Westinghouse Electric Corporation

Advanced Power Systems Divisions

Waste Technology Services Division

Box 286
Madison Pennsylvania 15663-0286
(412) 722 5000

May 25, 1984

DER

MAY 29 1984

BAQM

Mr. Clair Fancy
Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32301

Re: Westinghouse Air Construction Permit Application for Bay County Resource Recovery Facility AC 03-84703 and AC 03-84704

Dear Mr. Fancy:

Enclosed please find the following documents submitted by the Waste Technology Services Division of Westinghouse Electric Corporation in regard to the above-referenced air permit applications.

1. Responses to each item of your letter to Mr. F. S. Pollier dated April 16, 1984, in which the Department requested additional information regarding the air permit application for the proposed facility submitted by Westinghouse on March 22, 1984. (See Attachments I and II hereto.)

2. The original and four copies of a revised air construction permit application for the proposed facility, with Attachments "A" through "I".

Please note that the revised permit application includes one change in the facility design. Economic studies have determined that this project cannot be financed at the original design capacity of 350 tons per day of MSW because of the need for a larger revenue stream. This can best be accomplished by increasing plant capacity to the equivalent of 510 tons per day of MSW and supplementing the available MSW with increased quantities of wood waste. This allows higher steam production and increased electrical generation, which is our primary revenue base outside the Bay County tipping fee. We are obligated to minimize this tipping fee for the benefit of Bay County and its citizens.

In an effort to avoid delay in the permitting process, the air permit application and attachments have been substantially revised to provide the information necessary for PSD review of the proposed facility, and to supply all information requested in your letter of April 16, 1984. Westinghouse believes this approach is in the best interests of the Bay County project, provided that the Department can review and process the revised application on an expedited schedule, as you indicated would be the case at your meeting with Peter Cunningham on April 16, 1984. The only information that remains outstanding is Attachment "J" to the revised permit application (the Air Quality Dispersion Modeling Report), which is being finalized by Southern Company Services and will be submitted in the very near future.

Any questions regarding this permit application should be addressed to:

Fred S. Pollier/J.D. Phillips
Westinghouse Electric Corporation
Waste Technology Services Division
Post Office Box 286
Madison, PA 15663-0286

Please note our change in location since the original application.

Sincerely,

FOR Fred S. Pollier
Project Manager
Bay County Project

Enclosures

cc: Nancy Wright, Esquire (w/o enclosure)
Bob King (w/ enclosure, except Attachment "J")
Cleve Holladay (w/ Attachment "J" only)
Steve Fox (w/o enclosure)
Larry Lukin (w/o enclosure)
Robert V. Kriegel (w/o enclosure)

bcc: J.W. Bohlig
L.P. Duffy
J.W. Fisch
G.B. Levin
R.L. Grandy
J.D. Phillips
V. Campbell
C.J. Bailey, EPR
G. Layman, Gulf
L. Burke, Bay Co.
W. May, Sanders & Thomas
W.H. Green
J.T. McClain
M.E. Kirkpatrick (2)

ATTACHMENT I

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301-8241

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

April 16, 1984

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

F. S. Pollier/J. D. Phillips
Westinghouse Electric Corporation
Waste Technology Services Division
P. O. Box 10864
Pittsburgh, Pennsylvania 15236

Re: Bay County Resource Recovery Facility,
Air Construction Permits: AC 03-84703, and AC 03-84704

Dear Mr. Pollier:

The Bureau of Air Quality Management received your applications on March 26, 1984, for construction permits of two MSW-fired incinerators in Panama City, Florida. After reviewing these applications, the bureau has determined both applications to be incomplete. Before the applications can be further processed, the bureau has comments and requires additional information for each application as following:

1. According to EPA's document, if the resource recovery facility has a charging rate greater than 50 tons per day and burns solid waste, it would be subject to the incinerator NSPS. Therefore, your proposed new sources (350 tons/day) are subject to Subpart E, NSPS. Section IV of the application is applicable.

2. The proposed facility is a major facility based on the Table 500-1, Major Facility Categories, in Chapter 17-2. Therefore, the state PSD requirement applies to this facility according to FAC Rule 17-2.500(2)(d)2. Submit the necessary information and data for BACT analysis review. Also submit an air quality impact analysis to include an analysis of existing air quality, a PSD increment analysis, a National Ambient Air Quality Standards (NAAQS) analysis and an analysis of impact on soils, vegetation and visibility and growth related air quality impacts.

3. Provide all information on the turbine generators including, but not limited to, rating, manufacturer, and efficiency.

4. Will the Bay County Board of County Commissioners or the selected vendor operate this resource recovery facility?

5. Submit a vendor's guarantee that the two proposed ESPs will be capable of controlling particulate emissions to 0.02 gr/dscf corrected to 12% CO_2 when firing MSW, wood chips or both.

6. When burning wood chips in the incinerators, what is the expected resistivity (ohm/centimeter) of the fly ash?

7. What percent (by weight) of the fly ash will be less than 10 microns when burning wood chips? What percent of the fly ash will be less than 5 microns?

8. When burning wood chips, there is the possibility of a fire hazard in the ESP. What precautions will be taken to avoid such a possibility?

9. The air emission tests at Gallatin, TN indicate that NRT fuel behaves differently in the O'Connor Rotary Combustor than raw waste. Will there be any difference when burning wood chips?

10. Will each rotary combustor have the capability to be operated under automatic combustion control (ACC)?

11. Attachment 11.A. in your application refers to the baghouse failure at Gallatin, TN. The control device at Gallatin was a Apitron electrostatically-assisted fabric filter. Submit your data that indicated the baghouse was at fault, not the ESP.

12. Cooper Engineers tested two 165 TPD units (in Japan) with an air pollution control system consisting of a TESI dry scrubber, dry venturi and baghouse. The

preliminary test results indicate: 99% plus reduction in particulate, HCl gases, and SO_2 emissions; 70% plus reduction in HF gases; 30% reduction in mercury. Submit economic, energy, and environmental impact analysis for the comparison between this system and the control system you proposed on the application.

13. Will your proposed sources burn any sludge from any wastewater treatment plant?

14. Submit fuel sample analysis reports on the proposed fuels: MSW and wood chips. The SO_2 and Pb emissions listed in your application seem much lower than average.

15. Submit revised applications to replace the current applications, the revised ones should include all corrections and additional information required by items 1 thru 14 on this letter.

When the revised applications are received, we will resume processing your applications. If you have any questions on the information we request, please write me at the above address or call Bob King, Review Engineer, at (904)488-1344. Cleve Holladay should be called on any question related to modeling.

Sincerely,

C. H. Fancy, P.E.
Deputy Bureau Chief
Bureau of Air Quality Management

CHF/BK/s
cc: Jack Preece
Peter Cunningham
Alan Richter
Cleve Holladay

ATTACHMENT II

Westinghouse Responses to DER Questions on
Air Permit Application for
Bay County Resource Recovery Facility

Response to Item 1.

As explained in Peter Cunningham's letter of April 16, 1984 to Steve Smallwood, Westinghouse believes the proposed combustor/boilers are "Carbonaceous Fuel Burning Equipment" under the Department's rules, and not "incinerators" or "Municipal Incinerators". In an effort to expedite the permitting process for this facility, however, Section IV of the attached revised air permit application has been filled out, and other information requirements for an "incinerator" have been provided.

Response to Item 2.

The attached revised air permit application and attachments include the necessary information regarding BACT review (Attachment "G"), air quality impact analysis (Attachments "H") and additional impact analyses. (Attachment "I".) No preconstruction monitoring is required for the proposed facility because its predicted ambient air quality impacts fall below the de minimus impact levels specified in F.A.C. §17-2.500, Table 500-3. See F.A.C. §17-2.500(3)(e).

Response to Item 3.

Turbine generators will be purchased from one of the following manufacturers: Westinghouse, Mitsubishi, Turbodyne, Terry. Other information on the turbine generators is listed below.

Rating:	10 megawatts
Efficiency:	78%
Steam Inlet Conditions:	600 PSIG
	750°F
	Approx. 114,000 lb/hr.
Steam Exhaust Conditions:	3" Hga

Response to Item 4.

Operation of the proposed facility will be by Gulf Power Company, via Southern Company's unregulated subsidiary, Southern Electric International.

Response to Item 5.

Performance guarantees from the selected vendor will state that the ESP outlet particulate concentration will be no greater than 0.02 grams per standard cubic foot dry absolute, corrected to 12% CO_2. These guarantees will apply for firing of both municipal solid waste and supplementary fuel consisting of wood waste and bark.

Response to Item 6.

Fly ash resistivity resulting from burning of wood waste and bark is normally in the range of 10^5 to 10^7 ohms per centimeter. Resistivity of municipal solid waste incinerator fly ash is normally in the range of 10^9 ohms per centimeter. The difference in fly ash resistivity for these two fuels should not result in any significant difference in ESP performance. Moreover, wood waste will be utilized only as a supplemental fuel, with municipal solid waste as the primary fuel providing the vast majority of annual heat input. The minimum daily MSW tonnage weighed to date in Bay County is 250 tons per day. The design and equipment for the proposed facility provides for supplementing the 250 ton per day of MSW (minimum) with up to 220 tons per day of waste wood to keep the plant at full capacity and maximize revenues to the benefit of Bay County. Burning of 100% wood waste in the proposed facility is not intended or anticipated.

Response to Item 7.

Fly ash from burning of wood waste can be expected to produce particle size ranges in the following percentages:

Particle Size (microns)	Percentage
Less than 1	5
Less than 5	30-67
Less than 10	50-98
Less than 20	99

Source: American Air Filter Corp.

Response to Item 8.

The best method for preventing ESP fires is adherence to good operation and maintenance practice, along with control of the boiler to eliminate fuel-rich conditions in the furnace. In addition, the ESP will be fitted with a steam smothering nozzle to minimize fire hazard.

Response to Item 9.

There is no reason to believe that combustion characteristics of wood waste and bark will adversely affect the performance of either the combustor/boilers or the ESP's proposed for control of particulate emissions. The revised permit application utilizes emission factors for wood waste and bark from EPA's AP-42 publication in regard to emission levels for pollutants other than particulate matter. Note that the O'Connor rotary combustor was originally patented as a wood-burning unit.

Response to Item 10.

An automatic combustion control system will be provided for each of the two rotary combustors.

Response to Item 11.

The Apitron unit originally installed at the Gallatin facility cannot be considered an electrostatic precipitator followed by a baghouse. While there was a small (so-called) electrostatic section in the lower part of the unit, the failures were caused by burning bags ignited by burning particles in the gas stream (sparklers), along with a very poor air to cloth ratio that allowed bag blinding to inhibit boiler draft. In addition, flue gas entered the bags from the inside rather than the outside, thus adding to the propensity for unit failure. It is, therefore, clear that the baghouse was "at fault." Suffice it to say that Apitron has withdrawn from this market and this technology is not a viable option for the proposed facility.

Response to Item 12.

The air pollution control devices utilized at the referenced Japanese facility are addressed in the BACT analysis provided with the revised air permit application. (See Attachment "G".) It should be emphasized that the Japanese system provides no better particulate emission control than is expected from the proposed ESPs. Control of other pollutants (SO_2, HCL gases, HF gases, mercury) does not justify utilization of the Japanese system at the proposed facility because of the minimal levels of emissions of such pollutants that will be emitted from the proposed facility, and the insignificant environmental impact of those emissions. As shown in the BACT analysis, higher capital, operation and maintenance costs of the Japanese system make it non-cost-effective as compared to the proposed ESPs.

Response to Item 13.

No wastewater treatment plant sludge will be burned at the proposed facility.

Response to Item 14.

Fuel analyses for MSW and wood waste are provided in Attachment "C" to the revised air permit application. The abated lead emission levels shown in the application are calculated on the basis of data from the Gallatin facility showing lead as a percentage of particulate matter, multiplied by the weight of particulate emissions. (See Attachment "D" to the revised air permit application.) Note that lead emission factors in Table 5-24 in Cooper Engineers' report on the Gallatin facility are unabated -- i.e., from samples taken prior to the particulate control device. After discussion with BAQM staff, the SO_2 emission factor utilized in the revised permit application has been changed to 2.8 pounds per ton of MSW, based on the data from the Gallatin facility.

Response to Item 15.

An original and four copies of a revised air permit application are enclosed, along with Attachments "A" through "I" thereto. Attachment "J" to the application (the Air Quality Dispersion Modeling Report) is being finalized and will be submitted in the very near future.

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

NORTHWEST DISTRICT

160 GOVERNMENTAL CENTER
PENSACOLA, FLORIDA 32501

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

ROBERT V. KRIEGEL
DISTRICT MANAGER

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Resource Recovery Facility Comprising 2 Combustor/Boilers [X] New[1] [ ] Existing[1]

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

COMPANY NAME: Bay County Energy Resources, "A Joint Venture" 5433 Westheimer, Suite 1106, Houston, Texas 77056 c/o Environmental Protection Resources, Inc. COUNTY: Bay

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) 2 MSW-fired combustor/ boilers with electrostatic ~~precipitators and separate~~ stacks

SOURCE LOCATION: Street U.S. Highway 231 City Panama City

UTM: East ______ North ______

Latitude 30 ° 15 ' ___ "N Longitude 85 ° 30 ' ___ "W

APPLICANT NAME AND TITLE: Bay County Energy Resources, "A Joint Venture" - C.J. Bailey, ~~President~~

APPLICANT ADDRESS: c/o Westinghouse Waste Technology Services Division, Bay County ~~Waste-To-Energy Project, P.O.Box 286, Madison, PA 15663~~ Attention: F.S. Pollier, Project Manager

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of Bay County Energy Resource "A Joint Venture"

I certify that the statements made in this application for an Air Pollution Source 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 contro facilities in such a manner as to comply with the provision of Chapter 403, Florid Statutes, and all the rules and regulations of the department and revisions thereof. also understand that a permit, if granted by the department, will be non-transferabl and I will promptly notify the department upon sale or legal transfer of the permitte establishment.

*Attach letter of authorization

Signed: [signature]

C.J. Bailey, Jr., President, Environmental Protection Resources, In
Name and Title (Please Type)

Date: ______ Telephone No. (713)626-5691

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 hav been designed/examined by me and found to be in conformity with modern engineerin principles applicable to the treatment and disposal of pollutants characterized in th permit application. There is reasonable assurance, in my professional judgment, tha

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

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.

ALAN F. RICHTER
CERTIFICATE
No. 13826
STATE OF FLORIDA
REGISTERED ENGINEER

Signed

Alan F. Richter, P.E., President
Name (Please Type)

STV ENGINEERS, INC.
Company Name (Please Type)

11 Robinson St., Pottstown, PA 19464
Mailing Address (Please Type)

Florida Registration No. 13826 Date: 4/25/84 Telephone No. 215-326-4600

*Also see Attachment "A" for certification of Milton E. Kirkpatrick, P.E.

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 "B"

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

Start of Construction 4th Quarter 1984 Completion of Construction 4th Quarter 1986

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.)

Preliminary engineering estimates for two (2) electrostatic precipitators are $1,100,000. This figure includes the cost of precipitators, transformer-rectifier units, heated-insulated ash hoppers, and controls.

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

None

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ; if power plant, hrs/yr 8760; if seasonal, describe: This facility is expected to be in continuous operation except for maintenance outages. Full capacity of 350 tons per day of municipal solid waste will not normally be realized except in the summer vacation season. Wood-waste and bark will be burned as supplemental fuel.

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

1. Is this source in a non-attainment area for a particular pollutant? No

   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. Yes

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

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

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

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? No

   a. If yes, for what pollutants? ______

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

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

* This revised application has been completed as if the proposed facility constitutes an Incinerator subject to NSPS requirements under 40 CFR Part 60, Subpart E.

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

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

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): 29166.6 lbs/hr MSW plus 11,233.3 lbs/hr. Wood = 40,400 lbs/hr. total
2. Product Weight (lbs/hr): 114,400 lbs/hr steam

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)
For each of the two combustor/boiler stacks: (See Attachment "D")

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 Matter	5.72	25.05	0.08 grains per scf dry gas corr. to 50% excess air*	15.3	429	1879	
CO	115.4	505			115.4	505	
SO_2	22.1	96.4			22.1	96.4	
NO_x	24.4	107			24.5	107	
HC	9.0	39			9.0	39	
Lead	.0358	315 #/Yr			2	8.76	

[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).

* per 17-2.600(1)(c)1. Also see 40 CFR §60.52 (NSPS for incinerators as incorporated by reference in 17-2.660) which establishes a standard for particulate matter of 0.08 grains per dscf, corrected to 12% CO_2.

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

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

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): 29166.6 lbs/hr MSW plus 11,233.3 lbs/hr. Wood = 40,400 lbs/hr. total
2. Product Weight (lbs/hr): 114,400 lbs/hr steam

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)
For each of the two combustor/boiler stacks: (See Attachment "D")

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 Matter	5.73	25.05	0.08 grains per scf dry	~~15.3~~ 5.73	429	1879	
CO	115.4	505	gas corr. to 50% excess	↑	115.4	505	
SO_2	22.1	96.4	air* BACT →		22.1	96.4	
NO_x	24.4	107			24.5	107	
HC	9.0	39			9.0	39	
Lead	.0358	315 #/Yr			2	8.76	

[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).

* per 17-2.600(1)(c)1. Also see 40 CFR §60.52 (NSPS for incinerators as incorporated by reference in 17-2.660) which establishes a standard for particulate matter of 0.08 grains per dscf, corrected to 12% CO_2.

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 Precipitator	Particulate/ Lead	Approx. 99%	1.0 Micron to 20 Micron	Cooper & Clark Table 5-11

E. Fuels For each of the two units:

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
Municipal Solid Waste	12,500	14583.3	65.6
Wood Waste and Bark	7408	9,201	48.16
Natural Gas	Will be used for startup & shutdown	30 MCF/hr	30

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

Fuel Analysis: For standard MSW (See Attachment "C" for wood waste analysis)

Percent Sulfur: 0.16 Percent Ash: 27.58 (typical)

Density: N/A lbs/gal Typical Percent Nitrogen: 0

Heat Capacity: 4500 BTU/lb N/A BTU/gal

Other Fuel Contaminants (which may cause air pollution): Primary fuel will be type III municipal solid waste. Small quantities of lead will be present. No hazardous waste will be accepted for burning.

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

Annual Average ________ Maximum ________

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

Bottom ash and fly ash to be co-mingled and transported to Bay County Landfill. All liquid wastes (cooling tower blowdown, boiler blowdown, ash quench water overflow, excess cooling water, sanitary waste, plant washdown water) will be pretreated and discharged through sanitary sewers to Bay County Sewage Treatment Plant.

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

Stack Height: 2 stacks, each 125 ft. Stack Diameter: 4 ft.

Gas Flow Rate: 42744 ACFM 22280 DSCFM Gas Exit Temperature: 400 °F.

Water Vapor Content: 20 % Velocity: 3403 FPM ~~FPS~~

SECTION IV: INCINERATOR INFORMATION

Combined total for both units:

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	875	——4375——		23917	—	—	—
Uncontrolled (lbs/hr)	——510 lbs/hr. max.——						

Description of Waste Municipal Solid Waste, supplemented by waste wood and bark

Total Weight Incinerated (lbs/hr) 29166.6 MSW Design Capacity (lbs/hr) 40,400 MSW + wood

Approximate Number of Hours of Operation per day 24 day/wk 7 wks/yr. 52

Manufacturer O'Connor Combustor Corp.

Date Constructed 1984-5 Model No. RC-120(2)

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

Stack Height: 2 stacks, each 125 ft. Stack Diamter: 4 ft. Stack Temp. 400°F

Gas Flow Rate: 42744 ACFM 22280 DSCFM* Velocity: 3403 FPM ~~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) Electrostatic Precipitator

Brief description of operating characteristics of control devices: ESP with approx. 99% particulate removal efficiency and design emission rate of 0.02 grains per dscf corr. to 12% CO_2. (Also see BACT Analysis provided as Attachment "G".)

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

Bottom ash and fly ash to be co-mingled and transported to Bay County Landfill. All liquid wastes (cooling tower blowdown, boiler blowdown, ash quench water overflow, excess cooling water, sanitary waste, plant washdown water) will be pretreated and discharged through sanitary sewers to Bay County Sewage Treatment Plant.

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)]
   See Attachment "C".
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 Attachment "D".
3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).
   See Attachment "D".
4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)
5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).
   See Attachment "D".
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 Attachment "E".
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 Attachment "F".
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 Attachment "F".

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.
Check for $2,000.00 previously submitted.

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

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

[X] Yes [ ] No

Contaminant	Rate or Concentration
Particulate Matter	0.08 grains per dscf, corrected to 12%
	40 CFR §60.52

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

[ ] Yes [X] No (According to information provided by Bob King of BAQM.)

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?
For each of the two stacks:

Contaminant	Rate or Concentration
Particulate Matter	0.03 grains per scf, corrected to 12% CO_2 (5.72 lb/hr.)
CO	115.4 lbs/hr. (daily average)
NO_x	24.5 lbs/hr. (daily average)
SO_2	22.1 lbs/hr. (daily average)

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

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).

See BACT analysis provided as Attachment "G"

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: (Also see BACT Analysis provided as Attachment "G").

1. Control Device: Electrostatic Precipitator

2. Efficiency:[1] 99% - [See efficiency calculation in Attachment "D"]

3. Capital Cost: $1,100,000.00

4. Useful Life: 20 years

5. Operating Cost: 30,000/yr.

6. Energy:[2] 60 KW

7. Maintenance Cost: 30,000/yr

8. Manufacturer: To be selected

9. Other locations where employed on similar processes:

a. (1) Company: Nashville Thermal Transfer Corp.

(2) Mailing Address: 110 First Avenue South

(3) City: Nashville

(4) State: Tennessee 37201

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

(5) Environmental Manager: James T. Hestle, General Manager

(6) Telephone No.: (615) 244-3150

(7) Emissions:[1]

Contaminant	Rate or Concentration
Particulate Matter	0.02 grains per scf, corr. to 12% CO_2 (test data); permit limit = 0.08 gr/scf

(8) Process Rate:[1] 400 TPD MSW

b. (1) Company: Pinellas County, Dept. of Public Works

(2) Mailing Address: 310 Court Street

(3) City: Clearwater (4) State: Florida 33516

(5) Environmental Manager: D.F. Acenbrack, Director Dept. of Public Works

(6) Telephone No.: (813) 825-1565

(7) Emissions:[1]

Contaminant	Rate or Concentration
Particulate Matter	0.03 grains per scf, corr. to 12% CO_2
Lead	1.3 lb/hr.
Visible Emissions	10%, with up to 20% opacity for up to 3 minutes per hour, plus provisions for startup and upset conditions per §17-2.250, F.A.C.

(8) Process Rate:[1] Approx. 3000 TPD

10. Reason for selection and description of systems:
See BACT analysis provided as Attachment "B"

[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

A. Company Monitored Data – No preconstruction monitoring required for this facility as predicted impacts are less than the de minimus levels specified in 17-2.500 Table 500-3 as per 17-2.500(3)(e) (See Attachment "J")

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. 5 Year(s) of data from 1 / 1 / 65 (month day year) to 12 / 31 / 69 (month day year)

2. Surface data obtained from (location) Panama City - Nat. Weather Service Station

3. Upper air (mixing height) data obtained from (location) Eglin Air Force Base

4. Stability wind rose (STAR) data obtained from (location) N/A

C. Computer Models Used

1. SCSTER 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. See Attachment "J"

D. Applicants Maximum Allowable Emission Data See Attachment "J"

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

E. Emission Data Used in Modeling See Attachment "J"

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.
See Attachment "H"

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.
See Attachment "G"

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.

See Attachment "G"

LIST OF ATTACHMENTS TO REVISED AIR PERMIT
APPLICATION FOR BAY COUNTY RESOURCE RECOVERY FACILITY

ATTACHMENT "A"	-	Certification of Milton E. Kirkpatrick, P.E.
ATTACHMENT "B"	-	General Project Information
ATTACHMENT "C"	-	Fuel Analyses for MSW and Wood Waste
ATTACHMENT "D"	-	Basis of Emission Estimates Basis of Potential Discharge Estimates Derivation of Control Device Efficiency Proposed Compliance Test Methods
ATTACHMENT "E"	-	Flow Diagram
ATTACHMENT "F"	-	Plot Plan, Site Plan
ATTACHMENT "G"	-	BACT Analysis
ATTACHMENT "H"	-	Additional Impacts Analysis
ATTACHMENT "I"	-	List of References
ATTACHMENT "J"	-	Air Quality Dispersion Modeling Report

Milton Elder Kirkpatrick Jr.
3713 West End Avenue · Nashville, Tennessee 37205

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 JUDGEMENT, 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.

MILTON E. KIRKPATRICK
WESTINGHOUSE ELECTRIC COMPANY

POST OFFICE BOX 286
MADISON, PA 15663-0286

TENN #10268
LOUISIANA #1431
ALABAMA #1901
MARYLAND #13040

ATTACHMENT "A"

GENERAL PROJECT INFORMATION

ATTACHMENT "B"

ATTACHMENT "B" - GENERAL PROJECT INFORMATION

This project involves the construction of a resource recovery facility that will generate steam-electric power by burning the combustible fraction of municipal solid waste generated within Bay County. The project is the major part of the Bay County Commission's response to solid waste management planning for the future. Please note that the plant capacity will be sufficient to accommodate Bay County's municipal solid waste for well into the 21st century.

The facility will consist of two (2) O'Connor RC 120 combustor units with provision for future addition of a third unit. Capacity of the facility will be 350 tons per day of municipal solid waste plus 135 tons per day of waste wood and bark which will be used as a supplemental fuel to maximize plant capacity factor and revenues. Steam produced in the two incinerator/boilers will be used to produce electrical energy by turbine generators, which will be sold to Gulf Power Company. Design of the facility will provide for future steam sales for manufacturing or other uses in the adjacent industrial park.

Electrostatic precipitators are proposed for control of particulate emissions from the incinerator/boilers. This choice is based upon successful operating experience with this control technology in resource recovery facilities utilizing waterwall boilers for the incineration of municipal solid waste in Nashville, Tennessee; Saugus, Massachusetts; Hampton, Virginia; and Pinellas County, Florida. The design criteria for particulate emissions from the precipitators will be 0.02 grains per standard cubic foot, corrected to 12% CO_2. This represents a particulate removal efficiency of approximately 99%.

The use of baghouse filter technology has been rejected for this project in view of the baghouse failure at Gallatin, Tennessee and the lack of experience with baghouses on existing municipal solid waste incinerator/boilers. The early failure involving the use of a wet scrubber at the Nashville facility, and the lack of successful operating experience on waterwall boilers equipped with dry scrubbers in the U.S.A., form the basis of the decision not to utilize scrubber technology for this project. The electrostatic precipitator is the only proven method in use on MSW fired waterwall boilers in the United States that meets or exceeds all air quality standards.

As proposed, this project will result in full compliance with all applicable requirements of Florida Administrative Code Chapter 17-2.

BASIC DATA
RESOURCE RECOVERY PLANT
BAY COUNTY, FLORIDA

Introduction

This document presents design criteria on the proposed Bay County project. Plant capacity will be 350 tons per day of municipal solid waste plus 135 tons per day of waste wood and bark. Data from scales at the Majette Tower Landfill indicate a maximum of 350 TPD, a minimum of 250 TPD, and an annual 109,500 tons of MSW. Wood waste and bark will be used as supplemental fuel to maximize plant capacity and revenues. The plant will be designed with two O'Connor RC 120 Combustor units. Energy produced by turbine generators will be sold to Gulf Power Company. Future steam sales will be provided for in plant design.

Site

The plant site will be in an Industrial Park approximately eight miles from the center of Panama City on U.S. Highway 231. Gulf Power has a 115 kV line adjacent to the site.

Architectural and Civil

The plant will be designed to present an aesthetically attractive grouping of buildings and equipment. MSW is to be weighed on automatic scales and tipped on a reinforced concrete slab in a 140' x 260' rigid frame building. Reclaiming of waste will be with a rubber tired front end loader to two (2) four feet (4') wide pan conveyors. Each conveyor is 90 feet long and transfers material to a second conveyor which terminates at the hopper of each combustor train. Floor storage in the center of the building, away from all walls, will accommodate over 1000 tons of MSW and still leave room for truck traffic. The building will be designed for access by 18 wheel semi-trailers now in service from the two transfer stations in Panama City. Provision for individuals in small vehicles is to be provided. Elevation is to be compatible with conveyor runs to the power train and power train elevation. Center line of the conveyors to the combustor hoppers is 35 feet. A building extension over the conveyors is to be provided, along with walkways by each conveyor. A gravity roof ventilator is to be provided. In addition, combustion air is to be ducted from the building extension to the forced draft fans.

No additional equipment is proposed for acceptance of wood chips. They will be stored as is MSW and mixed by the operator in the storage building.

All equipment foundations will be on piling. Designers will provide soil borings as required.

Pretreatment of quench water prior to discharge to sewer is required.

Electrical

Maximum energy efficiency in the plant is to be provided. Energy efficient electric motors are to be designed into the plant. Lighting is to be high pressure sodium vapor.

The four fan drive motors are to be AFAC (adjustable frequency/alternating current).

Interface with Gulf Power and Southern Services will be required. Possible subcontract to Southern Services for generator terminals to switchyard is pending.

Maximum usage of cable trays for all electrical and instrument lines is required. Minimum conduit.

Southern Services will design 115/12 kV substation on a one acre site between the plant and their 115 kV line. Their substation will be sized for future growth in the Industrial Park.

An office building will be designed for four day personnel, a conference room, and a change room for plant operating and maintenance personnel. Visual access from the office building to the scale is required. Parking is required. Roads will be provided. Property is to be fenced with chain link galvanized fencing.

A building to enclose the power train is to match the refuse storage building.

Sewer and water to the site are to be provided by others.

Process Train

The process train from the hopper on the combustor to the stack will be designed by Westinghouse. It is intended to have a left hand and a right hand boiler with soot blowers offset and in the center between the units. The stack will be four feet in diameter, self supporting, with a ladder to an E.P.A. test platform. Copper bearing steel is to be used to minimize corrosion. Stack height is to be a nominal 125 feet. No taper or high velocity nozzles are to be on the stacks.

Mechanical

Equipment design for plant is to include:

Turbine Generators
Condensers - with Appurtenances
Cooling Tower
Circulating Water Pumps
Boiler Feed Pumps
Deaerating Heater and Storage Tank
Condenser Water Pumps
Switchgear
Ash Hopper - Boiler
Ash Hopper - Siftings
Ash Conveyors
Instrument and Control System
Air Compressor(s)
Boiler Blowdown Flash Tank

Support Facilities for air emission equipment - It is intended to use an electrostatic precipitator for control of particulate emissions.

Boiler water treatment facilities are to be designed for 100% makeup.

All support facilities for the power plant are to be provided. Items such as P.A. systems, CCTV, sump pumps and any item not listed but required in the proper operation of the plant is to be a part of this scope.

FUEL ANALYSES

ATTACHMENT "C"

Wood Waste Analysis:

Sulfur	- 0 -
Ash	0.36%
Nitrogen	0.04%
Hydrogen	3.55
Carbon	27.90
Oxygen	18.15
Moisture	50% as rec'd.
Density	20-25 lb/cu.ft.
HHV	5230 Btu/lb.

Ref: Hayes Testing Laboratories, Pensacola, Florida

Standard Municipal Solid Waste Analysis:

		Percent by Weight
Carbon	-	25.53
Hydrogen	-	3.35
Oxygen	-	21.38
Sulfur	-	.16
Moisture	-	22.00
Inerts	-	27.58
Total		100.00
HHV	-	4500 Btu/lb

Ref: O'Connor Combustor Corp.

BASIS OF EMISSION ESTIMATES
BASIS OF POTENTIAL DISCHARGE ESTIMATES
DERIVATION OF CONTROL DEVICE EFFICIENCY
PROPOSED COMPLIANCE TEST METHODS

ATTACHMENT "D"

Total Process Rate - Application Page 4

Case I - Maximum MSW - 350 TPD
Minimum Wood Waste - 135 TPD

Case II - Minimum MSW - 250 TPD
Maximum Wood Waste - 220 TPD

Case III - Average - Annual

MSW - 300 TPD
Wood Waste - 178 TPD

Case I - O'Connor RC-120 Rotary Combustor Design Input 95×10^6 Btu/hr. per unit

190×10^6 Btu/hr. Total

Less Maximum MSW at 4500 Btu/lb
131.25×10^6 Btu/hr

Equals Wood Waste and Bark by difference 58.75×10^6 Btu/hr

$$\frac{58.75 \times 10^6 \text{ Btu}}{5230 \text{ Btu/lb}} = 11{,}233 \text{ lb/hr}$$
or 5.6 tons/hr.

Case II - Design Input 190×10^6 Btu/hr.

Less minimum MSW at 4500 Btu/lb.
93.75×10^6 Btu/hr

Equals Wood Waste and Bark by difference 96.25×10^6 Btu/hr

$$\frac{96.25 \times 10^6 \text{ Btu}}{5230 \text{ Btu/lb}} = 18{,}403 \text{ lb/hr}$$
or 9.2 tons/hr.

Plant Capacity - Application Page 6

2 - RC 120 O'Connor Rotary Combustors

510 Tons per day - MSW @ 4500 Btu/lb
equivalent - 190 x 10^6 Btu/hr

Bay County MSW Stream
Based on 13 months of weight data - 300 TPD Average
- 350 TPD Maximum
- 250 TPD Minimum

Case I	-	Maximum MSW	29,166.6	lb/hr
		Minimum Wood	11,233	lb/hr
		Total	40,399.6	lb/hr

Case III - Annual Average - MSW and Wood

MSW - 300 TPD x 365 = 109,500 tons/yr

109,500 x 9 x 10^6 Btu/ton = 985,500 x 10^6 Btu/yr

Design Capacity -
190 x 10^6 8760 = 1,664,400 x 10^6 Btu/yr

Design Capacity	1,664,400	x 10^6 Btu/yr
Less MSW	985,500	x 10^6 Btu/yr
Wood Waste	678,900	x 10^6 Btu/yr

$$\frac{678{,}900 \times 10^6}{5230} = 129.8 \times 10^6 \text{ lb/yr}$$

64,904 tons/yr

Maximum Wood Capability based on 109,500 ton/yr MSW stream

Plant Capacity - Application Page 5

Fuels (for each of 2 units)

Case I Maximum MSW

MSW $\frac{29,166.2}{2}$ = 14,583.3 lb/hr

Wood $\frac{11,233}{2}$ = 5,616 lb/hr

Total 20,199.3 lb/hr

Case II Minimum MSW

MSW $\frac{250 \times 2000}{24 \times 2}$ = 10,416 lb/hr

Wood $\frac{18,403}{2}$ = 9,201.5 lb/hr

Total 19,616.5 lb/hr

Case III Annual Averages

MSW 300 TPD
Wood 64,904 tons/yr ÷ 365 = 177.8 tons/day

MSW $\frac{300 \times 2000}{24 \times 2}$ = 12,500 lbs/hr

Wood $\frac{177.8 \times 2000}{24 \times 2}$ = 7,408 lbs/hr

Total 19,908 lbs/hr

Maximum Btu - MSW - 131.25×10^6 Btu/hr
65.6×10^6 Btu/hr/stack

Wood Waste 96.25×10^6 Btu/hr
48.125×10^6 Btu/hr/stack

Particulate Emissions

Unabated

Emission Factors:

MSW 42.5 lb/ton
Ref: Hahn, Table 3

Wood Waste & Bark 42.5 lb/ton
Ref: EPA (1982)

Worst Case	350 TPD	MSW
	135 TPD	Wood Waste

Emissions	lb/hr
lb/hr/stack	429
lb/hr - Total	858
tons/yr/stack	1879
tons/yr - Total	3758

Particulate Emissions

Controlled

Control to 0.03 Grains per DSCF Corr.

$$\frac{\dfrac{0.03 \text{ Grains}}{\text{S.C.F.}} \times \dfrac{22{,}280 \text{ S.C.F.}}{\text{Min.}} \times \dfrac{60 \text{ min.}}{\text{Hr.}}}{\dfrac{7{,}000 \text{ Grains}}{\text{lb.}}} =$$

5.72 lb/hr per stack

11.45 lb/hr Total

ESP Efficiency

Unabated PM Emissions	=	429 lb/hr/stack
Controlled PM Emissions	=	5.72 lb/hr/stack

$$5.72 \div 429 = 0.0133$$

$$1 - 0.0133 = 0.9867$$

ESP Efficiency = 98.7%

Allowable Emission Rate

Per Rule 17-2

0.08 Grains per SCF Dry Gas

Corr. to 50% excess air

$$\frac{\frac{.08 \text{ Grains}}{\text{SCF}} \times \frac{22{,}280 \text{ S.C.F.}}{\text{Min.}} \times \frac{60 \text{ min.}}{\text{Hr.}}}{7000 \ \frac{\text{Grains}}{\text{lb}}} =$$

15.2 lb/hr/stack

30.4 lb/hr - Total

Bay County, Florida
Resource Recovery Plant

Unabated Lead Emissions

(Prior to Emission Controls)

Emission Factor:

.274 lb/ton MSW

Ref: Table 5-24
Cooper Engineers
Gallatin, Tenn.
1983

$$\frac{.274 \times 350}{24 \times 2} = 2 \text{ lb/hr/stack}$$

4 lb/hr Total

$$\frac{2 \times 8760}{2000} = 8.76 \text{ tons/yr/stack}$$

17.52 tons/yr total

Assume no lead in waste wood

Bay County, Florida
Resource Recovery Plant

Lead Emissions

Controlled

Emission Factor:

MSW 0.626% of Weight of Particulate

Reference: Hahn - Gallatin

Wood Assume no lead

Emissions:

$$\frac{5.72 \text{ lb/hr Particulate} \times 0.626}{100} = .0358 \text{ lb/hr/stack}$$

$$.0358 \times 8760 = 315 \text{ lb/yr/stack}$$

630 lb/yr total

NOx EMISSIONS

Emission Factors:

MSW 2.2 lb/ton

Reference: Hahn

Wood 2.8 lb/ton

Reference: EPA (1982)

Worst Case:

250 TPD MSW
220 TPD Waste Wood

Emissions

lb/hr/total	23.0	MSW
	26.0	wood
	49.0	Total
lb/hr/stack	24.5	
tons/yr/stack	107	
tons/yr/ total	214	

Bay County, Florida
Resource Recovery Plant

CO Emissions

Emission Factor

4.5 lb/ton MSW
Reference: Hahn

20 lb/ton waste wood
Reference: EPA (1982)

Worst Case: 250 TPD MSW
220 TPD Waste Wood

Emissions:

	MSW	Wood	Total
lb/hr/stack	23.4	92	115.4
lb/hr - total	46.8	184	230.8
tons/yr/stack	102	403	505
tons/yr - total	204	806	1010

Bay County, Florida
Resource Recovery Plant

SO2 EMISSIONS

Emission Factor

2.8 lb/ton MSW
Reference: Hahn

0.30 lb/ton Waste Wood
Reference: EPA (1982)

Worst Case:

350 TPD	MSW
135 TPD	Wood Waste
485 TPD	Total

Emissions	MSW	Wood	Total
lb/hr/stack	20.4	1.7	22.1
lb/hr - total	40.8	3.4	44.2
tons/yr/stack	89	7.4	96.4
tons/yr - total	179	14.8	193.8

Bay County, Florida
Resource Recovery Plant

Non-Methane Hydrocarbons

Emission Factors

.232 lb/ton MSW
Reference: Hahn

1.7 lb/ton Wood Waste
Reference: EPA (1982)

Worst Case Emissions

250 TPD MSW
220 TPD Waste Wood

$$\frac{.232 \times 250}{2 \times 24} = 1.2 \text{ lb/hr} \quad \text{MSW}$$

$$\frac{1.7 \times 220}{2 \times 24} = 7.8 \text{ lb/hr} \quad \text{Waste Wood}$$

9.0 lb/hr/stack Total
18.0 lb/hr (both stacks)

$$\frac{9 \times 8760}{2000} = 39 \text{ tons/yr/stack}$$

78 tons/yr - total

Mercury

Emission Factor

0.00171 lb/ton MSW
Reference: Hahn

Assume Wood - no contribution

Worst Case

350 TPD MSW

Emissions

$$\frac{350 \times 0.00171}{24} = .025 \text{ lb/hr - total}$$

.0125 lb/hr/stack

8760 x .025 = 218 lb/yr - total
109 lb/yr/stack

Bay County, Florida
Resource Recovery Plant

Beryllium

Emission Factor

<0.000048 lb/ton MSW

Reference: Hahn

No significance

TABLE 3

AVERAGE UNABATED AIR EMISSIONS DATA FROM THE GALLATIN ROTARY COMBUSTOR

"REGULATED AIR POLLUTANTS"

Pollutant	Average Concentration	"Worst Case" Rolling Average Concentration (Time Period)	Average lb/hr	Average* lb/ton	Average** lb/10^6 Btu
Particulate: U.S. EPA and BAAQMD (without condensibles)	2.92 gr/SDCF at 12% CO_2	---	170.0	42.5	5.35
SCAQMD and Other California (with condensibles)	2.92 gr/SDCF at 12% CO_2	---	170.0	42.5	5.35
NO_x	147 ppm_v at 7% O_2	241 ppm_v at 7% O_2 (1 hr)	9.11	2.2	0.303
SO_2: U.S. EPA Method 8	154 ppm_v at 7% O_2	---	9.49	2.38	0.300
SO_2: Continuous Emission Monitoring	180 ppm_v at 7% O_2	651 ppm_v*** at 7% O_2 (1 hr) 454 ppm_v*** at 7% O_2 (3 hr)	11.41	2.8	0.424
NMHC	40.2 ppm_{wv} at 10% O_2 (wet)	124 ppm_{wv} at 10% O_2 (wet) (3 hr)	1.09	0.232	0.0369
CO	586 ppm_v at 7% O_2	2055 ppm_v at 7% O_2 (1 hr)	17.88	4.5	0.631
Hg	---	---	0.0067	0.00171	0.000216
Pb	---	---	1.024	0.274	0.0353
Be	---	---	<0.00018	<0.000048	<0.0000062

* Process feed weight approximately 92 TPD.
** Based on as-received MSW less the heating value of the residue.
*** Given high values because of high sulfur fuel.

TABLE 5-35
NO, NO_2, AND NO_x EMISSION RATES

CONCENTRATION:	NO Calculation Method:		
	Average NO_x (Table 5-33) @ 12% O_2		105.6 ppm_v
	Correction (Table 5-32)		− 6.0 ppm_v
	Average NO_x @ 12% O_2		99.6 ppm_v
	Average NO_2 @ 12% O_2 (Table 5-36)		− 3.6 ppm_v
	Average NO @ 12% O_2		96.0 ppm_v
NO_x Average @ 12% O_2		—	99.6 ppm_v
NO_x Range @ 12% O_2		—	82.0 to 135.0 ppm_v
NO_x "Worst Case" Rolling Average @ 12% O_2 (time period)		—	111.5 ppm_v (1 hr.)
NO Average @ 12% O_2		—	96.0 ppm_v
NO_2 Average @ 12% O_2		—	3.6 ppm_v
NO_x Average @ 3% O_2		—	200.3 ppm_v
NO_x Range @ 3% O_2		—	178 to 274 ppm_v
NO Average @ 3% O_2		—	193 ppm_v
NO_2 Average @ 3% O_2		—	7.3 ppm_v
POUNDS PER HOUR: (based on process feed rate 165TPD)	NO_x Average	—	13.45 Lbs./Hr.
	NO_x Range	—	11.1 to 18.2 Lbs./Hr.
	NO Average	—	8.46
	NO_2 Average	—	0.489
POUNDS PER TON:	NO_x Average	—	1.99 Lbs./T
	NO_x "Worst Case" Rolling Average (Time Period)	—	2.22 Lbs./T (1 hr.)
POUNDS PER 10^6 Btu: (based on "as-received" municipal solid waste)	NO_x Average	—	0.35 Lbs./10^6Btu
	NO Average	—	0.224 Lbs./10^6Btu
	NO_2 Average	—	0.0122 Lbs./10^6Btu

NOTE: Based on Typical Rotary Combustor Operating Conditions.

TABLE 5-23
ESP INLET AND OUTLET SO_2 CONCENTRATIONS AND EMISSION RATES

Location	Date & Time	Feed Rate		SO_2 ppm v		Lbs./Hr. SO_2	Lbs./T SO_2	Lbs./ 10^6 Btu
		% Design	Tm PH	@ Duct % O_2	@ 12% O_2			
ESP No. 2 Inlet	11/20/80 23:37 - 00:07	109	6.8	77.8 @ 11.4	72.9	13.7	1.83	0.328
ESP No. 1 Outlet	11/21/80 3:10 - 4:50	88	5.5	55.0 @ 14.4	75.3	10.0	1.65	0.295
ESP No. 1 Outlet	11/21/80 6:20 - 8:00	101	6.3	27.2 @ 12.4	28.5	4.8	0.69	0.124
ESP No. 2 Inlet	11/21/80 11:15 - 11:21	89	5.56	48 @ 10.0	39.2	8.3	1.36	0.243
Average					54	9.2	1.38	0.248

NOTE: As measured by U.S. EPA Method 5-8.

TABLE 5-24
TCA OUTLET SO_2 CONCENTRATIONS AND EMISSION RATES

Location	Date & Time	Feed Rate		SO_2 ppm$_v$		Lbs./Hr. SO_2	Lbs./T SO_2	Lbs./ 10^6 Btu
		% Design	Tm PH	@ Duct % O_2	@ 12% O_2			
TCA Outlet	11/20/80 23:57 - 00:17	109	6.8	10.1 @ 11.4	9.5	1.8	0.24	0.043
TCA Outlet*	11/21/80 9:35 - 9:53	89	5.56	5.4 @ 10.0	4.4	0.9	0.15	0.027
Average					7.0	1.35	0.195	0.035

NOTE: As measured by U.S. EPA Method 6.

* This test was completed as the simultaneous Inlet test was shut down and was not resumed when the Inlet test was restarted; therefore, the data cannot be used for TCA efficiency calculations.

TABLE 5-35
EMISSION FACTORS (LBS/TON) FOR CO, NO_x AND SO_2
CALCULATED FROM CEM DATA TAKEN DURING SAMPLING

	EMISSION RATE (LB/HR)			FEED RATE (TPH)		EMISSION FACTORS (LB/TON)					
						CO		NO_x		SO_2	
Date & Time	CO	NO_x	SO_2	During Sampling	Daily Avg.	During Sampling	Daily Avg.	During Sampling	Daily Avg.	During Sampling	Daily Avg.
2/7/83 1050 to 1437	10.22	10.25	2.94	3.88	3.86	2.6	2.6	2.6	2.6	0.76	0.76
2/8/83 0855 to 1150	37.82	10.44	9.41	3.81	4.0	9.9	9.5	2.7	2.6	2.5	2.4
2/8/83 1320 to 1500	6.31	10.16	9.23	4.63	4.0	1.4	1.6	2.2	2.5	2.0	2.3
2/8/83 1647 to 1825	9.25	9.92	9.71	5.06	4.0	1.8	2.3	2.0	2.5	1.9	2.4
2/9/83 0940 to 1215	18.42	6.59	10.48	4.12	3.79	4.5	4.9	1.6	1.7	2.5	2.8
2/11/83 1552 to 1735	25.23	7.27	26.70	3.86	3.3	6.5	7.6	1.9	2.2	6.9	8.1
AVERAGE						**4.5**	**4.8**	**2.2**	**2.4**	**2.8**	**3.1**

TABLE 5-45

NON-METHANE HYDROCARBONS (NMHC) CONCENTRATIONS, EMISSION RATES AND EMISSION FACTORS AT THE COMBUSTOR OUTLET, FEBRUARY 7-11, 1983

Date & Time	CEM Concentration During Sampling (PPM wet at actual O_2)*	Emission Rate (lb/hr)**	Feed Rate		Emission Factors	
			TPH	10^6Btu/hr	lb/ton	lb/10^6BTU
2/7/83 1050 to 1437	12	0.324	3.88	35.58	0.0835	0.00911
2/8/83 0855 to 1150	17.1	0.475	3.81	30.59	0.125	0.0155
2/8/83 1320 to 1500	30.7	0.858	4.63	32.96	0.185	0.0291
2/8/83 1647 to 1825	85.2	2.42	5.06	30.65	0.478	0.0790
2/9/83 0940 to 1215	90	2.33	4.12	28.41	0.566	0.0820
2/11/83 1552 to 1735	5.9	0.156	3.86	22.51	0.0404	0.00693
AVERAGE	40.2				0.232	0.0369

* Data as ppm carbon

** Data as methane, MW of 16.

TABLE 5-24
UNABATED (COMBUSTOR OUTLET) HEAVY METAL EMISSION RATES

Element	Average Weight %	Particulate Average lb/hr	Element E.R. (lb/hr)	Average Feed Rate TPH	Average Feed Rate 10^6Btu/hr	Emission Factors 10^{-3} lb/ton	Emission Factors 10^{-4} lb/10^{-6}-Btu
Arsenic (As)	0.0073	163.5	0.0119	3.74	29.01	3.18	4.10
Beryllium (Be)	<0.00011	163.5	<0.000180	3.74	29.01	<0.048	<0.062
Cadmium (Cd)	0.054	163.5	0.0883	3.74	29.01	23.6	30.4
Chromium (Cr)	0.018	163.5	0.0294	3.74	29.01	7.86	10.1
Selenium (Se)	<0.00033	163.5	<0.000540	3.74	29.01	<0.144	<0.186
Nickel (Ni)	<0.00076	163.5	<0.00124	3.74	29.01	<0.332	<0.427
Vanadium (V)	<0.0031	163.5	<0.00507	3.74	29.01	<13.6	<1.75
Zinc (Zn)	1.9	163.5	3.107	3.74	29.01	831	1,071
Lead (Pb)	0.626	163.5	1.024	3.74	29.01	274	353
Antimony (Sb)	0.085	163.5	0.139	3.74	29.01	37.2	47.9
Copper (Cu)	0.077	163.5	0.126	3.74	29.01	33.7	43.4
Manganese (Mn)	0.138	163.5	0.226	3.74	29.01	60.4	77.9
Molybdenum (Mo)	0.0037	163.5	0.00605	3.74	29.01	1.62	209
Tin (Sn)	<0.071	163.5	<0.116	3.74	29.01	<31.0	<40.0

TABLE 1.6-1. EMISSION FACTORS FOR WOOD AND BARK COMBUSTION IN BOILERS

EMISSION FACTOR RATING: B

Pollutant/Fuel Type	kg/Mg	lb/ton
Particulate[a,b]		
Bark[c]		
Controlled, with flyash reinjection[d]	7	14
Controlled, without flyash reinjection[d]	4.5	9
Uncontrolled	24	47
Wood/bark mixture[c]		
Controlled, with flyash reinjection[d,e]	3	6
Controlled, without flyash reinjection[d]	2.7	5.3
Uncontrolled[f]	3.6	7.2
Wood[g]		
Uncontrolled	4.4	8.8
Sulfur Dioxide[h]	0.074 (0.009 – 0.193)	0.148 (0.019 – 0.386)
Nitrogen Oxides(as NO_2)[i]		
50,000–400,000 lb steam/hr	1.4	2.8
<50,000 lb steam/hr	0.34	0.68
Carbon Monoxide[j]	2–24	4–47
Nonmethane VOC[k]	0.8	1.7

[a]References 2,4,9,17-18. For boilers burning gas or oil as an auxiliary fuel, assuming all particulates result from the waste fuel alone.

[b]May include condensible hydrocarbons consisting of pitches and tars, mostly from the back half catch of EPA Method 5. Tests reported in Reference 20 indicate that condensible hydrocarbons account for about 4% of total particulate by weight.

[c]Based on moisture content of about 50%.

[d]After the control equipment, assuming an average collection efficiency of 80%. Data from References 4, 7 and 8 indicate that 50% flyash reinjection increases the dust load at the boiler outlet (before control) by 1.2 to 1.5 times, while 100% flyash reinjection increases the load 1.5 to 2 times the load without reinjection.

[e]Based on large dutch ovens and spreader stokers (averaging 23,430 kg steam/hr) with steam pressures from 10.5 - 42 kg/cm².

[f]Based on small dutch ovens and spreader stokers (usually operating less than 9075 kg/hr of steam), with steam pressures from 2.3 - 17.6 kg/cm². Careful air adjustments and improved fuel separation and firing were used on some of these boilers, but the effects cannot be isolated.

[g]References 12-13,19,27. Wood waste includes cuttings, shavings, sawdust and chips, but not bark. Moisture content ranges from 20 to 50% by weight. Based on 28 small boilers (less than 3,300 kg steam/hr) located in the States of New York and North Carolina.

[h]Reference 23. Based on tests of fuel sulfur content and sulfur dioxide emissions at four mills burning bark. The lower limit of the range in parentheses should be used for wood, and higher values for bark. A heating value of 4,987 kcal/kg (9,000 Btu/lb) is assumed. The factors are based on the dry weight of fuel.

[i]References 7,24-26. It should be noted that several factors can influence emission rates, including combustion zone, temperatures, excess air, boiler operating conditions, fuel moisture and fuel nitrogen content.

[j]Reference 30.

[k]Reference 20. Nonmethane VOC reportedly consists of compounds with a high vapor pressure such as alpha pinene. Emission factors for methane are not available.

PROPOSED COMPLIANCE TEST METHODS

To the extent emission limits are imposed for the pollutants listed below, Westinghouse proposes the following compliance test methods:

Particulate Matter Emission Limit - EPA Methods 1 through 5

Visible Emission Limit - DER Method 9

(Note - Westinghouse also proposes to install and operate an opacity monitor for each stack)

SO_2 Emission Limit - DER Method 6 or EPA Method 6A

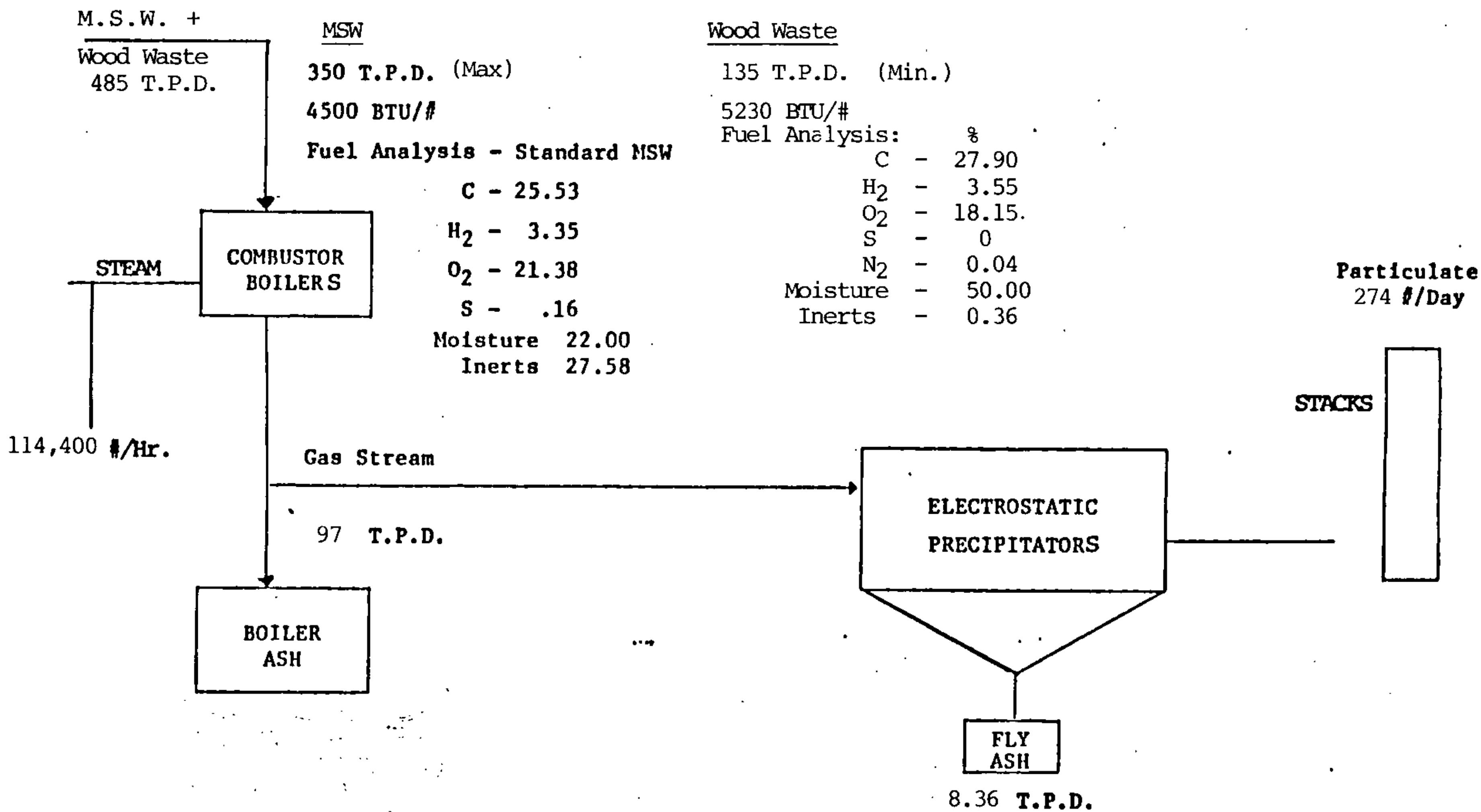
NO_x Emission Limit - EPA Method 7, 7A or 7B

Stack sampling ports and access thereto will be provided in accordance with F.A.C. Rule 17-2.700(4).

FLOW DIAGRAM

ATTACHMENT "E"

FLOW DIAGRAM



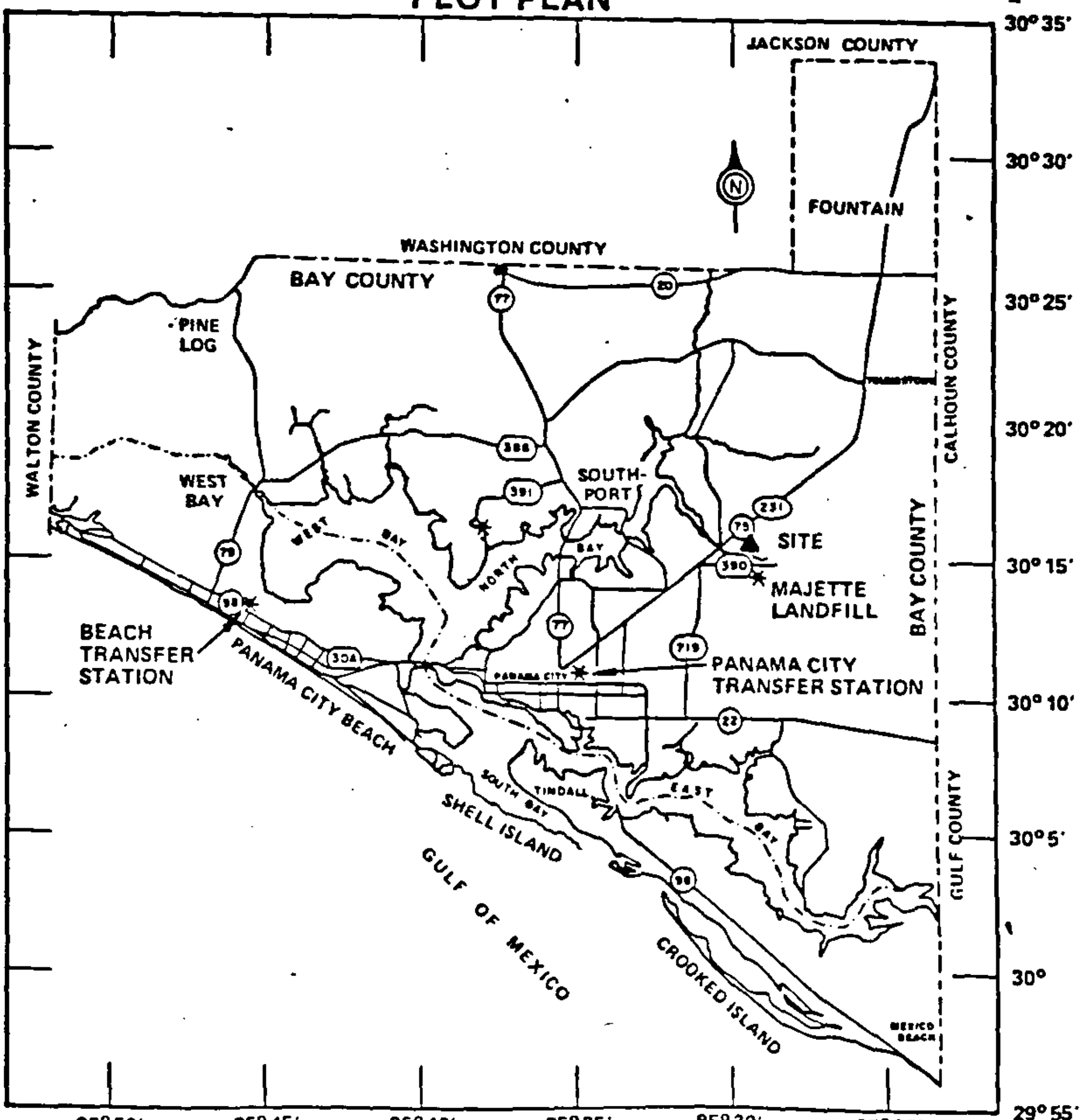
PLOT PLAN, SITE PLAN

ATTACHMENT "F"

Westinghouse

Bay County Waste to Energy Project

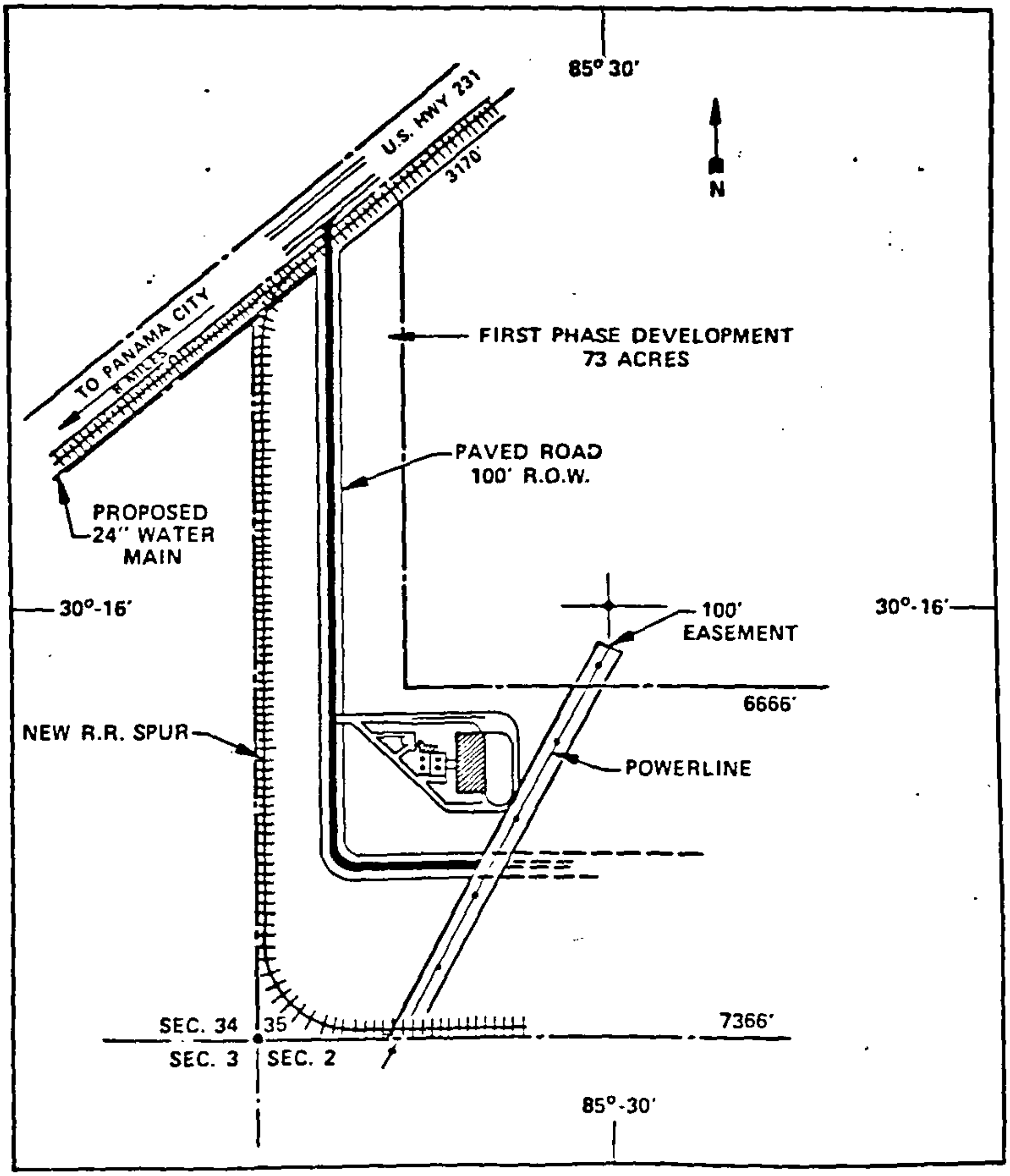
PLOT PLAN



766245-1A

Westinghouse

Bay County Waste to Energy Project
SITE PLAN

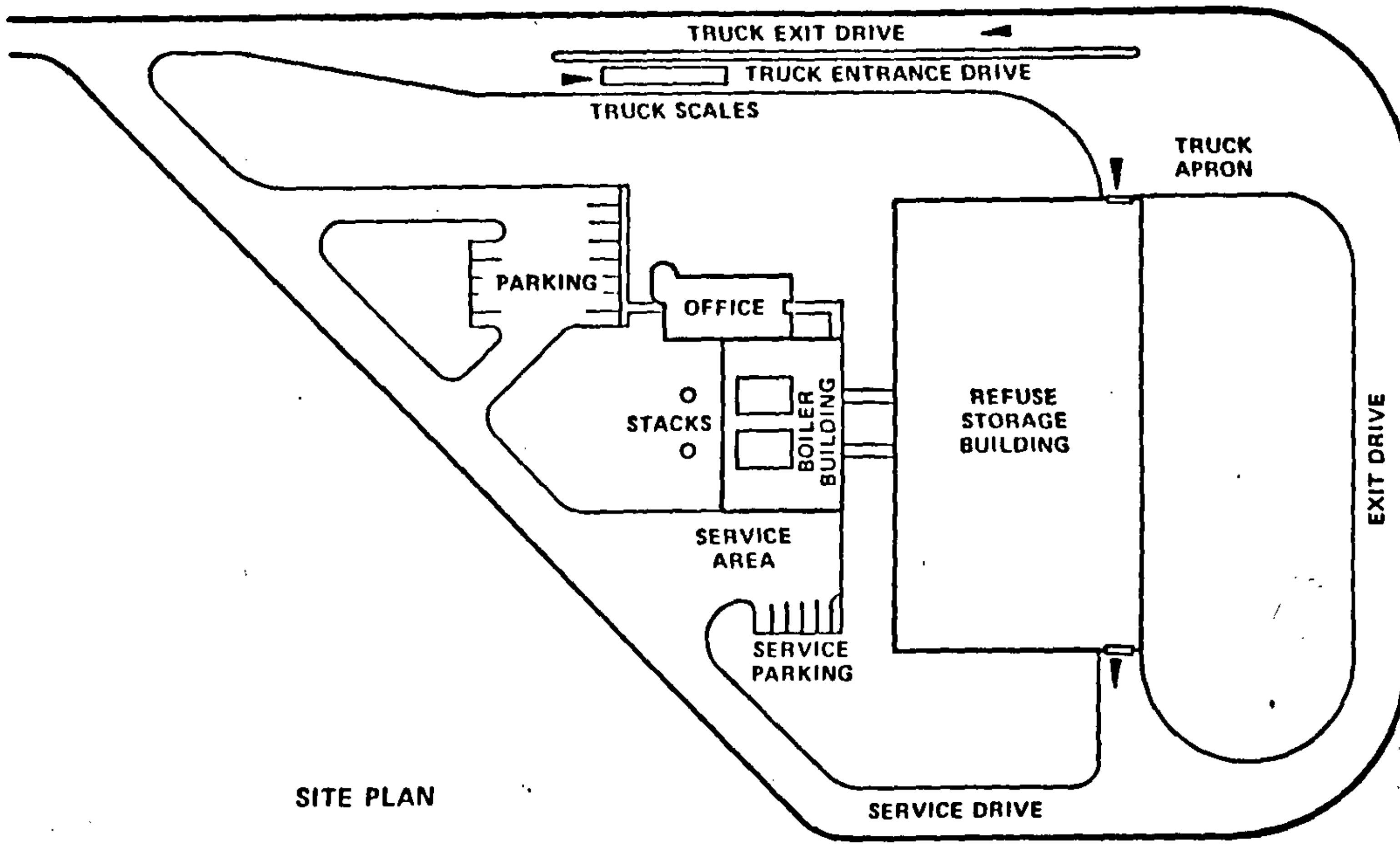


766245-2A

Westinghouse

Bay County Waste to Energy Project

MUNICIPAL SOLID WASTE FACILITIES



SITE PLAN

766245-3A

BACT ANALYSIS

ATTACHMENT "G"

BACT

Electrostatic Precipitators are operationally proven effective devices for removal of particulate matter from flue gas streams from solid fueled boiler furnaces. In Municipal Solid Waste fueled waterwall boilers, electrostatic precipitators have been established as effective control devices at most of America's successful MSW resource recovery plants. Several of these plants are Nashville, Tennessee; Chicago Northwest; Saugus, Massachusetts; Pinellas County, Florida; and Hampton, Virginia. These devices have operated with removal efficiencies of 99% and above.

Baghouse filters have been used for many years to remove particulate matter from dust laden gas or air streams. In addition, baghouse technology has been applied to solid fuel fired boilers, primarily coal fired units. Use of the baghouse technology for boilers has necessitated the development of material for the bag filter media which can withstand temperatures of 450^{o} - 500^{o}F range. Such materials are now available, and many successful baghouse installations on small and industrial sized coal fired boilers are in operation. The baghouse technology, however, while holding promise for the future, is not presently established as a reliable control device on municipal solid waste fired boilers. None of the MSW fired waterwall boilers installed in the United States during the last ten years have used a baghouse except Gallatin, Tennessee. This installation was not successful and the baghouse is presently being replaced by an electrostatic precipitator. The one successful baghouse installation on a municipal incinerator is the Framingham, Massachusetts Plant, which is not applicable since it is on a refractory wall incinerator, has no heat recovery and is preceeded by a dry scrubber system.

Baghouses also have a higher pressure drop through the unit, resulting in a higher energy usage by fans.

Scrubbers are used to remove SO_2 and acid gasses from the flue gas stream, in addition to particulates. However, successful scrubber installations in the power industry on coal fired boilers all have particulate removal devices ahead of the scrubbers.

Both dry scrubbers and wet scrubbers are in service. In a dry scrubber, lime slurry is injected in the gas stream in quantities that allow the heat in the gas stream to evaporate the water in the lime slurry, allow the lime to react with SO_2 and acid gasses and allow the dry particulate matter to be collected in a baghouse or an electrostatic precipitator.

A wet scrubber passes flue gas through a curtain spray of lime slurry, completely saturating the flue gas stream. An example of a wet scrubber is an air washer in a heating, ventilating, and air conditioning system. Saturated, actually supersaturated flue gasses, include entrained droplets. An example of a wet scrubber on a municipal solid waste resource recovery plant was the disasterous experience in Nashville, where the low energy wet scrubber failed to meet air quality standards, and was replaced with electrostatic precipitators.

There is a dry scrubber on the Framingham, Massachusetts, incinerator mentioned earlier. This installation is, however, not comparable to a waterwall power boiler installation.

All scrubber technologies add to the residue produced, with either a dry particulate that includes reagent and by-products in addition to the dust in the flue gas, or with a wet sludge. This waste stream can be twice the weight of flue gas particulate.

Wet scrubbers are in use in some coal fired steam electric stations. The plants are characterized by a constant vapor plume from the stack. Scrubbers remove about 1% more particulate from the gas stream, but generate twice the amount of solid waste, use more energy, and increase capital and operating cost.

BACT Pollutants and

Control Technologies

Pollutant	Control Technologies
Particulate Matter	Electrostatic Precipitator Baghouse (Fabric Filter)
Sulfur Dioxide	Wet Scrubber Dry Scrubber Low Sulfur Fuel (As is MSW)
Nitrogen Oxide	Ammonia Injection Catalytic Reduction Low Excess Air Designs* Operating Procedures
Carbon Monoxide	Boiler-Burner Design Operating Procedures

*Such as is inherent in the design of the O'Connor Combustor.

ESTIMATED COSTS

COSTS OF EMISSION CONTROL

BAY COUNTY, FLORIDA

	Electrostatic Precipitators	Fabric Filter	Dry Scrubber Plus Fabric Filter
Capital Investment	$1,100,000	$800,000	$2,600,000
Operating & Maintenance Costs	60,000	45,000	120,000
Debt Service	192,000	140,000	455,000
Total Annual Costs	252,000	185,000	575,000
Removal Efficiency	99%	99%+	99%+

ADDITIONAL IMPACTS ANALYSIS

ATTACHMENT "H"

ATTACHMENT "H" - ADDITIONAL IMPACT ANALYSES

This analysis addresses the effects of the proposed Bay County Resource Recovery Facility and associated development on visibility, soils and vegetation having a significant commercial or recreational value, as well as the air quality impact projected for the area as a result of general commercial, residual, industrial and other growth.

Growth Analysis

Bay County is a growing community in Northwest Florida, with a population of 97,175 (including resident population of Tyndall Air Force Base) according to the 1980 census. This represents a 29% population increase over the 1970 figure of 75,283.

Population projections for Bay County, as prepared by the University of Florida's Bureau of Economics and Business Research and reported in the Florida Statistical Abstract (1979), are as follows:

1980	1985	1990	2000
97,175	112,400	124,100	144,800

These figures represent a projected growth rate of approximately 2% per year.

The construction force for the proposed facility is expected to comprise approximately 100 people, or only 0.1% of the Bay County population. It is anticipated that the construction force will be from the Bay County vicinity, with the exception of supervisory personnel. Consequently, no growth-related impacts are expected from the construction phase of the project.

Operation of the Resource Recovery Facility will require approximately 30 persons. Most operating personnel will be recruited from the Bay County area. Consequently, no residential or associated commercial growth impact is expected to result from operation of the proposed facility itself.

It is possible that the proposed facility will induce development of manufacturing or other industrial plants in the adjacent industrial park, in view of the availability of steam to be produced by the Resource Recovery Facility. At this time it is impossible to predict what type of plants might seek to locate at the industrial park, or what air quality or other environmental impacts might be associated with such development.

Visibility Analysis

The proposed facility will emit relatively small amounts of particulates, sulfur dioxide and nitrogen oxides. Based on these low emission rates and the distance to the nearest Class I area, EPA's "Workbook for Estimating Visibility Impairment" indicates that the proposed facility will not cause adverse visibility impairment in any Class I area.

In regard to local visibility impacts, it should be emphasized that the proposed particulate emission control equipment (ESP) should allow the Bay County facility to operate with no visible emissions. The clear stack will ensure that there will be no local visibility impairment from this facility.

Vegetation Impact Analysis

Maximum concentrations of criteria pollutants, which are predicted to occur in close proximity to the Bay County facility, are far below the levels known to affect relevant plant species. Consequently, no impairment to vegetation with significant commercial or recreational value is expected to occur from the proposed facility.

Soils Impact Analysis

Bay County lies in the Gulf Coastal Plain, and soils in the vicinity consist primarily of sand overlying silt and organic layers. Organic soils act as nutrient traps and can adsorb sulfates, nitrates and any metals resulting from deposition of sulfur dioxide, nitrogen oxides and particulates with little change in pH. While deposition of these compounds can increase the acidity of sandy soils, the extremely low concentrations resulting from the proposed facility are expected to have a negligible effect on soil pH.

LIST OF REFERENCES

ATTACHMENT "I"

LIST OF REFERENCES

Cooper Engineering; "Air Emissions Tests of Solid Waste Combustion in a Rotary Combustor/Boiler System at Gallatin, Tennessee."

Cooper & Clark Engineering; "Air Emissions Tests of Solid Waste Combustion in a Rotary Combustor/Boiler System at Kure, Japan."

Hahn, Jeffry L.; "Air Emission Measurement of MSW Combustion"; Cooper Engineers, Inc.

U.S. Environmental Protection Agency (1980) - "Workbook for Estimating Visibility Impairment." Office of Air, Noise and Radiation/Office of Air Quality Planning and Standards, Research Triangle Park, North Carolina.

U.S. Environmental Protection Agency (1982) - "Compilation of Air Pollutant Emission Factors"; External Combustion Sources, §1.6 "Wood Waste Combustion in Boilers" (8/82)

AIR QUALITY DISPERSION MODELING REPORT

(Will be supplied in near future)

ATTACHMENT "J"