STATE OF FLORIDA A029-189.206

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

PAID E.P.C. OF H.C. 11-14-90 2,645 - PH

RECEIVED NOV 14 1990 E.P.C. OF H.C. AIR PROGRAM

APPLICATION FOR RENEWAL OF PERMIT TO OPERATE AIR POLLUTION SOURCE(S)

If major alterations have occurred, the applicant should complete the Standard Air Permit Application Form.

Source Type: Air Pollution Renewal of DER Permit No. A029-112412

Company Name: Tampa Electric Company County: Hillsborough

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

Gannon Station Unit #2

Source Location: Street: Port Sutton Road City: Tampa

UTM: East 359,923 North 3,087,486

Latitude: 27° 54' 25"N. Longitude: 82° 25' 23"W.

1. Attach a check made payable to the Department of Environmental Regulation in accordance with operation permit fee schedule set forth in Florida Administrative Code Rule 17-4.05. Enclosed

2. Have there been any alterations to the plant since last permitted? [ ] Yes [X] No If minor alterations have occurred, describe on a separate sheet and attach.

3. Attach the last compliance test report required per permit conditions if not submitted previously. Submitted 8/3/90

4. Have previous permit conditions been adhered to? [X] Yes [ ] No If no, explain on a separate sheet and attach.

5. Has there been any malfunction of the pollution control equipment during tenure of current permit? [X] Yes [ ] No If yes, and not previously reported, give brief details and what action was taken on a separate sheet and attach. Previously addressed in Quarterly Reports.

6. Has the pollution control equipment been maintained to preserve the collection efficiency last permitted by the Department? [X] Yes [ ] No

7. Has the annual operating report for the last calendar year been submitted? [X] Yes [ ] No If no, please attach.

I. Please provide the following information if applicable:

A. Raw Materials and Chemical Used in Your Process: Not applicable.

Description	Contaminant Type	Contaminant %Wt	Utilization Rate lbs/hr

B. Product Weight (lbs/hr): Not Applicable

C. Fuels

Type (Be Specific)	Consumption* Avg/hr*	Consumption* Max/hr**	Maximum Heat Input (MMBTU/hr)
Coal		51 Tons/hr	1257

D. Normal Equipment Operating Time: hrs/day 24; days/wk 7; wks/yr 52; hrs/yr (power plants only) 8760; if seasonal, describe Not Applicable

The undersigned owner or authorized representative*** of Tampa Electric Company is fully aware that the statements made in this application for a renewal of a permit to operate an air pollution source are true, correct and complete to the best of his knowledge and belief. Further, the undersigned agrees to maintain and operate the pollution source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403, Florida Statutes, and all the rules and regulations of the Department. He also understands that a permit, if granted by the Department, will be non-transferable and he will promptly notify the Department upon sale or legal transfer of the permitted facility.

*During actual time of operation.
**Units: Natural Gas-MMCF/hr; Fuel Oils-barrels/hr; Coal-lbs/hr.
***Attach letter of authorization if not previously submitted

Jerry L. Williams
Signature, Owner or Authorized Representative (Notarization is mandatory)

Jerry L. Williams, Director - Environmental
Typed Name and Title

Tampa Electric Company, P.O. Box 111
Address

Tampa FL 33601
City State Zip

11/12/90 (813) 228-4837
Date Telephone No.

ER Form 17-1.202(4)
Effective November 30, 1982

STATE OF FLORIDA
COUNTY OF HILLSBOROUGH

Sworn to and subscribed before me this 12 day of November, 1990.

NOTARY PUBLIC

Diana R. Hofer
Notary Public

Commission Expires:
NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP. DEC. 4,1993
BONDED THRU GENERAL INS. UND.

Professional Engineer in Florida (as required by Subsection 17-4.05(3), F.A.C.)

This is to certify that the engineering features of this air pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgement, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statuates of the State of Florida and the rules and the regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintainance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed Douglas H. Finke

Date: 11/9/90 Telephone No. (813) 228-4111

Douglas H. Finke
Name (Please type)

Tampa Electric Company
Company Name (Please type)

P.O. Box 111, Tampa, FL 33601-0111
Mailing Address (Please Type)

Affix seal here

Florida Registration No. 24635

This certification is only applicable for the permit renewal application of Tampa Electric Company's F.J. Gannon Station - Unit No. Two.

F.J. GANNON STATION - UNIT #2

Operation and Maintenance Plan for the
Processing System and Particulate Control/Collection System

INTRODUCTION

F.J. Gannon Station is owned and operated by Tampa Electric Company. The station is located on the eastern shore of Hillsborough Bay at Port Sutton. The station consists of six coal fired, steam electric generating units.

Unit 2 was placed in service in November, 1958. The boiler was manufactured by the Babcock and Wilcox Corporation and is of the "wet" bottom, cyclone firing type. Boiler flue gas passes through an electrostatic precipitator prior to discharge through a 306 foot stack.

PROCESS SYSTEM PERFORMANCE PARAMETERS

The Unit 2 boiler burns low sulfur coal. The design fuel consumption at maximum continuous rating is 51 tons/hr., operating pressure is 1580 psi and operating temperature is 1000°F.

The maximum design steam capacity of the boiler is 950,000 pounds per hour. Steam flow is recorded on a continuous basis.

PARTICULATE CONTROL EQUIPMENT DATA

Gannon Unit 2 is equipped with an electrostatic precipitator for the control of particulate emissions. The rigid frame precipitator was manufactured by Combustion Engineering, Inc. Fly ash collected by the precipitator is either pneumatically transported to a storage silo for sale or reinjected into the boiler. Fly ash is reinjected into the boiler when the silo approaches its maximum storage capacity. Important design information and data applicable to the particulate control system are listed below.

Precipitator Data

Design Flow Rate	440,000 acfm
Primary Voltage	460 volts
Primary Current	258 amps
Secondary Voltage	56.6 kilovolts
Secondary Current	1500 milliamps
Design Efficiency	99.09%
Pressure Drop	1.59 inches of H_2O (average)
Rapper Frequency	1/1.5 min-1/4.0 min (average)
Rapper Duration	Impact
Temperature	250 $\pm$ 55°F (average)

Precipitator (ESP) performance parameters are recorded on a daily basis. The information recorded includes primary voltage, primary current, secondary current and secondary voltage. This information is kept in the precipitator technician's office. Fly ash hopper high levels are alarmed in the control room.

MAINTENANCE AND INSPECTION SCHEDULES

Precipitator

All generating units of the Tampa Electric Company system are regularly scheduled for periodic maintenance. The schedule for planned maintenance outages is affected by system load and forced outage requirements. Typically, planned outages are scheduled during non-peak load periods such as the spring or fall.

The Unit 2 particulate control system receives regular preventive maintenance. The following preventive maintenance procedures are performed on a monthly basis.

- Inspection of insulator compartment heaters/blowers. Service as needed.
- Observation of operation of all rapper and transformer/rectifier controls.

The following preventive maintenance procedures are performed on a daily basis.

- Inspection of system controls. Minor adjustments as needed.

Should these procedures indicate repairs are necessary, maintenance job requests are initiated. All records are maintained for a minimum of two years.

TAMPA ELECTRIC
A TECO ENERGY COMPANY

TO WHOM IT MAY CONCERN:

Please be advised that Jerry L. Williams, Director of Environmental, is the authorized representative of Tampa Electric Company concerning matters with which this permit application deals.

Very truly yours,

WN Cantrell

William N. Cantrell
Vice President
Regulatory Affairs

WNC/ams/GG073.DOC

A029-112412
PAID NOV 19 1985

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

Rec'd by HCEPC 11-19-85

BOB GRAHAM
GOVERNOR
VICTORIA TSCHINKEL
SECRETARY
D. E. R.

NOV 19 1985
SOUTH WEST DISTRICT
TAMPA

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Air Pollution [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Tampa Electric Company COUNTY: Hillsborough

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Gannon Station Unit #2

SOURCE LOCATION: Street Port Sutton Road City Tampa

UTM: East 359,923 North 3,087,486

Latitude 27° 54' 25"N Longitude 82° 25' 23"W

APPLICANT NAME AND TITLE: Tampa Electric Company

APPLICANT ADDRESS: P.O. Box 111, Tampa, Florida 33601 - Attn: Environmental Planning

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Tampa Electric Company

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

*Attach letter of authorization

Signed: A. Spencer Autry

A. Spencer Autry, Manager, Environmental Planning
Name and Title (Please Type)

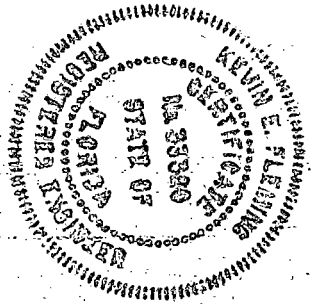
Date: 11/8/85 Telephone No. 813/228-4111

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

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

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

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



Signed Kevin E Fleming

Kevin E. Fleming
Name (Please Type)

Tampa Electric Company
Company Name (Please Type)

P.O. Box 111, Tampa, Florida 33601
Mailing Address (Please Type)

Florida Registration No. 0033320 Date: 11-11-85 Telephone No. 813/228-4111

SECTION II: GENERAL PROJECT INFORMATION

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

See Attachment "A"

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

Start of Construction _____ Completion of Construction _____

Not Applicable

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

Electrostatic Precipitator $10,750,000*

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

A029-47730 1/27/82 - 1/25/87, A029-15953 2/27/79 - 1/15/84

AC29-41942 8/7/81 - 3/15/86, A029-2489 3/11/77 - 10/31/78

*As of May, 1985

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;

if power plant, hrs/yr 8760; if seasonal, describe: Not Applicable

F. If this is a new source or major modification, answer the following questions. (Yes or No) Not Applicable

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

   a. If yes, has "offset" been applied? _____

   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____

   c. If yes, list non-attainment pollutants. _____

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. _____

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. _____

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

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? _____

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

   a. If yes, for what pollutants? Particulate

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

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

See Attachment "B".

*Pursuant to Florida Administrative Code 17-2.650(2)(a)1.; "Any existing source that emits particulate matter and is located in a particulate non-attainment area or in the area of influence of such a non-attainment area except a source which has received a determination of Best Available Control Technology pursuant to 17-2.630 or received a permit in connection with 17-2.500 or 17-2.510, shall limit the emission of particulate matter through the application of Reasonably Available Control Technology (RACT)...."

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

A. Raw Materials and Chemicals Used in your Process, if applicable: Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

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

1. Total Process Input Rate (lbs/hr): See Section III-E

2. Product Weight (lbs/hr): Not Applicable

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

Name of Contaminant	Emission[1] *		Allowed[2] Emission Rate per Rule 17-2 **	Allowable[3] Emission lbs/hr	Potential[4] Emission		Relate to Flow Diagram
	Maximum lbs/hr	Actual T/yr			lbs/hr	T/yr	
Particulate	125.7	374.4	0.1 lb/10^6Btu	125.7	13813	60502	Fig. 1
Sulfur Dioxide	3017	8985	2.4 lb/10^6Btu	3017	3017	8985	

[1]See Section V, Item 2.

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

[3]Calculated from operating rate and applicable standard.

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

*See Attachment "C"
**Chapter 17-2.600(5)(b)2 and 17-2.600(5)(b)3.b

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

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Electrostatic	Particulate	99.09%	NA	Equipment
Precipitator				Specification
Combustion Engineering				
Rigid Frame				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Coal		51 T/hr	1257

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

Fuel Analysis:

Percent Sulfur: 1.19* Percent Ash: 8.04*

Density: ---- lbs/gal Typical Percent Nitrogen: ----

Heat Capacity: 12,361* BTU/lb ---- BTU/gal

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

F. If applicable, indicate the percent of fuel used for space heating. Not Applicable

Annual Average _____ Maximum _____

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

Flyash - from flyash handling system is either conveyed to silo for sale or is reinjected back into the boiler.

Bottom ash (slag) - is sluiced to dewatering bins where the slag is dewatered and sold. The transport water is then piped to a settling pond before being discharged.

*Average values, Gannon Station Unit #4, 1984 emissions inventory.

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

Stack Height: 306 ft. Stack Diameter: 10 ft.

Gas Flow Rate: 440,000 ACFM -- DSCFM Gas Exit Temperature: 250± 55 °F.

Water Vapor Content: 7.4 % Velocity: 93 FPS

SECTION IV: INCINERATOR INFORMATION

Not Applicable

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Incinerated							
Uncontrolled (lbs/hr)							

Description of Waste _____

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

Approximate Number of Hours of Operation per day _____ day/wk _____ wks/yr. _____

Manufacturer _____

Date Constructed _____ Model No. _____

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

Stack Height: _____ ft. Stack Diamter: _____ Stack Temp. _____

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

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

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

[ ] Other (specify) _____

Brief description of operating characteristics of control devices:

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

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]
   1257 X 10^6 Btu/Hr
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made. See Source Emission Test, August 28-29, 1985 - Attachment D and Precipitator Performance Test, May 29-30, 1985 - Attachment E
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   See Attachment C
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.) Not Applicable
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency). Not Applicable
6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. See Figure 1
7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).
   See Figure 2
8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.
   See Figure 3

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

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

Not Applicable

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

[ ] Yes [ ] No

Contaminant	Rate or Concentration

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

[ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

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

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

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

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

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

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

j. Applicability to manufacturing processes:

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

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

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

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

Not Applicable

A. Company Monitored Data

1. _____no. sites _____ TSP _____( ) SO^2* _____ Wind spd/dir

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

Other data recorded _____

Attach all data or statistical summaries to this application.

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

2. Instrumentation, Field and Laboratory

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

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

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

2. Surface data obtained from (location)_____

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

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

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

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

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate	
TSP	_____	grams/sec
SO_2	_____	grams/sec

E. Emission Data Used in Modeling

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

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

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

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

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

AIR POLLUTION SOURCES
CERTIFICATE OF COMPLETION OF CONSTRUCTION*

PERMIT NO. AC29-41942 DATE: _____

Company Name: Tampa Electric Company County: Hillsborough

Source Identification(s): F.J. Gannon Station - Unit #2

Actual costs of serving pollution control purpose: $ 10,750,000*

Operating Rates: _____ Design Capacity: 125 MW-Maximum Generator Nameplate rating.

Expected Normal ---- During Compliance Test 111 MW

Date of Compliance Test: August 28-29, 1985 (Attach detailed test report)

Test Results: Pollutant	Actual Discharge	Allowed Discharge
Particulate (non-soot blow.)	0.01 lb/MMBtu	0.1 lb/MMBtu
Particulate (soot blow.)	0.01 lb/MMBtu	0.3 lb/MMBtu
Sulfur Dioxide	1.97 lb/MMBtu	2.4 lb/MMBtu

Date plant placed in operation: November, 1958

This is to certify that, with the exception of deviations noted**, the construction of the project has been completed in accordance with the application to construct and Construction Permit No. AC29-41942 dated 8/7/81.

A. Applicant:

A. Spencer Autry
Name of Person Signing (Type)

A. Spencer Autry
Signature of Owner or Authorized Representative and Title

Manager
Environmental Planning

Date: 11/18/85 Telephone: (813) 228-4111

B. Professional Engineer:

Kevin E. Fleming
Name of Person Signing (Type)

Kevin E. Fleming
Signature of Professional Engineer

Tampa Electric Company
Company Name

Florida Registration No. 0033320

Date: 11-11-85

(Seal)

P.O. Box 111, Tampa, Florida 33601
Mailing Address

(813) 228-4111
Telephone Number

KEVIN E. FLEMING CERTIFICATE No. 33320 STATE OF FLORIDA REGISTERED ENGINEER

*This form, satisfactorily completed, submitted in conjunction with an existing application to construct permit and payment of application processing fee will be accepted in lieu of an application to operate.

**As built, if not built as indicated include process flow sketch, plot plan sketch, and updates of applicable pages of application form.

*As of May 1985.

ATTACHMENT A

Section II.A

The source is the F.J. Gannon Station Coal Fired Steam Electric Power Generating Plant Unit #2. The Unit consists of a Babcock and Wilcox cyclone fired boiler which generates steam to drive the Allis Chalmers generator. Flue gas from the combustion of coal is discharged through a 306 ft stack. Particulates (flyash) are removed from the flue gas by an electrostatic precipitator. The collected flyash is pneumatically conveyed to the Units 1-4 flyash silo or reinjected into the boiler.

ATTACHMENT B

F.J. GANNON STATION - UNIT #2

Operation and Maintenance Plan for the
Processing System and Particulate Control/Collection Systems

INTRODUCTION

F.J. Gannon Station is owned and operated by Tampa Electric Company. The station is located on the eastern shore of Hillsborough Bay at Port Sutton. The station consists of six steam electric generating units. Unit 1 is presently being re-converted from oil to coal fired while Units 2 through 6 are coal fired.

Unit 2 was placed in service in November, 1958 with a generator nameplate capacity of 125 MW. The boiler was manufactured by the Babcock and Wilcox Corporation and is of the "wet" bottom, cyclone firing type. Boiler flue gas passes through an electrostatic precipitator prior to discharge through a 306 feet high stack.

PROCESS SYSTEM PERFORMANCE PARAMETERS

The Unit 2 boiler burns low sulfur coal. The design fuel consumption at 100% rating is 51 tons/hr., operating pressure is 1575 psi and operating temperature is 1000°F. Fuel input is monitored and recorded on control room charts.

The maximum design steam capacity of the boiler is 910,000 pounds per hour. Steam flow is recorded on a continuous basis.

PARTICULATE CONTROL EQUIPMENT DATA

Gannon Unit 2 is equipped with an electrostatic precipitator for the control of particulate emissions. The rigid frame precipitator was manufactured by Combustion Engineering, Inc. Flyash collected by the precipitator is either pneumatically transported to a storage silo for sale or reinjected into the boiler. Flyash is reinjected into the boiler during particulate emission testing or when the silo approaches its maximum storage capacity. Important design information and data applicable to the particulate control system are listed below:

Precipitator Data

Design Flow Rate	440,000 acfm
Primary Voltage	460 volts
Primary Current	258 amps
Secondary Voltage	56.6 kilovolts
Design Efficiency	99.09%
Pressure Drop	1.59 inches of H_2O
Rapper Frequency	1/1.5 min-1/4.0 min
Rapper Duration	Impact
Temperature	250 $\pm$ 55°F

Precipitator (ESP) performance parameters are recorded on a daily basis. The information recorded includes primary voltage, primary current, secondary current, and spark rate. This information is kept in the precipitator technician's office in a log book for each section of the ESP. Flyash hopper high levels are alarmed in the control room.

MAINTENANCE AND INSPECTION SCHEDULES

Precipitator

All generating units of Tampa Electric Company system are regularly scheduled for periodic maintenance. The schedule for planned maintenance outages is affected by system load and forced outage requirements. Typically, planned outages are scheduled during non-peak load periods such as the spring or fall.

The Unit 2 particulate control system receives regular preventive maintenance. The following preventive maintenance procedures are performed on a weekly basis.

- Inspection of penthouse pressurizing fan filters. Replace as needed.

- Observation of operation of all rappers and vibrators weekly. Check rotation of rappers and sequence of operation.

The following preventive maintenance procedures are performed on a daily basis.

- Inspection of system controls. Minor adjustments as needed.

Should these procedures indicate repairs are necessary, maintenance job requests are initiated. All records are stored on magnetic tape for future reference.

ATTACHMENT C
EMISSIONS CALCULATIONS

Section III

C. Airborne Contaminants Emitted

1. Particulates

a. Emissions

$$1257 \times 10^6 \frac{\text{Btu}}{\text{Hr}} \times 0.1 \frac{\text{lb}}{10^6 \text{ Btu}} = 125.7 \frac{\text{lb}}{\text{Hr}} \text{ maximum emissions}$$

$$125.7 \frac{\text{lb}}{\text{Hr}} \times \frac{1}{2000} \frac{\text{Ton}}{\text{lb}} \times 8760 \frac{\text{Hr}}{\text{Yr}} \times 0.68 \text{ capacity factor} =$$

$$374.4 \frac{\text{Tons}}{\text{Yr}} \text{ Actual emissions}$$

b. Allowed Emission Rate = $0.1 \frac{\text{lb}}{10^6 \text{ Btu}}$

c. Allowable Emissions = $125.7 \frac{\text{lb}}{\text{Hr}}$ (same as maximum emissions)

d. Potential Emissions

= Maximum emissions ÷ (1-Precipitator Efficiency)

= 125.7 ÷ (1-0.9909) = $13813 \frac{\text{lb}}{\text{Hr}} = 60502 \frac{\text{Tons}}{\text{Yr}}$

2. Sulfur Dioxide

a. Emissions

$$1257 \times 10^6 \frac{\text{Btu}}{\text{Hr}} \times 2.4 \frac{\text{lb}}{10^6 \text{ Btu}} = 3017 \frac{\text{lb}}{\text{Hr}} \text{ maximum emissions}$$

$$3017 \frac{\text{lb}}{\text{Hr}} \times \frac{1}{2000} \frac{\text{Ton}}{\text{lb}} \times 8760 \frac{\text{Hr}}{\text{Yr}} \times 0.68 \text{ capacity factor} =$$

$$8{,}985 \frac{\text{Tons}}{\text{Yr}} \text{ actual emissions}$$

b. Allowed Emission Rate = $2.4 \frac{\text{lb}}{10^6 \text{ Btu}}$

c. Allowable Emission = $3017 \frac{\text{lb}}{\text{Hr}}$ (same as maximum emissions)

d. Potential Emissions

= Maximum emissions = $3017 \frac{\text{lb}}{\text{Hr}}$; $8985 \frac{\text{Tons}}{\text{Yr}}$

Test Method for compliance - Fuel Analysis

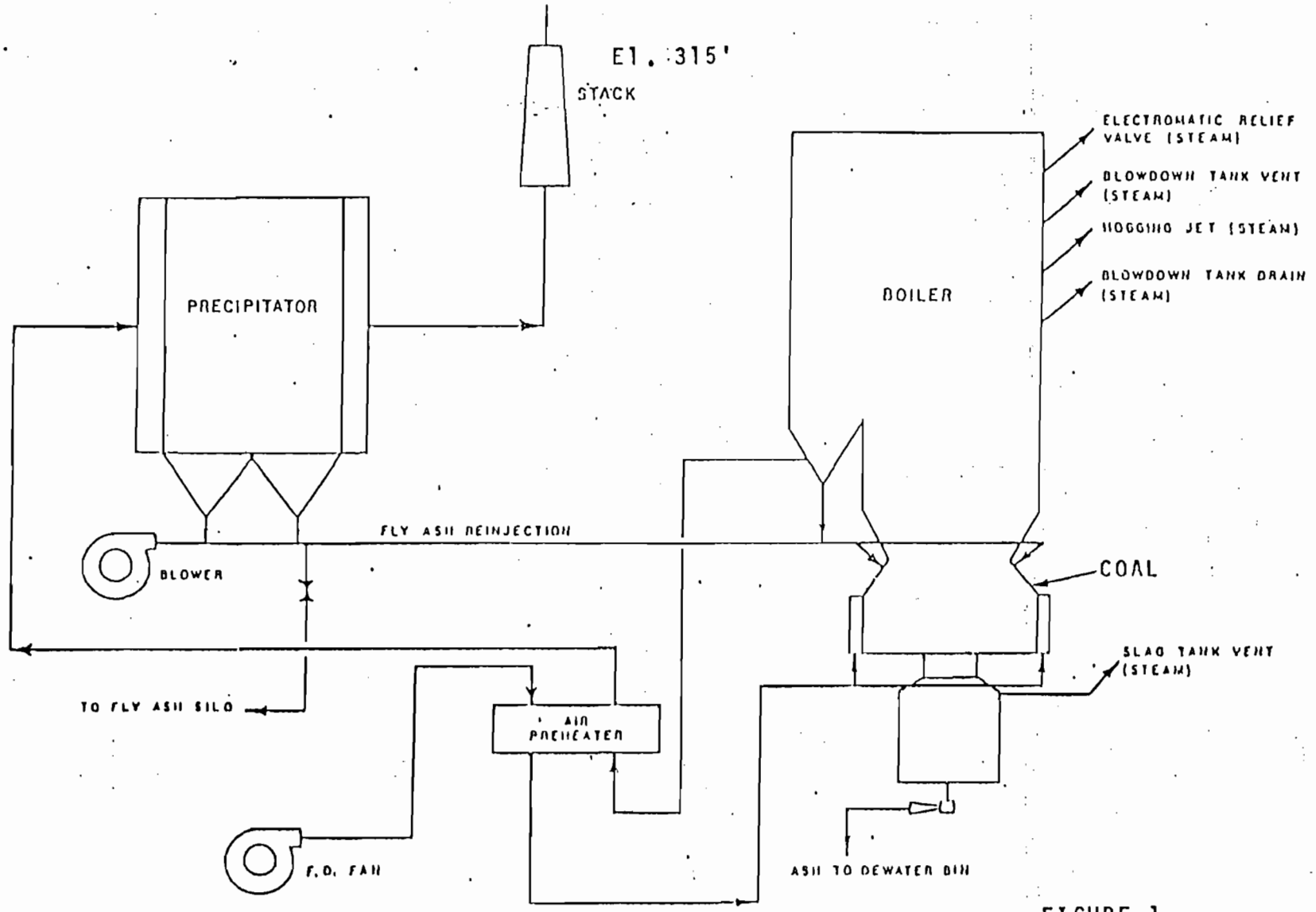


FIGURE 1
GANNON STATION-UNIT 2
TAMPA ELECTRIC COMPANY

Best Available Copy

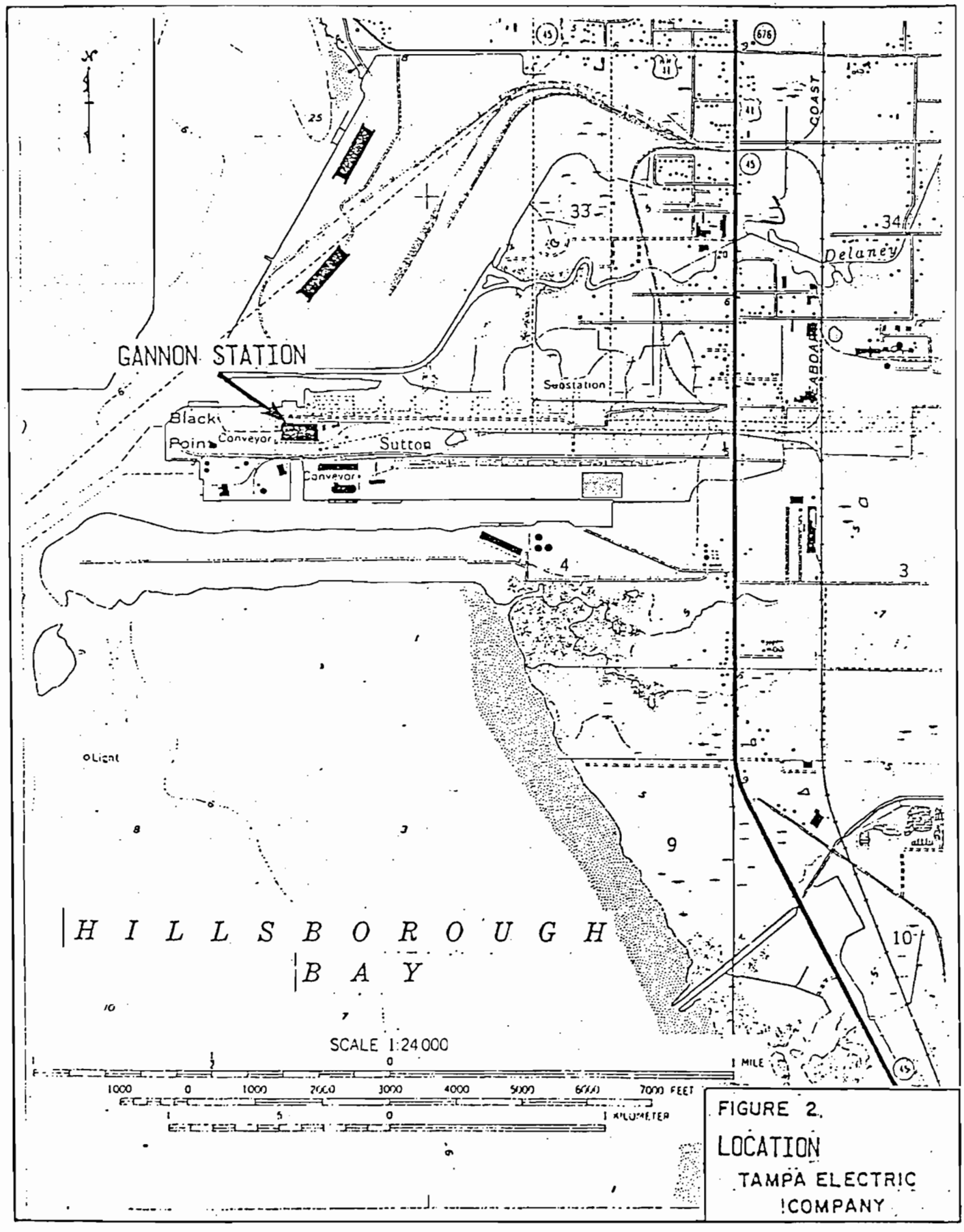


FIGURE 2.
LOCATION
TAMPA ELECTRIC
COMPANY

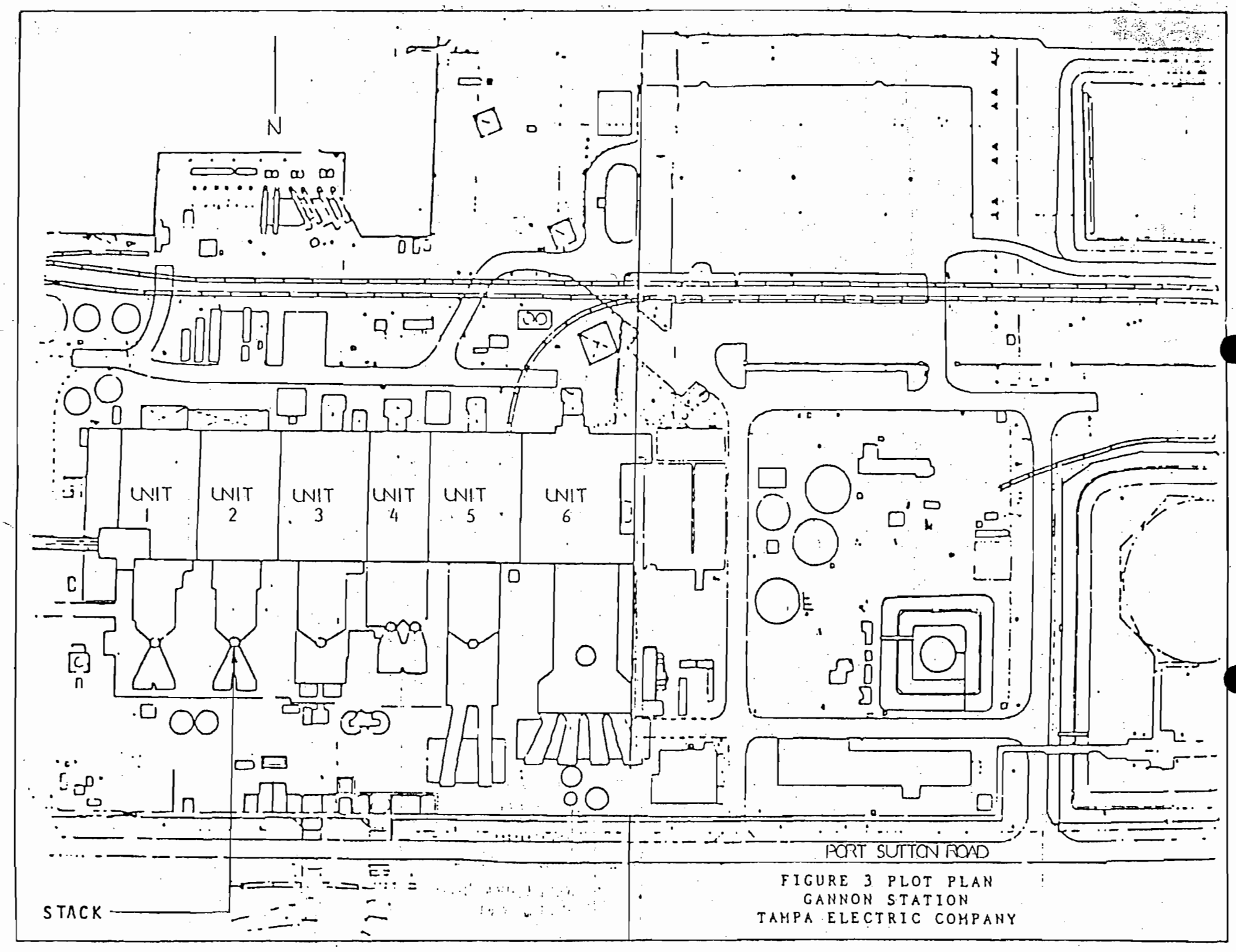


FIGURE 3 PLOT PLAN
GANNON STATION
TAMPA ELECTRIC COMPANY

TAMPA ELECTRIC
A TECO ENERGY COMPANY

D. E. R.

NOV 19 1985

SOUTH WEST DISTRICT
TAMPA

October 11, 1985

RE: Gannon Station Unit No. 2 - Air Operations Permit Application

TO WHOM IT MAY CONCERN:

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

Very truly yours,

Heywood A. Turner

Heywood A. Turner
Senior Vice President
Production

HAT/tb

TAMPA ELECTRIC COMPANY
P.O. Box 111 Tampa, Florida 33601 (813) 228-4111

TAMPA ELECTRIC
A TECO ENERGY COMPANY

October 11, 1985

RE: Gannon Station Unit No. 2 - Air Operations Permit Application

TO WHOM IT MAY CONCERN:

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

Very truly yours,

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Heywood A. Turner
Senior Vice President
Production

HAT/tb

TAMPA ELECTRIC COMPANY
P.O. Box 111 Tampa, Florida 33601 (813) 228-4111

D.E.R.

PAID SEP 17 1981

SOUTHWEST [illegible]

SEP 18 1981

H.C.E.P.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: AIR POLLUTION [ ] New[1] [X] Existing[1]

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

COMPANY NAME: Tampa Electric Company COUNTY: Hillsborough

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peeking Unit No. 2, Gas Fired) Gannon Station Unit 2

SOURCE LOCATION: Street Port Sutton Road City Tampa

UTM: East 360,000 North 3,087,500

Latitude 27 ° 54 ' 25 "N Longitude 82 ° 25 ' 21 "W

APPLICANT NAME AND TITLE: Tampa Electric Company

APPLICANT ADDRESS: P.O. Box 111, Tampa, Florida 33601

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Tampa Electric Company

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

*Attach letter of authorization

Signed: Jerry L. Williams

Jerry L. Williams, Manager Environmental Planning
Name and Title (Please Type)

Date: 9-15-81 Telephone No. 813/228-4111

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

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed: William N. Cantrell

William N. Cantrell
Name (Please Type)

(Affix Seal)

Tampa Electric Company
Company Name (Please Type)

P. O. Box 111, Tampa, Florida 33601
Mailing Address (Please Type)

Florida Registration No. 23494 Date: 9-15-81 Telephone No. 813/228-4111

[1]See Section 17-2.02(15) and (22), Florida Administrative Code, (F.A.C.)

SECTION II: GENERAL PROJECT INFORMATION

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

The source is an oil fired boiler which generates steam to drive a turbine and produce electricity. The generating unit operates in compliance with applicable emission limits.

B. Schedule of project covered in this application (Construction Permit Application Only) Not Applicable

Start of Construction _____ Completion of Construction _____

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

Oil Conversion (Units 1-4)	$19,566,000*
Stack Extensions (Units 1-5)	$ 2,337,000*

* Individual Unit Costs Not Available

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

A029-2191 May 25, 1973 - July 1, 1975
A029-2489 Mar. 11, 1977 - Oct. 13, 1978
A029-15953 Feb. 27, 1979 - Jan. 15, 1984
AC29-41942 Aug. 7, 1981 - Mar. 15, 1986

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? ____ Yes __X__ No

F. Normal equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ; if power plant, hrs/yr * ;
if seasonal, describe: Not Applicable

G. If this is a new source or major modification, answer the following questions. (Yes or No) Not Applicable

1. Is this source in a non-attainment area for a particular pollutant? _____
   a. If yes, has "offset" been applied? _____
   b. If yes, has "Lowest Achievable Emission Rate" been applied? _____
   c. If yes, list non-attainment pollutants.
2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. _____
3. Does the State "Prevention of Significant Deterioriation" (PSD) requirements apply to this source? If yes, see Sections VI and VII. _____
4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? _____
5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? _____

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

* [illegible]riable

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

A. Raw Materials and Chemicals Used in your Process, if applicable: Not Applicable

Description	Contaminants		Utilization Rate - lbs/hr	Relate to Flow Diagram
	Type	% Wt		

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

1. Total Process Input Rate (lbs/hr): See Section III-E

2. Product Weight (lbs/hr): Not Applicable

C. Airborne Contaminants Emitted:

Name of Contaminant	Emission[1]		Allowed Emission[2] Rate per Ch. 17-2, F.A.C.	Allowable[3] Emission lbs/hr	Potential Emission[4]		Relate to Flow Diagram
	Maximum lbs/hr	Actual* T/yr			lbs/hr	T/yr	
Sulfur Dioxide	1382.7	1,742	1.1 lbs/MMBTU	1382.7	1382.7	6056	Fig 1
Particulates	125.7	89.8	0.1 lbs/MMBTU	125.7	125.7	550.6	

* From 1980 Emission Inventory

D. Control Devices: (See Section V, Item 4) Not Applicable (1)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles[5] Size Collected (in microns)	Basis for Efficiency (Sec. V, It[5]

[1] See Section V, Item 2.

[2] Reference applicable emission standards and units (e.g., Section 17-2.05(6) Table II, E. (1), F.A.C. – 0.1 pounds per million BTU heat input)

[3] Calculated from operating rate and applicable standard

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

[5] If Applicable

(1) Existing precipitator originally installed while burning coal; it is not required to achieve compliance while burning oil.

E. Fuels - From 1980 Emission Inventory

Type (Be Specific)	Consumption* Gal/Hr		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Fuel Oil	5084	8,044	1257

*Units Natural Gas, MMCF/hr; Fuel Oils, barrels/hr; Coal, lbs/hr

Fuel Analysis:

Percent Sulfur: 0.94 Percent Ash: N.A.

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

Heat Capacity: _____ BTU/lb 141,283 BTU/gal

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

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

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

None

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

Stack Height: 306 ft. Stack Diameter: 10.0 ft.

Gas Flow Rate: 500,000 ACFM Gas Exit Temperature: 329 °F.

Water Vapor Content: 5.2 % Velocity: 106.3 FPS

SECTION IV: INCINERATOR INFORMATION

NOT APPLICABLE

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs/hr Incinerated							

Description of Waste _____

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

Approximate Number of Hours of Operation per day _____ days/week _____

Manufacturer _____

Date Constructed _____ Model No. _____

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

Stack Height: _____ ft. Stack Diameter _____ Stack Temp. _____

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

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

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner [ ] Other (specify) _____

Brief description of operating characteristics of control devices: _____

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

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight – show derivation.
2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.,) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, etc.).
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3, and 5 should be consistent: actual emissions = potential (1-efficiency).
6. An 8½" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained. SEE FIGURE 1
7. An 8½" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map). SEE FIGURE 3
8. An 8½" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram. SEE FIGURE 2

9. An application fee of $20, unless exempted by Section 17-4.05(3), F.A.C. The check should be made payable to the Department of Environmental Regulation.

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

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

NOT APPLICABLE

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?
[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy) [ ] Yes [ ] No

Contaminant	Rate or Concentration

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

Contaminant	Rate or Concentration

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

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:
5. Useful Life:
6. Operating Costs:
7. Energy:
8. Maintenance Cost:
9. Emissions:

Contaminant	Rate or Concentration

*Explain method of determining D 3 above.

10. Stack Parameters

a. Height: ft. b. Diameter: ft.

c. Flow Rate: ACFM d. Temperature: °F

e. Velocity: FPS

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

1.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy*: h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

2.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Useful Life: f. Operating Cost:

g. Energy**: h. Maintenance Costs:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

*Explain method of determining efficiency.

**Energy to be reported in units of electrical power – KWH design rate.

3.

a. Control Device:

b. Operating Principles:

c. Efficiency*: d. Capital Cost:

e. Life: f. Operating Cost:

g. Energy: h. Maintenance Cost:

*Explain method of determining efficiency above.

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

4.

a. Control Device

b. Operating Principles:

c. Efficiency*:

d. Capital Cost:

e. Life:

f. Operating Cost:

g. Energy:

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

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

F. Describe the control technology selected:

1. Control Device:

2. Efficiency*:

3. Capital Cost:

4. Life:

5. Operating Cost:

6. Energy:

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

(5) Environmental Manager:

(6) Telephone No.:

*Explain method of determining efficiency above.

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

b.

(1) Company:

(2) Mailing Address:

(3) City:

(4) State:

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

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions*:

Contaminant	Rate or Concentration

(8) Process Rate*:

10. Reason for selection and description of systems:

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

SECTION VII – PREVENTION OF SIGNIFICANT DETERIORATION

NOT APPLICABLE

A. Company Monitored Data

1. _____ no sites _____ TSP _____ ( ) SO^2* _____ Wind spd/dir

Period of monitoring _____/_____/_____ to _____/_____/_____
month day year month day year

Other data recorded _____

Attach all data or statistical summaries to this application.

2. Instrumentation, Field and Laboratory

a) Was instrumentation EPA referenced or its equivalent? _____ Yes _____ No

b) Was instrumentation calibrated in accordance with Department procedures? _____ Yes _____ No _____ Unknown

B. Meteorological Data Used for Air Quality Modeling

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

2. Surface data obtained from (location) _____

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

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

C. Computer Models Used

1. _____ Modified? If yes, attach description.

2. _____ Modified? If yes, attach description.

3. _____ Modified? If yes, attach description.

4. _____ Modified? If yes, attach description.

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

D. Applicants Maximum Allowable Emission Data

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

E. Emission Data Used in Modeling

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

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

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

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

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

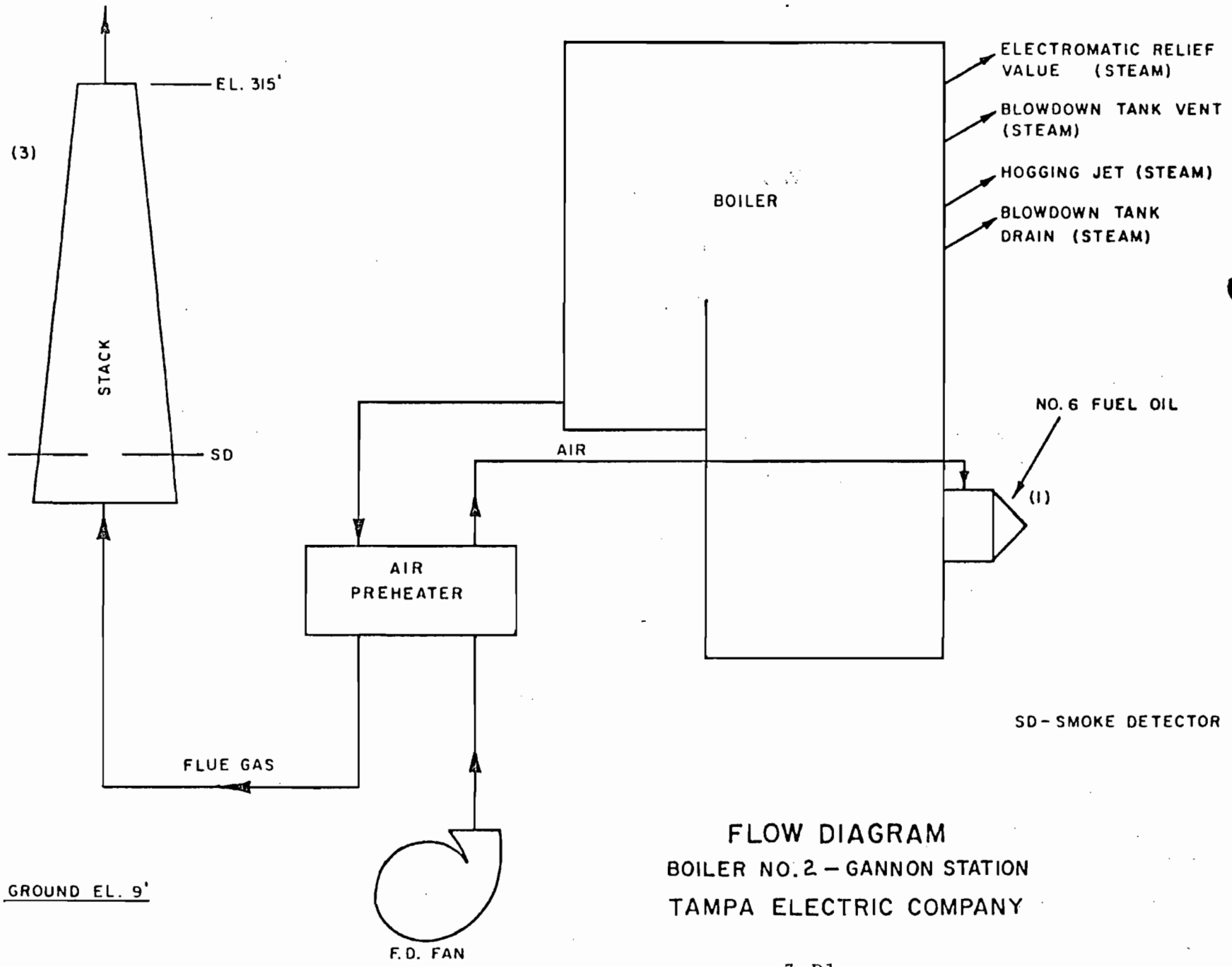


FIGURE 1

FLOW DIAGRAM

BOILER NO. 2 – GANNON STATION

TAMPA ELECTRIC COMPANY

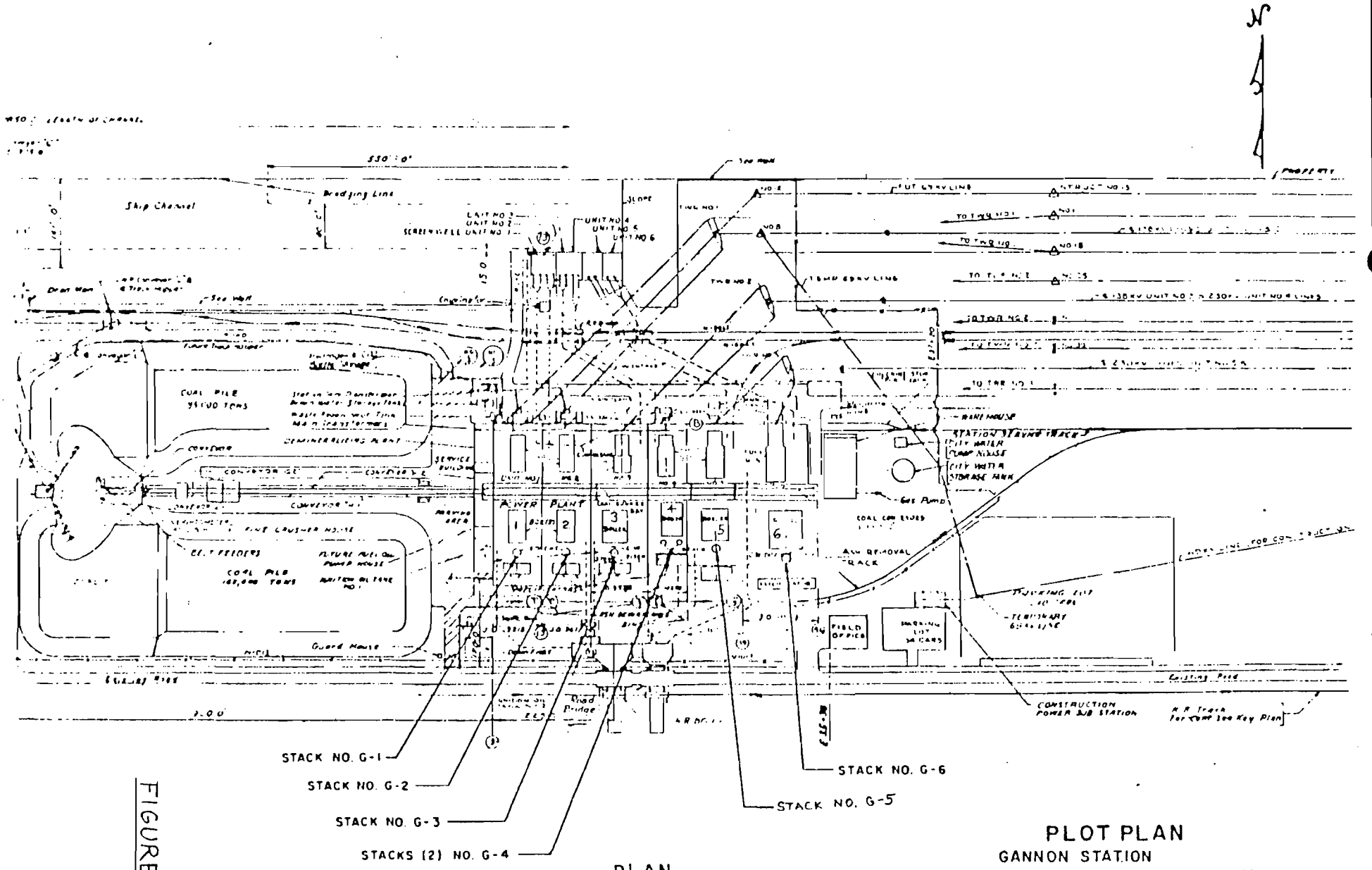


FIGURE 2

PLAN

PLOT PLAN
GANNON STATION
TAMPA ELECTRIC COMPANY
STONE & WEBSTER ENGINEERING CORPORATION
3-C2

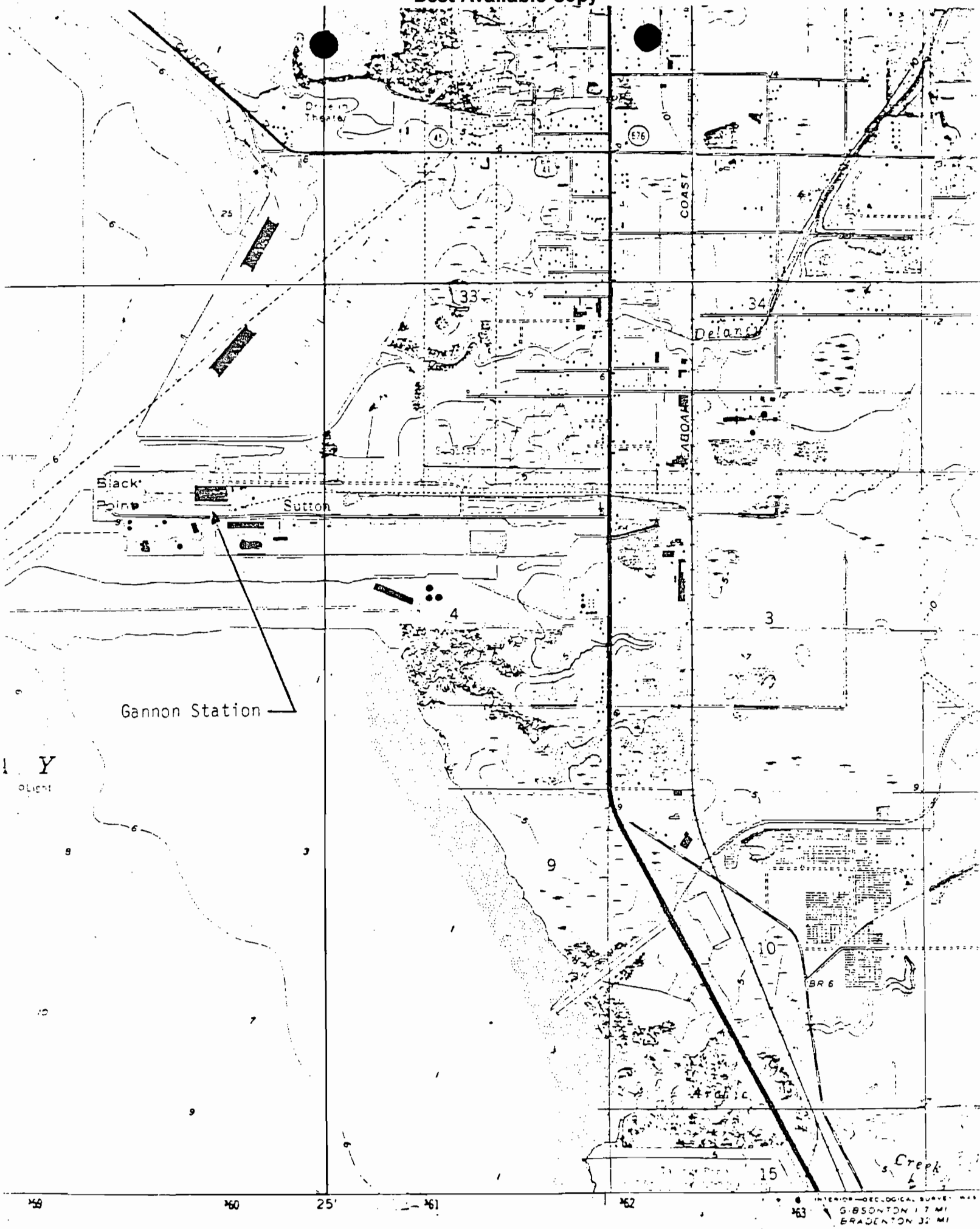


FIGURE 3

ATTACHMENT

GANNON 2

CALCULATIONS

- Maximum/Allowable Emissions

SO_2 $\frac{1.1 \text{ lbs. } SO_2}{\text{MMBTU}} \times \frac{1257 \text{ MMBTU}}{\text{HOUR}} = 1382.7 \frac{\text{lbs. } SO_2}{\text{HOUR}}$

Particulate $\frac{0.1 \text{ lbs.}}{\text{MMBTU}} \times \frac{1257 \text{ MMBTU}}{\text{HOUR}} = 125.7 \frac{\text{lbs. Part}}{\text{HOUR}}$

- Potential Emissions

SO_2 $\frac{1382.7 \text{ lbs. } SO_2}{\text{HOUR}} \times \frac{8760 \text{ Hour}}{\text{YEAR}} \times \frac{1 \text{ Ton}}{2000 \text{ lbs}} = 6056 \frac{\text{Tons } SO_2}{\text{YEAR}}$

Particulate $\frac{125.7 \text{ lbs.}}{\text{HOUR}} \times \frac{8760 \text{ Hour}}{\text{YEAR}} \times \frac{1 \text{ Ton}}{2000 \text{ lbs.}} = 550.6 \frac{\text{Tons}}{\text{YEAR}}$

- Test Methods for Compliance

SO_2 - Fuel Analysis

Particulate - EPA Reference Method 17

TECO
TAMPA ELECTRIC COMPANY

POST OFFICE BOX 111 TAMPA, FLORIDA 33601 TELEPHONE (813) 879-4111

September 8, 1981

TO WHOM IT MAY CONCERN:

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

Very truly yours,

Alex Kaiser
Vice President
Energy Supply

F.J. GANNON STATION - UNITS 1 THROUGH 4

Operation and Maintenance Plan

Introduction

F.J. Gannon Station is owned and operated by Tampa Electric Company. The plant is located on the eastern shore of Hillsborough Bay at Port Sutton. The plant consists of six steam electric generating units. Units 1 through 4 are oil fired while Units 5 and 6 fire coal.

Gannon Station Units 1 through 4 boilers were manufactured by the Babcock and Wilcox Company and are cyclone type furnaces. The boilers were originally designed to burn coal but have been converted to burn oil. The date each unit was placed in service and the generator nameplate capacities are listed below.

Unit No.	Year	Nameplate Capacity, MW
1	1957	125
2	1958	125
3	1960	179.52
4	1963	187.5

Boiler exhaust gases from these units are exhausted through stacks at an elevation of 306 feet.

Process System Performance Parameters

Units 1 through 4 burn low sulfur No. 6 fuel oil. Fuel oil quality is monitored upon delivery. In addition, daily samples are taken for a monthly composite analysis. The design fuel consumption and steam flow rates are listed below:

Unit No.	Design Fuel Consumption	Design Steam Flow
1	201 BBL./HR	950,000 lbs./HR
2	201 BBL./HR	950,000 lbs./HR
3	258 BBL./HR	1,250,000 lbs./HR
4	307 BBL./HR	1,386,000 lbs./HR

Actual fuel input to the boilers is monitored on a daily basis. Steam flow is monitored continuously. Fuel oil to the boilers is maintained at optimum temperatures and pressures, and recorded hourly. Excess air is monitored and maintained at levels to produce efficient fuel combustion.

Maintenance and Inspection

All generating units of the Tampa Electric Company system are regularly scheduled for periodic maintenance. The schedule for planned maintenance outages is affected by system load and forced outage requirements.

During major outages, the boilers, controls, auxileries, and duct work are inspected and repaired as necessary. On-going procedures include burner inspections and cleanings, burner tip replacements and maintenance of optimum flame patterns to achieve efficient fuel combustion.

FINAL No. 09862

STATE OF FLORIDA
DEPARTMENT OF
ENVIRONMENTAL REGULATION

OPERATION PERMIT

FOR Tampa Electric Company
P.O. Box 111
Tampa, Fla. 33601

PERMIT NO. AO29-15953 DATE OF ISSUE February 27, 1979

PURSUANT TO THE PROVISIONS OF SECTIONS 403.061 (16) AND 403.707 OF CHAPTER 403 FLORIDA STATUTES AND CHAPTERS 17-4 AND 17-7 FLORIDA ADMINISTRATIVE CODE, THIS PERMIT IS ISSUED TO:
William J. Johnson, Acting Environmental Manager

FOR THE OPERATION OF THE FOLLOWING
Gannon Station No. 2, oil fired steam generator. Input is 1257 MBTU/hr. Subject to attached conditions 1,2,3,5, & 6.

LOCATED AT Port Sutton Road, Tampa
UTM: 17-360.0E 3,087.5N

IN ACCORDANCE WITH THE APPLICATION DATED December 1978

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

THIS PERMIT SHALL BE EFFECTIVE FROM THE DATE OF ISSUE UNTIL January 15, 1984 OR UNLESS REVOKED OR SURRENDERED AND SHALL BE SUBJECT TO ALL LAWS OF THE STATE AND THE RULES AND REGULATIONS OF THE DEPARTMENT.

DISTRICT ENGINEER

JOSEPH W. LANDERS, JR.
SECRETARY

Roger P. Stewart, Director
Hillsborough Co. Env. Protection Commission

DISTRICT MANAGER

JG Replaces AO29-2489 101800052004002

DER Form PERM 11-3 (Mar. 76)

App Rec'd 12-19-78 GH

D.E.R.
DEC 28 1978
SOUTHWEST DISTRICT
TAMPA

0040
02

RECEIVED
DEC 13 1978
H.C.E.P.C.

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type **Air Pollution [X]** **Incinerator [ ]**
Type application: [X] Operation [ ] Construction
Source Status: [ ] New [ ] Existing [ ] Modification

Source Name: F. J. Gannon Station Boiler 2 County Hillsborough

Source Location: Street Port Sutton Road City Tampa

UTM: East 360,000 m North 3,087,500 m

Appl. Name and Title: Tampa Electric Company
Appl. Address: P. O. Box 111, Tampa, Florida 33601

STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

The undersigned owner or authorized representative of * Tampa Electric Company is fully aware that the statements made in this application for a Operating permit are true, correct and complete to the best of his knowledge and belief. Further, the undersigned agrees to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403, Florida Statutes, and all the rules and regulations of the Department or revisions thereof. He also understands that a permit, if granted by the Department, will be non-transferable and he will promptly notify the Department upon sale or legal transfer of the permitted establishment.

William J. Johnson
Signature of the Owner or Authorized Representative

Date: 12/12/78 Telephone No.: 813/879-4111

*Attach a letter of authorization. If applicant is a corporation, a Certificate of Good Standing must be submitted with application. This may be obtained, for a $5.00 charge, from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my profesional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature William J. Johnson Mailing Address P. O. Box 111
Name William J. Johnson Tampa, Florida 33601
(Please Type)
Company Name Tampa Electric Company Telephone No.: 813/879-4111
Florida Registration Number 17142 Date 12/12/78
(Affix Seal)

DETAILED DESCRIPTION OF SOURCE

A. Describe the nature and extent of the project. Refer to existing pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance. Attach additional sheet if necessary.

This boiler was originally designed as a coal fired boiler which was converted in 1975 to burn oil. The conversion was done to achieve compliance with applicable sulfur dioxide and particulate regulations. The boiler is utilized to generate steam which in turn drives a turbine-generator and produces electricity.

B. Schedule of Project Covered in this Application (Construction Permit Application Only).

Start of Construction N/A

Completion of Construction

C. Costs of Construction (Show a breakdown of costs for individual components/units of the project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Oil Conversion (Boilers 1-4)* $19,566,000

Stack Extension (Stacks 1-5)* 2,337,000

*A breakdown of costs related to each boiler is not available.

D. For this source indicate any previous DER permit: issuance dates, and expiration dates; and orders and notices.

AO-29-2191 issued May 25, 1973, expired July 1, 1975

AO-29-2489 issued March 11, 1977, expired October 13, 1978

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code? .....Yes ...X...No

AIR POLLUTION SOURCES & CONTROL DEVICES
(other than incinerators)

A. Identification of Air Contaminants

1) [X] Particulates
   a) [ ] Dust b) [X] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [X] Sulfur Compounds
   a) a) [X] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [X] Nitrogen Compounds
   a) [X] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [ ] Flourides 5) [ ] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify) _____

B. Raw Materials and Chemicals Used (Be Specific)

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
None				

C. Process Rate:

1) Total Process input Rate* N/A Units.

2) Product ~~Weight~~* Electricity (megawatts) Units.

3) Normal Operating Time 24 hrs/day, 7 days/week, if seasonal describe: N/A
   hrs./day _____ days/wk. _____ wks/yr. _____

D. Airborne Contaminants Discharged: (See Attachment I for calculations)

Name of Contaminant	Actual** Discharge		Discharge Criteria Rate*	Allowable Discharge Lbs./hr.	Relate to Flow Diagram (See Figure 1)
	lbs./hr.	T/yr.			
Sulfur Dioxide	1425	3439	1.1 lbs/mm BTU	1438	Discharge at stack
Particulates	52.28	126	0.1 lbs/mm BTU	131	Discharge at stack

*Refer to Chapter 17-2.04(2), Florida Administrative Code.
(Discharge Criteria: Rate= #/ton P_2O_5, #/M BTU/hr., etc.)
**Estimate only if this is an application to construct.

D. Airborne Contaminants Discharged. (Cont'd.)

Name of Contaminant	Hourly Emission (~~lb/hr~~ lbs/mm BTU)	Daily Emission (lb./day)	Yearly Emission (T/yr.)	Basis for Emission Estimate (Test Data, Material Balance)
Sulfur Dioxide	1.09	See previous page		Source Emissions Test (10-4-78)
Particulate	0.04	See previous page		Source Emissions Test (10-4-78)

E. Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency*	Conditions of Operations	Basis for Efficiency Operational Data, Test, Design, Data)
Electrostatic Precipitator (Research Cottrell)	Particulate	Note: This precipitator was designed for a coal burning boiler. Its efficiency has not been tested since conversion to oil. The original design efficiency was 90% but the manufacturer does not make any guarantees of efficiency while burning oil.		

*See required supplement.
(Include any test data and/or design data for efficiency substantiation)

F. Fuels

Type (Be Specific, includes %S, etc.)	Daily Consumption * (Gal./Hr.)*		Maximum Heat Input MBTU/hr.
	Avg./hr.	Max./hr.	
#6 oil (1%S)	5338	8044	1257
*From 1977 HCEPC Emission Inventory			

* Units: Natural Gas–MCF/hr.; Fuel Oils, Coal–lbs./hr.

Fuel Analysis:

Percent Sulfur 1.03 Percent Ash N/A

Density 8.1273 lb./gal.

Heat Capacity 18,621 BTU/lb. 151,947 BTU/gal.

Other Fuel Contaminants N/A

G. Describe briefly, without revealing trade secrets, the processes/operations generating the airborne emissions identified in this application.

Oil is burned to generate steam which is used to generate electricity.

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

None

I. Emission Stack Geometry and Flow Characteristics, (Provide Date for each Stack).

Stack Height 306 ft, Stack Diameter 10 ft.

Gas Flow Rate 257,000 (Avg.) / 372,000 (Max.) ACFM, Gas Exit Temperature 309 °F

J. Required Supplements:

1. Total process input rate and product weight – show deviation. Maximum design heat input is 1257 MM BTU/Hr. Operating range is approximately 35% to 100% load.*
2. Efficiency Estimation. N/A
3. An 8½" x 11" flow diagram, which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate whether raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particulates are evolved and where finished products are obtained.

   See Figure 1
4. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

   See Figure 2A & 2B
5. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways.

   See Figure 3
6. If applicable, provide a brief description of the control device or treatment system serving the discharge point for airborne contaminants identified in this application. Include details of the manufacturer, model, size, type and capacity for control/treatment device and the features of the discharge point (height above ground, diameter, period(s) of discharge and discharge temperature).

   N/A
7. Plans for storm water control during and after construction.

   All wastewater from the station will be transported to an evaporation/percolation pond for treatment and disposal. Storm water is not treated, it is collected in yard drains and discharged to the Bay.

*NOTE: The maximum design heat input is calculated using design fuel characteristics. The actual heat input may vary somewhat depending upon the true characteristics of the combustion fuel. Emission testing is performed at or very near 100% load.

INCINERATOR INFORMATION

N/A

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patho-logical)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs./Hr. incinerated							

Description of Waste _____

Total Weight Incinerated lbs./hr. _____ Design Capacity lbs./hr. _____

Approximate Number of Hours of Operation per Day _____, days/week _____

Manufacturer _____ Model No.: _____

Date Constructed: _____

	Volume (ft. *)³	Heat Release (BTU/hr.)	Fuel		Temp. (° F)
			Type	BTU/hr.	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp.: _____ °F

Type of Pollution Control Device [ ] Cyclone [ ] Wet scrubber [ ] Afterburner
[ ] Other (Specify): _____

Brief Description of Operating Characteristics of Control Device: _____

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

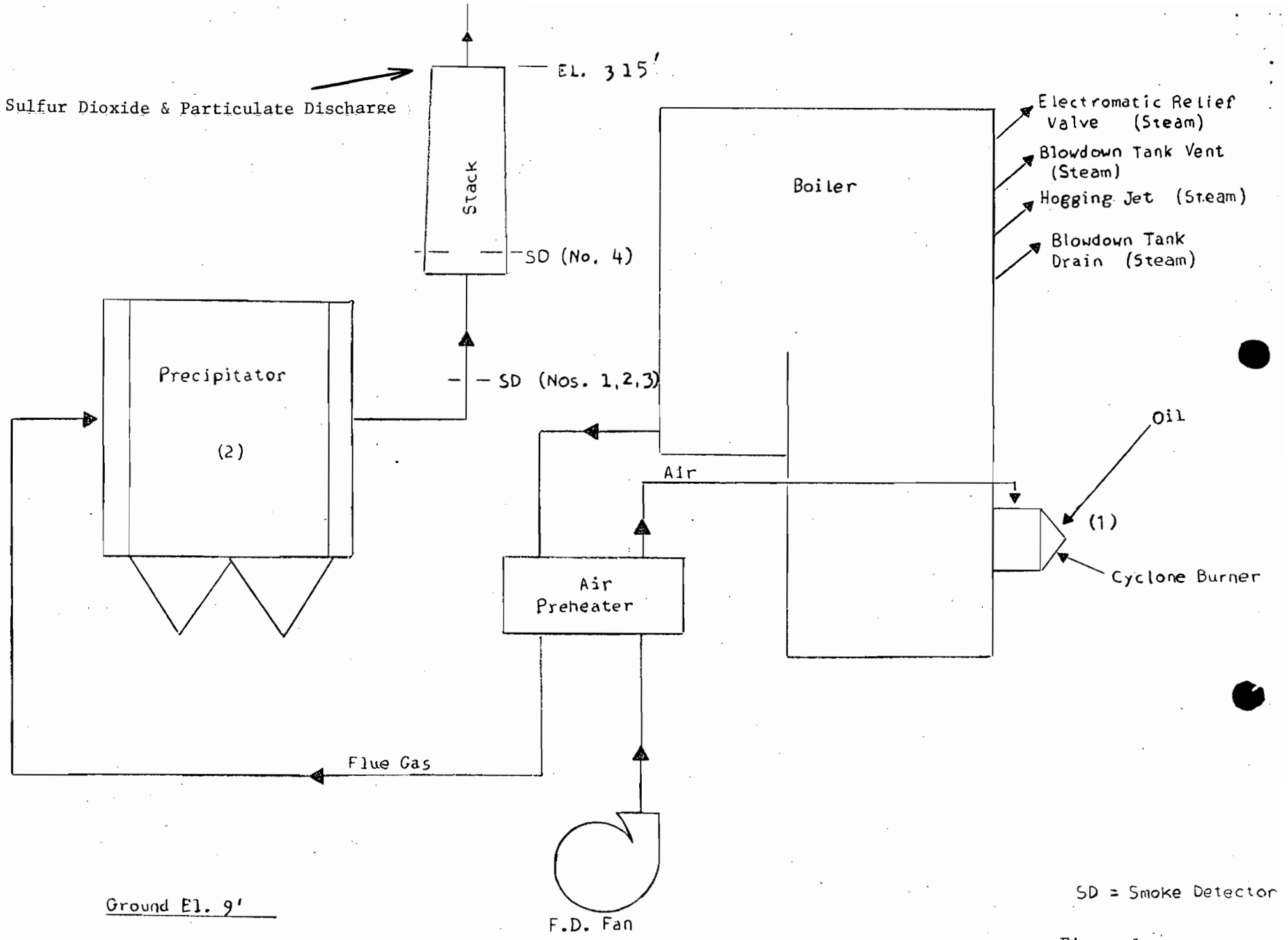
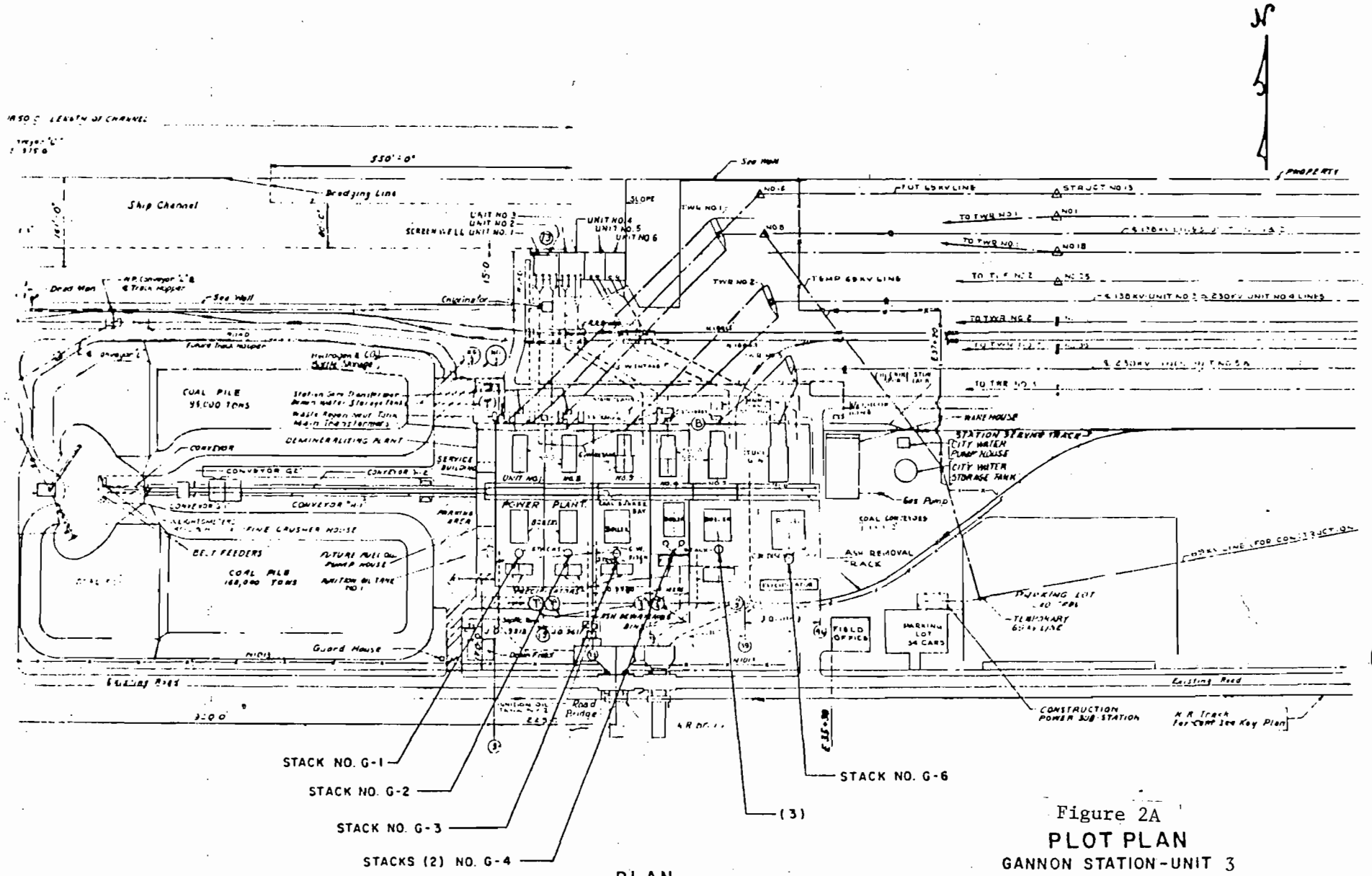


Figure 1
FLOW DIAGRAM
BOILER NO. 2 GANNON STATION
TAMPA ELECTRIC CO.



PLAN

Figure 2A

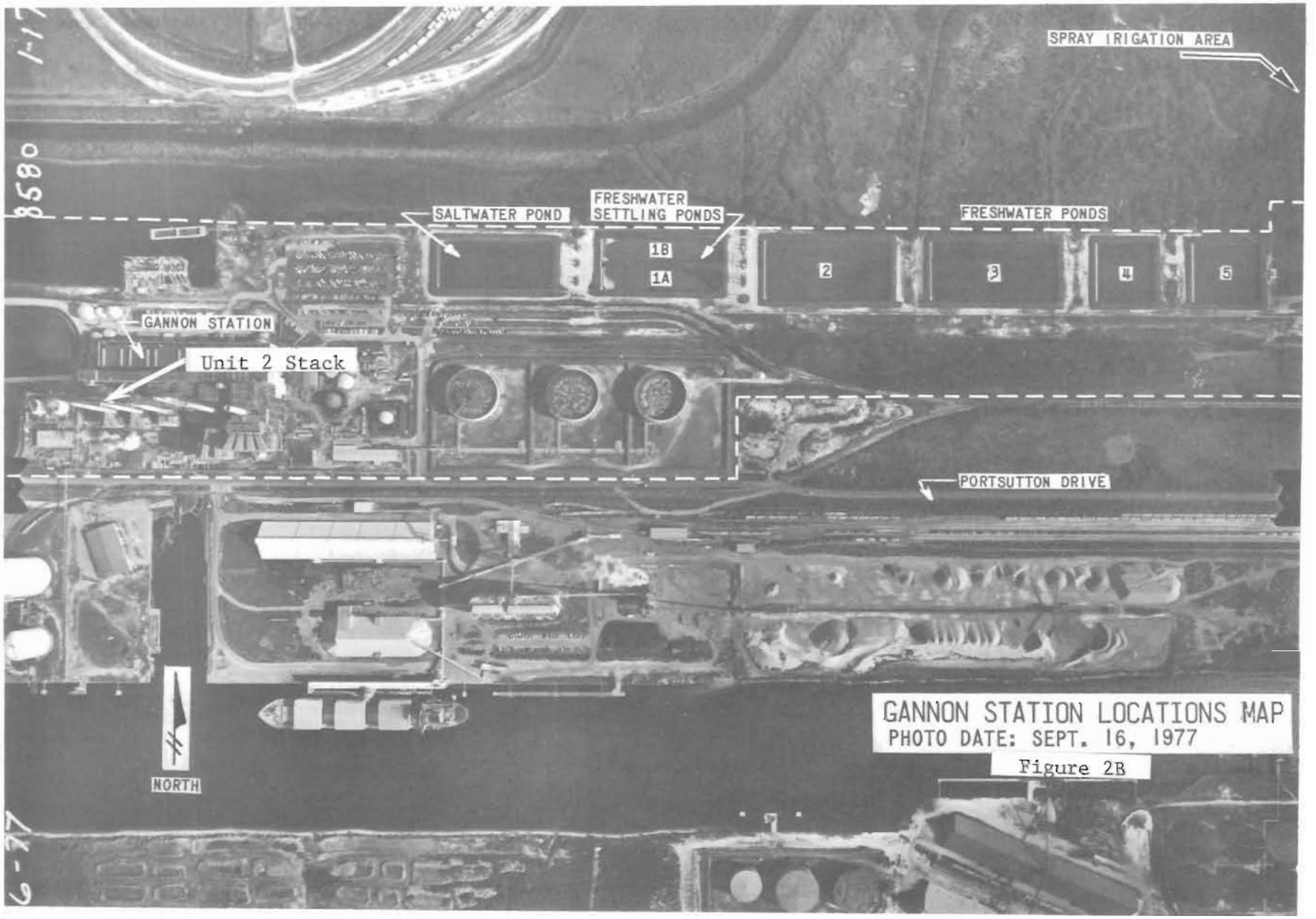
PLOT PLAN

GANNON STATION - UNIT 3

TAMPA ELECTRIC COMPANY

STONE & WEBSTER ENGINEERING CORPORATION

3 - C2



GANNON STATION LOCATIONS MAP
PHOTO DATE: SEPT. 16, 1977

Figure 2B

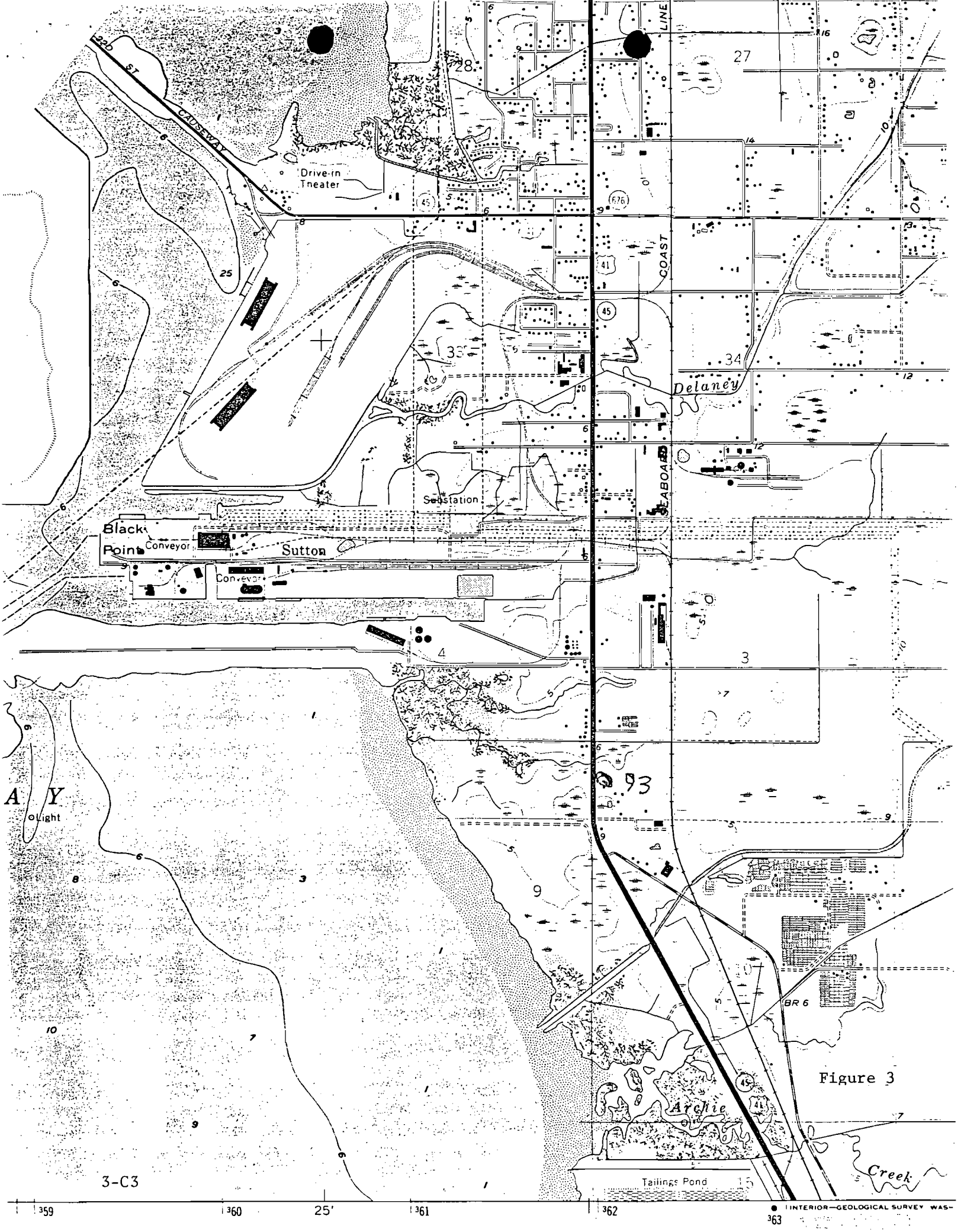

22b ST
CAUSEWAY
Drive-in Theater
COAST LINE
SEABOARD
Delaney
Substation
Black Point
Conveyor
Sutton
Conveyor
Light
Archie
Tailings Pond
Creek
BR 6
3-C3
359
360
25'
361
362
363
INTERIOR—GEOLOGICAL SURVEY WAS-

Figure 3

ATTACHMENT I

GANNON UNIT 2
PERMIT CALCULATIONS

Acutal Discharges*

Sulfur Dioxide

$$\frac{1.09 \text{ lbs.}}{\text{MM BTU}} \times \frac{1307 \text{ MM BTU}}{\text{Hour}} = \frac{1425 \text{ lbs}}{\text{Hour}}$$

$$\frac{1425 \text{ lbs}}{\text{Hour}} \times \frac{1 \text{ Ton}}{2000 \text{ lbs.}} \times \frac{4826 \text{ Hours}}{\text{Year}} = \frac{3439 \text{ Tons}}{\text{Year}}$$

Particulates

$$\frac{0.04 \text{ lbs}}{\text{MM BTU}} \times \frac{1307 \text{ MM BTU}}{\text{Hour}} = \frac{52.28 \text{ lbs}}{\text{Hour}}$$

$$\frac{52.28 \text{ lbs}}{\text{Hour}} \times \frac{1 \text{ Ton}}{2000 \text{ lbs.}} \times \frac{4826 \text{ Hours}}{\text{Year}} = \frac{126 \text{ Tons}}{\text{Year}}$$

Allowable Discharges

Sulfur Dioxide

$$\frac{1.10 \text{ lbs}}{\text{MM BTU}} \times \frac{1307 \text{ MM BTU}}{\text{Hour}} = \frac{1438 \text{ lbs}}{\text{Hour}}$$

Particulates

$$\frac{0.10 \text{ lbs}}{\text{MM BTU}} \times \frac{1307 \text{ MM BTU}}{\text{Hour}} = \frac{131 \text{ lbs}}{\text{Hour}}$$

*Calculated from Source Emissions Test Data of October 4, 1978

TECO
TAMPA ELECTRIC COMPANY

POST OFFICE BOX 111 TAMPA, FLORIDA 33601 TELEPHONE (813) 879-4111

May 31, 1978

TO WHOM IT MAY CONCERN:

Please be advised that W. J. Johnson, Ph.D., Acting Manager of Environmental Planning, is the authorized representative of Tampa Electric Company concerning matters with which this permit application deals.

Very truly yours,

J. D. Hicks
Vice President-Operations

State of Florida

DEPARTMENT OF STATE • DIVISION OF CORPORATIONS

I certify from the records of this office that TAMPA ELECTRIC COMPANY, is a corporation organized under the laws of the State of Florida.

The charter number for this corporation is 157782.

I further certify that said corporation has filed all annual reports and paid all annual report filing fees due this office through December 31, 1977, and has until July 1, 1978 to file its 1978 annual report, before becoming delinquent.

GIVEN under my hand and the Great Seal of the State of Florida, at Tallahassee, the Capital, this the 22nd day of March, 1978.

SECRETARY OF STATE

CER 101 8-15-77

APPROVED OCT 11 1976
10/15/76 S.D. A. McDonald per HCEPC

A029-2489
0040
02

RECEIVED SEP 14 1976 H.C.E.P.C.

D.E.R. OCT 15 1976 SOUTH WEST DISTRICT ST. PETERSBURG

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

Source Type **Air Pollution** [XX] **Incinerator** [ ]
Type application: [XX] Operation [ ] Construction
Source Status: [ ] New [XX] Existing [ ] Modification

Source Name: F.J. Gannon Station, No. 2 Boiler County Hillsborough

Source Location: Street Port Sutton Road City Tampa

UTM: East 360,000 North 3,087,500

Appl. Name and Title: Tampa Electric Company
Appl. Address: P.O. Box 111, Tampa, Florida 33601

STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

The undersigned owner or authorized representative of * Tampa Electric Company is fully aware that the statements made in this application for an Operating permit are true, correct and complete to the best of his knowledge and belief. Further, the undersigned agrees to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provisions of Chapter 403, Florida Statutes, and all the rules and regulations of the Department or revisions thereof. He also understands that a permit, if granted by the Department, will be non-transferable and he will promptly notify the Department upon sale or legal transfer of the permitted establishment.

Signature of the Owner or Authorized Representative

Date: 9/13/76 Telephone No.: 813/879-4111

*Attach a letter of authorization. If applicant is a corporation, a Certificate of Good Standing must be submitted with application. This may be obtained, for a $5.00 charge, from the Secretary of State, Bureau of Corporate Records, Tallahassee, Florida 32304.

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA

This is to certify that the engineering features of this pollution control project have been designed/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my profesional judgment, that the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the Department. It is also agreed that the undersigned will furnish the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signature

Name B. D. Kitchings
(Please Type)

Company Name Tampa Electric Company

Florida Registration Number 8083
(Affix Seal)

Mailing Address P.O. Box 111
Tampa, Florida 33601

Telephone No.: 813/879-4111

Date

DETAILED DESCRIPTION OF SOURCE

A. Describe the nature and extent of the project. Refer to existing pollution control facilities, expected improvement in performance of the facilities and state whether the project will result in full compliance. Attach additional sheet if necessary.

The source is an oil fired boiler which generates steam to drive a turbine and produce electricity. The recent conversion from coal firing to oil firing (completed) was done to allow compliance with applicable sulfur dioxide and particulate regulations.

B. Schedule of Project Covered in this Application (Construction Permit Application Only).

Start of Construction N.A.
Completion of Construction

C. Costs of Construction (Show a breakdown of costs for individual components/units of the project serving pollution control purpose only). Information on actual costs shall be furnished with the application for operation permit.

Estimated final completion cost for conversion of Gannon Units 1-4 to oil firing - $19,013,000 (April 1, 1976 est.)

A breakdown of costs related to each boiler is not available.

D. For this source indicate any previous DER permit: issuance dates, and expiration dates; and orders and notices.

AO-29-2191 issued May 25, 1973, expired July 1, 1975.

E. Is this application associated with or part of a Development of Regional Impact (DRI) pursuant to Chapter 380, Florida Statutes, and Chapter 22F-2, Florida Administrative Code ? .....Yes ..XX..No

AIR POLLUTION SOURCES & CONTROL DEVICES
(other than incinerators)

A. Identification of Air Contaminants

1) [XX] Particulates
   a) [ ] Dust b) [XX] Fly Ash c) [ ] Smoke d) [ ] Other (Identify)

2) [XX] Sulfur Compounds
   a) a) [XX] SO_x as SO_2 b) [ ] Reduced Sulfur as H_2S c) [ ] Other (Identify)

3) [XX] Nitrogen Compounds
   a) [XX] NO_x as NO_2 b) [ ] NH_3 c) [ ] Other (Identify)

4) [ ] Flourides 5) [ ] Acid Mist 6) [ ] Odor

7) [ ] Hydrocarbons 8) [ ] Volatile Organic Compounds

9) [ ] Other (Specify) _____

B. Raw Materials and Chemicals Used (Be Specific)

Description	Utilization Rate lbs./hr.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	% Wt.	
NONE				

C. Process Rate:

1) Total Process input Rate* N.A. Units.
2) Product ~~Weight~~ Electricity Units.
3) Normal Operating Time 24 hrs/day; 7 days/wk., if seasonal describe: N.A.

hrs./day _____ days/wk. _____ wks/yr. _____

D. Airborne Contaminants Discharged:

Name of Contaminant	Actual** Discharge lbs./hr.	Actual** Discharge T/y(1)	Discharge Criteria Rate*	Allowable Discharge Lbs./hr.	Relate to Flow Diagram
SO_2	980	935	1.1#/MM BTU	1,007	(3)
Particulates	35.6	34	0.1#/MM BTU	91.3	(3)

*Refer to Chapter 17-2.04(2), Florida Administrative Code. (Discharge Criteria: Rate= #/ton P_2O_5, #/M BTU/hr., etc.)

**Estimate only if this is an application to construct.

NOTE (1) Calculated using July 28, 1976 source test emission rates and an annual projected BTU usage of $1,747,600 \times 10^6$ BTU/yr.

D. Airborne Contaminants Discharged. (Cont'd.)

Name of Contaminant	Hourly Emission (lb./hr.) #/MM BTU	Daily Emission (lb./day)	Yearly Emission (T/yr.)	Basis for Emission Estimate (Test Data, Material Balance)
SO_2	1.07	See previous	page	Fuel analysis from 7-28-76 source test
Particulate	0.039	See previous	page	*Test data (7-28-76 test)
		*Note - test	data previously sent to HCEPC	

E. Control Devices:

Name and Type (Model and Serial No.)	Contaminant	Efficiency*	Conditions of Operations	Basis for Efficiency Operational Data, Test, Design, Data)
(1) Research Cottrell	fly ash	90%	Coal fly ash	Design

NOTE (1) The precipitator had originally been installed to collect fly ash from a coal fired boiler. With the conversion to oil firing, the precipitator has been kept operational even though it is not required to meet compliance with particulate emission standards in our judgement as is evidenced by emissions tests from Hookers Point Station. Efficiency has not been tested while burning oil and the precipitator manufacturer does not make any guarantees of efficiency while burning oil.

*See required supplement.
(Include any test data and/or design data for efficiency substantiation)

F. Fuels

Type (Be Specific, includes %S, etc.)	Daily Consumption *		Maximum Heat Input MBTU/hr.
	Avg./hr.	Max./hr.	
#6 Oil (1%S)	48,218# (2)	68,400#	1,257

NOTE (2) Hourly fuel usage during July 28, 1976 source test

* Units: Natural Gas–MCF/hr.; Fuel Oils, Coal–lbs./hr.

Fuel Analysis:

Percent Sulfur 1.07 Percent Ash N.A.

Density 7,676 lb./gal.

Heat Capacity 19,020 BTU/lb. BTU/gal.

Other Fuel Contaminants N.A.

G. Describe briefly, without revealing trade secrets, the processes/operations generating the airborne emissions identified in this application.

Oil is burned to generate steam which is used to generate electricity.

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

None

I. Emission Stack Geometry and Flow Characteristics, (Provide Date for each Stack).

Stack Height 306' ft, Stack Diameter 10.0 ft.

Gas Flow Rate 248,213 ACFM avg.(1) / 413,689 ACFM Max. ACFM, Gas Exit Temperature 260 °F

J. Required Supplements:

1. Total process input rate and product weight – show deviation. Maximum design heat input is $1,257 \times 10^6$ BTU/hr. Operating range is from approximately 35% load to 100% load.
2. Efficiency Estimation.

   N.A.
3. An 8½" x 11" flow diagram, which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate whether raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particulates are evolved and where finished products are obtained.

   See Figure 1
4. An 8½" x 11" plot plan showing the exact location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

   See Figure 2
5. An 8½" x 11" plot plan showing the exact location of the establishment, and points of airborne emissions in relation to the surrounding area, residences and other permanent structures and roadways.

   See Figure 3
6. If applicable, provide a brief description of the control device or treatment system serving the discharge point for airborne contaminants identified in this application. Include details of the manufacturer, model, size, type and capacity for control/treatment device and the features of the discharge point (height above ground, diameter, period(s) of discharge and discharge temperature).

   N.A.
7. Plans for storm water control during and after construction.

   All wastewater from the station will be transported to an evaporation/ percolation pond for treatment and disposal. Storm water will not be treated.

NOTE (1) Assumes a 60% capacity factor during hours of operation.

INCINERATOR INFORMATION

Type of Waste	Type O (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Patho-logical)	Type V (Liq. & Gas By-prod.)	Type VI (Solid By-prod.)
Lbs./Hr. incinerated							

Description of Waste _____

Total Weight Incinerated lbs./hr. _____ Design Capacity lbs./hr. _____

Approximate Number of Hours of Operation per Day _____, days/week _____

Manufacturer _____ Model No.: _____

Date Constructed: _____

	Volume (ft. *)³	Heat Release (BTU/hr.)	Fuel		Temp. (° F)
			Type	BTU/hr.	
Primary Chamber					
Secondary Chamber					

Stack Height: _____ ft. Stack Diameter: _____ Stack Temp.: _____ °F.

Type of Pollution Control Device [ ] Cyclone [ ] Wet scrubber [ ] Afterburner
[ ] Other (Specify): _____

Brief Description of Operating Characteristics of Control Device: _____

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

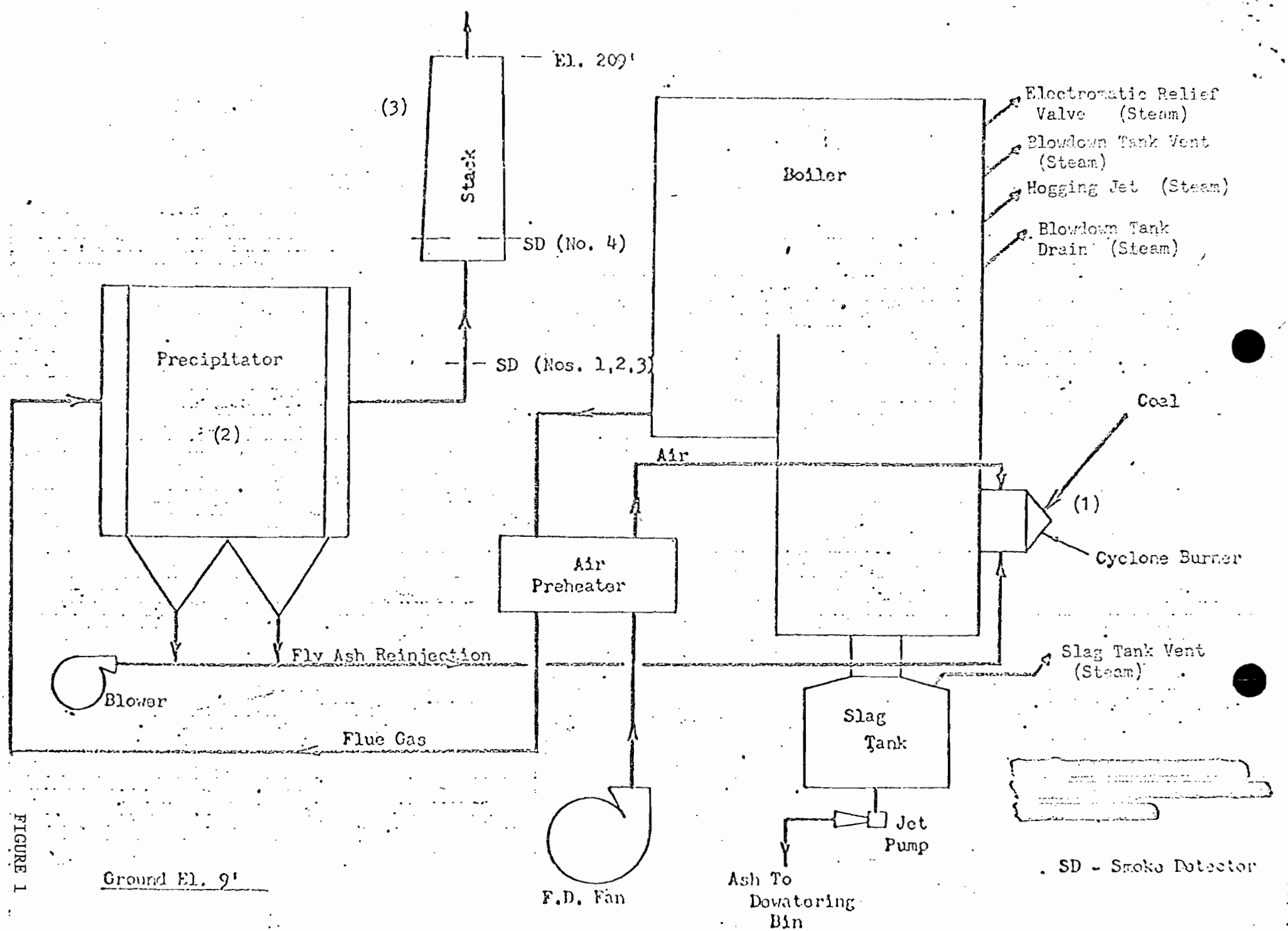


FIGURE 1

FLOW DIAGRAM
BOILER NO. 2 - GANNON STATION
TAMPA ELECTRIC CO.

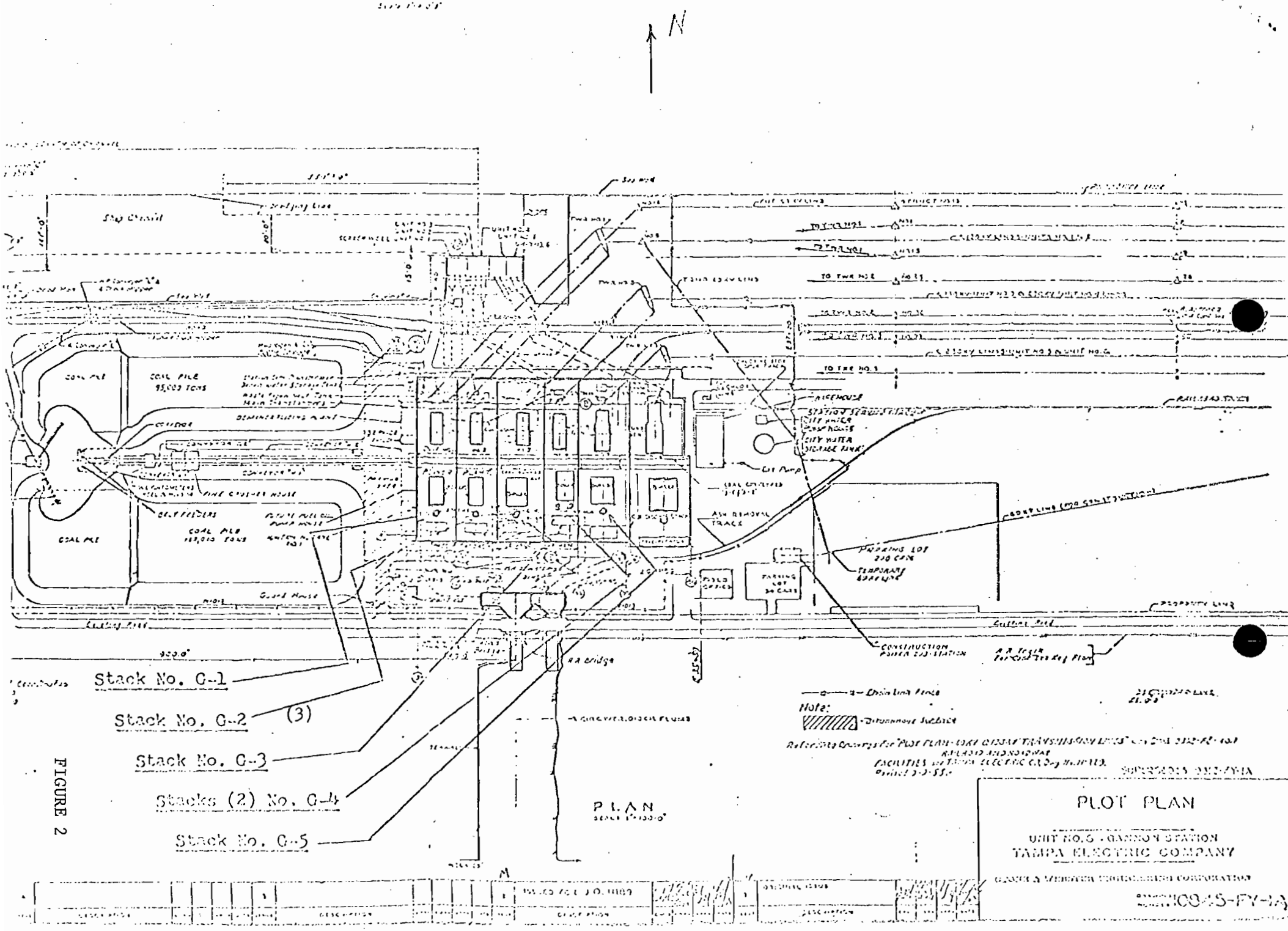


FIGURE 2

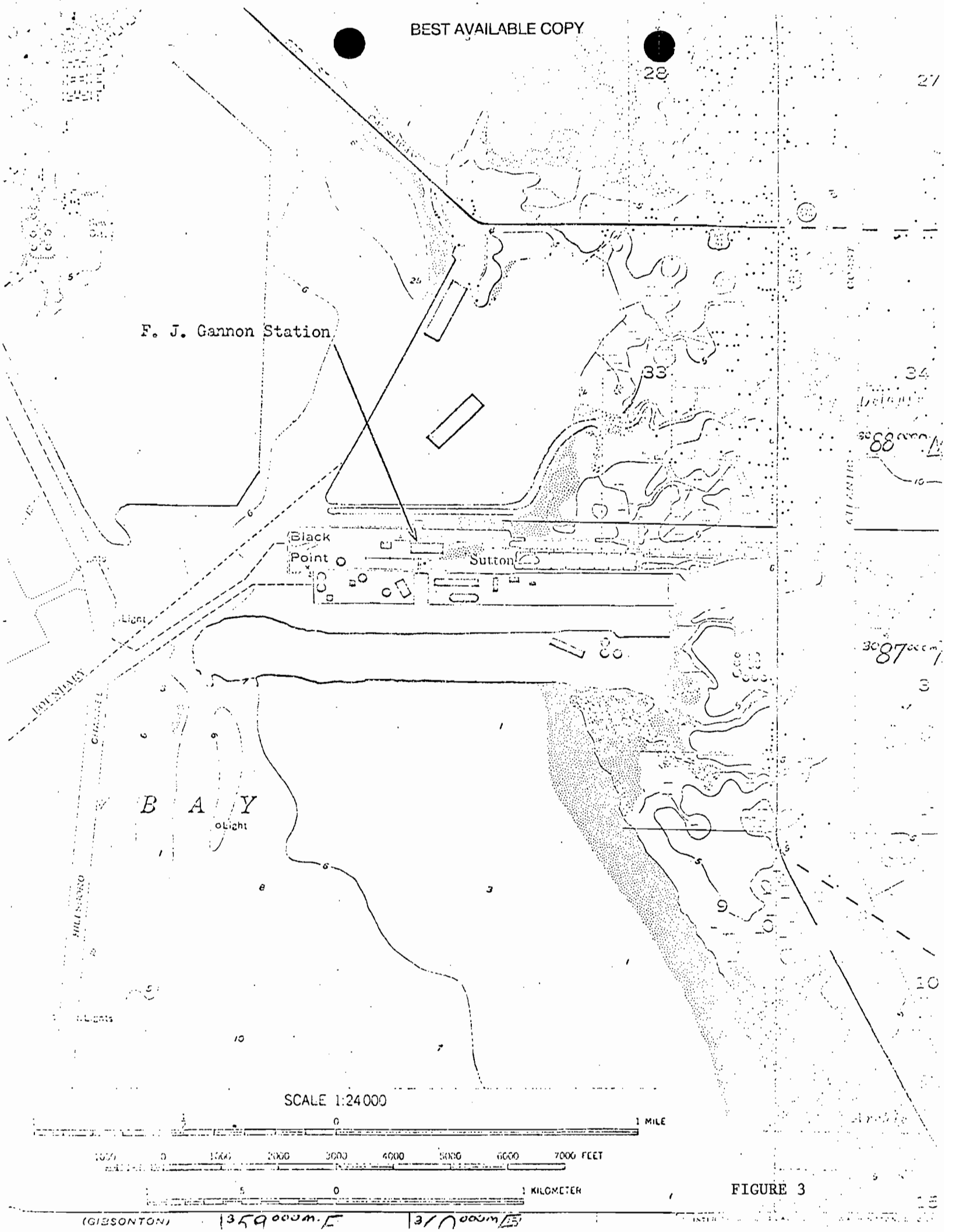


FIGURE 3

Unit 2

29-977

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State of Florida
Department of Air and Water Pollution Control

Application For Permit to Operate Air Pollution Control Facilities

Applicant (Owner or authorized agent): H. A. Moshell, Jr.
General Manager of Production
(Name and Title)

Name of Establishment: TAMPA ELECTRIC COMPANY
F. J. Gannon Station - No. 2 Boiler
(Corporation, Company, Political SD, Firm, etc.)

Mailing Address: P.O. Box 111 Tampa, Florida 33601

Location of Pollution Source: Port Sutton Road Tampa
(Number and Street) (City)

Hillsborough
(County)

Nature of Industrial Operation: Generation of Electricity

Permit Applied For Operating:

- New Source ☐
- Existing Source ☒
- Existing Source after modification ☐
- Existing Source after Expansion ☐
- Existing Source After relocation, expansion or reconstruction ☐

Project Engineer:

B. D. Kitching
Name

TAMPA ELECTRIC COMPANY
Firm

P.O. Box 111, Tampa, Florida 33601
Mailing Address

Signature

6503
Florida Registration Number

For Department's Use Only Permit No. #2 Date:

The undersigned owner or authorized representative* of TAMPA ELECTRIC COMPANY is fully aware that the statements made in this form and the attached exhibits and statements constitute the application for a Operating Permit from the Florida Department of Air and Water Pollution Control and certifies that the information in this application is true, correct and complete to the best of his knowledge and belief. Further, the undersigned agrees to comply with the provisions of Chapter 403 Florida Statutes and all the rules and regulations of the Department or revisions thereof. He also understands that the Permit is non transferable and, if granted a permit, will promptly notify the Department upon sale or legal transfer of the permitted establishment.

H. A. Moshell, Jr.

Signature of owner or agent.

H. A. Moshell, Jr.
General Manager of Production

Name and Title

Date: 2/25/71

*Attach letter of authorization.

Information Regarding Pollution Sources and Proposed Control Facilities

1. Estimated cost of proposed control facilities $ 449,180.

2. Prepare and attach an 8½" x 11" flow diagram, without revealing trade secrets, identifying the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particulates are evolved and where finished products are obtained.
   P. 3-D1

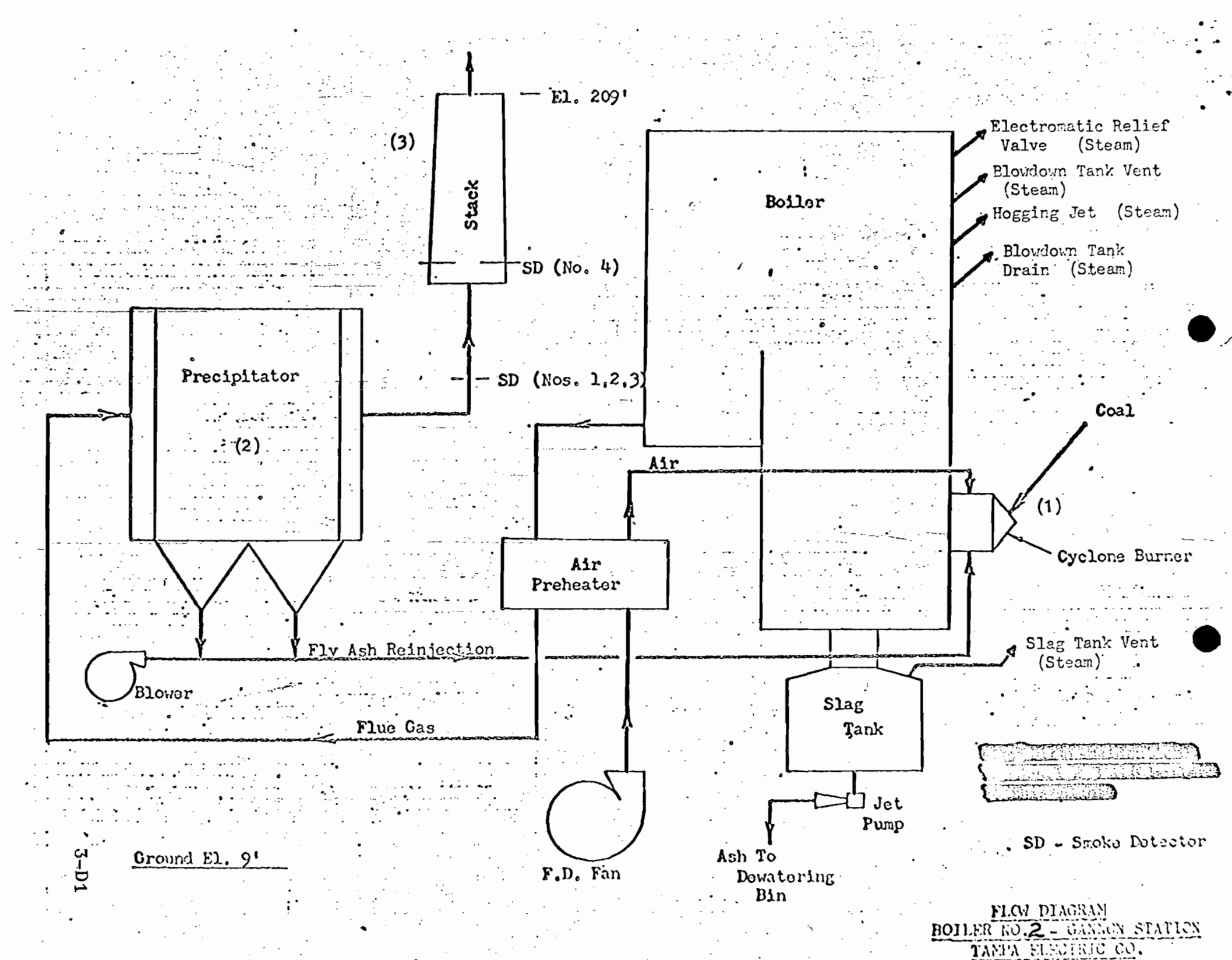
3. Include an 8½" x 11" plot plan showing location of manufacturing processes and location of outlets for airborne emissions. Relate all flows to the flow diagram.
   P. 3-D2

4. Submit an 8½" x 11' plot plan showing the exact location of the establishment and points of discharge in relation to the surrounding area, residences and other permanent structures and roadways.
   P. 3-D3

I General

A. Raw Materials and Chemicals Used.

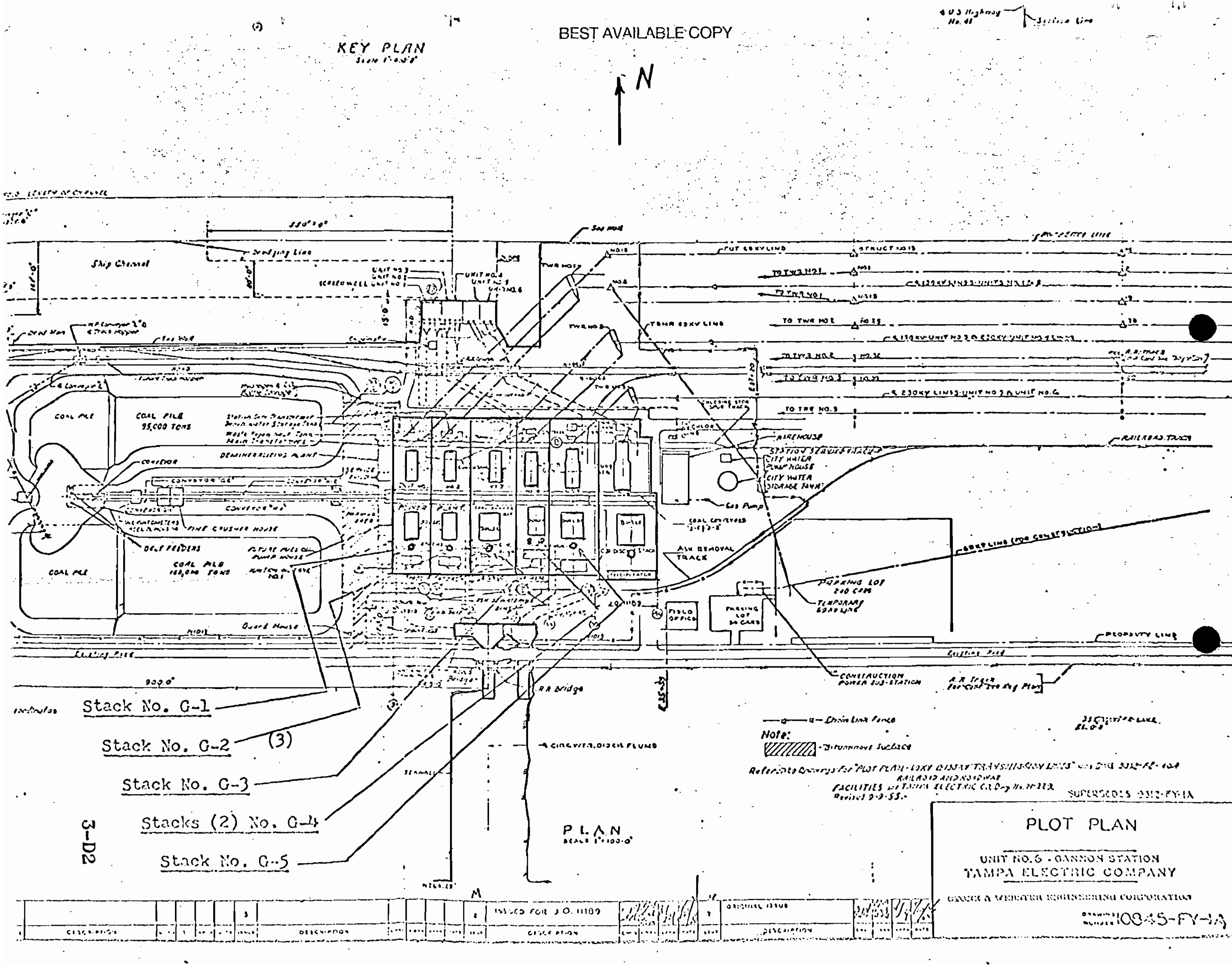
Description	Utilization Tons/day, Lbs./day, etc.	Approximate Contaminant Content		Relate to Flow Diagram
		Type	Percent Dry Weight	
None				



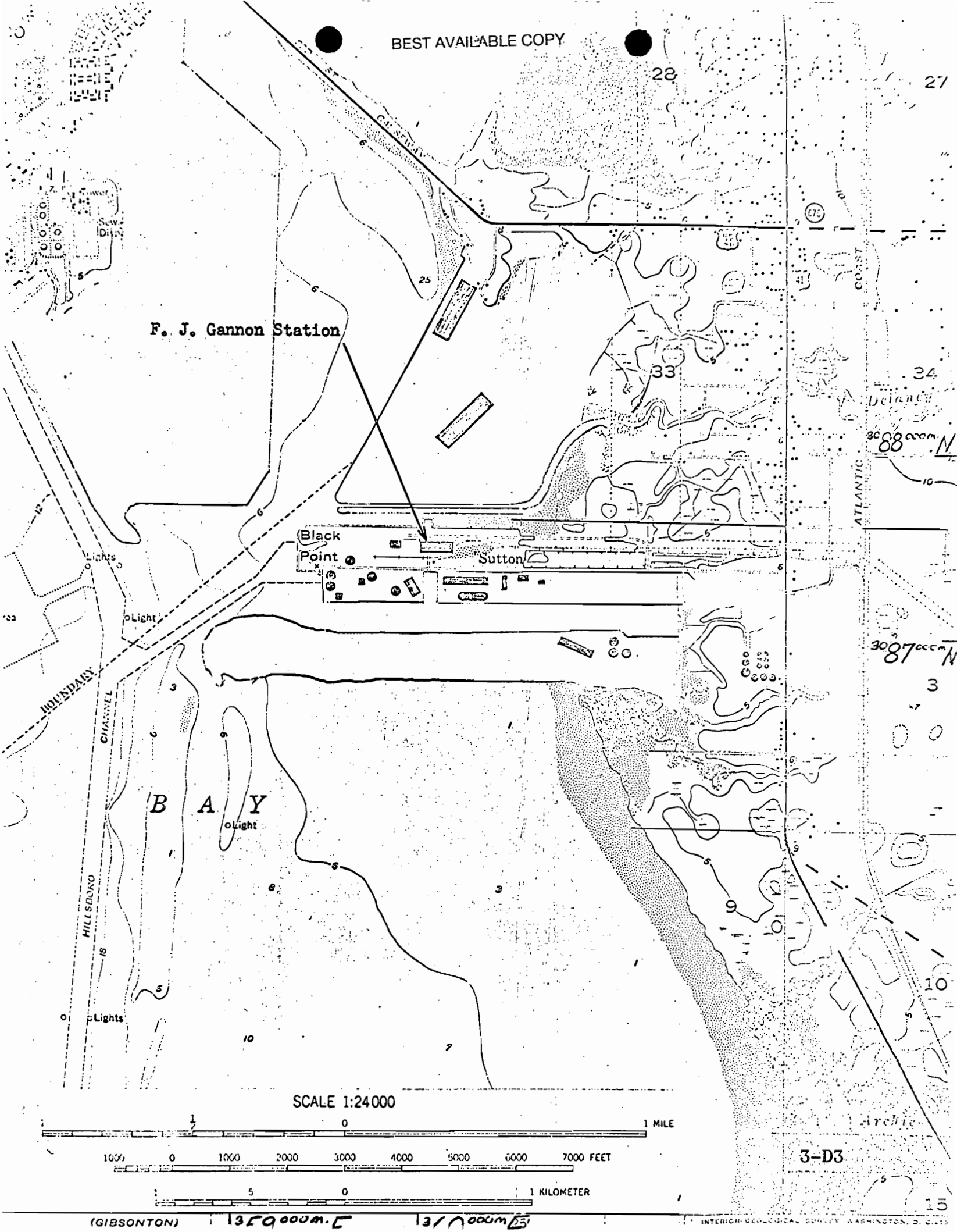
2-D1

FLOW DIAGRAM
BOILER NO. 2 - GANNON STATION
TAMPA ELECTRIC CO.

BEST AVAILABLE COPY



3-D2



INTERIOR-GEOLOGICAL SURVEY, WASHINGTON, D. C.

B. Fuels

Type (Be Specific)	Daily Consumption	Gross Maximum Heat Output	Relate to Flow Diagram
Coal	1,847,000 lb/day	2.10×10^{10} BTU/day 840 MM Btu/hr.	(1)

C. Products

Description	Average Daily Production (Tons/Day. Lbs/Hr. etc.)
Electricity	2,120 MWH/day = 90 MW

D. Normal operation: Hours/Day 24 hr/day Day and Week 7 day/wk

If operation or process is seasonal, describe: _____

III Identification of Air Contaminants

Compounds of:		Also —			
Chlorine	☐	Hydrocarbons	☐	Acid Mists	☐
Flourine	☐	Smoke	☐	Odors	☐
Nitrogen	☐	Fly Ash	☒	Radioisotopes	☐
Sulfur	☒	Dusts	☐	Other _____	☐

Specific Compounds SO_2, SO_3

III Air Pollution Control Devices

Contaminant	Control Device	Relate to Flow Diagram	Note 1 Operating Efficiency	Conditions (Particle Size Range, Temp. etc.)
Fly Ash	Electrostatic Precipitator	(2)	91.3%	31.5 ft/sec 309° F
SO_x	None			

Provide a brief description of the control device or treatment system. Attach separate sheets giving details regarding principle of operation, manufacturer, model, size, type and capacity of control/treatment device and the basis for calculating its efficiency. Show any bypasses of the control device and specify when such bypasses are to be used and under what conditions.

This piece of equipment is designed to remove solid particulate matter from the flue gases leaving the boiler.

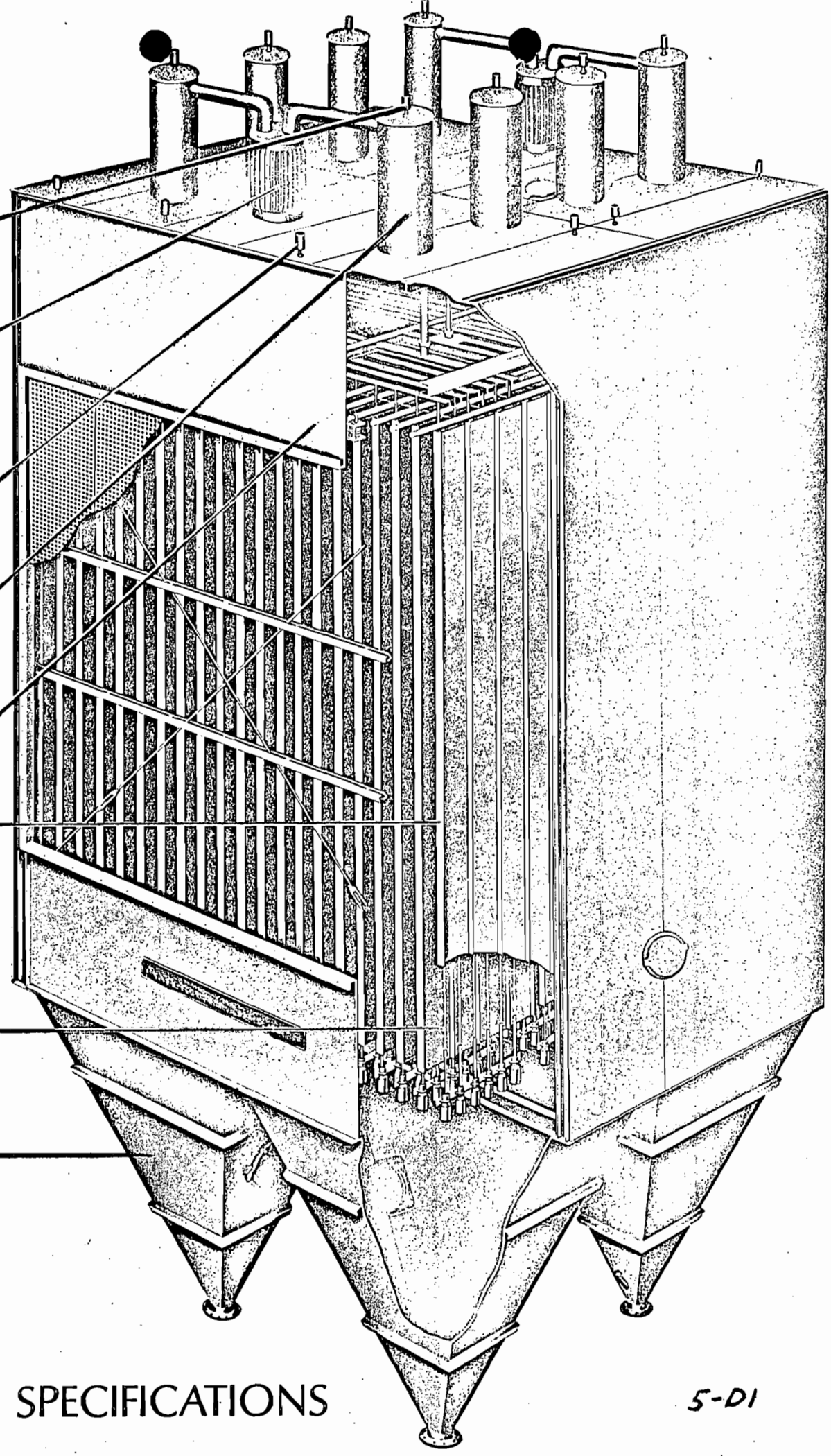
A cutaway view of a typical electrostatic precipitator is shown on Page 5-D1. Gas flow through the precipitator is between the parallel plates designated as "collecting surfaces".

The operating principle and basis for calculating the efficiency are shown on page 5-D2 and 5-D3 respectively. Some additional information regarding the precipator for this unit follows.

Manufacturer - Research-Cottrell

Design air flow - 377,000 CFM
Guaranteed removal efficiency - 90.0%
at design conditions

There are no by-passes of the precipitator.



Discharge electrode rappers—choice of pneumatic or electrical in a weather enclosure; separate control system allows full flexibility of intensity and cycling.

High Voltage Power Supply
Transformer—full range KVA, depending on size and specified efficiency of precipitator

Rectifier—silicon type, oil immersed; connected by bridge circuit; full or half wave DC output

Collecting surface rappers—choice of pneumatic or electrical in a weather enclosure, with flexible cycling and intensity controls.

Insulator compartments—house insulators and electrode rappers; fabricated of mild steel; can be equipped with heaters to minimize condensation.

Casing—column and beam construction with shell fabricated of mild steel.

Collecting surfaces—flat plate design with roll-formed pockets improves clean-plate sparking voltages, provides less duct turbulence for maximum efficiency, improves rappability.

Discharge electrodes—coppered, stainless or mild steel; carried on steel frames; supported on insulators; tensioned by cast iron weights

Hoppers—pyramidal, fabricated of mild steel; baffled to prevent gas sneak-by; can be equipped with vibrators

GENERAL SPECIFICATIONS

5-01

OPERATING PRINCIPLE OF ELECTROSTATIC PRECIPITATOR

Particles suspended in a gaseous medium enter the precipitator, passing through ionized zones around high voltage electrode wires. These high voltage electrodes, through a corona effect, emit negatively charged ions into the gases surrounding the electrode.

The negatively charged gas field around each electrode wire ionizes passing particulates, causing the particulates to migrate to the electrode of opposite polarity, the collector plates.

The charged particulates gather on the grounded collector plates and lose their charge. Rappers shake loose the agglomerate which fall into the collection hoppers for removal.

BASIS FOR CALCULATING PRECIPITATOR EFFICIENCY

A method similar to ASME Power Test Code - 27 is used to determine dust loadings. Very briefly the method is as follows:

1. Unit is base loaded for 2 to 4 hours (steady load).

2. Velocity profile of the inlet and outlet ducts is determined using a pitot tube, draft gauge, and thermocouple.

3. Inlet and outlet ducts are sampled simultaneously and isokinetically using alundum thimbles as the filtering medium.

4. Amount of dust per unit time is obtained and efficiency is arrived at by using the following formula:

$$\frac{\text{Inlet dust concentration} - \text{Outlet dust concentration}}{\text{Inlet dust concentration}} \times 100 = \text{efficiency}$$

IV. Contaminant Balance

From contaminant content in raw materials, waste products, and manufactured products, summarize daily contaminant flow:

	Pounds Contaminant per Day	
	Input	Output
List Raw Materials:		
Coal Ash	219,000	
Coal Sulfur	70,500	
List Manufactured Products:		
Electricity		
List Solid Wastes:		
Bottom Slag (ash)		212,260
List Liquid Wastes:		
None		
Totals	289,500	212,260

Airborne Wastes (Total input minus total output)

77,240

Note: If more than one contaminant, specify each
Contaminants recovered in control devices should be shown as either a liquid or a solid waste.

V. Discharged Emmissions to Atmosphere

A. Discharge Points and Design Conditions

Note 2

Discharge Point Description	Relate to Flow Diagram	Height above Ground (ft.)	Cross Sect. Area (sq. ft.)	Periods of Flow Hrs./ Day	Periods of Flow days/ year	Temp. of Discharge (°F)
Stack	(3)	200	156	23.3	345	309

B. Tabulation of Discharged Contaminants

Note 3

	Discharge Point – Relate to Flow Diagram	Flow Rate at Std. Cond. (cfm)	Total Contaminants Discharged: Particulates Gr/ft3 (Std.Cond.)	Particulates lbs./ Day	Other Contaminants (F^-, SO_X, NO_X etc.) Gr/ft3 (Std. Cond.)	Other Contaminants lbs/ Day	Other Contaminants Gr/ft3 (Std.Cond)	Other Contaminants lbs/ Day
Avg. Cond.	Stack -(3)	202,600	0.166	6,740	3.82	141,000		
Peak Cond.	Stack - (3)	276,500	0.166	-	3.82	-		
	Totals							

NOTE: Standard conditions used are 20° C and 1 atm.

VI. Treatment and Disposal of Liquid and Solid Waste

1. Identify the contaminants which will be discharged as liquid or solid wastes.

   Bottom slag (ash)

2. Describe the treatment and disposal of liquid and solid wastes. Indicate the concentrations and volume of individual contaminants in treated wastes before disposal.

There is 212,260 lb/day of slag produced.

The bottom slag is tapped from the bottom of the furnace as a molten liquid. It falls into a tank of water where it rapidly cools and shutters into small pieces (approximately 1/4" in diameter). This water - solid mixture is pumped to a dewatering bin where the water is drained off.

The slag is then carried off by truck to a stockpiling area on the power plant site.

The solid slag is hard, glassy, insoluble in water, and chemically inert. A typical mineral analysis of slag is as follows:

SiO_2 - 41.06%, Fe_2O_3 - 27.46%, Al_2O_3 - 17.00%, CaO - 5.47%, SO_3 - 4.91%, K_2O - 1.88%, TiO_2 - 0.83%, MgO - 0.67%, P_2O_5 - 0.37%, Na_2O - 0.25%, Undetermined - 0.10%.

NOTE 1: The operating efficiency shown for the electrostatic precipitator is the efficiency obtained by tests which were conducted in April, 1958. These tests were conducted at the designed maximum continuous load on the boiler. Tests are scheduled and due to be completed by December 31, 1971, which will reflect current efficiencies at the average operating condition. This information will be forwarded to the department as soon as the tests have been completed.

The test method to be used will be similar to the method adopted by the Department of Air and Water Pollution Control for the sampling of solid particulate matter from power plant stack gases.

NOTE 2: The hrs/day figure shown was arrived at by dividing the hours per year that the boiler was in operation for the year 1969 by the number of days in 1969 that the boiler operated.

NOTE 3: The grain loading shown for the average operating condition and the peak emission condition is the grain loading that was obtained by test at the design maximum continuous load on the boiler. This means that, theoretically, the grain loading for the average operating condition should be less than that shown and the grain loading for the peak emission condition could be greater than that shown. Tests are scheduled to obtain what the values actually are.