0570040-11-AC

File -

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BUREAU OF AIR REGULATION

November 22, 2000

Mr. Scott Sheplak, P.E
Administrator, Title V Section
Division of Air Resources Management
Florida Department of Environmental Protection
2600 Blair Stone Road, MS # 5505
Tallahassee, Florida 32399-2400

Via FedEx
Airbill No. 7919 0433 0689

Re: Tampa Electric Company
F.J. Gannon Station - Units 1, 2, 3, and 4
FDEP File No. 0570040-011-AC
Combustion of Coal/Wood-Derived Fuel (WDF) Blends
Response to Additional Information Request

Dear Mr. Sheplak:

Tampa Electric Company (TEC) is in receipt of your letter dated September 26, 2000 requesting additional information regarding the above referenced project. The following is a restatement of the Department's additional information request items and TEC's response.

FDEP Item 1

We need from you a PSD non-applicability analysis. We need at least a comparison of past actual emissions with future actual representative annual emissions as defined in our rules. {See the definitions of actual emissions for electric steam utilities.} Future emissions shall not exceed past emissions by more than 40 TPY of SO2, NOx, VOC or 15 TPY of PM10, 7 TPY of H2SO4, etc.

TEC Response

Please refer to the enclosed document prepared by Tom Davis, P.E., Environmental Consulting & Technology, Inc.

FDEP Item 2

Are there any physical changes that are needed on the boilers or the conveying equipment to burn such fuel? Will any NSPS standards be triggered?

TEC Response

Incorporation of the Wood-Derived Fuel (WDF) will not require any physical change to the boilers or the conveying equipment. No NSPS standards will be triggered.

FDEP Item 3

Is the heat input from this wood fuel separate on an annualized basis from the heat input from coal? Remember that there is a heating value throughput limit on the coalyard. Burning other fuels may actually debottleneck the facility if you are close to the coal use limit.

TEC Response

The annual heat input limitation referred to above (found in Permit No. 0570040-006-AC, Specific Condition 3.a.) is clearly specific to coal fuel heat input only. The amount of WDF throughput, on a 12 consecutive month period, is separately regulated in the above referenced permit at Specific Condition 5. Since these requirements remain in place, there is no debottlenecking issue.

FDEP Item 4

Please provide the WDF test data again from Unit 3 to support this specific application.

TEC Response

The requested information is enclosed.

Your continued expeditious review and approval of this construction permit modification request is appreciated. Please contact Jamie Hunter or me at (813) 641-5033, if there are any questions.

Sincerely,

Karen A. Sheffield

Karen A. Sheffield, P.E.
General Manager/ Responsible Official
F.J. Gannon Station

EP\gm\JJH941

Enclosures

c: Jerry Kissel - FDEP – Southwest District
Jerry Campbell - EPCHC

Re: Tampa Electric Company - F.J. Gannon Station Units 1-4
Modification to Air Construction Permit 0570040-011-AC
Response to Request for Additional Information – PSD Non-Applicability Analysis

Professional Engineer Certification

1. Professional Engineer Name: **Thomas W. Davis**
   Registration Number: **36777**
2. Professional Engineer Mailing Address:
   Organization/Firm: **Environmental Consulting & Technology, Inc.**
   Street Address: **3701 Northwest 98th Street**
   City: **Gainesville** State: **Florida** Zip Code: **32606**
3. Professional Engineer Telephone Numbers:
   Telephone: **(352) 332-0444** Fax: **(352) 332-6722**
4. Professional Engineer Statement:

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

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

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

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

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

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

Thomas W. Davis
Signature

11/17/00
Date

(seal)

* Attach any exception to certification statement.

F.J. GANNON STATION – UNITS 1, 2, 3, AND 4
COMBUSTION OF COAL/WOOD-DERIVED FUEL (WDF) BLENDS
PSD APPLICABILITY ANALYSIS

The procedures for determining applicability of the PSD NSR permitting program to modifications planned at existing major Florida facilities are specified in Rule 62-212.400(2)(d)4., F.A.C. Because the existing F.J. Gannon Station is a major facility (i.e., has potential emissions of 100 tpy or more of an air pollutant subject to regulation under Chapter 403, Florida Statutes) that would be subject to PSD preconstruction review if it were itself a proposed new facility (i.e., has potential emissions of 100 tpy or more of a pollutant regulated under the Clean Air Act and is located in an attainment area), modifications to the existing F.J. Gannon Station which result in a *significant net emissions increase* of any pollutant regulated under the Clean Air Act are subject to PSD NSR.

The term "significant net emission increase" is defined by Rule 62-212.400(2)(e), F.A.C. For each regulated pollutant, the net emission increase for a modification project is equal to the sum of the increases in emissions associated with the proposed project plus all facility-wide creditable, contemporaneous emission increases minus all facility-wide creditable, contemporaneous emission decreases. If this net emissions increase is equal to or greater than the applicable Table 212.400-2, F.A.C. Regulated Pollutants—Significant Emission Rates, then the net emission increase is considered to be "significant" and the modification will be subject to PSD NSR for that particular regulated pollutant.

In accordance with Rule 62-212.400(2)(e)3., F.A.C., the "contemporaneous" period for a modification project begins five years prior to the date of submittal of a complete permit application and ends when the new or modified emission units are estimated to begin operation.

In accordance with Rule 62-212.400(2)(e)4., F.A.C., contemporaneous emission increases and decreases are "creditable" if:

(1) the emission increase or decrease will affect PSD increment consumption; i.e., will

consume or expand the available increment;

(2) The emission increase or decrease was not previously considered in the issuance of a PSD NSR permit (to avoid "double counting"); and

(3) The FDEP has not relied on the emission increase or decrease in attainment or reasonable further progress demonstrations.

Contemporaneous emission increases and decreases are based on *actual* emission rates. The term "actual emissions" is defined by Rule 62-210.200(12), F.A.C. For new emission units, including new electric utility steam generating units, actual emissions are equal to potential emissions. For changes to existing emission units, actual emissions are generally the actual average emission rates, in tpy, for the two year period preceding the change and which are representative of normal operations. The Department may allow the use of a different time period if it is determined that the other time period is more representative of the normal operation of an emissions unit.

For emission decreases, the old level of actual or allowable emissions (whichever is lower) must be greater than the new level of actual emissions. The actual emission decrease must also take place on or before the date that emissions from the modification project first occur and must be federally enforceable on and after the date the Department issues a construction permit for the modification project.

With respect to the use of WDF at the F.J. Gannon Station and PSD applicability, the primary consideration is whether co-firing of WDF at F.J. Gannon Station Units 1, 2, 3, and 4 will cause a significant increase in air emissions. Because the proposed use of WDF at Units 1, 2, 3, and 4 will replace the current use of coal (in amounts up to 4 percent by weight), a significant net increase due to the use of WDF will not occur as long as the emissions resulting from WDF combustion, for each PSD regulated air pollutant, do not exceed the 2 year historical average coal emission rates.

The pollutants addressed by the PSD regulatory program with respect to significant emission rates are listed in Chapter 62-212, Table 212.400-2, F.A.C; these pollutants and their

significant emission rates are shown on Table 1. For the F.J. Gannon Station, measured historical emission rates are obtainable for sulfur dioxide (SO_2), nitrogen oxides (NO_x), and particulate matter (PM) for each unit. SO_2 and NO_x are monitored using continuous emissions monitoring systems (CEMS). PM is monitored on an annual basis using EPA Reference Method 17.

A screening assessment of PSD applicability was first conducted by evaluating the potential for WDF/coal blends to cause an increase in emission rates in comparison to baseline coal based on the test burn results and fuel characteristics. For emissions of PSD pollutants that do not have any potential to increase, no further analysis was necessary.

Because year-to-year variations in operating hours, load, or coal sulfur content are generally *not* considered operational changes and therefore do *not* constitute modifications under the PSD regulatory program, the comparison of actual emission rates was made on a pound of pollutant per million British thermal unit (lb/MMBtu) heat input basis. The F.J. Gannon Station is a baseload facility. The use of WDF will not change the electrical generation capacity of the facility nor change its operating hours from what would have occurred if WDF were not utilized. Hence, a comparison of actual emissions on a lb/MMBtu basis is the most appropriate measure because it effectively excludes permissible variations in operating hours and production rate. To develop actual emission rate changes in terms of the tons per year (tpy) values shown in Chapter 62-212, Table 212.400-2, F.A.C, average load and operating hours for calendar years 1998 and 1999 were used for both the historical and future representative actual annual emissions.

A discussion of the actual emission rate change for each of the PSD pollutants listed on Table 1 is provided in the following sections.

Table 1. Significant Emission Rates for PSD Review

Pollutant	Emission Rate (tpy)	Emission Rate (lb/yr)
CO	100	
NO_x	40	
SO_2	40	
Ozone	40 (as VOC)	
PM	25	
PM_{10}	15	
Total reduced sulfur (including H_2S)	10	
Reduced sulfur compounds (including H_2S)	10	
Sulfuric acid mist	7	
Fluorides	3	
Lead		1,200
Mercury		200
Municipal waste combustor organics		0.007
Municipal waste combustor metals	15	
Municipal waste combustor acid gases	40	
Municipal solid waste landfill emissions	50	

Source: Chapter 62-212, Table 212.400-2, F.A.C.

Sulfur Dioxide (SO_2)

The sulfur content of WDF (0.22 percent by weight, on a dry basis) is much lower than the sulfur content of baseline coal (1.06 percent by weight, on a dry basis). Assuming all fuel sulfur is completely oxidized to sulfur dioxide (SO_2), substitution of WDF for baseline coal will reduce SO_2 emissions by a factor of 4.8 on a pound of WDF per pound of baseline coal basis. To illustrate, 100 lb (dry basis) of baseline coal will generate 2.12 lb of SO_2. In contrast, 100 lb (dry basis) of WDF will generate only 0.44 lb of SO_2. The April 2000 WDF/coal test burn results confirm this conclusion; i.e., the use of 4.0 percent by weight WDF/coal blend resulted in a lower SO_2 emission rate (i.e., 1.538 lb/MMBtu) in comparison to baseline coal (i.e., 1.551 lb/MMBtu). Accordingly, it is concluded that the use of a 4.0 percent by weight WDF/coal blend at F.J. Gannon Station Units 1, 2, 3, and 4 will not cause a significant increase in SO_2 emissions.

Sulfuric Acid Mist (H_2SO_4)

As noted above, the sulfur content of WDF is much lower than the sulfur content of baseline coal. A small portion of fuel sulfur that is oxidized to SO_2 will be further oxidized to sulfur trioxide (SO_3). SO_3, in turn, will readily react with water to form H_2SO_4. Due to the lower sulfur content of WDF in comparison to baseline coal, the potential for WDF to generate H_2SO_4 is also lower. Because of the relatively low conversion rate of SO_2 to SO_3 (approximately seven percent) and low mass fraction of WDF in the WDF/coal blend, use of WDF would not be expected to result in any measurable increase in H_2SO_4 emission rates. The April 2000 WDF/coal test burn results confirm this conclusion; i.e., the use of 4.0 percent by weight WDF/coal blend resulted in the same H_2SO_4 emission rate as baseline coal; i.e., 0.003 lb/MMBtu. Accordingly, it is concluded that the use of a 4.0 percent by weight WDF/coal blend at F.J. Gannon Station Units 1, 2, 3, and 4 will not cause a significant increase in H_2SO_4 emissions.

Nitrogen Oxides (NO_x)

The nitrogen content of WDF (0.774 percent by weight, on a dry basis) is significantly lower than the nitrogen content of baseline coal (1.18 percent by weight, on a dry basis).

NO_x emissions from combustion sources consist of two components: oxidation of combustion air atmospheric nitrogen (thermal NO_x and prompt NO_x) and conversion of chemically fuel bound nitrogen (FBN). Thermal NO_x results from the oxidation of atmospheric nitrogen under high temperature combustion conditions. The amount of thermal NO_x formed is primarily a function of combustion temperature and residence time, air/fuel ratio, and, to a lesser extent, combustion pressure. Thermal NO_x increases exponentially with increases in temperature and linearly with increases in residence time as described by the Zeldovich mechanism. Prompt NO_x is formed near the combustion flame front from the oxidation of intermediate combustion products such as hydrogen cyanide, nitrogen, and NH. Prompt NO_x comprises a small portion of total NO_x in conventional near-stoichiometric burners. Fuel NO_x arises from the oxidation of nonelemental nitrogen contained in the fuel. The conversion of FBN to NO_x depends on the bound nitrogen content of the fuel. In contrast to thermal NO_x, fuel NOx formation does not vary appreciably with combustion variables such as temperature or residence time.

Units 1, 2, 3, and 4 combustion conditions (i.e., combustion temperature and residence time, air/fuel ratio, and combustion pressure) during the use of WDF/coal blends will not differ in comparison to conditions occurring during only coal combustion. Based on the NO_x formation mechanisms described above, substitution of WDF for baseline coal would be expected to result in a reduction in NO_x emissions due to the lower FBN content of WDF. The April 2000 WDF/coal test burn results confirm this conclusion; i.e., the use of 4.0 percent by weight WDF/coal blend resulted in a lower NO_x emission rate (i.e., 0.715 lb/MMBtu) in comparison to baseline coal (i.e., 0.767 lb/MMBtu). Accordingly, it is concluded that the use of a 4.0 percent by weight WDF/coal blend at F.J. Gannon Station Units 1, 2, 3, and 4 will not cause a significant increase in NO_x emissions.

Particulate Matter (PM/PM_{10})

The ash content of WDF (12.1 percent by weight, dry basis) is slightly higher than the ash content of baseline coal (9.75 percent by weight, dry basis). Accordingly, emissions of PM/PM_{10} could potentially increase due to the substitution of WDF for baseline coal. However, Units 1, 2, 3, and 4 are each equipped with efficient electrostatic precipitators

(ESPs) for PM/PM_{10} removal. Accordingly, the slight increase in WFD ash content and low mass fraction of WDF in the WDF/coal blend would not be expected to result in any measurable increase in PM/PM_{10} emission rates. The April 2000 WDF/coal test burn results confirm this conclusion; i.e., the use of 4.0 percent by weight WDF/coal blend resulted in the same PM/PM_{10} (conservatively assuming PM_{10} and PM emissions are equal) emission rate as baseline coal; i.e., 0.03 lb/MMBtu. In addition, the observed opacity (i.e., an average of zero percent) was the same for both baseline coal and the WDF/coal blend tests. Accordingly, it is concluded that the use of a 4.0 percent by weight WDF/coal blend at F.J. Gannon Station Units 1, 2, 3, and 4 will not cause a significant increase in PM/PM_{10} emissions.

Carbon Monoxide (CO) and Volatile Organic Compounds (VOCs)

Emissions of CO and VOCs from fossil fuel combustion result from the partial oxidization of hydrocarbons contained in the fossil fuel. CO and VOC emissions are a function of the combustion process including combustion temperature and residence time, air/fuel ratio, and combustion pressure. As with most combustion processes, Units 1, 2, 3, and 4 operate with excess air to ensure complete combustion. For this reason, emissions of CO and VOCs from fossil fuel combustion are relatively low.

As noted previously, Units 1, 2, 3, and 4 combustion conditions during the use of WDF/coal blends will not differ in comparison to conditions occurring during only coal combustion. Because CO and VOC emissions depend primarily on process operations (i.e., extent of complete combustion) and not on fuel characteristics, no measurable changes in CO or VOC emissions are expected due to the substitution of WDF for coal. The April 2000 WDF/coal test burn results confirm this conclusion for VOCs; i.e., the use of 4.0 percent by weight WDF/coal blend resulted in the same VOC emission rate as baseline coal; i.e., an exhaust concentration of 1.00 parts per million by volume (ppmv) based on the minimum detection limit of the test. Therefore, it is concluded that the use of a 4.0 percent by weight WDF/coal blend at F.J. Gannon Station Units 1, 2, 3, and 4 will not cause a significant increase in CO or VOC emissions.

Remaining PSD Pollutants

In addition to the PSD pollutants discussed above, significant emission rate thresholds exist for total reduced sulfur (including H_2S), reduced sulfur compounds (including H_2S), fluorides, lead, mercury, municipal waste combustor organics, municipal waste combustor metals, municipal waste combustor acid gases, and municipal solid waste landfill emissions.

Emissions of total reduced sulfur and reduced sulfur compounds due to the combustion of WDF are considered to be negligible. As mentioned previously, Units 1, 2, 3, and 4 operate with excess air to ensure complete combustion. Therefore, the formation of reduced sulfur or reduced sulfur compounds would be expected to be negligible in the oxidizing atmosphere of a fossil fuel combustion process. The fluoride, lead, and mercury contents of WDF are negligible or lower than baseline coal. Units 1, 2, 3, and 4 do not combust municipal waste and therefore the PSD emission thresholds for municipal waste pollutants are not applicable.

Based on the above, it is concluded that the use of a 4.0 percent by weight WDF/coal blend at F.J. Gannon Station Units 1, 2, 3, and 4 will not cause a significant increase in total reduced sulfur (including H_2S), reduced sulfur compounds (including H_2S), fluorides, lead, mercury, municipal waste combustor organics, municipal waste combustor metals, municipal waste combustor acid gases, and municipal solid waste landfill emissions.

Summary of Actual Emission Changes for PSD Regulated Air Pollutants

As indicated in Table 1, the significant emission rates for PSD review are expressed in units of tpy. Summaries of the actual emission rate changes due to the use of up to 4.0 weight percent WDF as a replacement for coal for F.J. Gannon Station Units 1, 2, 3, and 4 are shown on Tables 2 through 5, respectively.

Table 2. Summary of Actual Emission Rate Changes, F.J. Gannon Station PSD Regulated Air Pollutants - Unit No. 1

Average 98/99 Heat Input for Unit No. 1 5,627,183 MMBtu/yr

Pollutant	Emission Factors		Actual Emission Rates[1]		Emission Rate Change[2] (tpy)
	Baseline Coal (lb/MMBtu)	WDF/Coal Blends (lb/MMBtu)	Baseline Coal (tpy)	WDF/Coal Blends (tpy)	
CO[3]	0.295	0.295	830.0	830.0	0.0
NO_x[4]	0.767	0.715	2,158.0	2,011.7	-146.3
SO_2[4]	1.551	1.538	4,363.9	4,327.3	-36.6
Ozone (as VOC)[5]	0.0058	0.0058	16.2	16.2	0.0
PM[4]	0.030	0.030	84.4	84.4	0.0
PM10[4,6]	0.030	0.030	84.4	84.4	0.0
Total Reduced Sulfur	Neg.	Neg.	Neg.	Neg.	Neg.
Reduced Sulfur Compounds	Neg.	Neg.	Neg.	Neg.	Neg.
Sulfuric Acid Mist[7]	0.007	0.007	20.8	20.8	0.0
Fluorides	Neg.	Neg.	Neg.	Neg.	Neg.
Lead	Neg.	Neg.	Neg.	Neg.	Neg.
Mercury	Neg.	Neg.	Neg.	Neg.	Neg.
Municipal waste combustor organics	N/A	N/A	N/A	N/A	N/A
Municipal waste combustor metals	N/A	N/A	N/A	N/A	N/A
Municipal waste combustor acid gases	N/A	N/A	N/A	N/A	N/A
Municipal solid waste landfill emissions	N/A	N/A	N/A	N/A	N/A

[1] [Emission Factor (lb/MMBtu)] * [Average Heat Input (MMBtu/yr)] * [(1 ton / 2,000 lb)]

[2] [WDF/Coal Blend (tpy) - Coal (tpy)]

[3] Unit 5 April 2000 stack test data.

[4] Unit 3 April 2000 baseline coal and 4.0 percent by weight WDF/coal blend performance tests.

[5] AP-42 emission factor of 0.11 lb/ton and baseline coal heat content of 9,524 Btu/lb.

[6] Assume PM and PM_{10} emissions are equal.

[7] 7.0 % conversion of fuel S to SO_3, 100% conversion of SO_3 to H_2SO_4, baseline coal sulfur content of 0.82 weight % and heat content of 9,524 Btu/l

Neg = negligible

N/A = not applicable

Table 3. Summary of Actual Emission Rate Changes, F.J. Gannon Station
PSD Regulated Air Pollutants - Unit No. 2

Average 98/99 Heat Input for Unit No. 2 5,352,678 MMBtu/yr

Pollutant	Emission Factors		Actual Emission Rates[1]		Emission Rate Change[2]
	Baseline Coal (lb/MMBtu)	WDF/Coal Blends (lb/MMBtu)	Baseline Coal (tpy)	WDF/Coal Blends (tpy)	(tpy)
CO[3]	0.295	0.295	789.5	789.5	0.0
NO_x[4]	0.767	0.715	2,052.8	1,913.6	-139.2
SO_2[4]	1.551	1.538	4,151.0	4,116.2	-34.8
Ozone (as VOC)[5]	0.0058	0.0058	15.5	15.5	0.0
PM[4]	0.030	0.030	80.3	80.3	0.0
PM10[4,6]	0.030	0.030	80.3	80.3	0.0
Total Reduced Sulfur	Neg.	Neg.	Neg.	Neg.	Neg.
Reduced Sulfur Compounds	Neg.	Neg.	Neg.	Neg.	Neg.
Sulfuric Acid Mist[7]	0.007	0.007	19.8	19.8	0.0
Fluorides	Neg.	Neg.	Neg.	Neg.	Neg.
Lead	Neg.	Neg.	Neg.	Neg.	Neg.
Mercury	Neg.	Neg.	Neg.	Neg.	Neg.
Municipal waste combustor organics	N/A	N/A	N/A	N/A	N/A
Municipal waste combustor metals	N/A	N/A	N/A	N/A	N/A
Municipal waste combustor acid gases	N/A	N/A	N/A	N/A	N/A
Municipal solid waste landfill emissions	N/A	N/A	N/A	N/A	N/A

[1] [Emission Factor (lb/MMBtu)] * [Average Heat Input (MMBtu/yr)] * [(1 ton / 2,000 lb)]

[2] [WDF/Coal Blend (tpy) - Coal (tpy)]

[3] Unit 5 April 2000 stack test data.

[4] Unit 3 April 2000 baseline coal and 4.0 percent by weight WDF/coal blend performance tests.

[5] AP-42 emission factor of 0.11 lb/ton and baseline coal heat content of 9,524 Btu/lb.

[6] Assume PM and PM_{10} emissions are equal.

[7] 7.0 % conversion of fuel S to SO_3, 100% conversion of SO_3 to H_2SO_4, baseline coal sulfur content of 0.82 weight % and heat content of 9,524 Btu/

Neg = negligible
N/A = not applicable

Table 4. Summary of Actual Emission Rate Changes, F.J. Gannon Station
PSD Regulated Air Pollutants - Unit No. 3

Average 98/99 Heat Input for Unit No. 3 8,766,658 MMBtu/yr

Pollutant	Emission Factors		Actual Emission Rates[1]		Emission Rate
	Baseline Coal (lb/MMBtu)	WDF/Coal Blends (lb/MMBtu)	Baseline Coal (tpy)	WDF/Coal Blends (tpy)	Change[2] (tpy)
CO[3]	0.295	0.295	1,293.1	1,293.1	0.0
NO_x[4]	0.767	0.715	3,362.0	3,134.1	-227.9
SO_2[4]	1.551	1.538	6,798.5	6,741.6	-57.0
Ozone (as VOC)[5]	0.0058	0.0058	25.3	25.3	0.0
PM[4]	0.030	0.030	131.5	131.5	0.0
PM10[4,6]	0.030	0.030	131.5	131.5	0.0
Total Reduced Sulfur	Neg.	Neg.	Neg.	Neg.	Neg.
Reduced Sulfur Compounds	Neg.	Neg.	Neg.	Neg.	Neg.
Sulfuric Acid Mist[7]	0.007	0.007	32.4	32.4	0.0
Fluorides	Neg.	Neg.	Neg.	Neg.	Neg.
Lead	Neg.	Neg.	Neg.	Neg.	Neg.
Mercury	Neg.	Neg.	Neg.	Neg.	Neg.
Municipal waste combustor organics	N/A	N/A	N/A	N/A	N/A
Municipal waste combustor metals	N/A	N/A	N/A	N/A	N/A
Municipal waste combustor acid gases	N/A	N/A	N/A	N/A	N/A
Municipal solid waste landfill emissions	N/A	N/A	N/A	N/A	N/A

[1] [Emission Factor (lb/MMBtu)] * [Average Heat Input (MMBtu/yr)] * [(1 ton / 2,000 lb)]

[2] [WDF/Coal Blend (tpy) - Coal (tpy)]

[3] Unit 5 April 2000 stack test data.

[4] Unit 3 April 2000 baseline coal and 4.0 percent by weight WDF/coal blend performance tests.

[5] AP-42 emission factor of 0.11 lb/ton and baseline coal heat content of 9,524 Btu/lb.

[6] Assume PM and PM_{10} emissions are equal.

[7] 7.0 % conversion of fuel S to SO_3, 100% conversion of SO_3 to H_2SO_4, baseline coal sulfur content of 0.82 weight % and heat content of 9,524 Btu

Neg = negligible
N/A = not applicable

Table 5. Summary of Actual Emission Rate Changes, F.J. Gannon Station PSD Regulated Air Pollutants - Unit No. 4

Average 98/99 Heat Input for Unit No. 4 8,967,597 MMBtu/yr

Pollutant	Emission Factors		Actual Emission Rates[1]		Emission Rate Change[2] (tpy)
	Baseline Coal (lb/MMBtu)	WDF/Coal Blends (lb/MMBtu)	Baseline Coal (tpy)	WDF/Coal Blends (tpy)	
CO[3]	0.295	0.295	1,322.7	1,322.7	0.0
NO_x[4]	0.767	0.715	3,439.1	3,205.9	-233.2
SO_2[4]	1.551	1.538	6,954.4	6,896.1	-58.3
Ozone (as VOC)[5]	0.0058	0.0058	25.9	25.9	0.0
PM[4]	0.030	0.030	134.5	134.5	0.0
PM10[4,6]	0.030	0.030	134.5	134.5	0.0
Total Reduced Sulfur	Neg.	Neg.	Neg.	Neg.	Neg.
Reduced Sulfur Compounds	Neg.	Neg.	Neg.	Neg.	Neg.
Sulfuric Acid Mist[7]	0.007	0.007	33.1	33.1	0.0
Fluorides	Neg.	Neg.	Neg.	Neg.	Neg.
Lead	Neg.	Neg.	Neg.	Neg.	Neg.
Mercury	Neg.	Neg.	Neg.	Neg.	Neg.
Municipal waste combustor organics	N/A	N/A	N/A	N/A	N/A
Municipal waste combustor metals	N/A	N/A	N/A	N/A	N/A
Municipal waste combustor acid gases	N/A	N/A	N/A	N/A	N/A
Municipal solid waste landfill emissions	N/A	N/A	N/A	N/A	N/A

[1] [Emission Factor (lb/MMBtu)] * [Average Heat Input (MMBtu/yr)] * [(1 ton / 2,000 lb)]

[2] [WDF/Coal Blend (tpy) - Coal (tpy)]

[3] Unit 5 April 2000 stack test data.

[4] Unit 3 April 2000 baseline coal and 4.0 percent by weight WDF/coal blend performance tests.

[5] AP-42 emission factor of 0.11 lb/ton and baseline coal heat content of 9,524 Btu/lb.

[6] Assume PM and PM_{10} emissions are equal.

[7] 7.0 % conversion of fuel S to SO_3, 100% conversion of SO_3 to H_2SO_4, baseline coal sulfur content of 0.82 weight % and heat content of 9,524 Btu/

Neg = negligible

N/A = not applicable