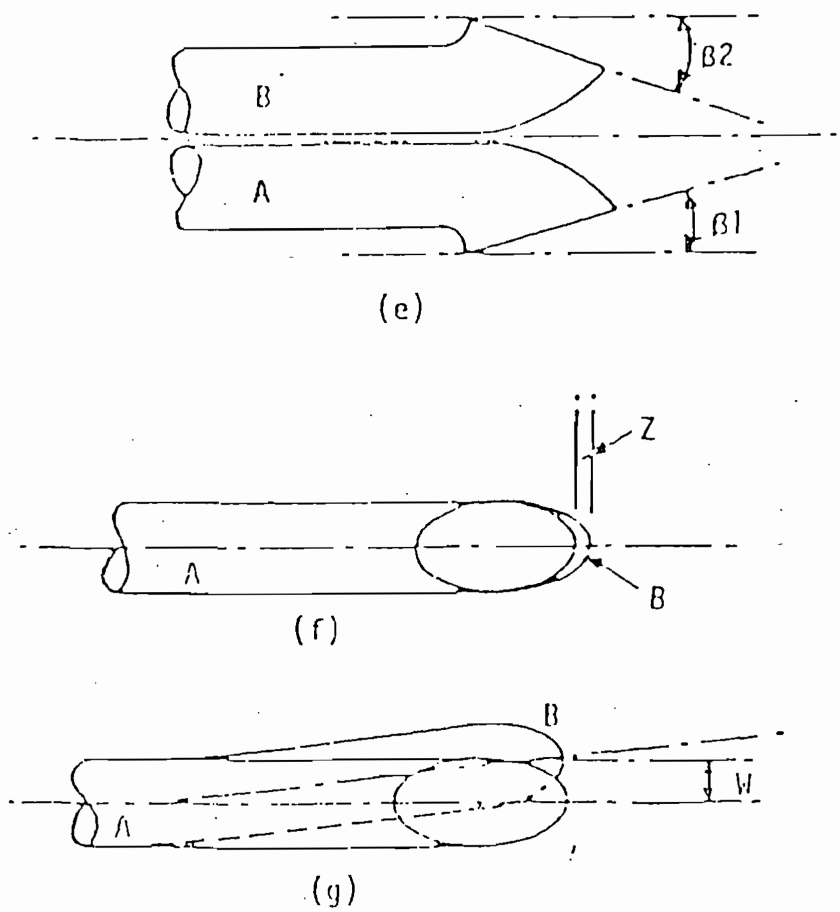
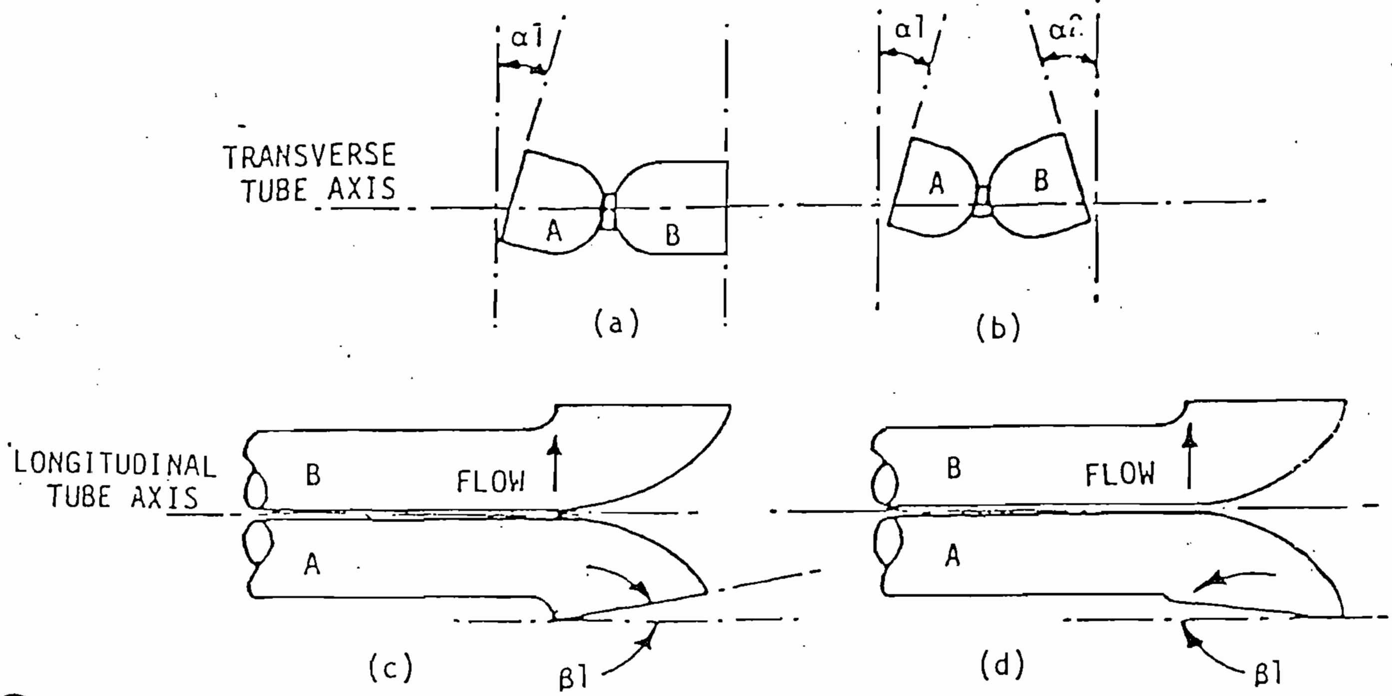


Figure 1.4. Types of face-opening misalignment that can result from field use or improper construction of Type S pitot tubes. These will not affect

PITOT TUBE ALIGNMENT CHECK

PITOT TUBE # AO-6 B

DATE: 2/28/88



a_1	=	1°
a_2	=	1.5°
B_2	=	.5
Z	=	0
W	=	0
BY:		LL

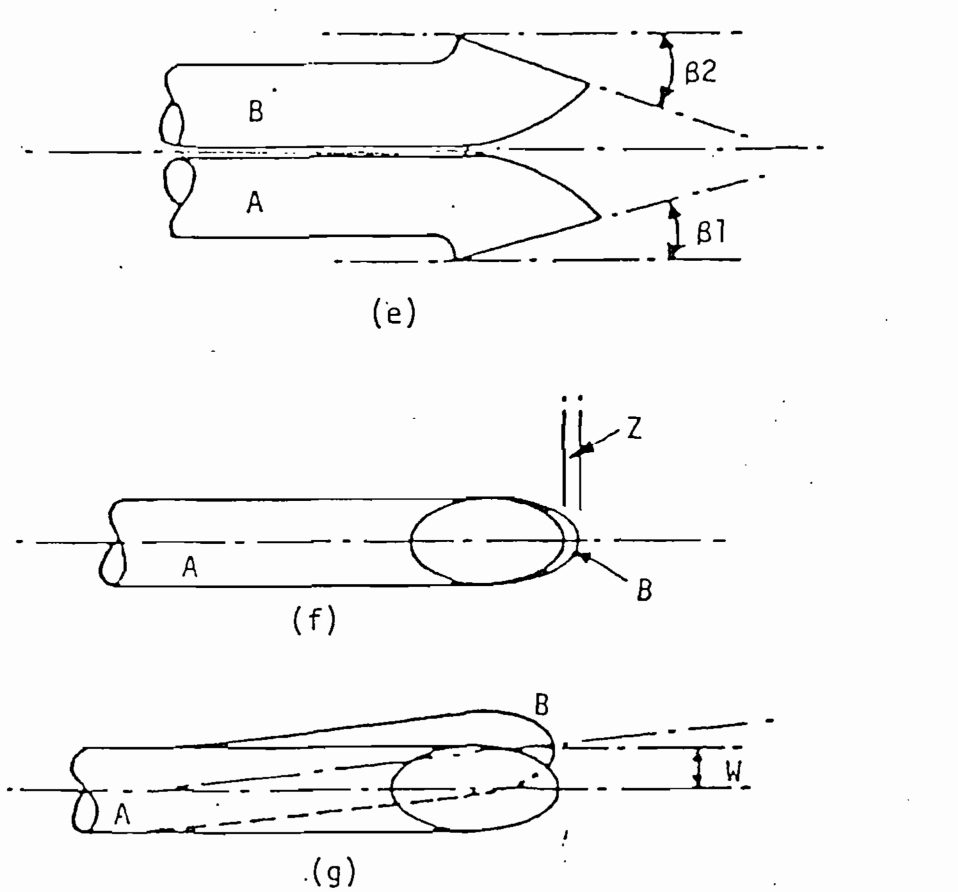


Figure 1.4. Types of face-opening misalignment that can result from field use or improper construction of Type S pitot tubes. These will not affect Cp so long as α_1 and α_2 <10°, β_2 <5°,

PROBE NOZZLE CALIBRATION

SOURCE: Gulf Coast
Charging / Tapping / Keel Cast
Blast

DATE: 10/21/91 / 10/22/91 10/23/91
10/24/91

NOZZLE DIAMETER MEASUREMENTS (Inches):

1)	.205	.205	.206	.206
2)	.206	.206	.206	.205
3)	.206	.206	.205	.206
4)	.209	.206	.206	.206

AVERAGE: .206

NOZZLE TIP AREA (Sq. Ft.): ____________

[signature]

PROBE NOZZLE CALIBRATION

SOURCE: SCK/Refining

DATE: 10/22/91

NOZZLE DIAMETER MEASUREMENTS (Inches):

1) .182
2) .182
3) .182
4) .181

AVERAGE: .182

NOZZLE TIP AREA (Sq. Ft.): ____________________

[signature]

AIR CONSULTING & ENGINEERING ANNUAL METER CALIBRATION

DATE 2-15-91 LEAK CHECK 0.000 CFM at 5 In. Hg.

METER BOX NUMBER 2126190 BAROMETRIC PRESSURE 29.72 In. Hg

STEVENSON & ASS.

DRY GAS METER TEMPERATURE 69 °F/ASTM GLASS THERMOMETER TEMPERATURE 69 °F

ΔHS	AVERAGE ΔHD	GAS VOLUME, STANDARD METER			GAS VOLUME, DRY GAS METER			TEMP. STD. METER	TEMP. OF DRY METER	TIME (Minutes)	TIMER
		INITIAL	FINAL	ACTUAL ft^3	INITIAL	FINAL	ACTUAL ft^3				
-.06	0.5	801.256	806.896	5.640	250.208	255.840	5.632	67	73	14	14
-.12	1.0	807.222	812.313	5.091	256.152	261.231	5.079	67	74	9	
-.20	1.5	812.710	818.170	5.460	261.627	267.044	5.417	67	74	8	
-.28	2.25	818.533	824.268	5.735	267.406	273.105	5.699	67	76	7	
-.37	3.0	824.608	830.301	5.693	273.426	279.053	5.627	67	77	6	
-.51	4.0	830.708	836.238	5.530	279.467	284.898	5.431	67	77	5	

	DELTA H	Ya	SCFM	Ys	Y
	1.712	1.012	0.401	1.000	1.012
	1.734	1.013	0.563	0.997	1.010
	1.786	1.018	0.679	0.995	1.012
	1.853	1.018	0.815	0.992	1.010
	1.838	1.023	0.944	0.991	1.014
	1.804	1.027	1.101	0.987	1.014
MEAN:	1.788	1.018		0.994	1.012

CALIBRATED BY: G. F. [illegible]

Rozi V

POSTTEST DRY GAS METER CALIBRATION DATA FORM (English units)

Test numbers ________ Date 10/31/91 Meter box number S+A-1 Plant ________

Barometric pressure, P_b = 30.01 in. Hg Dry gas meter number S+A-T1 Pretest Y 1.012

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	Temperature: Wet test meter (t_w), °F	Temperature: Dry gas meter: Inlet (t_{d_i}), °F	Temperature: Dry gas meter: Outlet (t_{d_o}), °F	Temperature: Dry gas meter: Average[a] (t_d), °F	Time (Θ), min	Vacuum setting, in. Hg	Y_i	$Y_i = \dfrac{V_w P_b (t_d + 460)}{V_d \left(P_b + \frac{\Delta H}{13.6}\right)(t_w + 460)}$
1.00	120.785 / 130.785	311.810 / 321.545	80	80	80	80	17.3	5"		
1.00	130.785 / 140.785	321.545 / 331.365	88	88	88	88	17.4	5"		
1.00	140.785 / 150.785	331.365 / 341.240	92	92	92	92	17.5	5"		
									Y =	

1. 9.735 = .265
2. 9.82 = .180
3. 9.875 = .125

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

V_w = Gas volume passing through the wet test meter, ft^3.

V_d = Gas volume passing through the dry gas meter, ft^3.

t_w = Temperature of the gas in the wet test meter, °F.

t_{d_i} = Temperature of the inlet gas of the dry gas meter, °F.

t_{d_o} = Temperature of the outlet gas of the dry gas meter, °F.

t_d = Average temperature of the gas in the dry gas meter, obtained by the average of t_{d_i} and t_{d_o}, °F.

ΔH = Pressure differential across orifice, in H_2O.

Y_i = Ratio of accuracy of wet test meter to dry gas meter for each run.

Y = Average ratio of accuracy of wet test meter to dry gas meter for all three runs; tolerance = pretest Y $\pm 0.05Y$

P_b = Barometric pressure, in. Hg.

Θ = Time of calibration run, min.

15.0 VISIBLE EMISSION READINGS

STEVENSON AND ASSOCIATES

(813)-651-0878

Source/Process Information

Y NAME: Gulf Coast Recycling

SOURCE NAME: Charging

PERMIT NO: A029-173310

LOCATION/ADDRESS: 1901 N 66th St

CONTACT: George Townsend

PHONE NO: 626-6151

PROCESS/PRODUCTION RATE: Secondary Pb Smelter

CONTROL EQUIPMENT: Baghouse

OPERATING MODE: Continuous

FUEL TYPE/RATE:

MATERIAL TYPE/RATE:

PERMITTED RATE:

DESCRIBE EMISSION POINT: Baghouse Exit

HEIGHT ABOVE GROUND LEVEL: 60 FT

HEIGHT RELATIVE TO OBSERVER: 60 FT

Emissions Description

DESCRIBE EMISSIONS START: NONE END:

PLUME COLOR:

PLUME TYPE:

WATER DROPLETS PRESENT? YES ☐ NO ☒

IF YES, IS PLUME: ATTACHED ☐ DETACHED ☐

Meteorological Information

BACKGROUND START: Sky END: Sky

BACKGROUND COLOR START: Blue END: Blue

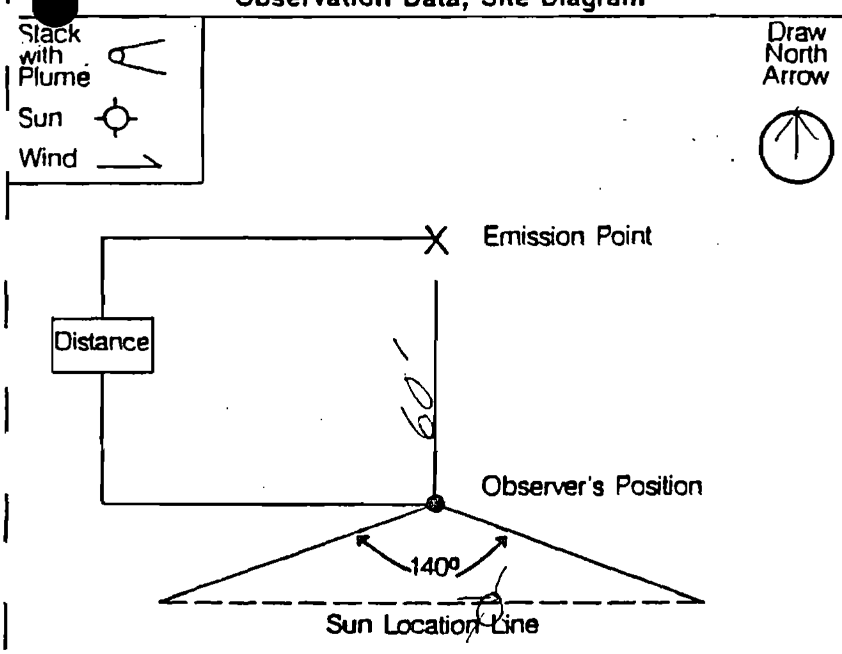
SKY CONDITIONS/% CLOUD COVER START: 30 END: 30

AMBIENT TEMP START: 75 END: 75

WIND SPEED START: 5-10 END: 5-10

WIND DIRECTION START: Variable END:

Observation Data, Site Diagram



Opacity Readings

OBSERVATION: 10/21/91 START TIME: 10:47 STOP TIME: 11:47

MIN	0	15	30	45	MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

Compliance Information

RANGE OF OPACITY READINGS MIN 0 MAX 0

ERAGE OF HIGHEST 24 CONSECUTIVE READINGS: 0%

M AVERAGE DATA

AVERAGING PERIOD ______ MINUTES ACTUAL AVERAGE ______ %

Process Rate Data

I CERTIFY THE ABOVE PROCESS RATE DATA IS TRUE TO THE BEST OF MY KNOWLEDGE.

Certification Data, Signatures

OBSERVERS NAME: Lynne Stevenson

OBSERVERS SIGNATURE: Lynne Stevenson

COMMENTS:

CERTIFIED BY: ETD

DATE: [illegible]

I HAVE RECEIVED A COPY OF THESE OBSERVATIONS SIGNATURE DATE

APIS NUMBER:

STEVENSON AND ASSOCIATES

(813)-651-0878

Source/Process Information

FACILITY NAME: Gulf Coast Recycling

SOURCE NAME: Refining — PERMIT NO: AC29-184883

LOCATION/ADDRESS: 1901 N. 66th St. Tampa

CONTACT: Grace Townsend — PHONE NO: 626-6151

PROCESS/PRODUCTION RATE: Secondary Pb Smelting

CONTROL EQUIPMENT: (Baghouse) Exit — OPERATING MODE: Continuous

FUEL TYPE/RATE: — MATERIAL TYPE/RATE: — PERMITTED RATE:

DESCRIBE EMISSION POINT: Baghouse Exit

HEIGHT ABOVE GROUND LEVEL: 20 FT — HEIGHT RELATIVE TO OBSERVER: 20 FT

Emissions Description

DESCRIBE EMISSIONS: START None — END None

PLUME COLOR: — PLUME TYPE:

WATER DROPLETS PRESENT? YES ☐ NO ☐ — IF YES, IS PLUME: ATTACHED ☐ DETACHED ☐

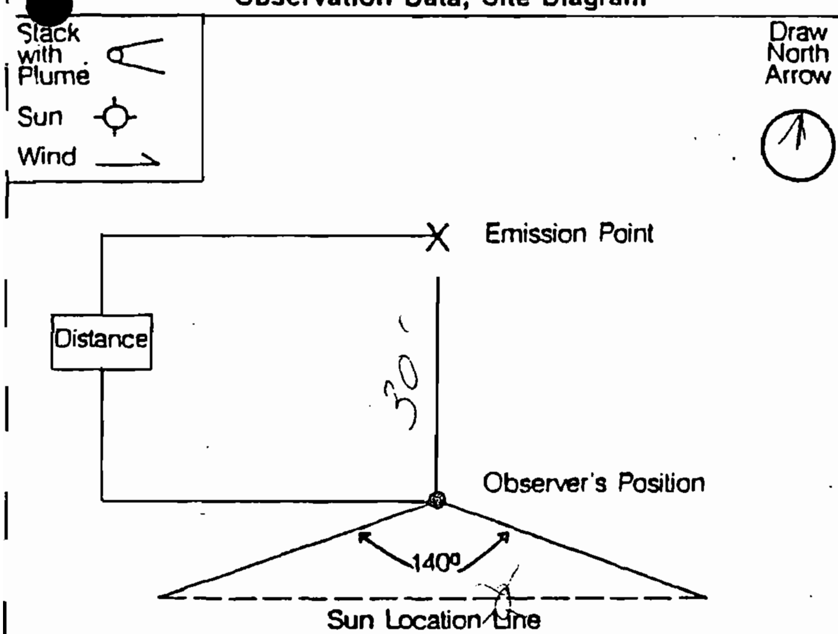
Meteorological Information

BACKGROUND: START Sky — END Sky — BACKGROUND COLOR: START Blue — END Blue

SKY CONDITIONS/% CLOUD COVER: START 20 — END 20 — AMBIENT TEMP: START 80's — END 80's

WIND SPEED: START 0-5 — END 0-5 — WIND DIRECTION: START Variable — END

Observation Data, Site Diagram



Opacity Readings

OBSERVATION DATE: 10-22-91 — START TIME: 10:41 — STOP TIME: 11:41

MIN \ SEC	0	15	30	45	MIN \ SEC	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

Compliance Information

RANGE OF OPACITY READINGS: MIN 0 — MAX 0

AVERAGE OF HIGHEST 24 CONSECUTIVE READINGS: 0%

LONG TERM AVERAGE DATA

AVERAGING PERIOD ______ MINUTES — ACTUAL AVERAGE ______ %

Process Rate Data

I CERTIFY THE ABOVE PROCESS RATE DATA IS TRUE TO THE BEST OF MY KNOWLEDGE.

____

Certification Data, Signatures

OBSERVERS NAME: Lynne Stevenson

OBSERVERS SIGNATURE: Lynne Stevenson

COMMENTS:

CERTIFIED BY: ETA — DATE: 9/91

I HAVE RECEIVED A COPY OF THESE OBSERVATIONS — SIGNATURE — DATE

APIS NUMBER:

STEVENSON AND ASSOCIATES

(813)-651-0878

Source/Process Information

FACILITY NAME: Gulf Coast Recyclin	
SOURCE NAME: Tapping	PERMIT NO: A029-173310
LOCATION/ADDRESS: 1901 N 66th St, Tampa	
CONTACT: George Townsend	PHONE NO: 626-6151
PROCESS/PRODUCTION RATE: Secondary Pb Smelting	
CONTROL EQUIPMENT: Baghouse	OPERATING MODE: Continuous
FUEL TYPE/RATE:	MATERIAL TYPE/RATE: / PERMITTED RATE:
DESCRIBE EMISSION POINT: Baghouse Exit	
HEIGHT ABOVE GROUND LEVEL: 20 FT	HEIGHT RELATIVE TO OBSERVER: 20 FT

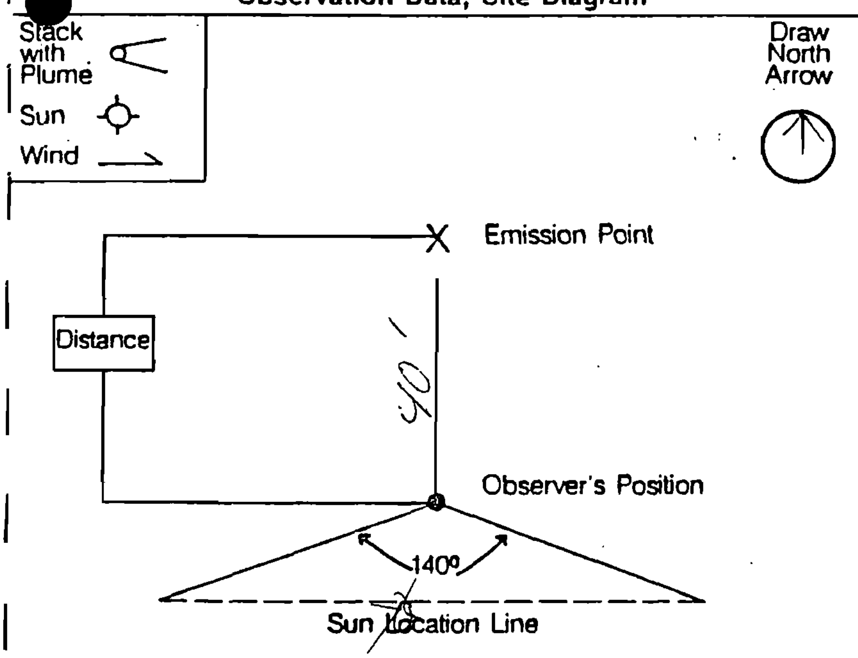
Emissions Description

DESCRIBE EMISSIONS START: NONE	END: None
PLUME COLOR:	PLUME TYPE:
WATER DROPLETS PRESENT? YES ☐ NO ☐	IF YES, IS PLUME: ATTACHED ☐ DETACHED ☐

Meteorological Information

BACKGROUND START: Sky END: Sky	BACKGROUND COLOR START: Blue END: Blue
SKY CONDITIONS/% CLOUD COVER START: 20 END: 20	AMBIENT TEMP START: 80's END: 80's
WIND SPEED START: Variable 0-5 END: 0-5	WIND DIRECTION START: Variable END: Same

Observation Data, Site Diagram



Opacity Readings

OBSERVATION DATE: 10-22-91 START TIME: 12:59 STOP TIME: 1:59

MIN	0	15	30	45	MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

Compliance Information

RANGE OF OPACITY READINGS MIN 0 MAX 0

AVERAGE OF HIGHEST 24 CONSECUTIVE READINGS 0%

SHORT TERM AVERAGE DATA

AVERAGING PERIOD ______ MINUTES ACTUAL AVERAGE ______ %

Process Rate Data

I CERTIFY THE ABOVE PROCESS RATE DATA IS TRUE TO THE BEST OF MY KNOWLEDGE.

____

Certification Data, Signatures

OBSERVERS NAME: Lynne Stevenson

OBSERVERS SIGNATURE: Lynne Stevenson

COMMENTS:

CERTIFIED BY: ETA DATE: 9/91

I HAVE RECEIVED A COPY OF THESE OBSERVATIONS SIGNATURE ______ DATE ______

APIS NUMBER:

STEVENSON AND ASSOCIATES

(813)-651-0878

Source/Process Information

FACILITY NAME: Gulf Coast Recyclin

SOURCE NAME: Reel Castin

PERMIT NO: A0297 130736

LOCATION/ADDRESS:

CONTACT:

PHONE NO: 626-6151

PROCESS/PRODUCTION RATE:

CONTROL EQUIPMENT:

OPERATING MODE:

FUEL TYPE/RATE:

MATERIAL TYPE/RATE:

PERMITTED RATE:

DESCRIBE EMISSION POINT:

HEIGHT ABOVE GROUND LEVEL: 35 FT

HEIGHT RELATIVE TO OBSERVER: 35 FT

Emissions Description

DESCRIBE EMISSIONS START: NONE END: NONE

PLUME COLOR:

PLUME TYPE:

WATER DROPLETS PRESENT? YES ☐ NO ☑

IF YES, IS PLUME: ATTACHED ☐ DETACHED ☐

Meteorological Information

BACKGROUND START: SKY END: SKY

BACKGROUND COLOR START: BLUE END: BLUE

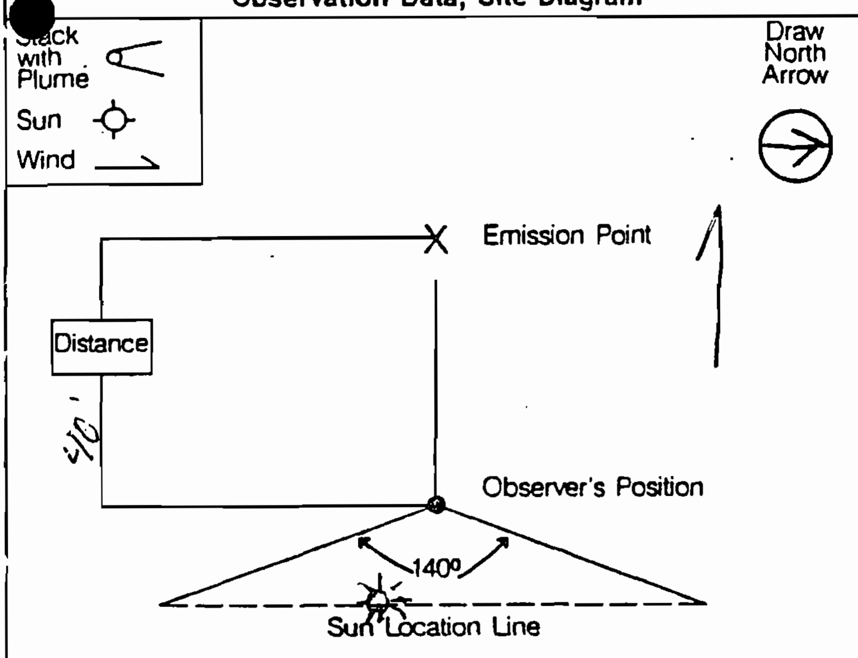
SKY CONDITIONS/% CLOUD COVER START: 50% END: 50%

AMBIENT TEMP START: 70'S END: 70'S

WIND SPEED START: 0-5 END: 0-5

WIND DIRECTION START: EAST END: EAST

Observation Data, Site Diagram



Opacity Readings

OBSERVATION: 10/23/91 START TIME: 0749 STOP TIME: 849

MIN	0	15	30	45	MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0	0	0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

Compliance Information

RANGE OF OPACITY READINGS MIN MAX

AVERAGE OF HIGHEST 24 CONSECUTIVE READINGS

SHORT TERM AVERAGE DATA

AVERAGING PERIOD ______ MINUTES ACTUAL AVERAGE ______ %

Process Rate Data

I CERTIFY THE ABOVE PROCESS RATE DATA IS TRUE TO THE BEST OF MY KNOWLEDGE.

Certification Data, Signatures

OBSERVERS NAME: RON OLIVER

OBSERVERS SIGNATURE: Ron Oliver

COMMENTS:

CERTIFIED BY: ETA DATE:

I HAVE RECEIVED A COPY OF THESE OBSERVATIONS. SIGNATURE DATE

APIS NUMBER:

STEVENSON AND ASSOCIATES

(813)-651-0878

Source/Process Information

FACILITY NAME: Gulf Coast Recycling

SOURCE NAME: Blast furnace — PERMIT NO: A029-173310

LOCATION/ADDRESS: 1901 N. 66th St.

CONTACT: George Townsend — PHONE NO: 626-6151

PROCESS/PRODUCTION RATE:

CONTROL EQUIPMENT: — OPERATING MODE:

FUEL TYPE/RATE: — MATERIAL TYPE/RATE: — PERMITTED RATE:

DESCRIBE EMISSION POINT: Stack opening

HEIGHT ABOVE GROUND LEVEL: 150 FT — HEIGHT RELATIVE TO OBSERVER: 150 FT

Emissions Description

DESCRIBE EMISSIONS: START None — END None

PLUME COLOR: None — PLUME TYPE: None

WATER DROPLETS PRESENT? YES ☐ NO ☑ — IF YES, IS PLUME: ATTACHED ☐ DETACHED ☐

Meteorological Information

BACKGROUND: START Sky — END Sky

BACKGROUND COLOR: START Blue — END Blue

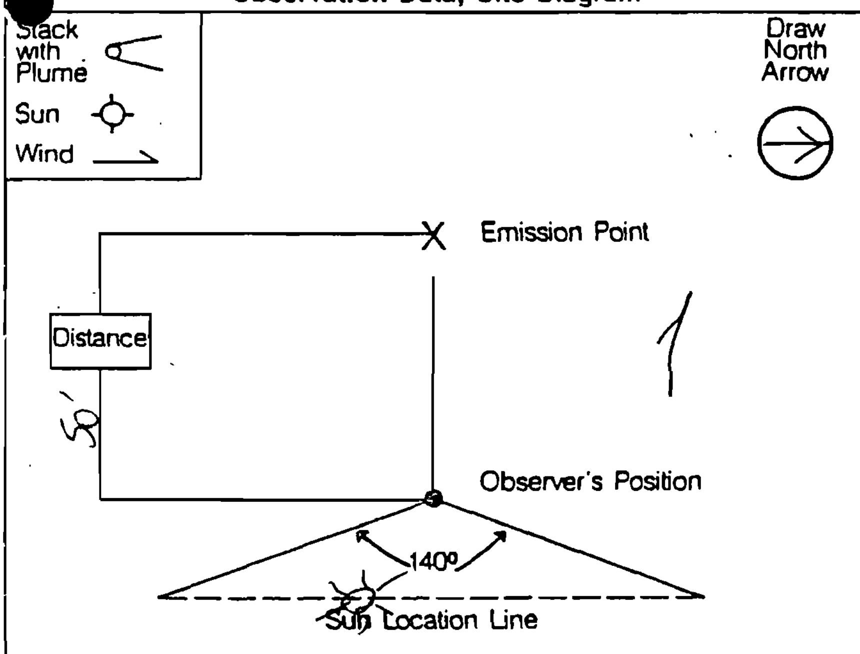
SKY CONDITIONS/% CLOUD COVER: START 10% — END 10%

AMBIENT TEMP: START 70's — END 70's

WIND SPEED: START 5-10 — END 5-10

WIND DIRECTION: START East — END East

Observation Data, Site Diagram



Opacity Readings

OBSERVATION: 10/24/91 — START TIME: 0800 — STOP TIME: 0900

MIN	0	15	30	45	MIN	0	15	30	45
1	0	0	0	0	31	0	0	0	0
2	0	0	0	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	0	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	0	0	0	0	36	0	0	0	0
7	0	0	0	0	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	0	0	39	0	0	0	0
10	0	0	0	0	40	0	0	0	0
11	0	0	0	0	41	0	0	0	0
12	0	0	0	0	42	0	0	0	0
13	0	0	0	0	43	0	0	0	0
14	0	0	0	0	44	0	0	0	0
15	0	0	0	0	45	0	0	0	0
16	0	0	0	0	46	0	0	0	0
17	0	0	0	0	47	0	0	0	0
18	0	0	0	0	48	0		0	0
19	0	0	0	0	49	0	0	0	0
20	0	0	0	0	50	0	0	0	0
21	0	0	0	0	51	0	0	0	0
22	0	0	0	0	52	0	0	0	0
23	0	0	0	0	53	0	0	0	0
24	0	0	0	0	54	0	0	0	0
25	0	0	0	0	55	0	0	0	0
26	0	0	0	0	56	0	0	0	0
27	0	0	0	0	57	0	0	0	0
28	0	0	0	0	58	0	0	0	0
29	0	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

Compliance Information

RANGE OF OPACITY READINGS: MIN 0 — MAX 0

AVERAGE OF HIGHEST 24 CONSECUTIVE READINGS: 0

SHORT TERM AVERAGE DATA: AVERAGING PERIOD ______ MINUTES — ACTUAL AVERAGE ______ %

Certification Data, Signatures

OBSERVERS NAME: Ron Oliver

OBSERVERS SIGNATURE: Ron Oliver

COMMENTS:

CERTIFIED BY: ETA — DATE: 8/28/91

I HAVE RECEIVED A COPY OF THESE OBSERVATIONS — SIGNATURE: — DATE:

APIS NUMBER:

Process Rate Data

I CERTIFY THE ABOVE PROCESS RATE DATA IS TRUE TO THE BEST OF MY KNOWLEDGE.

____

16.0 PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

LYNNE STEVENSON	President Technical Project Manager
RON OLIVER	Environmental Scientist Test Team Leader
TIM CAPELLE	Environmental Technician
LEE BARREIRO	Laboratory Manager Environmental Chemist

ATTACHMENT XXIV

Source Test Report
for
Oxides of Nitrogen, Volatile Organic Compounds
and Carbon Monoxide
Prepared By
Air Consulting & Engineering, Inc.

SOURCE TEST REPORT
for
OXIDES OF NITROGEN, VOLATILE ORGANIC COMPOUNDS AND CARBON MONOXIDE

BLAST FURNACE OUTLET
GULF COAST RECYCLING
TAMPA, FLORIDA

OCTOBER 21 & NOVEMBER 4, 1991

Prepared for:

STEVENSON & ASSOCIATES
333 FALKENBURG ROAD N, UNIT A-115
TAMPA, FLORIDA 33619

Prepared by:

AIR CONSULTING AND ENGINEERING, INC.
2106 N.W. 67TH PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606
(904) 335-1889

289-91-07

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3.0	SAMPLING POINT LOCATION	4
4.0	FIELD AND ANALYTICAL PROCEDURES	6
4.1	DETERMINATION OF NITROGEN OXIDES--EPA METHOD 7E	6
4.2	DETERMINATION OF CARBON MONOXIDE--EPA METHOD 10	6
4.3	DETERMINATION OF TOTAL GASEOUS ORGANIC CONCENTRATION USING A FLAME IONIZATION ANALYZER--EPA METHOD 25a	9
4.4	DETERMINATION OF OXYGEN IN EMISSIONS FROM STATIONARY SOURCES --EPA METHOD 3A	11
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APPENDIX B--EMISSION SUMMARY AND STRIP CHARTS

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3	*EPA METHOD 10, 3A SAMPLING SCHEMATIC*	8
4	*EPA METHOD 25A RATFISCH RS55 FIA*	10

ACE AIR CONSULTING & ENGINEERING, INC.
2106 N.W. 67th Place • Suite 4 • Gainesville, Florida • 32606
(904) 335-1889 FAX (904) 335-1891

REPORT CERTIFICATION

To the best of my knowledge, all applicable field and analytical procedures comply with Florida Department of Environmental Regulation requirements and all test data and plant operating data are true and correct.

Dagmar Neck

Dagmar Neck

11/22/91

Date

1.0 INTRODUCTION

On October 21, 1991, Air Consulting and Engineering, Inc. (ACE), conducted oxides of nitrogen (NO_x), Carbon Monoxide (CO), and Volatile Organic Compound (VOC) testing on the Blast Furnace Outlet at Gulf Coast Recycling in Tampa, Florida.

Testing was performed using United States Environmental Protection Agency (EPA) Method 7E for NO_x emission determination, EPA Method 10 for CO and EPA Method 25A for VOC. The CO, CO2, and O2 tests were repeated by orsat analysis (EPA Method 3) on November 4, 1991.

This work was done as a subcontract to Stevenson & Associates of Tampa, Florida.

2.0 SUMMARY AND DISCUSSION OF RESULTS

The emission results are summarized in Table 1.

Oxides of nitrogen and VOC emissions averaged 1.98 and 33.10 pounds per hour (lbs/Hr), respectively.

Carbon monoxide testing was repeated by orsat on November 4, 1991, since the CO analyzer results were off scale during the scheduled testing. CO emission averaged 8440 ppm or 683.32 lbs/Hr.

Flow calculations, emission summary with strip chart copies and orsat results are presented in Appendices A, B, and C, respectively.

Table 1 Emission Summary
Blast Furnace Outlet
Gulf Coast Recycling
Tampa, Florida
October 21, 1991 & November 4, 1991

Run Number	Flow Rate SCFMD	NOx Emissions ppm	NOx Emissions lbs/Hr	VOC Emissions as propane ppm	VOC Emissions as propane lbs/Hr	CO Emissions %	CO Emissions ppm	CO Emissions lbs/Hr
1	18676	17.5	2.34	303	38.77	--	---	-----
2	17974	14.3	1.84	237	29.18	--	---	-----
3	19062	12.8	1.75	240	31.34	--	---	-----
AVERAGE	18571	14.9	1.98	260	33.10	0.844	8440	683.32

lbs/Hr = ppm (2.595×10^{-9}) MW (SCFMD) 60

MW NO_x = 46

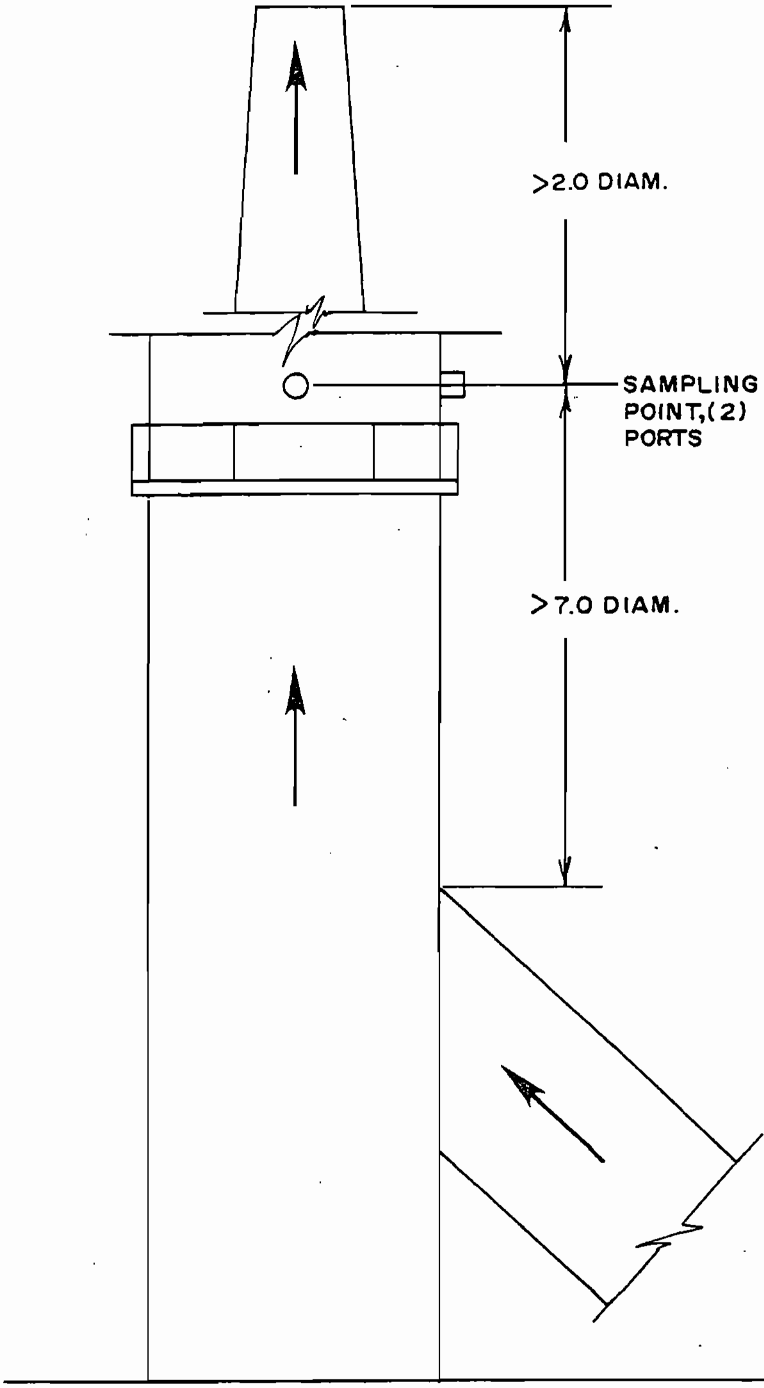
MW C_3H_8 = 44

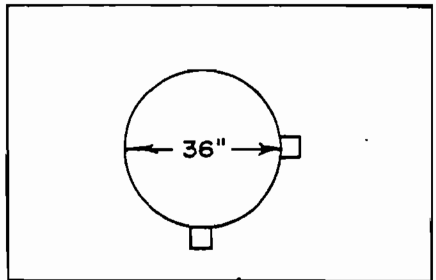
MW CO = 28

10^6 ppm = 100%

3.0 SAMPLING POINT LOCATION

Sample port locations and a stack schematic is provided in Figure 1.





TRAVERSE POINT NUMBER	INCHES INSIDE STACKWALL
1	1.58
2	5.26
3	10.66
4	25.34
5	30.74
6	34.42

NOTE: NOT TO SCALE

FIGURE 1.
SAMPLING POINT LOCATION
BLAST FURNACE EXHAUST
GULF COAST
TAMPA, FLORIDA

AIR CONSULTING and ENGINEERING

4.0 FIELD AND ANALYTICAL PROCEDURES

4.1 Determination of Nitrogen Oxides Emissions From Stationary Sources (Instrumental Analyzer Procedure)--EPA Method 7E

The sampling system is shown in Figure 2. A sample was drawn from the stack at a rate of approximately 2 SCFH. A stainless steel probe and filter assembly was followed by a three-way stainless steel valve. The sample was pumped through a non-heated 1/4" O.D. TEFLON sampling line and condensate trap housed in an ice bath. Calibration gases were introduced at the sampling interface (the three way valve) through another 1/4" O.D. TEFLON line that was not heated. The sample pump delivered gases to a manifold system where one stream was sent to a Thermo Electron Model 10 AR Chemiluminescent Analyzer, converted to nitric oxide, reacted with ozone, and a chemiluminescent response measured by a photomultiplier. A second stream was delivered to a Teledyne 320P O_2 analyzer. A third stream was dumped to the ambient air. All instrument responses were recorded on strip chart recorders. The sampling system yields NO_x and O_2 concentrations on a dry gas basis.

All calibration gases were certified NBS traceable.

4.2 Determination of Carbon Monoxide Emissions from Stationary Source --EPA Method 10

The sampling system is shown in Figure 3. A sample was drawn from the stack at a rate of approximately 2 SCFH. A stainless steel probe assembly was followed by a three-way stainless steel valve. The sample was pumped through an ice-cooled condensate trap followed by a 1/4" O.D. TEFLON sampling line.

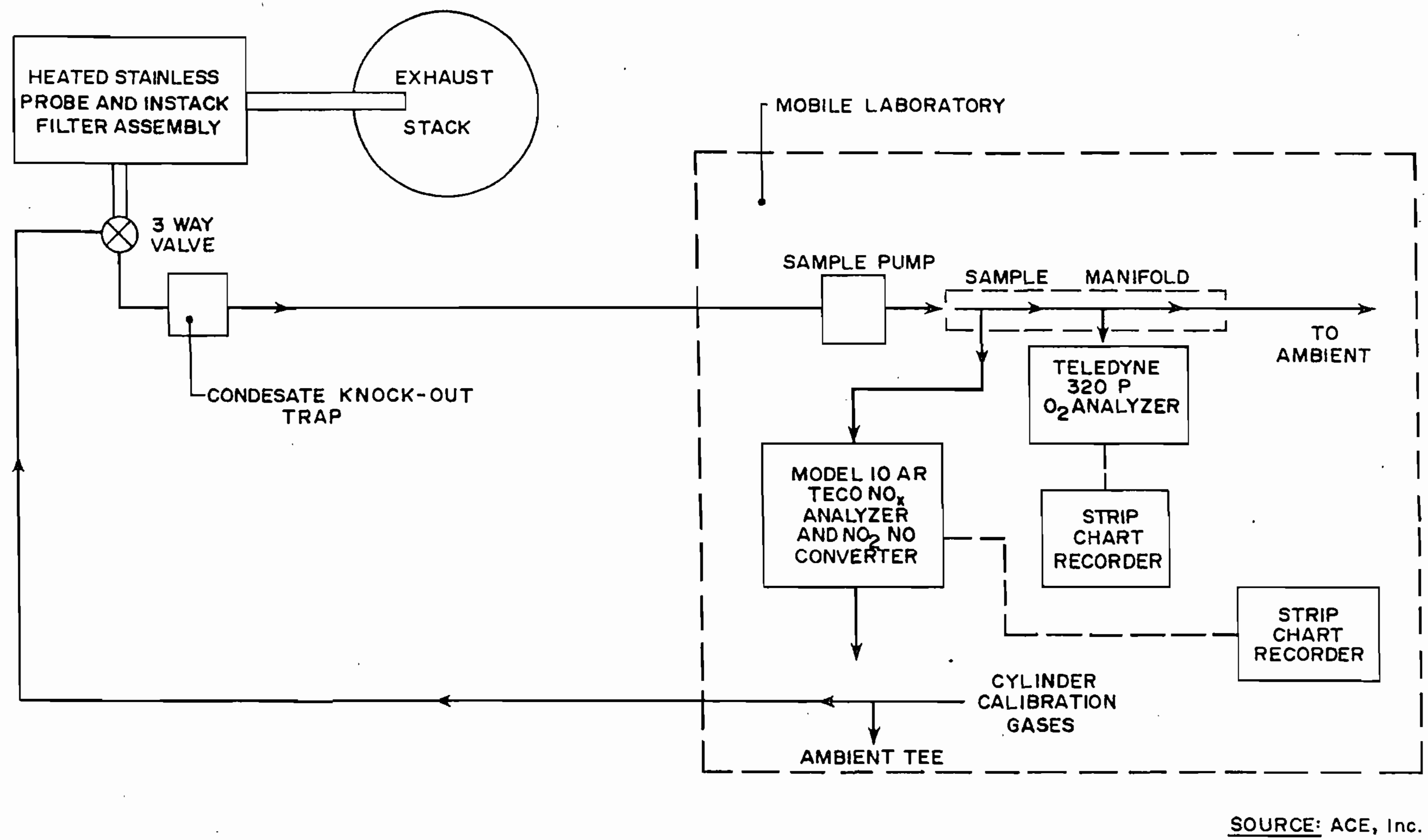


FIGURE 2
EPA METHOD 7E SAMPLING SCHEMATIC

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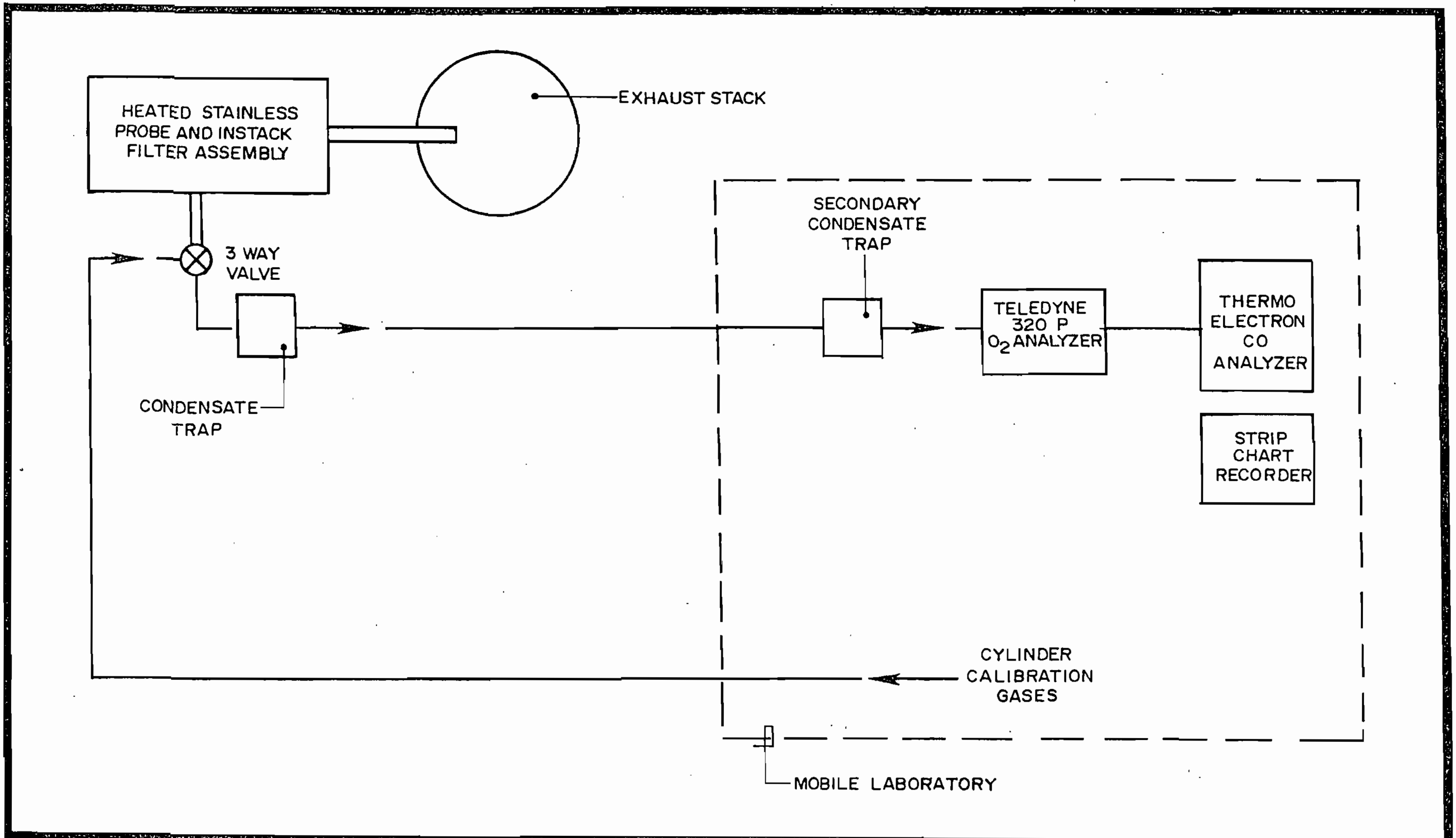

FIGURE 3
EPA METHOD 10, 3A SAMPLING SCHEMATIC

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Calibration gases were introduced at the sampling interface (the three way valve) through another 1/4" O.D. TEFLON line. The sample pump delivered gases to a manifold system where one flow is divided between a Teledyne 320P O_2 analyzer and a Thermo Electron Model 48 CO analyzer (NDIR with gas filter correlation). Excess flow is dumped to ambient. All instrument responses were recorded on strip chart recorders. The sampling system yields O_2, and CO, concentrations on a dry gas basis.

Calibration gases consisted of CO, and O_2 standards in nitrogen. All calibration gases were certified NBS traceable, Protocol 1.

4.3 Determination of Total Gaseous Organic Concentration Using a Flame Ionization Analyzer--EPA Method 25A

A Flame Ionization Analyzer (FIA) is used to monitor Volatile Organic Compounds (VOC) concentrations based on propane calibrations. Results are reported as ppm carbon. A Ratfisch Model RS55 analyzer with heated components was used for the testing.

A schematic of the sample system is provided in Figure 4. Sample gases are continuously removed through a probe and heat traced TEFLON sample line maintained at approximately 300°F. They pass through a non-reactive diaphragm sample pump and are then directed to the analyzer and analyzer bypass through a second heat traced line. Propane calibration gases are injected through a motorized three-way valve at the probe exit so that they "see" the same sample system as source gases. Three calibration gases plus a zero air gas are utilized for the sample range of interest (0 - 100 ppm, 0 - 1000 ppm, and 0 - 10000 ppm).

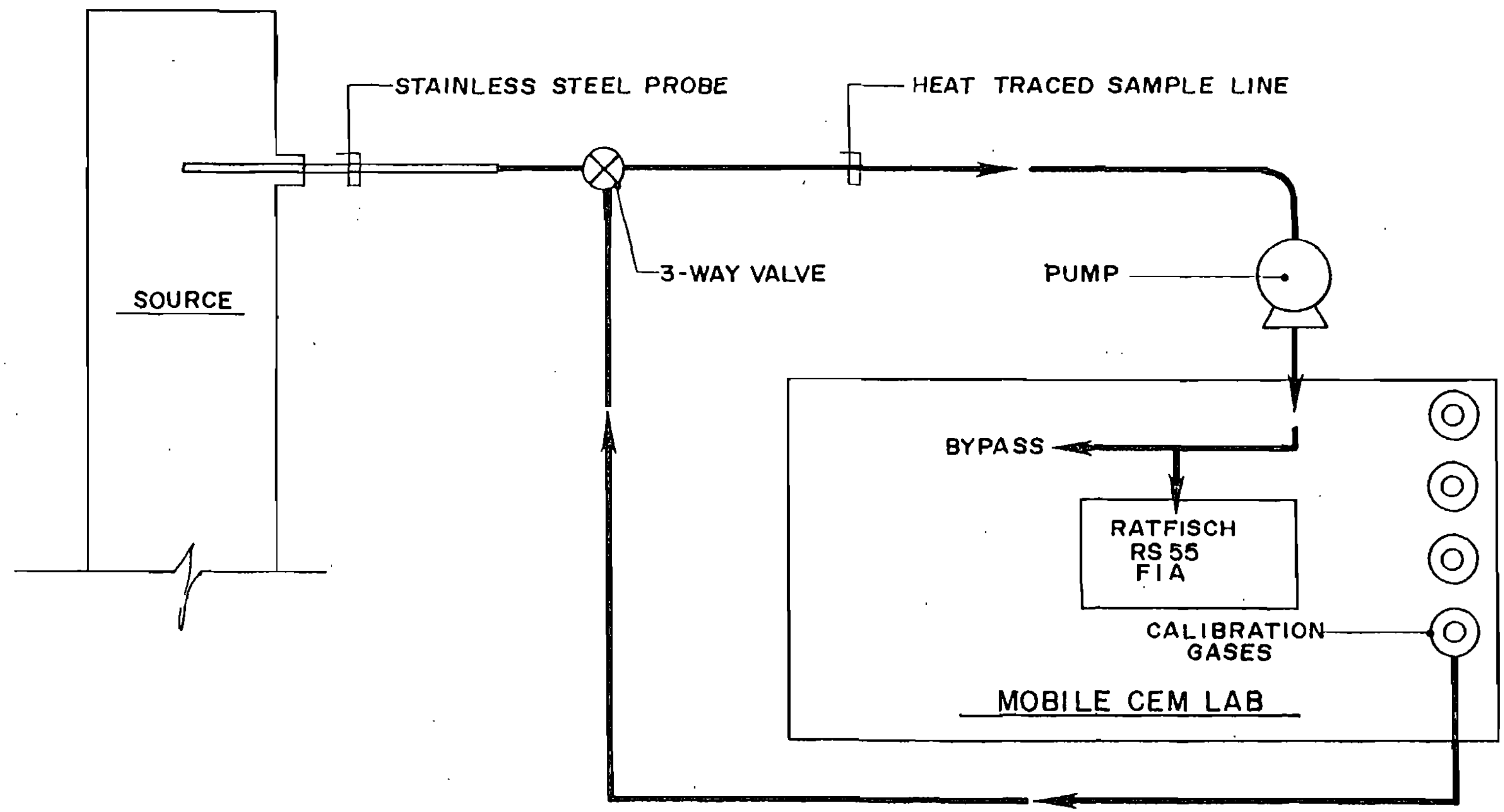


FIGURE 4
EPA-25A
RATFISCH RS55 FIA

AIR CONSULTING
and
ENGINEERING

Before testing a calibration error test is conducted after adjustment of zero and span gas values by injecting the remaining two gases into the sample system. These gases must demonstrate a linearity of within 5% of the calibration gas values.

After each test run (or hourly), a propane and zero gas are injected to demonstrate the drift rate. Both gases should demonstrate a drift of ≤3% of range.

Since all source gases are sampled on a wet basis, final concentrations must be divided by the source dry gas fraction to correct values to a dry gas basis. Total mass emissions as carbon are then determined by multiplying these concentrations by the source standard hourly flow rate.

4.4 Determination of Oxygen in Emissions From Stationary Sources (Instrumental Analyzer Procedure) --EPA METHOD 3A

A sample is continuously extracted from the effluent stream. A portion of the sample stream is conveyed to an instrumental analyzer, a Teledyne Model 320P O_2 analyzer, for determination of O_2 concentrations.

The sample gas is transported via tubing from a leak-free probe to the moisture removal system and then to the analyzer.

4.5 CO_2 and O_2 Sampling and Analysis--EPA Method 3

CO_2 and O_2 samples were collected by an integrated bag system. The orsat sampling system consisted of a stainless steel probe, sample line from probe to a condenser, a small vacuum pump with a rotometer, and a TEDLAR bag.

The orsat sampling procedure consists of the following leak-check and sampling techniques. Prior to sampling, the bag was leak-checked at 2 to 4 inches of water. The inlet to the condenser was plugged and a vacuum of 10 inches of Hg was pulled. The outlet of the pump was then plugged and the pump shut off. The vacuum held steady for at least 30 seconds. The sample line was then purged with stack gas and the bag was connected. Sampling was conducted at an appropriate constant rate at the same points and for the same length of time as the particulate sampling. At the conclusion of the run, the pump was shut off and the bag secured.

After leak checking the orsat gas analyzer, the average value for each gas was determined. The gas was measured until two values were obtained that fell within the specified variance of the gas tested.

Data were recorded on the field data sheet and the bag was evacuated for the next sample run.

APPENDIX A
FIELD DATA AND FLOW CALCULATIONS

FLOWRATE CALCULATIONS

PLANT	GULF COAST RECYCLING
STACK	BLAST FURNACE
DATE	10/21/91
RUN NO.	1

	BAROMETRIC PRESS.	30.23 IN.HG
	STACK PRESS.	30.50 IN.HG
	STACK AREA	7.069 SQ.FT
	AVG.STACK TEMP	158.00 F
	CP	0.84
	AVG. SQRT VELOCITY HEAD	0.870 IN. H2O
ORSAT:	PERCENT CO2	1.5
	PERCENT O2	18.3
	PERCENT N2	79.1
	FRACTION OF DRY AIR	0.954
	MOISTURE FRACTION	0.046
	MWGT. OF DRY STACK GAS	28.664
	MWGT. OF WET STACK GAS	28.178
	AVG.VELOCITY	52.97 FPS
	ACTUAL VOL. FLOW	22467.96 ACFM
	STD. VOL. FLOW	18675.74 SCFMD

FLOWRATE CALCULATIONS

PLANT	GULF COAST RECYCLING
STACK	BLAST FURNACE
DATE	10/21/91
RUN NO.	2

	BAROMETRIC PRESS.	30.23 IN.HG
	STACK PRESS.	30.50 IN.HG
	STACK AREA	7.069 SQ.FT
	AVG.STACK TEMP.	162.00 F
	CP	0.84
	AVG. SQRT VELOCITY HEAD	0.840 IN. H2O
ORSAT:	PERCENT CO2	1.5
	PERCENT O2	19.3
	PERCENT N2	79.1
	FRACTION OF DRY AIR	0.954
	MOISTURE FRACTION	0.046
	MWGT. OF DRY STACK GAS	28.664
	MWGT. OF WET STACK GAS	28.178
	AVG.VELOCITY	51.31 FPS
	ACTUAL VOL. FLOW	21763.30 ACFM
	STD. VOL. FLOW	17973.67 SCFMD

FLOWRATE CALCULATIONS

PLANT	GULF COAST RECYCLING
STACK	BLAST FURNACE
DATE	10/21/91
RUN NO.	3

	BAROMETRIC PRESS.	30.23 IN.HG
	STACK PRESS.	30.50 IN.HG
	STACK AREA	7.069 SQ.FT
	AVG.STACK TEMP	158.00 F
	CP	0.84
	AVG. SQRT VELOCITY HEAD	0.888 IN. H2O
ORSAT:	PERCENT CO2	1.5
	PERCENT O2	18.3
	PERCENT N2	79.1
	FRACTION OF DRY AIR	0.954
	MOISTURE FRACTION	0.046
	MWGT. OF DRY STACK GAS	28.664
	MWGT. OF WET STACK GAS	28.178
	AVG.VELOCITY	54.07 FPS
	ACTUAL VOL. FLOW	22932.82 ACFM
	STD. VOL. FLOW	19062.13 SCFMD

VELOCITY TRAVERSE

PLANT	GULF COAST RECYCLING		
DATE	10/21/91		
SOURCE	BLAST FURNACE		
BAROMETRIC PRESS.	30.230 IN.HG		
STACK PRESS.	30.500 IN.HG		
OPERATORS	NECK/HODGE		
TIME	1100	TIME	1235
RUN	1	RUN	2

TRAVERSE POINT NUMBER	VEL. HEAD in. H2O	SQR VEL. HEAD	STACK TEMP. F	TRAVERSE POINT NUMBER	VEL. HEAD in. H2O	SQR VEL. HEAD	STACK TEMP. F
1-1	0.640	0.800	158	1-1	0.700	0.837	164
1-2	0.820	0.906	158	1-2	0.820	0.906	164
1-3	0.880	0.938	159	1-3	0.940	0.970	164
1-4	0.790	0.889	159	1-4	0.830	0.911	164
1-5	0.630	0.794	158	1-5	0.830	0.911	165
1-6	0.640	0.800	158	1-6	0.750	0.866	164
2-1	0.630	0.794	158	2-1	0.590	0.768	153
2-2	0.760	0.872	158	2-2	0.790	0.889	161
2-3	0.860	0.927	159	2-3	0.870	0.933	162
2-4	0.900	0.949	159	2-4	0.840	0.917	162
2-5	0.830	0.911	159	2-5	0.780	0.883	161
2-6	0.740	0.860	158	2-6	0.680	0.825	160
		0.870	158			0.884	162

VELOCITY TRAVERSE

PLANT	GULF COAST RECYCLING
DATE	10/21/91
SOURCE	BLAST FURNACE
BAROMETRIC PRESS.	30.230 IN.HG
STACK PRESS.	30.300 IN.HG
OPERATORS	NECK/HODGE
TIME	1450
RUN	3

TRAVERSE POINT NUMBER	VEL. HEAD in. H2O	SQR VEL. HEAD	STACK TEMP. F
1-1	0.670	0.819	155
1-2	0.760	0.872	156
1-3	0.910	0.954	157
1-4	0.840	0.917	158
1-5	0.740	0.860	158
1-6	0.740	0.860	158
2-1	0.690	0.831	156
2-2	0.860	0.927	158
2-3	0.890	0.943	159
2-4	0.880	0.938	161
2-5	0.780	0.883	161
2-6	0.730	0.854	161
		0.888	158

PRELIMINARY VELOCITY TRAVERSE

ACE AIR CONSULTING & ENGINEERING, INC.
2106 N.W. 67th PLACE · Suites 9810
GAINESVILLE, FLORIDA · 32606
(904)335-1889

PLANT Gulf Coast
DATE 10-2-91
SOURCE Blast Furnace
STACK I.D. 36" STACK AREA 7.07
BAROMETRIC PRES., in. Hg 30.23
STATIC PRES. in. H_2O +3.7 STACK PRES. in. Hg. 30.50
PORT DIAM. NIPPLE LENGTH
PITOT TUBE NO. 48 TYPE S
OPERATORS Neck - Hodge

18.3 % O_2
1.5 % CO_2

SCHEMATIC OF TRAVERSE POINT LAYOUT

1100 Time | 1235 Time

TRAVERSE POINT NUMBER	VELOCITY HEAD (ΔP_s) in. H_2O	STACK TEMPERATURE (T_s, °F)	DISTANCE FROM INSIDE STACK WALL	TRAVERSE POINT NUMBER	VELOCITY HEAD (ΔP_s in. H_2O	STACK TEMPERATURE (T_s, °F)
1-1	.64	158			.70	164
2	.82	158			.82	164
3	.88	159			.94	164
4	.79	157			.83	164
5	.63	158			.83	165
6	.64	158			.75	164
2-1	.63	158			.59	153
2	.76	158			.79	161
3	.86	159			.87	162
4	.90	159			.84	162
5	.83	159			.78	161
6	.74	158			.68	160
	100°F Wet Bulb					
160 ^ 110	89° Dew Point				Wet bulb = 100°F	
	4.56% H_2O					
	$\overline{\sqrt{\Delta P}}$ = .870					
	3158 FPM					
	22322 ACFM					
	SCFMD = 18537					
AVERAGE				AVERAGE		

PRELIMINARY VELOCITY TRAVERSE

ACE AIR CONSULTING & ENGINEERING, INC.
2106 N.W. 67th PLACE · Suites 9810
GAINESVILLE, FLORIDA · 32606
(904)335-1889

PLANT Gulf Coast
DATE 10-21-91
SOURCE Blast Furnace
STACK I.D. ______ STACK AREA ______
BAROMETRIC PRES., in. Hg ______
STATIC PRES. in H_2O ______ STACK PRES. in. Hg. ______
PORT DIAM. ______ NIPPLE LENGTH ______
PITOT TUBE NO. ______ TYPE S
OPERATORS Neck - Hodge

1450 Time

SCHEMATIC OF TRAVERSE POINT LAYOUT

TRAVERSE POINT NUMBER	VELOCITY HEAD (ΔP_s) in. H_2O	STACK TEMPERATURE (T_s, °F)	DISTANCE FROM INSIDE STACK WALL	TRAVERSE POINT NUMBER	VELOCITY HEAD (ΔP_s In. H_2O)	STACK TEMPERATURE (T_s, °F)
1-1	.67	155				
2	.76	156				
3	.91	157				
4	.84	158				
5	.74	158				
6	.74	158				
2-1	.69	156				
2	.86	158				
3	.89	159				
4	.88	161				
5	.78	161				
6	.73	161				
Wet Bulb	≈98°F					
AVERAGE				AVERAGE		

APPENDIX B

EMISSION SUMMARY AND STRIP CHARTS

```
******** STOP ********
10:13:54 10/21/91
Run statistics N=00004
  Min    Avg    Max
3 001.32 001.33 001.34
4 87.605 87.695 87.725
5 0000.0 0000.0 0000.0

10:16:55 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** PROG ********
Ch4 Type(J,K,T,E,V,SKIP)
Program Volts mX+b
m Polarity = +
m Val? (0.00000-9.99999)
m = +5.00000
b Polarity = +
b Val? (000000-999999)
b = +002000
Units? (00-64,99 to list)
Units = PPM
Decimal Position? (0-5)
Decimal Position = 2
4 V PPM 5.00000 002000
10:16:50 10/21/91
Interval=00:00:05 60Hz
Stop in 0000:03:14:25
TagJust=+50.0F
3 U V 2.00000-000300
4 V PPM 5.00000 002000
5 U V 0.30000 000000
EXIT leaves program mode
OK skips to next field

Select channel? (1-6)
******** EXIT ********
******** RUN ********
10:16:53 10/21/91

******** STOP ********
10:17:27 10/21/91
Run statistics N=00005
  Min    Avg    Max
3 001.30 001.31 001.32
4 874.65 875.35 876.25
5 0000.0 0000.0 0000.1

10:17:29 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** PROG ********
Ch4 Type(J,K,T,E,V,SKIP)
Program Volts mX+b
m Polarity = +
m Val? (0.00000-9.99999)
m = +5.00000
b Positive? (Yes/No)
b Polarity = +
b Val? (000000-999999)
b = +000000
******** EXIT ********
```

```
03
2
4 856.40 856.57 856.85
5 0000.0 0000.1 0000.1

10:18:20 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
10:21:39 10/21/91

******** STOP ********
10:21:56 10/21/91
Run statistics N=00003
  Min    Avg    Max
3 001.30 001.31 001.32
4 316.15 316.28 316.40
5 0000.0 0000.2 0000.3

10:21:57 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
10:22:54 10/21/91

******** STOP ********
10:23:07 10/21/91
Run statistics N=00002
  Min    Avg    Max
3 001.30 001.31 001.32
4 293.75 293.78 293.80
5 0000.0 0000.2 0000.3

10:23:09 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** STOP ********
10:23:24 10/21/91
Run statistics N=00002
  Min    Avg    Max
3 001.30 001.31 001.32
4 293.75 293.78 293.80
5 0000.0 0000.2 0000.3

10:23:25 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** RUN ********
10:23:52 10/21/91

******** STOP ********
10:24:05 10/21/91
Run statistics N=00002
  Min    Avg    Max
3 001.30 001.30 001.30
4 297.95 298.10 298.25
5 0000.1 0000.1 0000.1

10:24:06 10/21/91
RUN sta
STOP sto
```

```
***
******** ***
10:25:48 10/21/91

******** STOP ********
10:25:03 10/21/91
Run statistics N=00003
  Min    Avg    Max
3 001.30 001.30 001.30
4 515.30 515.53 515.65
5 0000.2 0000.2 0000.3

10:26:04 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
10:28:50 10/21/91

******** STOP ********
10:29:09 10/21/91
Run statistics N=00003
  Min    Avg    Max
3 001.30 001.30 001.30
4 804.70 804.87 805.20
5 0000.1 0000.1 0000.2

10:29:10 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
10:31:01 10/21/91

******** STOP ********
10:31:51 10/21/91
Run statistics N=00010
  Min    Avg    Max
3 001.30 001.30 001.30
4 855.50 855.96 856.45
5 0000.0 0000.2 0000.4

10:31:52 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
10:33:0 10/21/91

******** STOP ********
10:33:26 10/21/91
Run statistics N=00004
  Min    Avg    Max
3 001.28 001.30 001.30
4 305.35 305.47 305.70
5 0000.5 0000.5 0000.6

10:35:27 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming
```

10:34:55 10/21/91

******** STOP ********
10:35:02 10/21/91
Run statistics N=00003
Min Avg Max
3 001.30 001.30 001.30
4 524.35 524.40 524.55
5 0000.2 0000.3 0000.4

10:35:10 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
10:36:54 10/21/91

******** STOP ********
10:37:11 10/21/91
Run statistics N=00003
Min Avg Max
3 000.14 000.15 000.16
4 -003.05-002.96-002.90
5 0155.7 0155.8 0155.9

10:37:12 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********

10:39:01 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** RUN ********
10:39:09 10/21/91

******** STOP ********
10:39:55 10/21/91
Run statistics N=00003
Min Avg Max
3 000.88 000.88 000.88
4 015.40 015.42 015.45
5 0000.4 0000.5 0000.5

10:39:56 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** STOP ********
10:40:03 10/21/91
Run statistics N=00003
Min Avg Max
3 000.88 000.88 000.88
4 015.40 015.42 015.45
5 0000.4 0000.5 0000.5

[illegible]

Min Max
3 000.73 000.73 000.73
4 010.75 010.75 010.75
5 0003.5 0003.5 0003.5

10:47:02 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
10:49:24 10/21/91

******** STOP ********
11:45:01 10/21/91
Run statistics N=00715
Min Avg Max
3 000.13 ****** ******
4 063.75 302.75 512.90
5 0012.3 0017.5 0023.1

11:45:03 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
11:51:39 10/21/91

******** STOP ********
11:51:59 10/21/91
Run statistics N=00004
Min Avg Max
3 001.24 001.25 001.26
4 029.00 029.41 030.25
5 0156.2 0156.5 0156.8

11:52:00 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
11:54:13 10/21/91

******** STOP ********
11:54:41 10/21/91
Run statistics N=00005
Min Avg Max
3 000.12 000.34 000.96
4 071.55 079.21 140.70
5 0001.5 0001.7 0001.9

11:54:42 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

Run statistics N=00005
Min Avg Max
3 001.24 001.24 001.24
4 015.50 015.59 015.65
5 0001.5 0001.6 0001.9

11:58:02 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
12:00:04 10/21/91

******** STOP ********
12:00:30 10/21/91
Run statistics N=00005
Min Avg Max
3 001.24 002.41 005.22
4 016.00 016.21 016.70
5 0001.2 0001.4 0001.5

12:00:32 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
12:25:58 10/21/91

******** STOP ********
12:51:15 10/21/91
Run statistics N=00705
Min Avg Max
3 000.08 ****** ******
4 073.75 207.10 356.85
5 0011.4 0014.0 0021.5

12:51:16 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming
******** RUN ********
12:51:29 10/21/91

******** STOP ********
13:05:49 10/21/91
Run statistics N=00172
Min Avg Max
3 011.96 039.71 105.18
4 126.52 193.39 243.45
5 0010.0 0011.3 0014.7

******** OFF ********

Run statistics N=[illegible]
Min Avg Max
3 ******* ******* *******
4 [illegible]
5 [illegible]

13:[illegible] 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
13:[illegible] 10/21/91

******** STOP ********
13:25:55 10/21/91
Run statistics N=00224
Min Avg Max
3 000.88 024.55 097.30
4 000.30 277.50 339.87
5 0006.0 0010.1 0012.

13:25:56 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
13:27:09 10/21/91

******** STOP ********
13:27:55 10/21/91
Run statistics N=0000[illegible]
Min Avg Max
3 002.14 002.81 003.14
4 04[illegible].90 045.02 046.20
5 0146.0 0145.2 0145.[illegible]

13:27:56 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
13:30:29 10/21/91

******** STOP ********
13:30:46 10/21/91
Run statistics N=0000[illegible]
Min Avg Max
3 001.74 001.74 001.74
4 044.20 044.35 044.35
5 0001.0 0001.1 0001.1

13:30:47 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

Run statistics N=00005
Min Avg Max
3 001.22 001.22 001.22
4 013.80 018.89 019.25
5 0005.2 0005.6 0005.7

13:33:44 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
13:36:19 10/21/91

******** STOP ********
13:36:40 10/21/91
Run statistics N=00004
Min Avg Max
3 001.22 001.22 001.22
4 317.60 317.64 317.65
5 0001.8 0002.0 0002.1

13:36:41 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
14:05:21 10/21/91

******** STOP ********
15:05:43 10/21/91
Run statistics N=00724
Min Avg Max
3 002.10 ****** ******
4 009.30 179.86 359.70
5 0010.4 0012.8 0022.6

15:05:44 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
15:11:05 10/21/91

******** STOP ********
15:11:22 10/21/91
Run statistics N=00003
Min Avg Max
3 004.22 004.30 004.34
4 017.60 017.70 017.80
5 0002.4 0002.6 0002.8

15:11:22 10/21/91
RUN starts logging
STOP stops logging

******** RUN ********
15:13:31 10/21/91

******** STOP ********
15:13:44 10/21/91
Run statistics N=00005
Min Avg Max
3 008.95 010.38 011.80
4 015.35 015.67 016.00
5 0157.4 0158.1 0158.9

15:13:46 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
15:15:34 10/21/91

******** STOP ********
15:15:51 10/21/91
Run statistics N=00007
Min Avg Max
3 007.88 007.71 008.96
4 316.70 316.80 316.90
5 0001.4 0001.5 0001.6

15:15:53 10/21/91
RUN starts logging
STOP stops logging
PROG starts programming

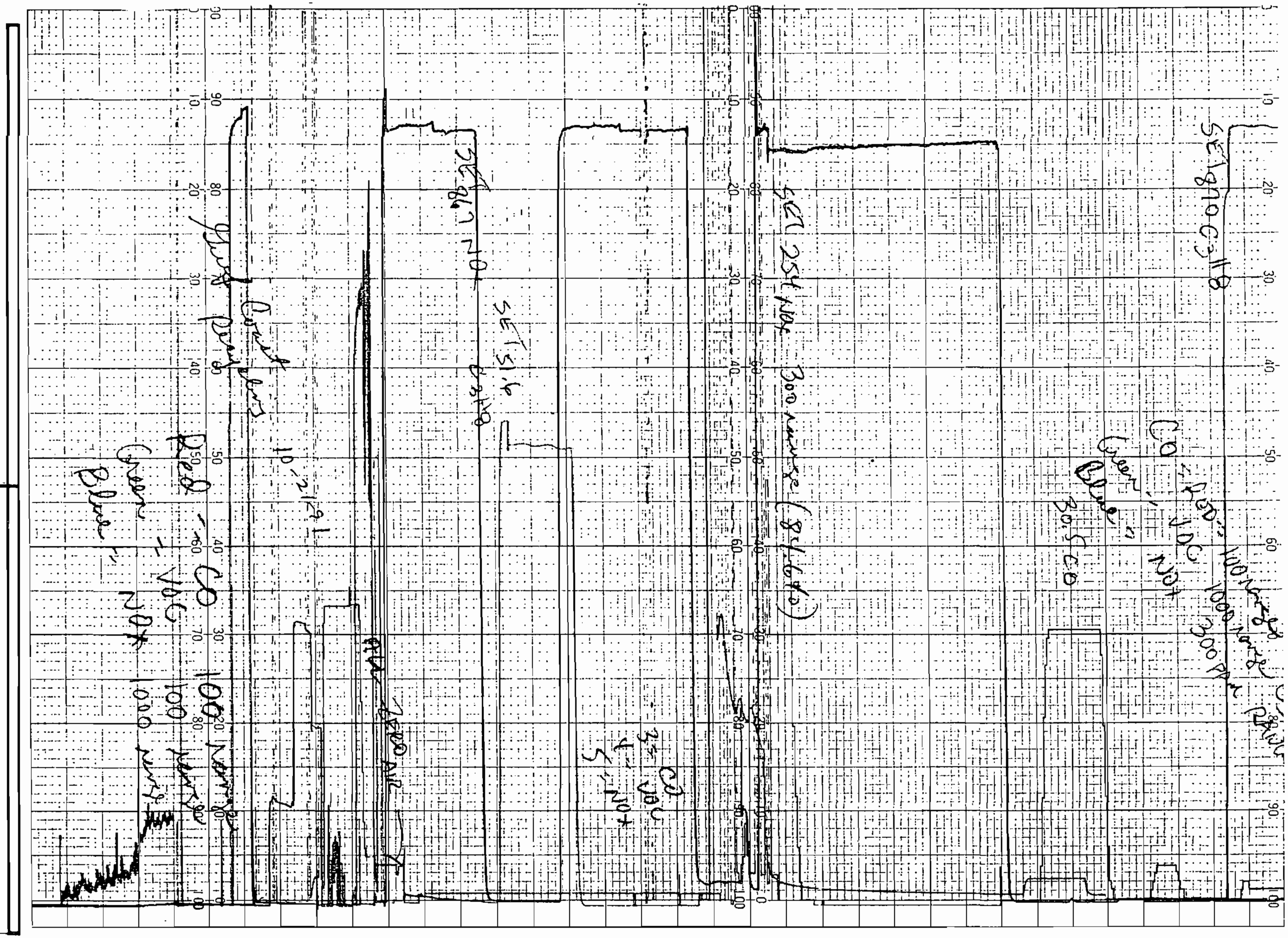
******** OFF ********

******** ON ********
******** RUN ********
15:18:16 10/21/91

******** STOP ********
15:18:45 10/21/91
Run statistics N=00005
Min Avg Max
3 030.76 030.77 030.78
4 031.25 031.29 031.40
5 0001.2 0001.3 0001.5

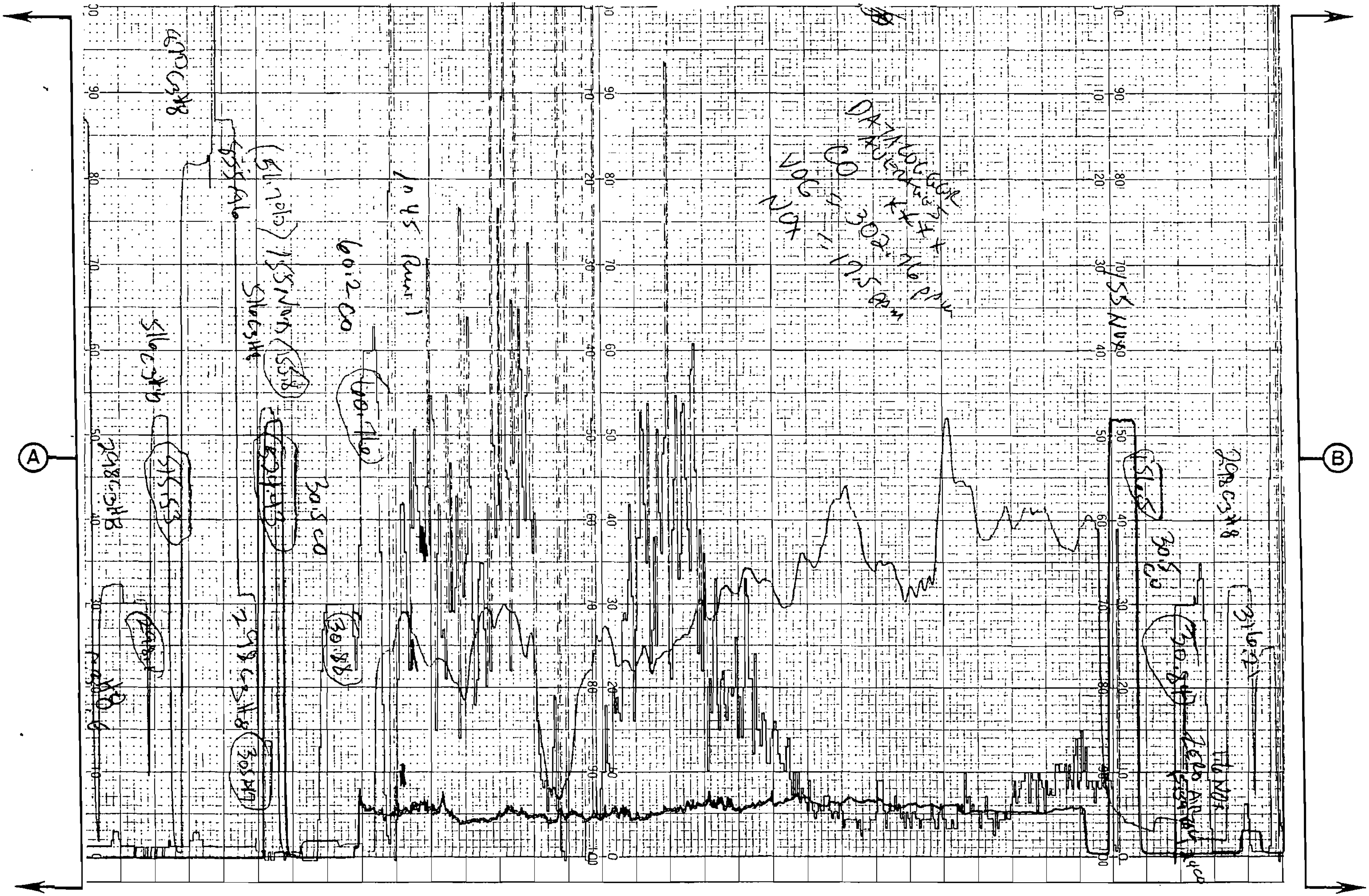
15:22:44 10/21/91

START

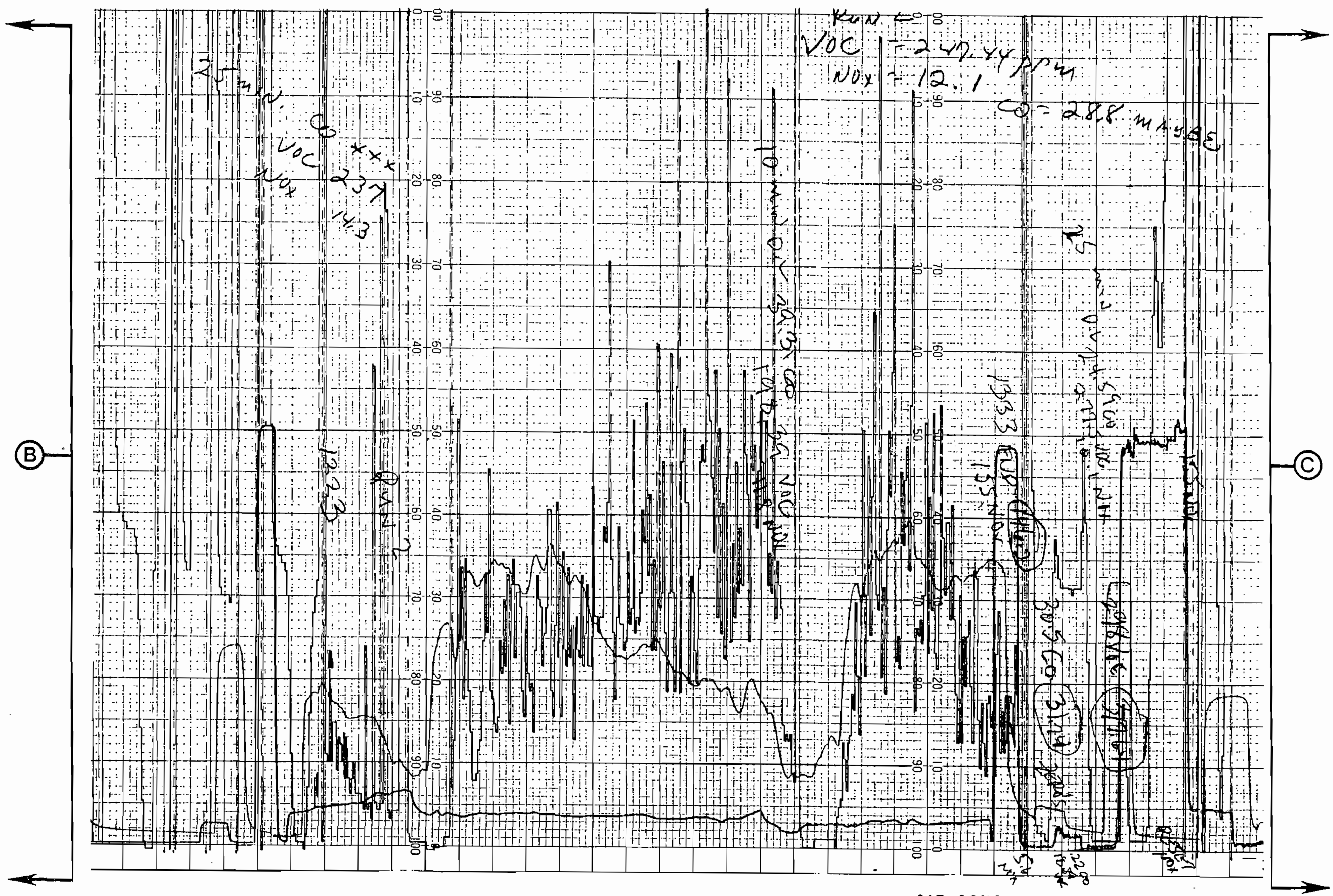


(A)

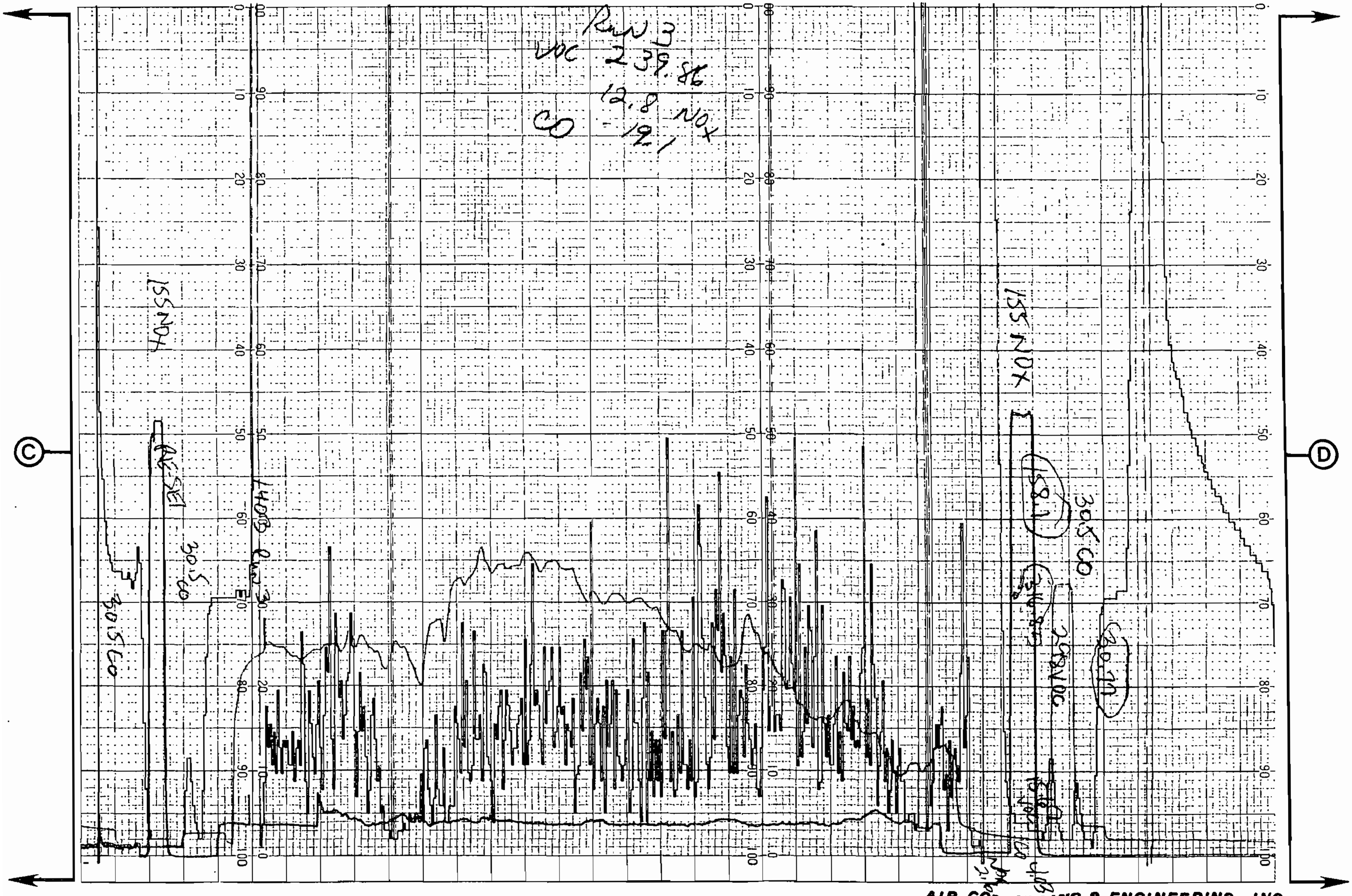
AIR CONSULTING & ENGINEERING, INC.



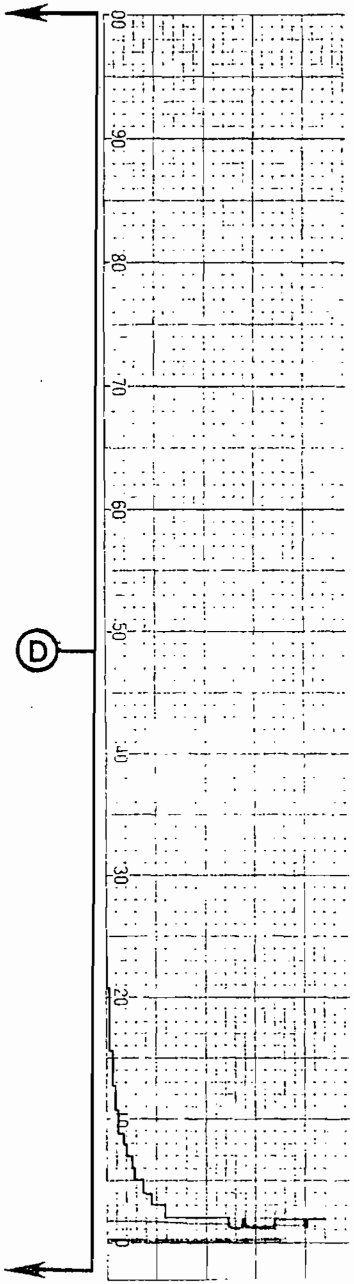
AIR CONSULTING & ENGINEERING, INC.



AIR CONSULTING & ENGINEERING, INC.



Run 3
VOC 239.86
12.8 NOx
CO 19.1
155 NOX
RESET
30.5 CO
30.5 CO
140.9 Run 3
155 NOX
158.1
30.5 CO
34.8
239 VOC
30.17



end

AIR CONSULTING & ENGINEERING, INC.

APPENDIX C
ORSAT ANALYSIS

11-4-

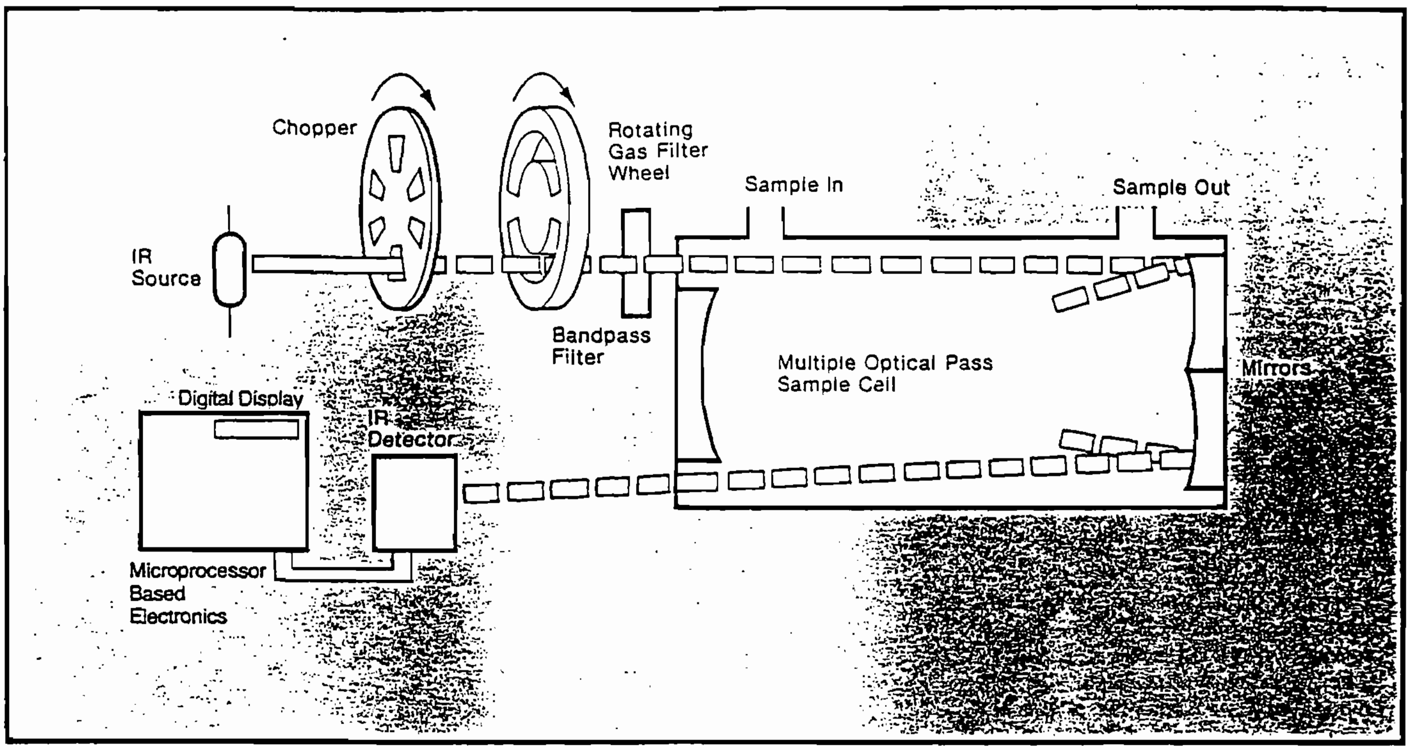
GULF COAST RECYCLING
TAMPA FL.

TIME	% CO_2	% O_2	% CO
1400	3.4	14.4	2.2
1415	3.2	17.5	—
1430	2.8	17.6	0.8
1445	2.6	20.4	—
1500	2.6	17.6	1.0
1515	3.0	17.4	1.0
1530	3.0	17.4	1.0
1545	2.0	18.2	0.6
1600	3.8	17.2	1.0

NOTE: STACK UNDER POSITIVE PRESSURE

APPENDIX D

QUALITY ASSURANCE



Principle of Operation

The basic components of a Gas Correlation System are illustrated in the above diagram. Radiation from an infrared source is chopped and then passed through a gas filter which alternates between CO and N_2 due to Rotation of the filter wheel. The radiation then passes through a narrow bandpass filter and a multiple optical pass sample cell where absorption by the sample gas occurs. The IR radiation exits the sample cell and falls on a solid state IR detector.

The CO gas filter acts to produce a reference beam which cannot be further affected by CO in the sample chamber. The N_2 side of the filter wheel is transparent to IR radiation and therefore produces a measure beam which *can* be absorbed by CO. The chopped detector signal is modulated by the alternation between the two gas filters with an amplitude proportional to the concentration of CO in the sample chamber. Other gases do not cause modulation of the detector signal since they absorb the reference and measure beams equally. Thus, the Gas Filter Correlation System responds solely to CO.

Options

48-001 — Particulate Filter

48-002 — Rack Mounts

48-003 — Remote activation of zero and span solenoids.

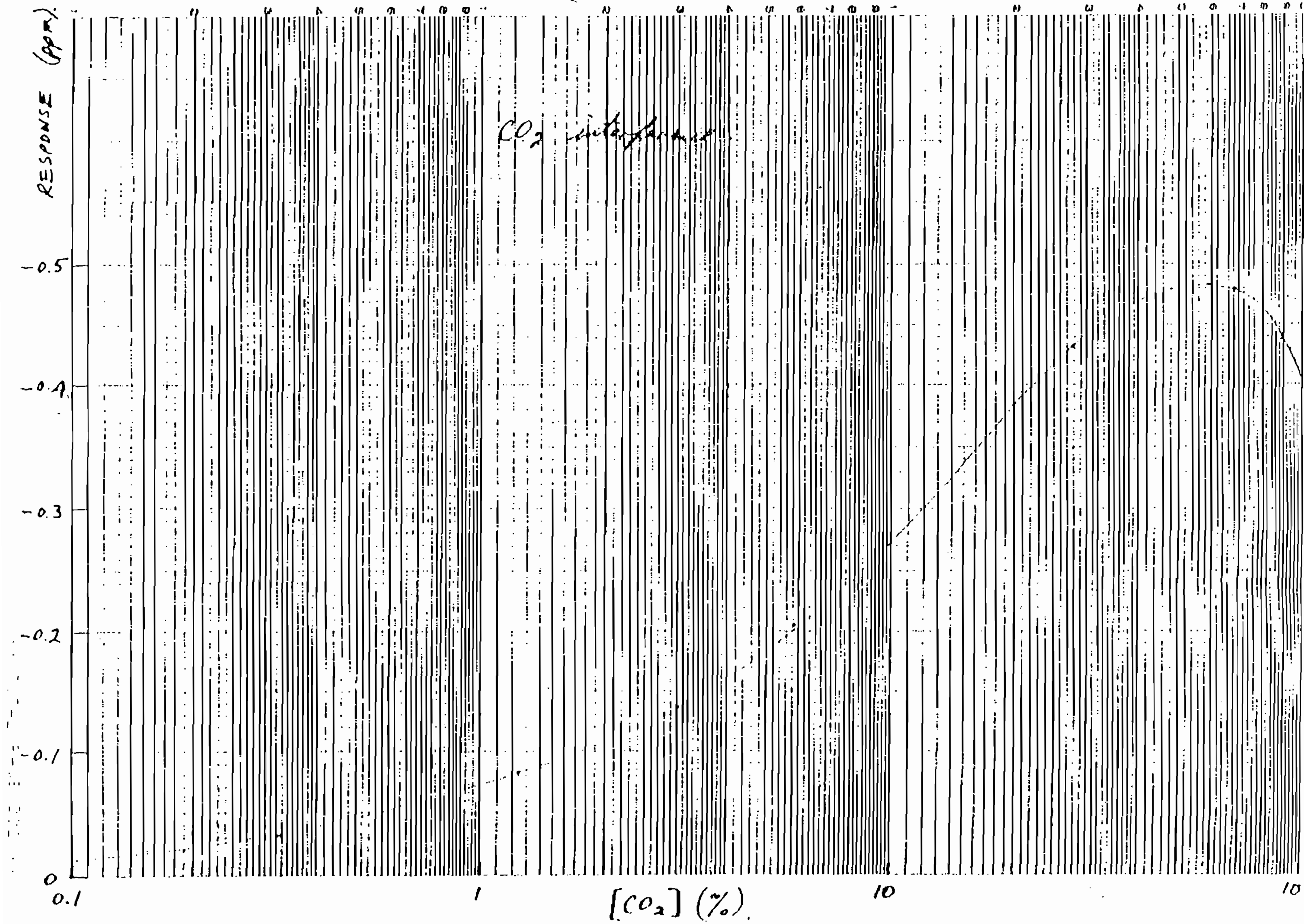
Thermo Electron
CORPORATION

Instruments Division

108 South Street
Hopkinton, Massachusetts 01748
Telephone (617) 435-5321
Telex 948325

Printed in U.S.A. — 1/83 5M

MODEL A8 (Baseline unit). 4/29/87.



SPECIFICATION
FOR
TELEDYNE ANALYTICAL INSTRUMENTS
MODEL 320P-4
PORTABLE OXYGEN ANALYZER
(WITH BUILT-IN PUMP)

Ranges:	0–5, 0–10, 0–25% O_2
Sensitivity:	0–5% of Full Scale
Accuracy:	±1% of full scale at constant temperature; ±5% of reading or ±1% of full scale, whichever is greater, throughout the operating temperature range.
Operating Temperature:	30–125° F.
Response Time:	Class B-1, 90% in less than 5 seconds.
Signal Output:	Internal, high resolution meter External, 0–100 mv DC full Scale
Micro-Fuel Cell:	Class B-1, Life is dependent upon duty cycle (e.g. 2.5 years, assuming 10% duty cycle in air). continuous duty in air 6 months.
Power Requirements:	2 NiCad rechargeable batteries. Batteries fully charged provide 1 month's continuous operation. Charging time overnight (14 hours). Charger built-in requires 115VAC, 50-60 Hz, power.

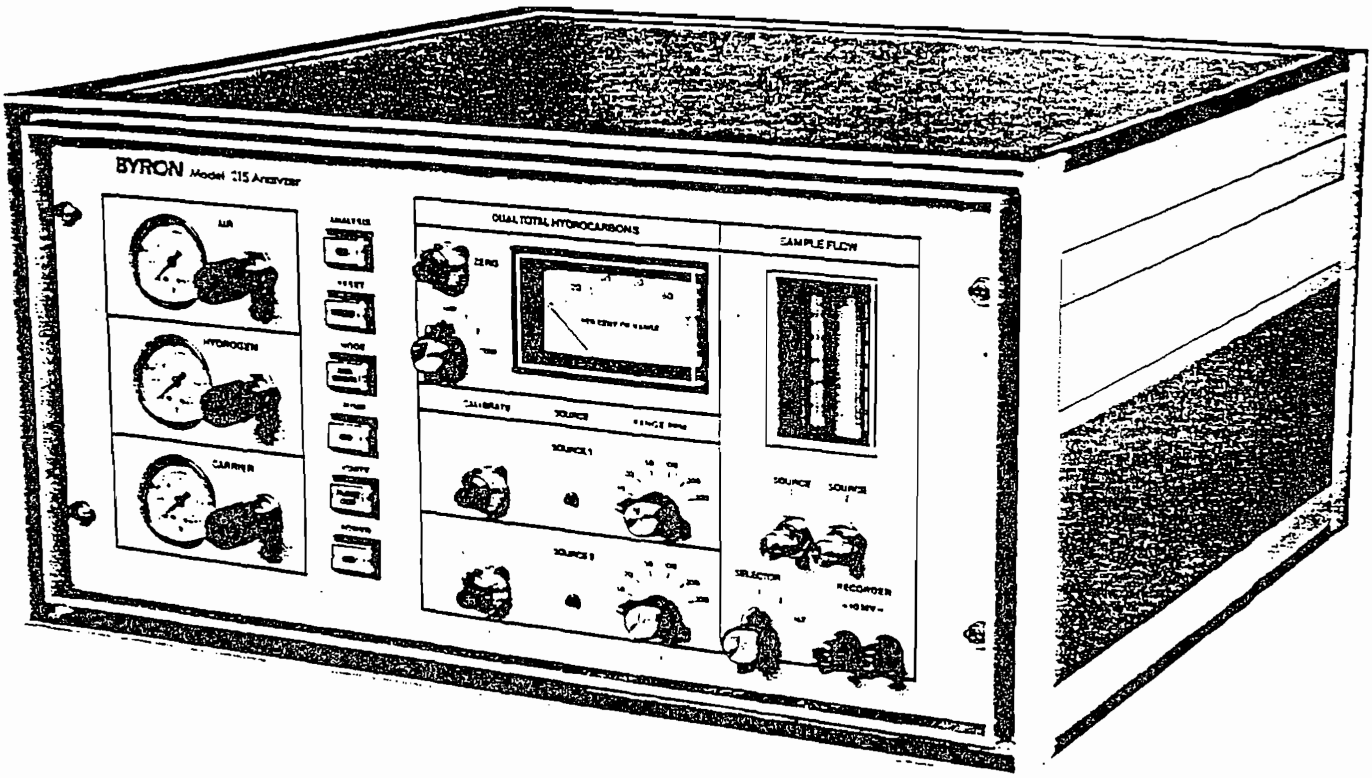
PUMP SPECIFICATION

Type:	Diaphragm
Duty:	Designed for Intermittant use.
Flow Rate:	3 to 4 scfh (about 1500 - 2000 cc/min) 5 VDC supplied by Amplifier batteries. (30 - 40 hrs. per charge)
Max. Vacuum:	60" water column

NOTE: TELEDYNE DOES NOT PUBLISH INTERFERENCE DATA BUT ACCORDING TO MR. JEFF BURKE OF CORPORATE ENGINEERING, THE B-1 FUEL CELL HAS NO INTERFERENCE, SO_2, NO_x, CO_2, AND CO EFFECT ONLY CELL LIFE, NOT ACCURACY.

Byron Model 215

DUAL TOTAL HYDROCARBON ANALYZER



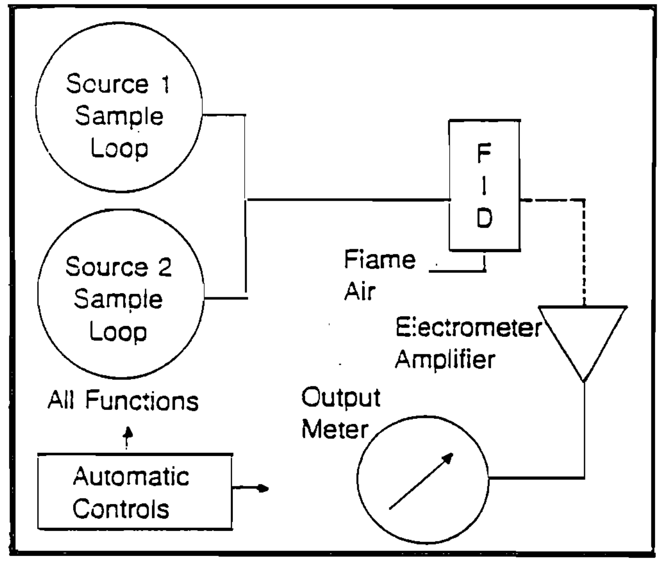
Byron Model 215 is two complete total hydrocarbon analyzers built into a single cabinet. Whenever two separate sources need to be monitored for hydrocarbon levels, Model 215 Dual Total Hydrocarbon Analyzer solves the problem. While the analyzer was designed for accuracy, it is in fact a very convenient analyzer to use. All pressure regulators, sampling, calibrating and operating conrols are located on the front panel. The function of the unit, from sampling to analysis, is fully automatic. An internal vacuum pump draws sample from the two sources. The operator can select either source exclusively or both sources alternately for analysis. The total hydrocarbon level is detected in a single hydrogen flame ionization detector. By using the same detector, the sources can be compared accurately, eliminating errors caused by individual FID characteristics. Peak heights for both sources are presented on the front panel output meter and recorder terminals. Each peak is electronically integrated to increase accuracy of the measurement. This integrated value is stored in memory and is updated as each peak is completed. The integrated value of the total hydrocarbon measurement for each source can be read on the front panel output meter and recorder terminals by selector switch. Both peak height and peak area data are available by rear panel connector.

Separate calibration, controls, range selectors, flowmeters and valves for each source allow two sources with varying characteristics to be measured accurately. Standard ranges are from 0-10 ppm full scale up to 0-500 ppm with optional X1 and X100 multipliers. Sample flow rates up to more than 1 LPM usually can be attained, depending upon the distance and impedance of the sample flow line.

APPLICATIONS:

1. Monitoring inlet and outlet on carbon bed absorbers and incinerators for efficiency calculations
2. Measuring one carbon bed absorber for breakthrough while measuring a second during steam cleaning
3. Analyzing two related sources for cause and effect
4. Analyzing two nearby but unrelated sources
5. Monitoring a single process at two different points for time changes
6. Meeting the requirements of Method 25A for certain applications of measuring volatile organics
7. Rapid measurement of a single ambient or stack source

MODEL 215 BLOCK DIAGRAM



SPECIFICATIONS:

MEASUREMENTS:
Source 1 total hydrocarbons, Source 2 total hydrocarbons

DETECTOR:
Hydrogen flame ionization

RANGES:
0-10, 0-20, 0-50, 0-100, 0-200, 0-500 ppm (standard); other ranges available

RANGE MULTIPLIERS:
X1, X100 (optional)

ANALYSIS TIME:
Either source exclusively, 1 minute; both sources alternately, 2 minutes

ACCURACY:
1% full scale all ranges when calibrated in accordance with operating manual

LINEARITY:
1% full scale all ranges

REPRODUCIBILITY:
1/2 of 1% full scale

RANDOM NOISE:
Less than 1/2 of 1% most sensitive range

ZERO DRIFT:
None in bargraph mode; zero is automatically adjusted before each peak

SPAN DRIFT:
Less than 1% in a 24 hour period on any range

CONTROLS:
All normal sampling, calibrating and operating controls are located on the front panel

AMBIENT OPERATING TEMPERATURE:
5°-40° C

OUTPUT:
0-10 mv front panel recorder terminals;
0-1 VDC rear panel connector (0-5VDC, 0-20ma and 4-20ma, optional)

OPERATING GASES REQUIRED:
Zero air, 400 cc/min; UHP Hydrogen, 40 cc/min

EXTERNAL GAS CONNECTIONS:
1/8" tube, Swagelok (stainless, optional)

HYDROGEN CUT-OFF:
Automatic upon flame-out or extended loss of power

CABINET DIMENSIONS:
20" wide X 10½" high X 18½" deep; 8¾" panel fits standard 19" rack. Analyzer is available with rack mounting slides without cabinet (optional)

WEIGHT INCLUDING CABINET:
60 pounds

POWER REQUIREMENTS:
105/125 VAC, 60 Hz, 200 W max., plus 0.8 amp pump motor; 210/250 VAC, 50/60 Hz (optional)

SAMPLING VACUUM:
Up to 22" HG depending upon flowrate

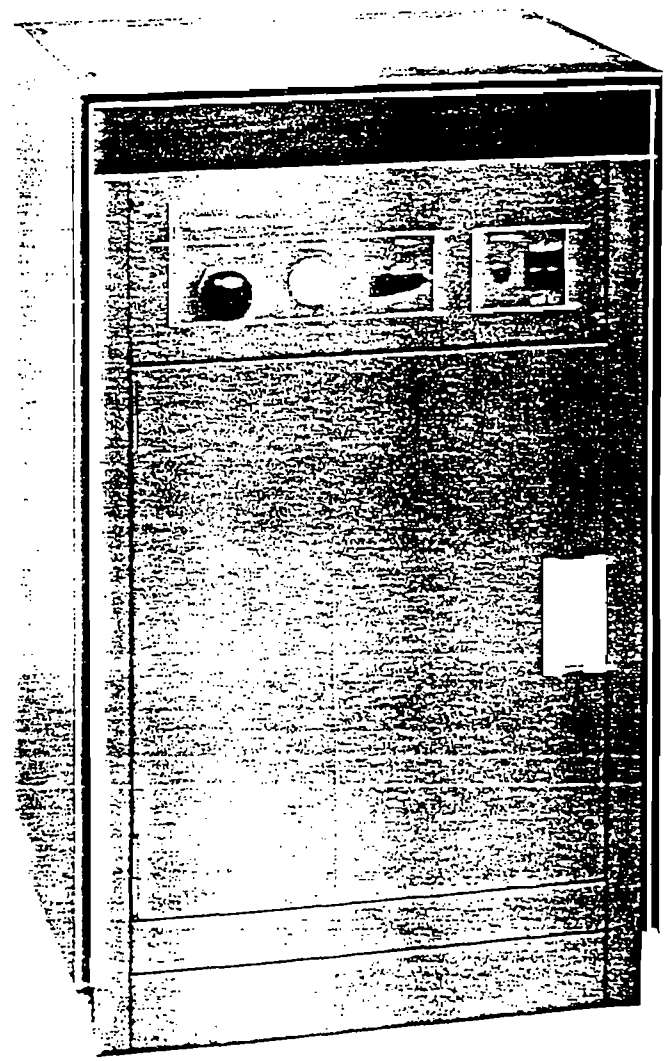
SAMPLING FLOW METERS:
0-1 LPM (other ranges optional)

WARRANTY:
Workmanship and parts are guaranteed for a period of one year from date of shipment

BYRON INSTRUMENTS

520 S. Harrington Street, Raleigh, NC 27601, 919-832-7501

Byron Model 25 Ultra Pure Air Supply



The Byron Model 25 Ultra Pure Air Supply is a completely self-contained source of ultra pure air at standard flowrates of up to 3 liters per minute. An internal air compressor capable of producing up to 0.5 scfm at 80 psig compresses ambient air. The compressed air is demoisturized and then flows into a prescrubber. Organics, moisture, and other contaminants are partially removed. Prescrubbers alternate so that one is in use and the other is being cleaned every 30 minutes. The air then passes through a catalytic oxidizer where all hydrocarbons are oxidized into carbon dioxide, water, and other by-products. From the oxidizer, the air flows into one of two scrubbing columns where the remaining carbon dioxide, water, and other contaminants are removed. While one scrubber is in use supplying ultra pure output air, the other scrubber is itself being cleaned by heat and reversed flow. A solid state programmer controls operation of the columns to allow for a continuous output of pure air. Unlike typical air supplies with heatless dryers, the Model 25 will not upset the baseline of sensitive analyzers, even during scrubber change-overs.

A pressure regulator and valve on the output permit any pressure from 0 to 50 psig. When used as an air supply for Byron analyzers, Model 25 can supply enough air for six analyzers. Air from the Model 25 Ultra Pure Air Supply is unsurpassed in its freedom from contaminants and may be used for any chromatograph requiring pure air. As long as there is a source of 120 VAC power, Model 25 may be used for laboratory, mobile van or remote applications.

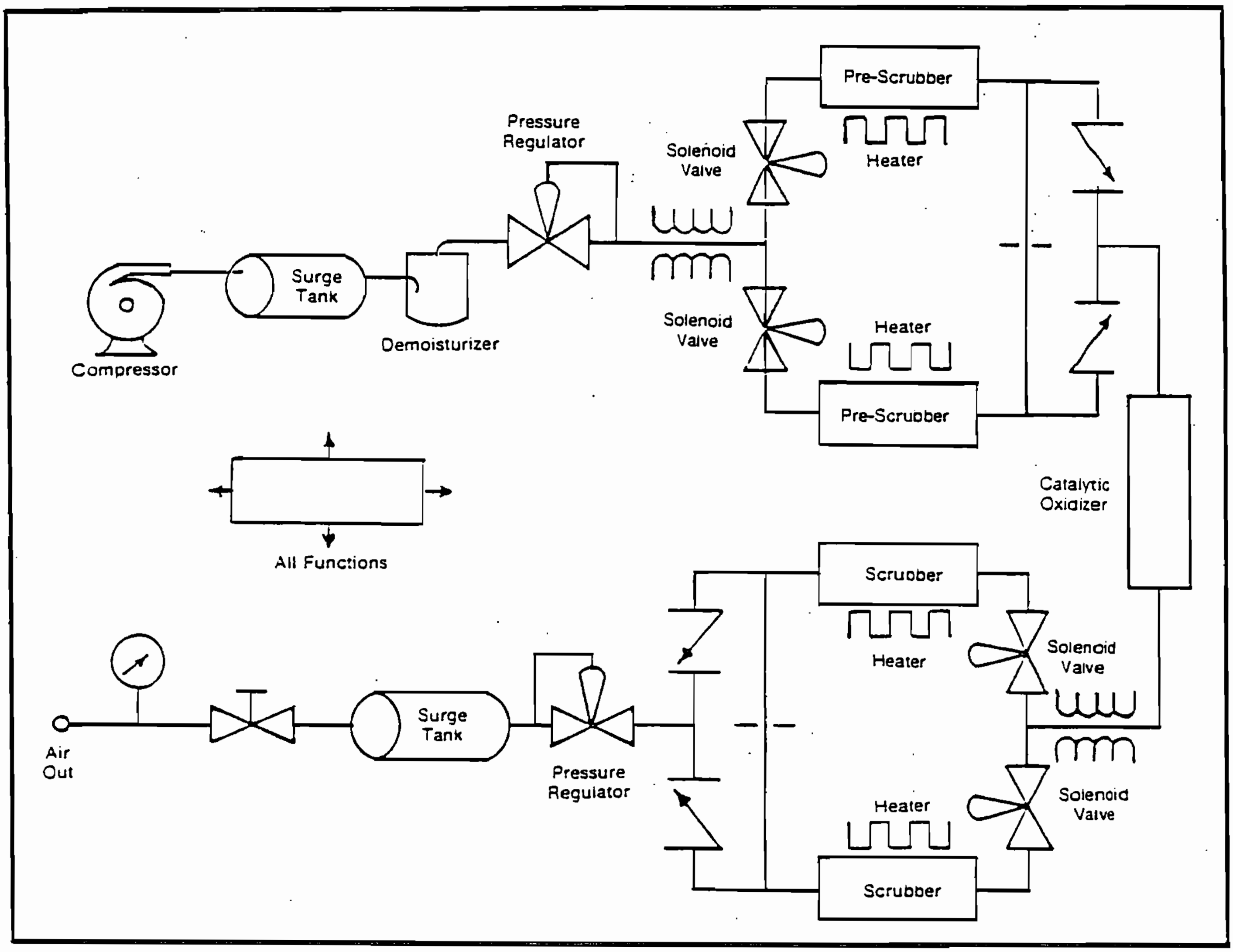
After start-up, the Model 25 system is fully automatic and requires no operator assistance. Aside from periodically draining the compressor surge tank, the Model 25 requires little or no routine maintenance. [illegible] free from heavily chlorinated solvents) the oxidizer catalyst will last several years [illegible] necessary.

Using Model 25 as a source of zero air eliminates problems [illegible] expense, and inconvenience of using cylinder air. In most areas of the country, the [illegible] amortized in less than a year when it is used to replace cylinder zero air for [illegible]

MODEL 25 SPECIFICATIONS:

OUTPUT PRESSURE:
0-50 psig
FLOW RATE:
3 liters per minute, standard; up to 10 LPM, optional
HYDROCARBONS IN OUTPUT AIR:
Less than 0.1 PPM
CARBON MONOXIDE IN OUTPUT AIR:
Less than 0.1 PPM
CARBON DIOXIDE IN OUTPUT AIR:
Less than 0.1 PPM
OTHER CONTAMINANTS IN OUTPUT AIR:
Less than 0.1 PPM
DEW POINT:
Below -75°C

POWER REQUIREMENTS:
120 VAC 60 Hz 300 W plus 1/6 HP motor, standard; 240 VAC 60/60 Hz optional
DUAL SCRUBBING SYSTEM:
Alternate scrubbing columns provided for continuous pure air output in a self-cleaning configuration
CABINET DIMENSIONS:
24¼" wide x 36½" high x 20" deep
WEIGHT:
145 pounds
EXTERNAL GAS CONNECTION:
¼" tube, Swagelok
WARRANTY:
Workmanship and parts guaranteed for a period of one year from date of shipment



BYRON INSTRUMENTS

520 S. Harrington Street. Raleigh, NC 27601, 919-832-7501

Instrument Performance Specifications

There are four different monitoring instrument tests required by the United States Environmental Protection Agency (EPA) Method 20 as regards "proposed" Title 40, Part 60, Subpart "FF" performance testing of diesel engines. These are listed below followed by documentation of each parameter.

1. Accuracy Demonstration (Calibration Test)
2. Response Time Documentation
3. Interference Response
4. NO_2/NO Converter Check

QUALITY ASSURANCE MEASUREMENTS

Determination of Response Time

With the probe positioned at a suitable location in the stack, the analyzers were stabilized with a zero calibration gas (ambient air for NO_x and high level NO_x/N_2 for the O_2 monitor). The three way valve was then switched to the sample position and the time necessary for the monitoring system to reach stable response was measured. The system was then stabilized with the high level calibration gas for O_2 (ambient air), and a similar test performed. After three repetitions of this test, all six responses for each monitor were evaluated and the slowest response time recorded became the documented response time. All subsequent testing was performed at 1-minute per test point plus the documented response time.

Calibration Check

NBS calibration gases were utilized for testing. The span range for this test was 1500 ppm. Three NO_x/NO calibration gases were used. One 11.8 O_2/N_2 gas was utilized. Ambient air was used for the O_2 span gas and for the NO_x zero gas. One of the NO/N_2 calibration gases was used as the O_2 analyzer zero gas. With these gases, monitor accuracy was demonstrated by calibrating the instruments using zero and high level calibration gases. Each of the other gases were then inserted. Acceptable responses for these gases are ≤2% of span (30 ppm).

NO_2-NO Converter

Before arriving at the test site, NO_2-NO converter test was conducted by filling a Tedlar bag approximately 50% with the high level NO/N_2 gas. The remainder of the bag was then filled with ambient air and immediately attached to the NO_x analyzer while in the NO_x mode. The analyzer output was recorded for 30 minutes during which time the stable response must not drift over 2% (6 ppm) of span to be considered acceptable.

Interference Test

Manufacturer's certification of interference response to SO_2, CO, CO_2, and O_2 is submitted with the test report.

Inteference Response

Procedure: Introduce the gaseous components into the measurement system. Record the inteference response.

Specification: Inteference $\leq$ 2 percent of span.

Compliance Test Result of January 18, 1980, Thermo Electron, Inc.

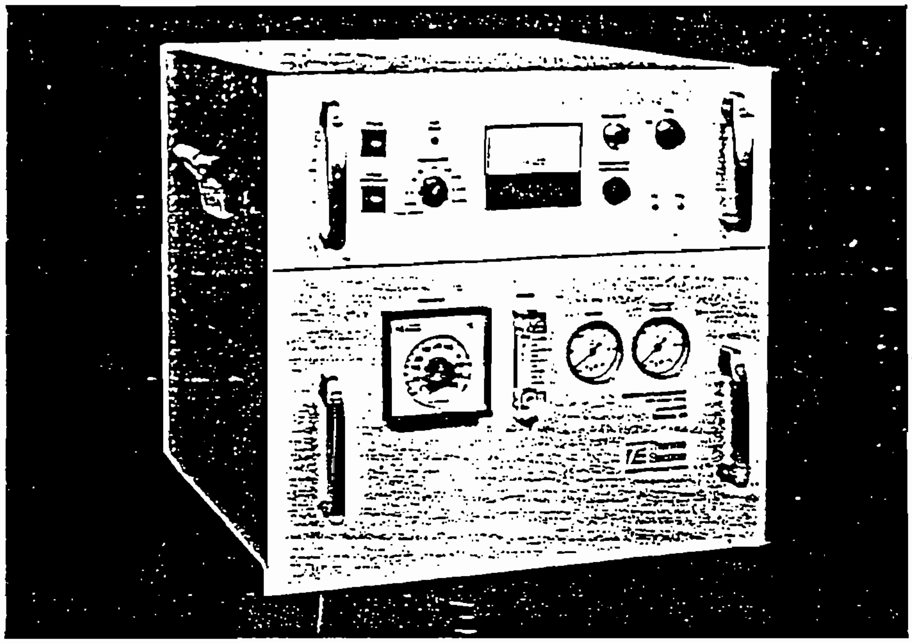
Gas Type	ppm	Analyzer Response	Percent of Span
CO	500	<.1 ppm	<.1%
SO2	201	<.1 ppm	<.1%
CO2	10%	<.1 ppm	<.1%
O2	20.9%	<.1 ppm	<.1%

ANALYZER TYPE 10AR RANGE 0-25PPM SERIAL NO. 10AR-014B-80

TEST GAS TYPE	CONCENTRATION PPM	ANALYZER OUTPUT RESPONSE	% OF SPAN
CO	500	< .1 PPM	< .1%
CO_2	201	< .1 PPM	< .1%
CO_2	10%	< .1 PPM	< .1%
O_2	20.9%	< .1 PPM	< .1%

Electron
CORPORATION
Environmental Instruments Division

Chemiluminescent NO/NO_x Analyzer



Model 10

For Continuous Source Gas Monitoring

Thermo Electron's Model 10 NO/NO_x Analyzer is based on the chemiluminescent reaction between nitric oxide (NO) and ozone (O_3) according to the reaction:

$$NO + O_3 \rightarrow NO_2 + O_2 + h\nu$$

Light emission results when the electronically excited NO_2 molecules revert to their ground state.

A front panel mode switch provides for either a direct readout of the NO concentration in the sample being analyzed ("NO" mode) or the total NO_x concentration ("NO_x" mode). When the Model 10 is placed in the "NO_x" mode, the sample stream passes through a NO_x-to-NO converter prior to entering the reaction chamber for subsequent analysis.

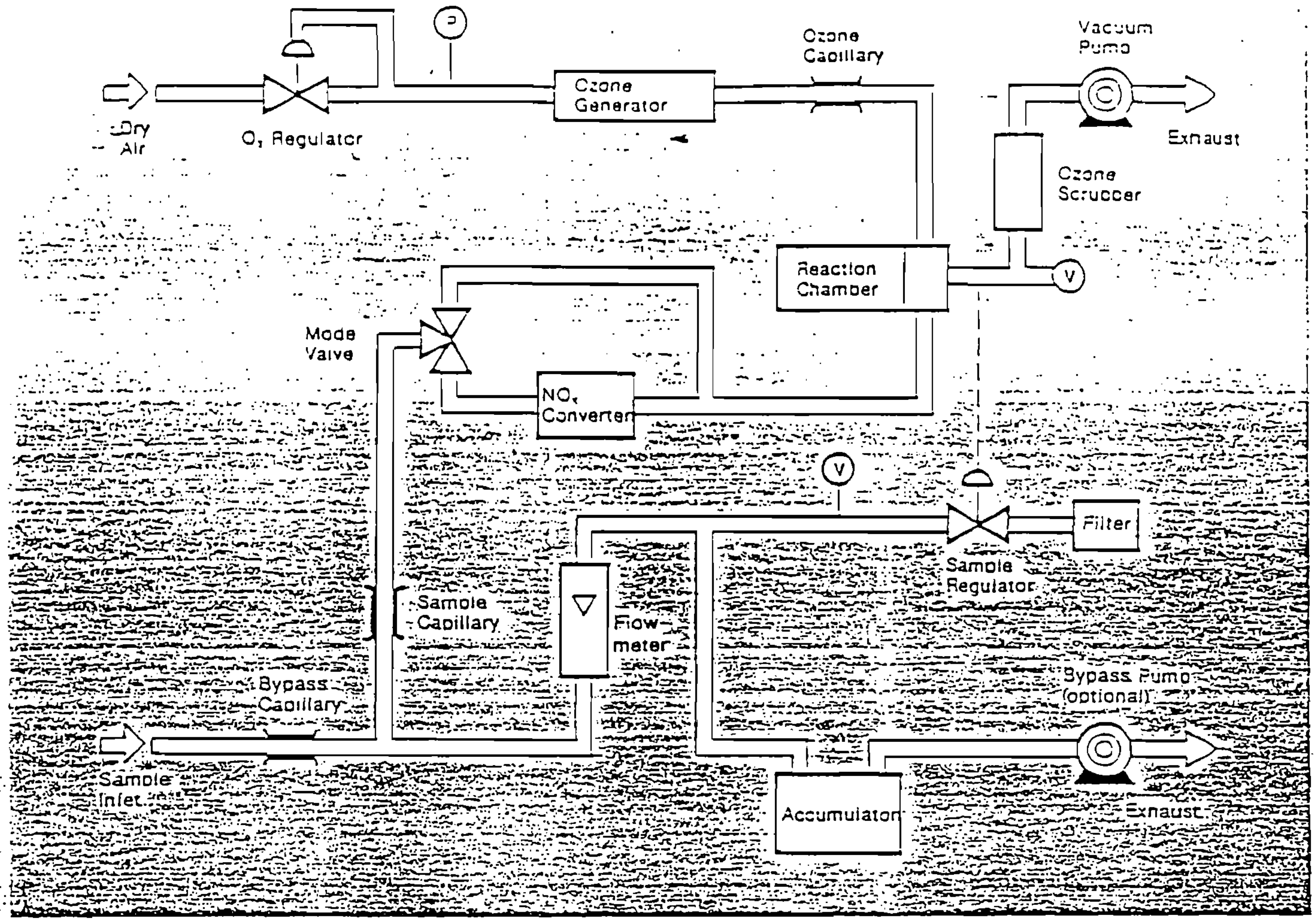
Key Features

- Selective detection of NO or NO_x
- Eight ranges, from 2.5 to 10,000 ppm FS
- Continuous monitoring with rapid response
- Linear on all ranges
- Field proven reliability
- Insensitive to changes in sample flow

Model 10 Specifications*

Ranges	0–2.5 ppm, 0–10 ppm, 0–25 ppm, 0–100 ppm, 0–250 ppm, 0–1000 ppm, 0–2500 ppm, 0–10,000 ppm
Minimum Detectable Concentration	.05 ppm
Noise	Less than 1% of FS
Reproducibility	1% of FS
Operating Temperature Extremes	0–40°C
Response Time (0–90%)	~1.5 second NO mode ~1.7 second NO_x mode
Zero Stability	± 1 ppm in 24 hours
Span Stability	± 1% in 24 hours
Linearity	± 1% from 0.05 to 10,000 ppm**
Power Requirements	1000 watts, 115 ± 10 volts, 60 Hz standard. Also available in 115V 50 Hz, and 210 ± 15 volts, 50 Hz versions
Physical Dimensions	19" wide × 17" high × 20" deep
Instrument Weight	75 lbs. (including pump)
Outputs	Two standard outputs supplied: 1) 0–10V; 2) Field selectable from 0–10V, 5V, 1V, 100mV or 10mV. (ma options available.)

*Specifications are typical and subject to change without notice.
**With O_2 Feed; With dry air, linearity to 2000 ppm.



As illustrated in the above diagram, sample gas enters the Model 10, flows through the bypass capillary, and divides. Most of the sample flows through the flowmeter, accumulator, bypass pump, and exhausts. Only a small amount of sample flows through the sample capillary for analysis. The bypass pump in conjunction with the sample regulator maintain a constant pressure differential across the sample capillary, thus maintaining constant sample flow for analysis. This plumbing network makes the analyzer insensitive to pressure fluctuation in the sample inlet.

From the sample capillary, the sample to be analyzed is either directed through the NO_x to NO converter or around it, depending on the choice of the operator. In the reaction chamber the sample reacts with ozone to produce the light emission and is exhausted. The ozone is produced internally from dry air entering through the oxygen regulator and ozonator. The light emission is sensed by the photomultiplier tube and amplified.

Options

10-001 Bypass pump assembly includes pump, shock tray, accumulator, tubing, and fittings.

Accessory Instruments

Model 700 Heated Capillary Module
Model 606H Heated Particulate Filter
Model 800 Sample Gas Conditioner
Model 900 Sample Gas Conditioner

Thermo Electron CORPORATION

Environmental Instruments Division

108 South Street
Hopkinton, MA 01748
Telephone (617) 435-5321
Telex 948325

Printed in USA 3/84 SM

O_2 INTERFERENCE

SPECIFICATION
FOR
TELEDYNE ANALYTICAL INSTRUMENTS
MODEL 320P-4
PORTABLE OXYGEN ANALYZER
(WITH BUILT-IN PUMP)

Ranges:	0—5, 0—10, 0—25% O_2
Sensitivity:	0—5% of Full Scale
Accuracy:	±1% of full scale at constant temperature; ±5% of reading or ±1% of full scale, whichever is greater, throughout the operating temperature range.
Operating Temperature:	30—125° F.
Response Time:	Class B-1, 90% in less than 5 seconds.
Signal Output:	Internal, high resolution meter External, 0—100 mv DC full Scale
Micro-Fuel Cell:	Class B-1, Life is dependent upon duty cycle (e.g. 2.5 years, assuming 10% duty cycle in air). continuous duty in air 6 months.
Power Requirements:	2 NiCad rechargeable batteries. Batteries fully charged provide 1 month's continuous operation. Charging time overnight (14 hours). Charger built-in requires 115VAC, 50-60 Hz, power.

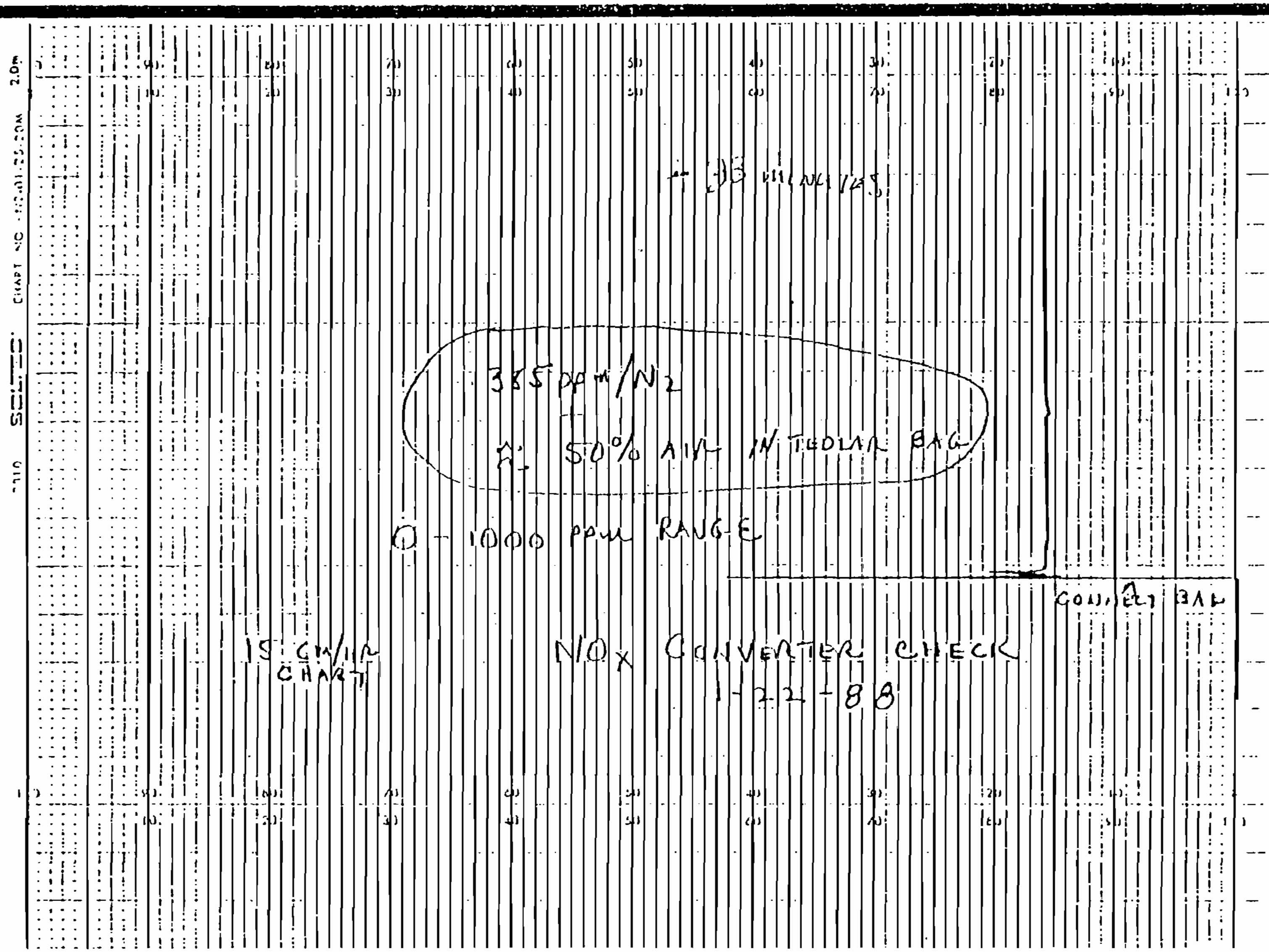
PUMP SPECIFICATION

Type:	Diaphragm
Duty:	Designed for Intermittant use.
Flow Rate:	3 to 4 scfh (about 1500 - 2000 cc/min) 5 VDC supplied by Amplifier batteries. (30 - 40 hrs. per charge)
Max. Vacuum:	60" water column

NOTE: TELEDYNE DOES NOT PUBLISH INTEFERENCE DATA BUT ACCORDING TO MR. JEFF BURKS OF COARPORATE ENGINEERING, THE B-1 FUEL CELL HAS NO INTEFERENCE. SO_2, NO_x, CO_2, AND CO EFFECT ONLY CELL LIFE, NOT ACCURACY

NO_2 — NO

CONVERTER CHECK



NO_X CONVERTER CHECK

AIR CONSULTING
and
ENGINEERING

Air Consulting and Engineering

CONTINUOUS MONITOR ACCURACY CERTIFICATION

PLANT Gulf Coast Recycling
LOCATION Tampa Fl
SOURCE ID Blast Furnace
DATE 10/21/91

NO_x CALIBRATION GAS	MONITOR VALUE ppm	DIFFERENCE ppm	%SPAN
155	156	1	0.3
254	253.5	0.5	0.2

~~O_2~~ C_3H_8 CALIBRATION GAS	MONITOR VALUE %	DIFFERENCE %	% SPAN
298	298.1	0.1	0.01
516	515.5	0.5	0.05
870	856	14	1.4

CO CALIBRATION GAS	MONITOR VALUE	DIFFERENCE	% SPAN
60.2	60.8	0.6	0.6
30.5	30.9	0.4	0.4

ALPHAGAZ

DIVISION OF LIQUID AIR CORPORATION

CERTIFICATE of ANALYSIS

EPA Protocol Gases

Date shipped 18 July 1991	Cylinder No. CC102247	Protocol No. 1
Order Number 995190	Expiration date 18 January 1993	Procedure No. 3.0.4
P.O. Number G310	Cylinder pressure 2000 psig	Section No. 4.0.5

COMPONENT	CONCENTRATION
Nitric oxide	155 ppm
Nitrogen	Balance Gas

GAS ANALYZER EMPLOYED	
Manufacturer	Thermo Inst.
Model Number	10AR
Serial Number	30323-237
Last Calibrated	6/24/91
Analytical Principle	Chemiluminescent

REFERENCE STANDARD EMPLOYED FOR ANALYSIS

COMPONENT	CONCENTRATION	CYLINDER NUMBER	SRM NUMBER
Nitric oxide	250 ppm	CLM764	1685b

ANALYSIS SUMMARY

FIRST ANALYSIS DATE: 11 July 1991

Zero	Reference	Mixture
0.00 volts	10.07	6.25
0.00	10.07	6.24
0.00	10.07	6.23

Mean Analytical Result: 155 ppm

SECOND ANALYSIS DATE: 18 July 1991

Zero	Reference	Mixture
0.01 volts	10.10	6.27
0.01	10.12	6.28
0.02	10.12	6.28

Mean Analytical Result: 154 ppm

CALCULATIONS PERFORMED BY	ANALYST	APPROVED BY
Earle R. Kebbekus	Earle R. Kebbekus	ER Kebbekus

19 Steel Road West • Morrisville, Pennsylvania 19067 • (215) 428-4600

ALPHAGAZ

DIVISION OF LIQUID AIR CORPORATION

CERTIFICATE of ANALYSIS

EPA Protocol Gases

Date shipped 18 July 1991	Cylinder No. CC102266	Protocol No. 1
Order Number 995190	Expiration date 18 January 1993	Procedure No. 3.0.4
P.O. Number G310	Cylinder pressure 2000 psig	Section No. 4.0.5

COMPONENT	CONCENTRATION
Nitric oxide	254 ppm
Nitrogen	Balance Gas

GAS ANALYZER EMPLOYED	
Manufacturer	Thermo Inst.
Model Number	10AR
Serial Number	30323-237
Last Calibrated	6/24/91
Analytical Principle	Chemiluminescent

REFERENCE STANDARD EMPLOYED FOR ANALYSIS

COMPONENT	CONCENTRATION	CYLINDER NUMBER	SRM NUMBER
Nitric oxide	250 ppm	CLM764	1685b

ANALYSIS SUMMARY

FIRST ANALYSIS DATE: 11 July 1991

Zero	Reference	Mixture
0.00 volts	10.02	10.21
0.01	10.08	10.24
0.00	10.04	10.22

Mean Analytical Result: 254 ppm

SECOND ANALYSIS DATE: 18 July 1991

Zero	Reference	Mixture
0.00 volts	10.04	10.21
0.01	10.06	10.22
0.01	10.08	10.23

Mean Analytical Result: 254 ppm

CALCULATIONS PERFORMED BY	ANALYST	APPROVED BY
Earle R. Kebbekus	Earle R. Kebbekus	ERK Kebbekus

Scott Specialty Gases, Inc.
PLUMSTEADVILLE, PA 18949 PHONE: 215-766-8861 FAX: 215-766-0320

AIR CONSULTING & ENGINEERING

Date Shipped 1-4-91
Our Project No: 24837
Your P.O. No: 3744

CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES*

(Concentrations are in mole % or ppm)

Cylinder Number AAL - 9485 CP = 2000 psig   Certified Accuracy ±1 % NBS Traceable   Analysis Dates: First 12-21-90 Last 12-29-90

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS FIRST	REPLICATE CONCENTRATIONS SECOND
CARBON MONOXIDE	30.4 ppm	6-29-92	NDIR	2635	30.43 ppm	30.36 ppm
					30.48 ppm	30.48 ppm
					30.38 ppm	30.42 ppm
NITROGEN	BALANCE					

Cylinder Number AAL - 19272 CP = 2000 psig   Certified Accuracy ±1 % NBS Traceable   Analysis Dates: First 12-21-90 Last 12-29-90

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS FIRST	REPLICATE CONCENTRATIONS SECOND
CARBON MONOXIDE	30.5 ppm	6-29-92	NDIR	2635	30.49 ppm	30.49 ppm
					30.47 ppm	30.49 ppm
					30.37 ppm	30.44 ppm
NITROGEN	BALANCE					

*We hereby certify the cylinder gas has been analyzed according to EPA Protocol No: 1 Procedure G1

Analyst [signature]   Approved By [signature] MARK S. SIRINIDES

The only liability of this Company for gas which fails to comply with this analysis shall be replacement thereof by the Company without extra cost.

Scott Specialty Gases, Inc.
PLUMSTEADVILLE, PA 18949 PHONE: 215-766-8861 FAX: 215-766-0320

AIR CONSULTING & ENGINEERING
SUITE #4
2106 NW 67TH PLACE
GAINESVILLE, FL 32606

ATTN: LARRY WURTS

Date Shipped 1-4-91
Our Project No: 24837
Your P.O. No: 3744
Page 1 of 2

CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES*
(Concentrations are in mole % or ppm)

Cylinder Number ALM - 001563 CP = 2000 psig Certified Accuracy ±1 % NBS Traceable Analysis Dates: First 12-26-90 Last 1-2-91

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS FIRST	REPLICATE CONCENTRATIONS SECOND
CARBON MONOXIDE	60.3 ppm	7-2-92	NDIR	2635	60.31 ppm	60.40 ppm
					60.24 ppm	60.32 ppm
					60.30 ppm	60.39 ppm
NITROGEN	BALANCE					

Cylinder Number AAL - 021796 CP = 2000 psig Certified Accuracy ±1 % NBS Traceable Analysis Dates: First 12-26-90 Last 1-2-91

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS FIRST	REPLICATE CONCENTRATIONS SECOND
CARBON MONOXIDE	60.3 ppm	7-2-92	NDIR	2635	60.36 ppm	60.42 ppm
					60.24 ppm	60.24 ppm
					60.24 ppm	60.25 ppm
NITROGEN	BALANCE					

*We hereby certify the cylinder gas has been analyzed according to EPA Protocol No: 1 Procedure G1

Analyst Fred ...

Approved By MARK S. SIRINIDES

The only liability of this Company for gas which fails to comply with this analysis shall be replacement thereof by the Company without extra cost.

Scott Specialty Gases, Inc.
PLUMSTEADVILLE, PA 18949 PHONE: 215-766-8861 FAX: 215-766-0320

Date Shipped 9-14-90
Our Project No: 22078
Your P.O. No: 3724
Page 4 of 6

AIR CONSULTING & ENGR
GAINSVILLE FL
ATTN: LARRY WURTS

CERTIFICATE OF ANALYSIS – EPA PROTOCOL GASES*
(Concentrations are in mole % or ppm)

Cylinder Number AAL-21700 CP = 2000 psig Certified Accuracy ±1 % NBS Traceable Analysis Dates: First 9-6-90 Last N.R.

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS FIRST	SECOND
PROPANE	298 ppm	3-6-92	F.I.D.	1669b	297.4 ppm	
					298.0 ppm	
					298.2 ppm	
AIR	BALANCE					

Cylinder Number ______ Certified Accuracy ______ % NBS Traceable Analysis Dates: First ______ Last ______

COMPONENTS	CERTIFIED CONC	EXPIRATION DATE	ANALYTICAL PRINCIPLE	PRIMARY STANDARD NBS/SRM's	REPLICATE CONCENTRATIONS FIRST	SECOND

*We hereby certify the cylinder gas has been analyzed according to EPA Protocol No: 1 Procedure G1

Analyst [signature] Approved By [signature] Mark S. Sirinides

The only liability of this Company for gas which fails to comply with this analysis shall be replacement thereof by the Company without extra cost.

ALPHAGAZ
DIVISION OF LIQUID AIR CORPORATION

MAY - 8 REC'D

MIXED AND SPECIALTY GASES

25-Apr-91
GATOR OXYGEN

P.O. Box 5548
2445 South St.

P.O.# G239
GAINESVILLE, FL.

Phone (213) 492-5340
Long Beach, CA 90805

CERTIFICATION OF CYLINDER # CC-59913

COMPONENT:	MEAN CONCENTRATION:
Propane	870.7 ± 1.0 ppm
Air	Balance

Cylinder pressure: 2000 psi
Expiration date: 24-Oct-92

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, per Procedure G1. The concentration of the Propane was determined by direct comparison with NBS SRM 2646A, Sample No. 103-47-B, S/N FF-27116, 1001 +/- 10 ppm Propane in Air, dated May 22, 1990. The analysis was performed on a Varian 3700 FID using a DB-1 Capillary, 30m x 0.25mm, 50cc/min. splitter flow on a 1ml loop. The last multipoint range calibration was done on APRIL 8, 1991.

Analyst

ALPHAGAZ

DIVISION OF LIQUID AIR CORPORATION

MAY - 9 REC'D

MIXED AND SPECIALTY GASES

25-Apr-91
GATOR OXYGEN

P.O.# G239
GAINESVILLE, FL.

P.O. Box 5548
2445 South St.

Phone (213) 492-5340
Long Beach, CA 90805

CERTIFICATION OF CYLINDER # AL-1971

COMPONENT:	MEAN CONCENTRATION:
Propane	516.4 ± 1.0 ppm
Air	Balance

Cylinder pressure: 2000 psi
Expiration date: 24-Oct-92

This mixture was prepared and analyzed following EPA Revised Traceability Protocol No.1, Section 3.0.4, per Procedure G1. The concentration of the Propane was determined by direct comparison with NBS SRM 1669B, Sample No. 81-48-E, S/N FF-19507, 476 +/- 4 ppm Propane in Air, dated JULY 16, 1990. The analysis was performed on a Varian 3700 FID using a DB-1 Capillary, 30m x 0.25mm, 50cc/min. splitter flow on a 1ml loop. The last multipoint range calibration was done on APRIL 8, 1991.

Analyst

APPENDIX E

PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

AIR CONSULTING AND ENGINEERING, INC.

Stephen L. Neck, P.E.
Project Manager
Field Testing

J. Colleen Hodge
Field Testing
Graphics Preparation

Dagmar Neck
Report Preparation
Computer Analysis

George F. Gabel
Orsat Analysis

Candace V. Taylor
Document Production

STEVENSON & ASSOCIATES

Lynne Stevenson
Test Coordinator

ATTACHMENT XXV

Air Pollutant Emission Report (AOR)
For 1983

HILLSBOROUGH COUNTY ENVIRONMENTAL PROTECTION COMMISSION
AIR POLLUTANT EMISSION REPORT

Representing Calender Year 1983
Date submitted: March 30, 1984

SECTION I - GENERAL INFORMATION

Plant, institution, or establishment name GULF COAST LEAD COMPANY
Plant, institution, or establishment address: 1901 N. 66th STREET (Street or Box Number) TAMPA (City) FLORIDA (State) 33619 (Zip)
Person to contact regarding this report: JOYCE D. MORALES-CARAMELLA Title: SAFETY & ENVIRONMENTAL DIRECTOR Telephone: 626-6151
Mailing address: SAME AS ABOVE (Street or Box Number) (City) (State) (Zip)

SECTION II - PROCESS/OPERATIONS EMISSIONS

Normal operating schedule: 24 Hours per day 7 Days per week 303 DAYS ~~Weeks~~ per year 7272 Hours per year.
Seasonal and/or peak operation period: N/A
Dates of annually occurring shutdowns of operations: N/A ** Additional operating info. enclosed
**The blast furnace is brought down once every 4 weeks for maintenance and repairs. The furnace stays down for two to four days.

Source Code[a,b]	Processes or Operations Releasing Pollutants to the Atmosphere[c,d]	Raw Materials Used for Processes or Operations[e] — Type	Quantity Hourly Process Rate, lbs. — Annual Average[f]	Design	Maximum	Products of Processes or Operations[g] — Type	Quantity Hourly Process Rate, lbs. — Annual Average[f]	Design	Maximum	Intermittent Operation Only — Average Hours/Week[h]
IIa	Blast furnace	ATTACHMENT A		7280	8600	blast lead	14995T	4200	5400	N/A
IIb,c,d	3-50T Re-fining kettles	blast lead alloy metals	15685T	8667	8667	soft & hard lead	14870T	8333	8333	72
IIe	20T Melt kettle	blast & scrap lead	1200T	4200	4200	keels	1140T	4000	4000	11

a. List a separate code number to represent each source(e.g.,IV-a,IV-b,IV-c,etc.) then enter required data on this page and for the same code number sources in Section III. IV, and V.
b. Multiple sources may be grouped if similar in size and type.
c. Sulfuric acid-contact:aluminum smelting-crucible furnace;cement manufacturing-dry process; etc (See instruction for examples and use approximate identification numbers): other non-listed processes and operations (specify).
d The pollutants to be covered in this report are listed in the accompanying instructions.
e. Sulfur burned:pig, foundry returns, or scrap aluminum melted;limestone, cement rock, clay,iron ore used; etc.
f. Pounds, tons, gallons, barrels, etc.
g. Sulfuric acid produced; aluminum ingots produced; etc.
h. For intermittent processes, indicate average number of hours per week of operation so that estimates of yearly

SECTION III - FUEL COMBUSTION FOR GENERATION OF HEAT, STEAM, AND/OR POWER

Source Code[a]	Type of Fuel[b]	Annual Consumption[c] Quantity[d]	Percent Distribution by Season: Spring March/May	Summer June/Aug.	Fall Sept./Nov.	Winter Dec./Febr	Hourly Consumption Maximum	Hourly Consumption Average Quantity	Heat Content BTU/Quan.[e]	Percent Sulfur[f]	Percent Ash (Solid) Fuel Only[c,f]
IIa	Coke	2512T	25	24	26	25	960#	700#	1300/lb.	0.58	5.40
IIb,c,d	Natural gas	278490 Therms	25	26	23	25	8mil. BTU	3.5mil. BTU	1000/ft.^{3}	0	--
IIe	Natural gas	Included above with IIb,c,d					1.5mil. BTU	1.5mil. BTU	1000/ft.^{3}	0	--

a. List code numbers corresponding to each emissions source reported in Section II.
b. Coke, bituminous coal, anthracite coal, lignite; No. 1, 2, 4, 5, and 6 fuel oil; natural gas; LPG; refinery or coke oven gas; etc. (Note: Indicate if two or more fuels are burned in the same boiler and provide all data pertinent to each fuel type).
c. Fuel data are to be reported on an "as burned" basis.
d. Solid fuel, tons; liquid fuel, gallons; gaseous fuel, 1000 cubic feet.
e. If unknown, please give name and address of fuel supplier.

SECTION IV - AIR CLEANING EQUIPMENT

Source Code	Type of Air Cleaning Equipment[a,b]	Pollutant Removed[c]	Inlet Gas Temperature °F	Inlet Gas Flow Rate ACFM	Maximum Pressure Drop, PSI.[e]	Efficiency[d] Design Percent	Efficiency[d] Operating Percent
IIa	Fabric filter	Particulate	170-250	18000	7.0"	99+	99+
IIb,c,d	Fabric filter	Particulate	150	3700	2.0"	99+	99+
IIe	Fabric filter	Particulate	150	3400	1.5"	99+	99+

a. Wet scrubber, electrostatic precipitator, fabric filter, etc.
b. Please list future equipment separately.
c. The pollutants to be covered in this survey are specified in the accompanying instructions.
d. Give efficiency in terms of pollutant removed.
e. Give maximum normal operating pressure drop across air cleaning system.

FORM# 158-75-M2

SECTION V - STACK AND POLLUTANT EMISSIONS DATA

STACK DATA					ESTIMATE OF POLLUTANT EMISSIONS				
Source Code[a]	Height Above Grade ft.	Inside Diameter at Top ft.	Exit Gas Velocity ft./sec.[b]	Exit Gas Temperature °F.[c]	Pollutant[d]	Technique[f]	Quantity tons/yr.	Average lb/hr.	Maximum lb/hr.
IIa	97	2	92	155	Particulate	EPA Method 5	9.30	2.559	3.058
					SO_2	EPA Method 6	1360	374	618
IIb,c,d	25	2	45	95	Particulate	EPA Method 5	0.03	0.017	0.020
IIe	25	1	50	90	Particulate	EPA Method 5	0.01	0.051	0.071

a. List code numbers corresponding to each emissions source reported in Section II, III, and IV.
b. Values should be representative of average flow conditions for hours of operation.
c. At actual flow conditions.
d. The pollutants to be covered in this survey are specified in the accompanying instructions.
e. Give stack test data if available (indicate stack sampling method used), otherwise, specify basis used. If unknown, please do not complete these columns.
f. Note technique used to arrive at estimation; AP-42, stack test, etc.

ATTACHMENT A

RAW MATERIALS USED - - BLAST FURNACE

TYPE	ANNUAL AVG.(T)	DESIGN(LBS/HR)	MAXIMUM(LBS/HR)
Lead bearing materials	20,525	5,600	7,400
Coke	2,512	700	960
Limestone	235	70	125
Cast iron	530	145	200

ATTACHMENT B

CALCULATIONS USED TO ESTIMATE 1983 EMISSIONS

IIa Blast Furnace - Particulates

$$\frac{(2.31 \text{ lbs/hr}^{1/} + 0.017 \text{ lbs/hr}^{2/} + 0.232 \text{ lbs/hr}^{3/}) \times 7272 \text{ hrs/year}}{2000 \text{ lbs/T}}$$

= 9.30 Tons/year

IIa Blast Furnace - Sulfur dioxide

$$\frac{(374 \text{ lbs/hr}^{4/} \times 7272 \text{ hrs/year})}{2000 \text{ lbs/T}}$$

= 1360 Tons/year

IIb,c,d Refining Kettles - Particulates

$$\frac{0.017 \text{ lbs/hr}^{2/} \times 72 \text{ hrs/week} \times 52 \text{ weeks/year}}{2000 \text{ lbs/T}}$$

= .032 Tons/year

IIe Keel Cast Kettle - Particulates

$$\frac{0.051 \text{ lbs/hr}^{2/} \times 11 \text{ hrs/week} \times 52 \text{ weeks/year}}{2000 \text{ lbs/T}}$$

= .015 Tons/year

1/ Figures taken from Emissions Test Report-1983

2/ Figures taken from Emissions Test Report-1981

3/ Figures taken from Emissions Test Report-1983, Skip Hoist Baghouse

4/ Figures taken from Emissions Test Report-1983, Blast Furnace Sulfur Dioxide

ATTACHMENT C

EMISSIONS TEST REPORT - 1983

GULF COAST LEAD COMPANY

Prepared For:

GULF COAST LEAD COMPANY
1901 66TH STREET NORTH
TAMPA, FLORIDA 33619

Prepared By:

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.
5119 NORTH FLORIDA AVENUE
TAMPA, FLORIDA 33603

February 17, 1984

TABLE 1

TEST SUMMATION - BLAST FURNACE

Plant: Gulf Coast Lead Company

Test Parameters: Particulate Matter (PM), Lead (Pb)

Date: January 18, 1984

RUN	SCF	SCFM	% H20	Ts, °F	% ISO
1	47.668	15,204	3.98	152	100.1
2	46.598	14,892	4.28	151	99.9
3	45.985	14,647	4.74	162	100.3
		14914			

RUN	PM, gr/DSCF	PM lb/hr	Pb, gr/DSCF	
1	0.021	2.74	0.017	
2	0.017	2.13	0.012	
3	0.016	2.06	0.010	
Average	0.018	2.31	0.013	1.66 lb/hr
Allowable *	—	2.50	—	

* Allowable emissions from Permit No. A029-78246, Specific Condition No. 4.

ATTACHMENT D

EMISSIONS TEST REPORT - 1981

GULF COAST LEAD COMPANY

Prepared for:

Gulf Coast Lead Company
1901 66th Street N.
Tampa, Florida 33619

Prepared by:

Envrionmental Engineering Consultants, Inc.
5500 North Florida Avenue
Tampa, Florida 33604

December 23, 1981

TABLE II

TEST SUMMATION - BLAST OPERATIONS VENTILATION

Test Parameters: Particulate Matter (PM)

Process Wt. Rate: 3.10 T/Hr

Date: December 4, 1981

Run No.	SCF	SCFM	% H_2O	Stack Temp °F	% ISO	PM lb/Hr	PM gr/DSCF
1	53.043	3271	1.71	86	99.6	0.017	0.0006
2	49.139	3051	1.49	95	98.9	0.020	0.0008
3	47.965	2943	1.53	97	100.1	0.015	0.0006
					Average	0.017	0.0007
					Allowable	N/A	0.05

TABLE III

TEST SUMMATION - REFINING KETTLE VENTILATION

Test Parameters: Particulate Matter (PM)

Process Wt. Rate: 49 T/Charge

Date: November 24, 1981

Run No.	SCF	SCFM	% H_2O	Stack Temp $^{\circ}F$	% ISO	PM lb/Hr	PM gr/DSCF
1	47.754	6826	1.52	87	100.5	0.015	0.0003
2	46.579	6643	1.87	98	100.7	0.017	0.0003
3	45.513	6413	1.91	100	101.9	0.020	0.0004
					Average	0.017	0.0003
					Allowable	N/A	0.05

TABLE IV

TEST SUMMATION - KEEL ROOM VENTILATION

Test Parameters: Particulate Matter (PM)

Process Wt. Rate: 21 T/Charge

Date: November 23, 1981

Run No.	SCF	SCFM	% H_2O	Stack Temp °F	% ISO	PM lb/Hr	PM gr/DSCF
1	32.703	3361	1.45	84	104.1	0.071	0.0025
2	31.585	3274	1.09	89	103.2	0.053	0.0019
3	31.895	3274	1.02	98	104.2	0.030	0.0011
					Average:	0.051	0.0018
					Allowable:	N/A	0.05

ATTACHMENT E

EMISSIONS TEST REPORT - 1983

SKIP HOIST BAGHOUSE

GULF COAST LEAD COMPANY

Prepared For:

GULF COAST LEAD COMPANY
1901 66TH STREET NORTH
TAMPA, FLORIDA 33619

Prepared By:

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.
5119 NORTH FLORIDA AVENUE
TAMPA, FLORIDA

January 12, 1984

TABLE 1

TEST SUMMATION

PLANT: Gulf Coast Lead

SOURCE: Blast Furnace Skip Hoist

DATE: October 6, 1983

RUN	DSCF	SCFM	% H20	Ts, °F	% ISO	PART. gr/dscf	lbs/hr
1	39.988	5791	3.00	90	100.9	.0044	.218
2	40.091	5798	3.01	104	101.0	.0060	.298
3	39.366	5741	2.14	113	100.2	.0037	.181
					Average	.0047	.232

ATTACHMENT F

EMISSIONS TEST REPORT - 1983

GULF COAST LEAD COMPANY

BLAST FURNACE SULFUR DIOXIDE

Prepared For:

GULF COAST LEAD COMPANY
1901 66TH STREET NORTH
TAMPA, FLORIDA

Prepared By:

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.
5119 NORTH FLORIDA AVENUE
TAMPA, FLORIDA

January 4, 1983

TABLE 1

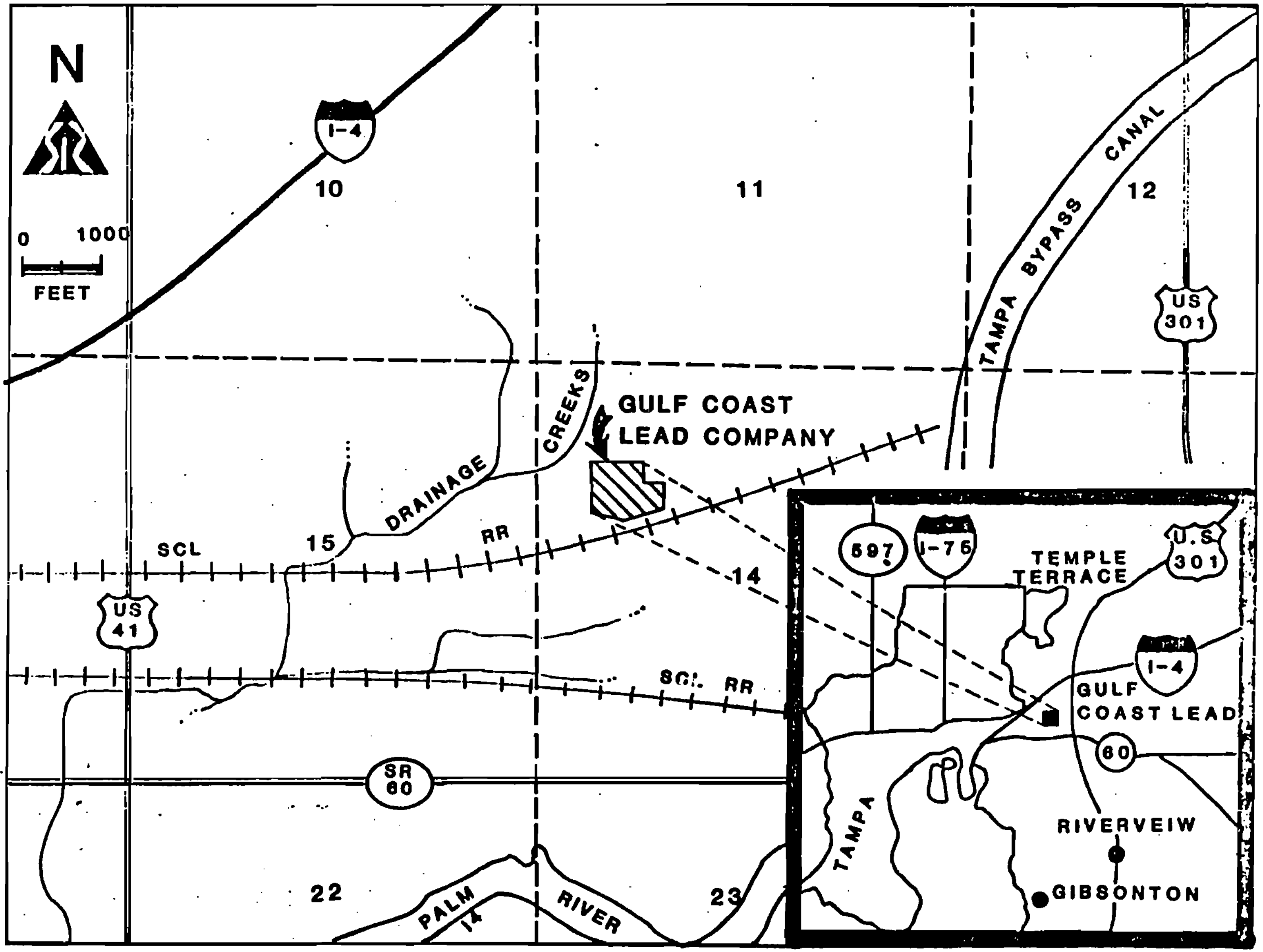
TEST SUMMATION

PLANT: Gulf Coast Lead

SOURCE: Blast Furnace

DATE: December 7, 8, 9, 1983

RUN	DSCF	SCFM	SULFUR DIOXIDE lbs/hr
1	.850	12,838	114
2	.852	12,838	375
3	.838	13,734	518
4	.839	13,734	33
5	.865	13,734	399
6	.848	13,734	330
7	.844	13,308	398
8	.846	13,308	466
9	.842	13,308	490
10	.836	13,308	618
		Average	374



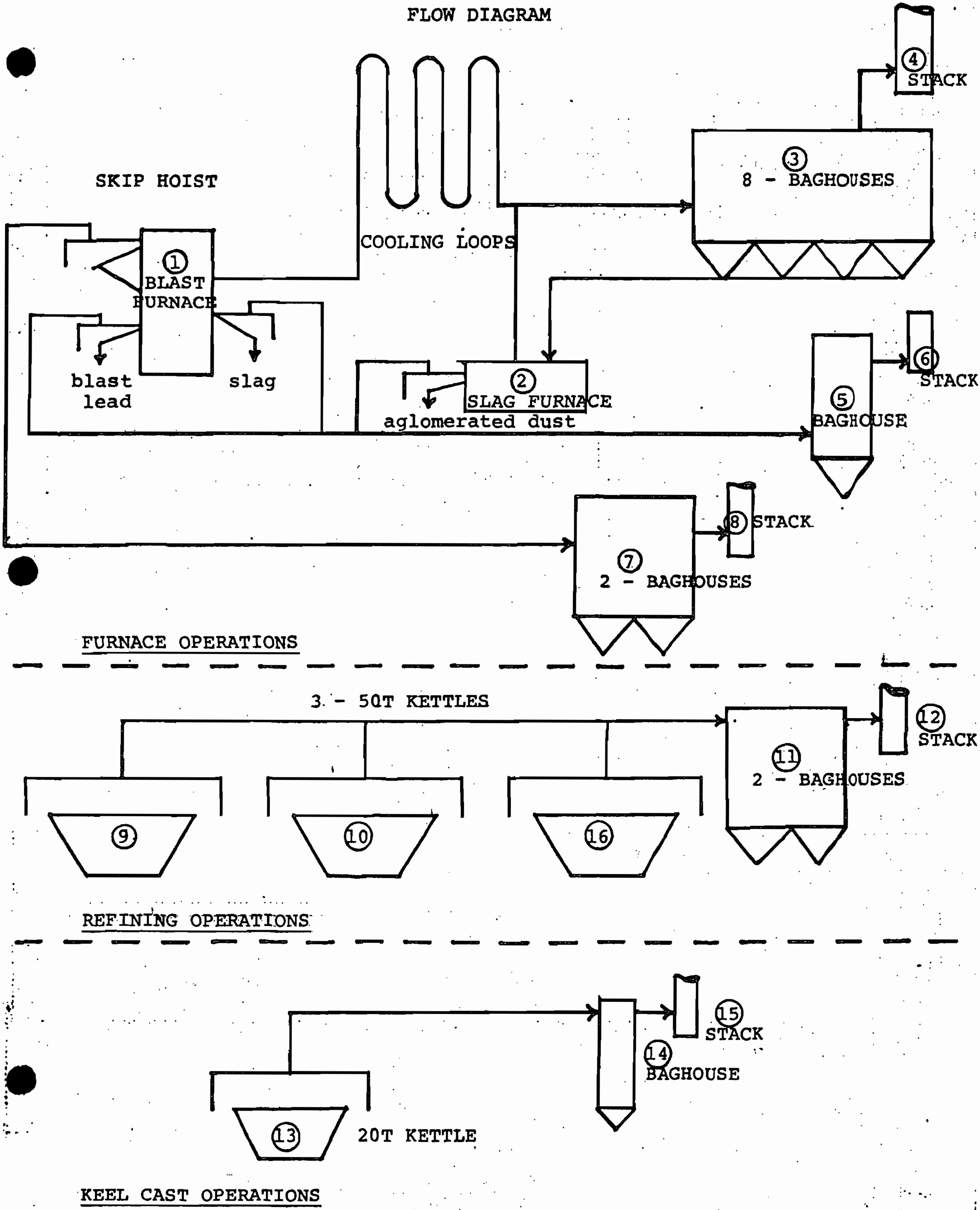
LOCATION OF GULF COAST LEAD COMPANY.

ATTACHMENT G

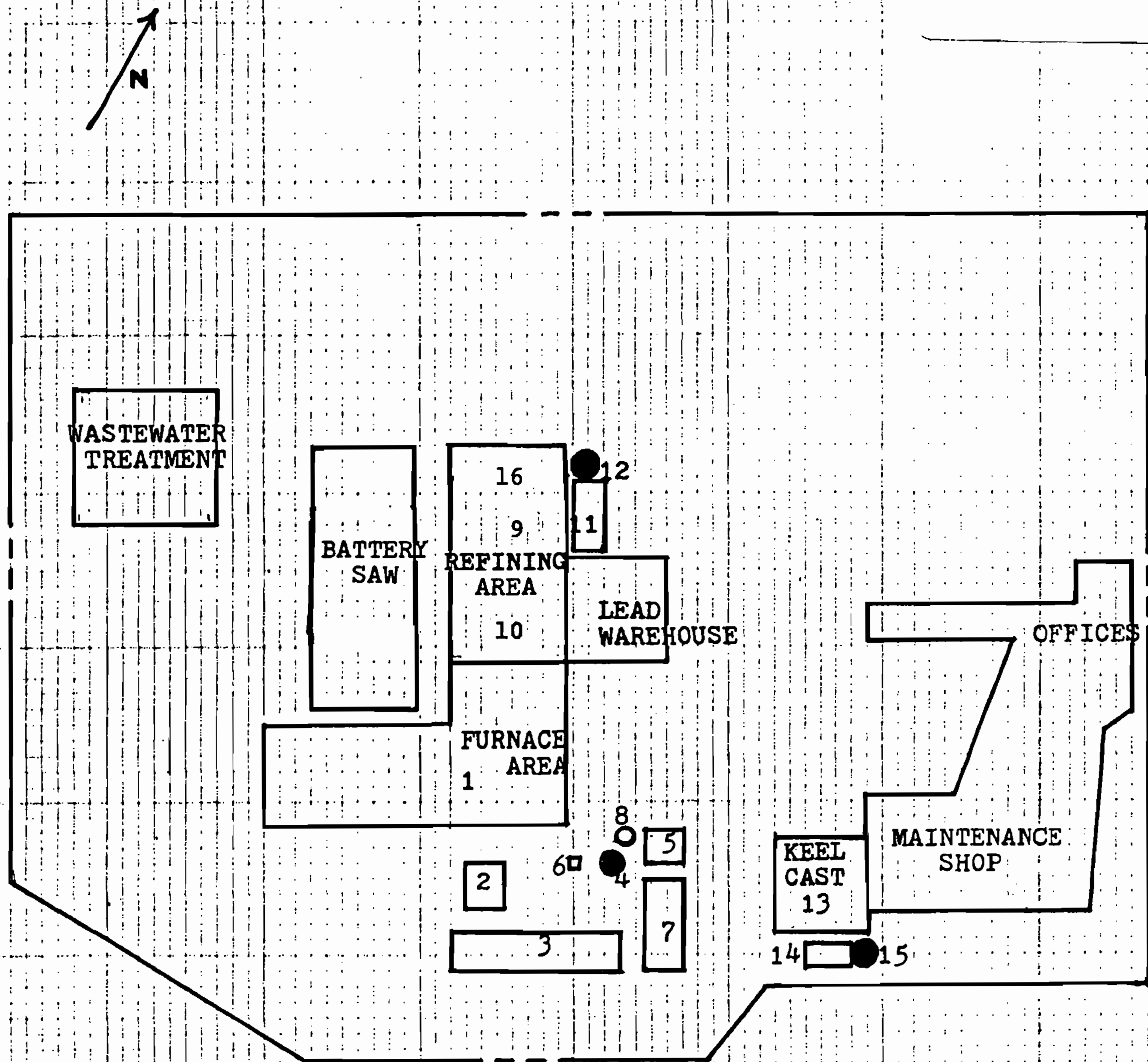
ATTACHMENT H

GULF COAST LEAD COMPANY

FLOW DIAGRAM



ATTACHMENT I



GULF COAST LEAD COMPANY

LOCATION OF MANUFACTURING
PROCESSES & EMISSION POINTS

ATTACHMENT XXVI

Annual Operating Report - For 1984

HILLSBOROUGH COUNTY ENVIRONMENTAL PROTECTION COMMISSION
ANNUAL OPERATING REPORT - MANUFACTURING PROCESS

Representing Calendar Year 1984
Date Submitted: February 20, 1985

SECTION I - GENERAL INFORMATION

Plant, institution, or establishment name: Gulf Coast Lead Company, Inc.
Plant, institution, or establishment address: 1901 N. 66th Street (Street or Box Number) Tampa (City) Florida (State) 33619 (Zip)
Person to contact regarding this report: Joyce Morales-Caramella Title: Safety & Environmental Director Telephone 626-6151
Mailing address: Same as above (Street or Box Number) (City) (State) (Zip)

SECTION II - PROCESS INFORMATION

Source	Raw Material Input Rate, Lbs/Hr		Product Rate, Lbs/Hr		Total tonnage Produced in 1984	Product Name
	Avg/Hr	Max/Hr	Avg/Hr	Max/Hr		
Blast Furnace (IIa)	See ATTACHMENT A		4200	5400	15,750	Blast Lead
3-50T Refining Kettles (IIb,c,d)	8667/kettle	8667/kettle	8333/kettle	8333/kettle	15,787	Refined Lead
1-20T Melt Kettle (IIe)	4200	4200	4000	4000	1,079	Ballast Lea (keels)

1560 Typical Operating Schedule for 1984 by Source

Source	Hrs/Day	Days/Week	Weeks/Year
IIa	24	7	45
IIb,c,d	12	5	50 **
IIe	10	1.5	36

Source	Hrs/Day	Days/Week	Weeks/Year

** There were 311 pots of lead refined in 1984 and each pot takes an average of 12 hours to refine. Sometimes, two pots are operated simultaneously. Although the schedule was 12 hrs/day, 5 days/wk, and 50 wks/year; the total hours of operation were 3732 hours.

SECTION III - FUEL COMBUSTION

Source	Fuel Type (Be Specific)	Consumption *			Max Heat Input, MMBTU/HR
		Avg/Hr	Max/Hr	Annual Total	
IIa	Primary: Coke	630 lbs	1,000 lbs	2,394.5 Tons	13.0 MMBTU/HR
	Back-up: None	--	--	--	--
IIb,c,d	Primary: Natural gas	33.49 CCF	38.27 CCF	205,502 CCF ***	4 MMBTU/HR/Kettle
	Back-up: None	--	--	--	--

*Units: Natural Gas - - MMCF/HR, Fuel Oils - - Gallons/HR, Coal - - Tons/HR

*** See Attachment J

Source	Fuel Type (Be Specific)	Fuel Analysis				Heat Capacity BTU/LB	Heat Capacity BTU/GAL
		Percent Sulfur	Percent Nitrogen	Percent Ash	Density Lb/Gal		
IIa	Primary: Coke	0.58	N/A	5.40	N/A	13,000 BTU/lb	N/A
	Back-up: None	--	--	--	--	--	--
IIb,c, d,e	Primary: Natural gas	0	N/A	N/A	N/A	N/A	1045BTU/CF
	Back-up: None	--	--	--	--	--	--

SECTION IV - ESTIMATE OF POLLUTANT EMISSIONS

Source	Pollutant Emitted	Measurement Technique	Average Emission Lbs/Hr	Maximum Emission Lbs/Hr	Quantity Emitted Tons/Year
IIa	Particulates	EPA MTD 5	2.559	3.058	9.72
IIa	Lead	Modified MTD 5	1.76	2.11	6.69
IIa	SO_2	See Dec. 1983 Stack Test	374	618	1,421
IIb,c,d	Particulates	EPA MTD 5	0.017	0.020	0.032
IIb,c,d	Lead	Part. x 40%	0.0068	0.0080	0.013

SECTION III - FUEL COMBUSTION (Continued)

Source	Fuel Type (Be Specific)	Consumption * Avg/Hr	Max/Hr	Annual Total	Max Heat Input, MMBTU/HR
IIe	Primary: Natural gas	14.35 CCF	14.35 CCF	15,093 CCF ***	1.5 MMBTU/HR
	Back-up: None	--	--	--	--
	Primary:				
	Back-up:				

*Units: Natural Gas - - MMCF/HR, Fuel Oils - - Gallons/HR, Coal - - Tons/HR

*** See Attachment J

Source	Fuel Type (Be Specific)	Fuel Analysis Percent Sulfur	Percent Nitrogen	Percent Ash	Density Lb/Gal	Heat Capacity BTU/LB	Heat Capacity BTU/GAL
	Primary:						
	Back-up:						
	Primary:						
	Back-up:						

SECTION IV - ESTIMATE OF POLLUTANT EMISSIONS (Continued)

Source	Pollutant Emitted	Measurement Technique	Average Emission Lbs/Hr	Maximum Emission Lbs/Hr	Quantity Emitted Tons/Year
IIe	Particulates	EPA MTD 5	0.051	0.071	0.0137
IIe	Lead	Part. x 40%	0.020	0.028	0.0055
IIa,b,c,c,e	VE	30 min. visual	0% opacity		

ATTACHMENT A

Raw Materials Used - - Blast Furnace

	Annual Tons	Average/Hour (#/hr)	Maximum/Hour (#/hr)
Lead Bearing Materials	21,743.5	5,722	7,400
Coke	2,393.5	630	960
Limestone	522	138	200
Cast Iron	522	138	200

ATTACHMENT B

Calculations Used to Estimate 1984 Emissions

IIa BLAST FURNACE - Particulates

$$\frac{(2.31 \text{ lbs/hr}^{1/} + 0.017 \text{ lbs/hr}^{2/} + 0.232 \text{ lbs/hr}^{3/}) \times 7600 \text{ hrs/year}}{2000 \text{ lbs/Ton}}$$

= 9.72 Tons/year

IIa BLAST FURNACE - Lead

$$\frac{(1.66 \text{ lbs/hr}^{1/}) + ((0.017 \text{ lbs/hr}^{2/} + 0.232 \text{ lbs/hr}^{3/}) 40\%) \times 7600 \text{ hrs/yr}}{2000 \text{ lbs/Ton}}$$

= 6.69 Tons/year

IIa BLAST FURNACE - Sulfur Dioxide

$$\frac{(374 \text{ lbs/hr}^{4/}) \times 7600 \text{ hrs/year}}{2000 \text{ lbs/Ton}}$$

= 1,421 Tons/year

II b,c,d REFINING KETTLES - Particulates

$$\frac{0.017 \text{ lbs/hr}^{2/} \times 3732 \text{ hrs/year}}{2000 \text{ lbs/Ton}}$$

= 0.032 Tons/year

II b,c,d REFINING KETTLES - Lead

(0.032 Tons/year) 40% = 0.013 Tons/year

ATTACHMENT C

EMISSIONS TEST REPORT - 1983

GULF COAST LEAD COMPANY

Prepared For:

GULF COAST LEAD COMPANY
1901 66TH STREET NORTH
TAMPA, FLORIDA 33619

Prepared By:

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.
5119 NORTH FLORIDA AVENUE
TAMPA, FLORIDA 33603

February 17, 1984

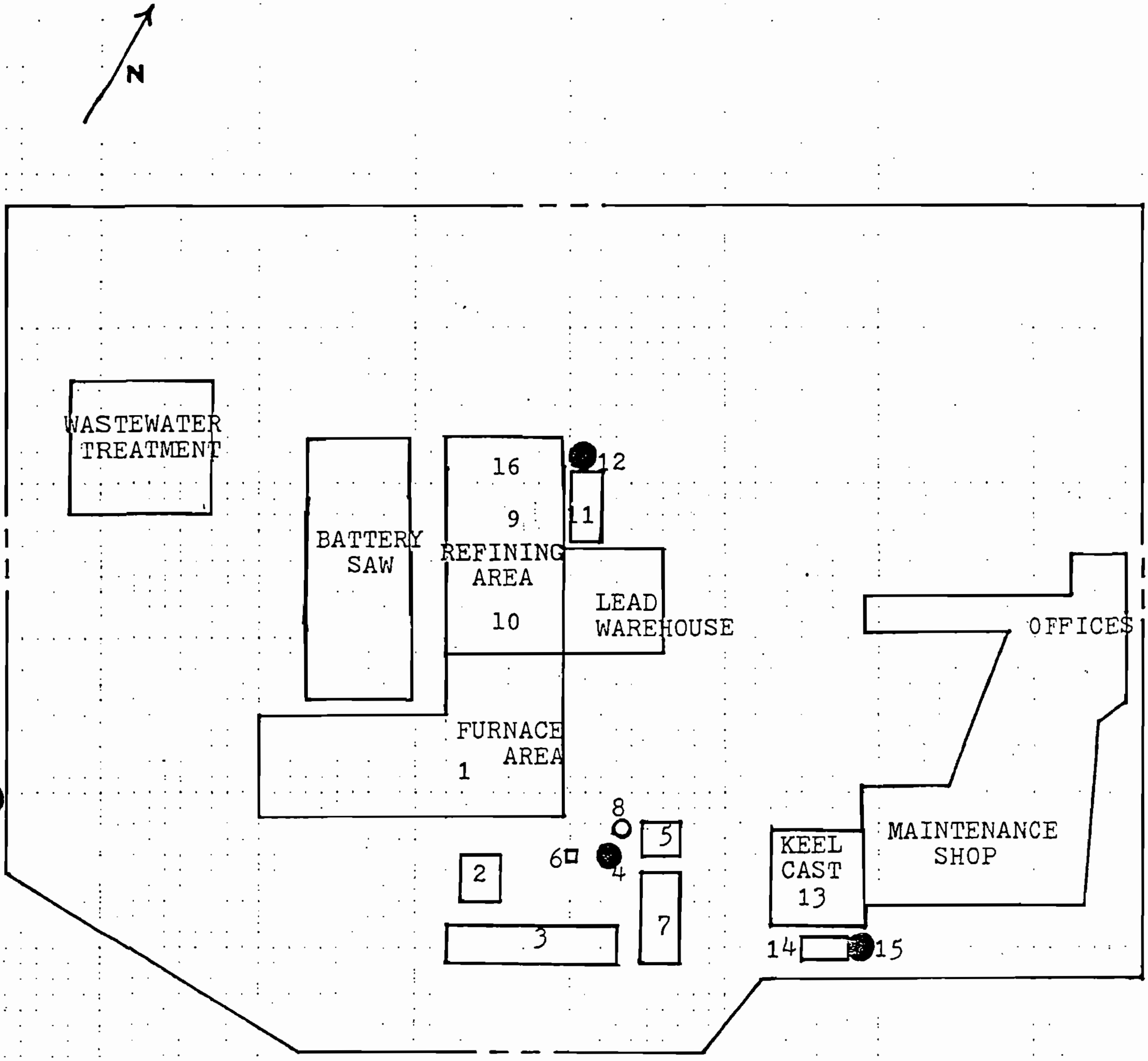
ATTACHMENT J

Fuel Consumption

There are two natural gas meters at Gulf Coast Lead Company, one near the keel cast building and a second one near the furnace building.

The annual total, natural gas consumption, listed for sources IIb, c,d (3 - 50 ton refining kettles) includes the burners on the refining kettles which are rated at 3.5 to 4 MMBTU/hr, the torches used in the refining area, and the gas used to heat the molds on the casting machines. Also included in this total is a small amount of natural gas used for furnace start-up and for the torches used in the furnace area.

The annual total, natural gas consumption, listed for source IIe (20 ton melt kettle in the keel cast building) includes the burner on the kettle which is rated at 1.5 MMBTU/hr plus the torches used in the keel room.



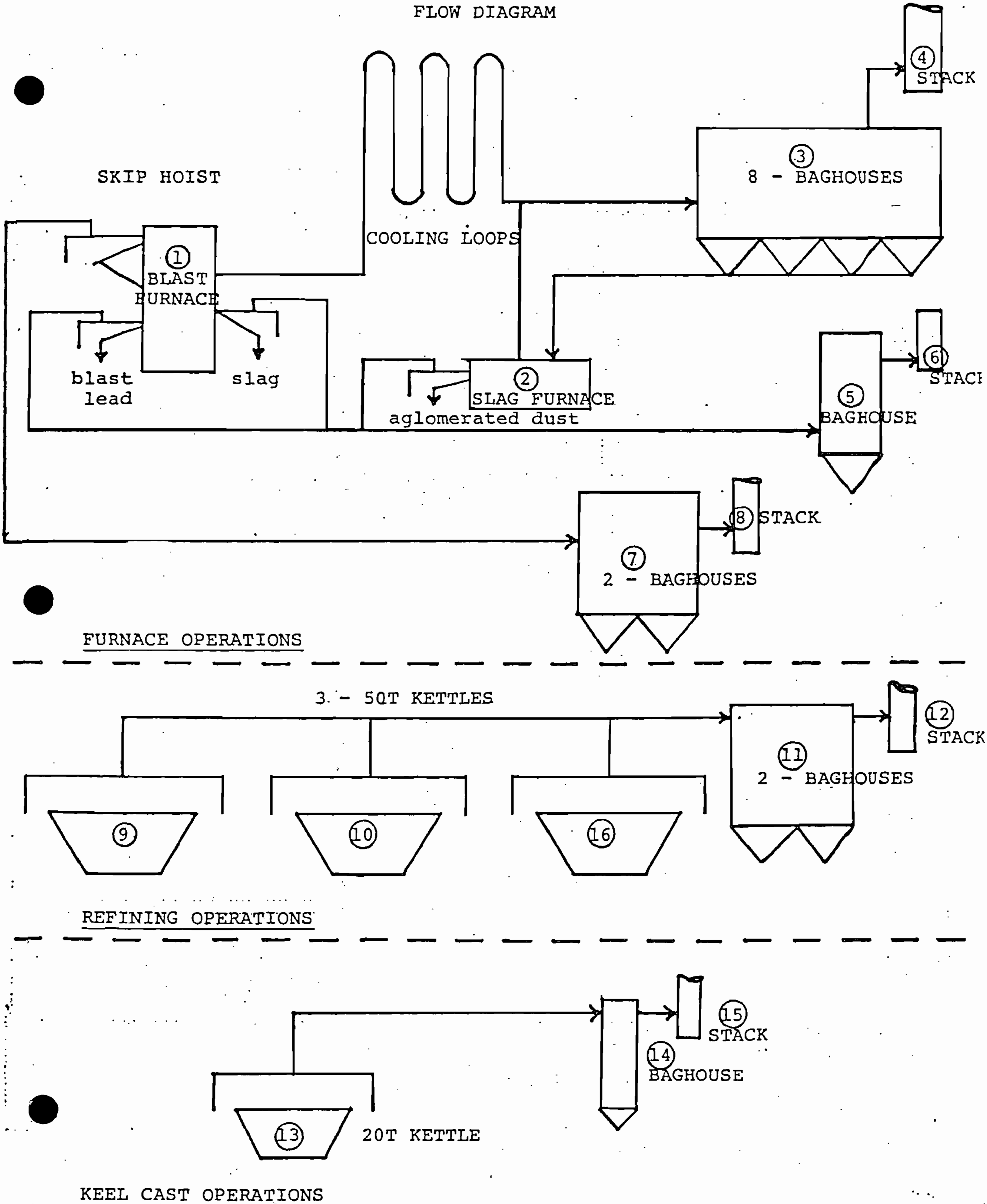
GULF COAST LEAD COMPANY

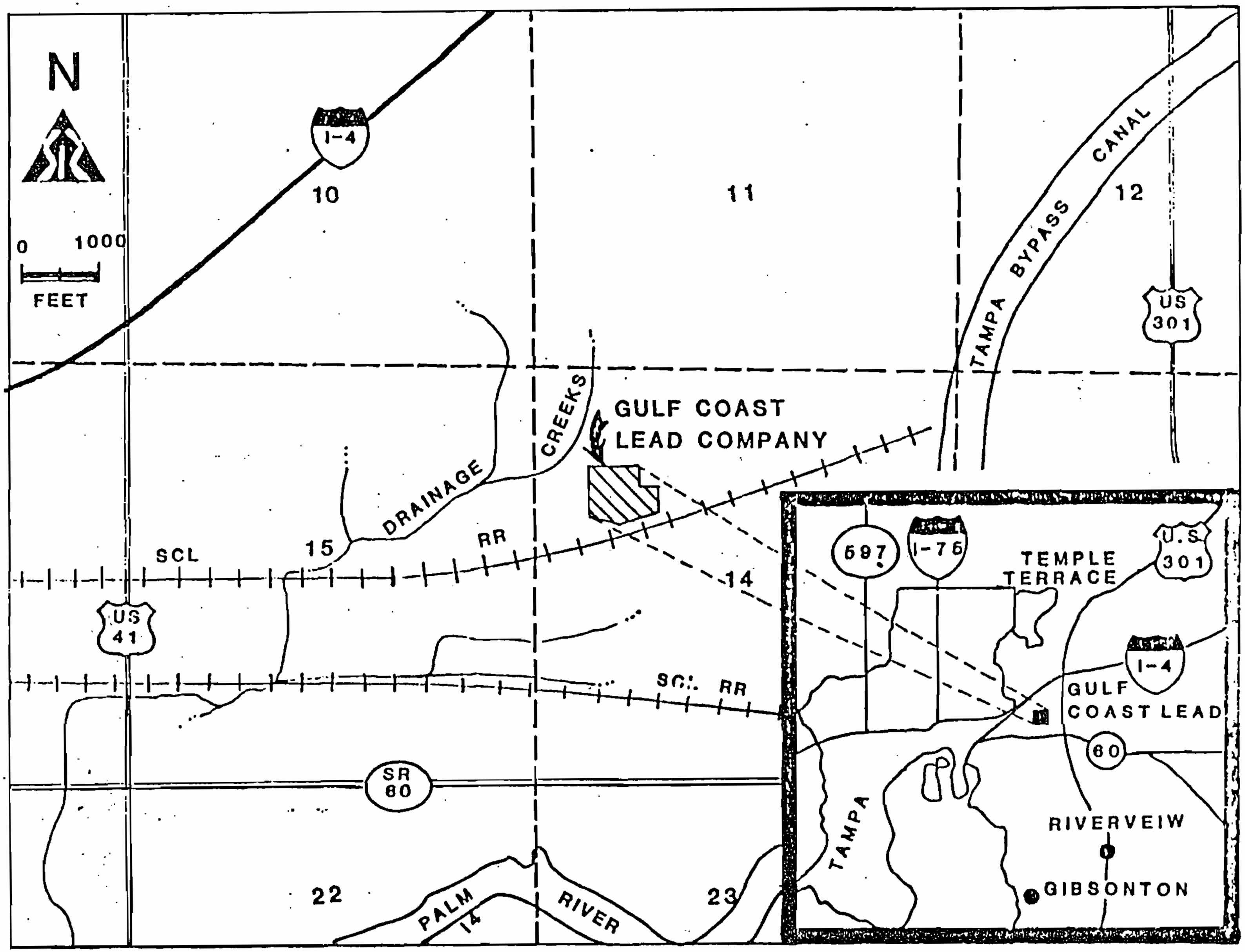
LOCATION OF MANUFACTURING PROCESSES & EMISSION POINTS

GULF COAST LEAD COMPANY

ATTACHMENT H

FLOW DIAGRAM





LOCATION OF GULF COAST LEAD COMPANY.

ATTACHMENT G

TABLE 1

TEST SUMMATION

PLANT: Gulf Coast Lead

SOURCE: Blast Furnace

DATE: December 7, 8, 9, 1983

RUN	DSCF	SCFM	SULFUR DIOXIDE lbs/hr
1	.850	12,838	114
2	.852	12,838	375
3	.838	13,734	518
4	.839	13,734	33
5	.865	13,734	399
6	.848	13,734	330
7	.844	13,308	398
8	.846	13,308	466
9	.842	13,308	490
10	.836	13,308	618
		Average	374

:MISSIONS TEST REPORT - 1983

GULF COAST LEAD COMPANY

3LAST FURNACE SULFUR DIOXIDE

Prepared For:

GULF COAST LEAD COMPANY
1901 66TH STREET NORTH
TAMPA, FLORIDA

Prepared By:

)NMENTAL ENGINEERING CONSULTANTS, INC.
5119 NORTH FLORIDA AVENUE
TAMPA, FLORIDA

January 4, 1983

TABLE II

TEST SUMMATION - BLAST OPERATIONS VENTILATION

Test Parameters: Particulate Matter (PM)

Process Wt. Rate: 3.10 T/Hr

Date: December 4, 1981

Run No.	SCF	SCFM	% H_2O	Stack Temp °F	% ISO	PM lb/Hr	PM gr/DSCF
1	53.043	3271	1.71	86	99.6	0.017	0.0006
2	49.139	3051	1.49	95	98.9	0.020	0.0008
3	47.965	2943	1.53	97	100.1	0.015	0.0006
					Average	0.017	0.0007
					Allowable	N/A	0.05

EMISSIONS TEST REPORT - 1983

SKIP HOIST BAGHOUSE

GULF COAST LEAD COMPANY

Prepared For:

GULF COAST LEAD COMPANY
1901 66TH STREET NORTH
TAMPA, FLORIDA 33619

Prepared By:

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.
5119 NORTH FLORIDA AVENUE
TAMPA, FLORIDA

January 12, 1984

TABLE 1

TEST SUMMATION

PLANT: Gulf Coast Lead

SOURCE: Blast Furnace Skip Hoist

DATE: October 6, 1983

RUN	DSCF	SCFM	% H20	Ts, °F	% ISO	PART. gr/dscf	lbs/hr
1	39.988	5791	3.00	90	100.9	.0044	.218
2	40.091	5798	3.01	104	101.0	.0060	.298
3	39.366	5741	2.14	113	100.2	.0037	.181
					Average	.0047	.232

EMISSIONS TEST REPORT - 1983

GULF COAST LEAD COMPANY

BLAST FURNACE SULFUR DIOXIDE

Prepared For:

GULF COAST LEAD COMPANY
1901 66TH STREET NORTH
TAMPA, FLORIDA

Prepared By:

ENVIRONMENTAL ENGINEERING CONSULTANTS, INC.
5119 NORTH FLORIDA AVENUE
TAMPA, FLORIDA

January 4, 1983

ATTACHMENT XXVII

EPA Memorandum Dated June 19, 1991
Subject: PSD Determination of Gulf Coast Recycling, Inc.

Veronda

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

MEMORANDUM

DATE: JUN 19 1991

SUBJECT: PSD Determination of Gulf Coast Recycling, Inc.

FROM: Brian L. Beals, Chief
Source Evaluation Unit

TO: Mark A. Armentrout, Chief
Northern Compliance Unit

This determination concerns the operations at Gulf Coast Recycling, Inc. and is in response to your memorandum dated April 26, 1991. Our determinations with respect to PSD are as follows:

(1) Gulf Coast Recycling is classified as a major stationary source,as defined in CFR 51.166, therefore, when notification was made of impending construction of a new 60 ton blast furnace, the PSD application process should have been initiated. This furnace qualified as a major modification as defined in CFR 51.166, due to the fact that construction would result in a significant net emissions increase and potential to emit increase in pollutants. Based on the emissions sampling data from 1979-90, there was a 43.7% increase in actual SO2 emissions from the pre-construction to post-construction periods. From 1979-84, actual SO2 emissions averaged 208.7 pounds per hour. After completion of the 60 ton blast furnace, actual SO2 emissions from 1985-90 averaged 300.0 pounds per hour. Based on Gulf Coast's annual operating level of 7800 hours per year, the actual emissions increase for SO2 rose from 814 tons per year in 1979-84 to 1170 tons per year in 1985-90. The significant rate of emissions for SO2 is defined as being 40 tons per year or more of that pollutant.

(2) The preconstruction requirements as outlined in Section 165 of the Clean Air Act should have been met. This would have included obtaining a construction permit for the 60 ton blast furnace prior to its fabrication, instead of obtaining one 6 years after the fact.

(3) The source is classified as a secondary lead smelter and due to the expected increases in pollutants, PSD review would subject all pollutants in the category to review. This would broaden the scope to include PM, Pb, CO, SO2, NOx, sulfuric acid mist, and hydrogen sulfide.

(4) Best Available Control Technology (BACT) analysis would be applicable for any pollutants subject to PSD review (from determination (3) above) which exceed their respective significant emissions rate.

(5) Further investigation is warranted into whether VOC emissions from the 60 ton blast furnace exceeds the 40 tons per year limit for NSR. If NSR is applicable, then LAER and emissions offsets would have to be taken into consideration.

(6) A final concern with respect to the operations at Gulf Coast pertains to the 50-ton refining kettle built and operated with no construction permit, designated as kettle #3. A valid construction permit should have addressed the operating limitations of kettle #3, specifically with reference to the simultaneous operation of more than two 50-ton kettles. Federally enforceable permit limits should have been incorporated into the construction permit, as they were in the eventual operating permit. According to Gulf Coast, kettle #1 operates independently; kettle #2 (calcium lead formation) is dependent upon the operations of kettle #3 (lead softening). The only impediment to simultaneous operation of all three kettles is manpower constraints, not design features; therefore, it is physically possible for all three 50-ton refining kettles to be operating simultaneously. The potential lead emissions for kettle #3 were 0.874 tons per year - an amount above the significance level of 0.6 tons per year; consequently, a PSD application was required for refining kettle #3.

Should you have any questions, please contact either Dennis Beauregard or Scott Davis at x5014.

ATTACHMENT XXVIII

Incineration System
Selection and Design
Calvin R. Brunner, P.E.

INCINERATION SYSTEMS
SELECTION AND DESIGN

Calvin R. Brunner, P.E.

VNR VAN NOSTRAND REINHOLD COMPANY

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Table 4-1. Enthalpy, Air and Moisture.

Relative to 60°F			Relative to 80°F	
H_{Air}, BTU/lb	H_{H_2O} BTU/lb	Temp., °F	H_{Air}, BTU/lb	H_{H_2O}, BTU/lb
21.61	1091.92	150	16.82	1071.91
33.65	1116.62	200	28.86	1096.61
45.71	1140.72	250	40.92	1120.71
57.81	1164.52	300	53.02	1144.51
69.98	1188.22	350	65.19	1168.21
82.19	1211.82	400	77.40	1191.81
94.45	1235.47	450	89.66	1215.46
106.79	1259.22	500	102.00	1239.21
119.21	1283.07	550	114.42	1263.06
131.69	1307.12	600	126.90	1287.11
144.25	1331.27	650	139.46	1311.26
156.87	1355.72	700	152.08	1335.71
169.59	1380.27	750	164.80	1360.26
187.38	1405.02	800	177.59	1385.01
195.26	1430.02	850	190.47	1410.01
208.21	1455.32	900	203.42	1435.31
221.25	1480.72	950	216.46	1460.71
234.36	1506.42	1000	229.57	1486.41
247.55	1532.40	1050	242.76	1512.40
260.81	1558.32	1100	256.02	1538.31
274.15	1584.80	1150	264.36	1564.80
287.55	1611.22	1200	282.76	1591.21
301.02	1638.26	1250	296.23	1618.20
314.56	1665.12	1300	309.77	1645.11
328.17	1692.15	1350	323.38	1672.15
341.85	1719.82	1400	337.06	1699.81
355.58	1747.70	1450	364.58	1727.70
369.37	1775.52	1500	364.58	1755.51
397.17	1832.12	1600	392.33	1812.11
425.08	1890.11	1700	420.29	1870.10
453.24	1948.02	1800	448.45	1928.01
481.57	2007.17	1900	476.78	1987.70
510.07	2067.42	2000	505.28	2047.41
538.72	2128.70	2100	533.93	2108.70
567.52	2189.92	2200	562.73	2169.91
596.45	2252.60	2300	591.66	2232.60
625.52	2315.32	2400	620.73	2295.31
654.70	2377.80	2500	649.91	2357.80
684.01	2443.30	2600	679.22	2423.30
713.42	2511.88	2700	708.63	2491.80

Source: Ref. 4-7 and 4-9.

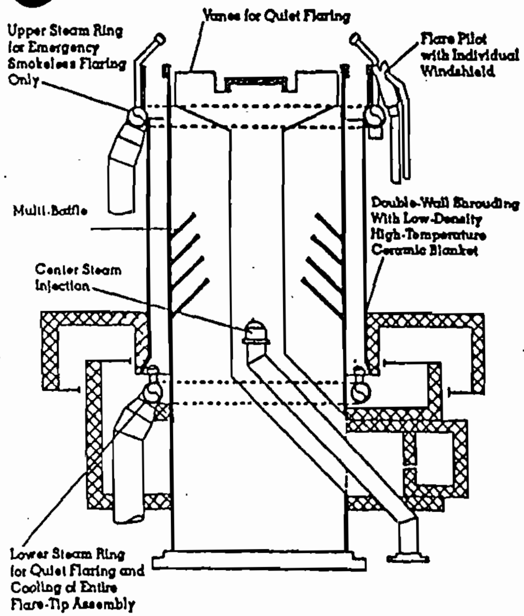

Fig. 15-5. Multi-purpose tower flare. *Source:* Ref. 15-8.

DIRECT FLAME INCINERATION

Direct flame incinerators, also referred to as fume incinerators and gas combustors, are chambers provided with supplemental fuel burners, which provide heat and retention time to destruct gaseous waste materials. Figure 15-9 is a schematic diagram of a direct flame incinerator. A thermocouple in the combustion chamber measures temperature. Appropriate control circuitry alters the rate of supplementary fuel entering the furnace to maintain the desired combustion chamber temperature. These incinerators are applicable for most gaseous waste. Their primary use may be for odor control, toxicity elimination or visible emissions control.

Combustion chamber temperatures are in excess of the autoignition temperature (see Table 15-2) and normally vary, depending on the waste constituents, from 800°F to 1500°F. Table 15-5 lists the efficiency of destruction for gaseous waste composed essentially of hydrocarbon compounds.

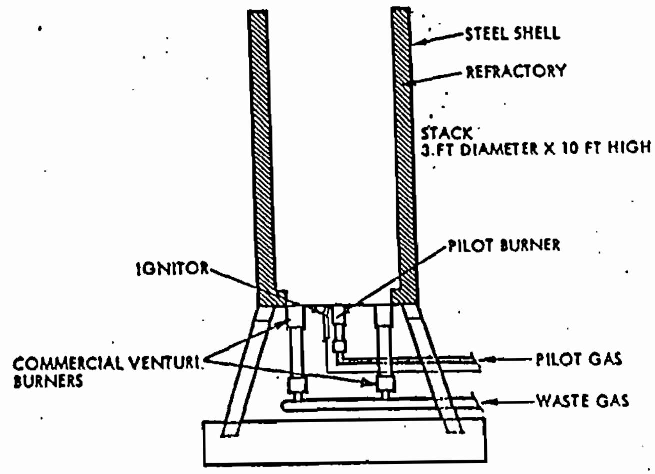

Fig. 15-6. Vertical Venturi type flare. *Source:* Ref. 15-5.

Table 15-3. Venturi Burner Capacities, ft^3/hr.

Gas pressure, in. H_2O	$\frac{3}{16}$-in. Orifice	$\frac{7}{16}$-in. Orifice	$\frac{1}{2}$-in. Orifice
2	70		
4	100		
6	123		
8	142		
10	160		
$\frac{1}{2}$ psig	210	1,042	1,360
1 psig	273	1,488	1,900
2 psig	385	2,157	2,640
3 psig		2,654	3,200
4 psig		3,065	3,680
5 psig		3,407	4,080
6 psig		3,742	4,480
7 psig		4,040	4,800
8 psig		4,320	5,160

Basis: 1,000 BTU/ft³ natural gas.
Source: Ref. 15-5.

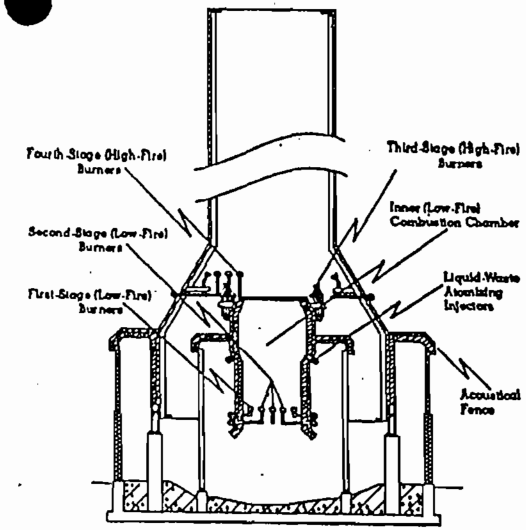

Fig. 15-7. Ground flare. *Source:* Ref. 15-8.

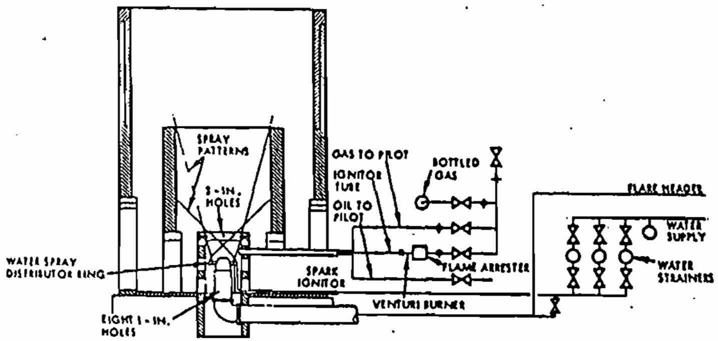

Fig. 15-8. Typical water spray type ground flare. *Source:* Ref. 15-5.

Table 15-4. Water Spray Pressures Required for Smokeless Burning.*

Gas Rate, SCFH	Unsaturates, % by vol	Molecular Weight	Water Pressure, psig	Water Rate, gpm
200,000	0–20	28	30–40	31–35
150,000	30	33	80	45
125,000	40	37	120	51

*The data in this table were obtained with a $1\frac{1}{2}$-inch-diameter spray nozzle in a ground flare with the following dimensions:

	Height, ft	Diameter, ft
Outer stack	30	14
Intermediate stack	12	6
Inner stack	4	12.5

Source: Ref. 15-5.

Retention time is as significant a parameter as temperature. These incinerators are normally designed for combustion chamber sizing to provide 0.25–0.50 seconds retention time, although units have been designed large enough to provide a retention time of 2–3 seconds.

The simplicity of automatic direct flame combustion makes it ideal for combustion control. The configuration of this equipment lends itself to heat recovery. Two modes of heat recovery are outlined in Fig. 15-10. In one case a heat exchanger utilizes the high temperatures in the combustor exhaust to preheat the incoming combustion air. The second case shows a heat exchanger heating a stream for external use. The stream can be gas, water, or water to steam.

Note that the energy requirement of this or any other heat-generating equipment is a function of the temperature to which the products of combustion

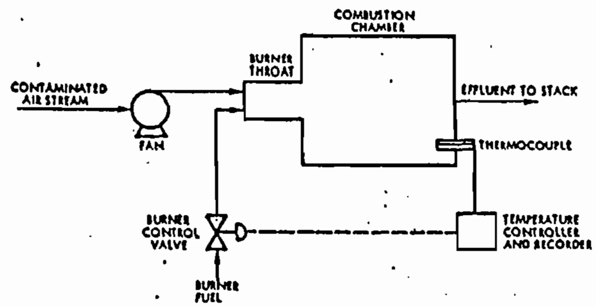

Fig. 15-9. Direct-flame thermal incinerator. *Source:* Ref. 15-5.

Table 15-5. Direct Flame Combustor Efficiency.

	Hydrocarbon Oxidation	Carbon Monoxide Oxidation	Odor* Destruction
Range of temp., °F	1000-1250	1250-1350	1000-1200
Average temp., °F	1100-1200	1300-1350	1100-1150
Efficiency, %	75-85	75-90	50-99
Range of temp., °F	1000-1300	1300-1450	1100-1300
Average temp., °F	1150-1250	1400-1450	1200-1250
Efficiency, %	85-90	90-99	90-99
Range of temp., °F	1100-1500	-	1200-1500
Average temp., °F	1200-1400	-	1350-1400
Efficiency, %	90-100	-	99+

*For odor generated from hydrocarbon compounds.

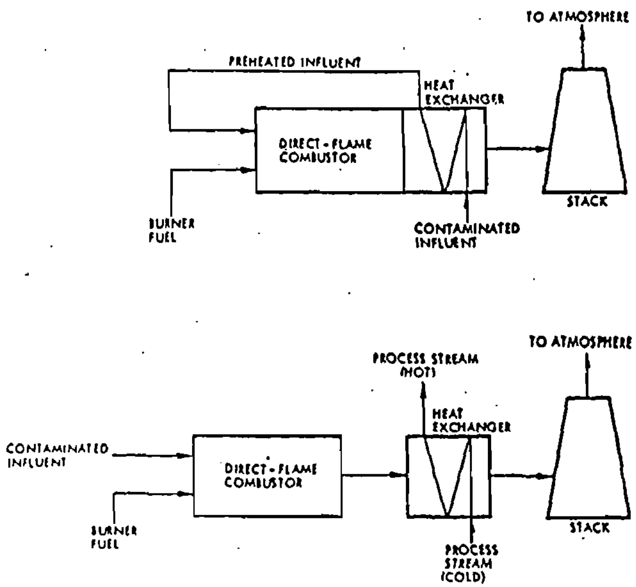

Fig. 15-10. Heat recovery options. *Source:* John Zink Company, Tulsa, OK.

must be raised. Burning at 1400°F in the combustion chamber, without heat recovery, the exiting stream will be at 1400°F. All of the products of combustion must be brought to this temperature. If a heat exchanger were installed to cool the gas outlet temperature, the temperature within the stack, to 1000°F, the products of combustion would only have to be brought to 1000°F although the combustion chamber would still be maintained at 1400°F. A rough calculation of efficiency, based on absolute temperature, is as follows:

With heat exchanger: 1000°F + 460°F = 1460°R outlet

Without heat exchanger: 1400°F + 460°F = 1860°R outlet

Fuel savings with heat exchanger: (1860 − 1460)/1860 = 22%

This figure is a measure of the efficiency of the heat exchanger. It can also be used for cost effectiveness calculations. For instance, if natural gas at $6.00 per million BTU were burned without a heat exchanger, and this incinerator would be in operation for 2000 hours per year burning natural gas at an average rate of 20 000 cubic feet/hr, one years savings with a heat exchanger would be:

$$20\,000\ \text{ft}^3/\text{hr} \times 2000\ \text{hr/year} \times 1000\ \text{BTU/ft}^3 \times \$6.00/1\,000\,000\ \text{hr} \times 0.22\ \text{efficiency} = \$52{,}800\ \text{per year}$$

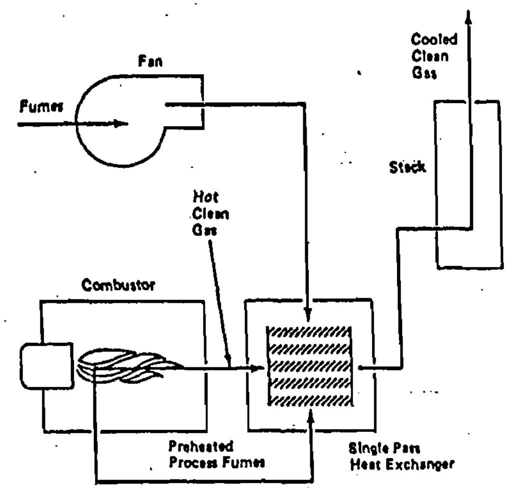

Fig. 15-11. Forced draft direct-flame fume incineration system with a single pass primary heat exchanger. *Source:* Ref. 15-9.

ATTACHMENT XXIX

Evaluation of Stationary Source
Particulate Measurement Methods
Volume V. Secondary Lead Smelters

United States
Environmental Protection
Agency

Environmental Sciences Research
Laboratory
Research Triangle Park NC 27711

EPA-600/2-79-116
June 1979

Research and Development

PB 300337

EPA

Evaluation of Stationary Source Particulate Measurement Methods

Volume V. Secondary Lead Smelters

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Evaluation of Stationary Source Particulate Measurement Methods Volume V. Secondary Lead Smelters

Battelle Columbus Labs, OH

Prepared for

Environmental Sciences Research Lab, Research Triangle Park, NC

Jun 79

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16. ABSTRACT

Operation of the Method 5 sampling system at secondary lead smelters with probe outlet and filter box temperatures of 93°C (200°F) and 149°C (300°F), respectively, yielded statistically equivalent mass loading results. Chemical analyses revealed no compositional differences in the particulate matter collected at the two different sampling temperatures. Sampling with MSA 1106 BH glass filters, as specified by Method 5, and with ADL quartz-type filters yielded no statistically significant differences for particulate mass loading or composition of the collected emissions. The Method 5 sampling train system did not induce compositional changes in the particulate collections. Samples taken from the probe and filter sections of the sampling train were compositionally similar to grab samples and to samples taken from the stack emission control baghouse collector.

The precision (repeatability) of particulate mass emission measurements by Method 5, on the basis of paired sampling tests, was about 1.5 percent when the two systems were operated simultaneously at a single fixed point in the stack. The collection efficiency of the system for lead compounds was very good.

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* Air pollution		13B
* Particles		21B
* Flue gases		14B
* Collection Methods		07B
* Evaluation		11F
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June 1979

EVALUATION OF STATIONARY SOURCE PARTICULATE MEASUREMENT METHODS
Volume V. Secondary Lead Smelters

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ABSTRACT

As part of an overall program to evaluate the EPA Method 5 procedure for measurement of particulate emissions as detailed in the Federal Register, Vol 36, No. 247, December 23, 1971, an experimental study was made of its specific applicability to secondary lead plant emissions. The study was carried out with two Method 5 sampling train systems operated simultaneously at a single point in the stack emission stream. A series of six statistically designed tests was conducted over a 5-day period to obtain data on the reliability of Method 5, the sensitivity of the method to variation of such key parameters as sampling system temperature, filter media, and particulate loading and to characterize the chemical composition of the emissions.

Comprehensive chemical analyses were made of particulates collected in the sampling system and from the baghouse control to ascertain if the sampling mode affected the composition of the particulate emissions. Essentially 100 percent of the particulates were accounted for by the chemical analyses. Compositional analysis of the gaseous species present in the stack gas stream also were performed. The results of the particulate and gas analyses do not indicate any chemical interactions with the sampling system components of the Method 5 train.

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1. INTRODUCTION

The Clean Air Act as amended in 1970 provides the impetus for programs to improve the air quality in the U.S. through research to broaden the understanding of the effects of air pollutants, research and development of techniques to control emissions, and the enactment of air quality regulations to protect the public welfare. Pursuant to Section 111 of the Act, the Environmental Protection Agency (EPA) on December 23, 1971, promulgated Standards of Performance for New Stationary Sources (amended) for fossil-fuel fired steam generators, incinerators, portland cement plants, and nitric and sulfuric acid plants[(1)]. On March 8, 1974, similar performance standards were issued for asphalt concrete plants, petroleum refineries, storage vessels for petroleum liquids, secondary lead smelters, secondary brass and bronze ingot production plants, iron and steel plants, and sewage treatment plants[(2)]. All new and modified sources in the preceding categories are required to demonstrate compliance with the standards of performance.

The performance standards are intended to reflect "the degree of emission limitation achievable through the application of the best system of emission reduction which (taking into account the cost of achieving such reduction) the Administrator determines has been adequately demonstrated"[(3)].

Compliance with required performance is determined by testing procedures specified with the standards. The use of the procedure called "Method 5 Determination of Particulate Emissions from Stationary Sources"[(4)] is specified in all instances where particulate mass emission measurements must be made. A copy of the Method as promulgated is given in Appendix A. The Method 5 procedure consists of isokinetic extraction of a sample from the emission stream with a heated probe and collection of the particulates on a heated filter. With the recent exception of fossil fuel-fired power plants[(5)], the same sampling system operating parameters have been adopted for all stationary sources.

The source categories subject to Method 5 particulate measuremenrs include diverse processes which encompass a wide range of the following emission characteristics; moisture content, gas temperature, gas composition, particulate concentration and composition, and flow dynamics. Interaction of these emission properties with the Method 5 sampling technique can produce significant variations in the results of particulate emission measurements. The following are examples of some of the reactions which may affect particulate measurements.

(1) SO_3 or H_2SO_4 in emissions can condense to form sulfates which increase the mass of collected "particulates". The SO_3-H_2SO_4 dew point is dependent on SO_3 concentration and moisture content of the emissions.

(2) The filter particulate catch may present a surface for reactions with gaseous emission components such as SO_x and NO_x. Reactivity would be dependent on particulate loading and composition and on gas composition of the emissions as well as interactions with the filter media.

(3) Changes in gas temperature in the sampling system may alter the apparent particulate concentration through condensation, or volatilization.

Such interactions with the sampling process must be recognized and controlled if Method 5 is expected to yield reliable particulate measurements for individual source categories.

The work presented in this report was performed as a part of an EPA program to study the applicability of the Method 5 procedure to measurement of particulate emissions from a variety of stationary sources. Specifically, this work addresses the question of whether Method 5 provides an accurate, reliable measurement of particulate emissions from secondary lead smelters. Volumes I, II, and IV in this series cover similar studies of cement plants, oil-fired steam generators, and basic oxygen steel making furnaces, respectively. Volume III is on gas temperature control during Method 5 sampling.

2. CONCLUSIONS

The following conclusions regarding the methodology for determining particulate emissions from secondary lead plants may be drawn from this study.

SAMPLING SYSTEM TEMPERATURE

Operation of the Method 5 sampling system with probe outlet and filter box temperatures of 93°C (200°F) and 149°C (300°F) yielded equivalent mass loading results based on statistical differences in the particulates collected at the two different sampling system temperatures. Therefore, it is concluded that operation of the sampling system at the minimum temperatures recommended in Method 5 produces representative mass emission measurements and that variations from 93 to 149°C do not affect the results.

FILTER MEDIA

Sampling with MSA 1106 BH glass filter as specified by Method 5 and the ADL quartz-type filter yielded no statistically significant differences either in respect to particulate mass loading or in the compositions of the collected emissions.

CHEMICAL INTERACTIONS

The Method 5 sampling train system did not induce compositional changes in the particulate collections. Samples taken from the probe and filter sections of the sampling train were compared compositionally with grab samples and with samples taken from the stack emission control baghouse collector and were found to be similar in chemical compositions.

PRECISION

The precision (repeatability) of particulate mass emissions by Method 5 on the basis of paired sampling tests was found to be about 1.5 percent when the two systems were operated simultaneously at a single fixed point in the stack. This precision was attained over a 5-day sampling period despite considerable variation in the particulate emission loadings.

COLLECTION EFFICIENCY

Examination of the impinger collections revealed only a very small fraction (0.4 percent of the Pb -- which constituted the probe and filter section loadings was transported through the filter. Approximately 26 percent of the total As passed through the filter and was collected in the impingers.

PARTICULATE EMISSION COMPOSITIONS

The major components of the particulate emissions was found to be lead, probably as $PbSO_4$ and/or $PbCl_2$ which constituted 80 to 85 percent of the emissions. Other heavy metals were Sn, Cd, Zn, Sb, and As, again probably present as chlorides and/or sulfates and in quantities of about 4, 1, 1, 0.5, and 0.5 percent of the particulate emissions. Organics, as indicated by the carbon contents of the emissions and by the extracts from the impinger solutions, constitute less than one percent by weight of the emissions and these are comprised mostly of relatively low molecular weight aliphatic compounds, carbonyls, esters, and diacids.

3. RECOMMENDATIONS

The results of this study indicate the EPA Method 5 is a satisfactory procedure for measuring particulate emissions from secondary lead plants and that no modifications are required to obtain representative and reproducible mass emission measurements.

4. OBJECTIVES

The objective of the overall EPA program is the evaluation of the applicability and reliability of Method 5 (conducted as specified in the Federal Register, December 23, 1971) for the determination of particulate mass emissions from stationary sources for which performance standards have been promulgated. The portion of the overall program covered by this report is aimed at evaluation of Method 5 performance when the procedure is applied to secondary lead smelters. The study sought to identify any characteristics of the sampling method or unique properties of process emissions which would adversely effect particulate measurements and, if possible, recommend appropriate corrective measures in sampling methodology.

A secondary objective in this program is the characterization of the emission species particularly in regard to heavy metal concentrations.

5. EXPERIMENTAL WORK AND RESULTS

EXPERIMENTAL APPROACH

An experimental plan was drawn up to test and evaluate the sensitivity of Method 5 to key sampling variables, including temperature, filter media, loading and to determine the specific chemical composition of the particulate emissions. The approach used was similar to that employed previously[6] and consisted of concurrent sampling at a single point in the stack with two Method 5 sampling train systems operated under the chosen conditions of study. Experiments were carried out in a statistically designed test pattern to permit the significance of observed differences to be assessed. The Method 5 sampling procedure as detailed in the Federal Register was strictly adhered to in the experimental tests except for stack profiling and, of course, the use of the planned variations designed to test the sensitivity of the method and to reveal potential problem areas.

Filter and probe collections were analyzed gravimetrically for mass loadings and in detail chemically to detect changes, if any, induced by the collection process. The sampling catches were compared compositionally with grab samples and with collections from the baghouse.

Descriptions of the secondary lead emission source, experimental testing, and test results are detailed in the following sections.

PROCESS AND SAMPLING SITE DESCRIPTIONS

Secondary Lead Smelting Process

This experimental study was performed at a secondary lead plant which uses a blast furnace for the smelting and refining process. The furnace is fed nearly continuously with coke, cast iron scrap, batteries, limestone, a silaceous slag, drosses and other lead-containing residues. About 10 charges are fed each 8-hour shift with a 7100 pound charge yielding about 4800 pounds of lead. Figure 1 shows the gas flow through the plant. Air is blown into the furnace to burn the coke in the feed. The heat of combustion melts the lead and the coke reduces the lead oxides. The off-gas from the furnace is combusted in an afterburner to oxidize any odiferous compounds and to incinerate oily and sticky materials which may blind the fabric filters. The off-gas is cooled in three air-cooled cyclones in series which also remove most of the dust. The remaining dust is removed in a baghouse. The gas is then exhausted through a 154-ft high stack.

A sketch of the blast furnace is shown in Figure 2. The furnace, rated at about 77 tons/day, is loaded from the top and tapped for lead recovery at the bottom of the hearth. Slag, which normally floats on the surface of the lead, also is drawn off near the bottom of the furnace. The

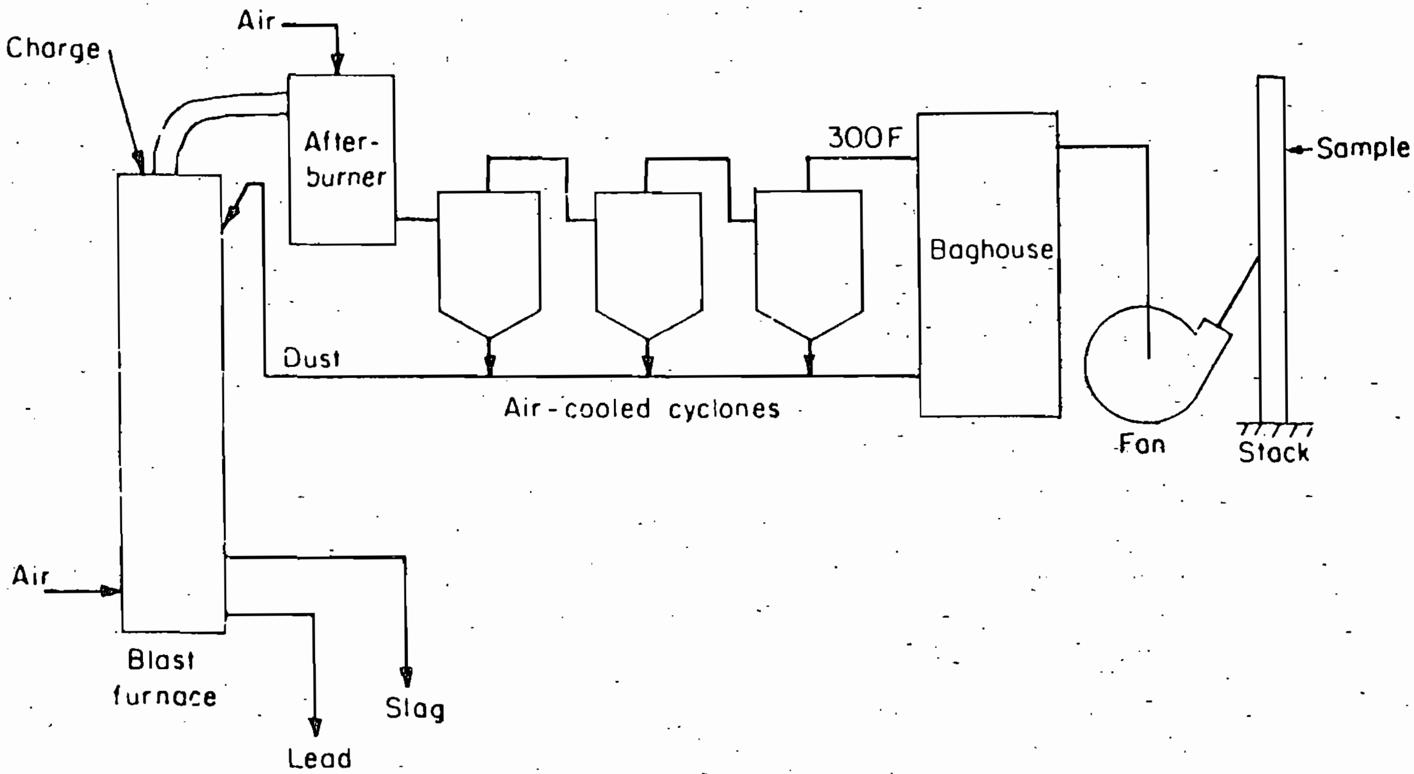

Figure 1. Gas flow diagram blast furnace secondary lead smelter.

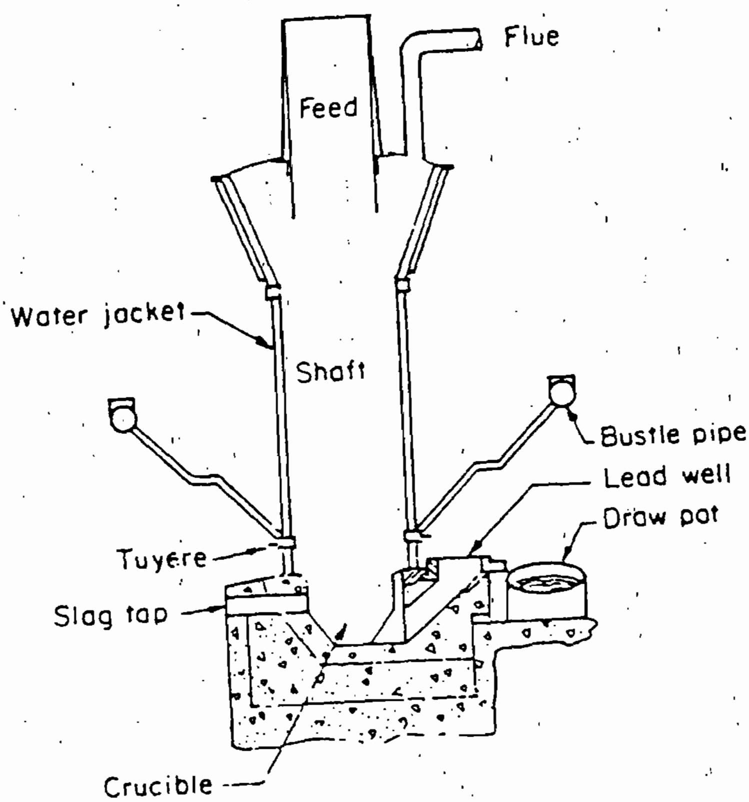

Figure 2. Lead blast furnace.

main gas stream leaving the blast furnace is heated to about 650 C (1200 F) in an afterburner with a natural gas flame in which most of the hydrocarbons and some CO in the exhaust gas are burned. The gas then passes through three forced air and water-cooled cyclones which also remove some particulates. The gas stream is cooled from about 650 C to about 150 C in the cyclones by heat transfer and by dilution with leakage air. Each volume of gas from the blast furnace is diluted with about 11 volumes of air in the exhaust system.

The sampling experiments were conducted at roof level (about 34 ft above ground) on the 46.9m (154-ft) stack after the gas from the blast furnace had passed through a baghouse. The diameter of the stack was about 1.22 m (4 ft) with two 7.62 cm (3-inch) diameter portholes, set at 90 degrees from each other and about 4 ft above roof level, providing access for the sampling probes. The velocity, pressure drop and temperature profiles of the stack are shown in Figure 3. The general emission characteristics of blast furnace stack emissions are given on Table 1. With the high volume of air dilution into the stack the gas composition is essentially that of ambient air except for the CO_2 and small amounts of SO_2 and CO. Particulate content varied from about 134 to 378 mg/Nm^3 during the test runs carried out over a 5 day period. During the 5 day sampling period the plant operators were having considerable difficulty with the emission control system, and the particulate emissions varied considerably, being well above the highest level of 6.4 mg/Nm^3 obtained in 1972 at this plant by Battelle personnel.

Sampling Equipment

Particulate sampling was performed with two identical Method 5 sampling trains operated concurrently. A single Type S pitot tube positioned equidistance between the sampling nozzles was used to measure velocity pressure of the stack gas. With the exceptions listed below, the trains consisted of components assembled as described in the Federal Register, Sections 2 and 3 of the Method 5 procedure.

Temperature Measurements

The glass connectors from the probe outlet to the filter and the filter outlet to the first impinger were modified to permit additional measurements of gas sample temperature. The probe outlet-to-filterholder connector contained a thin-wall thermocouple well which extends about 5.1 cm (2 inches) into the outlet end of the probe. The filterholder-to-impinger connector was fitted with a bi-metal dial thermometer. The tip of the thermometer was positioned about 1.3 cm (0.5 inch) from the filterholder frit.

Filter Materials

Mine Safety Appliance (MSA) 1106 BH glass fiber filter materials and Arthur D. Little experimental quartz filters were used throughout the test series.

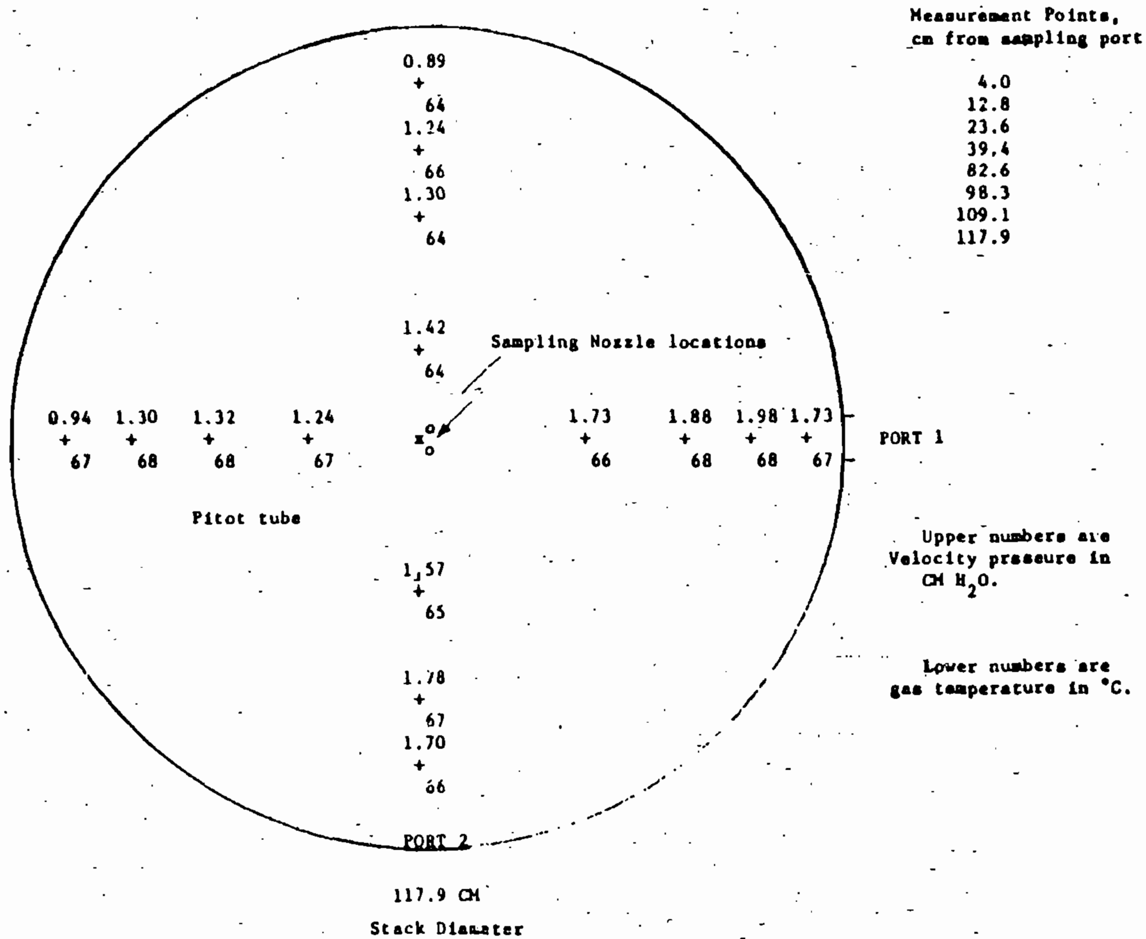

Figure 3. Velocity pressure and temperature profile of stack.

TABLE 1. EMISSION SOURCE CHARACTERISTICS

Flue Gas Conditions	
Temperature	61-74 C (142-165F)
Volumetric flow	49277 Nm^3/hr (29,000 DSCFM)
Average ΔP	1.47 cm (.58 in) H_2O
Static pressure	0.76 cm (0.3 in) H_2O, negative
Flue and Port Dimensions	
Flue size -	1.22m (4 ft) diameter
Port diameter -	7.62cm (3 in)
Composition of Stack Emissions	
Particulates	~216 mg/Nm^3 (avg.)
N_2	78.5%
O_2	18.5%
CO_2	2.3%
CO	65 ppm
SO_2	300 ppm
Moisture	~3 percent

Impingers

In some runs, the first impinger was loaded with 6N HNO_3 and the second with 1N NaOH to collect any volatile metals which might pass through the box filter.

Gas analyses for CO_2 and O_2 were performed with Fyrite equipment. In addition grab samples were taken with an evacuated glass gas sampling bulbs for mass spectrometric analysis of gases and low molecular weight organic species.

SAMPLE COLLECTION AND ANALYSIS PROCEDURES

Particulate Sampling

In all tests, particulate sampling was performed concurrently with two identical sampling train units (designated A and B) each with a separate operator. Sampling system equipment and operating conditions used in the tests were varied in accordance with a statistically designed experimental pattern.

All sampling was performed at a fixed-point at the center of the duct in an area of nearly uniform velocity. Sampling probes of the two systems were inserted into the duct through two ports, situated in the stack at a 90-degree angle to each other, so that the pitot tube attached to one of the probes was positioned equidistance between the sampling nozzles. The separation between the pitot tube and each nozzle was about 2.5 cm (1 inch).

At the start of each test day, the laboratory calibration of the gas metering components of both sampling systems was checked by setting the orifice manometer (ΔH) to the meter box calibration factor ($\Delta H@$) and measuring the flow rate through the dry gas meter over a 5-minute period. A flow rate of 0.021 m^3/min (0.75 cfm) confirmed that the gas metering system remained in calibration.

The preparation of the particulate collection trains for all tests was performed as specified in Paragraph 4.1.2 of Method 5.

In performance of the tests, sampling trains were operated as described in Paragraph 4.1.3 of Method 5 with the exception that readings of ΔP, ΔH, stack temperature and sampling system temperatures were recorded at 10-minute intervals. The velocity head (ΔP) for both systems was determined from one pitot tube and nomographs were used to obtain the proper sampling rate (ΔH). Temperature measurements were obtained at the points shown in Figure 4.

The sampling period for each test was 150 minutes and the total dry gas sample volumes at isokinetic sampling rates ranged from about 3 to 5.5Nm^3.

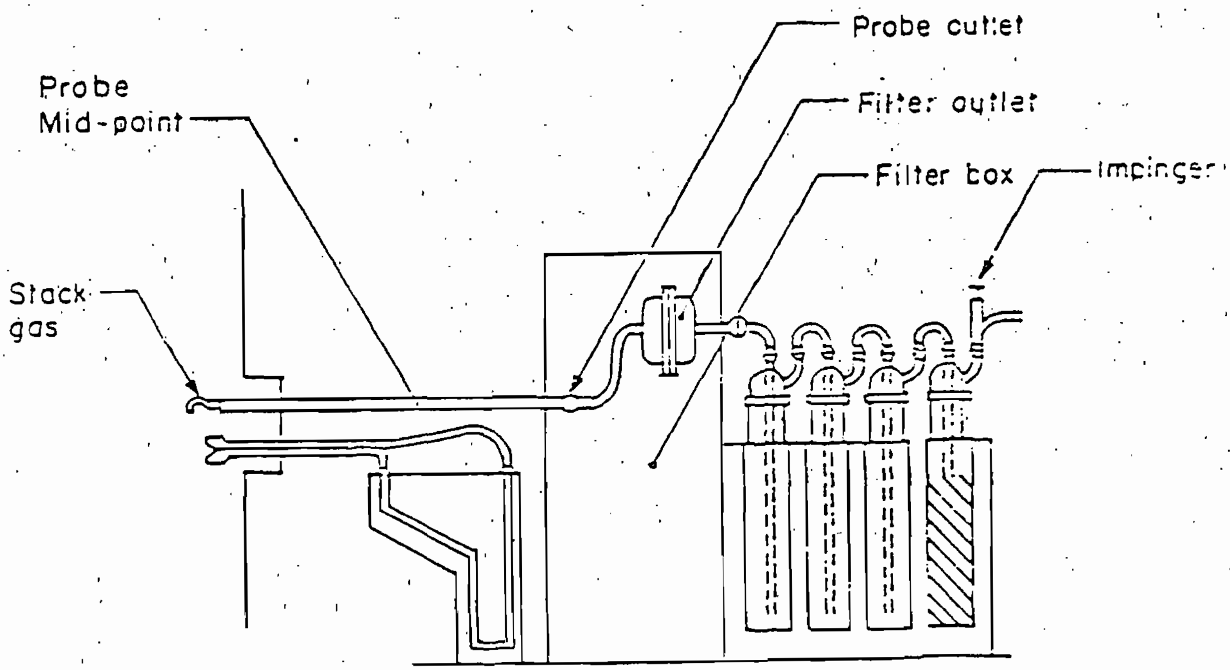

Figure 4. Temperature measurement points.

After completion of the tests, the trains were again leak checked, sealed to prevent contamination, and transferred to the sample recovery area.

Sample Recovery and Analysis

Filters were removed from holders, sealed in Petri dishes and immediately placed in a desiccator. The probe and nozzle were disassembled with washed separately. First, the probe was first rinsed with acetone without brushing, then rinsed with acetone while slowly inserting and removing a Nylon brush in a rotating fashion. The acetone wash and brushing were continued until visual inspection indicated that all particulates were removed. The brush was thoroughly flushed with acetone prior to removal from the probe. The probe wash (usually about 100 to 150 ml) was collected in an Erlenmeyer flask sealed onto the probe outlet ball joint. Particulates were recovered from the nozzle and the inlet half of the filter holder by alternately brushing and rinsing with acetone. The wash solutions from all three components (probe, nozzle, and filterholder) were combined for analysis.

At least one 200 ml acetone blank was obtained each day from the wash bottle dispenser. All acetone wash solutions and blanks were stored in glass bottles with Teflon-lined caps for transfer to the laboratory for analysis.

The filters and particulate catch were desiccated at least 24 hours (usually longer) prior to weighing. Acetone wash solutions were evaporated to dryness in a reverse airflow, clean hood and the residues were desiccated to a constant weight (usually 24 to 48 hours). Residues and filters were weighed to the nearest 0.1 mg.

All calculations were performed as described in Section 6 of Method 5.

TEST DESCRIPTIONS AND RESULTS

Variables selected for study were the sampling system temperature, the filter media, and the particulate loading. These, together with detailed chemical analyses of the particulate catches and gaseous emission to indicate potential chemical interactions (and possible formation of pseudo particulates) should indicate the reliability and sensitivity of Method 5 to the measurement of emissions from secondary lead plant operations.

The randomized test pattern for the study of the effects of the system variables temperature and filter media is shown in Table 2. An additional test pair was run wherein the filter in one system was changed midway through the 4-hour test period to assess the effect of particulate loading.

The experimental tests were carried out over a 5-day period when the plant was operating at full capacity. Some difficulty was being encountered with the emission control equipment during this period which resulted in overall higher and more erratic stack emissions than normally anticipated.

TABLE 2. RANDOMIZED TEST PATTERN FOR STUDY OF EFFECTS OF SYSTEM TEMPERATURE - FILTER MEDIA - SECONDARY LEAD PLANT DATA

Replication	Block	Test Number	System A[a] Temperature, C	System A[a] Media	System B[a] Temperature, C	System B[a] Media
1	1	1[b]	149	ADL	149	MSA
1	2	2[b]	93	ADL	93	MSA
2	1	3[c]	149	ADL	93	MSA
2	2	4[c]	149	MSA	93	ADL
3	1	5[d]	93	ADL	149	ADL
3	2	6[d]	149	MSA	93	MSA

(a) Both System A and System B are Method 5 trains.
(b) Tests 1 and 2 confound temperature with Blocks.
(c) Tests 3 and 4 confound temperature/filter with Blocks.
(d) Tests 5 and 6 confound filter with Blocks.

Particulate Measurements

The particulate collection data obtained in the seven paired runs are given in Table 3. Sampling and stack gas data for the runs are presented in the Appendix B.

The analysis of variance of the six runs (1 through 6) to study filter and temperature effects is shown in Table 4. The conclusions drawn from the statistical analysis are that neither variation of the filter media (MSA and ADL) nor the sampling system temperature (at 93 and 149C) had a statistically significance on the particulate mass results. Analysis of the variation in the six test pairs shows good repeatability with an overall coefficient of variation of 1.48 percent.

In Run 7, the System B box filter was changed midway through the four hour sampling period. System A filter was unchanged. The good agreement in the pair of results indicates that there is not a significant effect of mass loading or of reaction of the stack gases with the particulates catch on the filter.

Compositional Analyses

Probe and Filter Residues. Selected particulate catches from the probe, filter, and impinger segments of the sampling train, together with a bulk sample and a sample taken from the baghouse, were analyzed in detail to ascertain the compositions of the emissions.

Metallic elements were analyzed semiquantitatively by optical emission spectrography and the results obtained are shown in Table 5. These data indicate no great differences among the probe, filter catch, baghouse, or grab sample compositions. Selected additional probe and filter catch samples together with the grab sample and a baghouse sample were analyzed quantitatively and the results obtained are shown in Table 6. Again no major differences are observed among these samples. From averages of the quantitative data from Table 6 the cation, anion, and C values total 96.2 percent with presumably additional oxygen in the form of metallic oxides making up the difference between 96.2 and 100 percent. Cation-anion ratio given in Table 7 show an imbalance of 0.171 (0.913 - 0.742 = 0.171) which if attributed to oxygen gives a content of 1.4 percent. With the value for the additional undetermined oxygen and the Table 5 average values for cations, anions, and carbon compositional balance of 97.6 percent is obtained. This value, within analytical error, is sufficiently close to 100 percent to indicate that no other elements are present in more than trace amounts.

Impinger Residues. Total impinger catches (extracted organics plus aqueous residue) averaged approximately 7 percent of the front half particulate catch. The impinger catches collected in 6N HNO_3 and 1N NaOH were examined analytically to determine if potentially volatile metallic elements such as Pb and As, were carried through the filter. Organic extracts were analyzed gravimetrically and by infrared spectrometry.

TABLE 3. PARTICULATE COLLECTION DATA - SECONDARY LEAD PLANT

Run No	Temperature C Filter	Temperature C Probe Out	Filter	Particulate Catch, mg Filter	Particulate Catch, mg Probe	Particulate Catch, mg Total	Particulate Loading, mg/Nm^3
1A	142	148	ADL	766.1	344.5	1110.6	209.0
B	149	148	MSA	732.9	298.8	1031.7	203.8
2A	94	95	ADL	305.6	160.8	556.4	159.3
B	97	93	MSA	390.9	138.8	529.7	158.9
3A	92	94	ADL	488.7	125.3	614.0	180.5
B	149	148	MSA	459.9	135.6	595.5	182.5
4A	94	94	MSA	377.8	90.2	468.0	133.6
B	149	148	ADL	354.3	99.3	453.6	134.4
5A	148	148	MSA	414.0	177.5	591.5	170.0
B	96	99	MSA	397.8	178.9	557.7	166.2
6A	92	92	ADL	949.6	325.9	1275.5	377.8
B	151	148	ADL	972.1	232.0	1204.1	369.8
7A (a)	123	122	ADL	691.1	165.1	856.2	290.6
B (a)	118	120	ADL	693.6	140.3	833.9	293.9

(a) Filter changed midway through 4 hour test.

TABLE 4. ANALYSIS OF VARIANCE - FILTER MEDIA/SAMPLING SYSTEM TEMPERATURE EXPERIMENTS - SECONDARY LEAD PLANT

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F[a] Ratio	Conclusion
Filter Media (F)	1	2.4200	2.4200	0.1566	Not Significant
Temperature (T)	1	0.2450	0.2450	0.0159	Not Significant
F x T	1	6.1250	6.1250	0.3964	Not Significant
Reps	2	28,291.3067	14,145.6533	--	--
Blocks/Reps	3	46,806.0300	15,602.0100	--	--
Remainder	3	46.3500	15.4500	--	--
Total	11	75,152.4767	6832.0433	--	--

(a) For an F-ratio with 1 to 3 degrees of freedom, any calculated value of F exceeding 5.54 is significant at the 90 percent confidence level, exceeding 10.13 is significant at the 95 percent confidence level, and exceeding 34.12 is significant at the 99 percent confidence.

TABLE 5. ANALYSIS OF PARTICULATE EMISSIONS FROM SECONDARY LEAD SMELTER[a]

Sample	Weight Percent of Element in Sample																						
	Pb	Sn	Zn	As	Na	K	Si	Fe	Sb	Cu	Cd	Mg	Mn	Bi	Cr	Al	V	Ni	Ca	Ba	B	Mo	Ag
Filter (3A)	40-60	1-3	0.3	0.3	2-4	1	0.2	0.1	0.2	0.03	0.5-1	≤0.001	0.003	0.003	≤0.001	0.003	≤0.001	≤0.001	0.03	≤0.001	≤0.001	≤0.001	≤0.0005
Filter (3B)	40-60	1-3	0.3	0.3	2-4	1	0.2	0.1	0.2	0.03	0.5-1	≤0.001	0.001	0.003	≤0.001	0.003	≤0.001	≤0.001	0.03	≤0.001	≤0.001	≤0.001	≤0.0005
Probe (3A)	40-60	1-3	0.3	0.2	2-4	1	0.5	0.3	0.2	0.03	0.5-1	0.01	0.005	0.003	0.005	0.2	≤0.001	0.003	0.03	≤0.001	≤0.001	0.003	≤0.0005
Probe (3B)	40-60	1-3	0.3	0.2	2-4	1	0.3	0.3	0.2	0.03	0.5-1	0.01	0.005	0.003	0.005	0.2	≤0.001	0.003	0.03	≤0.001	≤0.001	0.003	≤0.0005
Baghouse catch	40-60	1-3	0.3	0.1	2-4	1	0.02	0.3	0.2	0.03	0.5-1	≤0.001	0.001	0.003	0.001	≤0.001	≤0.001	≤0.001	0.02	≤0.001	≤0.001	≤0.001	≤0.0005
Bulk sample	40-60	1-3	0.3	0.2	2-4	1	0.02	0.3	0.2	0.03	0.5-1	≤0.001	0.002	0.003	0.001	.003	≤0.001	≤0.001	0.02	≤0.001	≤0.001	≤0.001	≤0.0005

(a) Analysis performed by optical emission spectroscopy

TABLE 6. CHEMICAL ANALYSIS OF PARTICULATE EMISSIONS FROM SECONDARY LEAD SMELTING PROCESS

	Weight Percent in Sample												
Sample	Pb	Sn	As	Cd	Sb	Zn	$SO_4^=$	Cl^-	HCO_3^-	C	N	P	pH
Method 5 Filter (1A)	59.5	2.09	0.20	0.62	0.21	0.52	7.53	19.3	ND	.15	—	0.05	4.4
Method 5 Filter (2B)	60.1	2.11	0.24	0.64	0.31	0.53	4.61	23.4	1.0	--	--	0.07	5.4
Method 5 Probe Residue (1A)	55.1	2.07	0.18	0.75	0.22	0.59	6.50	20.7	0.22	1.7	--	0.06	4.8
Method 5 Probe Residue (2B)	55.7	2.27	0.20	0.55	0.22	0.70	6.09	21.6	0.43	--	--	0.06	5.2
Grab Sample of Stack emissions	60.5	2.05	0.22	0.64	0.27	0.47	6.92			.34	.21	0.07	4.7
Baghouse Catch	61.2	1.97	0.22	0.66	0.25	0.46	5.94	22.4	0.44	--	--	0.06	5.1

TABLE 7. CATION/ANION BALANCE IN SECONDARY LEAD PLANT EMISSION SAMPLES

Cation	Percent	Equivalent	Anion	Percent	Equivalent
$Pb^{=}$	58.7	0.567	$SO_4^{=}$	6.20	0.129
$Sn^{\equiv\equiv}$	2.1	0.071	Cl^{-}	21.5	0.606
$Zn^{=}$	0.55	0.017	HCO_3^{-}	0.4	0.007
$Cd^{=}$	0.65	0.012	Totals	28.1	0.742
$Sb^{\equiv}$	0.25	0.006	Total cation	= 0.913	
$As^{\equiv}$	0.21	0.008	Total anions	= 0.742	
Na^{-}	3.0	0.13	Difference	= 0.171: calculated as O_2 = 1.4 percent	
K^{-}	1.0	0.026			
$Si^{\equiv}$	0.2	0.040			
$Ca^{=}$	0.05	0.003			
$Fe^{\equiv}$	0.2	0.011			
$Al^{\equiv}$	0.2	0.022			
Totals	67.11	0.913			

Organic constituents were determined from chloroform-ether and acetone extracts from selected impinger washes. By weight these constituted about 9 to 15 percent, respectively, of the total residues in the impinger washes. Infrared spectrometric analysis showed the chloroform-ether extracts to be principally a complex mixture of carbonyl components with relatively short chains (aliphatics - high CH_3), a small amount of aromatic structure, some ether structure, and a small amount of hydroxyl. The acetone extract primarily consisted of sulfonic acids.

Inorganic analysis of the HNO_3 and NaOH impinger solutions were made by optical emission spectrography. The results show that about 0.4 of the total lead was collected in the impingers. However, about 26 percent of the total arsenic passed through the filter and was collected in the impinger.

Gaseous Components

Grab samples were taken of the stack gases by use of evacuated sampling bulbs and these were analyzed by gas chromatography and gas mass spectrometry. The results obtained are given in Table 8.

Except for the hydrocarbons found in Sample 1, the following were not detected and were less than 2 ppm in both samples: C_2H_2, C_2H_4, C_2H_6, C_2H_8, C_4H_{10}, C_5H_{10}, C_6H_{14}, CH_3OH, C_2H_5OH, COS, CS_2, H_2S and HCl. As stated previously, the principal component of the highly diluted stack gas in air. An SO_2 level of 200 to 400 ppm was found plus about 65 ppm of CO. No HCl nor free chorine were detected.

TABLE 8. GAS CHROMATOGRAPHIC AND MASS SPECTROMETRIC ANALYSIS OF GASEOUS EMISSIONS FROM SECONDARY LEAD SMELTER

Sample	Volume percent										
	CO_2	O_2	N_2	A	H_2	SO_2	C_6H_4	C_4H_{10}	C_3H_8	CO	CH_4
1	2.3	18.1	78.5	0.94	0.06	0.04	0.02	0.04	0.02	62	4
2	2.4	18.8	78.5	0.94	0.06	0.02	<0.01	<0.01	0.01	67	4

6. DISCUSSION

The parameters selected for study - sampling system temperature, filter media, and filter loading -- were those deemed most likely to have an effect in the application of Method 5 to the determination of particulate mass emissions from secondary lead plants. However, results of this study indicate that these factors within the limits investigated to not significantly effect the mass emission results obtained with Method 5. Unfortunately, during the sampling period, emissions from the secondary lead plant studied were higher than normal. Therefore the study results must be qualified somewhat by this fact. For example, at a lower particulate loading, the effects of the reaction of SO_2 or SO_3 with the filter medium could result in a detectable error.

The chemical analysis provide important data which corraborate the findings of the particulate mass measurements. The probe and filter catches have essentially the same composition as a grab sample and a sample of the baghouse catch which also indicates that the particulates collected by Method 5 are representative of the emission source and that no alterations occur during sampling.

7. REFERENCES

1. Federal Register, Volume 26, No. 247, pgs 24876-24895, Thursday, December 23, 1971.

2. Federal Register, Volume 30, No. 47, pgs 9308-9323, Friday, March 8, 1974.

3. Federal Register, Volume 30, No. 177, pg 32852, Wednesday, September 11, 1974.

4. Reference 1, pgs 24888-24890.

5. Reference 3, page 32856.

6. Evaluation of Stationary Source Particulate Measurement Methods -- Volume 1, Portland Cement Plants, EPA-650/2-75-051a, June 1975.

7. Sittig, M., Environmental Sources and Emissions Handbook, Noyes Data Corp., Park Ridge, New Jersey, pp 331-333 (1975).

APPENDIX A

EPA METHOD 5
Federal Register, December 23, 1971

METHOD 5—DETERMINATION OF PARTICULATE EMISSIONS FROM STATIONARY SOURCES

1. *Principle and applicability.*

1.1 Principle. Particulate matter is withdrawn isokinetically from the source and its weight is determined gravimetrically after removal of uncombined water.

1.2 Applicability. This method is applicable for the determination of particulate emissions from stationary sources only when specified by the test procedures for determining compliance with New Source Performance Standards.

2. *Apparatus.*

2.1 Sampling train. The design specifications of the particulate sampling train used by EPA (Figure 5-1) are described in APTD-0581. Commercial models of this train are available.

2.1.1 Nozzle—Stainless steel (316) with sharp, tapered leading edge.

2.1.2 Probe—Pyrex[1] glass with a heating system capable of maintaining a minimum gas temperature of 250° F. at the exit end during sampling to prevent condensation from occurring. When length limitations (greater than about 8 ft.) are encountered at temperatures less than 600° F., Incoloy 825[1], or equivalent, may be used. Probes for sampling gas streams at temperatures in excess of 600° F. must have been approved by the Administrator.

2.1.3 Pitot tube—Type S, or equivalent, attached to probe to monitor stack gas velocity.

[1] Trade name.

2.1.4 Filter Holder—Pyrex[1] glass with heating system capable of maintaining minimum temperature of 225° F.

2.1.5 Impingers / Condenser—Four impingers connected in series with glass ball joint fittings. The first, third, and fourth impingers are of the Greenburg-Smith design, modified by replacing the tip with a ½-inch ID glass tube extending to one-half inch from the bottom of the flask. The second impinger is of the Greenburg-Smith design with the standard tip. A condenser may be used in place of the impingers provided that the moisture content of the stack gas can still be determined.

2.1.6 Metering system—Vacuum gauge, leak-free pump, thermometers capable of measuring temperature to within 5° F., dry gas meter with 2% accuracy, and related equipment, or equivalent, as required to maintain an isokinetic sampling rate and to determine sample volume.

2.1.7 Barometer—To measure atmospheric pressure to ±0.1 inches Hg.

2.2 Sample recovery.

2.2.1 Probe brush—At least as long as probe.

2.2.2 Glass wash bottles—Two.

2.2.3 Glass sample storage containers.

2.2.4 Graduated cylinder—250 ml.

2.3 Analysis.

2.3.1 Glass weighing dishes.

2.3.2 Desiccator.

2.3.3 Analytical balance—To measure to ±0.1 mg.

2.3.4 Trip balance—300 g. capacity, to measure to ±0.05 g.

3. *Reagents.*

3.1 Sampling.

3.1.1 Filters—Glass fiber, MSA 1106 BH[1], or equivalent, numbered for identification and preweighed.

3.1.2 Silica gel—Indicating type, 6-16 mesh, dried at 175° C. (350° F.) for 2 hours.

3.1.3 Water.

3.1.4 Crushed ice.

3.2 Sample recovery.

3.2.1 Acetone—Reagent grade.

3.3 Analysis.

3.3.1 Water.

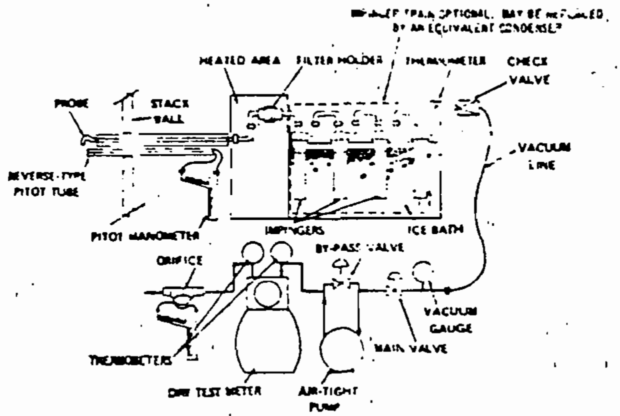

Figure 5-1. Particulate sampling train.

3.3.2 Desiccant—Drierite[1], indicating.

4. *Procedure.*

4.1 Sampling.

4.1.1 After selecting the sampling site and the minimum number of sampling points, determine the stack pressure, temperature, moisture, and range of velocity head.

4.1.2 Preparation of collection train. Weigh to the nearest gram approximately 200 g. of silica gel. Label a filter of proper diameter, desiccate[2] for at least 24 hours and weigh to the nearest 0.5 mg. in a room where the relative humidity is less than 50%. Place 100 ml. of water in each of the first two impingers, leave the third impinger empty, and place approximately 200 g. of preweighed silica gel in the fourth impinger. Set up the train without the probe as in Figure 5-1. Leak check the sampling train at the sampling site by plugging up the inlet to the filter holder and pulling a 15 in. Hg vacuum. A leakage rate not in excess of 0.02 c.f.m. at a vacuum of 15 in. Hg is acceptable. Attach the probe and adjust the heater to provide a gas temperature of about 250° F. at the probe outlet. Turn on the filter heating system. Place crushed ice around the impingers. Add more ice during the run to keep the temperature of the gases leaving the last impinger as low as possible and preferably at 70° F., or less. Temperatures above 70° F. may result in damage to the dry gas meter from either moisture condensation or excessive heat.

4.1.3 Particulate train operation. For each run, record the data required on the example sheet shown in Figure 5-2. Take readings at each sampling point, at least every 5 minutes, and when significant changes in stack flow conditions necessitate additional adjustments [illegible]

4.2

[1] Trade name.

[2] Dry using Drierite[1] at 70° F. ±10° F.

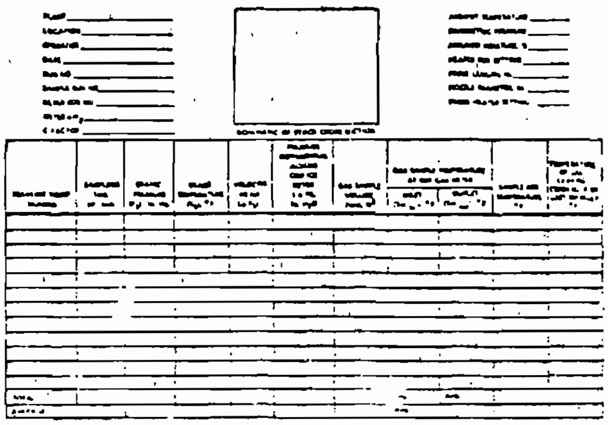

Figure 5-2. Particulate field data.

4.2 Sample recovery. Exercise care in moving the collection train from the test site to the sample recovery area to minimize the loss of collected sample or the gain of extraneous particulate matter. Set aside a portion of the acetone used in the sample recovery as a blank for analysis. Measure the volume of water from the first three impingers, then discard. Place the samples in containers as follows:

Container No. 1. Remove the filter from its holder, place in this container, and seal.

Container No. 2. Place loose particulate matter and acetone washings from all sample-exposed surfaces prior to the filter in this container and seal. Use a razor blade, brush, or rubber policeman to lose adhering particles.

Container No. 3. Transfer the silica gel from the fourth impinger to the original container and seal. Use a rubber policeman as an aid in removing silica gel from the impinger.

4.3 Analysis. Record the data required on the example sheet shown in Figure 5-3. Handle each sample container as follows:

Container No. 1. Transfer the filter and any loose particulate matter from the sample container to a tared glass weighing dish, desiccate, and dry to a constant weight. Report results to the nearest 0.5 mg.

Container No. 2. Transfer the acetone washings to a tared beaker and evaporate to dryness at ambient temperature and pressure. Desiccate and dry to a constant weight. Report results to the nearest 0.5 mg.

Container No. 3. Weigh the spent silica gel and report to the nearest gram.

5. *Calibration.*

Use methods and equipment which have been approved by the Administrator to calibrate the orifice meter, pitot tube, dry gas meter, and probe heater. Recalibrate after each test series.

6. *Calculations.*

6.1 Average dry gas meter temperature and average orifice pressure drop. See data sheet (Figure 5-2).

6.2 Dry gas volume. Correct the sample volume measured by the dry gas meter to standard conditions (70° F., 29.92 inches Hg) by using Equation 5-1.

$$V_{m_{std}}=V_m\left(\frac{T_{std}}{T_m}\right)\left(\frac{P_{bar}+\frac{\Delta H}{13.6}}{P_{std}}\right)=\left(17.71\ \frac{°R}{\text{in. Hg}}\right)V_m\left(\frac{P_{bar}+\frac{\Delta H}{13.6}}{T_m}\right)$$

equation 5-1

where:

$V_{m_{std}}$ = Volume of gas sample through the dry gas meter (standard conditions), cu. ft.

V_m = Volume of gas sample through the dry gas meter (meter conditions), cu. ft.

T_{std} = Absolute temperature at standard conditions, 530° R.

T_m = Average dry gas meter temperature, °R.

P_{bar} = Barometric pressure at the orifice meter, inches Hg.

ΔH = Average pressure drop across the orifice meter, inches H_2O.

13.6 = Specific gravity of mercury.

P_{std} = Absolute pressure at standard conditions, 29.92 inches Hg.

6.3 Volume of water vapor.

$$V_{w_{std}}=V_{l_c}\left(\frac{\rho_{H_2O}}{M_{H_2O}}\right)\left(\frac{RT_{std}}{P_{std}}\right)=\left(0.0474\ \frac{\text{cu. ft.}}{\text{ml.}}\right)V_{l_c}$$

equation 5-2

where:

$V_{w_{std}}$ = Volume of water vapor in the gas sample (standard conditions), cu. ft.

V_{l_c} = Total volume of liquid collected in impingers and silica gel (see Figure 5-3), ml.

ρ_{H_2O} = Density of water, 1 g./ml.

M_{H_2O} = Molecular weight of water, 18 lb./lb.-mole.

R = Ideal gas constant, 21.83 inches Hg—cu. ft./lb.-mole-°R.

T_{std} = Absolute temperature at standard conditions, 530° R.

P_{std} = Absolute pressure at standard conditions, 29.92 inches Hg.

6.4 Moisture content.

$$B_{wo}=\frac{V_{w_{std}}}{V_{m_{std}}+V_{w_{std}}}$$

equation 5-3

where:

B_{wo} = [illegible]

$V_{w_{std}}$ = [illegible]

$V_{m_{std}}$ = [illegible]

6.5 Total particulate weight. Determine the total particulate catch from the sum of the weights on the analysis data sheet (Figure 5-3).

6.6 Concentration.

6.6.1 Concentration in gr./s.c.f.

$$c'_s=\left(0.0154\ \frac{\text{gr.}}{\text{mg.}}\right)\left(\frac{M_n}{V_{m_{std}}}\right)$$

equation 5-4

where:

c'_s = Concentration of particulate matter in stack gas, gr./s.c.f., dry basis.

M_n = Total amount of particulate matter collected, mg.

$V_{m_{std}}$ = Volume of gas sample through dry gas meter (standard conditions), cu. ft.

APPENDIX B

STACK GAS AND SAMPLING DATA

PLANT ______________

DATE ______________

RUN NO. ______________

CONTAINER NUMBER	WEIGHT OF PARTICULATE COLLECTED, mg		
	FINAL WEIGHT	TARE WEIGHT	WEIGHT GAIN
1			
2			
TOTAL			

	VOLUME OF LIQUID WATER COLLECTED	
	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g
FINAL		
INITIAL		
LIQUID COLLECTED		
TOTAL VOLUME COLLECTED		g* ml

CONVERT WEIGHT OF WATER TO VOLUME BY DIVIDING TOTAL WEIGHT INCREASE BY DENSITY OF WATER. (1 g ml):

$$\frac{\text{INCREASE, g}}{(1\ \text{g/ml})} = \text{VOLUME WATER, ml}$$

Figure 5-3. Analytical data.

6.6 Concentration in lb./cu. ft.

$$c_s' = \frac{\left(\frac{1}{453{,}600}\ \frac{\text{lb.}}{\text{mg.}}\right) M_n}{V_{m_{std}}} = 2.205\times10^{-6}\ \frac{M_n}{V_{m_{std}}} \qquad \text{equation 5-5}$$

where

c_s' = Concentration of particulate matter in stack gas, [illegible] s.c.f., dry basis.

453,600 = Mg./lb.

M_n = Total amount of particulate matter collected, mg.

$V_{m_{std}}$ = Volume of gas sample through dry gas meter (standard conditions), cu. ft.

6.7 Isokinetic variation.

$$I = \frac{T_s\left[\frac{V_{l_c}(\rho_{H_2O})R}{M_{H_2O}} + \frac{V_m}{T_m}\left(P_{bar} + \frac{\Delta H}{13.6}\right)\right]}{\theta V_s P_s A_n} \times 100$$

$$= \frac{\left(1.667\,\frac{\text{min.}}{\text{sec.}}\right)\left[\left(0.00267\,\frac{\text{in. Hg-cu. ft.}}{\text{ml.-°R}}\right)V_{l_c} + \frac{V_m}{T_m}\left(P_{bar} + \frac{\Delta H}{13.6}\right)\right]}{\theta V_s P_s A_n} \qquad \text{Equation 5-6}$$

where

I = Percent of isokinetic sampling.

V_{l_c} = Total volume of liquid collected in impingers and silica gel (See Fig. 5-3), ml.

ρ_{H_2O} = Density of water, 1 g./ml.

R = Ideal gas constant, 21.83 inches Hg-cu. ft./lb.-mole-°R.

M_{H_2O} = Molecular weight of water, 18 lb./lb.-mole.

V_m = Volume of gas sample through the dry gas meter ([illegible] conditions), cu. ft.

T_m = Absolute average dry gas meter temperature (see Figure 5-2), °R.

P_{bar} = Barometric pressure at sampling site, inches Hg.

ΔH = Average pressure drop across the orifice (see Fig. 5-2), inches H_2O.

T_s = Absolute average stack gas temperature (see Fig. 5-2), °R.

θ = Total sampling time, min.

V_s = Stack gas velocity calculated by Method 2, Equation 2-2, ft./sec.

P_s = Absolute stack gas pressure, inches Hg.

A_n = Cross-sectional area of nozzle, sq. ft.

6.8 Acceptable results. The following range sets the limit on acceptable isokinetic sampling results:

If 90% ≤ I ≤ 110%, the results are acceptable, otherwise, reject the results and repeat the test.

7. *Reference.*

Addendum to Specifications for Incinerator Testing at Federal Facilities, PHS, NCAPC, Dec. 6, 1967.

Martin, Robert M., Construction Details of Isokinetic Source Sampling Equipment, Environmental Protection Agency, APTD-0581.

Rom, Jerome J., Maintenance, Calibration, and Operation of Isokinetic Source Sampling Equipment, Environmental Protection Agency, APTD-0576.

Smith, W. S., R. T. Shigehara, and W. F. Todd, A Method of Interpreting Stack Sampling Data, Paper presented at the 63d Annual Meeting of the Air Pollution Control Association, St. Louis, Mo., June 14-19, 1970.

Smith, W. S., et al., Stack Gas Sampling Improved and Simplified with New Equipment, APCA paper No. 67-119, 1967.

Specifications for Incinerator Testing at Federal Facilities, PHS, NCAPC, 1967.

TABLE B-1. STACK GAS DATA - SECONDARY LEAD SMELTER

Run No.	$\sqrt{\Delta P}$ (avg) cm H_2O	T_s (avg) C	P_s mm Hg	O_2, %	CO_2 %	Bwo, %	Md, lb/lb-mole	V_s (avg), m/s
1A	1.18	61	748.0	18.5	2.3	2.45	29.1	13.3
B						2.74		
2A	1.26	64	745.5	18.5	2.3	1.98	29.1	14.4
B						2.04		
3A	1.21	62	744.2	18.5	2.3	2.84	29.1	13.7
B						3.09		
4A	1.24	68	739.4	18.5	2.3	2.99	29.1	14.3
B						2.80		
5A	1.22	69	732.8	18.5	2.3	3.69	29.1	14.2
B						3.57		
6A	1.26	65	740.4	18.5	2.3	2.69	29.1	14.3
B						2.83		
7A	1.27	74	740.4	18.5	2.3	1.91	29.1	14.8
B						2.14		

TABLE 8-2. SAMPLING DATA - SECONDARY LEAD PLANT

Run No.	Meter Volume (V_m), m^3	Barometer mm Hg	ΔH mm H_2O	Avg. Meter Temp (T_m), C	Dry gas Sampled Std. Cond. ($V_{m\,std}$), m^3	Percent Isokinetic	Analysis System Temperature, C: Filter box	Gas @ Filter outlet	Gas @ probe outlet	Probe mid-point
1A	5.65	743.0	58.47	41	5.30	100	142	151	148	126
B	5.45			43	5.05	96	149	153	146	145
2A	3.73	745.5	66.04	42	3.49	99	94	98	95	94
B	3.66			46	3.33	94	97	95	93	96
3A	3.72	744.3	63.74	44	3.39	101	92	93	94	104
B	3.57			44	3.26	97	149	155	146	164
4A	3.56	739.4	66.55	45	3.50	103	94	101	94	95
B	3.69			42	3.37	99	149	157	146	136
5A	3.73	732.8	65.02	37	3.47	105	148	154	148	148
B	3.65			36	3.35	101	96	91	95	64
6A	3.64	740.4	67.31	33	3.37	102	92	94	92	108
B	3.43			36	3.25	98	151	148	146	153
7A	3.07	740.6	70.36	28	2.94	105	123	172	122	126
B	2.95			28	2.53	101	118	210	120	139