TAMPA ELECTRIC COMPANY
F.J. GANNON STATION
UNIT NUMBER THREE
TAMPA, FLORIDA

REQUEST FOR PERMIT AMENDMENT
AIR OPERATION PERMIT NO. A029-172179
TIRE DERIVED FUEL TEST BURN

AUGUST 1996

TABLE OF CONTENTS

FLORIDA DEP LOGO

Department of Environmental Protection

DIVISION OF AIR RESOURCES MANAGEMENT

APPLICATION FOR AIR PERMIT - LONG FORM

See Instructions for Form No. 62-210.900(1)

I. APPLICATION INFORMATION

This section of the Application for Air Permit form identifies the facility and provides general information on the scope and purpose of this application. This section also includes information on the owner or authorized representative of the facility (or the responsible official in the case of a Title V source) and the necessary statements for the applicant and professional engineer, where required, to sign and date for formal submittal of the Application for Air Permit to the Department. If the application form is submitted to the Department using ELSA, this section of the Application for Air Permit must also be submitted in hard-copy.

Identification of Facility Addressed in This Application

Enter the name of the corporation, business, governmental entity, or individual that has ownership or control of the facility; the facility site name, if any; and the facility's physical location. If known, also enter the facility identification number.

1. Facility Owner/Company Name: **Tampa Electric Company**		
2. Site Name: **F.J. Gannon Station**		
3. Facility Identification Number: **0570040**		[ ] Unknown
4. Facility Location: Street Address or Other Locator: **Port Sutton Road** City: **Tampa**	County: **Hillsborough**	Zip Code: **33619**
5. Relocatable Facility? [ ] Yes [X] No	6. Existing Permitted Facility? [X] Yes [ ] No	

Application Processing Information (DEP Use)

1. Date of Receipt of Application:	
2. Permit Number:	
3. PSD Number (if applicable):	
4. Siting Number (if applicable):	

Owner/Authorized Representative or Responsible Official

1. Name and Title of Owner/Authorized Representative or Responsible Official:
   Patrick A. Ho, P.E.
   Manager, Environmental Planning

2. Owner/Authorized Representative or Responsible Official Mailing Address:

   Organization/Firm: **Tampa Electric Company**
   Street Address: **702 North Franklin Street**
   City: **Tampa** State: **Florida** Zip Code: **33602**

3. Owner/Authorized Representative or Responsible Official Telephone Numbers:
   Telephone: **(813) 228-4844** Fax: **(813) 228-4881**

4. Owner/Authorized Representative or Responsible Official Statement:

   I, the undersigned, am the owner or authorized representative of the non-Title V source addressed in this Application for Air Permit or the responsible official, as defined in Rule 62-210.200, F.A.C., of the Title V source addressed in this application, whichever is applicable. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof. I understand that a permit, if granted by the Department, cannot be transferred without authorization from the Department, and I will promptly notify the Department upon sale or legal transfer of any permitted emissions unit.*

Patrick A. Ho
Signature

8/8/96
Date

* Attach letter of authorization if not currently on file.

TAMPA ELECTRIC
A TECO ENERGY COMPANY

TO WHOM IT MAY CONCERN:

Please be advised that Patrick A. Ho, Manager, Environmental Planning, is the authorized representative of Tampa Electric Company concerning matters with which this permit application deals.

Very truly yours,

William N. Cantrell
Vice President
Energy Supply

WNC\gm\ADMIN\AUTH.LTR

Scope of Application

This Application for Air Permit addresses the following emissions unit(s) at the facility. An Emissions Unit Information Section (a Section III of the form) must be included for each emissions unit listed.

Emissions Unit ID	Description of Emissions Unit	Permit Type
003	**Unit No. 3, Solid Fuel Steam Generator**	**AC1B**

Purpose of Application and Category

Check one (except as otherwise indicated):

Category I: All Air Operation Permit Applications Subject to Processing Under Chapter 62-213, F.A.C.

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for an existing facility which is classified as a Title V source.

[ ] Initial air operation permit under Chapter 62-213, F.A.C., for a facility which, upon start up of one or more newly constructed or modified emissions units addressed in this application, would become classified as a Title V source.

Current construction permit number: _____

[ ] Air operation permit renewal under Chapter 62-213, F.A.C., for a Title V source.

Operation permit to be renewed: _____

[ ] Air operation permit revision for a Title V source to address one or more newly constructed or modified emissions units addressed in this application.

Current construction permit number: _____

Operation permit to be revised: _____

[ ] Air operation permit revision or administrative correction for a Title V source to address one or more proposed new or modified emissions units and to be processed concurrently with the air construction permit application. Also check Category III.

Operation permit to be revised/corrected: _____

[**X**] Air operation permit revision for a Title V source for reasons other than construction or modification of an emissions unit. Give reason for the revision; e.g., to comply with a new applicable requirement or to request approval of an "Early Reductions" proposal.

Operation permit to be revised: **A029-172179**

Reason for revision: **Amendment to allow combustion of coal/tire-derived fuel blend.**

Category II: All Air Operation Permit Applications Subject to Processing Under Rule 62-210.300(2)(b), F.A.C.

This Application for Air Permit is submitted to obtain:

[ ] Initial air operation permit under Rule 62-210.300(2)(b), F.A.C., for an existing facility seeking classification as a synthetic non-Title V source.

Current operation/construction permit number(s):

_____

[ ] Renewal air operation permit under Rule 62-210.300(2)(b), F.A.C., for a synthetic non-Title V source.

Operation permit to be renewed: _____

[ ] Air operation permit revision for a synthetic non-Title V source. Give reason for revision; e.g., to address one or more newly constructed or modified emissions units.

Operation permit to be revised: _____

Reason for revision: _____

_____

Category III: All Air Construction Permit Applications for All Facilities and Emissions Units

This Application for Air Permit is submitted to obtain:

[ ] Air construction permit to construct or modify one or more emissions units within a facility (including any facility classified as a Title V source).

Current operation permit number(s), if any: _____

[ ] Air construction permit to make federally enforceable an assumed restriction on the potential emissions of one or more existing, permitted emissions units.

Current operation permit number(s): _____

[ ] Air construction permit for one or more existing, but unpermitted, emissions units.

Application Processing Fee

Check one:

[ ] Attached - Amount: $_____ [X] Not Applicable.

Construction/Modification Information

1. Description of Proposed Project or Alterations:

Tampa Electric Company (TEC) was authorized by FDEP to conduct a test burn of an 80-percent coal/20-percent tire-derived fuel (TDF) fuel blend for comparison to baseline coal emissions (see Attachment A for a copy of the FDEP test burn letters of authorization). TEC conducted the test burn from February 28 through April 29, 1996.

The results from the test burn enabled TEC to conduct a screening analysis to determine whether future long-term firing of coal/TDF blends would constitute a modification subject to Prevention of Significant Deterioration (PSD) review pursuant to Chapter 62-212.400, Florida Administrative Code (F.A.C.). The analysis of PSD applicability as shown in Attachment B was conducted by comparing the fuel blend test results with the 100-percent coal baseline emission test data in accordance with the FDEP authorization letter dated March 3, 1996. This comparison shows that PSD review is not applicable to this permit amendment request.

Based on the test burn results, TEC requests the F.J. Gannon Station Unit No. 3 permit be modified to allow for the combustion of coal and TDF blends on a permanent basis as an alternative method of operation to the currently approved use of 100-percent coal. Specifically, approval to combust blends of coal and TDF containing up to 20 weight percent TDF is requested.

As indicated, an analysis of PSD applicability along with the complete test burn report are provided in Attachments B and D, respectively. In addition, a no-threat-level guidance analysis is provided in Attachment C for those metals cited in FDEP's test burn approval.

2. Projected or Actual Date of Commencement of Construction:
N/A

3. Projected Date of Completion of Construction:
N/A

Professional Engineer Certification

1. Professional Engineer Name: **Douglas A. Dean**
Registration Number: **40094**

2. Professional Engineer Mailing Address:
Organization/Firm: **Environmental Consulting & Technology, Inc.**
Street Address: **3701 Northwest 98th Street**
City: **Gainesville** State: **Florida** Zip Code: **33606**

3. Professional Engineer Telephone Numbers:
Telephone: **(352) 332-0444** Fax: **(352) 332-6722**

4. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this Application for Air Permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

If the purpose of this application is to obtain a Title V source air operation permit (check here [ ] if so), I further certify that each emissions unit described in this Application for Air Permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance schedule is submitted with this application.

If the purpose of this application is to obtain an air construction permit for one or more proposed new or modified emissions units (check here [ ] if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

If the purpose of this application is to obtain an initial air operation permit or operation permit revision for one or more newly constructed or modified emissions units (check here [ ] if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Doug Lee Dean
Signature

08/07/96
Date

(seal)

* Attach any exception to certification statement.

Application Contact

1. Name and Title of Application Contact: **Janice Taylor** **Senior Engineer, Environmental Planning**
2. Application Contact Mailing Address: Organization/Firm: **Tampa Electric Company** Street Address: **702 North Franklin Street** City: **Tampa** State: **Florida** Zip Code: **33602**
3. Application Contact Telephone Numbers: Telephone: **(813) 228-4939** Fax: **(813) 228-4881**

Application Comment

N/A

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates: Zone: **17**	East (km): **360.0**	North (km): **3,087.5**
2. Facility Latitude/Longitude: Latitude (DD/MM/SS):	Longitude (DD/MM/SS):	

3. Governmental Facility Code:	4. Facility Status Code:	5. Facility Major Group SIC Code:	6. Facility SIC(s):
0	**A**	**49**	**4911**

7. Facility Comment (limit to 500 characters):

N/A

Facility Contact

1. Name and Title of Facility Contact:
   Cindy Barringer
2. Facility Contact Mailing Address:
   Organization/Firm: **Tampa Electric Company**
   Street Address: **Port Sutton Road**
   City: **Tampa** State: **Florida** Zip Code: **33619**
3. Facility Contact Telephone Numbers:
   Telephone: **(813) 228-1896** Fax: **(813) 228-1905**

Facility Regulatory Classifications

1. Small Business Stationary Source?	[ ] Yes [X] No [ ] Unknown
2. Title V Source?	[X] Yes [ ] No
3. Synthetic Non-Title V Source?	[ ] Yes [X] No
4. Major Source of Pollutants Other than Hazardous Air Pollutants (HAPs)?	[X] Yes [ ] No
5. Synthetic Minor Source of Pollutants Other than HAPs?	[ ] Yes [X] No
6. Major Source of Hazardous Air Pollutants (HAPs)?	[X] Yes [ ] No
7. Synthetic Minor Source of HAPs?	[ ] Yes [X] No
8. One or More Emissions Units Subject to NSPS?	[ ] Yes [X] No
9. One or More Emission Units Subject to NESHAP?	[ ] Yes [X] No
10. Title V Source by EPA Designation?	[ ] Yes [X] No
11. Facility Regulatory Classifications Comment (limit to 200 characters):	**N/A**

B. FACILITY REGULATIONS

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

A complete listing of all federal and state applicable requirements has been submitted with the initial F.J. Gannon Station Title V permit application.

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

N/A	

C. FACILITY POLLUTANTS

Facility Pollutant Information

1. Pollutant Emitted	2. Pollutant Classification
Provided with the initial F.J. Gannon Station Title V permit application.	

D. FACILITY POLLUTANT DETAIL INFORMATION

Facility Pollutant Detail Information: Pollutant 1 of 1

1. Pollutant Emitted: **SO2**		
2. Requested Emissions Cap:	(lb/hour) **21,200**	(tons/year) **N/A**
3. Basis for Emissions Cap Code: **FDEP Rule 62-296.405(1)(c)2.a, F.A.C.**		
4. Facility Pollutant Comment (limit to 400 characters): **Hourly emissions cap represents total sulfur dioxide emissions from F.J. Gannon Station Unit No. 1 through Unit No. 6 for a weekly average period. This is an existing requirement per FDEP Rule 62-296.405(1)(c)2.a, F.A.C.**		

Facility Pollutant Detail Information: Pollutant _____ of _____

1. Pollutant Emitted:		
2. Requested Emissions Cap:	(lb/hour)	(tons/year)
3. Basis for Emissions Cap Code:		
4. Facility Pollutant Comment (limit to 400 characters):		

E. FACILITY SUPPLEMENTAL INFORMATION

Supplemental Requirements for All Applications

1. Area Map Showing Facility Location: [**X**] Attached, Document ID: **II.D.1.1** [ ] Not Applicable [ ] Waiver Requested **Attachment E**
2. Facility Plot Plan: [**X**] Attached, Document ID: **II.D.2.4** [ ] Not Applicable [ ] Waiver Requested **Attachment E**
3. Process Flow Diagram(s): [ ] Attached, Document ID:_____ [**X**] Not Applicable [ ] Waiver Requested
4. Precautions to Prevent Emissions of Unconfined Particulate Matter: [ ] Attached, Document ID:_____ [**X**] Not Applicable [ ] Waiver Requested
5. Fugitive Emissions Identification: [ ] Attached, Document ID:_____ [**X**] Not Applicable [ ] Waiver Requested
6. Supplemental Information for Construction Permit Application: [ ] Attached, Document ID:_____ [**X**] Not Applicable

Additional Supplemental Requirements for Category I Applications Only

7. List of Proposed Exempt Activities: [ ] Attached, Document ID:_____ [ ] Not Applicable
8. List of Equipment/Activities Regulated under Title VI: [ ] Attached, Document ID:_____ [ ] Equipment/Activities On site but Not Required to be Individually Listed [ ] Not Applicable
9. Alternative Methods of Operation: [ ] Attached, Document ID:_____ [ ] Not Applicable
10. Alternative Modes of Operation (Emissions Trading): [ ] Attached, Document ID:_____ [ ] Not Applicable

11. Identification of Additional Applicable Requirements: [ ] Attached, Document ID:_____ [ ] Not Applicable
12. Compliance Assurance Monitoring Plan: [ ] Attached, Document ID:_____ [ ] Not Applicable
13. Risk Management Plan Verification: [ ] Plan Submitted to Implementing Agency - Verification Attached, Document ID:_____ [ ] Plan to be Submitted to Implementing Agency by Required Date [ ] Not Applicable
14. Compliance Report and Plan: [ ] Attached, Document ID:_____ [ ] Not Applicable
15. Compliance Certification (Hard-copy Required): [ ] Attached, Document ID:_____ [ ] Not Applicable

III. EMISSIONS UNIT INFORMATION

A separate Emissions Unit Information Section (including subsections A through L as required) must be completed for each emissions unit addressed in this Application for Air Permit. If submitting the application form in hard copy, indicate, in the space provided at the top of each page, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application. Some of the subsections comprising the Emissions Unit Information Section of the form are intended for regulated emissions units only. Others are intended for both regulated and unregulated emissions units. Each subsection is appropriately marked.

A. TYPE OF EMISSIONS UNIT (Regulated and Unregulated Emissions Units)

Type of Emissions Unit Addressed in This Section

1. Regulated or Unregulated Emissions Unit? Check one:

[**X**] The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

[ ] The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

2. Single Process, Group of Processes, or Fugitive Only? Check one:

[**X**] This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

[ ] This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

B. GENERAL EMISSIONS UNIT INFORMATION
(Regulated and Unregulated Emissions Units)

Emissions Unit Description and Status

1. Description of Emissions Unit Addressed in This Section (limit to 60 characters): **Unit No. 3, Solid Fuel Steam Generator**		
2. Emissions Unit Identification Number: [ ] No Corresponding ID [ ] Unknown **003**		
3. Emissions Unit Status Code: **A**	4. Acid Rain Unit? [X] Yes [ ] No	5. Emissions Unit Major Group SIC Code: **49**
6. Emissions Unit Comment (limit to 500 characters): **N/A**		

Emissions Unit Control Equipment

A.

1. Description (limit to 200 characters): **Electrostatic precipitator system**
2. Control Device or Method Code: **010**

B.

1. Description (limit to 200 characters):
N/A
2. Control Device or Method Code:

C.

1. Description (limit to 200 characters):
N/A
2. Control Device or Method Code:

C. EMISSIONS UNIT DETAIL INFORMATION
(Regulated Emissions Units Only)

Emissions Unit Details

1.	Initial Startup Date: **N/A**			
2.	Long-term Reserve Shutdown Date: **N/A**			
3.	Package Unit: **N/A** Manufacturer:		Model Number:	
4.	Generator Nameplate Rating:	**180**	MW	
5.	Incinerator Information: **N/A**			
	Dwell Temperature:			°F
	Dwell Time:			seconds
	Incinerator Afterburner Temperature:			°F

Emissions Unit Operating Capacity

1.	Maximum Heat Input Rate:		**1,599**	mmBtu/hr
2.	Maximum Incineration Rate: **N/A**	lb/hr		tons/day
3.	Maximum Process or Throughput Rate: **N/A**			
4.	Maximum Production Rate: **N/A**			
5.	Operating Capacity Comment (limit to 200 characters):			

Maximum fuel heat input rate of 1,599 MMBtu/hr is on a monthly average basis.

Emissions Unit Operating Schedule

Requested Maximum Operating Schedule:				
	24	hours/day	**7**	days/week
	52	weeks/year	**8,760**	hours/year

D. EMISSIONS UNIT REGULATIONS
(Regulated Emissions Units Only)

Rule Applicability Analysis (Required for Category II applications and Category III applications involving non Title-V sources. See Instructions.)

A complete listing of all federal and state applicable requirements for Unit No. 3 has been submitted with the initial F.J. Gannon Station Title V permit application.

List of Applicable Regulations (Required for Category I applications and Category III applications involving Title-V sources. See Instructions.)

N/A	

E. EMISSION POINT (STACK/VENT) INFORMATION
(Regulated Emissions Units Only)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram:	
2. Emission Point Type Code: [X] 1 [ ] 2 [ ] 3 [ ] 4	
3. Descriptions of Emissions Points Comprising this Emissions Unit for VE Tracking (limit to 100 characters per point): **N/A**	
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common: **N/A**	
5. Discharge Type Code: [ ] D [ ] F [ ] H [ ] P [ ] R [X] V [ ] W	
6. Stack Height:	**315** feet
7. Exit Diameter:	**10.6** feet
8. Exit Temperature:	**290** °F

9. Actual Volumetric Flow Rate:	**537,259**	acfm
10. Percent Water Vapor : **N/A**		%
11. Maximum Dry Standard Flow Rate: **N/A**		dscfm
12. Nonstack Emission Point Height: **N/A**		feet
13. Emission Point UTM Coordinates: Zone: **17** East (km): **360.0** North (km): **3,087.5**		
14. Emission Point Comment (limit to 200 characters):		

F. SEGMENT (PROCESS/FUEL) INFORMATION
(Regulated and Unregulated Emissions Units)

Segment Description and Rate: Segment 1 of 1

1. Segment Description (Process/Fuel Type and Associated Operating Method/Mode) (limit to 500 characters):

Coal and coal/TDF blends in Unit No. 3.

2. Source Classification Code (SCC):
1-01-002-03

3. SCC Units:
Tons burned (all solid fuels)

4. Maximum Hourly Rate:	5. Maximum Annual Rate:
65.0	**569,400**

6. Estimated Annual Activity Factor:

7. Maximum Percent Sulfur:	8. Maximum Percent Ash:
1.3	**8.2**

9. Million Btu per SCC Unit:
25

10. Segment Comment (limit to 200 characters):

No. 2 fuel oil used for ignition during startups.
Fluxing agents may be added to fuel.
Maximum hourly rate (Field 4), maximum annual rate (Field 5), and Btu/SCC unit (Field 9) based on average heat content of 12,300 Btu/hr.
Fuel sulfur content based on 100-percent coal blend.
Ash content based on 80/20 percent coal/TDF blend.
Solid fuel blend may be supplemented with up to 48 gal/min used oil combustion, including liquid oil and oil-contamianted solids (i.e., oil absorbant, oily soil, etc.).
Up to 50 gal/min of nonhazardous boiler cleaning waste may be injected into boiler during firing as a routine maintenance activity.

G. EMISSIONS UNIT POLLUTANTS
(Regulated and Unregulated Emissions Units)

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
SO2			EL
NOx			NS
PM	010		EL
PM10	010		NS
CO			NS
VOC			NS
Pb	010		NS
H106 HCl			NS
H107 HF			NS
SAM			NS

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **SO2**	
2. Total Percent Efficiency of Control:	**0.0** %
3. Potential Emissions: **3,837.6** lb/hour	**16,808.7** tons/year
4. Synthetically Limited? [ ] Yes [**X**] No	
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3	_____ to _____ tons/year
6. Emission Factor: **N/A** Reference:	
7. Emissions Method Code: [**X**] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5	
8. Calculation of Emissions (limit to 600 characters): **Potential hourly and annual emission rates set equal to equivalent allowable emission rates.**	
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters): **N/A**	

Allowable Emissions (Pollutant identified on front of page)

A.

1. Basis for Allowable Emissions Code: **RULE**		
2. Future Effective Date of Allowable Emissions: **N/A**		
3. Requested Allowable Emissions and Units: **2.4 lb/MMBtu**		
4. Equivalent Allowable Emissions:	lb/hour **3,837.6**	tons/year **16,808.7**
5. Method of Compliance (limit to 60 characters): **Weekly composite fuel sampling and analysis or continuous emissions monitoring, per FDEP Rule 62-296.405(1)(f)1.b, F.A.C.**		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **Requested allowable emissions represent a weekly average, per Specific Condition No. 4 of Permit A029-172179 and FDEP Rule 62-296.405(1)(c)2.a, F.A.C.**		

B.

1. Basis for Allowable Emissions Code:		
2. Future Effective Date of Allowable Emissions:		
3. Requested Allowable Emissions and Units:		
4. Equivalent Allowable Emissions:	lb/hr	tons/year
5. Method of Compliance (limit to 60 characters):		
6. Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):		

H. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION
(Regulated Emissions Units Only - Emissions Limited Pollutants Only)

Pollutant Detail Information:

1. Pollutant Emitted: **PM/PM10**	
2. Total Percent Efficiency of Control:	**99.7** %
3. Potential Emissions: **479.7** lb/hour	**875.5** tons/year
4. Synthetically Limited? [ ] Yes [X] No	
5. Range of Estimated Fugitive/Other Emissions: [ ] 1 [ ] 2 [ ] 3	_____ to _____ tons/year
6. Emission Factor: **N/A** Reference:	
7. Emissions Method Code: [X] 0 [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5	
8. Calculation of Emissions (limit to 600 characters): **Potential hourly and annual emission rates set equal to equivalent allowable emission rates.**	
9. Pollutant Potential/Estimated Emissions Comment (limit to 200 characters):	

Allowable Emissions (Pollutant identified on front of page)

A.

1.	Basis for Allowable Emissions Code: **RULE**
2.	Future Effective Date of Allowable Emissions: **N/A**
3.	Requested Allowable Emissions and Units: **0.3 lb/MMBtu**
4.	Equivalent Allowable Emissions: **479.7** lb/hour **875.5** tons/year
5.	Method of Compliance (limit to 60 characters): **Annual testing using EPA Reference Method 5, 5B, or 17. As an option, three soot-blowing test runs will be used to demonstrate compliance with the nonsoot-blowing standard.**
6.	Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters): **0.3 lb/MMBtu applicable during soot-blowing (3 hours per day [hr/day]).** **0.1 lb/MMBtu applicable during nonsoot-blowing. Per FDEP Rules 62-210.700(3) and 62-296.405(1)(b), F.A.C.** **Hourly equivalent allowable emissions based on 0.3 lb/MMBtu. Annual equivalent allowable emissions based on 3 hr/day at 0.3 lb/MMBtu and 21 hr/day at 0.1 lb/MMBtu.**

B.

1.	Basis for Allowable Emissions Code:
2.	Future Effective Date of Allowable Emissions:
3.	Requested Allowable Emissions and Units:
4.	Equivalent Allowable Emissions: lb/hr tons/year
5.	Method of Compliance (limit to 60 characters):
6.	Pollutant Allowable Emissions Comment (Desc. of Related Operating Method/Mode) (limit to 200 characters):

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation 1 of 5

1.	Visible Emissions Subtype: **VE20**
2.	Basis for Allowable Opacity: [**X**] Rule [ ] Other
3.	Requested Allowable Opacity: Normal Conditions: **20** % Exceptional Conditions: **27** % Maximum Period of Excess Opacity Allowed: **6** min/hour
4.	Method of Compliance: **Continuous emissions monitoring**
5.	Visible Emissions Comment (limit to 200 characters): **FDEP Rule 62-296.405(1)(a), F.A.C.**

Visible Emissions Limitation: Visible Emissions Limitation 2 of 5

1.	Visible Emissions Subtype: **VE60**
2.	Basis for Allowable Opacity: [**X**] Rule [ ] Other
3.	Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **60** % Maximum Period of Excess Opacity Allowed: **60** min/hour
4.	Method of Compliance: **Continuous emissions monitoring**
5.	Visible Emissions Comment (limit to 200 characters): **Maximum period of excess opacity allowed for 3 hours in any 24-hour period during soot blowing and load change.** **FDEP Rule 62-210.700(3), F.A.C.**

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation 3 of 5

1. Visible Emissions Subtype: **VE100**	
2. Basis for Allowable Opacity:	[X] Rule [ ] Other
3. Requested Allowable Opacity:	
Normal Conditions: %	Exceptional Conditions: **100** %
Maximum Period of Excess Opacity Allowed:	**24** min/hour
4. Method of Compliance: **Continuous emissions monitoring**	
5. Visible Emissions Comment (limit to 200 characters): **Excess emission resulting from boiler cleaning and load change. Maximum period of excess opacity allowed is four 6-minute periods during a single 3-hour period. FDEP Rule 62-210.700(3), F.A.C.**	

Visible Emissions Limitation: Visible Emissions Limitation 4 of 5

1. Visible Emissions Subtype: **VE100**	
2. Basis for Allowable Opacity:	[X] Rule [ ] Other
3. Requested Allowable Opacity:	
Normal Conditions: %	Exceptional Conditions: **100** %
Maximum Period of Excess Opacity Allowed:	**60** min/hour
4. Method of Compliance: **Continuous emissions monitoring**	
5. Visible Emissions Comment (limit to 200 characters): **Excess emission resulting from boiler startup and shutdown. FDEP Rule 62-210.700(2), F.A.C.**	

I. VISIBLE EMISSIONS INFORMATION
(Regulated Emissions Units Only)

Visible Emissions Limitation: Visible Emissions Limitation __5__ of __5__

1. Visible Emissions Subtype: **VE100**	
2. Basis for Allowable Opacity:	[**X**] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: **100** % Maximum Period of Excess Opacity Allowed: **60** min/hour	
4. Method of Compliance: **Continuous emissions monitoring**	
5. Visible Emissions Comment (limit to 200 characters): **Excess emission resulting from startup, shutdown, and malfunction.** **Maximum period of excess opacity allowed is 2 hours during any 24-hour period.** **FDEP Rule 62-210.700(1), F.A.C.**	

Visible Emissions Limitation: Visible Emissions Limitation _____ of _____

1. Visible Emissions Subtype:	
2. Basis for Allowable Opacity:	[ ] Rule [ ] Other
3. Requested Allowable Opacity: Normal Conditions: % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance:	
5. Visible Emissions Comment (limit to 200 characters):	

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System: Continuous Monitor 1 of 5

1. Parameter Code: **VE**	2. Pollutant(s): **N/A**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: **Thermo Environmental Corporation** Model Number: **M400** Serial Number: **400B-3500**	
5. Installation Date: **10/01/93**	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **Required by FDEP Rule 62-296.405(1)(f)1.a, F.A.C., and 40 CFR 75. System includes one opacity monitor.**	

Continuous Monitoring System: Continuous Monitor 2 of 5

1. Parameter Code: **EM**	2. Pollutant(s): **SO2**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: **Thermo Environmental Corporation** Model Number: **43B** Serial Number: **43B-48171-279**	
5. Installation Date: **07/01/94**	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **Required by FDEP Rule 62-296.405(1)(f)1.b, F.A.C., and 40 CFR 75. System includes one SO_2 monitor with a backup system shared among Emission Unit Nos. 1, 2, and 3.**	

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System: Continuous Monitor 3 of 5

1. Parameter Code: **EM**	2. Pollutant(s): **NOx**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: **Thermo Environmental Corporation** Model Number: **42D**	Serial Number: **42D-47872-279**
5. Installation Date: **07/01/94**	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **Required by 40 CFR 75. System includes one NO_x monitor with a backup system shared among Emission Unit Nos. 1, 2, and 3.**	

Continuous Monitoring System: Continuous Monitor 4 of 5

1. Parameter Code: **FLOW**	2. Pollutant(s): **N/A**
3. CMS Requirement:	[X] Rule [ ] Other
4. Monitor Information: Manufacturer: **USI** Model Number: **Ultraflow 100**	Serial Number: **9401629**
5. Installation Date: **07/01/94**	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **Required by 40 CFR 75. System includes one flow monitor.**	

J. CONTINUOUS MONITOR INFORMATION
(Regulated Emissions Units Only)

Continuous Monitoring System: Continuous Monitor 5 of 5

1. Parameter Code: **CO2**	2. Pollutant(s): **N/A**
3. CMS Requirement:	[**X**] Rule [ ] Other
4. Monitor Information: Manufacturer: **Siemens** odel Number: **Ultramat 5E**	Serial Number: **E3-727**
5. Installation Date: **07/01/94**	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters): **Required by 40 CFR 75. System includes one CO_2 monitor with a backup system shared among Emission Unit Nos. 1, 2, and 3.**	

Continuous Monitoring System: Continuous Monitor _____ of _____

1. Parameter Code:	2. Pollutant(s):
3. CMS Requirement:	[ ] Rule [ ] Other
4. Monitor Information: Manufacturer: Model Number:	Serial Number:
5. Installation Date:	
6. Performance Specification Test Date:	
7. Continuous Monitor Comment (limit to 200 characters):	

K. PREVENTION OF SIGNIFICANT DETERIORATION (PSD) INCREMENT TRACKING INFORMATION
(Regulated and Unregulated Emissions Units)

PSD Increment Consumption Determination

1. Increment Consuming for Particulate Matter or Sulfur Dioxide?

   If the emissions unit addressed in this section emits particulate matter or sulfur dioxide, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for particulate matter or sulfur dioxide. Check the first statement, if any, that applies and skip remaining statements.

   [ ] The emissions unit is undergoing PSD review as part of this application, or has undergone PSD review previously, for particulate matter or sulfur dioxide. If so, emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after January 6, 1975. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after January 6, 1975, but before December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [ ] For any facility, the emissions unit began (or will begin) initial operation after December 27, 1977. If so, baseline emissions are zero, and emissions unit consumes increment.

   [**X**] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

2. Increment Consuming for Nitrogen Dioxide?

If the emissions unit addressed in this section emits nitrogen oxides, answer the following series of questions to make a preliminary determination as to whether or not the emissions unit consumes PSD increment for nitrogen dioxide. Check first statement, if any, that applies and skip remaining statements.

[ ] The emissions unit addressed in this section is undergoing PSD review as part of this application, or has undergone PSD review previously, for nitrogen dioxide. If so, emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source pursuant to paragraph (c) of the definition of "major source of air pollution" in Chapter 62-213, F.A.C., and the emissions unit addressed in this section commenced (or will commence) construction after February 8, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] The facility addressed in this application is classified as an EPA major source, and the emissions unit began initial operation after February 8, 1988, but before March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[ ] For any facility, the emissions unit began (or will begin) initial operation after March 28, 1988. If so, baseline emissions are zero, and emissions unit consumes increment.

[**X**] None of the above apply. If so, the baseline emissions of the emissions unit are nonzero. In such case, additional analysis, beyond the scope of this application, is needed to determine whether changes in emissions have occurred (or will occur) after the baseline date that may consume or expand increment.

3. Increment Consuming/Expanding Code:			
PM	[ ] C	[ ] E	[ ] Unknown
SO2	[ ] C	[ ] E	[ ] Unknown
NO2	[ ] C	[ ] E	[ ] Unknown
4. Baseline Emissions:			
PM		lb/hour	tons/year
SO2		lb/hour	tons/year
NO2			tons/year
5. PSD Comment (limit to 200 characters):			
Emission unit is part of baseline PSD emission inventory. Use of coal/TDF blends will result in a net decrease in emissions in comparison to 100-percent baseline coal.			

L. EMISSIONS UNIT SUPPLEMENTAL INFORMATION
(Regulated Emissions Units Only)

Supplemental Requirements for All Applications

1. Process Flow Diagram [X] Attached, Document ID: **II.D.3.6** [ ] Not Applicable [ ] Waiver Requested **Attachment E**
2. Fuel Analysis or Specification [ ] Attached, Document ID:_____ [X] Not Applicable [ ] Waiver Requested
3. Detailed Description of Control Equipment [ ] Attached, Document ID:_____ [X] Not Applicable [ ] Waiver Requested
4. Description of Stack Sampling Facilities [ ] Attached, Document ID:_____ [X] Not Applicable [ ] Waiver Requested
5. Compliance Test Report [ ] Attached, Document ID:_____ [ ] Previously submitted, Date:_____ [X] Not Applicable
6. Procedures for Startup and Shutdown [ ] Attached, Document ID:_____ [X] Not Applicable
7. Operation and Maintenance Plan [ ] Attached, Document ID:_____ [X] Not Applicable
8. Supplemental Information for Construction Permit Application [ ] Attached, Document ID:_____ [X] Not Applicable
9. Other Information Required by Rule or Statute [ ] Attached, Document ID:_____ [X] Not Applicable

Additional Supplemental Requirements for Category I Applications Only

10. Alternative Methods of Operation
[ ] Attached, Document ID:_____ [**X**] Not Applicable

11. Alternative Modes of Operation (Emissions Trading)
[ ] Attached, Document ID:_____ [**X**] Not Applicable

12. Identification of Additional Applicable Requirements
[ ] Attached, Document ID:_____ [**X**] Not Applicable

13. Compliance Assurance Monitoring Plan
[ ] Attached, Document ID:_____ [**X**] Not Applicable

14. Acid Rain Application (Hard-copy Required)

[ ] Acid Rain Part - Phase II (Form No. 62-210.900(1)(a))
Attached, Document ID:_____

[ ] Repowering Extension Plan (Form No. 62-210.900(1)(a)1.)
Attached, Document ID:_____

[ ] New Unit Exemption (Form No. 62-210.900(1)(a)2.)
Attached, Document ID:_____

[ ] Retired Unit Exemption (Form No. 62-210.900(1)(a)3.)
Attached, Document ID:_____

[**X**] Not Applicable

ATTACHMENT A

FDEP TEST BURN AUTHORIZATION LETTER

Department of Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

NOTICE OF TDF TEST AUTHORIZATION

Mr. Philip J. Matonte, P.E.
Tampa Electric Company
P.O. Box 111
Tampa, FL 33601-0111

Dear Mr. Matonte:

Re: Letters dated 10/20/95 & 12/8/95
Reference Permit No. AO29-172179

Pursuant to Rule 62-4.210(1)(b)6., F.A.C., the Department authorizes your request to conduct a trial test burn of a coal/tire-derived fuel (TDF) mix containing a maximum of 20% TDF by weight at your Gannon Unit 3 facility as proposed. The authorization is granted with the following stipulations:

1. The Tampa Electric Company (TEC) shall notify in writing this office and the Environmental Protection of Commission of Hillsborough County at least 15 days prior to the date on which each formal compliance emission test is to begin of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted.

2. TEC shall notify this office and the EPCHC of the date initial testing of the baseline test, which uses coal only, within 5 days after that date.

3. TEC shall notify this office and the EPCHC of the date of first introducing TDF in Unit 3, within 5 days after that date.

4. The baseline testing shall be conducted for no less than 7 days and no more than 10 days.

6. Trial test burn testing when using TDF shall be conducted for a maximum of 21 days.

7. All testing shall be conducted within 60 days after the date TDF is first introduced into Unit 3.

8. The maximum total amount of TDF that may be used is 13 tons/hr. and 5,000 tons for up to 60 days from the date of first introducing TDF in Unit 3.

9. Only TDF that has a nominal 1 square inch size may be used.

10. Coal used for the baseline tests and trial burn test shall be conducted with coal that has the same typical heat content.

11. No TDF shall be used after 60 days from the date of first introducing TDF in Unit 3. This limitation is applicable even if all testing has been completed before the end of the 60th day of when TDF was first introduced into Unit 3, provided the emission limitations of permit AO29-172179 are not exceeded.

12. Testing during <u>each</u> operating scenario shall be in accordance with the following:

    A. During each of the baseline and trial burn test periods when stack emission testing is conducted, sulfur dioxide, nitrogen oxides, carbon dioxide, and opacity emissions data shall be reported using continuous emission monitors (CEMS) that are located in the stack. The monitoring systems will be quality assured pursuant to 40 CFR 75, Appendix B. The data assessment report from 40 CFR 60, Appendix F, for the most recent relative accuracy test audit (RATA) and most recent cylinder gas audit (CGA), will be submitted with the test report(s).

    B. During the baseline test period that only uses coal (steady-state & soot blowing conditions), EPA reference method emission testing shall be performed for particulate matter, visible emissions, and sulfuric acid mist. The EPA Method 17 test for particulates shall include EPA Methods 1, 2, 3, and 4. During these tests Unit 3 shall be operating within 90%-100% of maximum capacity (159 MW output & 65 tons/hr. total fuel input rate).

    C. During each trial burn test that uses coal and TDF (steady-state & soot blowing conditions), EPA reference method emission testing shall be performed for particulate matter, visible emissions, and sulfuric acid mist. During these tests Unit 3 shall be operating with 90%-100% of maximum capacity (159 MW output & 65 tons/hr. total fuel input rate).

D. Particulate testing and visible emissions testing shall be conducted when fly ash collected by the ESP is being re-injected into the boiler.

E. Sulfuric acid mist emission testing shall be conducted when fly ash collected by the ESP is being re-injected into the boiler.

F. All fuel testing shall be done on coal alone prior to blending with tires.

G. Composite weekly coal fuel analysis results shall be supplied for the baseline test and the trial burn test. A single representative TDF fuel analysis results shall be supplied for each time the fuel bunker is charged for use during each CEM/stack tested operating scenario. The fuel analysis shall include the following:

Fuel Analysis	Trace Metal Analysis
Sulfur, wt. %	Beryllium
Volatiles, content, wt. %	Chromium
Nitrogen, wt. %	Lead
Ash, wt. %	Mercury
Calorific Value, BTU/lb.	Nickel
Carbon, wt. %	Vanadium
Moisture, wt. %	Zinc
TDF square inch size	
Coal origin (i.e., Eastern Kentucky, Blue Gem, etc.)	

H. Records of the following operating parameters during <u>each</u> CEM/stack tested operating scenario shall be submitted with the associated test report:

1. Fuel input rates (tons/hr.)
2. Fuel ratio(s) on an hourly basis
3. Opacity, CO, NOx, and SO2 CEM data, (The SO_2 and NO_x CEM data shall be reported in lbs./MMBTU on an hourly average basis)
4. Operating temperatures (degrees F)
5. Operating conditions (soot blowing, load changes, normal operations, fuel additives, etc.)
6. Power output (MW)
7. Air to fuel ratio(s)

13. TEC shall comply with the emission limitations of permit AO29-172179 at all times during the CEM/stack tests, operating scenarios, and operating modes approved by this authorization.

14. TEC shall notify this office and the EPCHC of the date the last test run is conducted within 5 days of that date.

15. All test reports/results shall be submitted to this office and the EPCHC within 45 days of the date of the last test run.

16. If at any time during the use of TDF the emission limitations of permit AO29-172179 are exceeded, TEC shall immediately cease using TDF. Performance testing or continued operation when using TDF shall not resume until the appropriate measures to correct the problem have been corrected and approved by the Department in writing.

17. The trial test burn and other related testing, requested to be conducted, shall be conducted under the supervision of a Florida registered professional engineer. The professional engineer shall sign and seal each copy of the stack test reports and other related information.

18. The use of TDF shall not result in the release of objectionable odors.

19. This authorization expires on June 30, 1996.

20. If additional time is needed to conduct the tests, TEC shall request in writing to this office and the EPCHC an extension of time. The request shall have attached documentation of the progress to date and shall identify what is left to be done to complete the tests.

Any party to this Order (authorization) has the right to seek judicial review of the permit 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 this Notice is filed with the Clerk of the Department.

Executed in Tampa, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

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

cc: EPCHC

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF TDF TEST AUTHORIZATION and all copies were mailed before the close of business on 3/5/96 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to Section 120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Carol S. Moore 3/5/96
(Clerk) (Date)

FLORIDA

Department of
Environmental Protection

Lawton Chiles
Governor

Southwest District
3804 Coconut Palm Drive
Tampa, Florida 33619

Virginia B. Wetherell
Secretary

NOTICE OF AMENDED TDF TEST AUTHORIZATION

Mr. Philip J. Matonte, P.E.
Tampa Electric Company
P.O. Box 111
Tampa, FL 33601-0111

Dear Mr. Matonte:

Re: Letter dated 05/01/96
Reference Permit No. AO29-255208

Pursuant to Rule 62-4.210(1)(b)6., F.A.C., the Department authorizes your request to conduct a trial test burn of a coal/tire-derived fuel (TDF) mix containing a maximum of 20% TDF by weight at your Gannon Unit 4 instead of Gannon Unit 3 facility as proposed. The authorization is granted with the following stipulations:

1. The Tampa Electric Company (TEC) shall notify in writing this office and the Environmental Protection of Commission of Hillsborough County at least 15 days prior to the date on which each formal compliance emission test is to begin of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted.

2. TEC shall notify this office and the EPCHC of the date initial testing of the baseline test, which uses coal only, within 5 days after that date.

3. TEC shall notify this office and the EPCHC of the date of first introducing TDF in Unit 4, within 5 days after that date.

4. The baseline testing shall be conducted for no less than 7 days and no more than 10 days.

6. Trial test burn testing when using TDF shall be conducted for a maximum of 21 days.

7. All testing shall be conducted within 60 days after the date TDF is first introduced into Unit 4.

8. The maximum total amount of TDF that may be used is 16 tons/hr. and 5,000 tons for up to 60 days from the date of first introducing TDF in Unit 4.

9. Only TDF that has a nominal 1 square inch size may be used.

10. Coal used for the baseline tests and trial burn test shall be conducted with coal that has the same typical heat content.

11. No TDF shall be used after 60 days from the date of first introducing TDF in Unit 4. This limitation is applicable even if all testing has been completed before the end of the 60th day of when TDF was first introduced into Unit 4, provided the emission limitations of permit AO29-255208 are not exceeded.

12. Testing during <u>each</u> operating scenario shall be in accordance with the following:

    A. During each of the baseline and trial burn test periods when stack emission testing is conducted, sulfur dioxide, nitrogen oxides, carbon dioxide, and opacity emissions data shall be reported using continuous emission monitors (CEMS) that are located in each stack. The monitoring systems will be quality assured pursuant to 40 CFR 75, Appendix B. The data assessment report from 40 CFR 60, Appendix F, for the most recent relative accuracy test audit (RATA) and most recent cylinder gas audit (CGA), will be submitted with the test report(s).

    B. During the baseline test period that only uses coal (steady-state & soot blowing conditions), EPA reference method emission testing shall be performed for particulate matter, visible emissions, and sulfuric acid mist. The EPA Method 17 test for particulates shall include EPA Methods 1, 2, 3, and 4. During these tests Unit 4 shall be operating within 90%-100% of maximum capacity (187.5 MW output & 80 tons/hr. total fuel input rate - corresponds to 1,876 MMBTU/hr. max.).

    C. During each trial burn test that uses coal and TDF (steady-state & soot blowing conditions), EPA reference method emission testing shall be performed for particulate matter, visible emissions, and sulfuric acid mist. During these tests Unit 4 shall be operating with 90%-100% of maximum capacity (187.5 MW output & 80 tons/hr. total fuel input rate - corresponds to 1,876 MMBTU/hr. max.).

D. Particulate testing and visible emissions testing shall be conducted when fly ash collected by the ESP is being re-injected into the boiler.

E. Sulfuric acid mist emission testing shall be conducted when fly ash collected by the ESP is being re-injected into the boiler.

F. All fuel testing shall be done on coal alone prior to blending with tires.

G. Composite weekly coal fuel analysis results shall be supplied for the baseline test and the trial burn test. A single representative TDF fuel analysis results shall be supplied for each time the fuel bunker is charged for use during each CEM/stack tested operating scenario. The fuel analysis shall include the following:

Fuel Analysis	Trace Metal Analysis
Sulfur, wt. %	Beryllium
Volatiles, content, wt. %	Chromium
Nitrogen, wt. %	Lead
Ash, wt. %	Mercury
Calorific Value, BTU/lb.	Nickel
Carbon, wt. %	Vanadium
Moisture, wt. %	Zinc
TDF square inch size	
Coal origin (i.e., Eastern Kentucky, Blue Gem, etc.)	

H. Records of the following operating parameters during <u>each</u> CEM/stack tested operating scenario shall be submitted with the associated test report:

1. Fuel input rates (tons/hr.)
2. Fuel ratio(s) on an hourly basis
3. Opacity, CO, NOx, and SO2 CEM data, (The SO_2 and NO_x CEM data shall be reported in lbs./MMBTU on an hourly average basis)
4. Operating temperatures (degrees F)
5. Operating conditions (soot blowing, load changes, normal operations, fuel additives, etc.)
6. Power output (MW)
7. Air to fuel ratio(s)

13. TEC shall comply with the emission limitations of permit AO29-255208 at all times during the CEM/stack tests, operating scenarios, and operating modes approved by this authorization.

14. TEC shall notify this office and the EPCHC of the date the last test run is conducted within 5 days of that date.

15. All test reports/results shall be submitted to this office and the EPCHC within 45 days of the date of the last test run.

16. If at any time during the use of TDF the emission limitations of permit AO29-255208 are exceeded, TEC shall immediately cease using TDF. Performance testing or continued operation when using TDF shall not resume until the appropriate measures to correct the problem have been corrected and approved by the Department in writing.

17. The trial test burn and other related testing, requested to be conducted, shall be conducted under the supervision of a Florida registered professional engineer. The professional engineer shall sign and seal each copy of the stack test reports and other related information.

18. The use of TDF shall not result in the release of objectionable odors.

19. This authorization expires on August 30, 1996.

20. If additional time is needed to conduct the tests, TEC shall request in writing to this office and the EPCHC an extension of time. The request shall have attached documentation of the progress to date and shall identify what is left to be done to complete the tests.

21. The Notice of TDF Test Authorization dated March 5, 1996, regarding Gannon Unit No. 3 is null and void.

22. Since the emissions from Gannon No. 4 are exhausted through 2 stacks, both stacks shall be tested simultaneously for emissions.

Persons whose substantial interests are affected by this authorization have a right, pursuant to Section 120.57, Florida Statutes, to petition for an administrative determination (hearing) in the Department's Office of General Counsel, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000, within fourteen (14)

days of receipt of this notice. Failure to file a petition within the fourteen (14) days constitutes a waiver of any right such person has to an administrative determination (hearing) pursuant to Section 120.57 Florida Statutes. This authorization is final and effective on the date filed with the Clerk of the Department unless a petition is filed in accordance with this paragraph 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 62-103.70, F.A.C. Upon timely filing of a petition or a request for an extension of time, this authorization will not be effective until further Order of the Department.

When the Order (authorization) 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, 3900 Commonwealth Boulevard, Tallahassee, Florida 32399-3000; 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.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

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

cc: EPCHC

CERTIFICATE OF SERVICE

The undersigned duly designated deputy agency clerk hereby certifies that this NOTICE OF AMENDED TDF TEST AUTHORIZATION and all copies were mailed before the close of business on 5/14/96 to the listed persons.

Clerk Stamp

FILING AND ACKNOWLEDGEMENT FILED, on this date, pursuant to Section 120.52(11), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Carol S. Moore (Clerk) 5/14/96 (Date)

ATTACHMENT B

ANALYSIS OF PSD APPLICABILITY

ATTACHMENT B

Baseline and Coal/TDF Blend Test Burn Results Comparison

BASELINE COAL TEST BURN DATA					
Pollutant	Emission Rate (lb/MMBtu)	Load (MMBtu/hr)	Emission Rate (lb/hr)	Annual Utilization* (hr/yr)	Annual Emission (tpy)
SO_2	2.0	1,527.3	3,054.6	5,875	8,972.9
NOx	1.32	1,527.3	2,016.0	5,875	5,922.1
PM	0.026	1,527.3	39.7	5,875	116.6
Pb	2.9E-07	1,527.3	4.4E-04	5,875	1.3E-03
H_2SO_4	0.012	1,527.3	18.3	5,875	53.8

COAL/TDF BLEND TEST BURN DATA					
Pollutant	Emission Rate (lb/MMBtu)	Load (MMBtu/hr)	Emission Rate (lb/hr)	Annual Utilization* (hr/yr)	Annual Emission (tpy)
SO_2	2.0	1,379.4	2,758.8	5,875	8,104.0
NOx	1.16	1,379.4	1,600.1	5,875	4,700.3
PM	0.026	1,379.4	35.9	5,875	105.4
Pb	2.1E-07	1,379.4	2.9E-04	5,875	8.4E-04
H_2SO_4	0.009	1,379.4	12.4	5,875	36.5

EMISSION RATE CHANGE (COAL/TDF BLEND TEST BUNE - COAL TEST BURN)				
Pollutant		Emission Rate (lb/hr)	Annual Utilization* (lb/yr)	Annual Emission (tpy)
SO_2		-295.8	5,875	-868.9
NOx		-415.9	5,875	-1221.8
PM		-3.8	5,875	-11.3
Pb		-1.5E-04	5,875	-4.6E-04
H_2SO_4		-5.9	5,875	-17.4

*From 1994 Annual Operating Report (AOR).

Source: TEC, 1996.

ATTACHMENT C

NO-THREAT-LEVEL GUIDANCE ANALYSIS

ATTACHMENT C

Coal/TDF Blend Test Burn Metals Emissions Comparison to No-Threat Levels

Metal	Metal Concentration (µg/g)*	PM Emission Rate (lb/hr)	PM Emission Rate (g/hr)	Metal Emission Rate (g/hr)	Stack Gas Flow ($dsft^3/min$)	Stack Gas Flow (dsm^3/hr)	Metal Concentration Emission Rate ($\mu g/m^3$)†	No-Threat Level		
								8-hr ($\mu g/m^3$)	24-hr ($\mu g/m^3$)	Annual ($\mu g/m^3$)
Beryllium	0.3	35.9	16,284.24	0.005	310,054	527,793	0.01	0.02	0.0048	0.00042
Chromium	6	35.9	16,284.24	0.098	310,054	527,793	0.19	5	1.2	None
Mercury	0.08	35.9	16,284.24	0.001	310,054	527,793	0.002	1	0.24	None
Nickel	6	35.9	16,284.24	0.098	310,054	527,793	0.19	10	2.4	0.0042
Vanadium	19	35.9	16,284.24	0.309	310,054	527,793	0.59	0.5	0.12	20

*Weighed average, coal/TDF blend.

†Worst-case scenario.

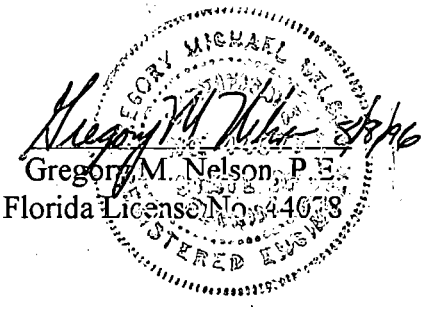
ATTACHMENT D

TEST BURN REPORT

Tire Derived Fuel Emissions Test
F. J. Gannon Generating Station
Boiler No. 3
February 26, 1996 Thru April 28, 1996
Particulate, Sulfuric Acid Mist
Visible Emissions, Sulfur Dioxide, Opacity
Oxides of Nitrogen and Fuel Analysis

Tampa Electric Company

August 8, 1996



Gregory M. Nelson, P.E.
Florida License No. 44078

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1.0 INTRODUCTION

Tampa Electric Company's (TEC) Corporate Environmental Services(CES) performed a series of emission tests on Unit No. 3 at the F.J. Gannon Generating Station located in Hillsborough County on Port Sutton Road, in Tampa, Florida. The tests performed were used to determine the effects on emissions of supplementing the normal fuel for the facility (bituminous coal) with tire derived fuel (TDF) . The authorized test conditions for this test were:

1. Baseline firing with no TDF.
2. 20% TDF with 80% normal fuels

The Florida Department of Environmental Protection issued a letter of authorization to Tampa Electric Company allowing for these tests relating to F. J. Gannon Unit No. 3, operating permit No. AO29-172179. The Baseline testing period began on February 26 and was completed March 3, 1996. The TDF Fuel blend began March 7, 1996 and ended April 28, 1996. TDF was not bunkered continuously during this blend period. Fuel blend stack testing was performed on April 23, 1996.

Unit No. 3 is a steam-generating boiler which is normally fired with coal. Tests for particulate matter, sulfuric acid mist and visible emissions were performed on the boiler during sootblowing conditions. Sulfur dioxide, nitrogen oxides and opacity data were recorded using continuous emission monitors (CEMS) during the baseline and trial burn tests.

All testing was performed following the procedures and quality control guidelines given in 40 CFR 60 Appendix A - Test Methods.

Section 2.0 presents a brief source description and diagram of the sample point locations.

Section 3.0 outlines the procedures and test methods used along with diagrams of sampling trains used.

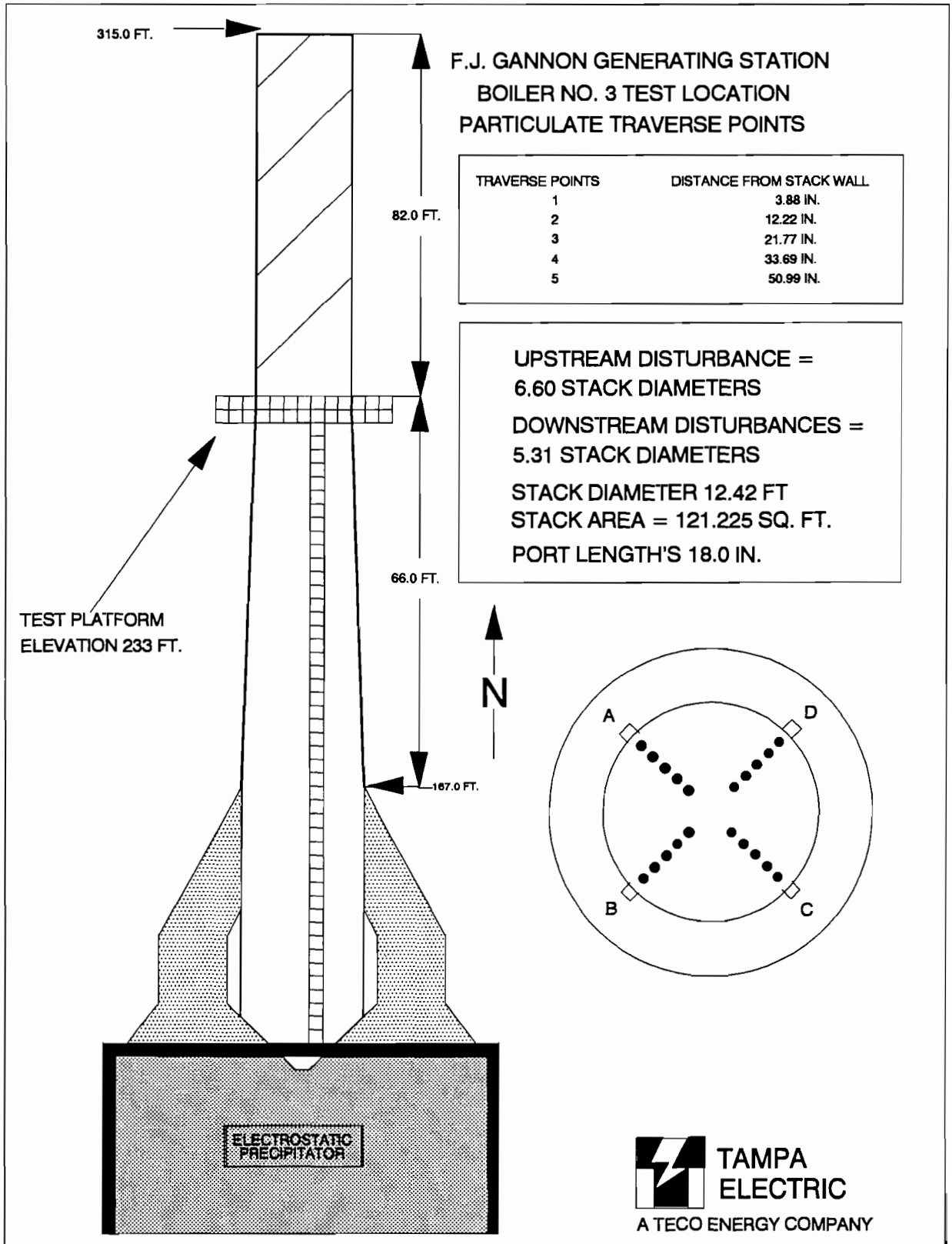
Section 4.0 presents the test results and comparison tables.

All supporting documentation, field data sheets, laboratory data, sample calculations, calibration data, quality assurance/quality control measures are included in the Appendices to this report.

2.0 SOURCE DESCRIPTION

F.J. Gannon Generating Station is a coal-fired steam electric generating facility located in Hillsborough County on Port Sutton Road, in Tampa, Florida at UTM coordinates East 360.0 North 3087.5. The Unit No. 3 source sampling location consists of four sample ports located 90° apart on the circumference of the 12 ft. diameter circular stack, which is 315 ft in height. Upstream and downstream gas flow disturbances were determined to be 6.60 and 5.31 stack diameters away from the test ports, respectively. Using these criteria, a total of 20 sampling points were chosen for particulate sampling and sulfuric acid mist sampling, as stipulated in the U.S. EPA Method 1 test procedure. A diagram of the stack sampling location is included in Figure 1 along with other pertinent information on the test site.

Unit No. 3 is equipped with an electrostatic precipitator for the control of flyash emissions. Appendix C details the operational parameters of the electrostatic precipitator during the test period.



F.J. GANNON GENERATING STATION
BOILER NO. 3 TEST LOCATION
PARTICULATE TRAVERSE POINTS

TRAVERSE POINTS	DISTANCE FROM STACK WALL
1	3.88 IN.
2	12.22 IN.
3	21.77 IN.
4	33.69 IN.
5	50.99 IN.

UPSTREAM DISTURBANCE =
6.60 STACK DIAMETERS

DOWNSTREAM DISTURBANCES =
5.31 STACK DIAMETERS

STACK DIAMETER 12.42 FT
STACK AREA = 121.225 SQ. FT.

PORT LENGTH'S 18.0 IN.

TAMPA ELECTRIC
A TECO ENERGY COMPANY

FIGURE 1

REVISED 6-26-95

3.0 TEST PROCEDURES/SAMPLING TRAIN DIAGRAMS

All particulate, sulfuric acid mist, oxygen, and visible emission testing followed the procedures and quality assurance/quality control guidelines given in 40 CFR 60 Appendix A.

Fuel analysis was performed on weekly composite coal samples taken during the baseline test and trial burn test period. Fuel analysis was also performed on a tire derived fuel sample collected during fuel bunkering for trial burn stack tests. Fuel sampling and analysis was performed following ASTM procedures and EPA methods. Fuel analysis of the composite coal samples for concentration of chromium, lead, nickel, beryllium, vanadium and zinc was prepared using ASTM 3683-78 (Re-approved 1989), "Standard Test Method for Trace Elements in Coal and Coke Ash by Atomic Absorption" and performed by EPA Method 200.7 "Determination of Metals and Trace Elements in Water and Wastes by Inductively Coupled Plasma-Atomic Emission Spectrometry." Fuel analysis on tire derived fuel for concentration of chromium, lead, nickel, beryllium, vanadium and zinc was performed using ASTM procedure D-3683, "Standard Test Method for Trace Elements in Coal and Coke Ash by Atomic Absorption." Trace metal analysis on all samples for concentration of mercury was prepared and analyzed using ASTM 3684-94 "Total Mercury in Coal by Oxygen Bomb Combustion/Atomic Absorption Method." Appendix E details the results of the coal and TDF analysis.

Particulate matter sampling was performed according to U.S. EPA Method 17, "Determination of Particulate Matter from Stationary Sources." Sampling was performed using the equipment depicted in Figure 2. Particulate matter was collected on a high purity glass micro fiber thimble measuring 19 X 90 mm. Sulfuric acid mist sampling was performed according to U.S. EPA Method 8 "Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions from Stationary Sources." Sampling was performed using the equipment depicted in Figure 3.

Diluent sampling and analysis was performed according to U.S. EPA Method 3 "Gas Analysis for Determination of Emission Rate Correction Factor, or Excess Air." Sampling was performed using the equipment depicted in Figure 4. Diluent analysis was performed using the equipment depicted in Figure 5.

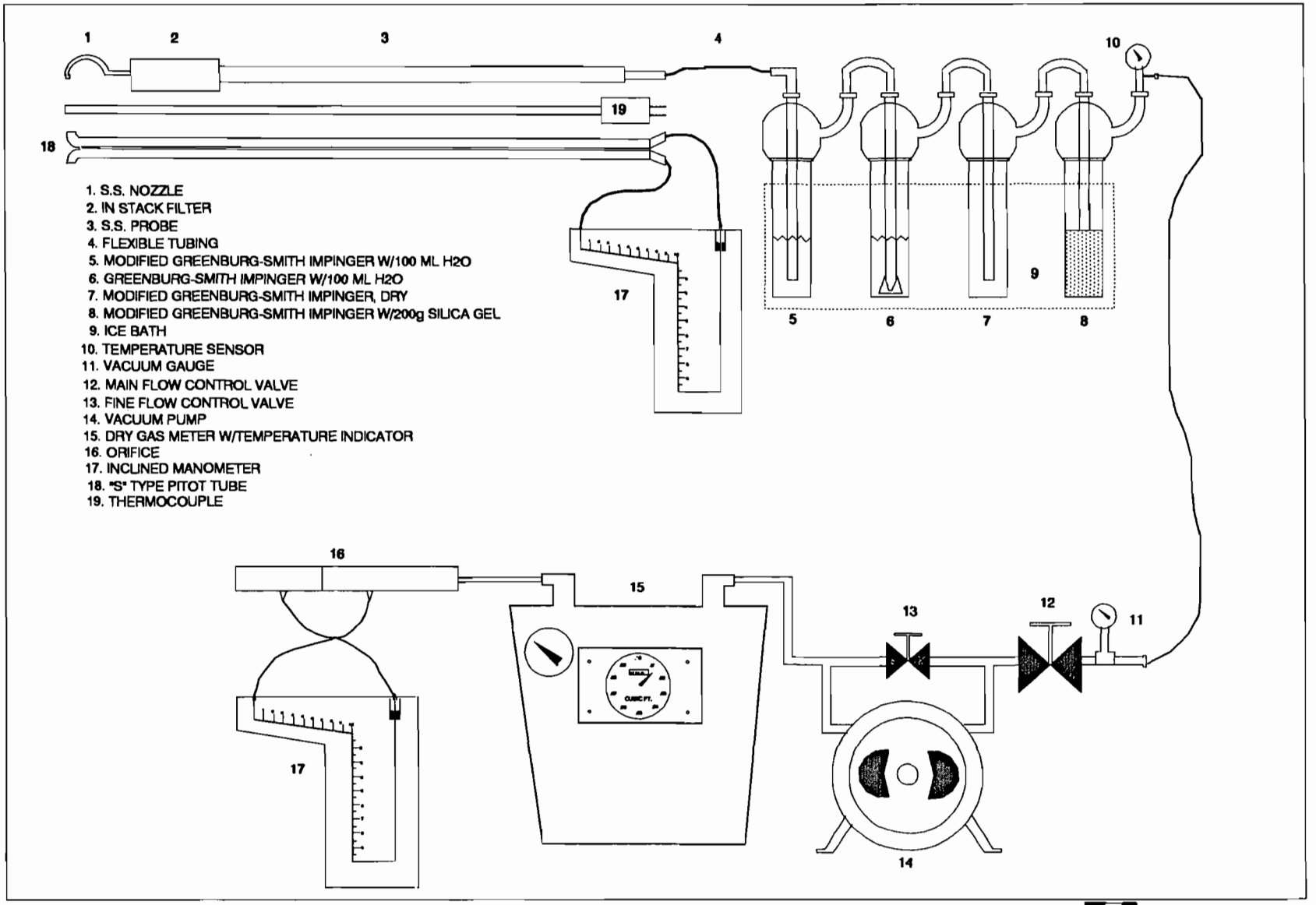


FIGURE 2
PARTICULATE SAMPLING TRAIN
USEPA METHOD 17

TAMPA ELECTRIC
A TECO ENERGY COMPANY

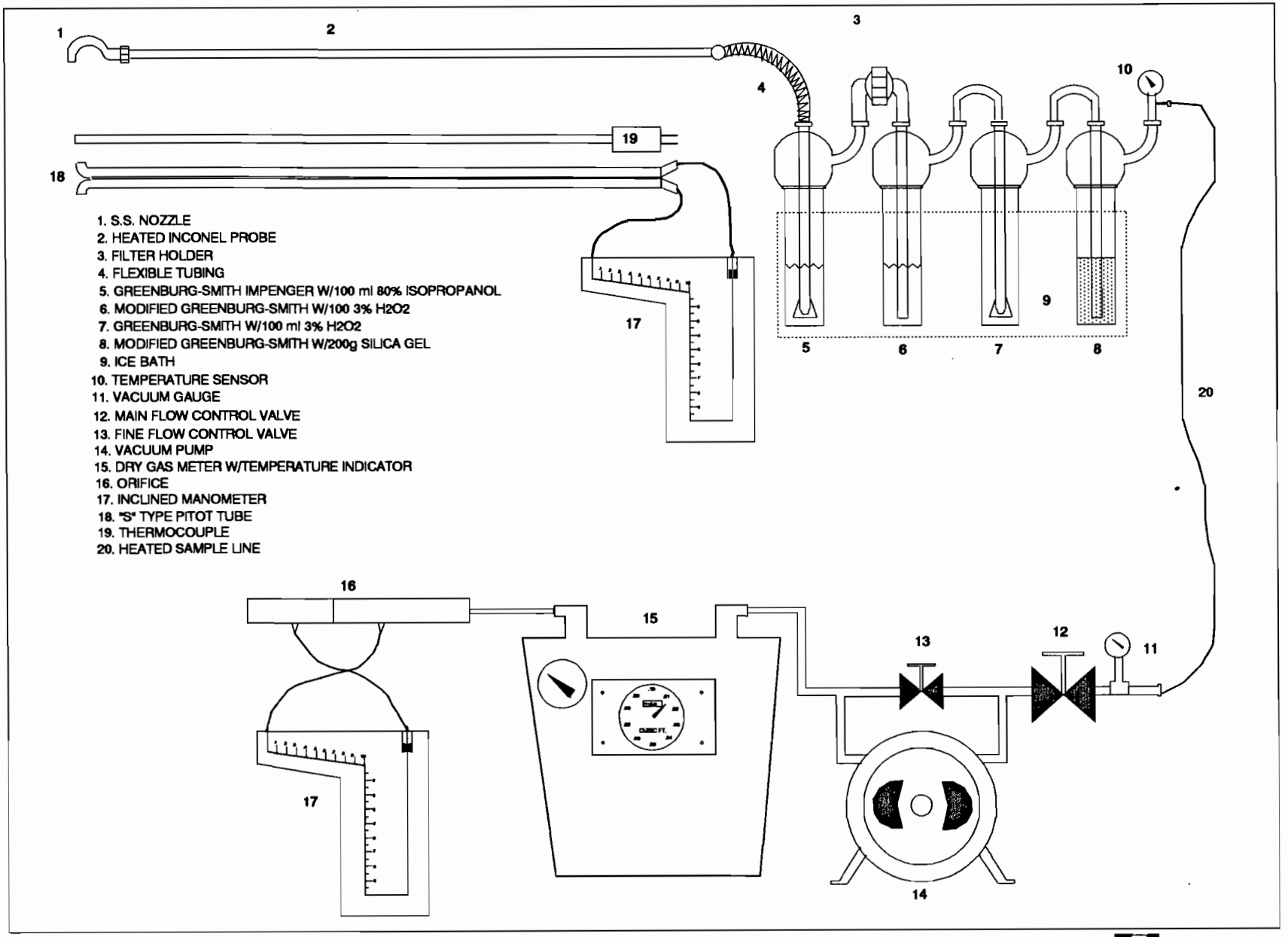


FIGURE 3
SULFURIC ACID MIST SAMPLING TRAIN
USEPA METHOD 8

TAMPA ELECTRIC
A TECO ENERGY COMPANY

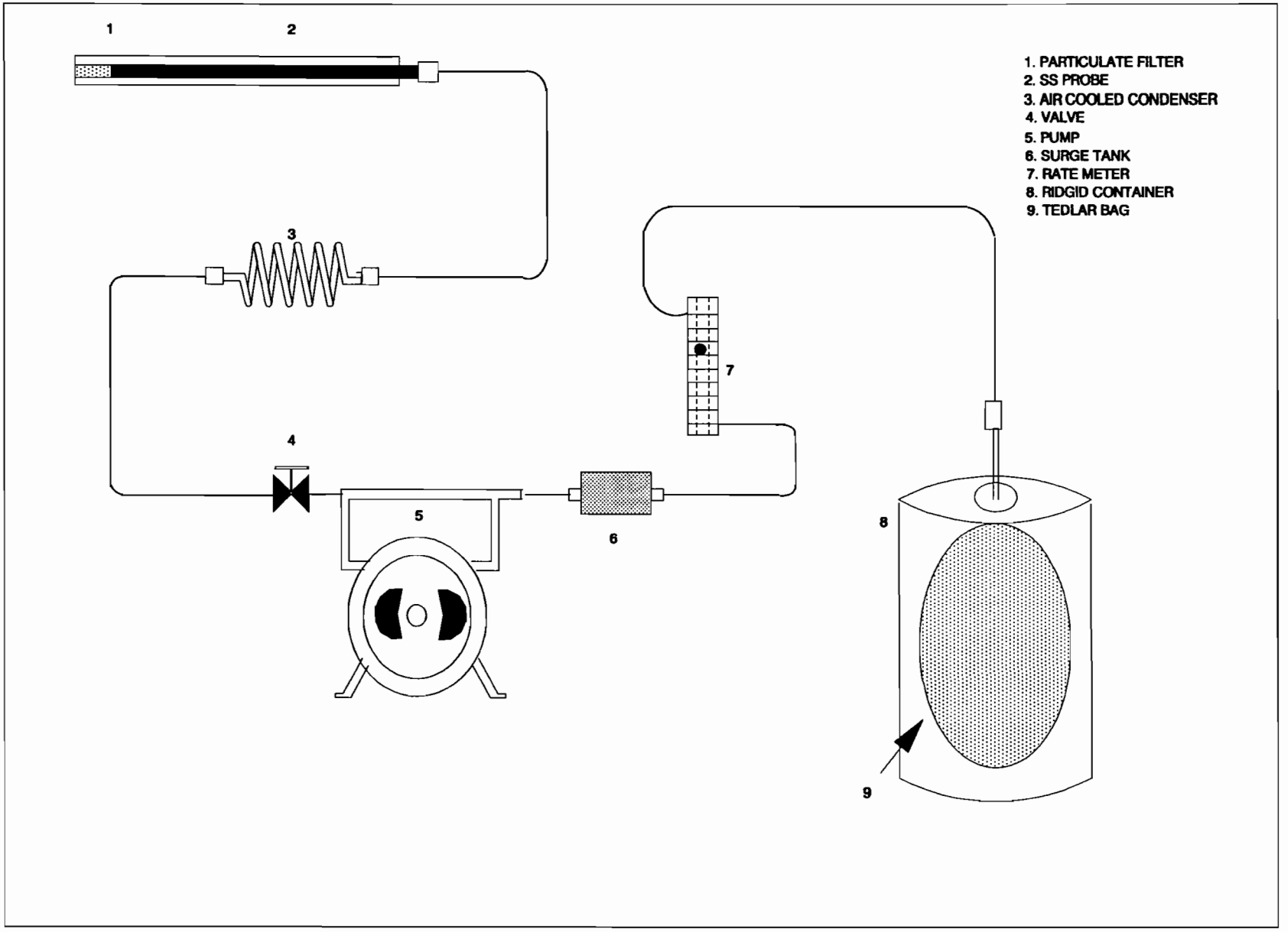


FIGURE 4
INTEGRATED GAS SAMPLING TRAIN
USEPA METHOD 3-B

TAMPA ELECTRIC
A TECO ENERGY COMPANY

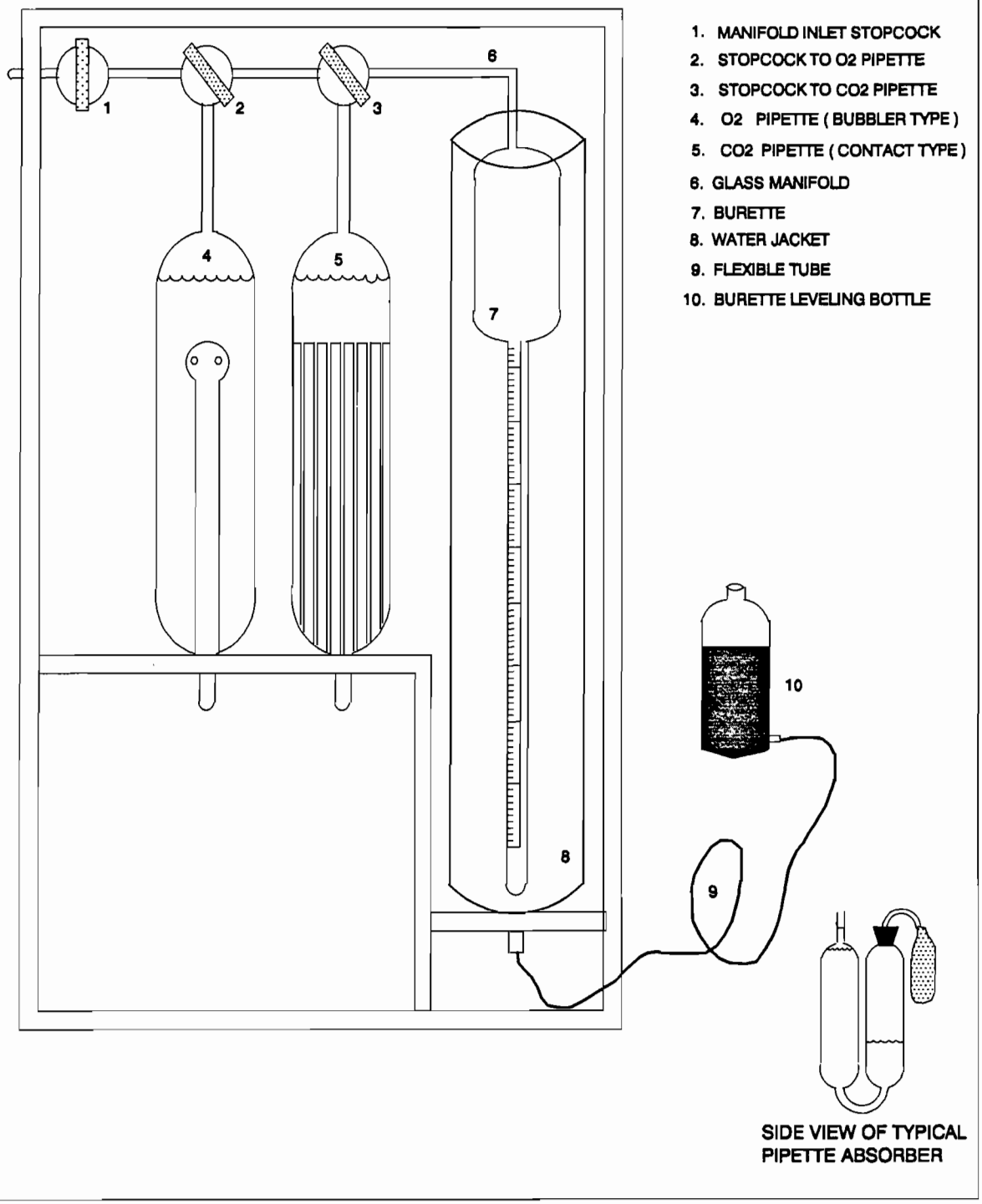


FIGURE 5
ORSAT ANALYZER
USEPA METHOD 3B

TAMPA ELECTRIC
A TECO ENERGY COMPANY

4.0 SUMMARY OF RESULTS

Section 4.1 presents the Continuous Emission Monitor Data from the baseline stack test and the fuel blend stack test. Data is presented comparing opacity, SO_2, No_x, during baseline and fuel blend burn stack tests. The test data is summarized below.

F.J. GANNON STATION UNIT NO. 3 CONTINUOUS EMISSION MONITOR DATA			
PARAMETER	BASELINE	TIRE DERIVED FUEL	EMISSION RATE
Opacity	5	3	(%)
SO_2	2.0	2.0	(LB/MMBtu)
NO_x	1.32	1.16	(LB/MMBtu)

Section 4.2 presents stack test data from the baseline test and the fuel blend test burn. Data is presented comparing particulate, sulfuric acid mist, and visible emissions test data.

F.J. GANNON STATION UNIT NO. 3 STACK TEST DATA			
PARAMETER	BASELINE	TIRE DERIVED FUEL	EMISSION RATE
Particulate	0.03	0.03	(LB/MMBtu)
H_2SO_4	0.01	0.01	(LB/MMBtu)
V.E.	5	0	(%)

Section 4.3 presents the fuel sampling and analysis of weekly coal composites taken during the baseline and TDF blend test burn. Analysis of TDF samples taken during fuel bunkering for each stack test day is also included.

4.1 CEM DATA

F.J. GANNON STATION UNIT NO. 3
CONTINUOUS EMISSION MONITOR DATA DURING STACK TESTS*
BASELINE TEST BURN
FEBRUARY 28, 1996
TIRE DERIVED FUEL BLEND
APRIL 23, 1996

SO2 (lb/MMBtu)

BASELINE VS FUEL BLEND

	DATE	TIME	AVG
BASELINE TESTS	02/28/96	0700-1800	2.0

	DATE	TIME	AVG
TIRED DERIVED FUEL BLEND	04/23/96	0800-1700	2.0

* CONTINUOUS EMISSION MONITOR DATA CORRESPONDS TO STACK TEST DAYS AND TIME

TABLE 4.1.1

F.J. GANNON STATION UNIT NO. 3
CONTINUOUS EMISSION MONITOR DATA DURING STACK TESTS*
BASELINE TEST BURN
FEBRUARY 28, 1996
TIRE DERIVED FUEL BLEND
APRIL 23, 1996

NOx (lb/MMBtu)

BASELINE VS FUEL BLEND

	DATE	TIME	AVG
BASELINE TESTS	02/28/96	0700-1800	1.32

	DATE	TIME	AVG
TIRED DERIVED FUEL BLEND	04/23/96	0800-1700	1.16

* CONTINUOUS EMISSION MONITOR DATA CORRESPONDS TO STACK TEST DAYS AND TIME

TABLE 4.1.2

F.J. GANNON STATION UNIT NO. 3
CONTINUOUS EMISSION MONITOR DATA DURING STACK TESTS*
BASELINE TEST BURN
FEBRUARY 28, 1996
TIRE DERIVED FUEL BLEND
APRIL 23, 1996

OPACITY (%)

BASELINE VS FUEL BLEND

	DATE	TIME	AVG
BASELINE TESTS	02/28/96	0700-1800	5

	DATE	TIME	AVG
TIRED DERIVED FUEL BLEND	04/23/96	0800-1700	3

* CONTINUOUS EMISSION MONITOR DATA CORRESPONDS TO STACK TEST DAYS AND TIME

TABLE 4.1.3

4.2 STACK TEST DATA

F.J. GANNON STATION UNIT NO. 3
STACK TEST DATA
BASELINE TEST BURN
FEBRUARY 28, 1996
TIRE DERIVED FUEL BLEND
APRIL 23, 1996

PARTICULATE (Lb/MMBtu)

U.S. EPA METHOD 17

BASELINE VS FUEL BLEND

RUN	1	2	3	AVG.
BASELINE TESTS	0.027	0.026	0.025	0.026
TIRE DERIVED FUEL BLEND	0.023	0.030	0.024	0.026

SULFURIC ACID MIST (Lb/MMBtu)

U.S. EPA METHOD 8

BASELINE VS FUEL BLEND

RUN	1	2	3	AVG.
BASELINE TESTS	0.015	0.012	0.010	0.012
TIRE DERIVED FUEL BLEND	0.012	0.008	0.006	0.009

TABLE 4.2.1

F.J. GANNON STATION UNIT NO. 3
STACK TEST DATA
BASELINE TEST BURN
FEBRUARY 28, 1996
TIRE DERIVED FUEL BLEND
APRIL 23, 1996

VISIBLE EMISSIONS (%)

U.S. EPA METHOD 9
60 MINUTE TEST

BASELINE VS FUEL BLEND

	AVG.
BASELINE TESTS	5
TIRE DERIVED FUEL BLEND	0

TABLE 4.2.2

4.3 FUEL ANALYSIS DATA

F. J. GANNON STA[illegible] UNIT NO. 3
TRACE METALS FU[illegible]ANALYSIS
WEEKLY COMPOSITE BASELINE
FEBRUARY 26, 1996 THRU MARCH 3, 1996
WEEKLY COMPOSITE FUEL BLEND
APRIL 22, 1996 THRU APRIL 28, 1996
TIRE DERIVED FUEL STACK TEST BUNKERING
APRIL 22, 1996

VANADIUM (ug/g)
ASTM D 3683-78 (REAPPROVED 1989)
EPA 200.7

SAMPLE DESCRIPTION	SAMPLE DATES	RESULTS
BASELINE TESTS PERIOD / WEEKLY COAL COMPOSITE (BLWCC)	02-26-96 THRU 03-03-96	17 ug/g
FUEL BLEND TEST PERIOD / WEEKLY COAL COMPOSITE (FBWCC)	04-22-96 THRU 04-28-96	17 ug/g
TIRE DERIVED FUEL / TDF DURING BUNKERING (TDF)	04-22-96	9 ug/g
CALCULATED FUEL BLEND = ((ug/g) * 80%(FBWCC)) + ((ug/g * 20%(TDF))		15 ug/g

NICKEL (ug/g)
ASTM D 3683-78 (REAPPROVED 1989)
EPA 200.7

SAMPLE DESCRIPTION	SAMPLE DATES	RESULTS
BASELINE TESTS PERIOD / WEEKLY COAL COMPOSITE (BLWCC)	02-26-96 THRU 03-03-96	9 ug/g
FUEL BLEND TEST PERIOD / WEEKLY COAL COMPOSITE (FBWCC)	04-22-96 THRU 04-28-96	9 ug/g
TIRE DERIVED FUEL / TDF DURING BUNKERING (TDF)	04-22-96	19 ug/g
CALCULATED FUEL BLEND = ((ug/g) * 80%(FBWCC)) + ((ug/g * 20%(TDF))		11 ug/g

(BLWCC)=BASELINE WEEKLY COAL COMPOSITE
(FBWCC) = FUEL BLEND WEEKLY COAL COMPOSITE - COAL ONLY
(TDF) = TIRE DERIVED FUEL

TABLE 4.3.1

F. J. GANNON STA[illegible] UNIT NO. 3
TRACE METALS FU[illegible] ANALYSIS
WEEKLY COMPOSITE BASELINE
FEBRUARY 26, 1996 THRU MARCH 3, 1996
WEEKLY COMPOSITE FUEL BLEND
APRIL 22, 1996 THRU APRIL 28, 1996
TIRE DERIVED FUEL STACK TEST BUNKERING
APRIL 22, 1996

BERYLLIUM (ug/g)
ASTM D 3683-78 (REAPPROVED 1989)
EPA 200.7

SAMPLE DESCRIPTION	SAMPLE DATES	RESULTS
BASELINE TESTS PERIOD / WEEKLY COAL COMPOSITE (BLWCC)	02-26-96 THRU 03-03-96	1 ug/g
FUEL BLEND TEST PERIOD / WEEKLY COAL COMPOSITE (FBWCC)	04-22-96 THRU 04-28-96	1 ug/g
TIRE DERIVED FUEL / TDF DURING BUNKERING (TDF)	04-22-96	3 ug/g
CALCULATED FUEL BLEND = ((ug/g) * 80%(FBWCC)) + ((ug/g * 20%(TDF))		1 ug/g

LEAD (ug/g)
ASTM D 3683-78 (REAPPROVED 1989)
EPA 200.7

SAMPLE DESCRIPTION	SAMPLE DATES	RESULTS
BASELINE TESTS PERIOD / WEEKLY COAL COMPOSITE (BLWCC)	02-26-96 THRU 03-03-96	13 ug/g
FUEL BLEND TEST PERIOD / WEEKLY COAL COMPOSITE (FBWCC)	04-22-96 THRU 04-28-96	6 ug/g
TIRE DERIVED FUEL / TDF DURING BUNKERING (TDF)	04-22-96	21 ug/g
CALCULATED FUEL BLEND = ((ug/g) * 80%(FBWCC)) + ((ug/g * 20%(TDF))		9 ug/g

(BLWCC)=BASELINE WEEKLY COAL COMPOSITE
(FBWCC) = FUEL BLEND WEEKLY COAL COMPOSITE - COAL ONLY
(TDF) = TIRE DERIVED FUEL

TABLE 4.3.2

F. J. GANNON STA[illegible] UNIT NO. 3
TRACE METALS FUEL ANALYSIS
WEEKLY COMPOSITE BASELINE
FEBRUARY 26, 1996 THRU MARCH 3, 1996
WEEKLY COMPOSITE FUEL BLEND
APRIL 22, 1996 THRU APRIL 28, 1996
TIRE DERIVED FUEL STACK TEST BUNKERING
APRIL 22, 1996

MERCURY (ug/g)
ASTM D 3684-94 (REAPPROVED 1994) (COAL)
DOUBLE GOLD AMALGAMATION, COLD VAPOR ATOMIC ABSORPTION (TDF)

SAMPLE DESCRIPTION	SAMPLE DATES	RESULTS
BASELINE TESTS PERIOD / WEEKLY COAL COMPOSITE (BLWCC)	02-26-96 THRU 03-03-96	0.09 ug/g
FUEL BLEND TEST PERIOD / WEEKLY COAL COMPOSITE (FBWCC)	04-22-96 THRU 04-28-96	0.10 ug/g
TIRE DERIVED FUEL / TDF DURING BUNKERING (TDF)	04-22-96	0.04 ug/g
CALCULATED FUEL BLEND = ((ug/g) * 80%(FBWCC)) + ((ug/g * 20%(TDF))		0.09 ug/g

(BLWCC)=BASELINE WEEKLY COAL COMPOSITE
(FBWCC) = FUEL BLEND WEEKLY COAL COMPOSITE - COAL ONLY
(TDF) = TIRE DERIVED FUEL

TABLE 4.3.4

F. J. GANNON STA[redacted] UNIT NO. 3
TRACE METALS FUEL ANALYSIS
WEEKLY COMPOSITE BASELINE
FEBRUARY 26, 1996 THRU MARCH 3, 1996
WEEKLY COMPOSITE FUEL BLEND
APRIL 22, 1996 THRU APRIL 28, 1996
TIRE DERIVED FUEL STACK TEST BUNKERING
APRIL 22, 1996

CHROMIUM (ug/g)
ASTM D 3683-78 (REAPPROVED 1989)
EPA 200.7

SAMPLE DESCRIPTION	SAMPLE DATES	RESULTS
BASELINE TESTS PERIOD / WEEKLY COAL COMPOSITE (BLWCC)	02-26-96 THRU 03-03-96	8 ug/g
FUEL BLEND TEST PERIOD / WEEKLY COAL COMPOSITE (FBWCC)	04-22-96 THRU 04-28-96	7 ug/g
TIRE DERIVED FUEL / TDF DURING BUNKERING (TDF)	04-22-96	9 ug/g
CALCULATED FUEL BLEND = ((ug/g) * 80%(FBWCC)) + ((ug/g * 20%(TDF))		7 ug/g

ZINC (ug/g)
ASTM D 3683-78 (REAPPROVED 1989)
EPA 200.7

SAMPLE DESCRIPTION	SAMPLE DATES	RESULTS
BASELINE TESTS PERIOD / WEEKLY COAL COMPOSITE (BLWCC)	02-26-96 THRU 03-03-96	25 ug/g
FUEL BLEND TEST PERIOD / WEEKLY COAL COMPOSITE (FBWCC)	04-22-96 THRU 04-28-96	25 ug/g
TIRE DERIVED FUEL / TDF DURING BUNKERING (TDF)	04-22-96	4327 ug/g
CALCULATED FUEL BLEND = ((ug/g) * 80%(FBWCC)) + ((ug/g * 20%(TDF))		886 ug/g

(BLWCC)=BASELINE WEEKLY COAL COMPOSITE
(FBWCC) = FUEL BLEND WEEKLY COAL COMPOSITE - COAL ONLY
(TDF) = TIRE DERIVED FUEL

TABLE 4.3.3

4.4 UNIT OPERATIONS SUMMARY

Boiler performance was not noticeably affected by the TDF blend. No measurable differences were observed in overall boiler operation. Extensive daily records exist for the baseline and TDF test burn. The records are available for inspection at the station but are not included because of the quantity of the material. Appendix C - Boiler Precipitator Operation data shows records from all stack tests performed during the test burn. These records include unit load, fuel ratio, and operating conditions.

APPENDIX A

SOURCE TEST CALCULATIONS

A-1 BASELINE PARTICULATE CALCULATIONS

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. 1

PLANT : F. J. GANNON STATION
DATE : 2-28-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: BASELINE /SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.198	in.
BAR. PRESSURE =	29.80	in.Hg	NOZZLE AREA =	0.000214	Sq.Ft.
STK. PRESSURE =	29.80	in.Hg	METER ORIFICE =	1.064	in. H2O
EFF. STACK AREA =	121.23	Sq.Ft.	METER VOLUME =	33.249	Cu.Ft.
Cp =	0.84		METER TEMP. =	80.2	DEG. F
GAS ANALYSIS =	13.8	% CO2	STACK TEMP. =	279.6	DEG. F
	5.0	% O2	SQ.RT. dP =	1.007	in. H2O
	0.0	% CO	CONDENSATE VOL.=	57.7	ml
	81.2	% N2	METER Y =	1.013	
LAB ANALYSIS =	0.03080	grams			
			F-FACTOR =	9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	=	2.720	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	=	32.861	scf
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.076	%
FDA = 1.0 - Bws	=	0.924	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)]	=	30.41	lb\lb-mole
Ms = (Md x FDA) + (18.0 x Bws)	=	29.47	lb\lb-mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	=	66.4	ft/sec
Qs = vs x As x 60	=	482960	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92)	=	317325	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	=	97.9	%
cs = 15.432 x grams / Vm(std)	=	0.0145	grains/dscf
grains/acf = cs x 17.647 x Ps x FDA / (Ts + 460)	=	0.0095	grains/acf
C = cs / 7000	=	2.07E-06	lbs/dscf
EM = C x Qs(std) x 60	=	39.4	lbs/hr
E = C x F x (20.9 / 20.9 - %O2) F-Factor method	=	0.027	lbs/MM Btu

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. 2

PLANT : F. J. GANNON STATION
DATE : 2-28-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: BASELINE /SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.198	in.
BAR. PRESSURE =	29.80	in.Hg	NOZZLE AREA =	0.000214	Sq.Ft.
STK. PRESSURE =	29.80	in.Hg	METER ORIFICE =	1.079	in. H2O
EFF. STACK AREA =	121.23	Sq.Ft.	METER VOLUME =	33.369	Cu.Ft.
Cp =	0.84		METER TEMP. =	81.5	DEG. F
GAS ANALYSIS =	13.8	% CO2	STACK TEMP. =	281.3	DEG. F
	5.2	% O2	SQ.RT. dP =	1.014	in. H2O
	0.0	% CO	CONDENSATE VOL.=	67.7	ml
	81.0	% N2	METER Y =	1.013	
LAB ANALYSIS =	0.02980	grams			
			F-FACTOR =	9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	= 3.191	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	= 32.902	scf
Bws = Vw(std) / (Vm(std) + Vw(std))	= 0.088	%
FDA = 1.0 - Bws	= 0.912	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)]	= 30.42	lb\lb-mole
Ms = (Md x FDA) + (18.0 x Bws)	= 29.33	lb\lb-mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	= 67.0	ft/sec
Qs = vs x As x 60	= 487325	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92)	= 315288	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	= 98.6	%
cs = 15.432 x grams / Vm(std)	= 0.0140	grains/dscf
grains/acf = cs x 17.647 x Ps x FDA / (Ts + 460)	= 0.0091	grains/acf
C = cs / 7000	= 2.00E-06	lbs/dscf
EM = C x Qs(std) x 60	= 37.8	lbs/hr
E = C x F x (20.9 / 20.9 - %O2) F-Factor method	= 0.026	lbs/MM Btu

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. 3

PLANT : F. J. GANNON STATION
DATE : 2-28-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: BASELINE /SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.198	in.
BAR. PRESSURE =	29.80	in.Hg	NOZZLE AREA =	0.000214	Sq.Ft.
STK. PRESSURE =	29.80	in.Hg	METER ORIFICE =	1.027	in. H2O
EFF. STACK AREA =	121.23	Sq.Ft.	METER VOLUME =	32.980	Cu.Ft.
Cp =	0.84		METER TEMP. =	82.3	DEG. F
GAS ANALYSIS =	13.2	% CO2	STACK TEMP. =	279.7	DEG. F
	5.6	% O2	SQ.RT. dP =	0.989	in. H2O
	0.0	% CO	CONDENSATE VOL.=	67.7	ml
	81.2	% N2	METER Y =	1.013	
LAB ANALYSIS =	0.02785	grams			
			F-FACTOR =	9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	=	3.191	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	=	32.469	scf
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.089	%
FDA = 1.0 - Bws	=	0.911	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)]	=	30.34	lb\lb-mole
Ms = (Md x FDA) + (18.0 x Bws)	=	29.24	lb\lb-mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	=	65.4	ft/sec
Qs = vs x As x 60	=	475687	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92)	=	308107	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	=	99.6	%
cs = 15.432 x grams / Vm(std)	=	0.0132	grains/dscf
grains/acf = cs x 17.647 x Ps x FDA / (Ts + 460)	=	0.0085	grains/acf
C = cs / 7000	=	1.89E-06	lbs/dscf
EM = C x Qs(std) x 60	=	34.9	lbs/hr
E = C x F x (20.9 / 20.9 - %O2) F-Factor method	=	0.025	lbs/MM Btu

A-2 BASELINE SULFURIC ACID MIST CALCULATIONS

U.S. EPA METHOD EIGHT
SULFURIC ACID MIST TEST CALCULATIONS
RUN NO. 1-S

PLANT : F.J. GANNON STATION
DATE : 2-28-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: BASELINE /SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =		0.198	in.
BAR. PRESSURE =	29.80	in.Hg	NOZZLE AREA =		0.00021382	Sq.Ft.
STK. PRESSURE =	29.80	in.Hg	METER ORIFICE =		0.971	in. H2O
EFF. STACK AREA =	121.23	Sq.Ft.	METER VOLUME =		33.416	Cu.Ft.
Cp =	0.84		METER TEMP. =		78.3	DEG. F
GAS ANALYSIS =	12.8	% CO2	STACK TEMP. =		263.6	DEG. F
	6.0	% O2	SQ.RT. dP =		1.000	in. H2O
	0.0	% CO	CONDENSATE VOL.=		75.5	ml
	81.2	% N2	METER Y =		1.000	
LAB ANALYSIS =	0.00000	grams	HEAT INPUT =	***		MM Btu/hr
			F-FACTOR =		9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	=	3.559	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	=	32.710	scf
		0.926	scm
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.098	%
FDA = 1.0 - Bws	=	0.902	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] =		30.29	lb/lb mole
Ms = (Md x FDA) + (18.0 x Bws)	=	29.09	lb/lb mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	=	65.6	ft/sec
Qs = vs x As x 60	=	477142	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92) =		312784	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	=	98.8	%

N = NORMALITY OF BaBI2 * 2H2O	=	0.0103	
Tb = TITRANT BLANK	=	0.0600	milliliters
Vs = VOLUME SOLUTION	=	5.05E+02	milliliters
Va = VOLUME ALIQUOT	=	100.0	milliliters
T = TITRANT	=	6.32	milliliters
H2SO4 (lb/dscf) = 0.0001081 x (N x (T-Tb) x Vs/Va)/Vm	=	0.00000108	lb/dscf
H2SO4 (g/dscm) = 0.04904 x (N x (T-Tb) x Vs/Va)/Vm	=	0.0172	g/dscm
H2SO4 (lb/MMBtu)		0.0148	lb/MMBtu

U.S. EPA METHOD EIGHT
SULFURIC ACID MIST TEST CALCULATIONS
RUN NO. 2-S

PLANT : F.J. GANNON STATION
DATE : 2-28-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: BASELINE /SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =		0.198	in.	
BAR. PRESSURE =	29.80	in.Hg	NOZZLE AREA =		0.00021382	Sq.Ft.	
STK. PRESSURE =	29.80	in.Hg	METER ORIFICE =		0.983	in. H2O	
EFF. STACK AREA =	121.23	Sq.Ft.	METER VOLUME =		33.923	Cu.Ft.	
Cp =	0.84		METER TEMP. =		80.5	DEG. F	
GAS ANALYSIS =	13.8	% CO2	STACK TEMP. =		267.4	DEG. F	
	5.3	% O2	SQ.RT. dP =		0.989	in. H2O	
	0.0	% CO	CONDENSATE VOL.=		72.3	ml	
	80.9	% N2	METER Y =		1.000		
LAB ANALYSIS =	0.00000	grams	HEAT INPUT =	***		MM Btu/hr	
			F-FACTOR =		9780	dscf/MMBtu	

Vw(std) = 0.04714 x Vic	=	3.408	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	=	33.075	scf
		0.937	scm
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.093	%
FDA = 1.0 - Bws	=	0.907	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] =		30.42	lb/lb mole
Ms = (Md x FDA) + (18.0 x Bws)	=	29.26	lb/lb mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	=	64.9	ft/sec
Qs = vs x As x 60	=	472050	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92) =		309536	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	=	101.0	%

N = NORMALITY OF BaBI2 * 2H2O	=	0.0103	
Tb = TITRANT BLANK	=	0.0600	milliliters
Vs = VOLUME SOLUTION	=	5.60E+02	milliliters
Va = VOLUME ALIQUOT	=	100.0	milliliters
T = TITRANT	=	4.08	milliliters
H2SO4 (lb/dscf) = 0.0001081 x (N x (T-Tb) x Vs/Va)/Vm	=	0.00000076	lb/dscf
H2SO4 (g/dscm) = 0.04904 x (N x (T-Tb) x Vs/Va)/Vm	=	0.0121	g/dscm
H2SO4 (lb/MMBtu)		0.0099	lb/MMBtu

U.S. EPA METHOD EIGHT
SULFURIC ACID MIST TEST CALCULATIONS
RUN NO. 3-S

PLANT : F.J. GANNON STATION
DATE : 2-28-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: BASELINE /SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =		0.198	in.
BAR. PRESSURE =	29.80	in.Hg	NOZZLE AREA =		0.00021382	Sq.Ft.
STK. PRESSURE =	29.80	in.Hg	METER ORIFICE =		0.983	in. H2O
EFF. STACK AREA =	121.23	Sq.Ft.	METER VOLUME =		33.756	Cu.Ft.
Cp =	0.84		METER TEMP. =		89.4	DEG. F
GAS ANALYSIS =	13.2	% CO2	STACK TEMP. =		267.5	DEG. F
	5.2	% O2	SQ.RT. dP =		0.991	in. H2O
	0.0	% CO	CONDENSATE VOL.=		71.6	ml
	81.6	% N2	METER Y =		1.000	
LAB ANALYSIS =	0.00000	grams	HEAT INPUT =	***		MM Btu/hr
			F-FACTOR =		9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	= 3.375	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	= 32.379	scf
	0.917	scm
Bws = Vw(std) / (Vm(std) + Vw(std))	= 0.094	%
FDA = 1.0 - Bws	= 0.906	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] =	30.32	lb/lb mole
Ms = (Md x FDA) + (18.0 x Bws)	= 29.16	lb/lb mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	= 65.1	ft/sec
Qs = vs x As x 60	= 473505	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92) =	310126	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	= 98.7	%

N = NORMALITY OF BaBl2 * 2H2O	= 0.0103	
Tb = TITRANT BLANK	= 0.0600	milliliters
Vs = VOLUME SOLUTION	= 6.69E+02	milliliters
Va = VOLUME ALIQUOT	= 100.0	milliliters
T = TITRANT	= 3.25	milliliters
	=	
H2SO4 (lb/dscf) = 0.0001081 x (N x (T-Tb) x Vs/Va)/Vm	= 0.00000073	lb/dscf
H2SO4 (g/dscm) = 0.04904 x (N x (T-Tb) x Vs/Va)/Vm	0.0118	g/dscm
H2SO4 (lb/MMBtu)	0.0096	lb/MMBtu

A-3 FUEL BLEND BURN PARTICULATE CALCULATIONS

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. 1-S

PLANT : F. J. GANNON
DATE : 4-23-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: TDF TEST BLEND/ SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.212	in.
BAR. PRESSURE =	30.05	in.Hg	NOZZLE AREA =	0.000245	Sq.Ft.
STK. PRESSURE =	30.05	in.Hg	METER ORIFICE =	1.265	in. H2O
EFF. STACK AREA =	122.72	Sq.Ft.	METER VOLUME =	38.748	Cu.Ft.
Cp =	0.84		METER TEMP. =	89.3	DEG. F
GAS ANALYSIS =	12.6	% CO2	STACK TEMP. =	279.2	DEG. F
	5.9	% O2	SQ.RT. dP =	0.972	in. H2O
	0.0	% CO	CONDENSATE VOL.=	64.2	ml
	81.8	% N2	METER Y =	1.000	
LAB ANALYSIS =	0.02825	grams			
			F-FACTOR =	9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	=	3.026	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	=	37.512	scf
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.075	%
FDA = 1.0 - Bws	=	0.925	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)]	=	30.34	lb\lb-mole
Ms = (Md x FDA) + (18.0 x Bws)	=	29.41	lb\lb-mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	=	63.8	ft/sec
Qs = vs x As x 60	=	469765	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92)	=	311750	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	=	100.4	%
cs = 15.432 x grams / Vm(std)	=	0.0116	grains/dscf
grains/acf = cs x 17.647 x Ps x FDA / (Ts + 460)	=	0.0077	grains/acf
C = cs / 7000	=	1.66E-06	lbs/dscf
EM = C x Qs(std) x 60	=	31.0	lbs/hr
E = C x F x (20.9 / 20.9 - %O2) F-Factor method	=	0.023	lbs/MM Btu

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. 2-S

PLANT : F. J. GANNON
DATE : 4-23-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: TDF TEST BLEND/ SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.212	in.
BAR. PRESSURE =	29.98	in.Hg	NOZZLE AREA =	0.000245	Sq.Ft.
STK. PRESSURE =	29.98	in.Hg	METER ORIFICE =	1.258	in. H2O
EFF. STACK AREA =	122.72	Sq.Ft.	METER VOLUME =	38.450	Cu.Ft.
Cp =	0.84		METER TEMP. =	87.2	DEG. F
GAS ANALYSIS =	12.3	% CO2	STACK TEMP. =	278.1	DEG. F
	6.3	% O2	SQ.RT. dP =	0.968	in. H2O
	0.0	% CO	CONDENSATE VOL.=	70.2	ml
	81.4	% N2	METER Y =	1.000	
LAB ANALYSIS =	0.03595	grams			
			F-FACTOR =	9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	=	3.309	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	=	37.278	scf
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.082	%
FDA = 1.0 - Bws	=	0.918	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)]	=	30.22	lb\lb-mole
Ms = (Md x FDA) + (18.0 x Bws)	=	29.22	lb\lb-mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	=	63.8	ft/sec
Qs = vs x As x 60	=	469765	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92)	=	309130	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	=	100.6	%
cs = 15.432 x grams / Vm(std)	=	0.0149	grains/dscf
grains/acf = cs x 17.647 x Ps x FDA / (Ts + 460)	=	0.0098	grains/acf
C = cs / 7000	=	2.13E-06	lbs/dscf
EM = C x Qs(std) x 60	=	39.5	lbs/hr
E = C x F x (20.9 / 20.9 - %O2) F-Factor method	=	0.030	lbs/MM Btu

U.S. EPA
PARTICULATE CALCULATIONS
RUN NO. 3-S

PLANT : F. J. GANNON
DATE : 4-23-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: TDF TEST BLEND/ SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.212	in.
BAR. PRESSURE =	30.05	in.Hg	NOZZLE AREA =	0.000245	Sq.Ft.
STK. PRESSURE =	30.05	in.Hg	METER ORIFICE =	1.841	in. H2O
EFF. STACK AREA =	122.72	Sq.Ft.	METER VOLUME =	39.301	Cu.Ft.
Cp =	0.84		METER TEMP. =	87.6	DEG. F
GAS ANALYSIS =	12.6	% CO2	STACK TEMP. =	278.3	DEG. F
	5.8	% O2	SQ.RT. dP =	0.967	in. H2O
	0.0	% CO	CONDENSATE VOL.=	72.4	ml
	81.6	% N2	METER Y =	1.000	
LAB ANALYSIS =	0.03075	grams			
			F-FACTOR =	9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	=	3.413	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	=	38.215	scf
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.082	%
FDA = 1.0 - Bws	=	0.918	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)]	=	30.25	lb/lb-mole
Ms = (Md x FDA) + (18.0 x Bws)	=	29.25	lb/lb-mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	=	63.7	ft/sec
Qs = vs x As x 60	=	469028	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92)	=	309282	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	=	103.1	%
cs = 15.432 x grams / Vm(std)	=	0.0124	grains/dscf
grains/acf = cs x 17.647 x Ps x FDA / (Ts + 460)	=	0.0082	grains/acf
C = cs / 7000	=	1.77E-06	lbs/dscf
EM = C x Qs(std) x 60	=	32.9	lbs/hr
E = C x F x (20.9 / 20.9 - %O2) F-Factor method	=	0.024	lbs/MM Btu

A-4 FUEL BLEND BURN SULFURIC ACID MIST CALCULATIONS

U.S. EPA METHOD EIGHT
SULFURIC ACID MIST TEST CALCULATIONS
RUN NO. 1-S

PLANT : F. J. GANNON
DATE : 4-23-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: TDF TEST BLEND/ SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.197	in.
BAR. PRESSURE =	30.00	in.Hg	NOZZLE AREA =	0.00021167	Sq.Ft.
STK. PRESSURE =	30.00	in.Hg	METER ORIFICE =	0.838	in. H2O
EFF. STACK AREA =	122.72	Sq.Ft.	METER VOLUME =	31.075	Cu.Ft.
Cp =	0.84		METER TEMP. =	81.1	DEG. F
GAS ANALYSIS =	10.4	% CO2	STACK TEMP. =	266.9	DEG. F
	5.1	% O2	SQ.RT. dP =	0.932	in. H2O
	0.0	% CO	CONDENSATE VOL.=	50.4	ml
	84.5	% N2	METER Y =	1.000	
LAB ANALYSIS =	0.00000	grams			
			F-FACTOR =	9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	=	2.376	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	=	30.457	scf
		0.863	scm
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.072	%
FDA = 1.0 - Bws	=	0.928	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] =		29.87	lb/lb mole
Ms = (Md x FDA) + (18.0 x Bws)	=	29.02	lb/lb mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	=	61.2	ft/sec
Qs = vs x As x 60	=	450620	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92) =		304584	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	=	96.7	%

N = NORMALITY OF BaBI2 * 2H2O	=	0.0102	
Tb = TITRANT BLANK	=	0.0400	milliliters
Vs = VOLUME SOLUTION	=	5.35E+02	milliliters
Va = VOLUME ALIQUOT	=	100.0	milliliters
T = TITRANT	=	4.66	milliliters
H2SO4 (lb/dscf) = 0.0001081 x (N x (T-Tb) x Vs/Va)/Vm	=	0.00000089	lb/dscf
H2SO4 (g/dscm) = 0.04904 x (N x (T-Tb) x Vs/Va)/Vm	=	0.0143	g/dscm
H2SO4 (lb/MMBtu)		0.0116	lb/MMBtu

U.S. EPA METHOD EIGHT
SULFURIC ACID MIST TEST CALCULATIONS
RUN NO. 2-S

PLANT : F. J. GANNON
DATE : 4-23-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: TDF TEST BLEND/ SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =	0.212	in.
BAR. PRESSURE =	30.00	in.Hg	NOZZLE AREA =	0.00024513	Sq.Ft.
STK. PRESSURE =	30.00	in.Hg	METER ORIFICE =	1.182	in. H2O
EFF. STACK AREA =	122.72	Sq.Ft.	METER VOLUME =	37.130	Cu.Ft.
Cp =	0.84		METER TEMP. =	88.4	DEG. F
GAS ANALYSIS =	11.6	% CO2	STACK TEMP. =	270.3	DEG. F
	5.1	% O2	SQ.RT. dP =	0.940	in. H2O
	0.0	% CO	CONDENSATE VOL.=	79.2	ml
	84.5	% N2	METER Y =	1.000	
LAB ANALYSIS =	0.00000	grams	HEAT INPUT =	***	MM Btu/hr
			F-FACTOR =	9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	=	3.733	scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	=	35.937	scf
		1.018	scm
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.094	%
FDA = 1.0 - Bws	=	0.906	%
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] =		30.40	lb/lb mole
Ms = (Md x FDA) + (18.0 x Bws)	=	29.23	lb/lb mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	=	61.6	ft/sec
Qs = vs x As x 60	=	453566	acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92) =		297914	dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	=	100.7	%

N = NORMALITY OF BaBI2 * 2H2O	=	0.0102	
Tb = TITRANT BLANK	=	0.0400	milliliters
Vs = VOLUME SOLUTION	=	6.40E+02	milliliters
Va = VOLUME ALIQUOT	=	100.0	milliliters
T = TITRANT	=	2.66	milliliters
H2SO4 (lb/dscf) = 0.0001081 x (N x (T-Tb) x Vs/Va)/Vm	=	0.00000051	lb/dscf
H2SO4 (g/dscm) = 0.04904 x (N x (T-Tb) x Vs/Va)/Vm	=	0.0082	g/dscm
H2SO4 (lb/MMBtu)		0.0067	lb/MMBtu

U.S. EPA METHOD EIGHT
SULFURIC ACID MIST TEST CALCULATIONS
RUN NO. 3-S

PLANT : F. J. GANNON
DATE : 4-23-96
SAMP. LOCATION : BOILER NO. 3
OPERATING COND.: TDF TEST BLEND/ SOOTBLOWING

SAMPLE TIME =	60.0	min.	NOZZLE DIA. =		0.212	in.
BAR. PRESSURE =	30.06	in.Hg	NOZZLE AREA =		0.00024513	Sq.Ft.
STK. PRESSURE =	30.06	in.Hg	METER ORIFICE =		1.149	in. H2O
EFF. STACK AREA =	122.72	Sq.Ft.	METER VOLUME =		36.481	Cu.Ft.
Cp =	0.84		METER TEMP. =		90.0	DEG. F
GAS ANALYSIS =	11.7	% CO2	STACK TEMP. =		269.2	DEG. F
	5.1	% O2	SQ.RT. dP =		0.926	in. H2O
	0.0	% CO	CONDENSATE VOL.=		74.6	ml
	85.6	% N2	METER Y =		1.000	
LAB ANALYSIS =	0.00000	grams	HEAT INPUT =	***		MM Btu/hr
			F-FACTOR =		9780	dscf/MMBtu

Vw(std) = 0.04714 x Vic	=	3.517 scf
Vm(std) = 17.647 x Vm x Y x (Pb + (dH / 13.6)) / (Tm + 460)	=	35.270 scf 0.999 scm
Bws = Vw(std) / (Vm(std) + Vw(std))	=	0.091 %
FDA = 1.0 - Bws	=	0.909 %
Md =(.44 x %CO2)+(.32 x %O2)+[.28 x (%N2 + %CO)] =		30.75 lb/lb mole
Ms = (Md x FDA) + (18.0 x Bws)	=	29.59 lb/lb mole
vs = 85.49 x CP x (Sq.Rt.dP) x [Sq.Rt.(Ts+460) / (Ms x Ps)]	=	60.2 ft/sec
Qs = vs x As x 60	=	443257 acf/min
Qs(std)=Qs x FDA x (528/(Ts + 460)) x (Ps/29.92) =		293112 dscf/min
I =(Ts + 460) x [(0.00267 x Vic) + (Vm(std) / 17.647)] x 100 / (Time x Ps x An x vs x 60)	=	100.4 %

N = NORMALITY OF BaBl2 * 2H2O	=	0.0102
Tb = TITRANT BLANK	=	0.0400 milliliters
Vs = VOLUME SOLUTION	=	5.58E+02 milliliters
Va = VOLUME ALIQUOT	=	100.0 milliliters
T = TITRANT	=	2.65 milliliters

H2SO4 (lb/dscf) = 0.0001081 x (N x (T-Tb) x Vs/Va)/Vm	=	0.00000046 lb/dscf
H2SO4 (g/dscm) = 0.04904 x (N x (T-Tb) x Vs/Va)/Vm	=	0.0073 g/dscm
H2SO4 (lb/MMBtu)		0.0059 lb/MMBtu

A-5 NOMENCLATURE

SOURCE SAMPLING NOMENCLATURE

A	=	Absorbance of sample.
A_n	=	Cross-sectional area of nozzle, m^2 (ft^2).
A_s	=	Cross-sectional area of stack, m^2 (ft^2).
B_{ws}	=	Water vapor in the gas steam, proportion by volume.
C	=	Concentration of particulate matter, (lbs/dscf), Method 5,17.
C	=	Concentration of NO_x, as NO_2, basis, corrected to standard conditions, mg/dscm (lbs/dscf), Method 7.
C_a	=	Concentration of acetone blank residue, mg/g.
$CH_2 SO_4$	=	Sulfuric acid (including SO_3) concentration, g/dscm (lbs/dscf).
C_p	=	Pitot tube coefficient, dimensionless.
cs	=	Concentration of stack gas particulates, dry basis corrected to standard conditions, g/dscm (lbs/dscf).
CSO_2	=	Sulfur dioxide concentration, mg/dscm (lbs/dscf).
E	=	Pollutant emissions, lbs/106 Btu.
EM	=	Particulate emission rate, lbs/hr.
F	=	Factor ratio of generated flue gases to calorific value of fuel, Method 5,17.
F	=	Dilution factor (i.e., 25/5, 25/10, etc.) required only if sample dilution was needed to reduce the absorbance to the range of calibration, Method 7.
FDA	=	Fraction of dry air.
I	=	Percent of isokinetic sampling, %.
K_c	=	Spectrophotometer calibration factor.
K_p	=	Pitot tube constant,

Metric

$$34.97 m/\sec \left[\frac{(g/g\text{-}mole)\,(mmHg)}{(\circ K)\,(mmH20)} \right] 1/2$$

English

$$85.49 ft/sec \left[\frac{(lb/lb\text{-}mole)\,(''Hg)}{(°K)\,(mmH2O)} \right] 1/2$$

L_a = Maximum acceptable leakage rate for either a pretest leak check or a leak check following a component change; equal to 0.00057 m^3/min (0.02 ft^3/min) or 4% of the average sampling rate, whichever is less.

L_i = Individual leakage rate observed during the leak check conducted prior to the "ith" component change (i = 1, 2, 3,...n), m^3/min (ft/min).

L_p = Leakage rate observed during the post test leak check, m^3/min (ft^3/min).

m = Mass of NO_x as NO_2 in gas sample, µg.

m_a = Mass of acetone residue after evaporation, mg.

M_d = Molecular weight of stack gas, dry basis, g/g-mole (lb/lb-mole).

m_f = Filter weight gain, mg.

m_n = Total amount of particulates collected, mg.

M_s = Molecular weight of stack gas, wet basis, g/g-mole (lb/lb-mole), or $M_d(1 - B_{ws})$ = 18.0 B_{ws}.

M_w = Molecular weight of water, 18.0 g/g-mole (18.0 lb/lb-mole).

N = Normality of $Ba(C10_4)_2$ titrant, g-eg/l.

N = Normality of barium perchlorate titrant, meq/ml.

P_a = Density of acetone, mg/ml (see bottle label).

P_{bar} = Barometric pressure at sampling site, mm Hg (in. Hg).

P_f = Final absolute pressure of flask, mm Hg (in. Hg).

P_g = Stack static pressure, mm Hg (in. Hg).

P_i = Initial absolute pressure of flask, mm Hg (in. Hg).

P_s = Absolute stack pressure, 760 mm Hg (29.92 in. Hg).

P_w = Density of water, 0.9982 g/ml (0.0022 lb/ml).

Q_s = Volumetric flow rate, actual cubic feet per min, acf/min.

Q_{std} = Dry volumetric stack gas flow rate corrected to standard conditions dsm^3/hr (dscf/hr).

R = Ideal gas constant, 0.06236 (mm Hg - m^3)/(°K - g - mole) for metric units and 21.85 (in. Hg - ft^3)(°R - 1b - mole) for English units.

S.V.P. = Saturated vapor pressure of water at average stack temperature mm Hg (in. Hg).

T_f = Final absolute temperature of flask, K (°R).

T_i = Initial absolute temperature of flask, K (°R).

T_m = Absolute average dry gas meter temperature, K (°R).

t_s = Stack temperature, °C (°F).

T_s = Absolute stack temperature, K (°R), or 273 + t_s for metric system or 460 + t_s for English system.

T_{std} = Standard absolute temperature, 293K (528°R).

V_a = Volume of acetone blank, ml, (Method 5,17).

V_a = Volume of sample aliquot titrated, ml, (Method 6).

V_a = Volume of absorbing solution, 25 ml, (Method 7).

V_a = Volume of sample aliquot titrated, 100 ml for H_2SO_4 and 10ml for SO_2 (Method 8).

V_{aw} = Volume of acetone used in wash, ml.

V_f = Final volume of condenser water, ml.

V_f = Volume of flask and valve, ml.

V_i = Initial volume of condenser water, ml.

V_{ic} = Total volumes of liquid and silica gel collected in impingers, ml.

V_m = Dry gas volume measured by dry gas meter, scm (dcf).

$V_{m(std)}$ = Volume of gas sample measured by the dry gas meter and corrected to standard condition, dscm (dscf).

vs = Average stack gas velocity calculated by Method 2, m/sec (ft/sec).

V_{sc} = Sample volume at standard conditions (dry basis), ml.

V_{soln} = Total volume of solution in which the sulfur dioxide sample is contained, 100 ml, (method 6).

V_{soln} = Total volume of solution in which the H_2SO_4 or SO_2 sample is contained, 250 ml or 1000 ml, respectively, (Method 8).

V_t = Volume of $Ba(C10_4)_2$ titrant used for the sample, ml, (Method 8).

V_t = Volume of barium perchlorate titrant used for the sample (average of replicate titrations), ml, (Method 6).

V_{tb} = Volume of barium perchlorate titrant used for the blank, ml.

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

$V_{wc(std)}$	=	Volume of condensed water vapor, corrected to standard conditions, sm^3(scf).
$V_{wsg(std)}$	=	Volume of water vapor collected in silica gel, corrected to standard conditions, sm^3 (scf).
W_a	=	Weight of acetone wash residue, mg.
W_f	=	Final weight of silica gel or silica gel plus impinger, g.
W_i	=	Initial weight of silica gel or silica gel plus impinger, g.
Y	=	Dry gas meter calibration factor.
ΔH	=	Average pressure differential across the orifice meter, mm (in) H_2O.
$\Delta H@i$	=	Measurement of pressure differential across the orifice meter, mm (in.) H_2O.
Δp	=	Average velocity head of stack gas, mm (in.) H_2O.
ΔV_m	=	Incremental volume measured by dry gas meter at each traverse point, dm^3 (dcf).
%CO	=	Percent CO by volume (dry basis), average of three CO values.
$\%CO_2$	=	Percent CO_2 by volume (dry basis), average of three analyses.
%EA	=	Percent excess air, %.
$\%N_2$	=	Percent N_2 by volume (dry basis), average of three N_2 values.
$\%O_2$	=	Percent O_2 by volume (dry basis), average of three O_2 values.
0.262	=	Ratio of O_2 to N_2 in air, v/v.
2	=	50/25, the aliquot factor, (Method 7).
13.6	=	Specific gravity of mercury (Hg).
18.0	=	Molecular weight of water, g/g-mole (lb/lb-mole).
32.03	=	Equivalent weight of sulfur dioxide.
60	=	Seconds per minute (sec/min).
100	=	Conversion to percent, %.
3600	=	Conversion factor, (sec/hr).
θ	=	Total sampling time, min.
θ_1	=	Interval of sampling time from beginning of a run until first component change, min.
θ_i	=	Interval of sampling time between two successive component changes, beginning with first and second changes, min.
θ_p	=	Interval of sampling time from final (nth) component change until the end of the sampling run, min.

APPENDIX B

LABORATORY ANALYTICAL DATA

B-1 BASELINE PARTICULATE LABORATORY DATA

SAMPLE ANALYTICAL DATA FORM

Plant F.D. GANNON STATION Run number RUN 1s

Sample location BOILER NO. 3

Relative humidity 37%

Sample Type	Sample Identifiable	Liquid Level Marked and/or Container Sealed
Acetone Rinse	YES	YES
Filters	YES	YES

Acetone rinse container number AIR-13

Acetone rinse volume (V_{aw}) 150 ml

Acetone blank residue weight (M_{ab}) 0.8 mg

Date and time of wt 3.5.96 7:00 32% Gross wt 104609.3 mg

Date and time of wt 3.5.96 15:00 37% Gross wt 104609.3 mg

Date and time of wt ——— Gross wt ——— mg

Average gross wt 104609.3 mg

Tare wt 104606.2 mg

Less acetone blank wt (M_{ab}) 0.8 mg

Weight of particulate in acetone rinse (m_a) 2.3 mg

Filter/Thimble Number 001093

Date and time of wt 3.4.96 7:15 39% Gross wt 1666.8 mg

Date and time of wt 3.4.96 14:15 35% Gross wt 1666.7 mg

Date and time of wt ——— Gross wt ——— mg

Average gross wt 1666.75 mg

Tare wt 1638.25 mg

Weight of particulate on filter(s) (m_f) 28.5 mg

Weight of particulate in acetone rinse (m_a) 2.3 mg

Total weight of particulate (m_n) 30.8 mg

Note: In no case should a blank residue >0.01 mg/g or 0.001% of the weight of acetone used be subtracted from the sample weight.

Remarks ———

Signature of analyst [signature]

Signature of reviewer [signature] 3/6/96

SAMPLE ANALYTICAL DATA FORM

Plant F.D. GANNON STATION Run number RUN 2S

Sample location BOILER NO. 3

Relative humidity 37%

Sample Type	Sample Identifiable	Liquid Level Marked and/or Container Sealed
Acetone Rinse	YES	YES
Filters	YES	YES

Acetone rinse container number AIR-14

Acetone rinse volume (V_{aw}) 150 ml

Acetone blank residue weight (M_{ab}) 0.8 mg

Date and time of wt 3.5.96 7:00 32% Gross wt 107543.0 mg

Date and time of wt 3.5.96 15:00 37% Gross wt 107542.9 mg

Date and time of wt ——— Gross wt ——— mg

Average gross wt 107542.95 mg

Tare wt 107540.6 mg

Less acetone blank wt (M_{ab}) 0.8 mg

Weight of particulate in acetone rinse (m_a) 1.55 mg

Filter/Thimble Number 001094

Date and time of wt 3.4.96 7:15 39% Gross wt 1759.1 mg

Date and time of wt 3.4.96 14:15 38% Gross wt 1759.2 mg

Date and time of wt ——— Gross wt ——— mg

Average gross wt 1759.15 mg

Tare wt 1730.85 mg

Weight of particulate on filter(s) (m_f) 28.3 mg

Weight of particulate in acetone rinse (m_a) 1.55 mg

Total weight of particulate (m_n) 29.85 mg

Note: In no case should a blank residue >0.01 mg/g or 0.001% of the weight of acetone used be subtracted from the sample weight.

Remarks ———

Signature of analyst [signature]

Signature of reviewer [signature] 3/6/96

SAMPLE ANALYTICAL DATA FORM

Plant F.D. GANNON STATION Run number RUN 3S

Sample location BOILER NO. 3

Relative humidity 37 %

Sample Type	Sample Identifiable	Liquid Level Marked and/or Container Sealed
Acetone Rinse	YES	YES
Filters	YES	YES

Acetone rinse container number AIR-15

Acetone rinse volume (V_{aw}) 150 ml

Acetone blank residue weight (M_{ab}) 0.8 mg

Date and time of wt 3.5.96 7:00 32% Gross wt 101426.8 mg

Date and time of wt 3.5.96 15:00 37% Gross wt 101426.8 mg

Date and time of wt ——— Gross wt ——— mg

Average gross wt 101426.8 mg

Tare wt 101425.25 mg

Less acetone blank wt (M_{ab}) 0.8 mg

Weight of particulate in acetone rinse (m_a) 0.75 mg

Filter/Thimble Number 001095

Date and time of wt 3.4.96 7:15 39% Gross wt 1714.1 mg

Date and time of wt 3.4.96 14:15 35% Gross wt 1714.2 mg

Date and time of wt ——— Gross wt ——— mg

Average gross wt 1714.15 mg

Tare wt 1687.05 mg

Weight of particulate on filter(s) (m_f) 27.1 mg

Weight of particulate in acetone rinse (m_a) 0.75 mg

Total weight of particulate (m_n) 27.85 mg

Note: In no case should a blank residue >0.01 mg/g or 0.001% of the weight of acetone used be subtracted from the sample weight.

Remarks ———

Signature of analyst [signature]

Signature of reviewer [signature] 3/4/96

BLANK ANALYTICAL DATA FORM

Plant F.D. GANNON STATION

Sample location BOILER NO. 3

Relative humidity 37 %

Liquid level marked and container sealed YES AIR-16

Blank volume (V_a) 150 ml

Date and time of wt 3.5.96 7:00 32% Gross wt 109294.4 mg

Date and time of wt 3.5.96 15:00 37% Gross wt 109294.2 mg

Date and time of wt ——— Gross wt ——— mg

Average Gross wt 109294.3 mg

Tare wt 109293.5 mg

Weight of blank (m_{ab}) 0.8 mg

Note: In no case should a blank residue greater than 0.001% of the blank weight be subtracted from the sample weight.

Filters Filter number 001097

Date and time of wt 3.4.96 7:15 39% Gross wt 1495.8 mg

Date and time of wt 3.4.96 14:15 35% Gross wt 1495.8 mg

Date and time of wt ——— Gross wt ——— mg

Average gross wt 1495.8 mg

Tare wt 1494.4 mg

Note: Average difference must be less than ±5 mg or 2% of total sample weight whichever is greater.

Remarks ———

Signature of analyst [signature]

Signature of reviewer [signature] 3/6/96

B-2 BASELINE SULFURIC ACID MIST LABORATORY DATA

TAMPA ELECTRIC COMPANY

Corporate Environmental Services

Laboratory Services

To: Stack Test Coordinator, CES

Laboratory Number: AA28439
Location Description: Gannon Unit #3 - SO3 Testing
Collection Date: 02/28/96
Report Date: 03/05/96
Analysis Date: 03/04/96

Parameter	Result	Units
Normality of BaCl2 * 2H2O	0.0103	
SO3, Volume of Sample Aliquot	100	milliliters
Sample Titration Results		
SO3, Avg. of Blank Titrations	0.06	milliliters
SO3, Run #1, Avg. of Titrations	6.32	milliliters
SO3, Run #2, Avg. of Titrations	4.08	milliliters
SO3, Run #3, Avg. of Titrations	3.25	milliliters

Sample Comments:
Total volume of solution in which the sample is contained.
Run #1 = 505 mls.
Run #2 = 560 mls.
Run #3 = 669 mls.

Frank Sanders — 3-5-96

Analyst — Date

Bret A. Nicholas — 3/5/96

Quality Assurance Specialist — Date

B-3 FUEL BLEND BURN PARTICULATE LABORATORY DATA

SAMPLE ANALYTICAL DATA FORM

Plant F.D. GANNON STATION Run number RUN 1S

Sample location BOILER NO. 3

Relative humidity 40%

Sample Type	Sample Identifiable	Liquid Level Marked and/or Container Sealed
Acetone Rinse	YES	YES
Filters	YES	YES

Acetone rinse container number A12-17

Acetone rinse volume (V_{aw}) 200 ml

Acetone blank residue weight (M_{ab}) 0.2 mg

Date and time of wt 4-26-96 7:13 37% Gross wt 111447.7 mg

Date and time of wt 4-26-96 13:24 39% Gross wt 111447.9 mg

Date and time of wt _____ Gross wt _____ mg

Average gross wt 111447.8 mg

Tare wt 111444.15 mg

Less acetone blank wt (M_{ab}) 0.2 mg

Weight of particulate in acetone rinse (m_a) 3.45 mg

Filter/Thimble Number 001098

Date and time of wt 4-25-96 14:53 42% Gross wt 1441.6 mg

Date and time of wt 4-26-96 7:13 37% Gross wt 1441.8 mg

Date and time of wt _____ Gross wt _____ mg

Average gross wt 1441.7 mg

Tare wt 1416.9 mg

Weight of particulate on filter(s) (m_f) 24.8 mg

Weight of particulate in acetone rinse (m_a) 3.45 mg

Total weight of particulate (m_n) 28.25 mg

Note: In no case should a blank residue >0.01 mg/g or 0.001% of the weight of acetone used be subtracted from the sample weight.

Remarks _____

Signature of analyst _____

Signature of reviewer _____ 4/30/96

SAMPLE ANALYTICAL DATA FORM

Plant F.D. GANNON STATION Run number RUN 25

Sample location BOILER No. 3

Relative humidity 40%

Sample Type	Sample Identifiable	Liquid Level Marked and/or Container Sealed
Acetone Rinse	YES	YES
Filters	YES	YES

Acetone rinse container number AIR-18

Acetone rinse volume (V_{aw}) 200 ml

Acetone blank residue weight (M_{ab}) 0.2 mg

Date and time of wt 4-26-96 7:13 37% Gross wt 108929.4 mg

Date and time of wt 4-26-96 13:24 39% Gross wt 108929.9 mg

Date and time of wt _____ Gross wt _____ mg

Average gross wt 108929.65 mg

Tare wt 108925.75 mg

Less acetone blank wt (M_{ab}) 0.2 mg

Weight of particulate in acetone rinse (m_a) 3.7 mg

Filter/Thimble Number 001099

Date and time of wt 4-25-96 14:53 42% Gross wt 1835.7 mg

Date and time of wt 4-26-96 7:13 37% Gross wt 1835.7 mg

Date and time of wt _____ Gross wt _____ mg

Average gross wt 1835.7 mg

Tare wt 1803.45 mg

Weight of particulate on filter(s) (m_f) 32.25 mg

Weight of particulate in acetone rinse (m_a) 3.7 mg

Total weight of particulate (m_n) 35.95 mg

Note: In no case should a blank residue >0.01 mg/g or 0.001% of the weight of acetone used be subtracted from the sample weight.

Remarks _____

Signature of analyst _____

Signature of reviewer _____ 4/30/96

SAMPLE ANALYTICAL DATA FORM

Plant F.D. GANNON STATION Run number RUN 3S

Sample location BOILER NO. 3

Relative humidity 40%

Sample Type	Sample Identifiable	Liquid Level Marked and/or Container Sealed
Acetone Rinse	YES	YES
Filters	YES	YES

Acetone rinse container number AIR-19

Acetone rinse volume (V_{aw}) 200 ml

Acetone blank residue weight (M_{ab}) 0.2 mg

Date and time of wt 4·26·96 7:13 37% Gross wt 1064666.0 mg

Date and time of wt 4·26·96 13:24 39% Gross wt 1064666.4 mg

Date and time of wt ——— Gross wt ——— mg

Average gross wt 1064666.2 mg

Tare wt 1064662.3 mg

Less acetone blank wt (M_{ab}) 0.2 mg

Weight of particulate in acetone rinse (m_a) 3.7 mg

Filter/Thimble Number 001100

Date and time of wt 4·25·96 14:53 42% Gross wt 1534.9 mg

Date and time of wt 4·26·96 7:13 37% Gross wt 1535.0 mg

Date and time of wt ——— Gross wt ——— mg

Average gross wt 1534.95 mg

Tare wt 1507.9 mg

Weight of particulate on filter(s) (m_f) 27.05 mg

Weight of particulate in acetone rinse (m_a) 3.7 mg

Total weight of particulate (m_n) 30.75 mg

Note: In no case should a blank residue >0.01 mg/g or 0.001% of the weight of acetone used be subtracted from the sample weight.

Remarks ———

Signature of analyst [signature]

Signature of reviewer [signature] 4/30/96

BLANK ANALYTICAL DATA FORM

Plant F.D. GANNON STATION

Sample location BOILER No. 3

Relative humidity 40%

Liquid level marked and container sealed YES AIR-2.0

Blank volume (V_a) 200 ml

Date and time of wt 4.26.96 7:13 37% Gross wt 109968.5 mg

Date and time of wt 4.26.96 13:24 39% Gross wt 109968.5 mg

Date and time of wt ——— Gross wt ——— mg

Average Gross wt 109968.5 mg

Tare wt 109968.3 mg

Weight of blank (m_{ab}) 0.2 mg

Note: In no case should a blank residue greater than 0.001% of the blank weight be subtracted from the sample weight.

Filters Filter number 001092

Date and time of wt 4.25.96 14:53 42% Gross wt 1015.0 mg

Date and time of wt 4.26.96 7:13 37% Gross wt 1015.0 mg

Date and time of wt ——— Gross wt ——— mg

Average gross wt 1015.0 mg

Tare wt 1013.8 mg

Note: Average difference must be less than ±5 mg or 2% of total sample weight whichever is greater.

Remarks ———

Signature of analyst [signature]

Signature of reviewer [signature] 4/30/96

B-4 FUEL BLEND BURN SULFURIC ACID MIST LABORATORY DATA

TAMPA ELECTRIC COMPANY

Corporate Environmental Services

Laboratory Services

To: Stack Test Coordinator, CES

Laboratory Number: AA29423
Location Description: Gannon Unit #3 - SO3 Testing
Collection Date: 04/23/96
Report Date: 04/26/96
Analysis Date: 04/25/96

Parameter	Result	Units
Normality of BaCl2 * 2H2O	0.0102	
SO3, Volume of Sample Aliquot	100	milliliters
Sample Titration Results		
SO3, Avg. of Blank Titrations	0.04	milliliters
SO3, Run #1, Avg. of Titrations	4.66	milliliters
SO3, Run #2, Avg. of Titrations	2.66	milliliters
SO3, Run #3, Avg. of Titrations	2.65	milliliters

Sample Comments:
Total volume of solution in which the sample is contained:
Run #1 = 535 ml
Run #2 = 640 ml
Run #3 = 558 ml

Frank Hardy — 4-26-96

Analyst — Date

Bret A. Nicholas — 4/26/96

Quality Assurance Specialist — Date

APPENDIX C

BOILER/PRECIPITATOR OPERATION DATA

C-1 BASELINE OPERATIONAL DATA

C-2 FUEL BLEND BURN OPERATIONAL DATA

C-1 BASELINE OPERATIONAL DATA

F.J. GANNON GENERATING STATION
HEAT INPUT CALCULATIONS

F.J. GANNON STATION BOILER NO. 3 BASELINE SULFURIC ACID MIST TEST FEBRUARY 28, 1996	
January Gross Heat Rate =	10.337 x 10^6 Btu/MWH
BOILER NO. 3 SOURCE TEST HEAT INPUT CALCULATIONS	
Final MWH (746152) - Initial MWH (745428) =	724 MWH
Time =	4.90 Hrs
Average MW =724 MWH ÷ 4.90 H =	147.8 MW
10.337 x 10^6 Btu/MWH x 724 MWH ÷ 4.90 H =	1527.3 x 10^6 Btu/H

COMPLIANCE TEST DATA

F. J. GANNON STATION

BOILER NO. 3 TEST DATE 2/28/96

UNIT LOAD (MN) 145 MW

BASE LOADED (TIME) 4:30

TEST DATA

MEGAWATTS INTEGRATOR			INITIALS
BEGIN MWH 0728	BEGIN SAMPLING 745428		C.RB
END MWH 1222	END SAMPLING 746152		CRB

SOOTBLOWING

RUN	BEGIN TIME	END TIME	INITIALS
1 SO3	0728	0836	C.RB / J.M.C
2 SO3	0921	1029	CRB / J.M.C.
3 SO3	1114	1232	CRB / J.M.C.

FLYASH REINJECTION

RUN	REINJECTION (Y/N)	% REINJECTION	INITIALS
1 SO3	yes	100%	CRB / LRJ
2 SO3	yes	100%	CRB / LRJ
3 SO3	yes	100%	C.RB / LRJ

COMPLIANCE TEST DATA
F. J. GANNON STATION

INTEGRATOR DATA

RUN NUMBER	START TIME	STOP TIME	INTEGRATOR START	INTEGRATOR STOP
1 SO3	0728	0836	745428	745597
2 SO3	0921	1029	745708	745874
3 SO3	1114	1222	745986	746152

STACK

* B cyclone tripped ≈ 1040; between run 2 & 3. Operator was able to return cyclone to service promptly - no MW drop.

* B cyclone tripped ≈ 1119; start of run 3. Operator was able to return cyclone to service promptly - no MW drop.

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 2/28/96

TIME : 1603

RUN NO. : 0735

INITIALS: CRB

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	290	40	50	325
A2	300	30	75	475
A3	350	22	85	550
A4	350	40	70	400
B1	300	46	60	350
B2	290	44	50	325
B3	290	44	50	325
B4	*	*	*	*
C1	330	52	55	300
C2	290	50	NE	250
C3	300	52	45	250
C4	280	50	45	225
D1	260	44	35	250
D2	180	30	17	75
D3	280	46	45	250
D4	280	44	40	225

U3LOG

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 2/28/96

TIME : 0925

RUN NO. : 2 SO3

INITIALS: CRB

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	290	38	50	350
A2	320	30	75	475
A3	350	24	80	550
A4	350	40	65	375
B1	300	46	60	350
B2	290	44	50	325
B3	290	44	50	325
B4	*	*	*	*
C1	300	52	55	325
C2	270	50	45	225
C3	300	52	45	250
C4	280	50	45	225
D1	240	44	40	250
D2	170	30	17	75
D3	280	46	45	250
D4	270	44	40	250

U3LOG

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 2/28/96

TIME : 1125

RUN NO. : 3 SO_3

INITIALS: CRB

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	270	38	50	300
A2	320	30	65	475
A3	350	22	85	550
A4	340	40	65	400
B1	300	46	60	350
B2	290	44	50	325
B3	290	44	50	325
B4	*	*	*	*
C1	330	52	50	350
C2	270	50	45	250
C3	300	52	45	250
C4	280	50	45	225
D1	250	44	40	275
D2	170	30	17	75
D3	280	46	50	275
D4	280	44	40	250

U3LOG

F.J. GANNON GENERATING STATION
HEAT INPUT CALCULATIONS

F.J. GANNON STATION BOILER NO. 3 BASELINE PARTICULATE TEST February 28, 1996	
January Gross Heat Rate =	10.337 x 10^6 Btu/MWH
BOILER NO. 3 SOURCE TEST HEAT INPUT CALCULATIONS	
Final MWH (746932) - Initial MWH (746308) =	624 MWH
Time =	4.22 Hrs
Average MW = 624 MWH ÷ 4.22 H =	147.9 MW
10.337 x 10^6 Btu/MWH x 624 MWH ÷ 4.22 H =	1528.5 x 10^6 Btu/H

COMPLIANCE TEST DATA
F. J. GANNON STATION

BOILER NO. 3 TEST DATE 2/28/96

UNIT LOAD (MN) 148

BASE LOADED (TIME) 0430

TEST DATA

MEGAWATTS INTEGRATOR			INITIALS
BEGIN MWH 1324	BEGIN SAMPLING 746308		CRB
END MWH 1737	END SAMPLING 746932		CRB

SOOTBLOWING

RUN	BEGIN TIME	END TIME	INITIALS
1 particulate	1324	1433	CRB / LME
2 particulate	1510	1615	CRB / LME
3 particulate	1633	1737	CRB / LME

FLYASH REINJECTION

RUN	REINJECTION (Y/N)	% REINJECTION	INITIALS
1 particulate	yes	100%	CRB / LRJ
2 particulate	yes	100%	CRB / LRJ
3 particulate	yes	100%	CRB / LRJ

COMPLIANCE TEST DATA
F. J. GANNON STATION

INTEGRATOR DATA

RUN NUMBER	START TIME	STOP TIME	INTEGRATOR START	INTEGRATOR STOP
1 particulate	1324	1433	746308	746479
2 particulate	1510	1615	746567	746730
3 particulate	1633	1737	746776	746932

STACK

UNIT: 3

DATE: 2/28/96

HOUR	MW	FUEL RATIO	TEMP	AIR/FUEL RATIO	OPERATING CONDITIONS
0700	145	100% Coal	290°	58% / 50%	Sootblowing, reinjection, Steady State
0800	147	100% Coal	290°	60% / 50%	Sootblowing, reinjection, Steady State
0900	147	100% Coal	295°	58% / 50%	Sootblowing, reinjection, Steady State
1000	146	100% Coal	290°	60% / 52%	Sootblowing, reinjection, Steady State
1100	148	100% Coal	285°	58% / 51%	Sootblowing, reinjection, Steady State
1200	147	100% Coal	280°	60% / 55%	Sootblowing, reinjection, Steady State
1300	147	100% Coal	290°	60% / 55%	Sootblowing, reinjection, Steady State
1400	147	100% Coal	290°	60% / 56%	Sootblowing, reinjection, Steady State
1500	147	100% Coal	290°	60% / 56%	Sootblowing, reinjection, Steady State
1600	147	100% coal	295°	58% / 50%	Sootblowing, reinjection, Steady State
1700	146	100% Coal	290°	60% / 55%	Sootblowing, reinjection, Steady

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 2-28-96

TIME : 1330

RUN NO. : 1 Particulate

INITIALS: L R J

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	270	39	50	300
A2	330	31	75	500
A3	350	23	85	575
A4	345	41	70	400
B1	290	46	60	350
B2	285	44	45	300
B3	285	45	50	300
B4	★	★	★	★
C1	310	51	60	350
C2	270	49	40	225
C3	300	52	45	250
C4	275	50	45	225
D1	250	43	40	275
D2	160	31	15	50
D3	280	46	45	250
D4	270	44	45	250

U3LOG

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 2-28-96

TIME : 1520

RUN NO. : #2 Particulate

INITIALS: LRJ

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	260	38	50	300
A2	340	31	75	500
A3	355	26	85	575
A4	345	41	65	400
B1	300	46	60	325
B2	285	44	45	300
B3	290	45	50	325
B4	☆	☆	☆	☆
C1	320	56	65	375
C2	270	49	45	225
C3	300	52	45	250
C4	265	50	40	200
D1	260	44	40	250
D2	165	30	15	50
D3	280	45	50	275
D4	275	44	45	275

U3LOG

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 2/28/96

TIME : 1645

RUN NO. : 3 Particulate

INITIALS: LCJ

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	270	39	50	350
A2	330	32	75	500
A3	380	22	80	575
A4	350	41	70	400
B1	300	47	55	325
B2	285	44	50	300
B3	290	46	50	325
B4	☆	☆	☆	☆
C1	300	52	55	300
C2	260	50	40	200
C3	290	52	45	250
C4	260	49	40	200
D1	240	44	40	250
D2	170	31	15	60
D3	280	46	50	250
D4	270	44	40	250

U3LOG

C-2 FUEL BLEND BURN OPERATIONAL DATA

F. J. GANNON GENERATING STATION
HEAT INPUT CALCULATIONS

F. J. GANNON STATION BOILER NO. 3 FUEL BLEND H2SO4 TEST APRIL 23, 1996	
March Gross Heat Rate =	10.233 X 10^6 Btu/MWH
BOILER NO. 3 SOURCE TEST HEAT INPUT CALCULATIONS	
Final MWH (873599) - Initial MWH(872956) =	643 MWH
Time =	4.77 Hours
Average MW = 643 MWH ÷ 4.77 H =	134.8 MW
10.233 X 10^6 Btu/MWH X 643 MWH ÷4.77 H =	1379.4 X 10^6 MMBtu/H

COMPLIANCE TEST DATA

F. J. GANNON STATION

BOILER NO. 3 TDF/Coal Blend TEST DATE 4/23/96

UNIT LOAD (MN) 133 MW

BASE LOADED (TIME) 5:00 a.m.

TEST DATA

MEGAWATTS INTEGRATOR			INITIALS
BEGIN MWH 0747	BEGIN SAMPLING 872956		CRB
END MWH 1233	END SAMPLING 873599		CRB

SOOTBLOWING

RUN	BEGIN TIME	END TIME	INITIALS
1 SO3	0747	0853	CRB/
2 SO3	0940	1046	CRB/
3 SO3	1129	1233	CRB/

FLYASH REINJECTION

RUN	REINJECTION (Y/N)	% REINJECTION	INITIALS
1 SO3	yes	100%	CRB/ F.D.
2 SO3	yes	100%	CRB/ F.D.
3 SO3	yes	100%	CRB/ F.D.

COMPLIANCE TEST DATA
F. J. GANNON STATION

INTEGRATOR DATA

RUN NUMBER	START TIME	STOP TIME	INTEGRATOR START	INTEGRATOR STOP
1 SO3	0747	0853	872956	873102
2 SO3	0940	1046	873210	873360
3 SO3	1129	1233	873454	873599

STACK

UNIT: 3

DATE: 4/23/96

HOUR	MW	FUEL * RATIO	TEMP	AIR/FUEL RATIO	OPERATING CONDITIONS
0700	133	18% tires	290°	54% / 53%	Soothblowing, reinjection Ducky Stati
0800	133	18% tires	300°	54% / 52%	Soothblowing, reinjection Ducky Stati
0900	133	18% tires	300°	54% / 52%	Soothblowing, reinjection Ducky Stati
1000	134	18% tires	300°	54% / 54%	Soothblowing, reinjection Ducky Stati
1100	135	18% tires	300°	55% / 53%	Soothblowing, reinjection Ducky Stati
1200	134	18% tires	300°	54% / 53%	Soothblowing, reinjection Ducky Stati
1300	133	18% tires	305°	52% / 51%	Soothblowing, reinjection Ducky Stati
1400	134	18% tires	309°	54% / 51%	Soothblowing, reinjection Ducky Stati
1500	133	18% tires	310°	54% / 51%	Soothblowing, reinjection Ducky Stati
1600	134	18% tires	310°	54% / 52%	Soothblowing, reinjection Ducky Stati
1700	133	18% tires	305°	55% / 52%	Soothblowing, reinjection Ducky Stati

* Based on 4/22/96 bunkering

UNIT 3 TDF / COAL BUNKERING WORKSHEET

BUNKER DATE 4/22/96

BURN DATE 4/23/96

NUMBER OF PAYLOADS OF TIRES 152

TOTAL TONS TIRES 245
(CONVERSION 3226 LBS TIRES /PAYLOAD)

CONVEYOR H1 START 116289
CONVEYOR H1 STOP 117123

DIFFERENCE 834

CONVEYOR H2 START 934265
CONVEYOR H2 STOP 934784

DIFFERENCE 519

TONS MIX 1353

PERCENT TIRES = TONS TIRES / TONS MIX x 100

PERCENT TIRES = 18%

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 4/23/96

TIME : 0751

RUN NO. : 1 503

INITIALS: CRB

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	300	38	45	375
A2	310	30	75	450
A3	330	22	100	575
A4	350	40	75	450
B1	290	44	100	375
B2	290	42	55	350
B3	290	44	55	375
B4	*	*	*	*
C1	310	50	55	375
C2	260	48	45	250
C3	270	48	45	250
C4	250	48	45	225
D1	240	44	40	275
D2	190	30	17	125
D3	280	44	55	325
D4	250	42	45	275

U3LOG

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 4/23/96

TIME : 0945

RUN NO. : 2 S03

INITIALS: CRB

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	290	38	60	375
A2	310	30	70	475
A3	330	20	85	575
A4	350	40	75	450
B1	300	46	65	375
B2	290	42	55	350
B3	290	44	55	350
B4	*	*	*	*
C1	310	48	65	350
C2	270	46	50	250
C3	270	48	45	250
C4	270	48	45	225
D1	200	44	40	275
D2	200	30	17	100
D3	280	42	55	275
D4	240	42	45	275

U3LOG

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 4/23/96

TIME : 1200

RUN NO. : 3 SO3

INITIALS: CRB

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	280	36	50	375
A2	310	32	75	500
A3	330	22	85	575
A4	350	40	75	450
B1	300	46	65	375
B2	290	44	50	325
B3	290	44	55	350
B4	*	*	*	*
C1	250	48	70	250
C2	270	46	45	250
C3	270	48	45	250
C4	270	46	45	250
D1	240	42	50	250
D2	190	30	17	125
D3	280	44	60	325
D4	270	40	50	250

U3LOG

F. J. GANNON GENERATING STATION
HEAT INPUT CALCULATIONS

F. J. GANNON STATION BOILER NO. 3 FUEL BLEND PARTICULATE TEST APRIL 23, 1996	
March Gross Heat Rate =	10.233 X 10^6 Btu/MWH
BOILER NO. 3 SOURCE TEST HEAT INPUT CALCULATIONS	
Final MWH (874224) - Initial MWH(873721) =	503 MWH
Time =	3.75 Hours
Average MW = 503 MWH ÷ 3.75 H =	134.1 MW
10.233 X 10^6 Btu/MWH X 503 MWH ÷3.75 H =	1372.6 X 10^6 MMBtu/H

COMPLIANCE TEST DATA

F. J. GANNON STATION

BOILER NO. 3 TDF/Coal Blend TEST DATE 4/23/96

UNIT LOAD (MN) 133

BASE LOADED (TIME) 5:00 a.m.

TEST DATA

MEGAWATTS INTEGRATOR				INITIALS
BEGIN MWH	1328	BEGIN SAMPLING	873721	CRB
END MWH	1713	END SAMPLING	874224	CRB

SOOTBLOWING

RUN	BEGIN TIME	END TIME	INITIALS
1 particulate	1328	1433	CRB/ JHF
2 particulate	1453	1554	CRB/ JHF
3 particulate	1610	1713	CRB/ JHF

FLYASH REINJECTION

RUN	REINJECTION (Y/N)	% REINJECTION	INITIALS
1 particulate	yes	100%	CRB/ JRP
2 particulate	yes	100%	CRB/ JRP
3 particulate	yes	100%	CRB/ JRP

COMPLIANCE TEST DATA
F. J. GANNON STATION

INTEGRATOR DATA

RUN NUMBER	START TIME	STOP TIME	INTEGRATOR START	INTEGRATOR STOP
1 particulate	1328	1433	873721	873868
2 particulate	1453	1556	873912	874052
3 particulate	1610	1713	874084	874224

STACK

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 4/23/96

TIME : 1338

RUN NO. : 1 particulate

INITIALS: CRB

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	300	36	60	450
A2	320	30	75	475
A3	330	26	85	575
A4	350	40	75	450
B1	300	46	65	375
B2	290	42	50	350
B3	290	44	55	350
B4	*	*	*	*
C1	310	46	75	475
C2	260	46	45	275
C3	270	48	45	250
C4	250	46	50	225
D1	200	42	25	250
D2	190	30	17	125
D3	280	44	50	300
D4	260	44	45	225

U3LOG

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 4/23/94

TIME : 1500

RUN NO. : 2 Particulate

INITIALS: CDB

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	300	38	60	400
A2	320	30	75	475
A3	330	24	85	575
A4	350	40	75	450
B1	300	46	65	375
B2	290	44	50	350
B3	290	44	55	350
B4	*	*	*	*
C1	300	48	75	475
C2	260	46	50	275
C3	270	48	40	250
C4	250	48	45	200
D1	240	42	45	250
D2	190	30	17	100
D3	280	44	50	275
D4	260	44	40	250

U3LOG

GANNON STACK TEST PRECIPITATOR LOG – UNIT 3

DATE : 4/23/96

TIME : 1015

RUN NO. : 3 Particle #1

INITIALS: CRB

T/R	PRIMARY VOLTS	SECONDARY VOLTS (DC)	PRIMARY AMPS	SECONDARY AMPS (DC)
A1	280	38	70	400
A2	310	30	75	475
A3	330	26	85	575
A4	350	40	80	450
B1	300	46	65	375
B2	290	44	50	350
B3	290	44	55	350
B4	*	*	*	*
C1	300	50	75	475
C2	260	46	50	275
C3	260	46	45	250
C4	250	46	45	225
D1	240	44	45	250
D2	180	30	17	125
D3	280	44	55	250
D4	270	40	45	250

U3LOG

APPENDIX D

CONTINUOUS EMISSION MONITORING DATA

D-1 BASELINE CEMS STACK TEST LOGS

D-2 FUEL BLEND BURN CEMS STACK TEST LOGS

D-3 CONTINUOUS EMISSION MONITOR RELATIVE ACCURACY TEST AUDIT RESULTS 1995

D-4 CONTINUOUS EMISSION MONITOR QUALITY ASSURANCE LINEARITY CHECKS - QUARTER 1 1996

D-1 BASELINE CEMS STACK TESTS LOGS

Gannon Station
Unit 3
Tampa

Today's Date: 03/04/96
Time: 13:23:28

Reporting Period
Day: 02/28/96

DAILY EPA CEM SUMMARY

Time	CO2 %	SO2 lb/mmBtu	NOX lb/mmBtu	OPACITY %
700	12.1	2.1	1.32	5
800	12.2	2.1	1.26	5
900	12.1	2.1	1.27	5
1000	12.0	2.0	1.30	5
1100	11.7	2.0	1.31	5
1200	11.8	2.0	1.34	5
1300	11.9	2.0	1.37	5
1400	11.2	1.9	1.36	5
1500	10.6	1.9	1.35	5
1600	10.9	1.9	1.33	5
1700	11.1	2.0	1.30	5
1800	11.4	2.0	1.31	5
	11.6	2.0	1.32	5

D-2 FUEL BLEND BURN CEMS STACK TEST LOGS

Gannon Station
Unit 3
Tampa

Today's Date: 04/24/96
Time: 10:03:52

Reporting Period
Day: 04/23/96

DAILY EPA CEM SUMMARY

Time	CO2 %	SO2 lb/mmBtu	NOX lb/mmBtu	OPACITY %
800	10.8	2.1	1.10	4
900	10.8	2.0	1.13	4
1000	11.0	2.0	1.14	4
1100	11.2	2.0	1.15	3
1200	11.2	2.0	1.16	3
1300	11.2	2.0	1.14	3
1400	10.3	1.9	1.20	3
1500	9.9	1.9	1.20	3
1600	10.0	2.0	1.13	3
1700	9.5	1.9	1.21	3
	10.6	2.0	1.16	3

D-3 CONTINUOUS EMISSION MONITOR RELATIVE ACCURACY TEST AUDIT RESULTS - 1995

TAMPA ELECTRIC
A TECO ENERGY COMPANY

CORPORATE ENVIRONMENTAL SERVICES
MEMORANDUM

SUBJECT: Continuous Emissions Monitoring (CEM) Systems
Relative Accuracy Test Audit Results - 1995
F. J. Gannon Station Boiler No.3

DATE: 25, January, 1996

FROM: Martin Duff

TO: Cindy Barringer

Corporate Environmental Services, Air Programs group, performed a Relative Accuracy Test Audit (RATA) on Boiler No. 3 (GB03), on October 30 thru November 1, 1995. This audit was conducted in accordance with the system supplier's directions, and meet the requirements of 40 CFR 75, Appendix B.

All results were deemed acceptable, meeting the performance specifications of 40 CFR 75, Appendix A, Performance Specification 3.31,3.32,3.33,3.34.

Attached to this memorandum, you will find data summary sheets for each system tested. All testing was performed under my direction, and the results are certified as true and accurate.

These records should be maintained at your facility for a period of three (3) years to comply with 40 CFR 75, Appendix F, Recordingkeeping Requirements. Corporate Environmental Services will maintain all supporting information for this test for the same time period.

Should you have any questions regarding this information, feel free to contact me at extension 38285.

Martin C. Duff
Technician
Corporate Environmental Services
Air Programs

ratarpt.wpd

cc: L.F. Robinson

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F.J. GANNON STATION DATE: 11/01/95

UNIT: UNIT NO.3

MONITOR: SPECTRUM SYSTEMS PRIMARY

COMPARISON: ppm SO2 (wet basis)

OPERATING LEVEL: HIGH GROSS SOURCE LOAD: 160

VALID OR INVALID RUN	RUN	TIME	RM ppm SO2	CEMS ppm SO2	DIFF ppm SO2
V	1	0845-0906	756.9	770.4	-13.5
V	2	0932-0953	754.9	757.4	-2.5
V	3	1032-1053	751.2	772.1	-20.9
V	4	1129-1150	738.9	742.6	-3.7
V	5	1220-1241	736.9	739.7	-2.8
V	6	1313-1334	725.0	732.0	-7.0
V	7	1421-1442	726.7	698.3	28.4
V	8	1508-1529	727.7	736.1	-8.4
v	9	1615-1636	730.7	738.9	-8.2
I	10	00:00 - 00:00	0.0	0.0	0.0
I	11	00:00 - 00:00	0.0	0.0	0.0
I	12	00:00 - 00:00	0.0	0.0	0.0
I	13	00:00 - 00:00	0.0	0.0	0.0
I	14	00:00 - 00:00	0.0	0.0	0.0
I	15	00:00 - 00:00	0.0	0.0	0.0

REFERENCE MEAN:	738.767	MD:	-4.291
MEAN CEM:	743.057	STD DEV:	13.582
		CC:	10.440
NUMBER OF RUNS:	9		
T-VALUE:	2.306		
		REL ACCY:	1.99%
BIAS TEST:	PASSED		
BIAS ADJ. (BAF)	1.000		

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F. J. GANNON STATION DATE: 11/01/95

UNIT: UNIT NO. 3

MONITOR: SPECTRUM SYSTEMS PRIMARY

COMPARISON: lb NOx/MMBTU

OPERATING LEVEL: HIGH GROSS SOURCE LOAD: 160

VALID OR INVALID RUN	RUN	TIME	RM lbNOx/ MMBTU	CEMS lbNOx/ MMBTU	DIFF lbNOx/ MMBTU
V	1	0845-0906	1.482	1.497	-0.015
V	2	0932-0953	1.503	1.519	-0.016
V	3	1032-1053	1.443	1.466	-0.023
V	4	1129-1150	1.499	1.509	-0.010
V	5	1220-1241	1.537	1.546	-0.009
V	6	1313-1343	1.626	1.626	0.000
V	7	1421-1442	1.653	1.649	0.004
V	8	1508-1529	1.648	1.672	-0.024
V	9	1615-1636	1.631	1.657	-0.026
I	10	00:00 - 00:00	0.000	0.000	0.000
I	11	00:00 - 00:00	0.000	0.000	0.000
I	12	00:00 - 00:00	0.000	0.000	0.000
I	13	00:00 - 00:00	0.000	0.000	0.000
I	14	00:00 - 00:00	0.000	0.000	0.000
I	15	00:00 - 00:00	0.000	0.000	0.000

REFERENCE MEAN: 1.558 MD: -0.013

MEAN CEM: 1.571 STD DEV: 0.011

CC: 0.008

NUMBER OF RUNS: 9

T-VALUE: 2.306

REL ACCY: 1.37%

BIAS TEST: PASSED

BIAS ADJ. (BAF) 1.000

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F. J. GANNON STATION DATE: 11/01/95

UNIT: UNIT NO. 3

MONITOR: SPECTRUM SYSTEMS PRIMARY

COMPARISON: Percent CO2 (wet basis)

OPERATING LEVEL: HIGH GROSS SOURCE LOAD: 160

VALID OR INVALID RUN	RUN	TIME	RM % CO2	CEMS % CO2	DIFF % CO2
V	1	0845-0906	12.26	12.4	-0.2
V	2	0932-0953	12.47	12.5	-0.0
V	3	1032-1053	12.28	12.5	-0.2
V	4	1129-1150	12.47	12.5	0.0
V	5	1220-1241	12.52	12.5	0.0
V	6	1313-1334	12.50	12.5	-0.0
V	7	1421-1442	12.43	12.0	0.4
V	8	1508-1529	12.46	12.5	-0.1
V	9	1615-1636	12.51	12.5	-0.0
I	10	00:00 - 00:00	0.00	0.0	0.0
I	11	00:00 - 00:00	0.00	0.0	0.0
I	12	00:00 - 00:00	0.00	0.0	0.0
I	13	00:00 - 00:00	0.00	0.0	0.0
I	14	00:00 - 00:00	0.00	0.0	0.0
I	15	00:00 - 00:00	0.00	0.0	0.0

REFERENCE MEAN:	12.433	MD:	-0.008
MEAN CEM:	12.441	STD DEV:	0.190
		CC:	0.146
NUMBER OF RUNS:	9		
T-VALUE:	2.306		
		REL ACCY:	1.24%
BIAS TEST:	PASSED		
BIAS ADJ. (BAF)	1.000		

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F.J.GANNON DATE: 11/01/95

UNIT: UNIT NO. 3

MONITOR: SPECTRUM SYSTEMS USI PRIMARY

COMPARISON: STACK FLOW

OPERATING LEVEL: HIGH GROSS SOURCE LOAD: 160

VALID OR INVALID RUN	RUN	TIME	RM FLOW WSCFH	CEMS FLOW WSCFH	DIFF FLOW WSCFH
V	1	0845-0906	394583	370195	24388
V	2	0932-0953	392482	370907	21575
V	3	1032-1053	391217	370679	20538
V	4	1129-1150	390320	367960	22360
V	5	1220-1241	388726	366795	21931
V	6	1313-1334	388913	367109	21804
V	7	1421-1442	386245	363730	22515
V	8	1508-1529	388064	364937	23127
v	9	1615-1636	384020	361965	22055
i	10	00:00 - 00:00	0	0	0
i	11	00:00 - 00:00	0	0	0
i	12	00:00 - 00:00	0	0	0
i	13	00:00 - 00:00	0	0	0
i	14	00:00 - 00:00	0	0	0
i	15	00:00 - 00:00	0	0	0

REFERENCE MEAN: 389397 MD: 22255

MEAN CEM: 367142 STD DEV: 1069

CC: 822

NUMBER OF RUNS: 9

T-VALUE: 2.306

REL ACCY: 5.93%

BIAS TEST: NOT PASSED

BIAS ADJ. (BAF) 1.061

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F.J.GANNON DATE: 10/30/95

UNIT: UNIT NO. 3

MONITOR: SPECTRUM SYSTEMS USI

COMPARISON: STACK FLOW

OPERATING LEVEL: MID GROSS SOURCE LOAD: 125

VALID OR INVALID RUN	RUN	TIME	RM FLOW WSCFH	CEMS FLOW WSCFH	DIFF FLOW WSCFH
I	1	1950-1958	317115	309429	7686
V	2	1959-2007	314989	308465	6524
V	3	2008-2016	316068	309476	6592
I	4	2029-2036	320665	311920	8745
V	5	2037-2045	318395	312024	6371
V	6	2046-2053	318454	313300	5154
V	7	2102-2110	316741	313788	2953
V	8	2111-2118	316373	313673	2700
V	9	2119-2126	317040	312580	4460
V	10	2136-2143	316816	311307	5509
V	11	2144-2151	316663	310000	6663
I	12	2152-2159	319967	310329	9638
I	13	00:00 - 00:00	0	0	0
I	14	00:00 - 00:00	0	0	0
I	15	00:00 - 00:00	0	0	0

REFERENCE MEAN: 316838
MEAN CEM: 311624

NUMBER OF RUNS: 9
T-VALUE: 2.306

BIAS TEST: NOT PASSED
BIAS ADJ. (BAF) 1.017

MD: 5214
STD DEV: 1547
CC: 1189

REL ACCY: 2.02%

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F.J.GANNON DATE: 10/31/95

UNIT: UNIT NO. 3

MONITOR: SPECTRUM SYSTEMS USI PRIMARY

COMPARISON: STACK FLOW

OPERATING LEVEL: LOW GROSS SOURCE LOAD: 85

VALID OR INVALID RUN	RUN	TIME	RM FLOW WSCFH	CEMS FLOW WSCFH	DIFF FLOW WSCFH
I	1	2136-2144	277887	266894	10993
V	2	2145-2151	275313	266977	8336
I	3	2152-2159	280308	269187	11121
V	4	2214-2222	275386	267288	8098
V	5	2223-2231	276380	267365	9015
I	6	2232-2238	277878	266269	11609
V	7	2245-2252	277287	267027	10260
V	8	2253-2300	277540	268227	9313
V	9	2301-2308	278215	269633	8582
V	10	2315-2324	275919	266247	9672
V	11	2325-2332	275461	265540	9921
V	12	2333-2340	277154	267547	9607
I	13	00:00 - 00:00	0	0	0
I	14	00:00 - 00:00	0	0	0
I	15	00:00 - 00:00	0	0	0

REFERENCE MEAN: 276517 MD: 9200

MEAN CEM: 267317 STD DEV: 743

CC: 571

NUMBER OF RUNS: 9

T-VALUE: 2.306

REL ACCY: 3.53%

BIAS TEST: NOT PASSED

BIAS ADJ. (BAF) 1.034

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F.J. GANNON STATION DATE: 11/01/95

UNIT: UNIT NO.3

MONITOR: SPECTRUM SYSTEMS BACKUP

COMPARISON: ppm SO2 (wet basis)

OPERATING LEVEL: HIGH GROSS SOURCE LOAD: 160

VALID OR INVALID RUN	RUN	TIME	RM ppm SO2	CEMS ppm SO2	DIFF ppm SO2
V	1	0845-0906	756.9	769.4	-12.5
V	2	0932-0953	754.9	757.6	-2.7
V	3	1032-1053	751.2	772.1	-20.9
V	4	1129-1150	738.9	743.2	-4.3
V	5	1220-1241	736.9	740.2	-3.3
V	6	1313-1334	725.0	733.4	-8.4
V	7	1421-1442	726.7	698.6	28.1
V	8	1508-1529	727.7	736.1	-8.4
V	9	1615-1636	730.7	738.3	-7.6
I	10	00:00 - 00:00	0.0	0.0	0.0
I	11	00:00 - 00:00	0.0	0.0	0.0
I	12	00:00 - 00:00	0.0	0.0	0.0
I	13	00:00 - 00:00	0.0	0.0	0.0
I	14	00:00 - 00:00	0.0	0.0	0.0
I	15	00:00 - 00:00	0.0	0.0	0.0

REFERENCE MEAN: 738.767
MEAN CEM: 743.224

NUMBER OF RUNS: 9
T-VALUE: 2.306

BIAS TEST: PASSED
BIAS ADJ. (BAF) 1.000

MD: -4.457
STD DEV: 13.433
CC: 10.325

REL ACCY: 2.00%

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F. J. GANNON STATION DATE: 11/01/95

UNIT: UNIT NO. 3

MONITOR: SPECTRUM SYSTEMS BACKUP

COMPARISON: lb NOx/MMBTU

OPERATING LEVEL: HIGH GROSS SOURCE LOAD: 160

VALID OR INVALID RUN	RUN	TIME	RM lbNOx/ MMBTU	CEMS lbNOx/ MMBTU	DIFF lbNOx/ MMBTU
V	1	0845-0906	1.482	1.463	0.019
V	2	0932-0953	1.503	1.487	0.016
V	3	1032-1053	1.443	1.433	0.010
V	4	1129-1150	1.499	1.476	0.023
V	5	1220-1241	1.537	1.513	0.024
V	6	1313-1334	1.626	1.590	0.036
V	7	1421-1442	1.653	1.606	0.047
V	8	1508-1529	1.648	1.637	0.011
V	9	1615-1636	1.631	1.626	0.005
I	10	00:00 - 00:00	0.000	0.000	0.000
I	11	00:00 - 00:00	0.000	0.000	0.000
I	12	00:00 - 00:00	0.000	0.000	0.000
I	13	00:00 - 00:00	0.000	0.000	0.000
I	14	00:00 - 00:00	0.000	0.000	0.000
I	15	00:00 - 00:00	0.000	0.000	0.000

REFERENCE MEAN: 1.558
MEAN CEM: 1.537

NUMBER OF RUNS: 9
T-VALUE: 2.306

BIAS TEST: NOT PASSED
BIAS ADJ. (BAF) 1.014

MD: 0.021
STD DEV: 0.013
CC: 0.010

REL ACCY: 2.02%

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F. J. GANNON STATION DATE: 11/01/95

UNIT: UNIT NO. 3

MONITOR: SPECTRUM SYSTEMS BACKUP

COMPARISON: Percent CO2 (wet basis)

OPERATING LEVEL: HIGH GROSS SOURCE LOAD: 160

VALID OR INVALID RUN	RUN	TIME	RM % CO2	CEMS % CO2	DIFF % CO2
V	1	0845-0906	12.26	12.7	-0.4
V	2	0932-0953	12.47	12.7	-0.2
V	3	1032-1053	12.28	12.8	-0.5
V	4	1129-1150	12.47	12.7	-0.2
V	5	1220-1241	12.52	12.7	-0.2
V	6	1313-1334	12.50	12.7	-0.2
V	7	1421-1442	12.43	12.2	0.2
V	8	1508-1529	12.46	12.8	-0.3
V	9	1615-1636	12.51	12.7	-0.2
I	10	00:00 - 00:00	0.00	0.0	0.0
I	11	00:00 - 00:00	0.00	0.0	0.0
I	12	00:00 - 00:00	0.00	0.0	0.0
I	13	00:00 - 00:00	0.00	0.0	0.0
I	14	00:00 - 00:00	0.00	0.0	0.0
I	15	00:00 - 00:00	0.00	0.0	0.0

REFERENCE MEAN: 12.433
MEAN CEM: 12.674

NUMBER OF RUNS: 9
T-VALUE: 2.306

BIAS TEST: PASSED
BIAS ADJ. (BAF) 1.000

MD: -0.240
STD DEV: 0.194
CC: 0.149

REL ACCY: 3.13%

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F.J.GANNON DATE: 11/01/95

UNIT: UNIT NO. 3

MONITOR: SPECTRUM SYSTEMS USI BACKUP

COMPARISON: STACK FLOW

OPERATING LEVEL: HIGH GROSS SOURCE LOAD: 160

VALID OR INVALID RUN	RUN	TIME	RM FLOW WSCFH	CEMS FLOW WSCFH	DIFF FLOW WSCFH
V	1	0845-0906	394583	369491	25092
V	2	0932-0953	392482	370216	22266
V	3	1032-1053	391217	369979	21238
V	4	1129-1150	390320	367251	23069
V	5	1220-1241	388726	367251	21475
V	6	1313-1334	388913	366074	22839
V	7	1421-1442	386245	362898	23347
V	8	1508-1529	388064	364095	23969
v	9	1615-1636	384020	361107	22913
I	10	00:00 - 00:00	0	0	0
I	11	00:00 - 00:00	0	0	0
I	12	00:00 - 00:00	0	0	0
I	13	00:00 - 00:00	0	0	0
I	14	00:00 - 00:00	0	0	0
I	15	00:00 - 00:00	0	0	0

REFERENCE MEAN: 389397 MD: 22912

MEAN CEM: 366485 STD DEV: 1192

CC: 917

NUMBER OF RUNS: 9

T-VALUE: 2.306

REL ACCY: 6.12%

BIAS TEST: NOT PASSED

BIAS ADJ. (BAF) 1.063

RELATIVE ACCURACY TEST AUDIT

DATA SUMMARY

PLANT: F.J.GANNON DATE: 10/30/95

UNIT: UNIT NO. 3

MONITOR: SPECTRUM SYSTEMS USI BACKUP

COMPARISON: STACK FLOW

OPERATING LEVEL: MID GROSS SOURCE LOAD: 125

VALID OR INVALID RUN	RUN	TIME	RM FLOW WSCFH	CEMS FLOW WSCFH	DIFF FLOW WSCFH
I	1	1950-1958	317115	308759	8356
V	2	1959-2007	314989	307800	7189
V	3	2008-2016	316068	308800	7268
I	4	2029-2036	320665	311233	9432
V	5	2037-2045	318395	311365	7030
V	6	2046-2053	318454	312627	5827
V	7	2102-2110	316741	313082	3659
V	8	2111-2118	316373	313000	3373
V	9	2119-2126	317040	311920	5120
V	10	2136-2143	316816	310620	6196
V	11	2144-2151	316663	309327	7336
I	12	2152-2159	319967	309648	10319
I	13	00:00 - 00:00	0	0	0
I	14	00:00 - 00:00	0	0	0
I	15	00:00 - 00:00	0	0	0

REFERENCE MEAN: 316838 MD: 5889

MEAN CEM: 310949 STD DEV: 1541

CC: 1184

NUMBER OF RUNS: 9

T-VALUE: 2.306

REL ACCY: 2.23%

BIAS TEST: NOT PASSED

BIAS ADJ. (BAF) 1.019

DATA SUMMARY

PLANT: F.J.GANNON DATE: 10/31/95

UNIT: UNIT NO. 3

MONITOR: SPECTRUM SYSTEMS USI BACKUP

COMPARISON: STACK FLOW

OPERATING LEVEL: LOW GROSS SOURCE LOAD: 85

VALID OR INVALID RUN	RUN	TIME	RM FLOW WSCFH	CEMS FLOW WSCFH	DIFF FLOW WSCFH
I	1	2136-2144	277887	266253	11634
V	2	2145-2151	275313	266277	9036
I	3	2152-2159	280308	268520	11788
V	4	2214-2222	275386	266635	8751
V	5	2223-2231	276380	266682	9698
I	6	2232-2238	277878	265600	12278
V	7	2245-2252	277287	266347	10940
V	8	2253-2300	277540	267587	9953
V	9	2301-2308	278215	268960	9255
V	10	2315-2324	275919	265579	10340
V	11	2325-2332	275461	264847	10614
V	12	2333-2340	277154	267547	9607
I	13	00:00 - 00:00	0	0	0
I	14	00:00 - 00:00	0	0	0
I	15	00:00 - 00:00	0	0	0

REFERENCE MEAN: 276517
MEAN CEM: 266718

NUMBER OF RUNS: 9
T-VALUE: 2.306

BIAS TEST: NOT PASSED
BIAS ADJ. (BAF) 1.037

MD: 9799
STD DEV: 734
CC: 564

REL ACCY: 3.75%

D-4 CONTINUOUS EMISSION MONITOR QUALITY ASSURANCE LINEARITY CHECKS - QUARTER 1 1996

TAMPA ELECTRIC
A TECO ENERGY COMPANY

CORPORATE ENVIRONMENTAL SERVICES
MEMORANDUM

SUBJECT: Continuous Emissions Monitoring (CEM) Systems
Quality Assurance Linearity Checks
Quarter 1, 1996
Gannon Unit 3, Primary and Backup

DATE: 27, March, 1996

FROM: R. A. Mc Darby

TO: Cindy Barringer

Corporate Environmental Services, Air Programs group, performed linearity checks on Gannon Unit 3, on March 25, 1996. These checks were conducted in accordance with the system supplier's directions, and meet the requirements of 40 CFR 75, Appendix B, Quality Assurance and Quality Control Procedures.

Linearity checks were performed on the primary and backup systems sequentially. Primary system linearity checks were performed from 13:41 through 15:28. Backup system linearity checks were performed from 16:06 through 17:34. A concerted effort was made to avoid causing any missing data periods during these tests. All final results were deemed acceptable, meeting the performance specifications of 40 CFR 75, Appendix A, section 3.2.

Attached to this memorandum, you will find data summary sheets for each analyzer tested. All testing was performed under my direction, and the results are certified as true and accurate. These records should be maintained at your facility for a period of three (3) years to comply with 40 CFR 75, Appendix F, Recordingkeeping Requirements. Corporate Environmental Services will maintain all supporting information for this test for the same time period.

Should you have any questions regarding this information, feel free to contact me at extension 38306.

Raymond A. Mc Darby
Quality Assurance Specialist
Corporate Environmental Services
Air Programs

Tampa Electric Company
Corporate Environmental Services
Air Programs

40 CFR 75 Appendix B
Linearity Check Data

Unit Under Test	Gannon Unit 3		
Monitor	SO2	Test Date	03/25/96
Manufacturer	Thermo Environmental		
Serial Number	43B-48171-279		
Unit ID #	GB03	Component ID #	001
Monitoring Plan System ID #	311		
Low-level Bottle Number	ALM - 054552		
Mid-level Bottle Number	ALM - 040737		
High-level Bottle Number	ALM - 022399		

Protocol Expiration Dates

03/05/98
03/05/98
09/11/97

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
Low-level	#1 13:51		345.0
	#2 14:54		353.9
	#3 15:14	347.0	354.9
Average Monitor Response (A)			351.267
Linearity Error (LE)			1.2

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
Mid-level	#1 14:11		784.8
	#2 15:01		759.8
	#3 15:20	762.0	763.1
Average Monitor Response (A)			769.233
Linearity Error (LE)			0.9

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
High-level	#1 14:19		1222.1
	#2 15:07		1232.5
	#3 15:28	1234.0	1233.4
Average Monitor Response (A)			1229.333
Linearity Error (LE)			0.4

LE = (|R-A|/R)*100

NOTE:
LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 5 ppm for SO_2 and NOx analyzers. For CO_2 analyzers, LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 0.5% by volume.

The analyzers must pass at all three levels.

Monitor Summary

Level	
Low	1.2 %
Mid	0.9 %
High	0.4 %

Comments: _____

_____

_____

Signature: _____

Tampa Electric Company
Corporate Environmental Services
Air Programs

40 CFR 75 Appendix B
Linearity Check Data

Unit Under Test: Gannon Unit 3
Monitor: NOx — Test Date: 03/25/96
Manufacturer: Thermo Environmental
Serial Number: 42D-47872-279
Unit ID #: GB03 — Component ID #: 003
Monitoring Plan System ID #: 313

		Protocol Expiration Dates
Low-level Bottle Number	ALM - 054552	03/05/98
Mid-level Bottle Number	ALM - 040737	03/05/98
High-level Bottle Number	ALM - 022399	09/11/97

Linearity Check Point	Reading Number & Time of Day		Reference Value (R)	Monitor Response
Low-level	#1	13:51	368.0	383.8
	#2	14:54		384.7
	#3	15:14		385.3
Average Monitor Response (A)				384.600
Linearity Error (LE)				4.5
Mid-level	#1	14:11	825.0	797.1
	#2	15:01		861.6
	#3	15:20		854.0
Average Monitor Response (A)				837.567
Linearity Error (LE)				1.5
High-level	#1	14:19	1431.0	1461.5
	#2	15:07		1444.8
	#3	15:28		1445.3
Average Monitor Response (A)				1450.533
Linearity Error (LE)				1.4

LE = (|R-A|/R)*100

NOTE:
LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 5 ppm for SO_2 and NOx analyzers. For CO_2 analyzers, LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 0.5% by volume.

The analyzers must pass at all three levels.

Monitor Summary

Level	
Low	4.5 %
Mid	1.5 %
High	1.4 %

Comments: _____

_____

_____

Signature: _____

Tampa Electric Company
Corporate Environmental Services
Air Programs

40 CFR 75 Appendix B
Linearity Check Data

Unit Under Test	Gannon Unit 3		
Monitor	CO2	Test Date	03/25/96
Manufacturer	Siemens		
Serial Number	E3-727		
Unit ID #	GB03	Component ID #	005
Monitoring Plan System ID #	315		
Low-level Bottle Number	ALM - 054552		
Mid-level Bottle Number	ALM - 040737		
High-level Bottle Number	ALM - 022399		

Protocol Expiration Dates
03/05/98
03/05/98
09/11/97

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
Low-level	#1 13:51	5.00	5.1
	#2 14:54		5.3
	#3 15:14		5.3
Average Monitor Response (A)			5.233
Linearity Error (LE), percent volume			0.2

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
Mid-level	#1 14:11	10.90	11.4
	#2 15:01		11.1
	#3 15:20		11.1
Average Monitor Response (A)			11.200
Linearity Error (LE)			2.8

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
High-level	#1 14:19	17.94	18.1
	#2 15:07		18.1
	#3 15:28		18.1
Average Monitor Response (A)			18.100
Linearity Error (LE)			0.9

LE = (|R-A|/R)*100

NOTE:
LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 5 ppm for SO_2 and NOx analyzers. For CO_2 analyzers, LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 0.5% by volume.

The analyzers must pass at all three levels.

Monitor Summary

Level	
Low	0.2 %
Mid	2.8 %
High	0.9 %

Comments: _____

Signature: _____

Tampa Electric Company
Corporate Environmental Services
Air Programs

40 CFR 75 Appendix B
Linearity Check Data

Unit Under Test: Gannon Unit 3 BACKUP
Monitor: SO2 Test Date: 03/25/96
Manufacturer: Thermo Environmental
Serial Number: 43B-47950-281
Unit ID #: GB03 Component ID #: 002
Monitoring Plan System ID #: 312

		Protocol Expiration Dates
Low-level Bottle Number	ALM - 054552	03/05/98
Mid-level Bottle Number	ALM - 040737	03/05/98
High-level Bottle Number	ALM - 022399	09/11/97

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
Low-level	#1 16:13		353.1
	#2 17:01		353.9
	#3 17:21	347.0	360.3
Average Monitor Response (A)			355.767
Linearity Error (LE)			2.5

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
Mid-level	#1 16:20		766.5
	#2 17:07		765.3
	#3 17:28	762.0	769.1
Average Monitor Response (A)			766.967
Linearity Error (LE)			0.7

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
High-level	#1 16:28		1229.1
	#2 17:15		1236.4
	#3 17:34	1234.0	1235.3
Average Monitor Response (A)			1233.600
Linearity Error (LE)			0.0

LE = (|R-A|/R)*100

NOTE:
LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 5 ppm for SO_2 and NOx analyzers. For CO_2 analyzers, LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 0.5% by volume.

The analyzers must pass at all three levels.

Monitor Summary

Level	
Low	2.5 %
Mid	0.7 %
High	0.0 %

Comments: _____

_____

_____

Signature: _____

Tampa Electric Company
Corporate Environmental Services
Air Programs

40 CFR 75 Appendix B
Linearity Check Data

Unit Under Test	Gannon Unit 3 BACKUP		
Monitor	NOx	Test Date	03/25/96
Manufacturer	Thermo Environmental		
Serial Number	42D-47871-279		
Unit ID #	GB03	Component ID #	004
Monitoring Plan System ID #	314		Protocol Expiration Dates
Low-level Bottle Number	ALM - 054552		03/05/98
Mid-level Bottle Number	ALM - 040737		03/05/98
High-level Bottle Number	ALM - 022399		09/11/97

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
Low-level	#1 16:13		384.2
	#2 17:01		383.6
	#3 17:21	368.0	381.8
Average Monitor Response (A)			383.200
Linearity Error (LE)			4.1

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
Mid-level	#1 16:20		857.5
	#2 17:07		855.0
	#3 17:28	825.0	854.0
Average Monitor Response (A)			855.500
Linearity Error (LE)			3.7

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
High-level	#1 16:28		1441.4
	#2 17:15		1445.5
	#3 17:34	1431.0	1441.7
Average Monitor Response (A)			1442.867
Linearity Error (LE)			0.8

LE = (|R-A|/R)*100

NOTE:
LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 5 ppm for SO_2 and NOx analyzers. For CO_2 analyzers, LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 0.5% by volume.

The analyzers must pass at all three levels.

Monitor Summary

Level	
Low	4.1 %
Mid	3.7 %
High	0.8 %

Comments: _____

_____

_____

Signature: _____

Tampa Electric Company
Corporate Environmental Services
Air Programs

40 CFR 75 Appendix B
Linearity Check Data

Unit Under Test	Gannon Unit 3 BACKUP		
Monitor	CO2	Test Date	03/25/96
Manufacturer	Siemens		
Serial Number	E2-786		
Unit ID #	GB03	Component ID #	006
Monitoring Plan System ID #	316		
Low-level Bottle Number	ALM - 054552		
Mid-level Bottle Number	ALM - 040737		
High-level Bottle Number	ALM - 022399		

Protocol Expiration Dates
03/05/98
03/05/98
09/11/97

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
Low-level	#1 16:13	5.00	5.2
	#2 17:01		5.2
	#3 17:21		5.3
Average Monitor Response (A)			5.233
Linearity Error (LE), percent volume			0.2

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
Mid-level	#1 16:20	10.90	11.1
	#2 17:07		11.1
	#3 17:28		11.1
Average Monitor Response (A)			11.100
Linearity Error (LE)			1.8

Linearity Check Point	Reading Number & Time of Day	Reference Value (R)	Monitor Response
High-level	#1 16:28	17.94	17.8
	#2 17:15		17.9
	#3 17:34		17.8
Average Monitor Response (A)			17.833
Linearity Error (LE)			0.6

LE = (|R-A|/R)*100

NOTE:
LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 5 ppm for SO_2 and NOx analyzers. For CO_2 analyzers, LE must not exceed 5%, or the absolute difference of R - A must be less than or equal to 0.5% by volume.

The analyzers must pass at all three levels.

Monitor Summary

Level	
Low	0.2 %
Mid	1.8 %
High	0.6 %

Comments: _____

_____

Signature: _____

APPENDIX E

FUEL ANALYSIS

E-1 BASELINE WEEKLY COMPOSITE

E-2 FUEL BLEND BURN WEEKLY COMPOSITES

E-3 TIRE DERIVED FUEL ANALYSIS

E-1 BASELINE WEEKLY COMPOSITE

From: Tampa Electric Company
Laboratory Services Department
5012 Causeway Blvd. Tampa, FL 33597
H.R.S. Certification # E54272
D.E.P. Comprehensive QA Plan #910140

May 20, 1996

To: Environmental Coord., Gannon
Fuel Data Coord., Envir. Plan.

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

Sample I.D. AA28456 Location code: GN-WK-3
Location Description: Gannon, Wkly Coal Comp, Unit 3
Sample collector: GANNON Sample collection date: 03/03/96
Lab submittal date: 03/04/96 Time: 13:37
Sample Matrix: Coal

Coal Identification Information
Gannon sample I.D. number: DER10-3G
Week ending date: 03/03/96

Parameter	Result	Units	MDL
Total Moisture	11.3	%	0.30
BTU in Coal, as Determined	13141	BTU/Lb.	1
Pounds SO2 / Million BTU, Coal	1.89	Lbs. SO2/MMBTU	
Ash, as Received	6.13	%	0.4
Ash, Dry Basis	6.91	%	0.4
BTU, as Received	12126	BTU/Lb	100
BTU, Dry Basis	13671	BTU/Lb.	100
Sulfur, as Received	1.21	%	0.08
Sulfur, Dry Basis	1.36	%	0.08
BTU, Moisture-Ash Free, Calc.	14686	BTU/Lb.	100
Sulfur in Coal, as Determined	1.31	%	0.01
Magnesium Oxide, MgO, X-Ray	1.26	%	
Sodium Oxide, Na2O, X-Ray	0.72	%	
Titanium Dioxide, TiO2, X-Ray	1.27	%	
Iron Oxide, Fe2O3, X-Ray	21.28	%	
Silicon Dioxide, SiO2, X-Ray	43.37	%	
Sulfur Trioxide, SO3, X-Ray	1.13	%	
Calcium Oxide, CaO, X-Ray	3.28	%	
Potassium Oxide, K2O, X-Ray	2.96	%	
Phosphorus, P2O5, X-Ray	0.41	%	
Aluminium Oxide, AL2O3, X-Ray	21.48	%	
Silica Value, Ash Mineral Analy	62.68	%	
T250 from Ash Mineral Analyses	2359	Degrees F	
Undetermined, Ash Mineral Analys	2.84	%	
Slagging Index	0.607	0.6-2.0 Medium	
Fouling Index	0.321	0.2-0.5 Medium	
Trace Elements in Coal by ICP	see below	---	---
Mercury in Coal by O2 Bomb/AA	0.09	ug/g (dry)	0.02

Data for Trace Elements in Coal by ICP:

Trace Metals in Coal and Coke by Inductively Coupled Plasma
Digestion Method: ASTM D-3683
Analysis Method: Inductively Coupled Plasma

Beryllium by ICP	0.96	ug/g
Chromium by ICP	7.53	ug/g
Nickel by ICP	9.32	ug/g
Lead by ICP	12.8	ug/g
Vanadium by ICP	17.2	ug/g
Zinc by ICP	25.4	ug/g

Note: All results reported represent concentrations in coal on a DRY BASIS.

Sample comments:

Trace Metal analysis request added 05/08/96

If there are any questions regarding this data, please call.

Robert L. Dorey
Supervisor of Laboratory Services

E-2 FUEL BLEND BURN WEEKLY COMPOSITES

From: Tampa Electric Company
Laboratory Services Department
5012 Causeway Blvd. Tampa, FL 33597
H.R.S. Certification # E54272
D.E.P. Comprehensive QA Plan #910140

May 20, 1996

To: Environmental Coord., Gannon
Fuel Data Coord., Envir. Plan.

The following analytical results have been obtained for the indicated sample which was submitted to this laboratory:

Sample I.D. AA29477 Location code: GN-WK-3
Location Description: Gannon, Wkly Coal Comp, Unit 3
Sample collector: GANNON Sample collection date: 04/28/96
Lab submittal date: 04/30/96 Time: 10:48
Sample Matrix: Coal

Coal Identification Information
Gannon sample I.D. number: DER18-3G
Week ending date: 04/28/96

Parameter	Result	Units	MDL
Total Moisture	8.71	%	0.30
BTU in Coal, as Determined	13532	BTU/Lb.	1
Pounds SO2 / Million BTU, Coal	1.88	Lbs. SO2/MMBTU	
Ash, as Received	6.11	%	0.4
Ash, Dry Basis	6.69	%	0.4
BTU, as Received	12643	BTU/Lb	100
BTU, Dry Basis	13849	BTU/Lb.	100
Sulfur, as Received	1.25	%	0.08
Sulfur, Dry Basis	1.37	%	0.08
BTU, Moisture-Ash Free, Calc.	14842	BTU/Lb.	100
Sulfur in Coal, as Determined	1.34	%	0.01
Magnesium Oxide, MgO, X-Ray	1.44	%	
Sodium Oxide, Na2O, X-Ray	0.44	%	
Titanium Dioxide, TiO2, X-Ray	1.26	%	
Iron Oxide, Fe2O3, X-Ray	22.19	%	
Silicon Dioxide, SiO2, X-Ray	41.18	%	
Sulfur Trioxide, SO3, X-Ray	1.36	%	
Calcium Oxide, CaO, X-Ray	2.80	%	
Potassium Oxide, K2O, X-Ray	3.22	%	
Phosphorus, P2O5, X-Ray	0.18	%	
Aluminium Oxide, AL2O3, X-Ray	22.30	%	
Silica Value, Ash Mineral Analy	60.91	%	
T250 from Ash Mineral Analyses	2340	Degrees F	
Undetermined, Ash Mineral Analys	3.63	%	
Slagging Index	0.637	0.6-2.0 Medium	
Fouling Index	0.205	0.2-0.5 Medium	
Trace Elements in Coal by ICP	see below	---	---
Mercury in Coal by O2 Bomb/AA	0.10	ug/g (dry)	0.02

Data for Trace Elements in Coal by ICP:

Trace Metals in Coal and Coke by Inductively Coupled Plasma
Digestion Method: ASTM D-3683
Analysis Method: Inductively Coupled Plasma

Beryllium by ICP	1.22	ug/g
Chromium by ICP	6.97	ug/g
Nickel by ICP	9.45	ug/g
Lead by ICP	5.71	ug/g
Vanadium by ICP	17.4	ug/g
Zinc by ICP	25.3	ug/g

Note: All results reported represent concentrations in coal on a DRY BASIS.

Sample comments:

Trace Metals analysis request added 05/08/96

If there are any questions regarding this data, please call.

Robert L. Dorey
Supervisor of Laboratory Services

E-3 TIRE DERIVED FUEL ANALYSIS

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • TEL: 708-953-9300 FAX: 708-953-9306
since 1908
Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD.
SOUTH HOLLAND, IL 60473
TEL: (708) 331-2900
FAX: (708) 333-3060

May 13, 1996

TAMPA ELECTRIC
Corporate Environmental Svcs.
5010 Causeway Blvd.
Tampa, FL 33619
Attn: Robert L. Dorey

Sample identification by
Tampa Electric

Kind of sample
reported to us TDF

Sample ID: TDF

Sample taken at ------

Sample taken by ------

Date sampled ------

Date received May 1, 1996

P.O. No. EN35816

REVISED REPORT 5/13/96

Analysis Report No. 71-24828 Page 1 of 2

PROXIMATE ANALYSIS

	As Received	Dry Basis	
% Moisture	5.57	xxxxx	
% Ash	12.54	13.28	
% Volatile	45.31	47.98	
% Fixed Carbon	36.58	38.74	
	100.00	100.00	
Btu/lb	13697	14505	MAF 16726
% Sulfur	1.52	1.61	
% CARBON	57.87	61.28	
% NITROGEN	0.72	0.76	

METHODS
Moisture: ASTM D 3302; Ash: ASTM D 3174; Volatile: ASTM D 3175; Fixed Carbon: Calculated Value; ASTM D 3172
Btu/lb: ASTM D 3286; Sulfur: ASTM D 4239 (Method C); Carbon & Nitrogen: ASTM D 5373

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

COMMERCIAL TESTING & ENGINEERING CO.
GENERAL OFFICES: 1919 SOUTH HIGHLAND AVE., SUITE 210-B, LOMBARD, ILLINOIS 60148 • TEL. 708-953-9300 FAX: 708-953-9306
SINCE 1908
Member of the SGS Group (Société Générale de Surveillance)

PLEASE ADDRESS ALL CORRESPONDENCE TO:
16130 VAN DRUNEN RD.
SOUTH HOLLAND, IL 60473
TEL: (708) 331-2900
FAX: (708) 333-3060

May 13, 1996

TAMPA ELECTRIC
Corporate Environmental Svcs.
5010 Causeway Blvd.
Tampa, FL 33619
Attn: Robert L. Dorey

Sample identification by
Tampa Electric

Kind of sample reported to us TDF

Sample ID: TDF

Sample taken at ------

Sample taken by ------

Date sampled ------

Date received May 1, 1996

P.O. No. SN35816

REVISED REPORT 5/13/96

Analysis Report No. 71-24828 Page 1 of 2

Dry Basis, ug/g

Berylium, Be	3
Chromium, Cr	9
Lead, Pb	21
Nickel, Ni	19
Mercury, Hg	0.04
Vanadium, V	9
Zinc, Zn	4327

METHOD
Mercury: Double Gold Amalgamation, Cold Vapor Atomic Absorption; Remaining Parameters: ASTM D 3683

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Manager, South Holland Laboratory

APPENDIX F

FIELD DATA SHEETS

F-1 BASELINE PARTICULATE DATA SHEETS

F-2 BASELINE SULFURIC ACID DATA SHEETS

F-3 BASELINE ORSAT DATA SHEETS

F-4 BASELINE VISIBLE EMISSIONS DATA SHEETS

F-5 FUEL BLEND BURN PARTICULATE DATA SHEETS

F-6 FUEL BLEND BURN SULFURIC ACID MIST DATA SHEETS

F-7 FUEL BLEND BURN ORSAT DATA SHEETS

F-8 FUEL BLEND VISIBLE EMISSIONS DATA SHEETS

F-1 BASELINE PARTICULATE DATA SHEETS

PARTICULATE SAMPLING FIELD DATA SHEET

SAMPLING LOCATION: F. J. Gannon station Blr 3
TEST METHOD: USEPA Method 17
OPERATOR: **CONTROL BOX:** M. Duff
SAMPLE PROBE: R. Bartholette

DATE February 28, 1996 **RUN NO.** 1-5 **MIN/PT** 3
TIME: START 1324 END 1432 TOTAL 60 MIN.

STACK DUCT DIMENSIONS: 12.4' I.D.
STACK AREA: 121.225 FT^2, **EFF. AREA:** 121.225 FT^2

EQUIPMENT
CONTROL BOX: NO. 4 PYROMETER NO. 5
NOZZLE NO. 16 (.198) PITOT TUBE NO. 00107
THIMBLE HOLDER NO. A PROBE LENGTH (ss) 8 FT
METER CALIBRATION: (Y) 1.013 (ΔH) 1.806
ASSUMED H20 9.0 % PITOT CP 0.84

WEATHER: Clear Warm W.Nov
Pb 29.80 "Hg Ps 29.80 "Hg TEMPERATURE 78 °F
COMMENTS:

DRY GAS METER VOLUME
FINAL 500 523 FT^3
INITIAL 467.274 FT^3
NET 33249 FT^3

MOISTURE DETERMINATION
IMPINGER 50 ml
SILICA GEL 7.7 ml
TOTAL 57.7 ml

EQUIPMENT LEAK CHECKS
INITIAL 0.00 CFM@ 15 "Hg
FINAL 0.00 CFM@ 10 "Hg
PITOT 0.00 @ 7 "H_2O

PROBE ASSEMBLY CHECKS
NOZZLE/PITOT 1 IN. (≥3/4 IN.)
THER./PITOT 2 IN. (≥ 2 IN.)
PROBE/PITOT 3 IN. (≥ 3 IN.)
DAMAGE DURING TEST? NO

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT³)	ΔP (IN.H_2O)	ΔH (IN.H_2O)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP(°F)	VACUUM (IN. HG)
1	1324	469.2	1.10	1.10	280	79	64	9
2		470.7	1.00	1.04	281	79	62	9
3		472.4	1.05	1.10	281	79	57	9
4		4738	0.85	0.89	275	79	54	8
5	1339	475.4	0.88	0.93	276	79	53	8
1	1344	477.0	1.10	1.15	280	79	57	8
2		478.8	1.05	1.10	282	80	50	9
3		480.4	1.10	1.15	282	81	50	9
4		481.8	0.96	1.01	281	80	50	9
5	1359	483.6	0.85	0.89	277	80	51	8

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT³)	ΔP (IN. H_2O)	ΔH (IN. H_2O)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP(°F)	VACUUM (IN. HG)
1	1400	485.6	1.15	1.21	283	79	53	9
2		487.4	1.08	1.13	282	80	53	9
3		488.8	1.08	1.13	282	80	53	10
4		491.0	1.03	1.08	281	81	52	9
5	1415	492.0	0.87	0.92	271	81	52	8
1	1417	493.8	1.10	1.15	283	80	52	10
2		495.5	1.10	1.15	282	82	51	10
3		497.1	1.15	1.20	283	82	50	10
4		499.0	1.08	1.13	281	82	51	10
5	1432	500.523	0.78	0.81	268	82	52	8

RUN NO. 1 PAGE 2 OF 2

PARTICULATE SAMPLING FIELD DATA SHEET

SAMPLING LOCATION: F.J. Gannon Station B/r 3
TEST METHOD: USEPA Method 17
OPERATOR: CONTROL BOX: M. DUFF
SAMPLE PROBE: R. A Bartlebbe

DATE February 24, 1996 RUN NO. 2-5 MIN/PT 3
TIME: START 15:09 END 16:15 TOTAL 60 MIN.

STACK DUCT DIMENSIONS: 12.4' I.D.
STACK AREA: 121.225 FT², EFF. AREA: 121.225 FT²

EQUIPMENT

CONTROL BOX: NO. 4 PYROMETER NO. 5
NOZZLE NO. 16 (0.198 PITOT TUBE NO. 00107
THIMBLE HOLDER NO. B PROBE LENGTH 8 FT
METER CALIBRATION: (Y) 1.013 (ΔH) 1.806
ASSUMED H20 9.0 % PITOT CP 0.84

WEATHER: clear windy
Pb 29.50 "Hg Ps 29.80 "Hg TEMPERATURE 78 °F
COMMENTS:

DRY GAS METER VOLUME

FINAL 534.148 FT³
INITIAL 500.779 FT³
NET 33.369 FT³

MOISTURE DETERMINATION

IMPINGER 60 ml
SILICA GEL 7.7 ml
TOTAL 67.7 ml

EQUIPMENT LEAK CHECKS

INITIAL 0.00 CFM@ 15 "Hg
FINAL 0.00 CFM@ 10 "Hg
PITOT 0.0 @ 6 "H_2O

PROBE ASSEMBLY CHECKS

NOZZLE/PITOT 1 IN. (≥3/4 IN.)
THER./PITOT 2 IN. (≥ 2 IN.)
PROBE/PITOT 3 IN. (≥ 3 IN.)
DAMAGE DURING TEST? NO

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT³)	ΔP (IN.H_2O)	ΔH (IN.H_2O)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP(°F)	VACUUM (IN. HG)
1	1509	502.7	1.15	1.21	280	80	62	11
2		504.3	1.10	1.15	283	82	57	9
3		506.2	1.08	1.13	283	82	56	9
4		507.6	1.08	1.13	283	81	55	8
5	15:24	509.3	1.05	1.10	281	81	55	8
1	15:26	510.8	1.10	1.15	282	80	55	9
2		512.4	1.10	1.15	282	80	54	9
3		513.5	1.10	1.15	281	81	53	9
4		515.5	1.00	1.05	281	82	54	9
5	15:42	517.4	0.85	0.89	278	83	55	8

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT³)	ΔP (IN.H_2O)	ΔH (IN.H_2O)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP(°F)	VACUUM (IN. HG)
1	15:44	519.0	1.10	1.15	282	82	55	9
2		520.7	1.00	1.05	282	83	54	9
3		522.4	1.05	1.10	282	83	54	9
4		524.1	0.96	1.01	280	83	53	9
5	15:59	525.7	0.85	0.89	278	82	53	8
1	16:00	527.5	1.10	1.15	283	81	53	9
2		530.1	1.10	1.15	283	81	52	9
3		530.9	1.05	~~1.10~~ 1.10	283	81	52	9
4		532.6	0.95	1.00	282	81	53	9
5	16:15	534.148	0.83	0.87	277	81	53	8

RUN NO. 2 PAGE 2 OF 2

PARTICULATE SAMPLING FIELD DATA SHEET

SAMPLING LOCATION: F.J. Gannon Bir No. 3
TEST METHOD: USEPA Method 17
OPERATOR: CONTROL BOX: M. Duff
SAMPLE PROBE: R. Barthelette

DATE Feb. 28, 1994 RUN NO. 3-5 MIN/PT 3
TIME: START 1633 END 1737 TOTAL 60 MIN.

STACK DUCT DIMENSIONS: 12.4' I.D.
STACK AREA: 121.225 FT², EFF. AREA: 121.225 FT²

EQUIPMENT
CONTROL BOX: NO. 4 PYROMETER NO. 5
NOZZLE NO. 16 (0.198) PITOT TUBE NO. 00107
THIMBLE HOLDER NO. C PROBE LENGTH FT
METER CALIBRATION: (Y) 1.013 (ΔH) 1.806
ASSUMED H2O 9.0 % PITOT CP 0.84

WEATHER: Clear windy
Pb 29.80 "Hg Ps 29.80 "Hg TEMPERATURE 78 °F
COMMENTS:

DRY GAS METER VOLUME
FINAL 567.750 FT³
INITIAL 534.770 FT³
NET 32.980 FT³

MOISTURE DETERMINATION
IMPINGER 60 ml
SILICA GEL 7.7 ml
TOTAL 67.7 ml

EQUIPMENT LEAK CHECKS
INITIAL 0.00 CFM@ 15 "Hg
FINAL 0.00 CFM@ 10 "Hg
PITOT 0 @ 7 "H₂O

PROBE ASSEMBLY CHECKS
NOZZLE/PITOT 1 IN. (≥3/4 IN.)
THER./PITOT 2 IN. (≥ 2 IN.)
PROBE/PITOT 3 IN. (≥ 3 IN.)
DAMAGE DURING TEST? NO

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT³)	ΔP (IN. H₂O)	ΔH (IN. H₂O)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP(°F)	VACUUM (IN. HG)
1	1633	536.3	1.08	1.13	283	80	59	10
2		537.3	0.95	0.99	284	81	56	9
3		540.0	1.00	1.04	284	81	54	9
4		541.6	0.91	0.95	283	83	54	8
5	1648	543.0	0.80	0.84	277	82	54	7
1	1649	544.6	0.98	1.03	281	82	56	7
2		546.0	1.05	1.10	282	82	55	9
3		548.1	1.05	1.10	281	82	53	9
4		549.9	0.98	1.03	280	82	53	8
5		551.2	0.82	0.86	274	83	55	7

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT^3)	ΔP ($IN.H_2O$)	ΔH ($IN.H_2O$)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP.(°F)	VACUUM (IN. HG)
1	1706	553.2	1.10	1.15	281	82	53	9
2		554.6	1.05	1.10	281	83	52	9
3		556.4	1.00	1.04	281	83	52	9
4		558.2	1.00	1.04	281	83	53	9
5	1721	559.5	0.87	0.91	271	83	55	8
1	1722	561.3	1.15	1.21	279	82	55	8
2		562.8	1.08	1.13	281	83	54	9
3		564.6	1.05	1.10	281	83	55	9
4		566.3	1.05	1.10	279	83	55	9
5	1737	567.750	0.65	0.68	269	82	55	8
6								

RUN NO. 3 PAGE 2 OF 2

F-2 BASELINE SULFURIC ACID DATA SHEETS

~~PARTICULATE~~ H_2SO_4 FIELD DATA FORM

Plant F.J. Gannon Station
Location Boiler No. 3
Method US EPA Method 8
Operator Mauldin/Rios/Ras
Date February 28 1996
Run Number 1
Min./Pt. 3
Stack Area ft² 121.225
Sample Box Number A/A
Meter Box Number 6
Meter ΔH@ 1.706
Meter Calibration (Y) 1.000
Nozzle I.D. No. 16 (0.198)
Nozzle Diameter (0.199)

Pitot Tube (C_p) 0.84
Probe Length 8'
Probe Liner Material Glass
Probe Heater Setting 250°
Ambient Temperature 65°
Barometric Pressure (P_b) 29.80 in. Hg
Assumed Moisture 9.0%
Static Pressure (P_a) 29.8 in. Hg
Time - Start 0728 End 0834
Total Sample Time 60 Min.
Gas Analysis CO_2 ____ % O_2 ____ %
CO_2 ____ % O_2 ____ %
Comments

Dry Gas Meter Volume
Final 637.812 Ft³
Initial 604.396 Ft³
Net 33.416 Ft³

Equipment Leak Checks
Initial 0.00 CFM@ 15 "Hg
Final 0.00 CFM@ 8 "Hg
Pitot Tube OK 0.00@ 7" H_2O

Moisture Determination
Impinger 58 ml
Silica Gel 17.5 gm
Total 75.5 ml

Traverse Point Number	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Stack Temp. Ts(°F)	Meter Temp. Tm(°F)	~~Sample Box~~ Umbilical Temp. (°F)	Probe Temp. (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	0728	606.7	1.20	1.13	264	72	255	303	58	7
2		607.8	1.00	0.94	265	74	256	308	55	6
3		609.3	~~0.95~~ ~~+1.5~~ HO	~~0.87~~ ~~+0.8~~ HO	~~256~~ 265 MO	75	~~265~~ 256 MO	307	57	5
4		611.0	0.93	0.87	~~251~~ 265 MO	76	251	308	59	5
5	0743	612.4	0.83	0.78	263	76	250	306	61	5

Traverse Point Number	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Stack Temp. Ts(°F)	Meter Temp. Tm(°F)	~~Sample~~ Umbilical Box Temp. (°F)	Probe Temp. (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	0744	614.5	1.10	1.03	264	77	254	300	61	6
2		615.8	0.92	0.86	264	78	251	300	61	6
3		617.5	0.96	0.90	264	79	252	300	61	6
4		619.3	0.95	0.90	262	80	250	299	60	6
5	0759	620.6	0.82	0.82	260	80	255	291	62	6
1	0802	622.5	1.20	1.19	260	76	255	306	61	7
2		623.6	0.98	0.97	264	80	254	306	59	7
3		625.9	1.05	1.05	264	81	255	306	59	7
4		627.6	1.10	~~1.10~~ 1.09	~~1.09~~ 263	81	255	307	60	7
5	0817	629.3	0.90	0.89	262	82	253	308	61	7
1	0821	631.9	0.97	0.96	265	78	255	308	62	7
2		633.0	1.10	1.09	265	80	255	308	58	6
3		635.3	1.10	1.09	265	80	255	308	58	6
4		636.3	1.10	1.09	265	80	251	302	59	6
5	0834	637.812	0.88	0.87	263	81	256	294	59	6

H_2SO_4

~~PARTICULATE~~ FIELD DATA FORM

Plant F.J Gannon
Location Boiler No 3
Method Method 8 RPA
Operator M Dun/KAB/JOS
Date February 28, 1994
Run Number 0 2
Min./Pt. 3
Stack Area ft² 121.225
Sample Box Number W/A
Meter Box Number 6
Meter ΔH@ 1.704
Meter Calibration (Y) 1.000
Nozzle I.D. No. 16
Nozzle Diameter (0.198)

Pitot Tube (C_p) 0.84
Probe Length 8'
Probe Liner Material Glass
Probe Heater Setting ~~300°~~ 250°
Ambient Temperature 70
Barometric Pressure (P_b) 29.80 in. Hg
Assumed Moisture 8.0%
Static Pressure (P_a) 29.80 in. Hg
Time - Start 0921 End 1028
Total Sample Time 60 Min.
Gas Analysis CO_2 % O_2 %
CO_2 % O_2 %
Comments

Dry Gas Meter Volume
Final 679.230 Ft³
Initial 645.307 Ft³
Net 33.923 Ft³

Equipment Leak Checks
Initial 0.00 CFM@ 15 "Hg
Final 0.00 CFM@ 7 "Hg
Pitot Tube OK

Moisture Determination
Impinger 59 ml
Silica Gel 13.3 gm
Total 72.3 ml

Traverse Point Number	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Stack Temp. Ts(°F)	Meter Temp. Tm(°F)	~~Sample~~ Umbilical Box Temp. (°F)	Probe Temp. (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	921	646.9	1.10	1.09	266	74	250	281	60	5
2		649.2	1.05	1.05	268	78	250	272	56	5
3		651.3	1.10	1.09	270	79	250	268	56	5
4		652.2	1.10	1.09	267	79	251	269	56	5
5	0936	654.1	0.85	0.85	265	80	252	269	57	5

Traverse Point Number	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Stack Temp. Ts(°F)	Meter Temp. Tm(°F)	~~Sample~~ Gas Box Temp. (°F)	Probe Temp. (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	09:37	655.8	1.10	1.10	269	79	253	268	58	4
2		657.7	1.10	1.10	268	80	253	268	57	4
3		659.4	1.05	1.05	268	80	252	267	57	4
4		661.1	1.05	1.05	267	80	252	268	58	4
5	09:52	662.8	0.90	0.90	266	82	253	267	58	4
1	09:54	664.5	1.10	1.10	267	81	256	265	59	4
2		666.3	1.00	1.00	267	82	253	264	57	4
3		667.9	0.95	0.95	267	82	256	264	57	4
4		669.5	0.90	0.90	266	83	257	264	58	4
5	10:09	670.8	0.50	0.50	264	82	256	265	59	2
1	1013	672.9	1.15	1.14	269	81	256	271	60	4
2		674.4	~~0.94~~ 0.92 (1.1)	~~0.82~~ 0.97 (1.0)	269	80	256	272	60	4
3		677.1	0.96	0.96	269	82	252	274	59	4
4		677.7	0.96	0.96	269	82	252	274	59	4
5	1028	679.230	0.84	0.84	267	83	254	273	60	4

H_2SO_4

~~PARTICULATE~~ FIELD DATA FORM

Plant F. J. Gannon
Location Boiler No. 3
Method USEPA 8
Operator M Duff RAS 905
Date 2/28/96
Run Number 3
Min./Pt. 3
Stack Area ft² 122.121.225
Sample Box Number N/A
Meter Box Number 6
Meter ΔH@ 1.704
Meter Calibration (Y) 1.000
Nozzle I.D. No. 16
Nozzle Diameter (0.198)

Pitot Tube (C_p) 0.84
Probe Length 8'
Probe Liner Material Glass
Probe Heater Setting 250° F
Ambient Temperature 76
Barometric Pressure (P_b) 29.85 in. Hg
Assumed Moisture 9.0 %
Static Pressure (P_a) 29.85 in. Hg
Time - Start 1114 End ~~1129~~ 1220
Total Sample Time 60 min Min.
Gas Analysis CO_2 ____ % O_2 ____ %
CO_2 ____ % O_2 ____ %
Comments

Dry Gas Meter Volume
Final 720.856 Ft³
Initial 687.100 Ft³
Net 33.756 Ft³

Equipment Leak Checks
Initial 0.00 CFM@ 15 "Hg
Final 0.00 CFM@ 7 "Hg
Pitot Tube OK

Moisture Determination
Impinger 59 ml
Silica Gel 12.6 gm
Total 71.6 ml

Traverse Point Number	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Stack Temp. Ts(°F)	Meter Temp. Tm(°F)	~~Sample~~ Umb. line Box Temp. (°F)	Probe Temp. (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	1114	689.2	1.10	1.09	269	84	255	268	62	5
2		690.2	0.96	0.958	268	85	252	270	61	5
3		692.1	1.10	1.09	268	85	251	270	61	5
4		693.8	0.88	0.88	269	87	256	269	61	5
5	1129	695.4	0.78	0.78	267	88	256	270	61	5

Traverse Point Number	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Stack Temp. Ts(°F)	Meter Temp. Tm(°F)	~~Sample~~ Unbill Box Temp. (°F)	Probe Temp. (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	1230	697.1	1.05	1.05	268	88	253	265	62	5
2		699.1	1.05	1.05	268	88	253	265	62	5
3		701.1	1.08	1.08	265	90	258	265	62	5
4		702.6	0.92	0.92	267	91	258	264	61	5
5	1245	703.9	0.95	0.95	265	91	258	264	62	5
1	1247	705.8	1.03	1.03	268	88	252	268	68 62	5
2		707.7	1.00	1.00	268	90	258	272	59	5
3		709.4	1.08	1.08	268	90	254	269	60	5
4		711.4	1.10	1.10	266	91	255	270	62	6
5	1202	712.5	0.86	0.86	269	91	253	270	63	5
1	1205	714.5	0.99	0.99	268	91	253	264	63	5
2		716.9	0.98	0.98	269	92	256	266	63	5
3		718.4	0.94	0.96	268	92	252	266	63	5
4		719.5	0.97	0.97	267	93	252	265	65	5
5	1220	720.856	0.83	0.83	264	92	252	264	64	5

F-3 BASELINE ORSAT DATA SHEETS

ORSAT DATA AND CALCULATION SHEET

Source Gannon station Location Boiler No. 3

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
1-5	2-28-94	CO2	13.8	13.8	13.8	13.8	
		O2	5.0	5.0	5.0	5.0	
		CO	0.0	0.0	0.0	0.0	
		N2	81.2	81.2	81.2	81.2	
							ND
2-5	2-28-94	CO2	13.8	13.8	13.8	13.8	
		O2	5.2	5.2	5.2	5.2	
		CO	0.0	0.0	0.0	0.0	
		N2	81.0	81.0	81.0	81.0	
							ND
3-5	2-28-94	CO2	13.2	13.2	13.2	13.2	
		O2	5.6	5.6	5.6	5.6	
		CO	0.0	0.0	0.0	0.0	
		N2	81.2	81.2	81.2	81.2	
							ND

ORSAT DATA AND CALCULATION SHEET

Source Boiler No. 3 Location Gannon Station

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
1	2/28/94	CO2	12.8	12.8	12.8	12.8	Method 8 Sulfuric Acid Mist ND
		O2	6.0	6.0	6.0	6.0	
		CO	0.0	0.0	0.0	0.0	
		N2	81.2	81.2	81.2	81.2	
2	2/28/94	CO2	13.8	13.8	13.8	13.8	Method 8 H2SO4 ND
		O2	5.4	5.2	5.3	5.3	
		CO	0.0	0.0	0.0	0.0	
		N2	80.8	81.0	80.9	80.9	
3	2/28/94	CO2	13.2	13.2	13.2	13.2	Method 8 H2SO4 ND
		O2	5.2	5.2	5.2	5.2	
		CO	0.0	0.0	0.0	0.0	
		N2	81.6	81.6	81.6	81.6	

F-4 BASELINE VISIBLE EMISSIONS DATA SHEETS

TAMPA ELECTRIC
A TECO ENERGY COMPANY

VISIBLE EMISSION OBSERVATION

E-496 R 10/85

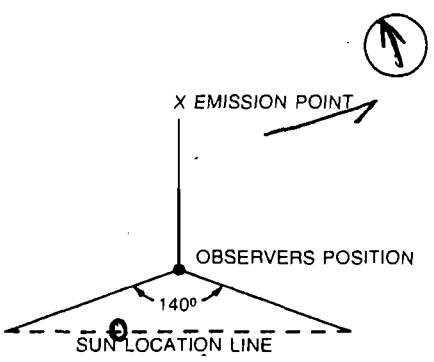
SOURCE NAME	SOURCE LOCATION	OBSERVATION DATE	START TIME	STOP TIME
Boiler #3	Gannon Station	2/28/96	1634	1734

TYPE OF FACILITY: Coal Fired Boiler

DISTANCE FROM OBSERVER: 1000'

SKY CONDITIONS/PLUME BACKGROUND: Partly Cloudy to Blue Skies

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



SUN-O- WIND →

AVERAGE OPACITY: 5.0 %

WIND SPEED (EST.): 5-10 mph

WIND DIRECTION (EST.): West

OBSERVER'S NAME (PRINT): Glenn Naslund

OBSERVER'S SIGNATURE: Glenn Naslund

DATE: 2/28/96

COMMENTS: Soot-Blowing Run

SEC. MIN	0	15	30	45	SEC MIN	0	15	30	45
1	5	5	5	5	31	5	5	5	5
2	5	5	5	5	32	5	5	5	5
3	5	5	5	5	33	5	5	5	5
4	5	5	5	5	34	5	5	5	5
5	5	5	5	5	35	5	5	5	5
6	5	5	5	5	36	5	5	5	5
7	5	5	5	5	37	5	5	5	5
8	5	5	5	5	38	5	5	5	5
9	5	5	5	5	39	5	5	5	5
10	5	5	5	5	40	5	5	5	5
11	5	5	5	5	41	5	5	5	5
12	5	5	5	5	42	5	5	5	5
13	5	5	5	5	43	5	5	5	5
14	5	5	5	5	44	5	5	5	5
15	5	5	5	5	45	5	5	5	5
16	5	5	5	5	46	5	5	5	5
17	5	5	5	5	47	5	5	5	5
18	5	5	5	5	48	5	5	5	5
19	5	5	5	5	49	5	5	5	5
20	5	5	5	5	50	5	5	5	5
21	5	5	5	5	51	5	5	5	5
22	5	5	5	5	52	5	5	5	5
23	5	5	5	5	53	5	5	5	5
24	5	5	5	5	54	5	5	5	5
25	5	5	5	5	55	5	5	5	5
26	5	5	5	5	56	5	5	5	5
27	5	5	5	5	57	5	5	5	5
28	5	5	5	5	58	5	5	5	5
29	5	5	5	5	59	5	5	5	5
30	5	5	5	5	60	5	5	5	5

COPY OF VISIBLE EMISSIONS CERTIFICATION CARD

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

GLENN NASLUND, has completed the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

THIS CERTIFICATE EXPIRES **Feb 29, 1996**

Edward E. [illegible]
CERTIFICATE OFFICER

Glenn Naslund
BEARER'S SIGNATURE

F5 FUEL BLEND BURN PARTICULATE DATA SHEETS

PARTICULATE SAMPLING FIELD DATA SHEET

SAMPLING LOCATION: F. J. Gannon Boiler No. 3
TEST METHOD: USEPA Method 17
OPERATOR: CONTROL BOX: David Smith
SAMPLE PROBE: Nate Alecz, Jeff Sellars

DATE 4-23-96 RUN NO. 1-5 MIN/PT 3
TIME: START 1328 END 1433 TOTAL 60 MIN.

STACK DUCT DIMENSIONS: 12.5'
STACK AREA: 122.718 FT^2, EFF. AREA: 122.718 FT^2

EQUIPMENT
CONTROL BOX: NO. 6 PYROMETER NO. 12
NOZZLE NO. 37 (0.212) PITOT TUBE NO. 00112
THIMBLE HOLDER NO. A PROBE LENGTH 12 FT
METER CALIBRATION: (Y) 1.000 (ΔH) 1.681
ASSUMED H2O 8.0 % PITOT CP 0.84

WEATHER: Partly Cloudy / warm
Pb 30.05 "Hg Ps 30.05 "Hg TEMPERATURE 90 °F
COMMENTS: See following this Run TDF Blend test

DRY GAS METER VOLUME
FINAL 716.614 FT^3
INITIAL 677.866 FT^3
NET 38.748 FT^3

MOISTURE DETERMINATION
IMPINGER 54 ml
SILICA GEL 10.2 ml
TOTAL 64.2 ml

EQUIPMENT LEAK CHECKS
INITIAL 0.0 CFM@ 15 "Hg
FINAL 0.0 CFM@ 10 "Hg
PITOT 0.0 @ 7.5 "H_2O

PROBE ASSEMBLY CHECKS
NOZZLE/PITOT 1 IN. (≥3/4 IN.)
THER./PITOT 2 IN. (≥ 2 IN.)
PROBE/PITOT 3 IN. (≥ 3 IN.)
DAMAGE DURING TEST? NO

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT^3)	ΔP ($IN.H_2O$)	ΔH ($IN.H_2O$)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP(°F)	VACUUM (IN. HG)
1	1328	680.6	0.99	1.32	282	85	68	7
2	↓	682.6	0.96	1.28	282	88	68	7
3		684.5	0.92	1.23	282	89	68	7
4		686.3	0.86	1.15	282	90	67	7
5	1343	687.4	0.68	0.91	277	91	68	5.5
1	1345	689.3	0.98	1.31	281	91	62	7
2	↓	691.1	0.93	1.24	280	91	57	7
3		693.0	0.94	1.26	278	92	56	7
4		694.9	0.94	1.26	278	91	55	7
5	1400	696.8	0.89	1.19	274	91	54	7

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT³)	ΔP (IN.H_2O)	ΔH (IN.H_2O)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP(°F)	VACUUM (IN. HG)
1	1402	698.8	0.96	1.28	280	89	63	7.5
2		700.7	0.99	1.32	281	89	57	8
3		702.7	0.99	1.32	280	89	63	8
4		704.7	0.94	1.26	278	89	63	8
5	1417	706.5	0.89	1.19	274	89	59	7
1	1418	708.6	1.10	1.47	280	88	64	8.5
2		710.6	1.10	1.47	281	88	59	8.5
3		712.7	1.10	1.47	280	88	62	9
4		714.7	0.95	1.27	281	89	62	8
5	1433	716.6	0.82	1.10	272	88	60	7

RUN NO. 1-5 PAGE 2 OF 2

PARTICULATE SAMPLING FIELD DATA SHEET

SAMPLING LOCATION: F.J. GANNON BOILER NO. 3
TEST METHOD: USEPA METHOD #17
OPERATOR: CONTROL BOX: JEFF SELLARS
SAMPLE PROBE: NATE ALLEN, DAVID SMITH

DATE 4-23-96 RUN NO. 2-5 MIN/PT 3
TIME: START 14:53 END 15:56 TOTAL 60 MIN.

STACK DUCT DIMENSIONS: 12.5'
STACK AREA: 122.718 FT², EFF. AREA: 122.718 FT²

EQUIPMENT
CONTROL BOX: NO. 6 PYROMETER NO. 12
NOZZLE NO. 37 (0.212) PITOT TUBE NO. 00112
THIMBLE HOLDER NO. 13 PROBE LENGTH 10 FT
METER CALIBRATION: (Y) 1.000 (ΔH) 1.681
ASSUMED H2O 8.0 % PITOT CP 0.84

WEATHER: PARTLY CLOUDY / WINDY / WARM
Pb 29.98 "Hg Ps 29.98 "Hg TEMPERATURE 84 °F
COMMENTS: SOOTBLOWING → "TDF BLEND TEST"

DRY GAS METER VOLUME
FINAL 755.609 FT³
INITIAL 717.159 FT³
NET 38.45 FT³

MOISTURE DETERMINATION
IMPINGER 62 ml
SILICA GEL 8.2 ml
TOTAL 70.2 ml

EQUIPMENT LEAK CHECKS
INITIAL 0.0 CFM@ 15 "Hg
FINAL 0.0 CFM@ 9 "Hg
PITOT 0.0 @ 7.5 "H₂O

PROBE ASSEMBLY CHECKS
NOZZLE/PITOT 1 IN. (≥3/4 IN.)
THER./PITOT 2 IN. (≥ 2 IN.)
PROBE/PITOT 3 IN. (≥ 3 IN.)
DAMAGE DURING TEST? NO

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT³)	ΔP (IN. H₂O)	ΔH (IN. H₂O)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP TEMP(°F)	VACUUM (IN. HG)
1	14:53	719.3	1.10	1.47	279	83	68	9
2		721.4	1.10	1.47	284	84	66	9
3		723.5	1.00	1.34	281	86	66	8.5
4		725.5	0.96	1.28	279	86	60	8.5
5	15:08	727.3	0.69	0.922	263	87	62	6
1	15:09	729.0	0.95	1.27	279	86	61	7
2	(	731.0	1.10	1.47	281	87	62	7
3		732.9	0.98	1.31	280	88	59	8
4	)	734.8	0.95	1.27	279	89	59	8
5	15:24	736.7	0.84	1.12	272	89	59	7

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT³)	ΔP (IN.H_2O)	ΔH (IN.H_2O)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP(°F)	VACUUM (IN. HG)
1	15:25	738.6	1.00	1.34	281	87	59	8
2		740.5	0.96	1.28	282	88	58	8
3		742.5	0.97	1.30	278	88	58	8
4		744.4	0.97	1.30	278	88	57	8
5	15:40	746.1	0.75	1.00	271	88	58	6.5
1	15:41	748.1	1.00	1.34	280	87	59	8
2		750.0	0.95	1.27	280	88	58	8
3		752.0	0.94	1.26	279	88	57	8
4		753.8	0.89	1.19	280	88	57	7
5	15:56	755.6	0.72	0.96	275	88	58	6

RUN NO. 2-5 PAGE 2 OF 2

PARTICULATE SAMPLING FIELD DATA SHEET

SAMPLING LOCATION: F.J. Gannon Boiler No. 3
TEST METHOD: USEPA METHOD #17
OPERATOR: CONTROL BOX: Jeff Sellars
SAMPLE PROBE: Nate Alcoz, David Smith

DATE 4-23-96 RUN NO. 3-S MIN/PT 3
TIME: START 16:10 END 17:13 TOTAL 60 MIN.

STACK DUCT DIMENSIONS: 12.5'
STACK AREA: 122.718 FT², EFF. AREA: 122.718 FT²

EQUIPMENT
CONTROL BOX: NO. 6 PYROMETER NO. 12
NOZZLE NO. 37 (0.212) PITOT TUBE NO. CO112
THIMBLE HOLDER NO. C PROBE LENGTH 10 FT
METER CALIBRATION: (Y) 1.000 (ΔH) 1.681
ASSUMED H2O 8.0 % PITOT CP 0.84

WEATHER: Partly Cloudy / windy / warm
Pb 30.00 "Hg Ps 30.00 "Hg TEMPERATURE 86 °F
COMMENTS: Soot blowing → "TOF BLEND TEST"

DRY GAS METER VOLUME
FINAL 794.943 FT³
INITIAL 755.642 FT³
NET 39.301 FT³

MOISTURE DETERMINATION
IMPINGER 64 ml
SILICA GEL 8.4 ml
TOTAL 72.4 ml

EQUIPMENT LEAK CHECKS
INITIAL 0.0 CFM@ 15 "Hg
FINAL 0.0 CFM@ 11 "Hg
PITOT 0.0 @ 7.5 "H_2O

PROBE ASSEMBLY CHECKS
NOZZLE/PITOT 1 IN. (≥3/4 IN.)
THER./PITOT 2 IN. (≥ 2 IN.)
PROBE/PITOT 3 IN. (≥ 3 IN.)
DAMAGE DURING TEST? NO

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT³)	ΔP (IN.H_2O)	ΔH (IN.H_2O)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP(°F)	VACUUM (IN. HG)
1	16:10	758.1	1.10	1.47	281	83	66	10
2		760.1	1.10	1.47	280	84	66	10.5
3		762.2	1.00	1.34	280	86	58	10
4		764.1	0.85	1.14	280	86	64	8.5
5	16:25	765.9	0.80	1.07	277	87	59	8
1	16:26	767.9	1.10	1.47	279	87	63	9.5
2		769.8	0.93	1.24	280	88	63	9
3		771.8	0.95	1.27	280	88	65	9
4		773.7	0.86	1.15	277	89	62	9
5	16:41	775.6	0.72	0.96	276	89	61	7

TRAVERSE POINT NO.	CLOCK TIME	METER READING (FT³)	ΔP (IN.H_2O)	ΔH (IN.H_2O)	STACK TEMP. Ts(°F)	METER TEMP. Tm(°F)	LAST IMP. TEMP(°F)	VACUUM (IN. HG)
1	16:42	777.3	0.91	1.22	280	89	60	8
2		779.2	1.00	1.34	280	89	58	8.5
3		781.2	0.97	1.30	278	89	58	9
4		783.1	0.92	1.23	278	89	58	9
5	16:57	785.0	0.80	1.07	271	89	56	9
1	16:58	787.1	1.10	1.47	278	88	56	10
2		789.1	1.00	1.34	280	88	58	10
3		791.1	0.98	1.31	280	88	62	10
4		793.1	0.93	1.24	278	88	55	9.5
5	17:13	794.8	0.76	1.02	272	88	66	8

RUN NO. 3-5 PAGE 2 OF 2

F6 FUEL BLEND BURN SULFURIC ACID MIST DATA SHEETS

Sulfuric Acid Mist Field Data Form

Plant F. J. GANNON
Location Boiler NO. 3
Method USEPA Method 8
Operator David Smith
Date 4-23-96
Run No. 1-5
Min. \ Pt. 3
Stack Area Ft.^{2} 122.718
Sample Box No. N/a
Meter Box No. 6
MeterΔH 1.681
Meter Cal. (Y) 1.000
Nozzle I.D. No. 6
Nozzle Diameter 0.197

Pitot Tube (C_p) 0.84
Probe Length 10
Probe Liner Material Inconel
Probe Heater Setting 250
Ambient Temperature 76
Barometeric Pressure (P_b) 30.00 in. Hg
Static Pressure(P_g) 30.00 in. Hg
Assumed Moisture (%) 8.2%
Time – Start 0747 End 0853
Total Sampling Time 60 min. Min.
Comments Soot blowing this Run
TDI Test Blend

Dry Gas Meter Volume
Final 576.941 Ft.^{3}
Initial 545.866 Ft.^{3}
Net 31.075 Ft.^{3}

Equipment Leak Checks
Initial 0.0 CFM@ 15 "Hg
Final 0.0 CFM@ 8 "Hg
Pitot Tube 0.0 @ 7.5 "H_2O

Moisture Determination
Impinger 30 ml
Silica Gel 20.4 gm
Total 50.4

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Umbilical Temp (°F)	Meter Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	0747	547.2	0.96	0.92	263	265	267	77	68	7
2		548.8	0.92	0.88	268	268	257	80	68	6.5
3		550.6	0.92	0.88	257	268	256	81	68	6.5
4		552.0	0.90	0.87	256	268	255	81	68	6
5	0802	553.4	0.82	0.79	255	265	257	82	68	6
1	0804	555.2	0.99	0.95	253	269	258	81	65	6.5
2		556.7	0.91	0.87	251	268	256	81	65	6
3		558.4	0.95	0.91	248	267	256	82	65	6.5
4		560.0	0.95	0.91	249	266	258	82	65	6.5
5	0819	561.5	0.84	0.81	247	264	257	82	66	6

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Umbilical Temp (°F)	Meter Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	0821	563.1	0.91	0.87	251	265	260	80	64	6
2		564.9	0.84	0.81	252	266	262	81	65	8
3		566.2	0.84	0.81	253	266	263	81	66	6
4		567.7	0.88	0.85	255	266	252	82	68	6
5	0836	569.2	0.58	0.56	252	263	255	81	68	6
1	0838	570.8	0.94	0.90	248	268	255	80	68	6.5
2		572.4	0.87	0.84	248	269	250	81	68	6
3		574.0	0.83	0.80	248	267	250	82	66	6
4		575.5	0.85	0.82	247	269	252	82	63	6
5	0853	576.9	0.74	0.71	248	268	249	82	62	5

Run No. 1-5 Page 2 Of 2

Sulfuric Acid Mist Field Data Form

Plant F.J. GANNON
Location Boiler No. 3
Method USEPA Method 8
Operator David Smith
Date 4-23-96
Run No. 2-5
Min. \ Pt. 3
Stack Area Ft.^{2} 122.718
Sample Box No. N/A
Meter Box No. 6
MeterΔH 1.681
Meter Cal. (Y) 1.005
Nozzle I.D. No. 37
Nozzle Diameter .212

Pitot Tube (C_p) 0.84
Probe Length 10
Probe Liner Material Inconel
Probe Heater Setting 250
Ambient Temperature 86
Barometeric Pressure (P_b) 30.00 in. Hg
Static Pressure(P_g) 30.00 in. Hg
Assumed Moisture (%) 8.0
Time – Start 0941 End 1046
Total Sampling Time 60 min Min.
Comments Switching this Run
TDI test Blend

Dry Gas Meter Volume
Final 622.755 Ft.^{3}
Initial 585.625 Ft.^{3}
Net 37.130 Ft.^{3}

Equipment Leak Checks
Initial 0.0 CFM@ 15 "Hg
Final 0.0 CFM@ 8.5 "Hg
Pitot Tube 0.0 @ 7.5 "H_2O

Moisture Determination
Impinger 62 ml
Silica Gel 17.2 gm
Total 79.2

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Umbilical Temp (°F)	Meter Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	0941	587.5	0.92	1.23	215	267	248	80	64	6
2		589.4	0.92	1.23	235	272	253	83	61	6
3		591.2	0.89	1.19	249	272	254	85	62	6
4		593.1	0.85	1.14	250	272	248	86	65	6
5	0956	594.7	0.72	0.96	246	270	249	87	66	5
1	0957	596.6	0.87	1.16	246	271	245	87	65	8.5
2		598.3	0.87	1.16	247	270	246	87	65	7
3		600.2	0.87	1.16	247	270	250	88	67	7
4		602.0	0.85	1.14	246	269	251	88	67	7
5	1013	603.8	0.83	1.11	245	268	247	89	65	7

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Umbilical Temp (°F)	Meter Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	1014	605.8	0.98	1.31	246	271	247	89	65	6.5
2		607.7	0.96	1.28	248	271	251	90	65	6
3		609.5	0.90	1.20	248	271	246	90	65	6
4		611.4	0.96	1.28	246	270	252	91	65	6
5	1029	613.4	0.83	1.11	246	268	251	91	66	6
X										
1	1031	615.4	0.91	1.22	250	272	247	90	65	6
2		617.1	0.92	1.23	254	271	247	91	64	6
3		619.0	0.95	1.27	254	271	247	91	65	6
4		620.9	0.94	1.26	254	271	250	92	66	6
5	1046	622.7	0.75	1.00	254	268	248	92	68	6
X										

Run No. 2-5 Page 2 Of 2

Sulfuric Acid Mist Field Data Form

Plant F. J. GANNON
Location Boiler NO. 3
Method USEPA Method 8
Operator DAVID SMITH
Date 4-23-96
Run No. 3-S
Min. \ Pt. 3
Stack Area Ft.² 122.718
Sample Box No. N/A
Meter Box No. 6
MeterΔH 1.681
Meter Cal. (Y) 1.000
Nozzle I.D. No. 3.7
Nozzle Diameter 0.212

Pitot Tube (C_p) 0.84
Probe Length 10
Probe Liner Material INCONEL
Probe Heater Setting 250
Ambient Temperature 80
Barometeric Pressure (P_b) 30.04 in. Hg
Static Pressure(P_g) 30.04 in. Hg
Assumed Moisture (%) 8.0 %
Time – Start 1129 End 1233
Total Sampling Time 60 MIN. Min.
Comments Soot blowing this Run
TDI= Test Blend

Dry Gas Meter Volume
Final 668.525 Ft.³
Initial 632.044 Ft.³
Net 36.481 Ft.³

Equipment Leak Checks
Initial 0.0 CFM@ 15 "Hg
Final 0.0 CFM@ 8 "Hg
Pitot Tube 0.0 @ 7.5 "H_2O

Moisture Determination
Impinger 60 ml
Silica Gel 14.6 gm
Total 74.6

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Umbilical Temp (°F)	Meter Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	1129	634.4	0.98	1.31	220	270	244	83	59	6
2	(	636.3	0.89	1.19	252	270	249	86	57	6
3	)	638.1	0.91	1.22	256	270	249	87	59	6
4		640.0	0.91	1.22	251	269	247	89	60	6
5	1144	641.8	0.75	1.00	252	266	248	89	60	5
1	1146	643.3	0.91	1.22	252	269	251	89	62	7
2	(	645.1	0.89	1.19	252	269	247	90	61	6
3	)	647.0	0.89	1.19	251	268	252	90	61	6
4		648.8	0.84	1.12	249	268	253	90	62	5.5
5	1201	650.5	0.79	1.06	248	266	253	91	63	5

Sulfuric Acid Mist Field Data Form (Continued)

Traverse Point No.	Clock Time	Gas Sample Volume (Ft^3)	ΔP (In. H_2O)	ΔH (In. H_2O)	Probe Temp. (°F)	Stack Temp. Ts (°F)	Umbilical Temp (°F)	Meter Temp. Tm (°F)	Last Imp. Temp. (°F)	Vacuum (In. Hg.)
1	1202	652.4	0.89	1.19	246	264	247	90	63	5.5
2		654.1	0.81	1.08	247	269	252	91	62	6
3		655.9	0.88	1.18	249	269	247	91	62	6
4		657.8	0.85	1.14	249	268	252	91	63	6
5	1217	659.6	0.81	1.08	248	268	250	91	63	5.5
1	1218	661.4	0.87	1.16	254	270	250	91	66	5.5
2		663.2	0.85	1.14	260	271	250	92	67	5.5
3		665.0	0.85	1.14	256	272	254	93	67	5.5
4		666.8	0.87	1.16	256	272	248	93	68	5.5
5	1233	668.5	0.73	0.98	256	271	252	93	68	5

Run No. 3-5 Page 2 Of 2

F-7 FUEL BLEND BURN ORSAT DATA SHEETS

ORSAT DATA AND CALCULATION SHEET

Source Boiler No. 3 Location F.J. GANNON

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume) 1	2	3	Avg.	Remarks
1-S	4-23-96 DAS	CO2	10.4	10.4	10.4	10.4	Method 8 TDF
		O2	6.2	4.4	7.8	5.1	F_o = 1.519
		CO	0	0	0	0	
		N2	83.4	85.2	84.8	84.5	
2-S	4-23-96 DAS	CO2	11.7	11.4	11.7	11.6	TDF Blend
		O2	4.1	3.4	4.1	3.9	F_o = 1.466
		CO	0	0	0	0	
		N2	84.2	85.2	84.2	84.5	
3-S	4-23-96 AHBoz	CO2	11.7	11.7	11.7	11.7	TDF Blend
		O2	2.7	2.7	2.7	2.7	F_o = 1.556
		CO	0	0	0	0	
		N2	85.6	85.6	85.6	85.6	

Note: Suspect a problem with orsat analyzer on Run 2-S and 3-S.

DAS

ORSAT DATA AND CALCULATION SHEET

Source Boiler NO. 3 Location F. J. GANNON

Run No.	Date	Gas	Orsat Analysis, Dry Basis (% Volume)				Remarks
			1	2	3	Avg.	
1-S Part.	4-23-96 DAS	CO2	12.6	12.6	12.6	12.6	TDF Blend Method 17
		O2	6	5.6	6	5.4	
		CO	0	0	0	0	F_o = 1.190
		N2	81.4	81.8	81.4	81.5	
2-S Part.	4-23-96 DAS	CO2	12.3	12.3	12.3	12.3	TDF Blend
		O2	6.3	6.3	6.3	6.3	
		CO	0	0	0	0	F_o = 1.187
		N2	81.4	81.4	81.4	81.4	
3-S Part.	4-23-96 DAS	CO2	12.6	12.6	12.6	12.6	TDF Blend
		O2	5.8	5.8	5.8	5.8	
		CO	0	0	0	0	F_o = 1.198
		N2	81.6	81.6	81.6	81.6	

F-8 FUEL BLEND VISIBLE EMISSIONS DATA SHEETS

TAMPA ELECTRIC
A TECO ENERGY COMPANY

VISIBLE EMISSION OBSERVATION

E-496 R 10/85

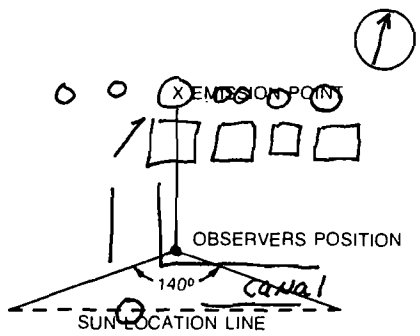
SOURCE NAME	SOURCE LOCATION	OBSERVATION DATE	START TIME	STOP TIME
J Gannon Unit #3	Tampa FL	4/23/96	13:29	14:29

TYPE OF FACILITY: Coal Fired boiler

DISTANCE FROM OBSERVER: ~750'

SKY CONDITIONS/PLUME BACKGROUND: Scattered / blue

SOURCE LAYOUT SKETCH — DRAW NORTH ARROW



SUN-O- WIND-→

AVERAGE OPACITY: 0.2 %

WIND SPEED (EST.): 15-18 mph

WIND DIRECTION (EST.): WSW

OBSERVER'S NAME (PRINT): R.A. McDarby

OBSERVER'S SIGNATURE: R.A. McDarby

DATE: 4/23/96

COMMENTS: sight angle ~21°

TDF test burn

SEC. MIN	0	15	30	45	SEC MIN	0	15	30	45
1	0	0	0	5	31	0	0	0	0
2	0	0	5	0	32	0	0	0	0
3	0	0	0	0	33	0	0	0	0
4	5	0	0	0	34	0	0	0	0
5	0	0	0	0	35	0	0	0	0
6	5	0	0	0	36	0	0	0	0
7	0	0	5	5	37	0	0	0	0
8	0	0	0	0	38	0	0	0	0
9	0	0	5	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	5
15	0	0	0	0	45	0	0	0	0
16	0	0	5	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	5	0	0	0	59	0	0	0	0
30	0	0	0	0	60	0	0	0	0

COPY OF VISIBLE EMISSIONS CERTIFICATION CARD

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

THIS IS TO CERTIFY THAT

RAY MCDARBY

has completed the STATE OF FLORIDA visible emissions evaluation training and is a qualified observer of visible emissions as specified by EPA reference method 9.

THIS CERTIFICATE EXPIRES Aug 29, 1996

CERTIFICATE OFFICER

BEARER'S SIGNATURE

APPENDIX G

SAMPLE EQUIPMENT CALIBRATIONS

G-1 BASELINE EQUIPMENT CALIBRATIONS

G-2 FUEL BLEND BURN EQUIPMENT CALIBRATIONS

G-1 BASELINE EQUIPMENT CALIBRATIONS

SUMMARY OF EQUIPMENT CALIBRATIONS

EQUIPMENT	CALIBRATION DATE	LOCATION	METHOD	RESULTS
Method 17 Console 4 Initial Test Post Test	 1-2-96 3-4-96	 CES CES	 Wet Test Meter Wet Test Meter	 Y = 1.013 Y = 1.019
Nozzle #16 Initial Measurement Post Test	 1-2-96 3-5-96	 CES CES	 3 Measurements w/calipers	 DN= 0.198 DN= 0.198
Pyrometer No. 5	1-12-96	CES	Comparison to ASTM Thermometer	Correct to ± 2°F
Pitot Tube 00107	1-4-96	CES	EPA Method	CP = 0.84
Wet Test Meter Serial No. 12-AH-4	1-9-96	CES	Liquid Displacement	CF= 1.007
Barometer SN 00224	1-3-96	CES	Comparison to National Weather Services	Correct to ± 0.04" Hg

INITIAL DRY GAS METER AND ORIFICE CALIBRATION

CONTROL BOX NO. 4 BAROMETRIC PRESS. 29.90 IN. HG.

DATE 1-2-96 PERFORMED BY

	RUN 1	RUN 2	RUN 3	RUN 4
VACUUM ("Hg)	3.0	3.0	3.0	3.0
dHw ("H2O)	0.65	1.10	1.30	2.00
dHd ("H2O)	0.50	1.00	1.50	2.00
INITIAL WTM	0.0000	0.0000	0.0000	0.0000
FINAL WTM	6.0038	8.3573	7.3038	7.6165
INITIAL DGM	810.306	816.907	826.221	834.414
FINAL DGM	816.260	825.338	833.687	842.297
TEMP. WTM (F)	71.5	72.0	72.5	72.5
TEMP. DGM (F)	85.0	88.0	89.0	91.0
TEST TIME (MIN.)	15.0	15.0	11.0	10.0

NET VOLUME WTM	6.0038	8.3573	7.3038	7.6165
NET VOLUME DGM	5.954	8.431	7.466	7.883
Y	1.033	1.019	1.005	0.995
dH@	1.715	1.764	1.863	1.881

AVERAGE Y = 1.013

ACCEPTABLE Y RANGE = 0.993 TO 1.033

AVERAGE dH@ = 1.806

ACCEPTABLE dH@ RANGE = 1.656 TO 1.956

$Y = (Vw (Pb) \times (Td + 460)) / (Vd (Pb + (dHd / 13.6)) \times (Tw + 460)$

$dH@ = 0.0317 \times dHd / (Pb (Td + 460)) \times ((Tw + 460) \times time) / Vw)^2$

1/18/96

RECHECK OF ORIFICE AND DGM CALIBRATION

CONTROL BOX NO. 4 BAROMETRIC PRESS. 30.40 IN. HG.

DATE 3-04-96 PERFORMED BY

LEAK CHECK OF METER SYSTEM ok @ 7" Hg. PRIOR Y = 1.013

	RUN 1	RUN 2	RUN 3
VACUUM ("Hg)	7.0	7.0	7.0
dHw ("H2O)	1.10	1.10	1.10
dHd ("H2O)	1.00	1.00	1.00
INITIAL WTM	0.0000	8.3770	16.7378
FINAL WTM	8.3770	16.7378	25.0900
INITIAL DGM	593.522	601.924	610.392
FINAL DGM	601.924	610.392	618.883
TEMP. WTM (F)	68.0	68.0	68.5
TEMP. DGM (F)	83.0	86.0	87.0
TEST TIME (MIN.)	15.0	15.0	15.0
NET VOLUME WTM	8.3770	8.3608	8.3522
NET VOLUME DGM	8.402	8.468	8.491
Y	1.023	1.019	1.016
dH@	1.717	1.714	1.717

PRIOR Y = 1.013
RECHECK Y = 1.019
% DIFFERENCE = 0.592

3/6/96

AVERAGE dH@ = 1.716

$Y = (Vw(Pb) \times (Td + 460)) / (Vd(Pb + (dHd / 13.6)) \times (Tw + 460)$

$dH@ = 0.0317 \times dHd / (Pb(Td + 460)) \times ((Tw + 460) \times time) / Vw)^2$

NOZZLE CALIBRATION DATA FORM

NOZZLE SET NO. 1

DATE: 1-2-96 CALIBRATED BY: [signature]

NOZZLE IDENTIFICATION	NOZZLE DIAMETER (IN.) D1	D2	D3	ΔD	D avg
1	.111	.111	.111	0.000	0.111
4	.125	.125	.125	0.000	0.125
5	.150	.150	.150	0.000	0.150
6	.197	.197	.197	0.000	0.197
9	.276	.276	.276	0.0000	0.276 ★
10	.295	.296	.296	0.001	0.296
12	.388	.388	.388	0.000	0.388
15	.164	.164	.164	0.000	0.164
16	.198	.198	.198	0.000	0.198
19	.274	.274	.274	0.000	0.274
22	.365	.364	.364	0.001	0.364
30	.314	.314	.314	0.000	0.314
36	.185	.185	.185	0.000	0.185
37	.211	.211	.212	0.001 ~~0.000~~	0.211 ★
38	.244	.244	.245	0.001	0.244
46	.192	.192	.192	0.000	0.192
48	.249	.249	.249	0.000	0.249
47	.200	.200	.201	0.001	0.200 ★
50	.314	.314	.314	0.000	0.314 ★
58	.236	.236	.236	0.000	0.236

where:

D1,2,3 = three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

ΔD= maximum difference between any two diameters, (in.) ΔD ≤ 0.004 in.

D Avg = average of D1, D2, and D3.

★ changed since last cal.

[signature] 1/10/96

FINAL NOZZLE CALIBRATION DATA FORM

NOZZLE NO 16

DATE: 3-5-96 CALIBRATED BY: [signature]

NOZZLE IDENTIFICATION	NOZZLE DIAMETER			Δ D (IN.)	D AVG
	D1 (IN.)	D2 (IN.)	D3 (IN.)		
#16	0.198	0.198	0.198	0.000	0.198

where:

D1,2,3= three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

Δ D= maximum difference between any two diameters,(in.).
Δ D≤ 0.004 in.

D AVG= average of D1,D2 and D3.

[signature] 3/6/96

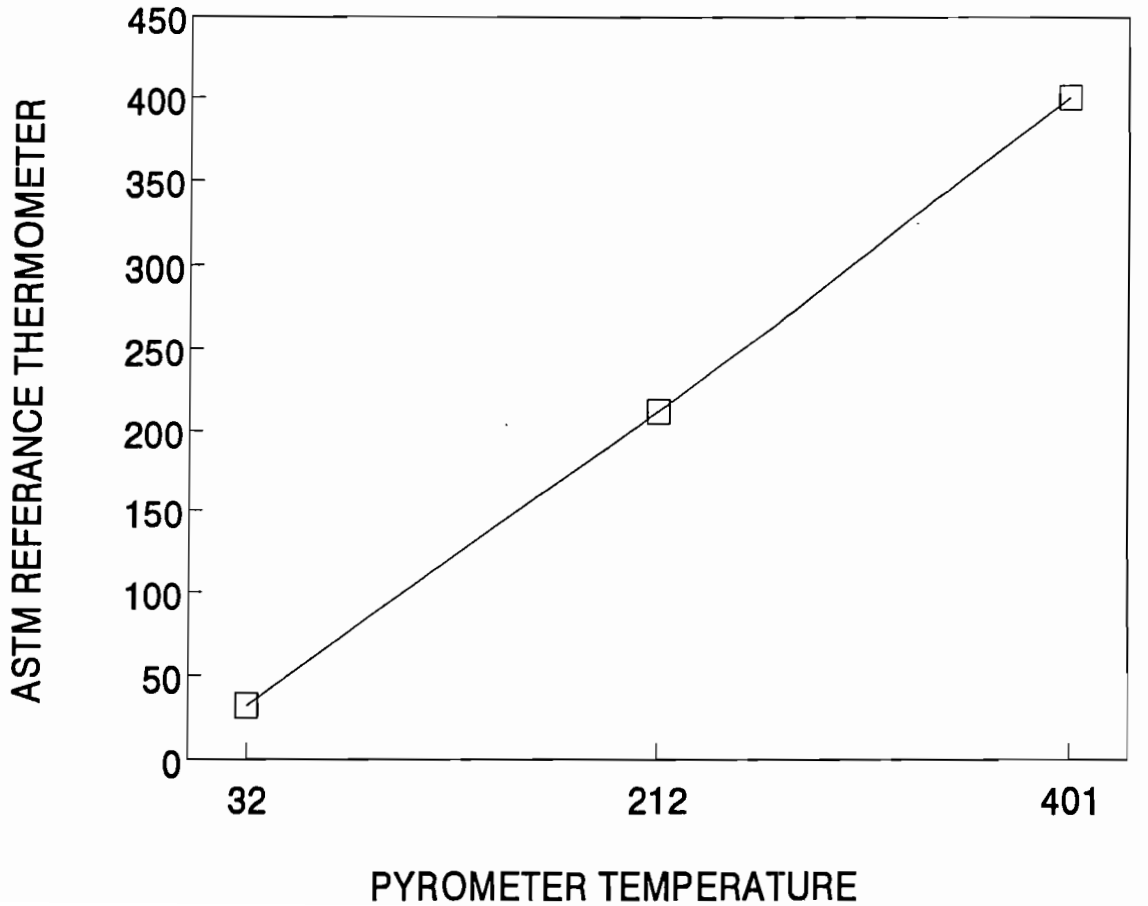
PYROMETER CALIBRATION

PYROMETER NO.	*5*	*REFERENCE THERMOMETER*	
CTL SERIAL NO.	*5*	*SERIAL NO.*	*1E2735*
DATE	*1-12-96*	*CALIBRATOR*	

REFERENCE TEMP. (F)	*PYROMETER INDICATION*
32	*32*
212	*212*
400	*401*

1/31/96

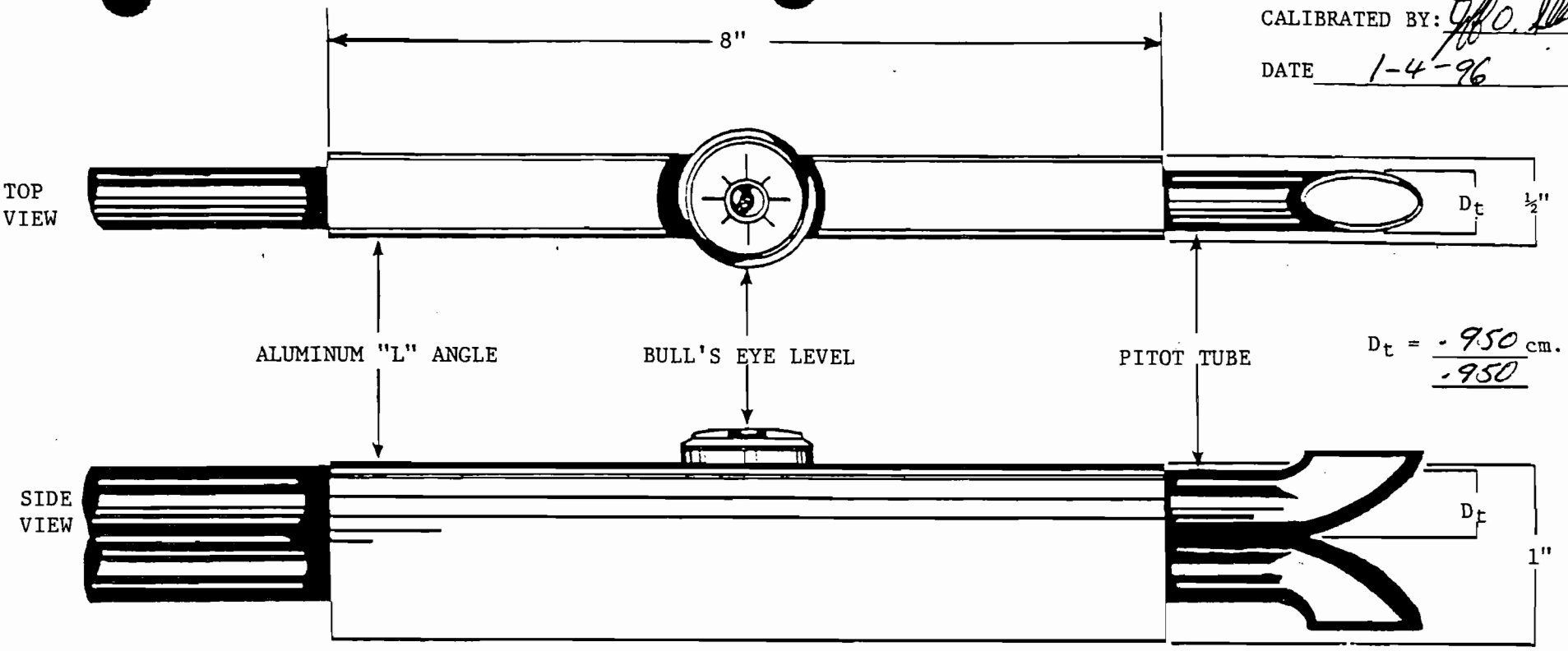
PYROMETER TEMPERATURE CALIBRATION



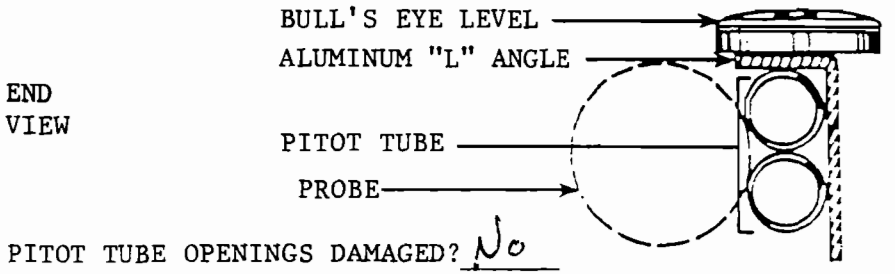
SERIAL NO. 00007

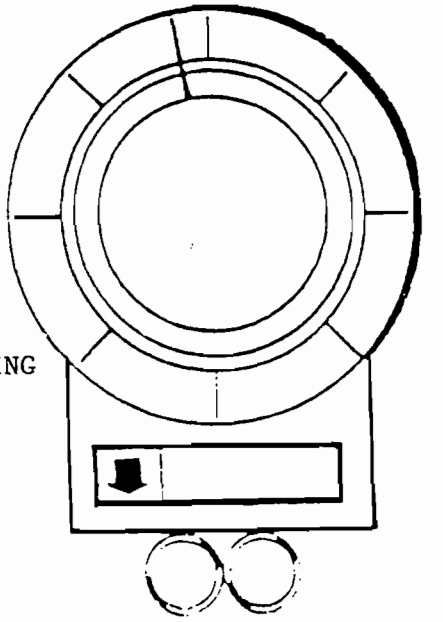
CALIBRATED BY: [signature]

DATE 1-4-96



D_t = -.950 / -.950 cm.





DEGREE INDICATING LEVEL

PITOT TUBE OPENINGS DAMAGED? No

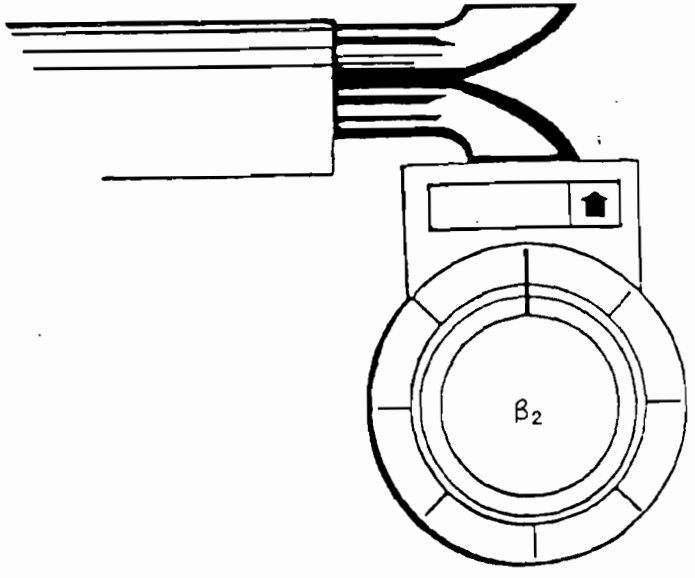
COMMENTS: [signature] 1/19/96

PITOT TUBE CALIBRATION SET-UP POSITION

SERIAL NO. 007

CALIBRATED BY [illegible]

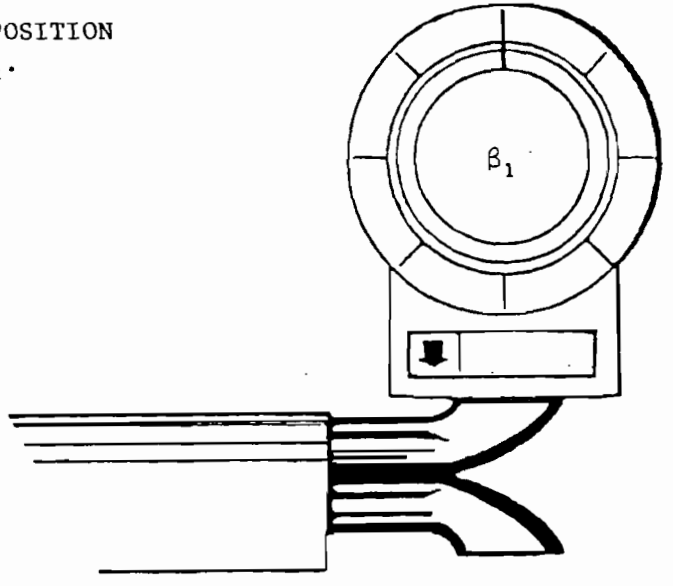
DATE 1-4-96

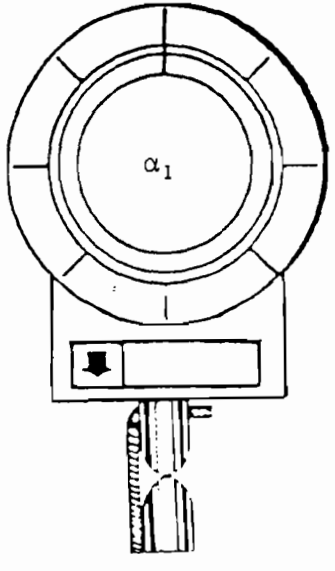


DEGREE INDICATING LEVEL POSITION FOR DETERMINING β_1 and β_2.

β_1 = 2.0 °(<5°)

β_2 = 2.0 °(<5°)

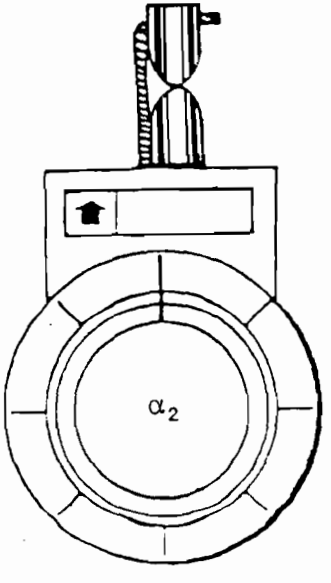




DEGREE INDICATING LEVEL POSITION FOR DETERMINING α_1 and α_2.

α_1 = 1.0 °(<10°)

α_2 = 1.0 °(<10°)

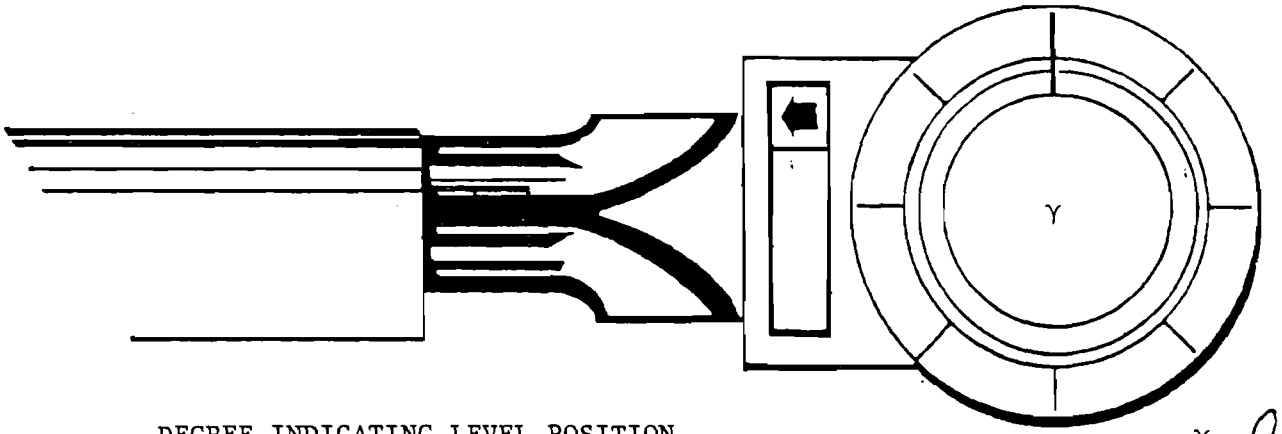


PITOT TUBE CALIBRATION; α and β DETERMINATION

SERIAL NO. 00197

CALIBRATED BY [signature]

DATE 1-4-96



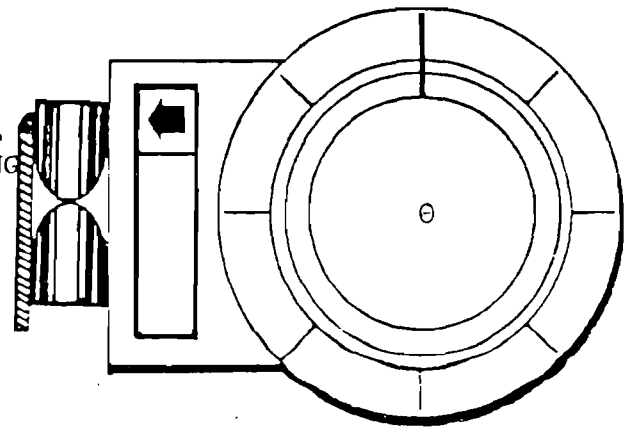
DEGREE INDICATING LEVEL POSITION
FOR DETERMINING γ, THEN CALCULATING Z.

γ = 0.5 °

A = DISTANCE BETWEEN TIPS, $(P_a + P_b)$, cm. = 2.220 .

Z = A sin γ = 0.02 cm; (<0.32 cm).

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



Θ = 1.0 °

W = A sin Θ = 0.04 cm; (<0.08 cm).

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

WET TEST METER CALIBRATION DATA SHEET

DATE 1-9-96

NAME [signature]

BAROMETRIC PRESSURE 30.32

AMBIENT TEMPERATURE 71.0°F

WET TEST METER SERIAL NUMBER 12-AH-4

RUN NO.	VOLUME OF WATER DISPLACED (LITERS) Va	INITIAL METER READING (FT3)	FINAL METER READING (FT3)	NET METER VOLUME (FT3)	NET METER VOLUME (LITERS) Vw (Vm)	ERROR
1	3.360	0.0000	0.1180	0.1180	3.342	-0.00535714
2	3.360	0.1180	0.2355	0.1175	3.328	-0.00952381
3	3.360	0.2355	0.3534	0.1179	3.339	-0.00625000
4	3.360	0.3534	0.4712	0.1178	3.336	-0.00714286
					AVG. ERROR =	-0.00706846

CALCULATIONS:

ERROR = (Vw − Va) / Va

CORRECTION FACTOR = 1 / (1 + AVG. ERROR)

C. F. = 1.007118779 ~~0.992981152~~

(1.000 +/− 0.010)

*CONVERSION FACTOR, FT3 TO LITERS = 28.32 x FT3

WHEN USING THE WET TEST METER, THE ACTUAL VOLUME OF AIR CAN BE DETERMINED BY THE EQUATION:

Va = Vw x C. F.

[signature] 10/96

WHERE:

Va = ACTUAL VOLUME OF AIR PASSED THROUGH THE WET TEST METER.

Vw = VOLUME OF AIR INDICATED BY THE WET TEST METER.

C. F. = CORRECTION FACTOR FOR THE METER.

BAROMETER CALIBRATION DATA FORM

DATE 1-3-96 CALIBRATOR [signature]

COMMENTS #00224
Time between readings due to weather Service shutdown.

TIME	BAROMETER READING (HG")	REFERENCE STANDARD READING (HG")	DIFFERENCE (HG")
1-3-96 2:16 pm	29.85"	29.81"	0.04"
1-4-96 9:15 AM	Jab ~~34.30~~" 30.30	Jab ~~34.34~~" 30.34	0.04"
			[signature] 1/10/96

*NOTE: BAROMETRIC READINGS MUST AGREE WITHIN 0.1 INCHES HG OF READINGS OBTAINED FROM THE REFERENCE STANDARD, THE NATIONAL WEATHER SERVICE, RUSKIN FL. TO BE DEEMED ACCEPTABLE.

G-2 FUEL BLEND BURN EQUIPMENT CALIBRATIONS

SUMMARY OF EQUIPMENT CALIBRATIONS

EQUIPMENT	CALIBRATION DATE	LOCATION	METHOD	RESULTS
Method 17 Console #6 Initial Test Post Test	 4-19-96 4-25-96	 CES CES	 Wet Test Meter Wet Test Meter	 Y = 1.000 Y = 1.004
Nozzle #37 Initial Measurement Post Test Measurement	 4-4-96 4-25-96	 CES CES	 3 Measurements w/calipers	 DN= 0.212 DN= 0.211
Nozzle #16 Initial Measurement Post Test Measurement	 4-4-96 4-5-96	 CES	 3 Measurements w/calipers	 DN= 0.197 DN= 0.197
Pyrometer No. 12	4-12-96	CES	Comparison to ASTM Thermometer	Correct to ± 2°F
Pitot Tube 00112	4-12-96	CES	EPA Method	CP = 0.84
Wet Test Meter Serial No. 12-AH-4	4-3-96	CES	Liquid Displacement	CF= 1.004
Barometer SN 00224	4-16-96	CES	Comparison to National Weather Services	Correct to ± 0.03"Hg

INITIAL DRY GAS METER AND ORIFICE CALIBRATION

CONTROL BOX NO. 6 BAROMETRIC PRESS. 30.13 IN. HG.

DATE 4-16-96 PERFORMED BY

	RUN 1	RUN 2	RUN 3	RUN 4
VACUUM ("Hg)	3.0	3.0	3.0	3.0
dHw ("H2O)	0.65	1.10	1.60	2.05
dHd ("H2O)	0.50	1.00	1.50	2.00
INITIAL WTM	0.0000	0.0000	0.0000	0.0000
FINAL WTM	6.1698	8.5264	6.8275	7.8093
INITIAL DGM	513.704	520.238	529.578	537.149
FINAL DGM	519.943	529.027	536.725	545.425
TEMP. WTM (F)	69.5	70.0	69.5	69.5
TEMP. DGM (F)	87.0	91.0	92.0	93.0
TEST TIME (MIN.)	15.0	15.0	10.0	10.0
NET VOLUME WTM	6.1698	8.5264	6.8275	7.8093
NET VOLUME DGM	6.239	8.789	7.147	8.276
Y	1.020	1.006	0.992	0.981
dH@	1.594	1.660	1.720	1.749

4/16/96

AVERAGE Y = 1.000

ACCEPTABLE Y RANGE = 0.980 TO 1.020

AVERAGE dH@ = 1.681

ACCEPTABLE dH@ RANGE = 1.531 TO 1.831

$Y = (Vw (Pb) \times (Td + 460)) / (Vd (Pb + (dHd / 13.6)) \times (Tw + 460)$

$dH@ = 0.0317 \times dHd / (Pb (Td + 460)) \times ((Tw + 460) \times time) / Vw)^{\wedge} 2$

RECHECK OF ORIFICE AND DGM CALIBRATION

CONTROL BOX NO 6 BAROMETRIC PRESS. 30.10 IN. HG.

DATE 4.25.96 PERFORMED BY [signature]

LEAK CHECK OF METER SYSTEM 0.000@15"Hg PRIOR Y = 1.000

	RUN 1	RUN 2	RUN 3
VACUUM ("Hg)	11.0	11.0	11.0
dHw ("H2O)	1.10	1.15	1.15
dHd ("H2O)	1.00	1.00	1.00
INITIAL WTM	0.0000	8.5414	17.0636
FINAL WTM	8.5414	17.0636	25.5678
INITIAL DGM	829.325	838.066	846.824
FINAL DGM	838.066	846.824	855.610
TEMP. WTM (F)	71.0	71.0	70.5
TEMP. DGM (F)	87.0	89.5	90.5
TEST TIME (MIN.)	15.0	15.0	15.0

NET VOLUME WTM	8.5414	8.5222	8.5042
NET VOLUME DGM	8.741	8.758	8.786
Y	1.004	1.005	1.002
dH@	1.674	1.674	1.675

PRIOR Y = 1.000
RECHECK Y = 1.004
% DIFFERENCE = 0.4%

AVERAGE dH@ = 1.674

Y = (Vw (Pb) x (Td + 460)) / (Vd (Pb + (dHd / 13.6)) x(Tw + 460)

[signature] 4/30/96

dH@ = 0.0317 x dHd / (Pb (Td + 460)) x ((Tw + 460) x time) / Vw)^2

NOZZLE CALIBRATION DATA FORM

NOZZLE SET NO. 1

DATE: 4-4-96 CALIBRATED BY: Jeff O.

NOZZLE IDENTIFICATION	NOZZLE DIAMETER (IN.) D1	D2	D3	ΔD	D avg
1	0.111	0.111	0.111	0.000	0.111
4	0.125	0.125	0.125	0.000	0.125
5	0.149	0.149	0.149	0.000	0.149
6	0.197	0.197	0.197	0.000	0.197
9	0.276	0.276	0.276	0.000	0.276
10	0.289	0.290	0.289	0.001	0.289
12	0.388	0.388	0.388	0.000	0.388
15	0.164	0.164	0.164	0.000	0.164
16	0.198	0.198	0.198	0.000	0.198
19	0.275	0.275	0.275	0.000	0.275
22	0.364	0.364	0.364	0.000	0.364
30	0.314	0.314	0.314	0.000	0.314
36	0.185	0.185	0.185	0.000	0.185
37	0.212	0.213	0.212	0.001	0.212
38	0.244	0.245	0.244	0.001	0.244
46	0.192	0.192	0.192	0.000	0.192
47	0.200	0.200	0.200	0.000	0.200
48	0.249	0.249	0.249	0.000	0.249
50	0.314	0.314	0.314	0.000	0.314
58	0.237	0.237	0.237	0.000	0.237

where:

D1,2,3 = three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

ΔD= maximum difference between any two diameters, (in.) ΔD ≤ 0.004 in.

D Avg = average of D1, D2, and D3.

5/7/96

FINAL NOZZLE CALIBRATION DATA FORM

NOZZLE NO 37

DATE: 4·25·96 CALIBRATED BY: Adriana Alcaz

NOZZLE IDENTIFICATION	NOZZLE DIAMETER			Δ D (IN.)	D AVG
	D1 (IN.)	D2 (IN.)	D3 (IN.)		
37	0.212	0.210	0.211	0.002	0.211

where:

D1,2,3= three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

Δ D= maximum difference between any two diameters,(in.).
Δ D≤ 0.004 in.

D AVG= average of D1,D2 and D3.

RAM 4/30/96

FINAL NOZZLE CALIBRATION DATA FORM

NOZZLE NO 6

DATE: 4·25·96 CALIBRATED BY: [signature]

NOZZLE IDENTIFICATION	NOZZLE DIAMETER			ΔD (IN.)	D AVG
	D1 (IN.)	D2 (IN.)	D3 (IN.)		
#6	0.197	0.196	0.197	0.001	0.197

where:

D1,2,3= three different nozzle diameters,(in); each diameter must be measured to the nearest 0.001 in.

ΔD= maximum difference between any two diameters,(in.).
ΔD≤ 0.004 in.

D AVG= average of D1,D2 and D3.

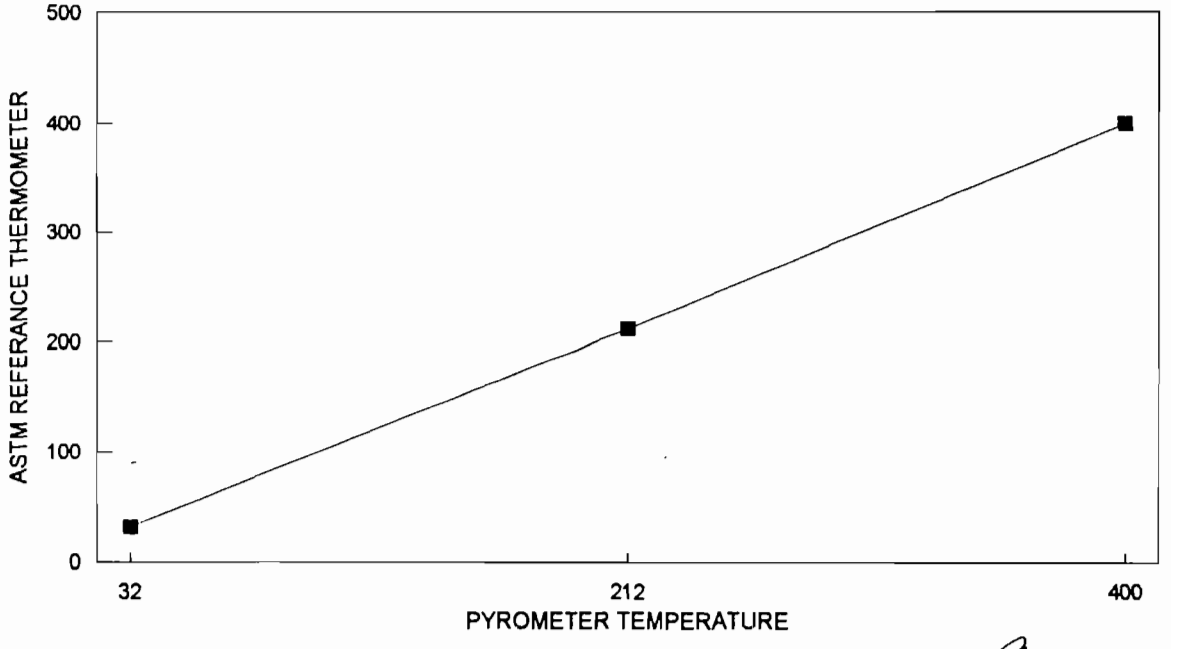
4/30/96

PYROMETER CALIBRATION

PYROMETER NO.	*12*	*REFERENCE THERMOMETER*	
CTL SERIAL NO.	*12*	*SERIAL NO.*	*1E2735*
DATE	*4-12-96*	*CALIBRATOR*	

REFERENCE TEMP. (F)	*PYROMETER INDICATION*
32	*32*
212	*212*
400	*400*

PYROMETER TEMPERATURE CALIBRATION

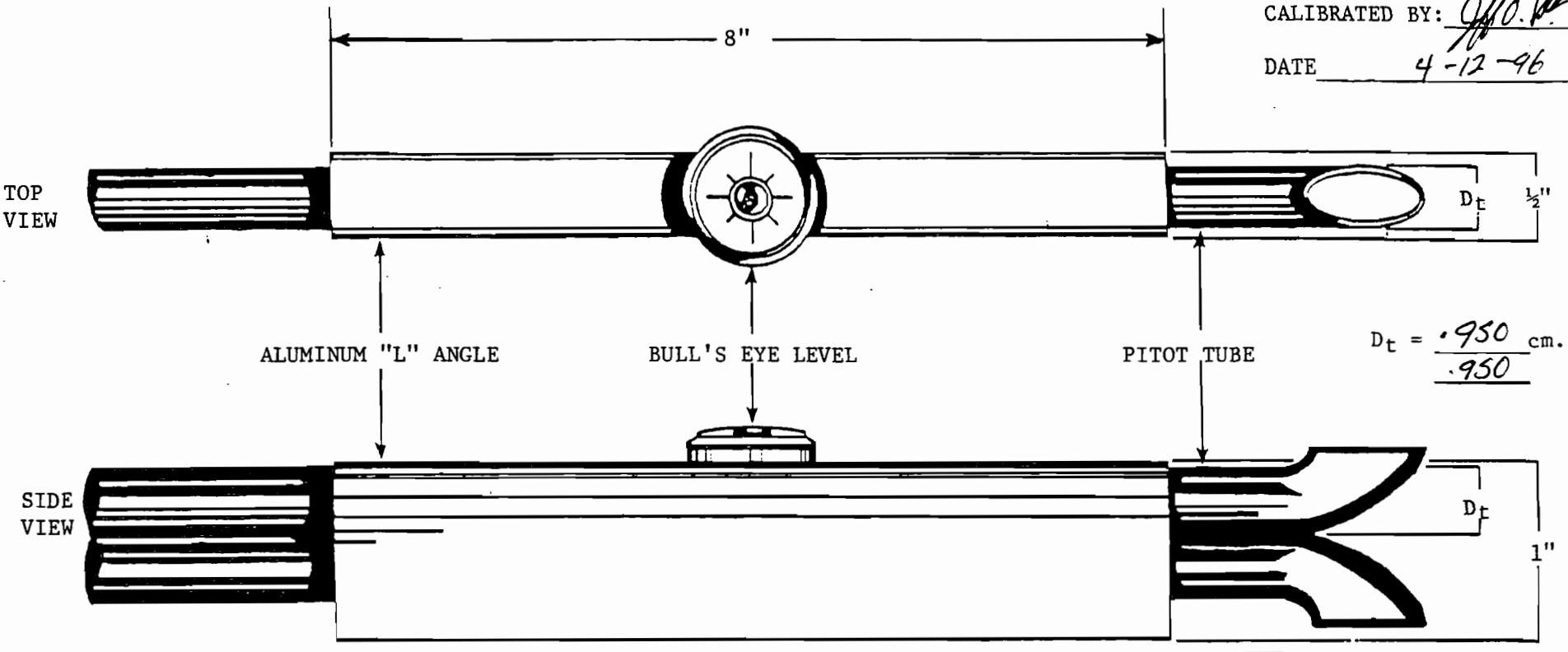


4/15/96

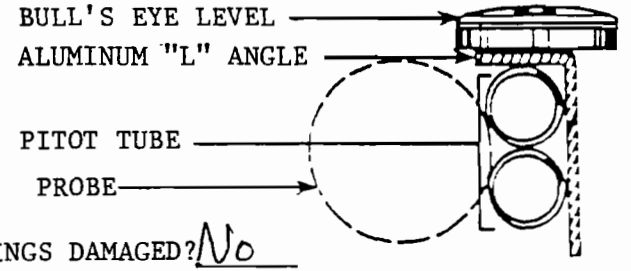
SERIAL NO. 002

CALIBRATED BY: [illegible]

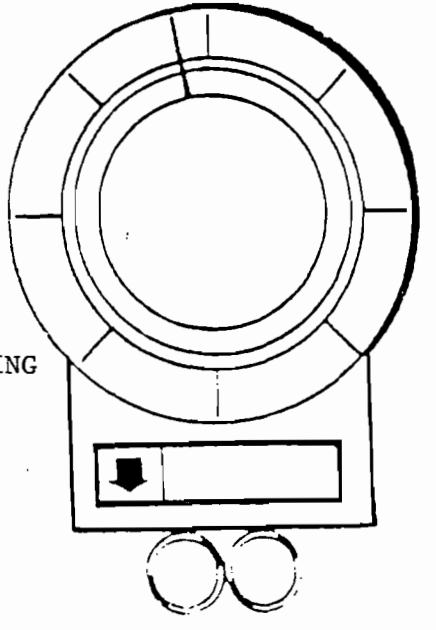
DATE 4-12-96



D_t = .950 / .950 cm.



END VIEW



DEGREE INDICATING LEVEL

PITOT TUBE OPENINGS DAMAGED? No

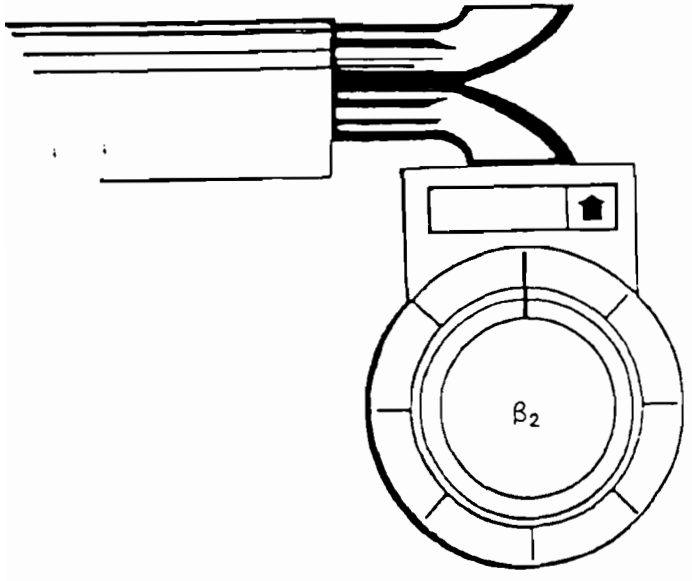
COMMENTS: - Not permanently attached

4/15/94

SERIAL NO. 001

CALIBRATED BY [signature]

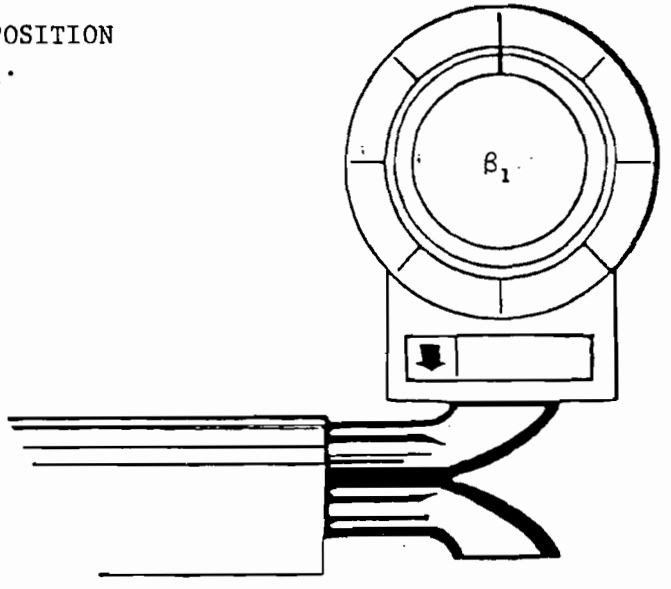
DATE 4-12-96

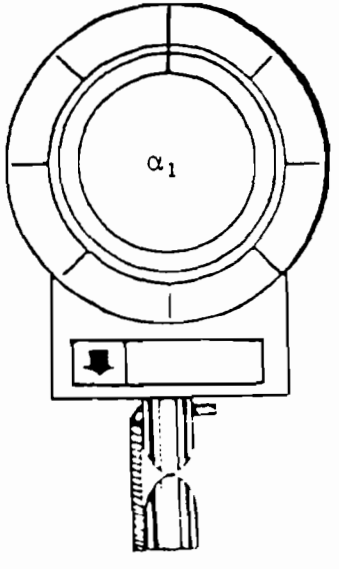


DEGREE INDICATING LEVEL POSITION FOR DETERMINING β_1 and β_2.

β_1 = 1.5 °(<5°)

β_2 = 1.5 °(<5°)

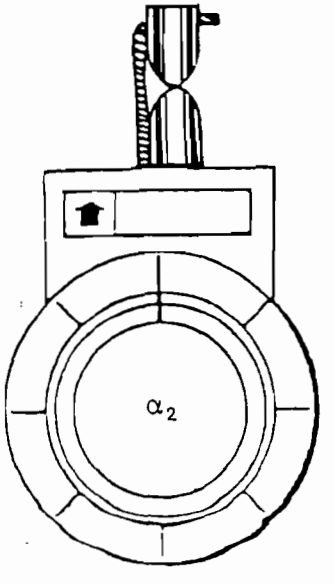




DEGREE INDICATING LEVEL POSITION FOR DETERMINING α_1 and α_2.

α_1 = 1.5 °(<10°)

α_2 = 1.5 °(<10°)

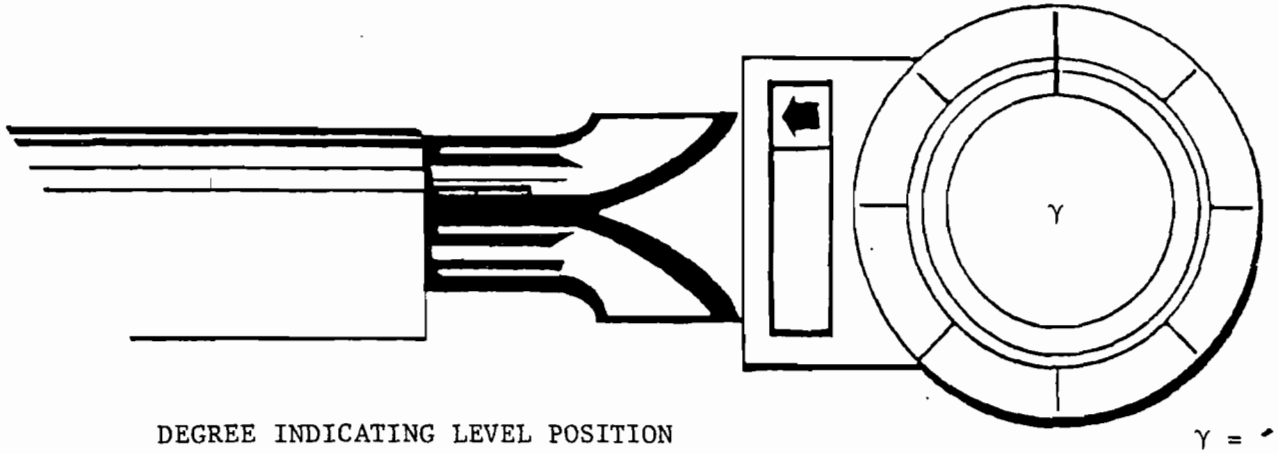


PITOT TUBE CALIBRATION; α and β DETERMINATION

SERIAL NO. 0012

CALIBRATED BY [signature]

DATE 4-12-96



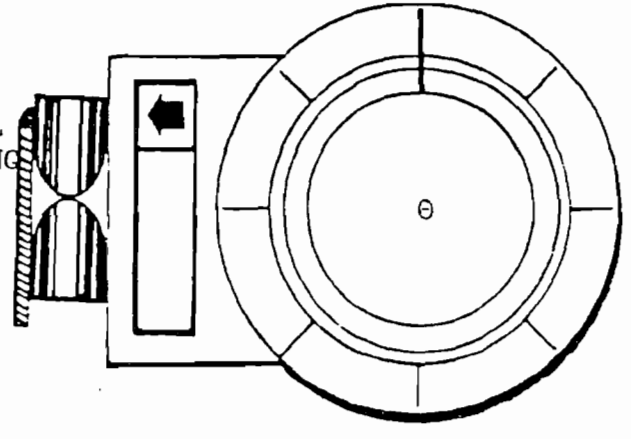
DEGREE INDICATING LEVEL POSITION
FOR DETERMINING γ, THEN CALCULATING Z.

γ = -.5 °

A = DISTANCE BETWEEN TIPS, $(P_a + P_b)$, cm. = 2.530.

Z = A sin γ = 0.02 cm; (<0.32 cm).

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



Θ = 1.0 °

W = A sin Θ = 0.04 cm; (<0.08 cm).

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

WET TEST METER CALIBRATION DATA SHEET

DATE 4-3-96

NAME [signature]

BAROMETRIC PRESSURE 30.30

AMBIENT TEMPERATURE 72°F

WET TEST METER SERIAL NUMBER 12-AH-4

RUN NO.	VOLUME OF WATER DISPLACED (LITERS) Va	INITIAL METER READING (FT3)	FINAL METER READING (FT3)	NET METER VOLUME (FT3)	NET METER VOLUME (LITERS) Vm.w	ERROR
1	3.360	0.0000	0.1175	0.1175	3.3276	-0.009642857
2	3.360	0.1175	0.2353	0.1178	3.3361	-0.007113095
3	3.360	0.2353	0.3538	0.1185	3.3559	-0.001220238
4	3.360	0.3538	0.4728	0.1190	3.3701	+0.003005952
					AVG. ERROR =	-0.003742560

CALCULATIONS:

ERROR = (Vw − Va) / Va

CORRECTION FACTOR = 1/(1 + AVG. ERROR)

C.F. = 1.003756619

(1.000 +/− 0.010)

*CONVERSION FACTOR, FT3 TO LITERS = 28.32 x FT3

WHEN USING THE WET TEST METER, THE ACTUAL VOLUME OF AIR CAN BE DETERMINED BY THE EQUATION:

Va = Vw x C.F.

WHERE:

Va = ACTUAL VOLUME OF AIR PASSED THROUGH THE WET TEST METER.
Vw = VOLUME OF AIR INDICATED BY THE WET TEST METER.
C.F. = CORRECTION FACTOR FOR THE METER.

[signature]
4/15/96

BAROMETER CALIBRATION DATA FORM

DATE 4-16-96 CALIBRATOR [signature]

COMMENTS #00224

TIME	BAROMETER READING (HG")	REFERENCE STANDARD READING (HG")	DIFFERENCE (HG")
9:05AM	30.18"	30.12"	0.06"
11:10AM	30.20"	30.15"	0.05"
2:15pm	30.17"	30.14"	0.03"
			[signature]
			4/16/96

*NOTE: BAROMETRIC READINGS MUST AGREE WITHIN 0.1 INCHES HG OF READINGS OBTAINED FROM THE REFERENCE STANDARD, THE NATIONAL WEATHER SERVICE, RUSKIN FL. TO BE DEEMED ACCEPTABLE.

APPENDIX H

CHAIN OF CUSTODY

H-1 BASELINE CHAIN OF CUSTODY

H-2 FUEL BLEND BURN CHAIN OF CUSTODY

H-1 BASELINE CHAIN OF CUSTODY

TAMPA ELECTRIC COMPANY
SAMPLE CHAIN OF CUSTODY

GENERATING STATION F.J. GANNON STATION

SOURCE IDENTIFICATION BOILER No. 3

DATE OF TEST FEBRUARY 28, 1996

POLLUTANT SAMPLED PARTICULATE (SOOT BLOWING)

SAMPLE RECOVERY

LOCATION CENTRAL TESTING LABORATORY

DATE / TIME FEBRUARY 29, 1996 @ 08:00

SIGNATURE Bruce Rodgers

TITLE SR. TECHNICAL ASSISTANT

SAMPLE ANALYSIS

LOCATION CENTRAL TESTING LABORATORY

DATES FEBRUARY 29 - MARCH 5, 1996

SIGNATURE Richard Alday

TITLE SR. TECHNICAL ASSISTANT

CONTAINER CODE	SAMPLE IDENTIFICATION	ANALYTICAL METHOD
THIMBLE No.	19×90mm GLASS MICROFIBER THIMBLE	USEPA
001093	RUN 1S	METHOD
001094	RUN 2S	17
001095	RUN 3S	
001097	BLANK	
BEAKER No.	ACETONE WASH SAMPLES	
AIR-13	ACETONE WASH - RUN 1S	
AIR-14	ACETONE WASH - RUN 2S	
AIR-15	ACETONE WASH - RUN 3S	
AIR-16	ACETONE WASH - BLANK	

RAM 3/6/96

SAMPLE RECOVERY AND INTEGRITY DATA

Plant F. J. GANNON Sample location Boiler NO. 3

Field Data Checks

Sample recovery personnel Robert Barthelette

Person with direct responsibility for recovered samples Martin Duff

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	RUN 1 isopropanol	2-28-96	~400 ml	✓
2	RUN 1 H_2O_2	2-28-96	~400 ml	✓
3	RUN 2 isopropanol	2-28-96	~400 ml	✓
4	RUN 2 H_2O_2	2-28-96	~400 ml	✓
5	RUN 3 isopropanol	2-28-96	~500 ml	✓
6	RUN 3 H_2O_2	2-28-96	~300 ml	✓
Blank				

Remarks For Method 8 Sulfuric Acid Mist Testing.

Signature of field sample trustee David A Scott

Laboratory Data Checks

Lab person with direct responsibility for recovered samples FRANK SARDUY

Date recovered samples received 2-28-96

Analyst Frank Sardy

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	AA28439	2-28-96	YES	YES
2	AA28439	2-28-96	YES	YES
3	AA28439	2-28-96	YES	YES
4				
5				
6				
Blank	AA28439		YES	YES

Remarks

Signature of lab sample trustee Frank Sardy

H-2 FUEL BLEND BURN CHAIN OF CUSTODY

TAMPA ELECTRIC COMPANY
SAMPLE CHAIN OF CUSTODY

GENERATING STATION F.J. GANNON STATION

SOURCE IDENTIFICATION BOILER NO. 3

DATE OF TEST APRIL 23, 1996

POLLUTANT SAMPLED TDF PARTICULATE

SAMPLE RECOVERY

LOCATION CENTRAL TESTING LABORATORY

DATE / TIME APRIL 24, 1996 @ 7:30

SIGNATURE [signature]

TITLE SR. TECHNICAL ASSISTANT

SAMPLE ANALYSIS

LOCATION CENTRAL TESTING LABORATORY

DATES APRIL 24 - 26, 1996

SIGNATURE [signature]

TITLE SR. TECHNICAL ASSISTANT

CONTAINER CODE	SAMPLE IDENTIFICATION	ANALYTICAL METHOD
THIMBLE NO.	19x90mm GLASS MICROFIBER THIMBLE	USEPA
001098	RUN 1S	METHOD
001099	RUN 2S	17
001100	RUN 3S	
001092	BLANK	
BEAKER NO.	ACETONE WASH SAMPLES	
AIR-17	ACETONE WASH - RUN 1S	
AIR-18	ACETONE WASH - RUN 2S	
AIR-19	ACETONE WASH - RUN 3S	
AIR-20	ACETONE WASH - BLANK	

[signature] 4/30/96

SAMPLE RECOVERY AND INTEGRITY DATA

Plant GANNON Sample location BOILER #3

Field Data Checks

Sample recovery personnel BRUCE RODRIGUEZ

Person with direct responsibility for recovered samples _____

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	1S, ISOPROPANOL	4-23-96 0920	✓	✓
2	1S, PEROXIDE	4-23-96 0930	✓	✓
3	2S, ISOPROPANOL	4-23-96 1115	✓	✓
4	2S, PEROXIDE	4-23-96 1125	✓	✓
5	3S, ISOPROPANOL	4-23-96 1300	✓	✓
6	3S, PEROXIDE	4-23-96 1310	✓	✓
Blank	80% ISOPROPANOL	4-23-96 1310	✓	✓
BLANK	3% H_2O_2	4-23-96 1310	✓	✓

Remarks _____

Signature of field sample trustee Bruce Rodriguez

Laboratory Data Checks

Lab person with direct responsibility for recovered samples FRANK SARDU

Date recovered samples received 4-23-96

Analyst Frank Sardu

Sample Number	Sample Identification Number	Date and Time of Recovery	Liquid Level Marked	Stored in refrigerated Container
1	AA29423	4-25-96 / 0900	YES	~~&~~ YES
2				
3				
4				
5				
6				
Blank				

Remarks _____

Signature of lab sample trustee Frank Sardu

APPENDIX I

PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

Corporate Environmental Services

Lynn F. Robinson, P.E.	Supervisor- Air Programs
Gregory M. Nelson, P.E.	Environmental Compliance Coordinator
Martin Duff	Test Project Leader Senior Environmental Technician
David Smith	Test Team Leader Environmental Technician
Robert Barthelette	Sr. Technical Assistant
Adriano Alcoz	Sr.Technical Assistant
Ray McDarby	Quality Assurance Specialist - CES
Frank Sarduy	Technician - CES
Tom Toombs	Technician-CES
Glenn Naslund	Technician - CES
Bruce Rodriguez	Sr. Technical Assistant
Jeff Sellars	Sr. Technical Assistant

F. J. Gannon Station

Cindy Barringer	Environmental Specialist

ATTACHMENT E

SUPPLEMENTAL INFORMATION

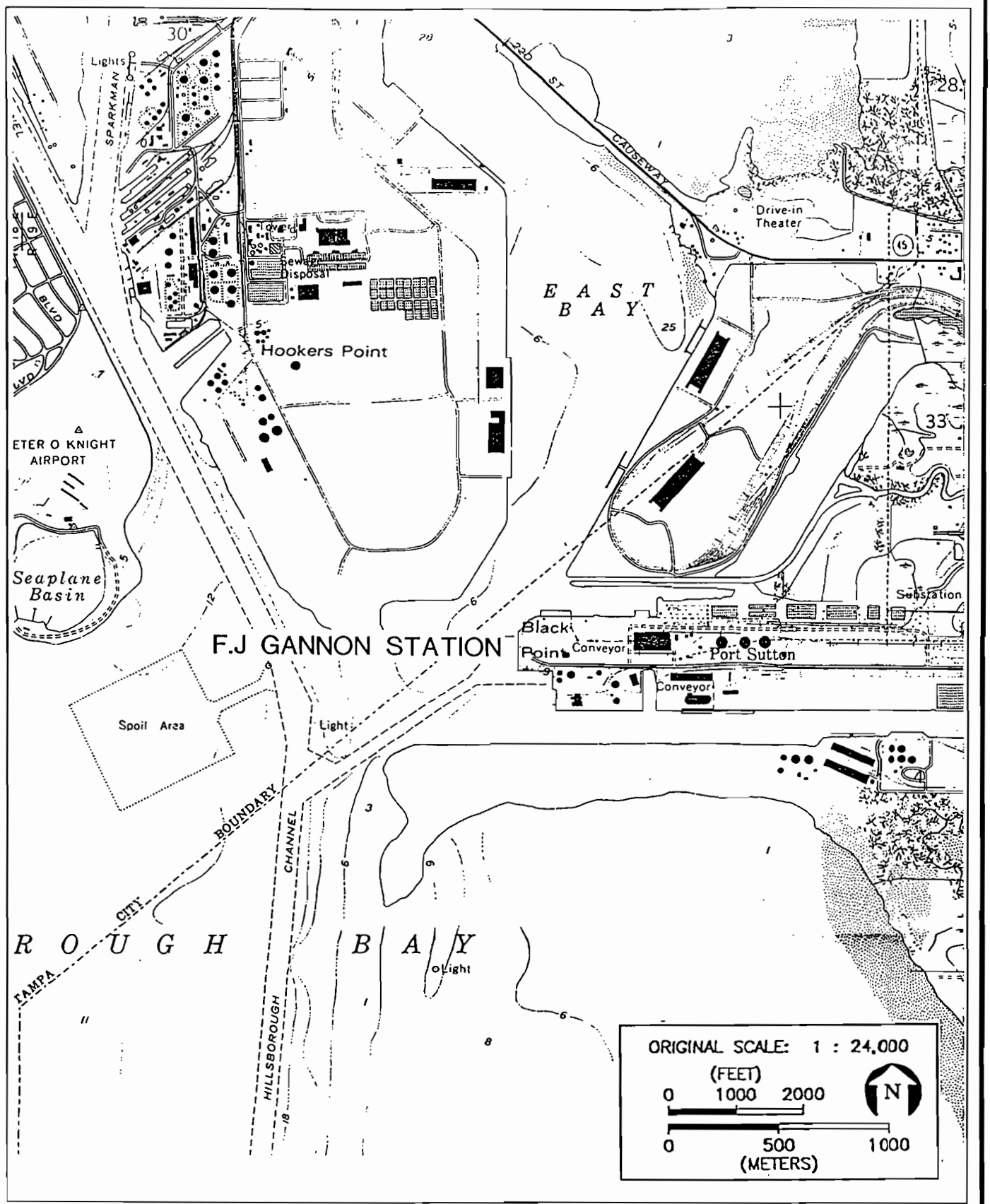


FIGURE II.D.1.1.
F.J. GANNON STATION AREA MAP

Sources: USGS Quad, Tampa, FL 1981.

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F:\ACAD\94500\GANNON\COMBUST

05/09/96

N

SCALE: 1"=250'

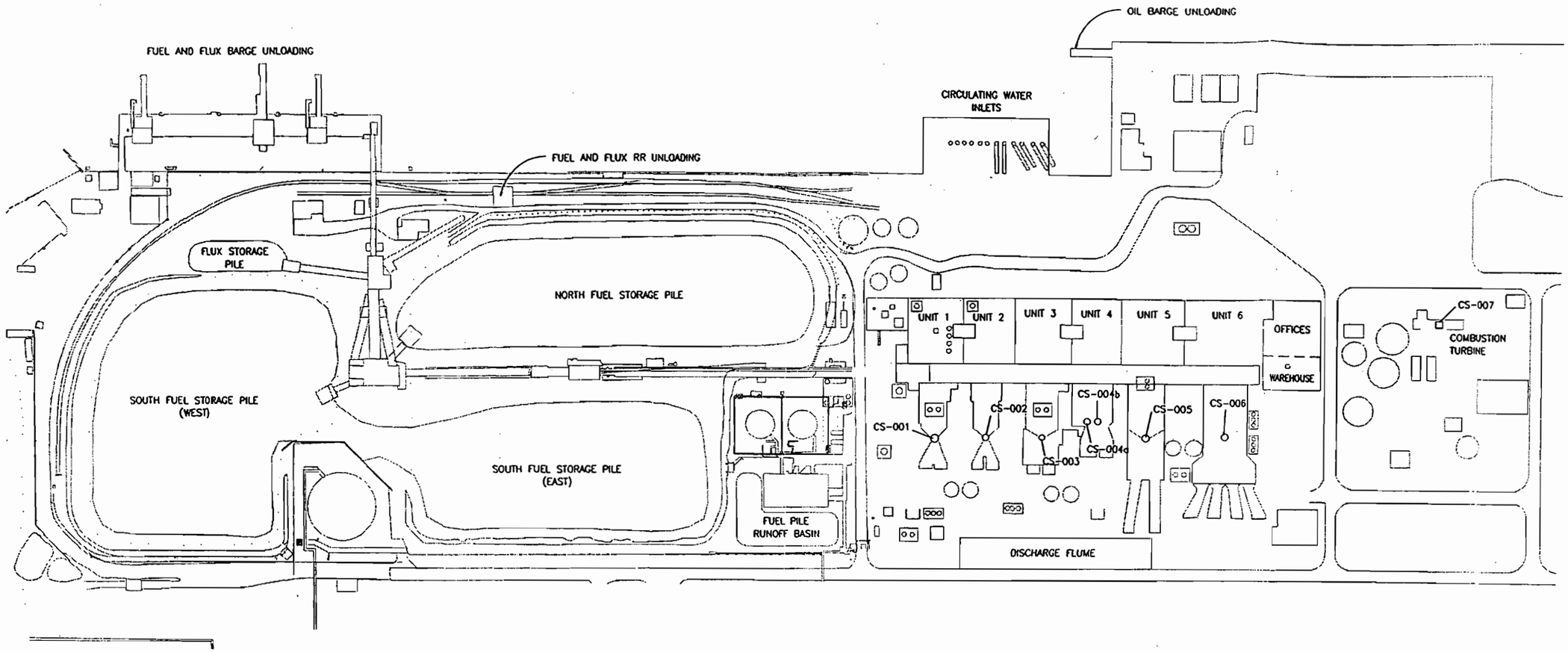

FIGURE II.D.2.4.

F.J. GANNON STATION
COMBUSTION EMISSION SOURCES

Source: TEC; ECT, 1996.

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Environmental Consulting & Technology, Inc.

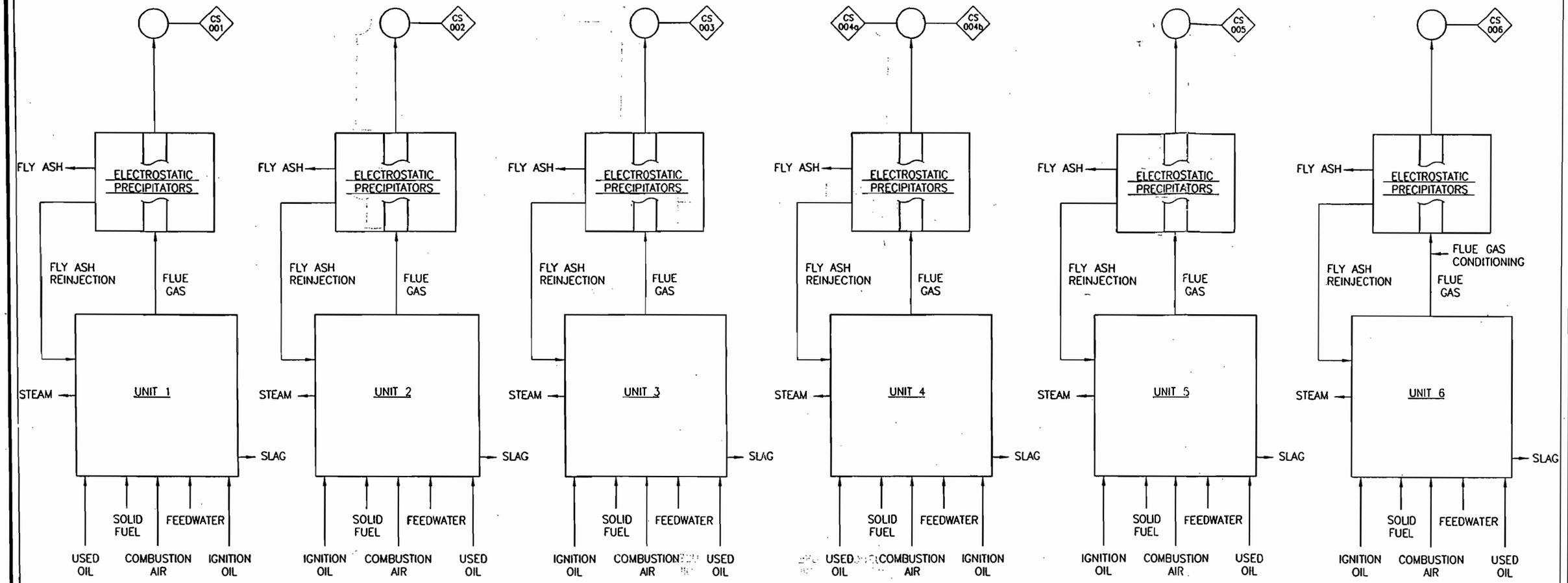

FIGURE II.D.3.6.

F.J. GANNON STATION

BOILER PROCESS FLOW DIAGRAM

Source: ECT, 1996.

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