

May 25, 2007

Mr. Jeffery F. Koerner, Air Permitting North Section  
Bureau of Air Regulation  
Florida Department of Environmental Protection  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400

**RECEIVED**

JUN 01 2007

BUREAU OF AIR REGULATION

**Re: Project No. 1070005-038-AC PSD-FL-380  
Modification of the No. 4 Recovery Boiler, No. 4 Lime Kiln and No. 4 Combination  
Boiler  
Response to Request for Additional Information No. 3**

Dear Mr. Koerner:

We are in receipt of your request for additional information, dated December 15, 2006, regarding our PSD permit application project to make modifications to the No. 4 Recovery Boiler, No. 4 Lime Kiln, and No. 4 Combination Boiler.

This response addresses question number 5 of the Department's December 15, 2006 request for additional information. A response to questions 2, 6 (second response) and 7 was submitted to FDEP on January 31, 2007. A response to questions 1, 3, 4 and 6 (second response) was submitted to FDEP on March 9, 2007.

Additionally, this response seeks relief from the short-term Recovery Boiler SO<sub>2</sub> limits while burning fuel oil, a concern voiced by GP in a conference call with FDEP on May 4, 2007.

For ease of following GP's responses, we have repeated the FDEP's questions prior to the answers.

**No. 4 Combination Boiler**

- 5. Based on your submittals, the Department believes several of the identified NO<sub>x</sub> control options are likely cost effective including selective non-catalytic reduction (SNCR), the Ecotube system with urea injection, and flue gas recirculation (FGR). These controls have been successfully installed on similar units. The Department's review focused on the SNCR system, which has been successfully installed and operated on several units in Florida including RDF boilers, wood-fired boilers, and bagasse-fired boilers. However, both the Ecotube with urea injection and flue gas recirculation (FGR) may also be able to provide similar reductions with comparable**

**costs.**

**SNCR:** The preliminary SNCR design was based on the co-firing of residual oil with a maximum fuel sulfur content of 2.5% by weight. When the fuel sulfur content is above approximately 1.5% by weight, the vendor indicates that a critical design constraint is to substantially limit the ammonia slip to prevent the formation of ammonium bisulfates, which can foul boiler heat transfer surfaces. With regard to the SNCR design, this will likely result in more injectors, additional injector levels, restricted urea injection rates, and reduced control efficiencies. Although the vendor indicated a reduction of 35% in the bid for the primary fuel scenario (bark/oil), the cost effectiveness estimate was based upon only 30% reduction. Existing biomass-fired boilers are achieving control efficiencies of up to 50% reduction. Will the No. 4 Combination Boiler fire bark/wood alone without other fuels? Please provide a vendor quote on equipment and installation costs for an SNCR system firing bark/wood alone and firing bark/wood with oil having a maximum fuel sulfur content of less than 1.0%. Please include the input criteria for the bid, the expected control efficiencies, and the urea injection rate.

**Ecotube Plus Urea Injection:** The estimated cost effectiveness for this system is actually lower than that estimated for SNCR. In addition, the vendor indicates co-benefits for reducing CO emissions, which is also subject to a BACT determination for this project. Please provide the vendor quote used for the Ecotube system with/without urea injection including the input criteria, estimated installation costs, control efficiencies, and urea injection rate.

**FGR:** When combined with air staging, flue gas recirculation (FGR) has achieved control efficiencies approaching 50% reduction for similar units depending on initial uncontrolled NO<sub>x</sub> emissions rates. Please provide the vendor quote for the FGR system including the input criteria, estimated installation costs, and control efficiency.

Provide a revised cost effectiveness analysis (\$/ton NO<sub>x</sub> removed) for each of these controls options and identify the most cost effective option.

The project identifies the following physical modifications to the No. 4 Combination Boiler: modified conveyors; new air swept bark distributors; a new overfire air (OFA) system; new low-NO<sub>x</sub> burners (LNB); and possibly new baffles to more evenly distribute the underfire air. The primary purpose for these modifications is to improve combustion of the bark/wood fuel and the overall burning rate of this fuel to reduce oil firing. Such changes will affect pollutant emissions, which could affect the design of the control systems. For the selected NO<sub>x</sub> control option, provide a schedule and comments regarding the following: commencement through completion of the boiler modifications, boiler shakedown; performance and emissions testing after completing the boiler modifications; development and final design of the NO<sub>x</sub> control system; commencement through completion of installing the NO<sub>x</sub> control system; initial startup and shakedown after completing the NO<sub>x</sub> control system; equipment shakedown and tuning; initial compliance testing; and monitor certification.

**Answer:** On Friday, May 4, 2007, a telephone conference call was held between Bruce Mitchell and Jeff Koerner of FDEP and Mike Curtis, Ron Reynolds, Wayne Galler, and Mark Aguilar of GP to discuss NO<sub>x</sub> control options for the No. 4 Combination Boiler. As discussed during the

telephone conversation, since the time that the PSD permit application for the No. 4 Combination Boiler was submitted by Golder & Associates (for GP) to FDEP in July 2006, GP has obtained new and more accurate cost data to install an SNCR system for the reduction of NO<sub>x</sub> emissions from the No. 4 Combination Boiler. The new cost data was prepared by Jacobs Engineering of Greenville, South Carolina in November 2006, and was prepared as part of their contract work for GP to estimate control system costs for the BART requirements. Jacob's cost estimate for installation of an SNCR system for the No. 4 Combination Boiler was based on a +/- 30% accuracy, but Jacob's cost estimate contains much more detail than the one prepared by Golder & Associates for the July 2006 PSD permit application. A copy of Jacob's cost estimate is attached to this submittal as Attachment 1. The basis for Jacob's cost estimate is attached to this submittal as Attachment 2.

Utilizing Jacob's cost data for installation of an SNCR system and Golder's cost effectiveness calculation spreadsheet (Table 5-10) contained in the July 2006 PSD permit application, the cost effectiveness for use of an SNCR system supplied by Fuel-Tech, Inc. would be \$7,848/ton NO<sub>x</sub> removed. This is much higher than the cost effectiveness value of \$5,419/ton NO<sub>x</sub> removed reported in Table 5-10 of Golder's July 2006 PSD permit application. The baseline emissions used in Table 5-10 was 356.1 tons of NO<sub>x</sub>, which is based on a "post-BART" NO<sub>x</sub> emission rate of 0.22 lbs NO<sub>x</sub>/MM Btu heat input. Previous conversations between Mark Aguilar of GP and FDEP resulted in an agreement that the baseline period for this analysis may consider the expected controls that would be in place for the No. 4 Combination Boiler. FDEP reaffirmed this agreement during the May 4<sup>th</sup> telephone discussion with GP. The basis for the 0.22 lb NO<sub>x</sub>/MM Btu heat input value comes from a performance guarantee provided to GP by Jansen Combustion and Boiler Technologies, Inc. for the No. 4 Combination Boiler (dated January 26, 2007, Revision 2-see Section 9.3.2 of Attachment 3). The emissions guarantee is based on the No. 4 Combination Boiler firing a combination of bark and natural gas over an eight-hour test period. The 0.22 lb/MM Btu value assumes the use of low-NO<sub>x</sub> gas-fired burners and an overfire air system.

GP does not believe a value of almost \$8,000 per ton of NO<sub>x</sub> removed for an SNCR system is a cost effective approach for reducing NO<sub>x</sub> emissions from the No. 4 Combination Boiler.

GP has not provided a cost effectiveness analysis for the use of an SNCR system for the No. 4 Combination Boiler burning a combination of bark and No. 6 Fuel Oil since it is not the Mill's intent to burn No. 6 fuel oil in the boiler under the future operating scenario. It is the Mill's intent to burn a combination of bark and natural gas in the No. 4 Combination Boiler under the future operating scenario.

Regarding the FDEP's question about whether or not the No. 4 Combination Boiler can burn 100% bark, the answer is rarely. Fuel oil is expensive and we certainly want to burn as much wood fuel as we can in the Combination Boiler. However, we generally must also burn fuel oil to meet the steam/energy needs of the mill. Even when fuel oil is not necessarily needed to supplement the BTUs from bark/wood fuel, some minimal amount of fuel oil is burned as a safety measure to protect against tripping the boiler, and perhaps shutting down the mill, in case of a malfunction in the wood fuel feed system.

Regarding the Ecotube technology offered by Synterprise LLC, GP does not believe the NO<sub>x</sub> emission reductions obtained with biomass boilers operated by certain Utilities in the northeast

United States are attainable for the No. 4 Combination Boiler. The Ecotube system has primarily been installed on waste to energy boilers and on larger biomass fired boilers which typically had operated in an excess oxygen range of 6% to 10%. NO<sub>x</sub> formation is highly dependant on proper fuel-air mixing as well as time and temperature of the reaction. The amount of excess oxygen in the furnace affects flame temperatures and amount of elemental nitrogen (N<sub>2</sub>) present for NO<sub>x</sub> formation as the higher the percent excess oxygen, the higher the NO<sub>x</sub> will be in general, due to higher flame temperatures and additional N<sub>2</sub> present in the air for conversion to NO<sub>x</sub>. Inversely, as excess oxygen is reduced to levels closer to sub-stoichiometric rates, flame temperatures are reduced, therefore, the amount of N<sub>2</sub> available is reduced, and a slight reducing atmosphere is created, thereby lowering NO<sub>x</sub> emissions.

In reviewing the operations of the No. 4 Combination Boiler, which normally has an excess oxygen content of 4% on a dry basis, the estimated reduction efficiency for NO<sub>x</sub> would be in the 15% range; a review of Ecotube's proposal to GP (E-mail from Bill Buckley of Synterprise to Rob Orender of GP, dated December 22, 2005-see Attachment 4, page 2, second to last paragraph), Synterprise stated that they would expect a 20% reduction in NO<sub>x</sub> emissions. This unit also has 6 burners which utilize air to keep the burners cool while they are out-of-service. This excess air is not effectively utilized in the combustion process and thereby can contribute to higher than expected NO<sub>x</sub> emissions.

Synterprise's available references for NO<sub>x</sub> emissions before and after Ecotube technology installations consist of two sites in Europe with NO<sub>x</sub> reductions and oxygen levels which are listed below:

	% Oxygen Before	% Oxygen After	NO <sub>x</sub> (ppm) Before	NO <sub>x</sub> (ppm) After	% Reduction
Karlskoga	6.0	4.0	130	60	53.8
Kristineheds	6.0	3.0	430	130	69.8

The Karlskoga site used the Ecotube system and limestone for NO<sub>x</sub> emissions controls and the Kristineheds site utilized Ecotube as well as a urea-based de-NO<sub>x</sub> system.

In order to obtain a guaranteed NO<sub>x</sub> reduction value for the No. 4 Combination Boiler from Synterprise, GP would need to pay an estimated \$35,000 fee for a modeling study to be performed by Synterprise. Based on what we know about the Ecotube technology and the operation of the No. 4 Combination Boiler, GP does not think it would be wise to spend the \$35,000 modeling fee with an expectation of only a 15-20% NO<sub>x</sub> reduction. We believe that the performance guarantee from Jansen Combustion and Boiler Technologies, Inc. of 0.22 lb/MM Btu is approximately equivalent to a 15-20% overall NO<sub>x</sub> reduction. The baseline NO<sub>x</sub> emissions from the No. 4 Combination Boiler prepared by Golder & Associates in Table 5-10 of the PSD permit application was 0.27 lb/MM Btu for fuel oil and 0.24 lb/MM Btu for bark. The 0.27 lb/MM Btu value for fuel oil combustion incorporated a 15% reduction with the use of low-NO<sub>x</sub> burners, so the uncontrolled NO<sub>x</sub> emission rate was equal to 0.31 lb/MM Btu. The actual NO<sub>x</sub> reduction achieved by incorporating the modifications required by Jansen to meet their performance guarantee for the No. 4 Combination Boiler will depend upon the fuel mix of bark and natural gas. However, just by switching fuel from No. 6 fuel oil to natural gas, the overall average emission factor changes by a minimum of 12% (by dropping from an average of 0.25 lbs NO<sub>x</sub>/MM Btu to 0.22 lbs/MM Btu). GP expects the actual NO<sub>x</sub> emission rate to be lower than

0.22 lbs/MM Btu when burning gas and bark, therefore, the actual NO<sub>x</sub> reduction achieved by the No. 4 Combination Boiler should be greater than 12%.

Regarding the final selection of the NO<sub>x</sub> control system for the No. 4 Combination Boiler and the control system installation schedule, GP offers the following information:

GP proposes to install a new overfire air system as the selected NO<sub>x</sub> control option for the initial phase of the modification to begin in November 2006. A second phase will proceed with the installation of low-NO<sub>x</sub> burners when the additional natural gas supply is made available by the local utility, which we are told could take up to two years. Shakedown of the boiler is anticipated to require up to 60 days after which initial compliance stack testing will be completed within the usual 60 days of achieving permitted capacity, but not later than 180 days after startup.

#### **No. 4 Recovery Boiler**

GP seeks relief from the short-term SO<sub>2</sub> limits while burning fuel oil, a concern that was also discussed in the conference call with FDEP on May 4, 2007.

**Comment:** GP has no objection to the Recovery Boiler SO<sub>2</sub> limitation of 153.9 tons per year (12-month rolling total) based on CEMS data. However, GP requests the following language be added in order to provide relief during periods of fuel oil firing from the current short term SO<sub>2</sub> limits of 75 ppm and 109.9 lb/hr:

*"During periods when fuel oil is burned, such as start ups, shutdowns, malfunctions, and other temporary upset or maintenance situations, SO<sub>2</sub> emissions shall be limited only by the sulfur content (2.35%) of the fuel oil and a maximum fuel oil firing rate of 84 GPM."*

**Discussion:** The current SO<sub>2</sub> limit, as represented in the Title V permit 1070005-031-AV, condition E.7., states that "Sulfur Dioxide Emissions shall not exceed 75 ppmvd at 8% O<sub>2</sub>; 109.9 lb/hr, and 481.4 TPY based on an average of three test runs"...etc. The proposed draft permit PSD-FL-380 lowers the annual SO<sub>2</sub> limit to 153.9 TPY based on a 12-month rolling CEMS total. GP has concerns regarding the short term limits of 75 ppm and 109.9 lbs/hr during startup, shutdown, malfunction, and other temporary situations when fuel oil must be burned at much higher than normal rates. The Title V permit language clearly states that the limits apply during stack testing conditions, which would typically involve near-maximum black liquor firing rates and very low or no fuel oil. However, if the old short-term limits are to be incorporated into the Title V with the proposed CEMS monitoring scheme then compliance will be impossible during the identified situations requiring high fuel oil use.

- During periods of startup, shutdown, malfunction, maintenance on the black liquor system, and process upsets, fuel oil must be burned for periods lasting from several hours to as much as 24 hours at much higher rates than during normal operation. During startup, the boiler must be fired on fuel oil until the furnace is hot enough to sustain combustion of black liquor. Then, the fuel oil guns gradually reduce the amount of fuel oil that is fired while the black liquor guns are added one-by-one until the boiler is stabilized on 100% black liquor. During shutdown periods, fuel oil is burned to burn the smelt bed out of the bottom of the Recovery. Maintenance work on the black liquor feed system may also necessitate burning only fuel oil in order to maintain steam.

Fuel oil may also be burned at higher than normal rates during process upsets or malfunction situations to maintain steam and stabilize the boiler until normal operation can be achieved. The suggested startup/shutdown/malfunction fuel oil firing rate of 84 gpm, and the resulting SO<sub>2</sub> emissions, was accounted for in short-term air modeling that was performed and submitted to the FL DEP in 2006, indicating compliance with the short-term SO<sub>2</sub> NAAQS standards. Therefore, GP proposes that incorporation of the suggested permit language will be sufficiently protective of air quality and allow needed operational flexibility while maintaining compliance.

If there are any questions regarding this response, please do not hesitate to contact Mike Curtis at 386-329-0918.

I, the undersigned, am the responsible official of the source for which this document is being submitted. I hereby certify, based on the information and belief formed after reasonable inquiry, that the statements made and the data contained in this document are true, accurate, and complete.

Sincerely,

A handwritten signature in cursive script that reads "Keith Wahoske".

Keith W. Wahoske, Vice-President  
Palatka Operations

cc: W. Galler, T. Champion, T. Wyles, S. Matchett, R. Reynolds, M. Curtis - GP

**TABLE 5-10  
COST EFFECTIVENESS OF SNCR SYSTEM  
FOR NO. 4 COMBINATION BOILER, GP PALATKA MILL**

Cost Items	Cost Factors <sup>a</sup>	Cost (\$)
<b>DIRECT CAPITAL COSTS (DCC):</b>		
Purchased Equipment Cost (PEC)		
SNCR Basic Process	Vendor quote <sup>b</sup>	\$875,000
NOxOUT Storage Tank	10,000 gallon; included in vendor quote	--
Emissions Monitoring	15% of equipment cost	\$131,250
Foundation and Structure Support	8% of equipment cost	\$70,000
Freight	Vendor quote <sup>b</sup>	\$12,000
Taxes	Florida sales tax, 6%	\$52,500
<b>Total PEC:</b>		<b>\$1,140,750</b>
Direct SNCR Installation	GP vendor quotes for similar boiler. 70% of basic	\$753,375
<b>Total DCC:</b>		<b>\$1,894,125</b>
<b>INDIRECT CAPITAL COSTS (ICC):</b>		
Air and Water Piping	Based on GP Engineering Estimate	\$50,000
Electrical and Controls	Based on GP Engineering Estimate	\$50,000
Performance testing	Based on GP Engineering Estimate	\$100,000
Engineering and Supervision	Portion performed by GP (5% of Total DCC)	\$94,706
Modeling	Included in vendor quote	--
Start-up and Optimization Service	Included in vendor quote	--
Temperature monitoring	Based on Engineering Estimate	\$45,000
Operation and Maintenance Manuals (5)	Included in vendor quote	--
General Facilities	5% of DCC	\$94,706
Engineering and home office fees	10% of DCC	\$189,413
Process Contingency	5% of DCC	\$94,706
<b>Total ICC:</b>		<b>\$718,531</b>
PROJECT CONTINGENCY (RETROFIT)	30% of (DCC + ICC)	\$783,797
<b>TOTAL CAPITAL INVESTMENT (TCI)</b>	<b>DCC + ICC + PROJECT CONTINGENCY</b>	<b>\$4,267,000</b>
<b>DIRECT OPERATING COSTS (DOC):</b>		
(1) Operating Labor		
Operator	2 hours/week, \$16/hr, 52 weeks/yr	\$1,664
Supervisor	1.5% of operator cost	\$250
(2) Maintenance	1.5% of TCI	\$64,005
(3) NOx-OUT solution cost	18 gal/hr, \$1.45/gal <sup>c</sup> , 80% C.F.	\$182,909
(4) Electricity	66 kW, \$0.08/kW-hr, 80% C.F.	\$37,002
(5) Water	520 gph, \$0.00064/ga, 80% C.F.	\$2,332
(6) Fuel- bark/wood (loss in efficiency)	1 MM Btu/yr, \$3/MM Btu, 80% C.F.	\$21,024
<b>Total DOC:</b>		<b>\$309,186</b>
<b>INDIRECT OPERATING COSTS (IOC)</b>		
Overhead	30% of oper. labor & maintenance	\$19,776
Property Taxes	0.5% of total capital investment	\$21,335
Insurance	1% of total capital investment	\$42,670
Administration	1% of total capital investment	\$42,670
<b>Total IOC:</b>		<b>\$126,451</b>
CAPITAL RECOVERY COSTS (CRC):	CRF of 0.09439 times TCI (20 yrs @ 7%)	\$402,762
<b>ANNUALIZED COSTS (AC):</b>	<b>DOC + IOC + CRC</b>	<b>\$838,399</b>
<b>BASELINE NO<sub>x</sub> EMISSIONS (TPY) :</b>		
	Bark-avg of 2004/2005 = 2,563,380 MM Btu	356.1 <sup>d</sup>
	Oil-avg of 2004/2005 = 673,878 MM Btu	
	0.22 lb/MMBtu for natural gas and for bark	
<b>MAXIMUM NO<sub>x</sub> EMISSIONS w/SNCR (TPY) :</b>		
	0.22 lb/MM for bark (4,042,127 MM Btu/yr)	444.6
	0.22 lb/MM Btu for natural gas (750,000 MM Btu)	82.5
	Total NO <sub>x</sub> future	527.1
<b>REDUCTION IN NO<sub>x</sub> EMISSIONS (TPY)</b>	30% reduction from baseline <sup>e</sup>	106.8
<b>COST EFFECTIVENESS:</b>	<b>\$ per ton of NO<sub>x</sub> Removed</b>	<b>\$7,848</b>

**Footnotes:**

<sup>a</sup> Unless otherwise specified, factors and cost estimates reflect EPA Air Pollution Cost Control Manual, Sixth Edition (EPA/452/B-02-001, Jan 2002)

<sup>b</sup> NO<sub>x</sub> OUT SNCR NO<sub>x</sub> Reduction System Proposal, Fuel Tech, Inc., January 5, 2006.

<sup>c</sup> NO<sub>x</sub> OUT solution cost based on actual cost incurred by U.S. Sugar Corporation for their SNCR system, as of January 2006

<sup>d</sup> Based on bark average usage of 284,820 tons/yr @ 4,500 Btu/lb, fuel oil average usage of 4,492,520 gal/yr @ 150,000 Btu/gal  
Bark = 2,563,380 MM Btu/yr and oil = 673,878 MM Btu/yr for a total of 3,237,258 MM Btu/yr  
NO<sub>x</sub> = baseline of 0.22 lb/MM Btu (after BART controls in place) or 356.1 tons/yr

<sup>e</sup> 30% NO<sub>x</sub> reduction was used as this was an average of the different fuel firing scenarios:

35% NO<sub>x</sub> reduction for bark/wood and 25% on fuel oil-bottom of Page 5-14 in July 2006 PSD application

**Note:** Natural gas will replace the Btu content of oil burned in the No. 4 Combination Boiler in the future

# **ATTACHMENT I**



**TOTAL COST SUMMARY - JE PRIME CODE**



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC0000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 Q:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC0000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC0000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls\PRIME

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WBSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

PRIME CODE	DESCRIPTION	W-H	QTY	UNIT	LABOR	EQUIPMENT	MATERIAL	SUBCONTRACT	TOTAL COST
<b>DIRECT COSTS</b>									
50	MAJOR EQUIPMENT	1,899	0	0	\$92,062	\$1,022,900	\$15,244	\$0	\$1,130,306
51	DEMOLITION	496	0	0	\$25,432	\$0	\$0	\$0	\$25,432
52	SITE EARTHMOVING	0	0	0	\$0	\$0	\$0	\$0	\$0
53	SITE IMPROVEMENTS	0	0	0	\$0	\$0	\$0	\$56,518	\$56,518
54	PIILING, CAISSONS	0	791	LF	\$0	\$0	\$0	\$79,121	\$79,121
55	BUILDINGS	0	1	LOT	\$0	\$0	\$0	\$80,000	\$80,000
56	CONCRETE	568	31	CY	\$16,955	\$0	\$16,955	\$0	\$33,909
57	MASONRY, REFRACTORY	0	0	0	\$0	\$0	\$0	\$0	\$0
58	STRUCTURAL STEEL	1,353	39	TN	\$67,818	\$0	\$139,637	\$0	\$207,455
59	ROOFING AND SIDING	0	0	0	\$0	\$0	\$0	\$0	\$0
60	FIRE PROOFING	0	0	0	\$0	\$0	\$0	\$0	\$0
61	PROCESS DUCTWORK (NON-BUILDING)	0	0	0	\$0	\$0	\$0	\$0	\$0
62	PIPING	1,689	556	LF	\$80,424	\$0	\$101,727	\$0	\$182,151
63	INSULATION - PIPE, EQUIPMENT & DUCTWORK	1,108	1	LOT	\$90,884	\$0	\$0	\$50,884	\$141,768
64	INSTRUMENTATION	111	6	EA	\$5,852	\$11,303	\$11,303	\$0	\$28,458
65	ELECTRICAL	550	2,200	LF	\$27,941	\$63,815	\$45,212	\$0	\$136,968
66	PAINTING, PROTECTIVE COATINGS	123	0	0	\$5,862	\$0	\$5,862	\$0	\$11,303
67	FURNITURE, LAB & SHOP EQUIPMENT	0	0	0	\$0	\$0	\$0	\$0	\$0
<b>TOTAL DIRECT COSTS</b>		<b>7,452</b>			<b>\$382,799</b>	<b>\$1,127,818</b>	<b>\$331,829</b>	<b>\$288,500</b>	<b>\$2,100,946</b>
	\$ / WH	\$81.37							
<b>CONSTRUCTION INDIRECT COSTS</b>									
75	CONSTRUCTION SUPPORT LABOR	1,490			\$80,409	\$0	\$0	\$0	\$80,409
76	TEMPORARY CONSTRUCTION FACILITIES (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
78	PREMIUM TIME				\$23,354	\$0	\$0	\$0	\$23,354
79	CRAFT FRINGE BENEFITS (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
	CRAFT PER CHEM (\$7 PER HOUR ON 100 % OF THE HOURS)				\$0	\$0	\$0	\$62,601	\$62,601
80	PAYROLL TAXES & INSURANCE (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
83	SMALL TOOLS (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
84	CONSUMABLE SUPPLIES (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
85	CONSTRUCTION EQUIPMENT (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
87	FIELD STAFF (IN WAGE RATES)				\$0	\$0	\$0	\$0	\$0
81	NON-PAYROLL TAX, INSURANCE & PERMITS				\$0	\$73,308	\$21,569	\$8,061	\$102,938
93	CONSTRUCTION HOME OFFICE COST (INC. WITH CONTRACTOR'S CONSTRUCTION FEE)				\$0	\$0	\$0	\$0	\$0
71	CRAFT START-UP ASSISTANCE	450			\$33,306	\$0	\$0	\$0	\$33,306
99	CONTRACTOR'S CONSTRUCTION HOME OFFICE & FEE		10.0%	TCC LESS EQ.	\$45,597	\$0	\$53,010	\$33,775	\$132,382
<b>TOTAL CONSTRUCTION INDIRECT COSTS</b>		<b>1,940</b>			<b>\$182,838</b>	<b>\$73,308</b>	<b>\$74,579</b>	<b>\$105,036</b>	<b>\$435,761</b>
<b>TOTAL CONSTRUCTION COSTS (TCC)</b>		<b>9,392</b>			<b>\$565,637</b>	<b>\$1,201,126</b>	<b>\$406,407</b>	<b>\$393,536</b>	<b>\$2,536,707</b>
	\$ / WH	\$73.97							
<b>PROJECT INDIRECT COSTS</b>									
88	CONSTRUCTION MANAGEMENT		4.5%	TIC	\$0	\$0	\$0	\$182,798	\$182,798
90	ENGINEERING PROFESSIONAL SERVICES		10.0%	TIC	\$0	\$0	\$0	\$424,953	\$424,953
90	STUDY COST				\$0	\$0	\$0	\$50,000	\$50,000
96	OUTSIDE CONSULTANT SERVICES				\$0	\$0	\$0	\$100,000	\$100,000
91	OWNER'S COST		3.0%	TIC	\$0	\$0	\$0	\$128,928	\$128,928
70	SPARE PARTS				\$0	\$56,391	\$0	\$0	\$56,391
71	NON-CRAFT START-UP ASSISTANCE				\$49,900	\$0	\$0	\$88,200	\$138,100
98	ALLOWANCE FOR UNFORESEEN		8.3%	TIC	\$89,541	\$128,782	\$40,841	\$128,742	\$388,866
98	ESCALATION		5.0%	TIC	\$0	\$128,752	\$58,182	\$33,483	\$320,417
	AIR INFILTRATION ALLOWANCE				\$0	\$0	\$0	\$100,000	\$100,000
	ROUND OFF				\$52	(\$21)	(\$231)	\$357	\$157
<b>TOTAL PROJECT COSTS</b>		<b>9,393</b>			<b>\$655,000</b>	<b>\$1,509,009</b>	<b>\$503,006</b>	<b>\$1,800,000</b>	<b>\$4,267,000</b>
	\$ / WH	\$73.97							

DETAIL DIRECT COST

JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 18DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 6 (+/- 30%)  
 G:\ESTIMATE\GEORGIA PACIFIC\FLORIDA\PALATKA\18DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\18DC9000 - TC5 - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.rvt\PRIME CODE TC5

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WBJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

LINE NO.	JE PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.'s	COST/ W.H.	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	UNIT COST	TOTAL ALL COSTS
<b>DIRECT COST - DETAILS</b>																
<b>MAJOR EQUIPMENT</b>																
1																
3	50	FUELTECH SNCR SYSTEM	1	LOT	1,350.00	1,350	\$54.17	\$73,131	\$875,000	\$875,000	\$0.00	\$0	\$0.00	\$0	\$848,131	\$848,131
4	50	LEVEL 1 NOZZLES (WITH RETRACTABLE LANCES)	6	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
5	50	RETRACTABLE NOZZLES	6	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
6	50	LEVEL 2 NOZZLES (FIXED POSITION NOZZLES)	3	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
7	60	DISTRIBUTION SKIDS	2	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
8	50	METERING SKID	1	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
11	50	PUMPING SKID	1	EA	INCLUDED	0	\$54.17	\$0	INCL.	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
15	60															
16	50	UREA STORAGE TANK - 10' DIAMETER X 12' HIGH	1	EA	100.00	100	\$54.17	\$5,417	\$14,000	\$14,000	\$0.00	\$0	\$0.00	\$0	\$19,417	\$19,417
17	50	DIKE	1	EA	IN CONCRETE	0	\$54.17	\$0	\$0	\$0	IN CONCRETE	\$0	\$0.00	\$0	\$0	\$0
18	50	LADDER	1	EA	8.00	8	\$54.17	\$433	\$1,000	\$1,000	\$0.00	\$0	\$0.00	\$0	\$1,433	\$1,433
19	50															
20	60	PIPING FROM UREA STORAGE TANK TO METERING SKID	1	LOT	IN PIPING	0	\$54.17	\$0	\$0	\$0	IN PIPING	\$0	\$0.00	\$0	\$0	\$0
21	50	PIPING FROM METERING SKID TO PUMPING SKID	1	LOT	IN PIPING	0	\$54.17	\$0	\$0	\$0	IN PIPING	\$0	\$0.00	\$0	\$0	\$0
22	50	PIPING FROM PUMPING SKID TO DISTRIBUTION SKIDS	1	LOT	IN PIPING	0	\$54.17	\$0	\$0	\$0	IN PIPING	\$0	\$0.00	\$0	\$0	\$0
23	50															
24	60	NEW AIR COMPRESSOR	1	EA	200.00	200	\$54.17	\$10,834	\$75,000	\$75,000	\$0.00	\$0	\$0.00	\$0	\$85,834	\$85,834
27	50															
28	50															
29	60	FREIGHT	1	LOT	N/A	0	\$54.17	\$0	\$57,900	\$57,900	\$0.00	\$0	\$0.00	\$0	\$57,900	\$57,900
30	50	SKIDS AND GROUT	1	LOT	41.45	41	\$54.17	\$2,245	\$0	\$0	\$15,344	\$16,344	\$0.00	\$0	\$17,589	\$17,589
35																
36	60	TOTAL - MAJOR EQUIPMENT				1,899	\$54.17	\$92,062		\$1,022,800		\$16,344		\$0	\$1,130,308	\$1,130,308
51																
52																
53																
54																
55																
56	51	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	469.47	469	\$54.17	\$25,432	\$0	\$0	\$0	\$0	\$0	\$0	\$25,432	\$25,432
57																
58	51	TOTAL - DEMOLITION				469	\$54.17	\$25,432		\$0		\$0		\$0	\$25,432	\$25,432
81																
82																
83																
84																
85																
86	53	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	0.00	0	\$45.91	\$0	\$0	\$0	\$0	\$0	\$56,515	\$56,515	\$56,515	\$56,515
87																
88	53	TOTAL - SITE IMPROVEMENTS				0	\$0.00	\$0		\$0		\$0		\$56,515	\$56,515	
91																
92																
93																
94																
95																
96	54	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	0.00	0	\$45.91	\$0	\$0	\$0	\$0	\$0	\$79,121	\$79,121	\$79,121	\$79,121
97																
98	54	TOTAL - PILING, CAISSONS	791	LF	8.00	8	\$0.00	\$0		\$0		\$0		\$79,121	\$79,121	
101																
102																
103																
104																
105																
106																
107																
108																
109																
110																
111	55.380	MCC ROOM, 20' X 20'	400	SF	S/C	0	\$45.91	\$0	\$0.00	\$0	\$0.00	\$0	\$200.00	\$80,000	\$200.00	\$80,000
112																
113	55.380	TOTAL - SPECIAL CONSTRUCTION				8	\$0.00	\$0		\$0		\$0		\$80,000	\$80,000	
114																
115																
116																
117																
118																
119																
120	56	DIKE (INCLUDED IN FACTOR)				0	\$45.91	\$0	\$0.00	\$0	\$0.00	\$0	\$0.00	\$0	\$0	\$0
121	58	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	389.31	389	\$45.91	\$18,955	\$0	\$0	\$18,955	\$18,955	\$0	\$0	\$33,909	\$33,909
122																
123	58	TOTAL - CONCRETE	31	CY	12.0	389	\$45.91	\$18,955		\$0		\$18,955		\$0	\$33,909	\$33,909
124																
125																
126																
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128																
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DETAIL DIRECT COST



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX  
 REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS # (14-307)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR(16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls)PRM2 CODE TCS

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

LINE NO.	JE PRIME CODE	01 PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.%	COST/ W.H.	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	UNIT COST	TOTAL ALL COSTS
<b>DIRECT COST - DETAILS</b>																
210																
231	58	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	1,292.88	1,293	\$50.13	\$67,818	\$0	\$0	\$135,637	\$135,637	\$0	\$0	\$203,455	\$203,455
232																
233	58	TOTAL - STRUCTURAL STEEL	39	TN	35.8	1,333	\$80.13	\$67,818	\$0	\$0	\$135,637	\$135,637	\$0	\$0	\$203,455	\$203,455
267																
268																
269		PIPING														
270																
307	62	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	1,688.23	1,688	\$54.17	\$80,424	\$0	\$0	\$101,727	\$101,727	\$0	\$0	\$182,152	\$182,152
308																
309	62	TOTAL - PIPING	556	LF	3.88	1,968	\$54.17	\$80,424	\$0	\$0	\$101,727	\$101,727	\$0	\$0	\$182,152	\$182,152
310																
311																
312		INSULATION - PIPE, EQUIPMENT & DUCTWORK														
313																
314	63	UREA TANK (INCLUDED IN FACTOR)					0	\$45.91	\$0	\$0.00	\$0.00	\$0	\$0.00	\$0	\$0.00	\$0
316	63	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	1,107.82	1,108	\$45.91	\$50,864	\$0	\$0	\$0	\$0	\$50,864	\$50,864	\$101,727	\$101,727
318																
319	63	TOTAL - INSULATION - PIPE, EQUIPMENT & DUCTWORK	1	LOT		1,108	\$45.91	\$50,864	\$0	\$0	\$0	\$0	\$50,864	\$50,864	\$101,727	\$101,727
320																
321																
322		INSTRUMENTATION														
323																
324																
336	64	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	111.23	111	\$50.81	\$5,652	\$11,303	\$11,303	\$11,303	\$11,303	\$0	\$0	\$28,258	\$28,258
337																
338	64	TOTAL - INSTRUMENTATION	8	EA	20.06	111	\$50.81	\$5,652	\$11,303	\$11,303	\$11,303	\$11,303	\$0	\$0	\$28,258	\$28,258
339																
340																
341		ELECTRICAL														
342																
343	65	UREA TANK HEAT TRACING (INCLUDED IN FACTOR)					0	\$50.81	\$0	\$0.00	\$0.00	\$0	\$0.00	\$0	\$0.00	\$0
344	65	TRANSFORMER - 13,800 V TO 480 V, RATED FOR 400 HP CONNECTED LOAD	1	EA	100.00	100	\$50.81	\$5,081	\$35,000	\$35,000	\$0.00	\$0	\$0.00	\$0	\$40,081	\$40,081
345	65	TESTING AND STARTUP	1	LOT	5.00	3	\$50.81	\$254	\$0.00	\$0	\$0.00	\$0	\$0.00	\$0	\$254.04	\$254
346	65	FREIGHT	1	LOT	N/A	0	\$50.81	\$0	\$2,100	\$2,100	\$0	\$0	\$0.00	\$0	\$2,100	\$2,100
355	65	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	444.93	445	\$50.81	\$22,904	\$58,515	\$58,515	\$45,212	\$45,212	\$0	\$0	\$124,334	\$124,334
356																
358	65	TOTAL - ELECTRICAL	2,200	LF	0.25	560	\$50.81	\$27,841	\$93,818	\$93,818	\$45,212	\$45,212	\$0	\$0	\$166,786	\$166,786
361																
362																
363																
364																
365		PAINTING, PROTECTIVE COATINGS														
366																
371	68	FACTORED FROM INSTALLED PROCESS EQUIPMENT COST	1	LOT	123.10	123	\$45.91	\$5,652	\$0	\$0	\$5,652	\$5,652	\$0	\$0	\$11,303	\$11,303
372																
373	68	TOTAL - PAINTING, PROTECTIVE COATINGS				123	\$45.91	\$5,652	\$0	\$0	\$5,652	\$5,652	\$0	\$0	\$11,303	\$11,303
386																
387																
388																
389																
390																
391		<b>TOTAL - DIRECT COST</b>				<b>7,452</b>	<b>\$91.37</b>	<b>\$382,780</b>		<b>\$1,127,818</b>		<b>\$331,629</b>		<b>\$286,800</b>		<b>\$2,108,948</b>

**CONTRACTOR'S CONSTRUCTION INDIRECT COST - CONSTRUCTION SUPPORT LABOR**



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTMAT\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX I

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.'s	COST/ W.H.	TOTAL DIRECT LABOR	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
75	<b>CONSTRUCTION SUPPORT LABOR</b>											
	<b>(LABOR COST ONLY)</b>											
	CAPITAL - CONSTRUCTION SUPPORT LABOR - ALLOWANCE @ 20 % OF DIRECT LABOR HOURS FOR BELOW LISTED ITEMS	7,452	WH	0.20	1,490	\$40.53	\$60,409	\$0	\$0	\$0	\$0	\$60,409
	CONS EQUIP OPERATION - CRANE				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	WELDER QUALIFICATIONS				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	RAINED OUT LABOR				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	SAFETY TRAINING				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	SCAFFOLDING (Rental Incl. W/ Constr. Eq. Rental)				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	UNLOAD AND STORE BULK MATERIAL				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	WAREHOUSEMAN				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	TOOL MAN				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	FIRE WATCH				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	YARD CREWS				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	SPECIAL HAULING / RIGGING				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	STARTUP - CRAFTSMEN				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	CLEAN UP				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	EMPLOYMENT & RANDOM DRUG TESTS				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	MOVE IN / MOVE OUT LABOR				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
	WATER / ICE				0	\$40.53	\$0	\$0	\$0	\$0	\$0	\$0
75	<b>TOTAL - CONSTRUCTION SUPPORT LABOR</b>				1,490		\$60,409		\$0		\$0	\$60,409

**CONTRACTOR'S CONSTRUCTION INDIRECT COST - PREMIUM TIME**



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALA

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	TOTAL WEEKLY W.H.'S	TOTAL PREMIUM W.H.'S	PREMIUM COST ADDER	TOTAL COST
78	<b><u>PREMIUM &amp; EFFICIENCY LOSS TIME CALCULATION WORKSHEET</u></b>				
	CAPITAL PREMIUM TIME COST:		BASED ON BARE WAGE RATE OF:	\$22.72	
	TOTAL CRAFT HOURS:		8,943 HRS		
	CRAFT HOURS WORKED ON 40 HR WEEK (0 HRS PT)	0.0%	0	0 HRS	
	CRAFT HOURS WORKED ON 50 HR WEEK (10 HRS PT)	100.0%	8,943	1,789 HRS	\$13.06
	CRAFT HOURS WORKED ON 60 HR WEEK (20 HRS PT)	0.0%	0	0 HRS	\$13.06
	CRAFT HOURS WORKED ON 70 HR WEEK (30 HRS PT)	0.0%	0	0 HRS	\$13.06
	CRAFT HOURS WORKED ON 84 HR WEEK (44 HRS PT)	0.0%	0	0 HRS	\$13.06
		100.0%	8,943	1,789 HRS	
	<b>TOTAL CAPITAL PREMIUM TIME COST</b>				<b>\$23,354</b>
78	<b>TOTAL</b>				<b>\$23,354</b>

**CONTRACTOR'S CONSTRUCTION INDIRECT COST - NON-PAYROLL TAX, INSURANCE AND PERMITS**



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMO

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
81	<b>NON-PAYROLL TAX, INSURANCE AND PERMITS</b>									
	SALES & USE TAX									
	6.5% OF EQUIPMENT	\$1,127,818	EQ \$	6.50%	\$73,308					\$73,308
	6.5% OF MATERIAL	\$331,829	MATL \$			6.50%	\$21,569			\$21,569
	6.5% ON 50% OF SUBCONTRACTS	\$133,250	SUB \$					6.50%	\$8,661	\$8,661
81	<b>TOTAL NON-PAYROLL TAX, INSURANCE AND PERMITS</b>				<b>\$73,308</b>		<b>\$21,569</b>		<b>\$8,661</b>	<b>\$103,538</b>

CONTRACTOR'S CONSTRUCTION INDIRECT COST - CRAFT START-UP ASSISTANCE



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 18DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\18DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\18DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls\PRIME CODE TCS

ESTIMATE DATE: 11/27/08  
 REVISION NO.: 1  
 ESTIMATOR: WBL  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 88212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.'s	COST/ W.H.	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
71	<b>CRAFT START-UP ASSISTANCE</b>													
	CRAFT START-UP SERVICES (3 CRAFT PERSONNEL @ 50 HOURS EACH)	3	WK	150.00	450	\$74.00	\$33,300	\$0	\$0	\$0	\$0	\$0	\$0	\$33,300
71	<b>TOTAL CRAFT START-UP ASSISTANCE</b>						\$33,300	\$0	\$0	\$0	\$0	\$0	\$0	\$33,300

CONTRACTOR'S CONSTRUCTION INDIRECT COST - CONTRACTOR'S CONSTRUCTION FEE



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls\PRIME CODE TC

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	LABOR UNIT COST	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
99	<b>CONTRACTOR'S CONSTRUCTION FEE</b>											
	LABOR (INCLUDED IN WAGE RATES)	499,861	LAB\$	9.1%	\$45,587							\$45,587
	EQUIPMENT	1,201,126	EQ\$			0.00%	\$0					\$0
	MATERIAL	353,396	MAT\$					15.00%	\$53,010			\$53,010
	SUBCONTRACT	337,763	SUB\$							10.00%	\$33,776	\$33,776
99	<b>TOTAL CONTRACTOR'S CONSTRUCTION FEE</b>				\$45,587		\$0		\$53,010		\$33,776	\$132,382

**TOTAL CONTRACTOR'S CONSTRUCTION FEE AS A % OF TOTAL CONSTRUCTION COST - EQUIP. = 10.0%**

**TOTAL CONSTRUCTION COST LESS PROCESS EQUIPMENT = \$1,323,404**



**PROJECT INDIRECT COST - CONSTRUCTION MANAGEMENT**



**JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR**  
**CLIENT: GEORGIA PACIFIC**  
**LOCATION: PALATKA, FLORIDA**  
**JOB NUMBER: 18DC9000**  
**CONSTRUCTION DURATION: TBD**  
**ESTIMATE TYPE: CLASS 5 (+/- 30%)**  
**G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\18DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\18DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR**

**ESTIMATE DATE: 11/27/06**  
**REVISION NO.: 1**  
**ESTIMATOR: WSJ**  
**PROJECT MGR: LELAND HENSON**  
**EST. FILE #: 06212**

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.'s	COST/ W.H.	TOTAL DIRECT LABOR	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	UNIT COST	TOTAL ALL COSTS
88	<b>TOTAL CONSTRUCTION MANAGEMENT</b>												
	TOTAL - CONSTRUCTION MANAGEMENT	1	LOT		0	\$0.00	\$0	\$0.00	\$0	\$192,798	\$192,798	\$192,798	\$192,798
88	<b>TOTAL - CONSTRUCTION MANAGEMENT</b>				0		\$0		\$0		\$192,798		\$192,798

PROJECT INDIRECT COST - ENGINEERING PROFESSIONAL SERVICES



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls\PRIME CODE TCS

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H/ UNIT	TOTAL W.H.'s	COST/ W.H.	LABOR UNIT COST	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	UNIT COST	TOTAL ALL COSTS
90	<b>ENGINEERING PROFESSIONAL SERVICES</b>															
	JACOBS	1	LOT		0	\$0.00	\$0.00	\$0	\$0	\$0	\$0	\$0	\$424,953	\$424,953	\$424,953	\$424,953
90	<b>TOTAL ENGINEERING PROFESSIONAL SERVICES</b>							\$0	\$0	\$0	\$0	\$0	\$424,953	\$424,953		\$424,953

PROJECT INDIRECT COST - STUDY COST



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMO

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
90	<b>STUDY COST</b>										
	STUDY COST		1 LOT	\$0	\$0	\$0	\$0	\$0	\$50,000	\$50,000	\$50,000
90	<b>STUDY COST</b>			\$0		\$0		\$0		\$50,000	\$50,000

**PROJECT INDIRECT COST - OUTSIDE CONSULTANT SERVICES**



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMO

ESTIMATE DATE: 11/27/08  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
96	<b>OUTSIDE CONSULTANT SERVICES</b>										
	OUTSIDE CONSULTANT SERVICES	1	LOT	\$0	\$0	\$0	\$0	\$0	\$100,000	\$100,000	\$100,000
96	<b>TOTAL OUTSIDE CONSULTANT SERVICES</b>			\$0		\$0		\$0		\$100,000	\$100,000

PROJECT INDIRECT COST - OWNER'S COST



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATI\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMO

ESTIMATE DATE: 11/27/08  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
91	<b>OWNER'S COST</b>										
	OWNER'S COST	1	LOT	\$0	\$0	\$0	\$0	\$0	\$128,928	\$128,928	\$128,928
91	<b>TOTAL OWNER'S COST</b>			\$0		\$0		\$0		\$128,928	\$128,928

PROJECT INDIRECT COST - SPARE PARTS



JOB: BART BOILER PROGRAM - PALATKA -  
 COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 16DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\16DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\16DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WBJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 08212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
70	<b>SPARE PARTS</b>										
	SPARE PARTS - ALLOWANCE OF 5% OF EQUIPMENT COST	1	LOT	\$0	\$56,391	\$56,391	\$0	\$0	\$0	\$0	\$56,391
70	<b>TOTAL SPARE PARTS</b>			\$0		\$56,391		\$0		\$0	\$56,391

PROJECT INDIRECT COST - NON-CRAFT START-UP ASSISTANCE



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 18DC9000  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 G:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\18DC9000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\18DC9000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\_R1.xls\PRIME CODE

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WSJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 08212

JE PRIME CODE	DESCRIPTION	QTY.	UNIT	W.H./ UNIT	TOTAL W.H.'s	COST/ W.H.	TOTAL DIRECT LABOR	PROCESS EQUIPMENT UNIT COST	TOTAL PROCESS EQUIPMENT	MATERIAL UNIT COST	TOTAL MATERIAL	SUB CONTRACT UNIT COST	TOTAL SUB CONTRACTS	TOTAL ALL COSTS
71	<b>NON-CRAFT START-UP ASSISTANCE</b>													
	PROFESSIONAL SERVICES START-UP	4	WK	150.00	600	\$83.25	\$49,950	\$0	\$0	\$0	\$0	\$0	\$0	\$49,950
	PROFESSIONAL SERVICES START-UP - EXPENSES	4	WK	0.00	0	\$0.00	\$0	\$0	\$0	\$0	\$0	\$4,800	\$19,200	\$19,200
	VENDOR START-UP SERVICES	1	LOT		0	\$0.00	\$0	\$0	\$0	\$0	\$0	\$50,000	\$50,000	\$50,000
71	<b>TOTAL NON-CRAFT START-UP ASSISTANCE</b>						<b>\$49,950</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$54,800</b>	<b>\$69,200</b>	<b>\$119,150</b>

PROJECT INDIRECT COSTS - ALLOWANCE FOR UNFORESEEN



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 1800900  
 CONSTRUCTION DURATION: TBD  
 ESTIMATE TYPE: CLASS 5 (+/- 30%)  
 Q:\ESTIMATE\GEORPAC\FLORIDA\PALATKA\18009000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - SNCR\18009000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR\18009000\PRIME CODE TCS

ESTIMATE DATE: 11/27/08  
 REVISION NO.: 1  
 ESTIMATOR: YMBJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

PRIME CODE	PRIME CODE	DESCRIPTION	LABOR	EQUIPMENT	MATERIAL	SUBCONT.	TOTAL COST	PERCENTAGES				DOLLARS				
								LABOR	EQUIP.	MAT.	S/C	LABOR	EQUIPMENT	MATERIAL	SUBCONT.	TOTAL COST
<b>DIRECT COSTS</b>																
08	50	MAJOR EQUIPMENT	\$92,082	\$1,022,800	\$16,344	\$0	\$1,130,305	10.0%	10.0%	10.0%	10.0%	\$9,208	\$102,280	\$1,634	\$0	\$113,031
08	51	DEMOLITION	\$26,432	\$0	\$0	\$0	\$26,432	10.0%	10.0%	10.0%	10.0%	\$2,643	\$0	\$0	\$0	\$2,643
08	52	SITE EARTHMOVING	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	53	SITE IMPROVEMENTS	\$0	\$0	\$0	\$36,815	\$36,815	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$5,852	\$5,852
08	54	PILING, CAISSONS	\$0	\$0	\$0	\$79,121	\$79,121	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$7,912	\$7,912
08	55	BUILDINGS	\$0	\$0	\$0	\$80,000	\$80,000	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$8,000	\$8,000
08	56	CONCRETE	\$18,856	\$0	\$18,856	\$0	\$33,808	10.0%	10.0%	10.0%	10.0%	\$1,886	\$0	\$1,886	\$0	\$3,391
08	57	MASONRY, REFRACTORY	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	58	STRUCTURAL STEEL	\$67,818	\$0	\$136,637	\$0	\$203,455	10.0%	10.0%	10.0%	10.0%	\$6,782	\$0	\$13,664	\$0	\$20,345
08	59	ROOFING AND SIDING	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	60	FIRE PROOFING	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	61	PROCESS DUCTWORK (NON-BUILDING)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	62	PIPING	\$90,424	\$0	\$101,727	\$0	\$192,152	10.0%	10.0%	10.0%	10.0%	\$9,042	\$0	\$10,173	\$0	\$19,215
08	63	INSULATION - PIPE, EQUIPMENT & DUCTWORK	\$60,864	\$0	\$0	\$60,864	\$121,727	10.0%	10.0%	10.0%	10.0%	\$6,086	\$0	\$0	\$6,086	\$12,173
08	64	INSULATION - STRUCTURAL	\$5,832	\$11,303	\$11,303	\$0	\$28,258	10.0%	10.0%	10.0%	10.0%	\$585	\$1,130	\$1,130	\$0	\$2,826
08	65	ELECTRICAL	\$27,941	\$93,816	\$48,212	\$0	\$169,768	10.0%	10.0%	10.0%	10.0%	\$2,794	\$9,382	\$4,821	\$0	\$16,977
08	66	PAINTING, PROTECTIVE COATINGS	\$5,852	\$0	\$5,852	\$0	\$11,303	10.0%	10.0%	10.0%	10.0%	\$585	\$0	\$585	\$0	\$1,130
08	67	FURNITURE, LAB & SHOP EQUIPMENT	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
<b>TOTAL DIRECT COSTS</b>			<b>\$382,798</b>	<b>\$1,127,818</b>	<b>\$331,829</b>	<b>\$288,200</b>	<b>\$2,108,948</b>					<b>\$38,280</b>	<b>\$112,782</b>	<b>\$33,183</b>	<b>\$28,450</b>	<b>\$210,895</b>
<b>CONSTRUCTION INDIRECT COSTS</b>																
08	75	CONSTRUCTION SUPPORT LABOR	\$50,408	\$0	\$0	\$0	\$50,408	10.0%	10.0%	10.0%	10.0%	\$5,041	\$0	\$0	\$0	\$5,041
08	76	TEMPORARY CONSTRUCTION FACILITIES (IN WAGE RATE)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	78	PREMIUM TIME	\$23,354	\$0	\$0	\$0	\$23,354	10.0%	10.0%	10.0%	10.0%	\$2,335	\$0	\$0	\$0	\$2,335
08	79	CRAFT FRINGE BENEFITS (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	80	CRAFT PER DIEM (\$7 PER HOUR ON 100% OF THE HOUR)	\$0	\$0	\$0	\$82,801	\$82,801	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$8,280	\$8,280
08	81	PAYROLL TAXES & INSURANCE (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	83	SMALL TOOLS (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	84	CONSUMABLE SUPPLIES (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	85	CONSTRUCTION EQUIPMENT (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	87	FIELD STAFF (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	91	NON-PAYROLL TAX, INSURANCE & PERMITS	\$0	\$73,308	\$21,088	\$8,861	\$103,866	10.0%	10.0%	10.0%	10.0%	\$0	\$7,331	\$2,108	\$889	\$10,828
08	93	CONSTRUCTION HOME OFFICE COST (INC. WITH CONTR)	\$0	\$0	\$0	\$0	\$0	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$0	\$0
08	71	CRAFT START-UP ASSISTANCE	\$33,300	\$0	\$0	\$0	\$33,300	10.0%	10.0%	10.0%	10.0%	\$3,330	\$0	\$0	\$0	\$3,330
08	99	CONTRACTOR'S CONSTRUCTION HOME OFFICE & FEE	\$45,597	\$0	\$63,010	\$33,776	\$132,282	10.0%	10.0%	10.0%	10.0%	\$4,560	\$0	\$6,301	\$3,378	\$13,238
<b>TOTAL CONSTRUCTION INDIRECT COSTS</b>												<b>\$18,288</b>	<b>\$7,331</b>	<b>\$7,458</b>	<b>\$19,504</b>	<b>\$41,581</b>
<b>TOTAL CONSTRUCTION COSTS (TCC)</b>			<b>\$545,458</b>	<b>\$1,201,128</b>	<b>\$406,407</b>	<b>\$371,339</b>	<b>\$2,524,531</b>					<b>\$54,548</b>	<b>\$120,113</b>	<b>\$40,641</b>	<b>\$37,154</b>	<b>\$252,453</b>
08	88	CONSTRUCTION MANAGEMENT	\$0	\$0	\$0	\$182,768	\$182,768	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$18,280	\$18,280
08	90	ENGINEERING PROFESSIONAL SERVICES	\$0	\$0	\$0	\$424,853	\$424,853	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$42,486	\$42,486
08	90	STUDY COST	\$0	\$0	\$0	\$50,000	\$50,000	10.0%	10.0%	10.0%	0.0%	\$0	\$0	\$0	\$0	\$0
08	90	OUTSIDE CONSULTANT SERVICES	\$0	\$0	\$0	\$100,000	\$100,000	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$10,000	\$10,000
08	91	OWNER'S COST	\$0	\$0	\$0	\$128,828	\$128,828	10.0%	10.0%	10.0%	10.0%	\$0	\$0	\$0	\$12,880	\$12,880
08	70	SPARE PARTS	\$0	\$58,391	\$0	\$0	\$58,391	10.0%	10.0%	10.0%	10.0%	\$0	\$5,838	\$0	\$0	\$5,838
08	71	NON-CRAFT START-UP ASSISTANCE	\$49,900	\$0	\$0	\$69,200	\$119,100	10.0%	10.0%	10.0%	10.0%	\$4,995	\$0	\$0	\$6,920	\$11,915
08	96	ALLOWANCE FOR UNFORESEEN	N/A	N/A	N/A	N/A	N/A									
08	98	ESCALATION	N/A	N/A	N/A	N/A	N/A									
08	98	ERC FEE	N/A	N/A	N/A	N/A	N/A									
08	98	CAPITAL INTEREST	N/A	N/A	N/A	N/A	N/A									
08	98	ROUND OFF	N/A	N/A	N/A	N/A	N/A									
<b>TOTAL PROJECT COSTS</b>			<b>\$695,408</b>	<b>\$1,287,917</b>	<b>\$486,407</b>	<b>\$1,337,418</b>	<b>\$5,398,780</b>					<b>\$59,541</b>	<b>\$125,762</b>	<b>\$40,641</b>	<b>\$128,742</b>	<b>\$354,879</b>



PROJECT INDIRECT COSTS - ESCALATION



JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - ENCR  
 CLIENT: GEORGIA PACIFIC  
 LOCATION: PALATKA, FLORIDA  
 JOB NUMBER: 180C8000  
 CONSTRUCTION DURATION: 180  
 ESTIMATE TYPE: CLASS 3 (H-30%)  
 0:4ERTMATHG0RRACFLORIDAPALATKA\180C8000 - BART BOILER PROGRAM\PALATKA COMBINATION BOILER NO. 4 - ENCR\180C8000 - TCS - PALATKA COMBINATION BOILER NO. 4 - NOX REMOVAL - ENCR .ITL .JOB CODE TCS

ESCALATION IS BASED ON THE ASSUMPTION THAT ALL WORK WILL BE COMPLETED BY DECEMBER 31, 2006

ESTIMATE DATE: 11/27/06  
 REVISION NO.: 1  
 ESTIMATOR: WBJ  
 PROJECT MGR: LELAND HENSON  
 EST. FILE #: 06212

EPC PRIME CODE	PRIME CODE	DESCRIPTION	DOLLARS				PERCENTAGES				DOLLARS					
			LABOR	EQUIPMENT	MATERIAL	SUBCONT.	TOTAL COST	LABOR	EQUIP.	MATL.	MC	LABOR	EQUIPMENT	MATERIAL	SUBCONT.	TOTAL COST
<b>DIRECT COSTS</b>																
00	50	MAJOR EQUIPMENT	\$82,082	\$1,022,900	\$18,344	\$0	\$1,130,326	0.0%	10.0%	10.0%	5.0%	\$0	\$102,200	\$1,634	\$0	\$103,834
00	51	DEMOLITION	\$28,432	\$0	\$0	\$0	\$28,432	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	52	SITE IMPROVEMENTS	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	53	SITE IMPROVEMENTS	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	54	PILENG. CAISSONS	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	55	BUILDINGS	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	56	CONCRETE	\$18,852	\$0	\$18,852	\$0	\$33,909	0.0%	10.0%	18.0%	5.0%	\$0	\$0	\$2,843	\$0	\$2,843
00	57	MASONRY, REFRACTORY	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	58	STRUCTURAL STEEL	\$97,618	\$0	\$138,637	\$0	\$203,485	0.0%	10.0%	15.0%	5.0%	\$0	\$0	\$20,345	\$0	\$20,345
00	59	ROOFING AND SIDING	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	60	FIRE PROOFING	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	61	PROCESS DUCTWORK (NON-BUILDING)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	62	PIPING	\$80,434	\$0	\$101,727	\$0	\$182,162	0.0%	10.0%	15.0%	5.0%	\$0	\$0	\$18,258	\$0	\$18,258
00	63	INSULATION - PIPE, EQUIPMENT & DUCTWORK	\$80,884	\$0	\$0	\$60,884	\$101,727	0.0%	10.0%	18.0%	5.0%	\$0	\$0	\$0	\$2,643	\$2,643
00	64	INSTRUMENTATION	\$5,852	\$11,303	\$0	\$0	\$28,258	0.0%	10.0%	18.0%	5.0%	\$0	\$11,303	\$1,885	\$0	\$2,824
00	65	ELECTRICAL	\$27,041	\$62,303	\$48,513	\$0	\$138,858	0.0%	10.0%	15.0%	5.0%	\$0	\$9,382	\$6,782	\$0	\$16,164
00	66	PAINTING, PROTECTIVE COATINGS	\$8,852	\$0	\$8,852	\$0	\$11,303	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$385	\$0	\$385
00	67	FURNITURE, LAB & SHOP EQUIPMENT	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
<b>TOTAL DIRECT COSTS</b>			<b>\$382,798</b>	<b>\$1,127,818</b>	<b>\$331,828</b>	<b>\$288,980</b>	<b>\$2,031,424</b>					<b>\$0</b>	<b>\$112,782</b>	<b>\$48,725</b>	<b>\$18,325</b>	<b>\$174,831</b>
<b>CONSTRUCTION INDIRECT COSTS</b>																
00	75	CONSTRUCTION SUPPORT LABOR	\$80,408	\$0	\$0	\$0	\$80,408	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	76	TEMPORARY CONSTRUCTION FACILITIES (IN WAGE RATE)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	78	PREMIUM TIME	\$23,384	\$0	\$0	\$0	\$23,384	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	79	GRAFT FRINGE BENEFITS (IN WAGE RATE)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	80	GRAFT PER DIEM (\$7 PER HOUR ON 100 % OF THE HOUR)	\$0	\$0	\$0	\$62,601	\$62,601	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$3,130	\$3,130
00	81	PAYROLL TAXES & INSURANCE (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	83	SMALL TOOLS (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	84	CONSUMABLE SUPPLIES (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	85	CONSTRUCTION EQUIPMENT (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	87	FIELD STAFF (IN WAGE RATES)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	81	NON-PAYROLL TAX, INSURANCE & PERMITS	\$0	\$73,308	\$21,589	\$8,881	\$103,688	0.0%	10.0%	10.0%	5.0%	\$0	\$7,331	\$2,157	\$433	\$8,921
00	93	CONSTRUCTION HOME OFFICE COST (INC. WITH CONTR)	\$0	\$0	\$0	\$0	\$0	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	71	GRAFT START-UP ASSISTANCE	\$53,300	\$0	\$0	\$0	\$53,300	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$0	\$0	\$0
00	99	CONTRACTOR'S CONSTRUCTION HOME OFFICE & FEE	\$46,687	\$0	\$53,010	\$33,778	\$133,382	0.0%	10.0%	10.0%	5.0%	\$0	\$0	\$6,301	\$1,889	\$8,990
<b>TOTAL CONSTRUCTION INDIRECT COSTS</b>			<b>\$382,798</b>	<b>\$1,127,818</b>	<b>\$331,828</b>	<b>\$288,980</b>	<b>\$2,031,424</b>					<b>\$0</b>	<b>\$7,331</b>	<b>\$7,458</b>	<b>\$3,282</b>	<b>\$28,071</b>
<b>TOTAL CONSTRUCTION COSTS (TCC)</b>			<b>\$845,488</b>	<b>\$1,201,128</b>	<b>\$498,407</b>	<b>\$371,838</b>	<b>\$2,524,531</b>					<b>\$0</b>	<b>\$120,113</b>	<b>\$56,182</b>	<b>\$18,577</b>	<b>\$194,872</b>
00	88	CONSTRUCTION MANAGEMENT	\$0	\$0	\$0	\$182,788	\$182,788	0.0%	0.0%	0.0%	0.0%	\$0	\$0	\$0	\$0	\$0
00	90	ENGINEERING PROFESSIONAL SERVICES	\$0	\$0	\$0	\$424,853	\$424,853	0.0%	0.0%	0.0%	0.0%	\$0	\$0	\$0	\$0	\$0
00	90	STUDY COST	\$0	\$0	\$0	\$50,000	\$50,000	0.0%	0.0%	0.0%	0.0%	\$0	\$0	\$0	\$0	\$0
00	98	OUTSIDE CONSULTANT SERVICES	\$0	\$0	\$0	\$100,000	\$100,000	0.0%	0.0%	0.0%	0.0%	\$0	\$0	\$0	\$0	\$0
00	91	OWNER'S COST	\$0	\$0	\$0	\$0	\$0	0.0%	0.0%	0.0%	0.0%	\$0	\$0	\$0	\$0	\$0
00	70	SPARE PARTS	\$0	\$68,391	\$0	\$0	\$68,391	0.0%	0.0%	0.0%	0.0%	\$0	\$68,391	\$0	\$0	\$68,391
00	71	NON-CONTRACT START-UP ASSISTANCE	\$48,950	\$0	\$0	\$68,200	\$118,150	0.0%	0.0%	0.0%	0.0%	\$0	\$0	\$0	\$3,460	\$3,460
00	98	ALLOWANCE FOR UNFORESEEN	N/A	N/A	N/A	N/A	N/A									
00	98	ESCALATION	N/A	N/A	N/A	N/A	N/A									
00	99	EPC FEE	N/A	N/A	N/A	N/A	N/A									
00	99	CAPITAL INTEREST	N/A	N/A	N/A	N/A	N/A									
00	99	ROUND OFF	N/A	N/A	N/A	N/A	N/A									
<b>TOTAL PROJECT COSTS</b>			<b>\$388,488</b>	<b>\$1,287,517</b>	<b>\$498,407</b>	<b>\$1,287,418</b>	<b>\$3,994,780</b>					<b>\$0</b>	<b>\$128,752</b>	<b>\$58,182</b>	<b>\$33,483</b>	<b>\$219,418</b>

\*ALL-IN WAGE RATE\*

CONSTRUCTION "ALL-IN" WAGE RATE																		
JOB: BART BOILER PROGRAM - PALATKA - COMBINATION BOILER NO. 4 - NOX REMOVAL - SNCR CLIENT: GEORGIA PACIFIC LOCATION: PALATKA, FLORIDA JOB NUMBER: 18DC9000																		
ITEM	CRAFT CONCRETE / MASONRY			CRAFT STRUCTURAL STEEL			CRAFT PIPING & MECHANICAL			CRAFT INSTRUMENTATION			CRAFT ELECTRICAL			CRAFT SUPPORT (INC. OPERATORS)		
	NOTES	%	COST	NOTES	%	COST	NOTES	%	COST	NOTES	%	COST	NOTES	%	COST	NOTES	%	COST
BASE JOURNEYMAN			\$22.80			\$22.80			\$22.80			\$22.80			\$22.80			\$21.80
COMPOSITE RATE		87.35%	\$19.85		98.41%	\$21.69		99.86%	\$22.47		98.78%	\$22.23		98.78%	\$22.23		97.17%	\$20.93
PAYROLL TAXES & INSURANCES:	33.40%																	
WORKMEN'S COMPENSATION		14.70%	\$2.80		14.70%	\$3.19		14.70%	\$3.30		14.70%	\$3.27		14.70%	\$3.27		14.70%	\$3.06
GENERAL LIABILITY		3.95%	\$0.78		3.95%	\$0.86		3.95%	\$0.89		3.95%	\$0.88		3.95%	\$0.88		3.95%	\$0.83
EXCESS LIABILITY		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
FECA		7.65%	\$1.60		7.65%	\$1.66		7.65%	\$1.72		7.65%	\$1.70		7.65%	\$1.70		7.65%	\$1.60
FUI		0.80%	\$0.16		0.80%	\$0.17		0.80%	\$0.18		0.80%	\$0.18		0.80%	\$0.18		0.80%	\$0.17
SUI		6.50%	\$1.28		6.50%	\$1.41		6.50%	\$1.48		6.50%	\$1.44		6.50%	\$1.44		6.50%	\$1.36
OTHER		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
FRINGES		12.50%	\$2.46		12.50%	\$2.71		12.50%	\$2.81		12.50%	\$2.78		12.50%	\$2.78		12.50%	\$2.62
PREMIUM TIME		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
CONSTRUCTION SUPPORT LABOR		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
TEMPORARY FACILITIES		7.50%	\$1.47		7.50%	\$1.63		7.50%	\$1.69		7.50%	\$1.67		7.50%	\$1.67		7.50%	\$1.57
SMALL TOOLS		7.50%	\$1.47		7.50%	\$1.63		7.50%	\$1.69		7.50%	\$1.67		7.50%	\$1.67		7.50%	\$1.57
CONSUMABLES		7.50%	\$1.47		10.00%	\$2.17		10.00%	\$2.26		7.50%	\$1.67		7.50%	\$1.67		7.50%	\$1.57
FIELD STAFF		25.00%	\$4.91		25.00%	\$5.42		25.00%	\$7.68		25.00%	\$7.78		25.00%	\$7.78		25.00%	\$5.23
EQUIPMENT RENTAL		40.00%	\$7.86		35.00%	\$7.59		35.00%	\$7.68		25.00%	\$3.56		25.00%	\$3.56		0.00%	\$0.00
CONSTRUCTION HOME OFFICE (ON TCS SHEET)		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
PER DIEM		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
CONTRACTOR FEE (ON TCS SHEET)		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00		0.00%	\$0.00
<b>TOTAL WAGE RATE WITH FEE</b>		<b>233.80%</b>	<b>\$45.81</b>		<b>231.10%</b>	<b>\$50.13</b>		<b>241.10%</b>	<b>\$54.17</b>		<b>228.60%</b>	<b>\$50.81</b>		<b>228.80%</b>	<b>\$50.81</b>		<b>183.60%</b>	<b>\$40.53</b>

# **ATTACHMENT II**

# **Appendix A: Basis of Estimated Costs**

## **BASIS OF ESTIMATED COSTS**

GEORGIA PACIFIC  
PALATKA, FLORIDA  
REGIONAL HAZE / BOILER BART PROGRAM  
JACOBS PROJECT NO. 16DC9000

### **GENERAL**

The purpose of these cost estimates is to provide Georgia Pacific with a Feasibility Study Level Report in 2006 dollars with an accuracy range of  $\pm 30\%$  for the Regional Haze/Boiler BART Program at the Wauna, Oregon Mill.

Estimates were prepared by Jacobs for various SO<sub>2</sub> and NO<sub>x</sub> control technologies for the boilers which were put in place or under construction between August 7, 1962 and August 7, 1977. These cost estimates were prepared in such a manner to ensure that each boiler proposed control technology and related cost estimate would stand alone on its own merit. This approach was selected to better address the uncertainty that will exist between which project or combination of projects might ultimately be implemented to meet the emissions targets established for the EPA Regional Haze / Boiler BART 2013 compliance date. Certain site specific conditions and / or the presence of alternate control technologies in the future may ultimately impact the overall project costs and feasibility of these projects if several of these projects are implemented concurrently on any given site.

In addition, the numbers used in this estimate for equipment cost do not always reflect the exact dollar amount that was provided by a vendor and reported in Appendix D. In many cases, Jacobs has used their sound engineering judgment and previous experience to change these prices. These changes may be for many reasons including but not limited to: adding or removing installation costs, adjusting for construction with a more expensive material, adding or removing options, increasing the controls included, etc.

In order to allow for air in-leakage in the existing Boilers, \$100,000 has been added to each estimate to locate and repair any areas where excessive air infiltration may be occurring. This is required to ensure that any control technologies installed operate as they were designed.

GP plans to utilize the results from this feasibility study report and cost estimate(s) to support the Regional Haze / Boiler BART documentation submittal requirements to the individual States. This will establish the viability for installing the Boiler BART Control Technologies on these respective site boilers or whether to de-rate or decommission them to a capacity level below BART-eligibility.

At the time of issue, this estimate reflects the fair market value for construction costs, based upon 2006 dollars, in the Wauna, Oregon area.

## **BASIS OF ESTIMATED COSTS**

### **ESTIMATE APPROACH**

The estimate is based on Jacobs providing Engineering, Construction Management and Procurement Services.

For the basis of the cost estimate, detailed engineering, procurement and construction activities are assumed be completed by December 31, 2006.

### **WAGE RATES**

This estimate is based on Union Wage Rates. The wage rates used in this estimate are composite all-in rates. The base journeyman rates range from \$28.34 to \$33.84. Jacobs established a crew mix for each craft, ranging from 89.98 % to 97.67 % of the base journeyman rate - see the All-In Wage Rate Sheet in the Estimate Detail Printout. Included in the wage rates are the following:

- **81 - PAYROLL TAXES AND INSURANCE**

Payroll Taxes and Insurance are included at 28.1 % of bare craft labor.

- **79 - CRAFT FRINGE BENEFITS**

Union Craft Fringe Benefits are included ranging from 35.11 % to 47.70 % of bare craft labor.

- **76 - TEMPORARY CONSTRUCTION FACILITIES**

Temporary Construction Facilities include Contractor's office supplies, PC's, copiers, postage, phones, Fed Ex, temporary sanitary facilities, mobilization, trash removal and temporary lights. These items are calculated at 7.5% of bare craft labor.

- **83 & 84 - SMALL TOOLS AND CONSUMABLES**

Small tools are included in the estimate at 7.5 % of bare craft labor. Construction consumables are included in the estimate at 7.5 % to 10 % of bare craft labor.

- **87 - CONTRACTORS FIELD STAFF**

Field staff includes all contractors' field support staff except for craft foremen which are included in the crew mix calculations. Contractors Field Staff is calculated at 25 % to 35 % of bare craft labor based on the type of work being performed.

- **85 - CONSTRUCTION EQUIPMENT RENTAL**

Construction equipment rental includes the contractors' automotive equipment, general equipment and small cranes. This construction equipment cost is calculated at 25 % to 40 % of bare craft labor based on the discipline - concrete, steel, pipe,

## **BASIS OF ESTIMATED COSTS**

electrical, etc. - being supported - see the All-In Wage Rate Sheet in the Estimate Detail Printout for the percent used for each discipline. If required, a line item is listed in the estimate for situations that require large cranes not covered by the allowance carried in the rate.

- **93 – CONTRACTOR’S HOME OFFICE**

Contractor’s Home Office cost includes time for Project Manager, accounting, safety, quality control, etc. is included in the Contractor’s Fee.

- **99 - CONTRACTOR’S FEE**

Contractor’s fee is included in the estimate at 10 % of contractor’s construction cost.

- **75 - CONTRUCTION SUPPORT LABOR**

Construction Support Labor includes drug testing, safety training, fire watch, final cleanup, yard crews, etc. This cost is calculated as 20 % of bare craft labor.

## **DIRECT COSTS**

### **50 - MAJOR EQUIPMENT**

Vendor budget quotes were received for the Major Equipment.

Pump and motor installation hours are from Jacobs Standards. Other equipment installation cost items are based on historical experience.

Freight cost is included at 6 % of equipment cost.

### **51 – DEMOLITION AND RELOCATION**

Demolition cost is factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **53 - SITE IMPROVEMENTS**

Site Improvement costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **56 – CONCRETE**

Concrete costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **58 – STRUCTURAL STEEL**

Structural Steel costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

## **BASIS OF ESTIMATED COSTS**

### **62 – PIPING**

Piping costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **63 – INSULATION**

Insulation costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **64 – INSTRUMENTATION**

Instrumentation costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **65 – ELECTRICAL**

Electrical Costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

### **66 – PAINTING**

Painting costs are factored from installed process equipment cost but have been adjusted, as required, to reflect specific site requirements.

## **INDIRECT COSTS**

### **70 – SPARE PARTS**

An allowance for Spare Parts of 5 % of the process equipment cost is included.

### **78 - PREMIUM TIME**

Premium Time is included based on the assumption that 100 % of the craft labor hours will be worked on a 50-hour week.

### **XX - CRAFT PER DIEM**

Craft Per Diem is included at \$7.00 per craft hour for all workers.

### **81 - NON-PAYROLL TAXES, INSURANCE AND PERMITS**

Sales Tax is included at 5 % on equipment, materials and 5 % on 50 % of subcontract costs.

### **88 - CONSTRUCTION MANAGEMENT**

Construction Management is estimated at 4.5 % of Total Installed Cost.



## **BASIS OF ESTIMATED COSTS**

### **90 – ENGINEERING PROFESSIONAL SERVICES**

Detail Design Engineering is estimated at 10 % of Total Installed Cost.

### **91 – OWNER'S COST**

Owner's Cost is included at approximately 3 % of Total Installed Cost.

### **96 – OUTSIDE CONSULTANT SERVICES**

**An allowance of \$100,000 is carried** in the estimates for Outside Consultant Services.

### **98 – CONTINGENCY**

Contingency is included in the estimate at 10 % of labor, equipment, material and subcontract costs.

This Contingency is part of the estimated project cost and is to cover unusual weather conditions, productivity issues, increases in costs not covered by contractual provisions, delays in delivery of equipment or materials, etc. It does not cover cost of additional work or scope changes after the definition of the project has been frozen for the estimate.

### **98 – ESCALATION**

**Escalation is based on the assumption that all work will be completed by December 31, 2006.** No escalation is included for labor. Escalation is included at 10 % on equipment, 10 % on all material except for concrete, steel, pipe, instrumentation and electrical material which is included at 15 % and 5 % on subcontract cost.

## **BASIS OF ESTIMATED COSTS**

### **ITEMS NOT INCLUDED**

The following is a list of items not included in this estimate:

- Cost of Land
- Cost of borrowing money
- Cost of operating supplies
- Property taxes
- Hazardous materials handling or disposal
- All Risk Insurance
- Payment and Performance Bond
- Permits, Fees and Licenses

### **ITEMS AFFECTING THE COST ESTIMATE**

Items, which may change the estimated construction cost, include, but are not limited to:

- Modifications to the scope of work included in this estimate
- Above normal escalation in material costs due to market availability and demands
- Special phasing requirements
- Restrictive technical specifications
- Volume discounts on National agreements
- Sole source specifications of materials or products
- Bids delayed beyond the projected schedule
- Sales and Use Tax exemptions
- Labor disputes or difficulties

# **ATTACHMENT III**

## 9. Performance and Guarantees

It is recognized that the performance of the equipment covered in this proposal cannot be exactly predicted for every possible operating condition. In consequence, any predicted performance data submitted is intended to show probable operating results.

JANSEN will work with G-P to better define the performance guarantees once the boiler evaluation phase of the work has been completed.

All performance data listed here are based on the conditions stated below and are to be substantiated or revised based on the Phase 1 performance testing and evaluation done by JANSEN at the initiation of the project.

### 9.1 Predicted Performance

Predicted performance data is submitted for G-P's convenience only. Such data is not offered by JANSEN, or to be construed by G-P as a proposal, offer, contract obligation, representation, warranty, or guarantee.

Table 9-1 provides predicted future operating conditions for waste wood firing only and combination of waste wood and natural gas.

<b>Table 9.1 Predicted Performance</b>			
	<b>Units</b>	<b>Waste Wood Only</b>	<b>MCR on Wood and Natural Gas</b>
Total Steam Production	lb/hr	262,500	360,000
Steam Production from Waste Wood	lb/hr	262,500	293,000
Wood Fuel Burned (as-fired wet)	ton/hr	50.0	56.1
Wood Fuel Burned (as-fired wet)	ton/day	1,200	1,346
Natural gas	scfh	0.0	92,243
No. 6 Fuel Oil	lb/hr	0.0	0.0
Waste Wood Fuel Moisture Content	%	50	50
Feedwater Temperature	°F	445	445
Flue Gas O <sub>2</sub> at Boiler Bank Outlet	vol. %, wet	4.1	4.1
Total Combustion Air Flow	lb/hr	407,800	539,200
Air Temperature from TAH	°F	523	559
Flue Gas Temperature from TAH	°F	420	477
Boiler Thermal Efficiency	%	65.7	66.4
Total Heat Input	10 <sup>6</sup> Btu/hr-ft <sup>2</sup>	412.9	558.3
Grate Heat Release	10 <sup>6</sup> Btu/hr-ft <sup>2</sup>	1.07	1.2
Particulate Matter at Generating Bank Outlet	grains/dscf @8% O <sub>2</sub>	1.15	1.50

**9.2 Fuel Quality**

The performance information and performance guarantees provided in this section pertain to operation of the unit while burning waste wood fuel and natural gas that are similar in elemental composition (ultimate analysis), moisture content, and heating value as listed in Table 9-2.

**9.3 Performance Guarantees**

The guarantees presented below are subject to the conditions specified in this section at the waste wood and natural gas quantities specified in Table 9-1.

The fuel used during the performance testing shall have a moisture content, nitrogen content, and heating value not less favorable than the values in Table 9-2. The remaining fuel components specified in Table 9-2 may vary by  $\pm 10\%$  during the testing. The waste wood size distribution is to be as described below:

100% shall be smaller than 4 inches in any direction, a maximum of 50% shall pass through a 1/4 inch screen, and no more than 25% shall pass through a 1/8 inch screen.

<b>Table 9-2. Fuel Composition</b>			
	<b>Unit</b>	<b>Waste Wood</b>	<b>Natural Gas</b>
Carbon	%, dry	49.8	69.3
Hydrogen	%, dry	6.1	22.7
Nitrogen *	%, dry	<0.2	8.0
Sulfur	%, dry	0.0	0.0
Oxygen	%, dry	42.5	0.0
Ash	%, dry	1.5	0.0
Moisture Content	%, as-received	50	0.0
HHV (Dry)	Btu/lb	8,200	23,000
HHV (Wet)	Btu/lb	4,100	23,000
*Nitrogen content to be determined by Kjeldahl method			

### **9.3.1 Steam Generation Rate**

9.3.1.1 JANSEN guarantees that the No. 4 Combination Boiler will be able to sustain an average steam generation rate of 360,000 lb/hr on waste wood and natural gas with the quantity of steam from waste wood of 293,000lb/hr, provided that the fuel qualities are as specified in Table 9-2 over an eight (8) hour test period.

9.3.1.2 JANSEN guarantees that the No. 4 Combination Boiler will be able to sustain an average steam generation rate of 262,500 lb/hr on waste wood only, with the fuel qualities specified in Table 9-2 over an eight (8) hour test period.

### **9.3.2 Emissions**

Under the conditions specified in paragraph 9.3.1.1 above, JANSEN guarantees the following emission levels at the stack:

The average of three (3) one-hour tests within an eight (8) hour test period for nitrogen oxides (NO<sub>x</sub>) will not exceed 0.22 lb/MMBtu.

This NO<sub>x</sub> guarantee is based on the premise that if the initial Phase 1 evaluation determines that an OFA system is not sufficient by itself to meet the guarantee, the use of flue gas recirculation, auxiliary fuel burner modifications, and/or changes in non-condensable gas incineration practices are acceptable options to enhance the NO<sub>x</sub> emissions reduction. The commercial terms for the additional work would be mutually agreed upon by GP and JANSEN.

### **9.4 Performance Tests**

JANSEN has guaranteed a certain performance level as per section 9.3. In order to determine the attainment of these guarantees, a performance test shall be performed. All performance tests shall be carried out on the boiler at the sole expense of G-P. These tests will be conducted within 60 days following start-up of the boiler, with the boiler in a clean state. G-P shall give JANSEN at least 15 days notice of the date or dates on which tests will be made. Test conditions will also require:

1. The general arrangement of equipment furnished by JANSEN, and the general design and arrangement of related equipment furnished by others shall not be less favorable than described in this Proposal. The equipment shall have been erected in accordance with JANSEN's plans and specifications, properly maintained and operated by G-P, and shall be in operating conditions satisfactory to both G-P and JANSEN.
2. The system for blending and feeding the fuel, and combustion control strategy shall be acceptable to both G-P and JANSEN. Further, G-P shall provide JANSEN with sufficient time to optimize the unit's operation over the load and fuel range prior to performance testing.

3. The existing boiler equipment and components shall be in good working condition. The heat absorbing surfaces shall be clean inside and out. The boiler casing, setting, and ducting shall be free from excessive air in-leakage. The auxiliary burners shall not have excessive air leakage into the furnace.
4. The treatment of feedwater and conditions of boiler water are beyond the control of JANSEN. Therefore, JANSEN shall not be held responsible for damage due to the presence of oil, grease, scale, or deposits on the internal surfaces of the equipment; or for damage resulting from foaming caused by chemical condition of the water; or for damage resulting from corrosion.
5. G-P shall satisfy JANSEN that all instrumentation used for the test is satisfactorily calibrated and accurate.
6. JANSEN representative shall have access to the records at all times
7. The heat and mass balance calculations for determining the grate fuel firing rate shall be consistent with the ASME Performance Test Code as agreed upon by both G-P and JANSEN.
8. Each performance guarantee acceptance test shall be executed for a time period not exceeding eight (8) hours.
9. The bark distribution system, bark refining/delivery systems and undergrate air system shall be operating to the satisfaction of GP and JANSEN.
10. G-P shall provide JANSEN with sufficient time to optimize the unit's operation at the firing conditions required by the performance guarantees prior to the actual guarantee acceptance test.
11. If G-P fails to perform the guarantee acceptance testing within 60 days after startup and the OFA system is operating as intended, or the conditions for testing stipulated herein are not met during testing, JANSEN will have met its obligations under these guarantees.
12. A complete copy of test data and results shall be furnished to JANSEN.

Other criteria for these tests, if any, shall be mutually agreed upon between JANSEN and G-P.

The equipment shall be considered as accepted if tests show that the guarantees have been fulfilled, or if G-P shall fail to have said equipment tested within the period mentioned.

### **9.5 Remedies For Failure To Pass Performance Test**

Should the Performance Tests demonstrate that the equipment fails to conform as specified herein, and G-P notifies JANSEN, JANSEN shall at its sole expense, including all parts, labor, materials, on-site work and other expenses, correct the non-

conformance to the equipment. Such corrective action may include, but shall not be limited to:

Repair, replacement, modification of the equipment, or additional design, equipment and construction services.

Upon completion of the corrective action, JANSEN shall notify G-P and additional tests shall be scheduled by G-P and conducted by G-P.

Any out-of-pocket expense to G-P for additional testing, except the expenses for G-P's mill operators and the raw materials required for the re-testing, shall be reimbursed by JANSEN.

JANSEN's total liability under this Section 9.5 is limited to the lesser of \$77,000 or 10% of the final contract price, including any change orders.



# **ATTACHMENT IV**

**From:** Bill Buckley [mailto:bbuckley@synterprise.com]

**Sent:** Thursday, December 22, 2005 11:18 PM

**To:** Orender, Robert H.

**Subject:** GP - PAL - Palatka Ecotube System Cost & Performance Estimates 12-22-05

**Importance:** High

Robert: Thank you so much again for your continuing interest in the Ecotube technology and its potential application in your Palatka, Florida operation. As you are probably aware, we have just commissioned our fifth project in the US with very positive results and have several other Ecotube projects on the drawing boards for calendar year 2006.

Following review of your information, it appears that a system consisting of two Ecotube assemblies would be appropriate for the Palatka boiler with a furnace dimension that's approximately 20 feet square. With that basis in mind, I have attached a "draft budgetary" purchase order for an "air only" system that will provide you with an estimated "turnkey" cost, a view of project division of responsibilities, Synterprise and GP obligations and possible milestone and payment schedules for a project with a target completion date of mid September 2006. We have just experienced a price increase in November from Ecomb but I feel confident that we can still meet or possibly beat this cost structure based on the results of an on-site engineering study.

The on-site engineering study is necessary to get an accurate sense of furnace temperature profiles which will help us determine the optimum elevation(s) for the actual Ecotube penetrations, obtain a more accurate estimate of project cost and performance benefits. Obviously, that location will determine the extent of structural steel support that might be required, obstacle clearance issues that must be addressed and things of that nature. In addition, the engineering study will generally consist of the following scope:

Synterprise Associate(s) will work closely with client personnel to:

- Schedule, coordinate and perform the required Engineering testing and site assessment activities
- Collect all plant operating, general equipment and electrical/mechanical design information necessary for Ecotube system installation
- Analyze all collected operating and design information
- Prepare Ecotube System Engineering Study Report

Some of the more specific value points of the Engineering Study process include:

- A. Boiler performance measurements and variance analysis will provide the client, and Synterprise, with a better understanding of current boiler operational modes
  - ◆ Boiler flame pattern analysis of combustion conditions (Video analysis)
  - ◆ Furnace gas temperatures (Multiple tests with optical pyrometer)
  - ◆ Boiler operational data review and analysis –
    - Air heater exit gas temp.
    - Air heater air inlet temp.
    - Relative humidity
    - Excess air
    - Cost of fuel \$/ton
    - Capacity factor
    - Gross heat rate BTU/kwh
    - O2 % at boiler exit
    - Reheat spray flow lb/hr [if applicable]
  - ◆ Review of original boiler design acceptance test information and any additional performance analysis data that may be available
  - ◆ Boiler fuel analysis
    - Fuel heating value btu/lb

Ultimate fuel analysis

% by Weight

Ash

Sulfur

Hydrogen

Carbon

Nitrogen

Oxygen

Moisture

- ◆ Boiler ash analysis - unburned carbon

B. Provide projected operational performance improvement based on implementation of the Ecotube system will provide the client with boiler performance improvement potential

- ◆ Boiler performance assessment and projected improvement opportunity identification
- ◆ Predicted performance projection based on Synterprise proprietary spreadsheet model built using ASME boiler performance criteria (if applicable)

C. Provide an equipment configuration arrangement and a project plan

- ◆ Ecotube system project equipment configuration plan developed to obtain projected performance objectives
- ◆ Project plan developed to install the required Ecotube system lance assemblies and wall boxes as required
- ◆ Location of equipment, platforms (if required), and control equipment
- ◆ Air and source of cooling water requirements will be defined

Our clients (even those that have not elected to go forward with Ecotube projects) have found significant value in the Engineering Studies. Typical pricing for a study is \$35,000 but I expect to have a team in the southeast region in mid January so, if you're interested, Synterprise will offer to perform the study at Palatka for \$27,400 during that period which will keep the project on a fast track toward a possible completion date in the September 2006 timeframe.

From an emissions reduction performance perspective, it is realistic to assume that a minimum NOx reduction of 20% and a CO reduction of 80% can be achieved with an "air only" installation. Our actual results have ranged close to 40% for NOx reduction and 90% for CO reduction in certain applications.

If reagent is added to the Ecotube system for purposes of NOx reduction, a minimum NOx reduction of 60% should be attainable. Actual results have indicated that NOx reduction with reagent may approach 70-75% in certain cases. The "ballpark" added cost for a reagent storage and delivery system with controls integrated into the Ecotube system would be around \$800 for a budgetary view.

As you know, the Ecotube technology also differentiates itself from many of the other "parasitic" emission reduction systems because Ecotube offers substantial combustion optimization value as well. Synterprise would be pleased to schedule a webcast or a direct visit to further discuss the Ecotube technology with GP personnel. In addition, we would be pleased to coordinate an actual site tour at either the Stratton or Ashland sites in Maine where Ecotube systems are in service on boilers with steam flows in the same region as your Palatka boiler.

Since you mentioned the potential replacement of your overfire air system at Palatka, let me advise you of another possible product that might be of interest. Synterprise now offers the Ecojet technology, which is a new proprietary "high energy", separated and "tunable" overfire air concept that has been developed by Synterprise during the last year (patent pending) to address issues that have been raised by a variety of clients. Basically, many clients are constrained by limited Capex, have serious combustion problems and have found that existing overfire air systems (both OEM and aftermarket offerings) are inadequate from a performance perspective. To address this need, we have successfully developed, completed production and conducted initial testing of the Ecojet system which now positions Synterprise to offer an integrated and phased strategy designed to give our clients the most appropriate system, yielding maximum benefits with lowest costs that best matches their particular business plans and objectives.

Again Robert, thank you very much for your continued interest in Synterprise's products and professional services and we'll look forward to your feedback. Please advise if you wish to proceed directly with an Engineering Study at Palatka and I'll get a proposal to you right away to initiate that effort.

Have a Joyous and Prosperous Holiday Season!

Very Best Regards,  
Bill

*William J. Buckley*

*Vice President Engineering and Construction*

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