



TAMPA ELECTRIC

January 13, 2000

Mr. David Zell  
Air Permitting Engineer  
Florida Department of Environmental Protection  
Southwest District  
3804 Coconut Palm Drive  
Tampa, Florida 33619

Mr. Sterlin Woodard  
Air Management Division  
Environmental Protection Commission  
of Hillsborough County  
1410 N. 21<sup>st</sup> Street  
Tampa, Florida 33605

**Re: Tampa Electric Company (TEC) – F.J. Gannon Station Unit 3  
Wood Derived Fuel (WDF) Test Burn  
FDEP Permit No. 0570040-008-AC**

Dear Mr. Zell and Mr. Woodard:

Tampa Electric Company is currently planning to conduct a test burn of wood/wood chips in the Gannon Station Unit 3 boiler during March of this year. As required by the above referenced permit, TEC plans to conduct a formal compliance test on March 7 and 8. This schedule is subject to change based on unit operation, testing conditions and manpower availability. Enclosed for your review is the proposed test protocol that TEC intends to use in support of this project.

If you have any questions, please feel free to call me at (813) 641-5125.

Sincerely,

Shannon K. Todd  
Engineer  
Environmental Planning

EP\gm\SKT135

Enclosures

c/enc: S.Sheplak – FDEP

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JAN 18 2000

BUREAU OF AIR REGULATION

Via FedEx  
Airbill No. 7903 2323 8381

Via FedEx  
Airbill No. 7922 9510 9977

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**BUREAU OF AIR REGULATION**

**Bio-mass WDF Emission Test Burn Protocol  
For  
Coal Fired Unit No. 3  
At**

**F. J. Gannon Station**

**Tampa, Florida**

**Prepared for  
Tampa Electric Company  
By  
Corporate Environmental Services  
Of  
Tampa Electric Company**



**January 13, 2000**

## Introduction

In reference to the F. J. Gannon Station Unit No. 3 Wood Derived fuel permit (number 0570040-08-AC), Tampa Electric Company is performing emissions testing on Boiler No. 3 with fuel blend composed of coal combined with wood/wood chips and or Yard Trash. Wood/wood chips are defined as:

*"Fuel derived from clean wood lumber, pallets, construction debris free of listed hazardous substances including, but not limited to, pentachlorophenol, creosote, tar, asphalt, and paint containing heavy metals. Specific Condition 3. B. iii."*

Yard Trash is defined as:

*"Vegetative material resulting from landscaping maintenance or land clearing operations and includes materials such as trees and shrub trimmings, grass clippings, palm fronds, trees and tree stumps." Specific Condition 3. B. ii.*

During this test burn, a maximum of 7.0% WDF by weight will be introduced to the boiler.

## Facility Description

Source:	F. J. Gannon Unit No. 3 is a 180 MW cyclone boiler that will be tested to determine continued compliance emissions. This unit is normally fueled on coal only.
Location:	F. J. Gannon Station is located in Hillsborough County on Port Sutton Rd., Tampa, Florida.
Regulation:	USEPA 40 CFR Part 60, Appendix A.
Test Coordinator:	Corporate Environmental Services (CES) Tampa Electric Company

## Proposed Testing Schedule

The testing is tentatively scheduled to begin in March 2000 and is subject to change based on unit operation, resource availability and/or equipment availability. Once begun, all testing will be completed within 5 days.

## Testing Protocol

### 1) Performance Test Methods and Sample Strategy

- A) Three test runs will be performed with the unit operating at base load. The average of the three runs will be used for reporting purposes. The unit will be operated at the normal maximum load available on the day of the test.
- B) Exhaust emission test runs will be at least the minimum required volume to be sampled as specified by each method.
- C) Coal and WDF fuel samples will be collected during each run and one composite sample of each fuel type created for analysis. Coal and WDF samples shall be collected according to procedures of American Society of Testing and Materials (ASTM).

A brief description of each test method used for exhaust sampling is listed below along with a test matrix combining all methods and parameters.

- A) EPA Method 2 for flow  
Stack gas flow shall be measured with an S-type pitot tube that will be connected to each sampling probe for measurement of stack gas velocity and volumetric flow. Each pitot tube is calibrated to method specifications before and after each test. During the test, periodic inspections are performed to assure no damage has occurred to the pitot tip.
- B) EPA Method 8 for Sulfuric Acid Mist  
 $H_2SO_4$  will be sampled isokinetically using a 10-foot heated probe with a pyrex glass insert. The sample is extracted through an approved glass fiber filter where any particulate bound  $H_2SO_4$  is captured. Prior to the filter, the system is heated to the minimum temperature required to prevent moisture condensation. Four glass impingers will capture the remaining acid mist components by reagent mixtures.
- C) EPA Method 9 for Visible Emissions  
One 60-minute visible emission observation will be performed during the particulate testing by a state certified observer.
- D) EPA Method 17 for Particulate Matter  
Particulate matter will be sampled isokinetically using a 10-foot stainless steel probe. The sample is extracted through an approved glass fiber filter where particulate matter is captured at stack

temperatures. Four glass impingers will capture moisture content of the stack gas.

E) EPA Method 18 for Non-Methane/Ethane Volatile Organic Compounds

A gaseous sample is extracted from the stack at a steady rate into a tedlar bag and sealed. The samples are delivered to an independent laboratory within 24 hours and analyzed by GC/mass Spectroscopy.

Table 1

TEST MATRIX OF METHODS WITH COAL AND FUEL BLENDS

TEST	TEST METHOD
Stack Gas Flow	EPA Method 2
Stack Gas Molecular Weight	EPA Method 3
Stack Gas Moisture	EPA Method 4
Sulfuric Acid Mist	EPA Method 8
Opacity	EPA Method 9
Particulate Matter	EPA Method 17
Total Non-Methane/Ethane VOC	EPA Method 18

F) Ambient Conditions. The following data will be collected during each test run to allow correction to standard conditions.

- 1) Temperature in °F
- 2) Barometric pressure in inches of Hg.

2) Operational data will be provided by Gannon Station to document the unit's operating parameters during the test. The following test data will be collected from the control instrumentation for each test run in one-minute averages:

- A) Fuel rate in tons/hr.
- B) ESP voltage and amperage levels.
- C) Boiler load in megawatts generated.
- D) Sootblowing logs

Continuous Emissions Monitoring (CEM) data shall be collected for SO<sub>2</sub>, NO<sub>x</sub> and Opacity in the form of daily averages. Fuel samples shall be analyzed for:

- Sulfur wt. %
- Volatiles wt. %
- Nitrogen wt. %
- Ash wt. %
- Heat Content Btu/lb
- Carbon wt %
- Moisture wt %
- Arsenic
- Beryllium
- Chromium
- Lead
- Nickel
- Vanadium
- Zinc
- Chlorides

### 3) Sample Quality Assurance/Quality Control

- A) Dry gas meter calibrations are performed each quarter and re-checked after testing. Leak checks on the dry gas meter system are also performed before and after each test run.
- B) Reagent mixtures are produced in a certified laboratory within 24 hours of testing. Reagents are stored in ice prior to and after use until analyzed with appropriate chain of custody forms to track the samples.
- C) Fuel sampling will be handled by Gannon Station personnel and analyzed by a certified laboratory with appropriate chain of custody forms to track the samples.

Enclosures:

Reference of Permit Requirements

Sample System Diagrams

Source Location Diagram

**Specific Conditions:**

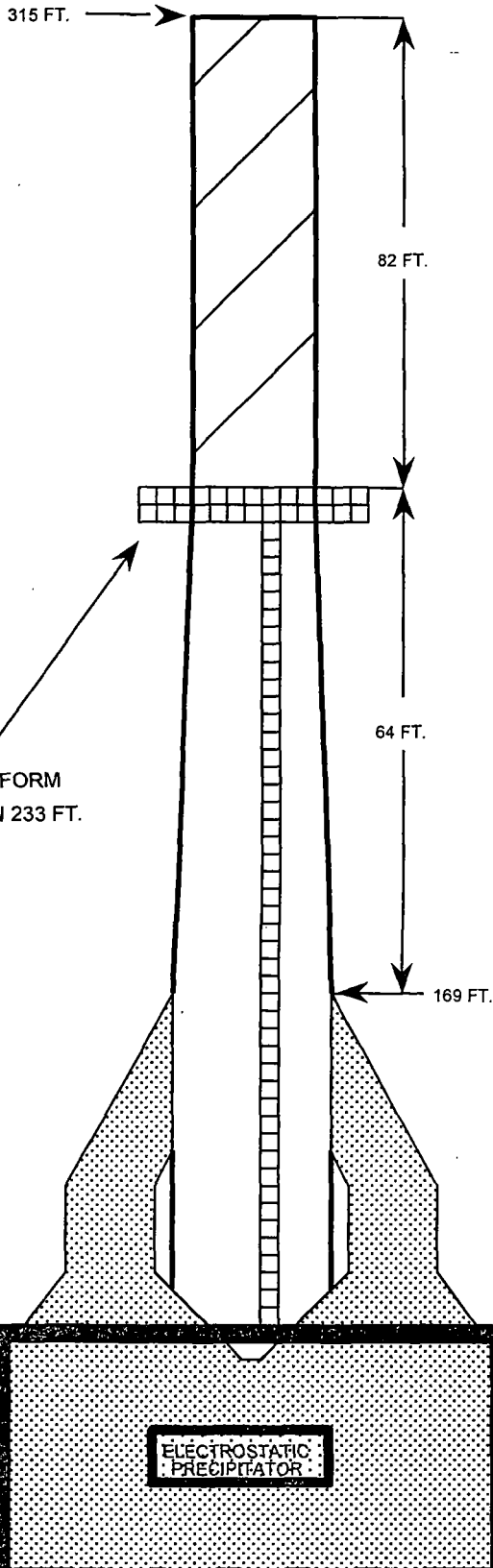
3. (continued)

C. Based upon the operating conditions during the (March 4 and May 27) 1998 WDF test burn, the following additional WDF usage restrictions apply until additional compliance stack testing is done during firing of different WDF blend ratios and WDF types.

- i. WDF is limited to a maximum of 7.0% of the fuel fired in the unit on a weight basis (based on tested WDF blend ratio (6.3%) + 10% = 7.0%).
- ii. WDF is limited to paper pellets only.

In order to increase the WDF blend ratio above the level in C. i. (but never to exceed 10% WDF), or allow for the blending of Yard Trash and Wood/Wood Chips as part of the WDF, then additional testing shall be conducted on Unit 3. To increase the blend % for WDF consisting of paper pellets only, PM and VE testing only will be required. Successful testing showing compliance with the operation permit limitations at a higher blend ratio will allow future operation up to that level + 10% (not to exceed 10% WDF by weight). Successful testing while firing Yard Trash and Wood/Wood Chips will allow for subsequent use of those categories of WDF as part of the coal/WDF blend. The permittee shall notify the Air Compliance Section of the Southwest District Office of the Department and the Air Management Division of the Environmental Protection Commission of Hillsborough County (EPC), at least 15 days prior to the date on which each formal compliance test is to begin of the date, time, and place of each such test, and the test contact person who will be responsible for coordinating and having such test conducted. The test notification shall include a proposed test protocol, which upon agreement by the Department will establish the testing to be done and the conditions under which the test will be conducted. A copy of the test report shall be submitted to the Air Management Division of the EPC and the Air Compliance Section of the Southwest District Office of the Department within 45 days after the test is completed.

*Testing Note: As it deems appropriate and applicable, the Department may take into account the results of any WDF blend testing conducted on F.J. Gannon Unit 4 in approving changes to WDF types and blend ratios for Unit 3 in lieu of additional testing on Unit 3.*



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

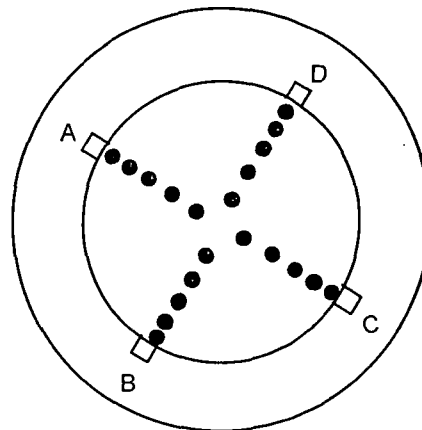
TRAVERSE POINTS	% OF STACK DIAMETER	IN. FROM STACK WALL
1	2.6 %	3.88 IN.
2	8.2 %	12.22 IN.
3	14.6 %	21.77 IN.
4	22.6 %	33.69 IN.
5	34.2 %	50.99 IN.

STACK DIAMETERS DOWNSTREAM  
FROM DISTURBANCE = 5.2

STACK DIAMETERS UPSTREAM  
FROM DISTURBANCE = 6.6

STACK DIAMETER = 12.4237 FT.  
STACK AREA = 121.225 SQ. FT.

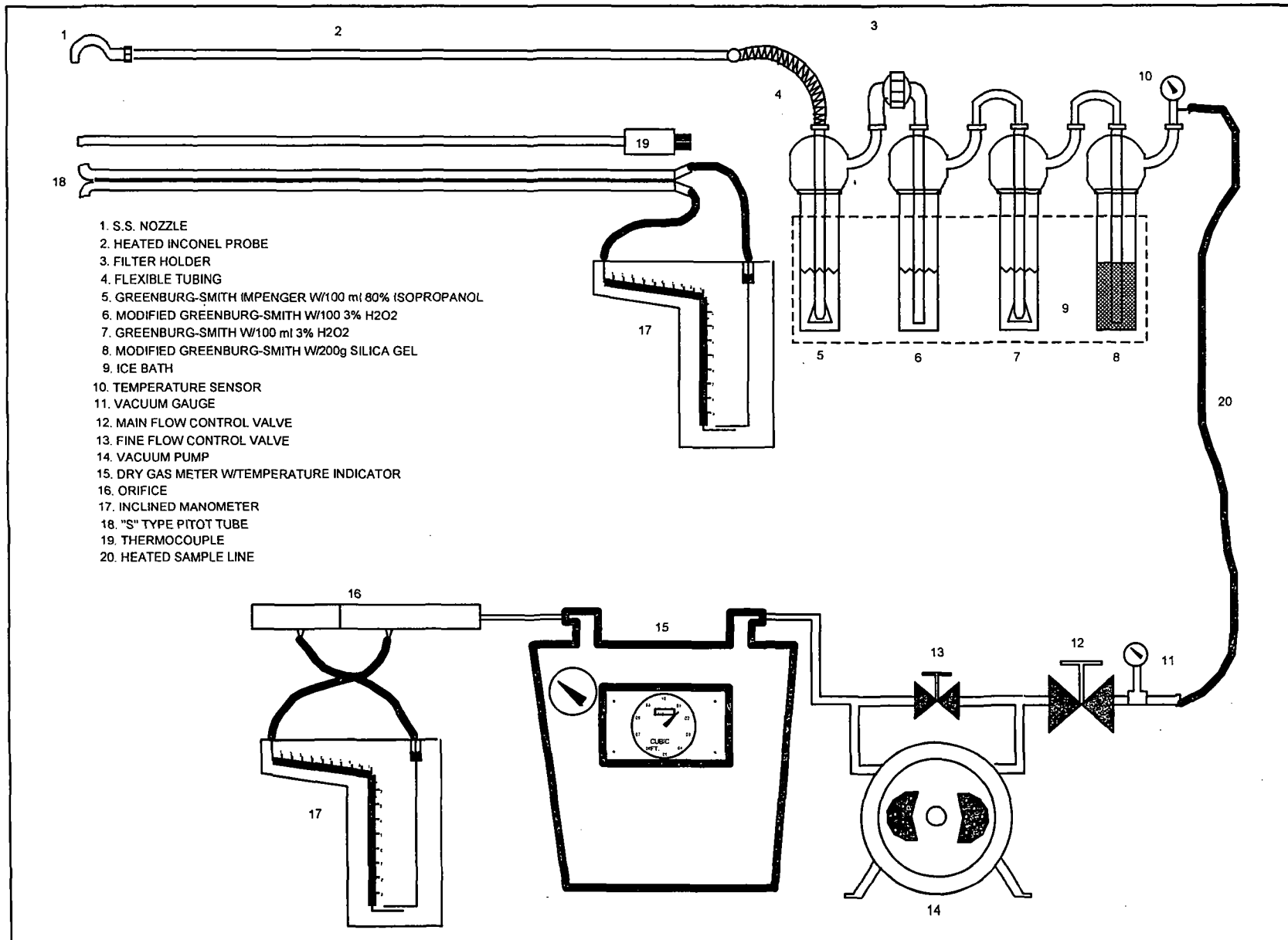
PORT LENGTH = 18 IN.



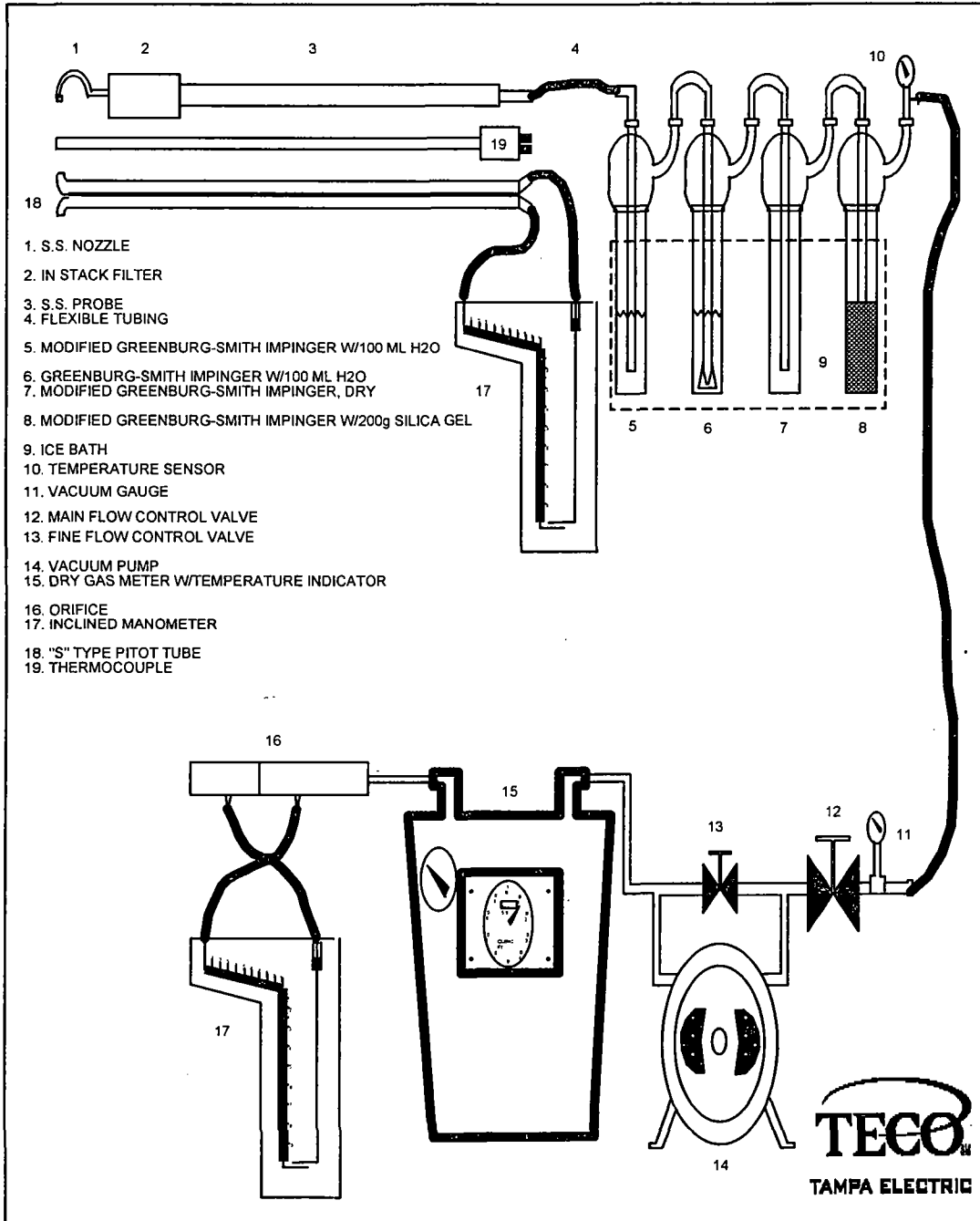
PORT LOCATION PLAN



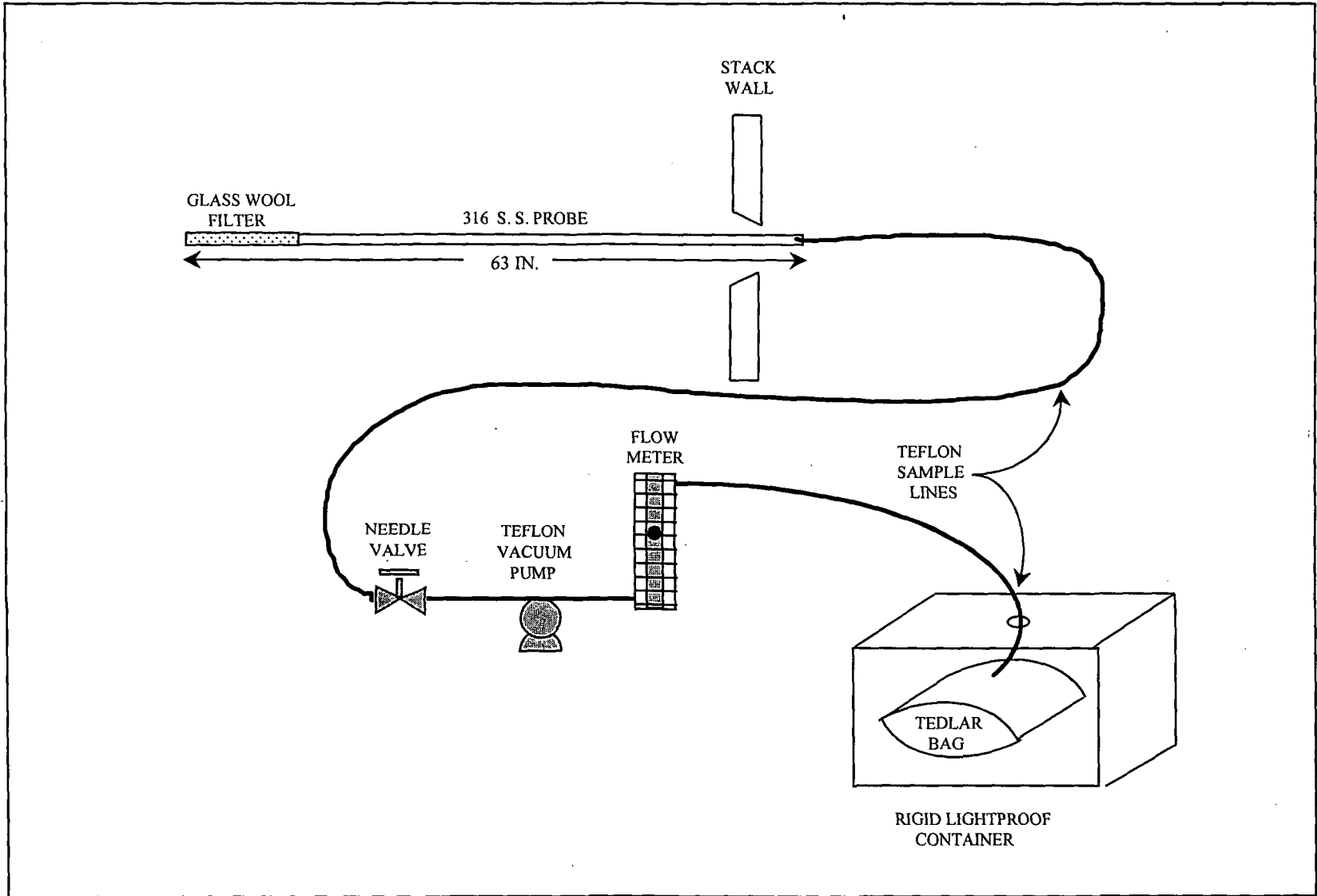




SULFURIC ACID MIST SAMPLING TRAIN  
 USEPA METHOD 8



PARTICULATE SAMPLING TRAIN  
 USEPA METHOD 17



VOC SAMPLING SYSTEM  
USEPA METHOD 18