

JEA BALDWIN SIMPLE CYCLE PROJECT

- New Brandy Branch Facility. Three dual-fuel simple cycle units.
- Prime movers are three 170 MW GE PG7241FA combustion turbines.
- Pre-application meeting in 1998, JEA proposed 15 ppm NO_x.
- We told them they could do better because CTs are identical to Duke.
- GE guaranteed 15 ppm “new and clean.” Alternative pricing for 9 ppm.
- GE agreed to lower new and clean value if JEA agreed to delivery delay.
- Application received May 19. NO_x at 12 ppm. 800 hours of 0.05% S oil.
- Incompleteness letter sent on May 26. Focused on hours of oil and 12 ppm.
- Response received on June 21. We have drafted another incompleteness letter.
- Do not cause or contribute to any NAAQS or increment violations.
- Okeefenokee less than 50 km away. Models showed no visibility problem.
- Parts of Okeefenokee more than 50 km away. Therefore regional haze review.
- JEA ran ISC and showed no regional haze problem.
- USFWS said they should have used higher humidity. ISC shows problems.
- USFWS said run CALPUFF “Light.” Shows problems.
- USFWS says we can issue intent if JEA will run full CALPUFF.
- JEA expects no better results. It will take several months. Expensive.
- Black & Veatch, Golder, Koogler, ECT are all inexperienced.
- Meanwhile we issued Intent on almost identical TEC project at 10.5 ppm.
- Project farther from Chassahowitzka than JEA is from Okeefenokee.
- That application was received before new USFWS changes in modeling.
- JEA haze problem can be alleviated by less (daily) hours on oil.
- We met with JEA on July 15. They expect a permit about like TEC.
- They point out Brandy Branch will allow closure of Southside Units.
- Even their 0.5 percent sulfur oil comes in at less than 0.01 percent sulfur.
- Southside shutdown not contemporaneous. 0.01% oil not enforceable.
- Recommend issuance of Intent and itemization of mitigative factors.

9-25-98

Bert Gianazza JEA

Rick Tetzloff B&V

Pre-Application Meeting Agenda

Chuck Bond JEA

JEA – Brandy Branch Combustion Turbine Project Air Permitting Issues

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Teresa

Al

Mike

1. Introductions
2. Project Overview
 - A. Location
 - ~ 1.5 miles northeast of Baldwin
 - See Attachment 1
 - B. Description
 1. Three GE 7FA class combustion turbines (~ 500 MW total)
 2. Operating in simple cycle mode only
 3. Natural gas (NG) fired with #2 fuel oil (FO) backup
 4. Base-load units (8,760 hours / year on NG, limited hours on FO)
 - C. Schedule
 1. Start of Construction – July 1999
 2. Commercial Operation – January 2001
3. PSD and Other Air Requirements
 - A. Attainment Status
 - B. NSR / PSD Applicability
 1. New Major Source
 2. NO_x, CO, PM10 with significant emission levels
 - C. BACT Issues
 1. Expected emission levels NO_x / CO
 2. PM front half catch / total condensable
 - D. Air Quality Impact Analysis
 1. Air Dispersion Modeling Workplan
 - a. ISCST3 model ver. 97363
 - b. EPA default options / flat terrain
 - c. BPIP / downwash
 - d. Worst-case emissions
 - Hourly emission rates for short-term impacts
 - Annual average data for annual impacts
 - e. Receptor grids
 - 10 km overall
 - 100m to 1km
 - 500m from 1 to 5 km
 - 1 km from 5 to 10 km
 - 50 m fenceline
 - f. Dispersion coefficients
 - Auer land use analysis / rural
 - g. Meteorological data
 - JAX / Waycross 1984 - 1988

2. Modeled Predicted Impacts
 - a. Significant Impact Area
 - If less than significant impact level (SIL), then done
 - b. Preconstruction monitoring
 - c. Ambient Air Quality Standards
 - Only if greater than SIL
 - d. Increment Analysis
 - Only if greater than SIL

3. Additional Impact Analyses
 - a. Commercial / Residential / Industrial Growth
 - b. Vegetation & Soils
 - c. Visibility
 - d. Class I Analysis
 - Nearest Class I areas: Okefenokee & Wolf Island
 - VISCREEN
 - Regional Haze analysis

E. Toxics

4. PSD Application
 - A. Long Form
 - B. ELSA
 - C. Concurrent Operating Permit
 - D. Review Schedule
 - E. Fees

JEA - Inlet Bleed Heat**ESTIMATED PERFORMANCE PG7241(FA)**

Load Condition		BASE	75%	50%	25%	BASE	75%	50%	25%
Ambient Temp.	Deg F.	59.	59.	59.	59.	59.	59.	59.	59.
Fuel Type		Cust Gas	Cust Gas	Cust Gas	Cust Gas	Liquid	Liquid	Liquid	Liquid
Fuel LHV	Btu/lb	20,675	20,675	20,675	20,675	18,550	18,550	18,550	18,550
Fuel Temperature	Deg F	60	60	60	60	60	60	60	60
Liquid Fuel H/C Ratio						1.9	1.9	1.9	1.9
Output	kW	173,200.	129,900.	86,600.	43,300.	182,000.	136,500.	91,000.	45,500.
Heat Rate (LHV)	Btu/kWh	9,370.	10,120.	12,190.	16,820.	10,010.	10,830.	12,780.	17,070.
Heat Cons. (LHV) X 10 ⁶	Btu/h	1,622.9	1,314.6	1,055.7	728.3	1,821.8	1,478.3	1,163.	776.7
Auxiliary Power	kW	608	608	608	608	1,542	1,542	1,542	1,542
Output Net	kW	172,590.	129,290.	85,990.	42,690.	180,460.	134,960.	89,460.	43,960.
Heat Rate (LHV) Net	Btu/kWh	9,400.	10,170.	12,280.	17,060.	10,100.	10,950.	13,000.	17,670.
Exhaust Flow X 10 ³	lb/h	3542.	2890.	2397.	2182.	3683.	2827.	2406.	2215.
Exhaust Temp.	Deg F.	1116.	1139.	1184.	1013.	1098.	1194.	1200.	1013.
Exhaust Heat (LHV) X 10 ⁶	Btu/h	973.0	823.2	720.4	551.1	1011.7	865.3	744.8	562.1
Water Flow	lb/h	0.	0.	0.	0.	119,700.	90,620.	61,970.	27,170.

EMISSIONS

NOx	ppmvd @ 15% O2	15.	15.	15.	77.	42.	42.	42.	42.
NOx AS NO2	lb/h	99.	79.	63.	220.	318.	256.	199.	131.
CO	ppmvd	15.	15.	15.	65.	20.	20.	30.	254.
CO	lb/h	48.	39.	33.	131.	65.	50.	63.	514.
UHC	ppmvw	7.	7.	7.	30.	7.	7.	7.	23.
UHC	lb/h	14.	11.	9.	36.	15.	11.	9.	28.
Particulates	lb/h	9.	9.	9.	9.	17.	17.	17.	17.

EXHAUST ANALYSIS % VOL.

Argon		0.89	0.90	0.90	0.90	0.86	0.84	0.86	0.90
Nitrogen		74.39	74.44	74.55	75.23	71.30	71.26	72.20	74.38
Oxygen		12.38	12.51	12.85	14.80	11.09	10.69	11.62	14.35
Carbon Dioxide		3.90	3.84	3.69	2.78	5.48	5.75	5.28	3.83
Water		8.44	8.32	8.02	6.29	11.28	11.46	10.04	6.55

SITE CONDITIONS

Elevation	ft.	27.0
Site Pressure	psia	14.69
Inlet Loss	in Water	3.0
Exhaust Loss	in Water	5.5
Relative Humidity	%	60
Application		7FH2 Hydrogen-Cooled Generator
Combustion System		15/42 DLN Combustor

Emission information based on GE recommended measurement methods. NOx emissions are corrected to 15% O2 without heat rate correction and are not corrected to ISO reference condition per 40CFR 60.335(c)(1). NOx levels shown will be controlled by algorithms within the SPEEDTRONIC control system.

Liquid Fuel is Assumed to have 0.015% Fuel-Bound Nitrogen, or less.
 FBN Amounts Greater Than 0.015% Will Add to the Reported NOx Value.
 Sulfur Emissions Based On 0 WT% Sulfur Content in the Fuel.

JEA - Inlet Bleed Heat**ESTIMATED PERFORMANCE PG7241(FA)**

Load Condition		BASE	75%	50%	25%	BASE	75%	50%	25%
Ambient Temp.	Deg F.	20.	20.	20.	20.	20.	20.	20.	20.
Fuel Type		Cust Gas	Cust Gas	Cust Gas	Cust Gas	Liquid	Liquid	Liquid	Liquid
Fuel LHV	Btu/lb	20,675	20,675	20,675	20,675	18,550	18,550	18,550	18,550
Fuel Temperature	Deg F	60	60	60	60	60	60	60	60
Liquid Fuel H/C Ratio						1.9	1.9	1.9	1.9
Output	kW	186,500.	139,900.	93,300.	46,600.	192,700.	144,500.	96,400.	48,200.
Heat Rate (LHV)	Btu/kWh	9,310.	9,950.	11,910.	16,280.	10,040.	10,840.	12,680.	16,690.
Heat Cons. (LHV) X 10 ⁶	Btu/h	1,736.3	1,392.	1,111.2	758.6	1,934.7	1,566.4	1,222.4	804.5
Auxiliary Power	kW	608	608	608	608	1,542	1,542	1,542	1,542
Output Net	kW	185,890.	139,290.	92,690.	45,990.	191,160.	142,960.	94,860.	46,660.
Heat Rate (LHV) Net	Btu/kWh	9,340.	9,990.	11,990.	16,500.	10,120.	10,960.	12,890.	17,240.
Exhaust Flow X 10 ³	lb/h	3801.	3025.	2486.	2297.	3914.	2925.	2439.	2332.
Exhaust Temp.	Deg F.	1081.	1112.	1160.	966.	1068.	1183.	1200.	962.
Exhaust Heat (LHV) X 10 ⁶	Btu/h	1036.9	863.8	751.3	569.2	1074.8	913.4	777.8	578.7
Water Flow	lb/h	0.	0.	0.	0.	130,530.	100,950.	68,710.	28,730.

EMISSIONS

NOx	ppmvd @ 15% O2	15.	15.	15.	80.	42.	42.	42.	42.
NOx AS NO2	lb/h	106.	84.	66.	238.	338.	271.	209.	136.
CO	ppmvd	15.	15.	15.	104.	20.	20.	26.	282.
CO	lb/h	52.	41.	34.	221.	69.	51.	57.	605.
UHC	ppmvw	7.	7.	7.	47.	7.	7.	7.	27.
UHC	lb/h	15.	12.	10.	60.	15.	12.	10.	35.
Particulates	lb/h	9.	9.	9.	9.	17.	17.	17.	17.

EXHAUST ANALYSIS % VOL.

Argon		0.91	0.89	0.89	0.90	0.86	0.84	0.86	0.91
Nitrogen		74.99	75.00	75.11	75.86	71.77	71.48	72.40	74.99
Oxygen		12.54	12.57	12.88	15.00	11.20	10.54	11.39	14.59
Carbon Dioxide		3.90	3.89	3.75	2.77	5.49	5.89	5.48	3.78
Water		7.67	7.65	7.37	5.48	10.69	11.25	9.87	5.74

SITE CONDITIONS

Elevation	ft.	27.0
Site Pressure	psia	14.69
Inlet Loss	in Water	3.0
Exhaust Loss	in Water	5.5
Relative Humidity	%	60
Application		7FH2 Hydrogen-Cooled Generator
Combustion System		15/42 DLN Combustor

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JEA - Inlet Bleed Heat**ESTIMATED PERFORMANCE PG7241(FA)**

Load Condition		BASE	75%	50%	25%	BASE	75%	50%	25%
Ambient Temp.	Deg F.	95.	95.	95.	95.	95.	95.	95.	95.
Fuel Type		Cust Gas	Cust Gas	Cust Gas	Cust Gas	Liquid	Liquid	Liquid	Liquid
Fuel LHV	Btu/lb	20,675	20,675	20,675	20,675	18,550	18,550	18,550	18,550
Fuel Temperature	Deg F	60	60	60	60	60	60	60	60
Liquid Fuel H/C Ratio						1.9	1.9	1.9	1.9
Output	kW	150,500.	112,800.	75,200.	37,600.	160,100.	120,100.	80,100.	40,000.
Heat Rate (LHV)	Btu/kWh	9,760.	10,690.	12,940.	18,180.	10,240.	11,170.	13,270.	18,180.
Heat Cons. (LHV) X 10 ⁶	Btu/h	1,468.9	1,205.8	973.1	683.6	1,639.4	1,341.5	1,062.9	727.2
Auxiliary Power	kW	608	608	608	608	1,542	1,542	1,542	1,542
Output Net	kW	149,890.	112,190.	74,590.	36,990.	158,560.	118,560.	78,560.	38,460.
Heat Rate (LHV) Net	Btu/kWh	9,800.	10,750.	13,050.	18,480.	10,340.	11,320.	13,530.	18,910.
Exhaust Flow X 10 ³	lb/h	3254.	2691.	2265.	2064.	3365.	2693.	2318.	2089.
Exhaust Temp.	Deg F.	1144.	1170.	1200.	1043.	1133.	1200.	1200.	1053.
Exhaust Heat (LHV) X 10 ⁶	Btu/h	901.9	776.4	679.4	527.2	936.0	810.4	701.1	540.4
Water Flow	lb/h	0.	0.	0.	0.	93,590.	69,010.	46,070.	19,720.

EMISSIONS

NOx	ppmvd @ 15% O2	15.	15.	15.	58.	42.	42.	42.	42.
NOx AS NO2	lb/h	89.	73.	58.	156.	286.	232.	182.	123.
CO	ppmvd	15.	15.	15.	61.	20.	20.	36.	254.
CO	lb/h	43.	36.	30.	115.	59.	47.	74.	480.
UHC	ppmvw	7.	7.	7.	28.	7.	7.	7.	21.
UHC	lb/h	13.	11.	9.	33.	13.	11.	9.	25.
Particulates	lb/h	9.	9.	9.	9.	17.	17.	17.	17.

EXHAUST ANALYSIS % VOL.

Argon	0.87	0.86	0.86	0.87	0.84	0.84	0.85	0.86
Nitrogen	72.71	72.76	72.89	73.50	70.25	70.48	71.33	73.01
Oxygen	12.10	12.24	12.64	14.42	10.97	10.92	11.83	14.06
Carbon Dioxide	3.82	3.75	3.57	2.74	5.37	5.45	4.99	3.78
Water	10.51	10.39	10.04	8.47	12.57	12.31	11.01	8.29

SITE CONDITIONS

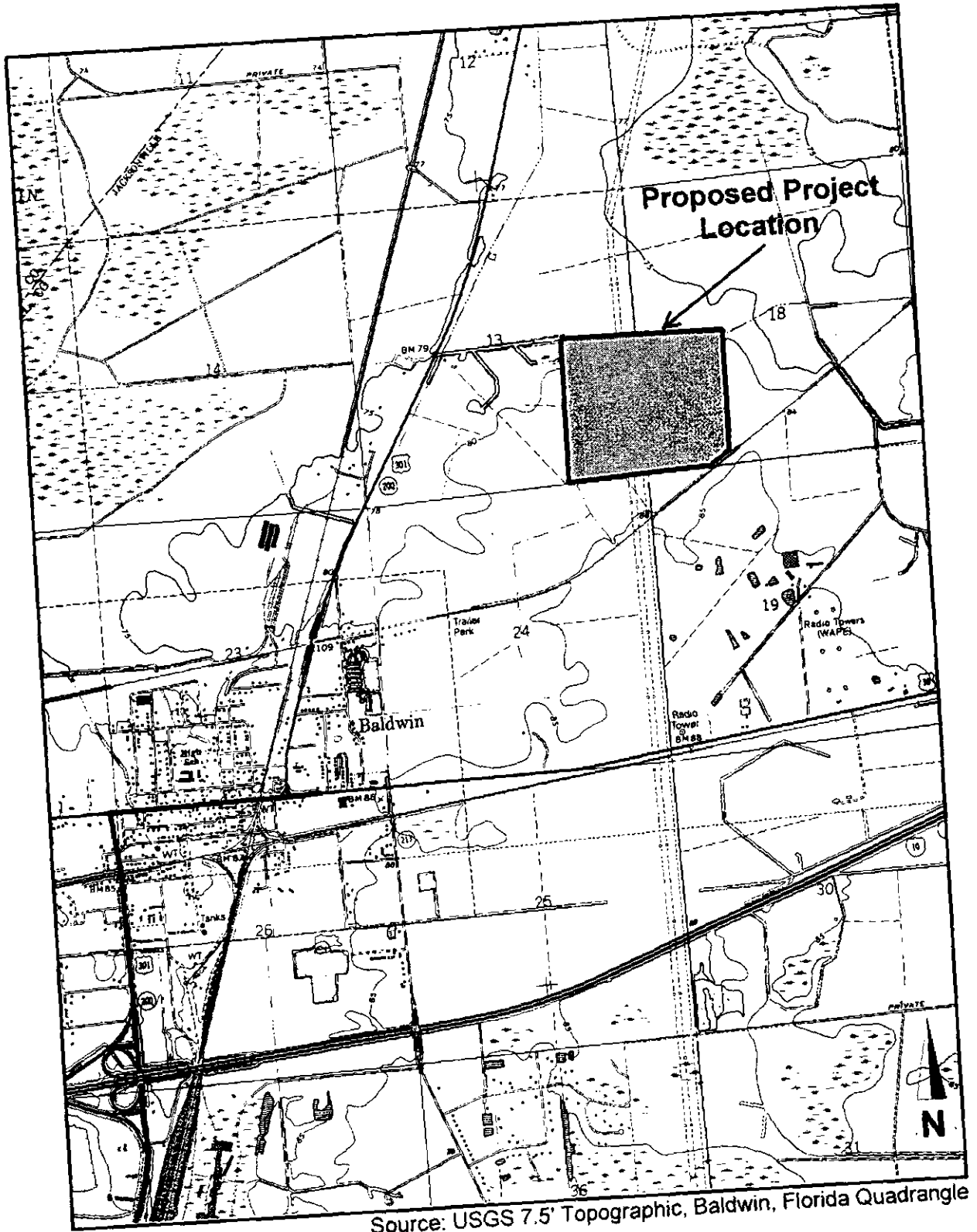
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Source: USGS 7.5' Topographic, Baldwin, Florida Quadrangle

Proposed Project Location