

# BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION (BACT)

Champion International Corporation  
McDavid Sawmill  
PSD-FL-271 and 0330260-001-AC  
Escambia County

## 1. BACKGROUND

The applicant proposes to construct a new sawmill at a new site at US Highway 29, Pine Barren, Escambia County, approximately 19 miles north of Pensacola.

The facility will consist of lumber sawmill with a capacity to produce up to 225 million board feet per year (mmBF/yr) of lumber. The mill will have two natural gas fired boilers that will provide steam to three lumber drying kilns, a planer mill to plane and trim dried lumber, and fugitive emissions.

This project addresses the following emissions unit(s):

EMISSIONS UNIT NO.	EMISSIONS UNIT DESCRIPTION
001	Natural gas fired boiler number 1
002	Natural gas fired boiler number 2
003	Lumber drying kilns 1, 2 and 3
004	Planer mill
005	Fugitive PM emissions

The applicant proposes to construct this new lumber sawmill consisting of the above emissions units.

The emissions units and fugitive sources are subject to limits determined as BACT for VOC, particulate matter, and visible emissions. The boilers are subject to regulation under the New Source Performance Standards: 40 CFR 60 Subpart A, General Provisions, and Subpart Dc, Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units. However, this regulation only requires record keeping and reporting for natural gas fired boilers. The boilers are also subject to regulation under Rule 62-296.406, F.A.C., for fossil fuel steam generators less than 250 mmBtu/hr, which requires a determination of BACT for sulfur dioxide and particulate matter emissions. The visible emissions provisions of this rule are less stringent than the limit determined as BACT for the boilers.

Emissions from the boilers will be controlled by good combustion of natural gas using low NOx burners. Emissions from the kilns are not subject to control, other than proper operation. Emissions from the planer mill will be controlled by a local exhaust collection system ducted to a cyclone/baghouse combination. Fugitive PM emissions will be controlled by reasonable precautions to prevent unconfined particulate emissions. Emission control is discussed in more detail in the TEPD.

The emissions associated with this project are summarized below, in units of tons per year. The facility will be PSD major because of VOC and PSD significant for PM and PM<sub>10</sub>.

Pollutant	Point Source Emissions	Quantifiable Fugitive Emissions	Total	PSD Major Threshold	PSD Significance Levels <sup>1</sup>	Subject to PSD Review?
VOC	326.0		326.0	250	--	Yes
PM	14.6	17.6	32.2	--	25	Yes
PM <sub>10</sub>	14.6	3.8	18.4	--	15	Yes
SO <sub>2</sub>	0.3		0.3	--	40	No
NOx	39.0		39.0	--	40	No
CO	70.2		70.2	--	100	No

<sup>1</sup> Florida Administrative Code 212.400-2.

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This facility is classified as a Major or Title V Source of air pollution because emissions of volatile organic compounds (VOC) exceeds 100 tons per year (TPY).

This facility is not within an industry included in the list of the 28 Major Facility Categories per Table 62-212.400-1, F.A.C. Because emissions are greater than 250 TPY for VOC, the facility is also a Major Facility with respect to Rule 62-212.400, Prevention of Significant Deterioration (PSD).

The applicant stated that this facility is not a major source of hazardous air pollutants (HAPs).

The project's process information, air quality effects, and rule applicability are discussed in more detail in the Technical Evaluation and Preliminary Determination (TEPD) dated July 30, 1999.

### 2. DATE OF RECEIPT OF A BACT APPLICATION

June 15, 1999, and updated by additional information as shown in the TEPD.

### 3. BACT DETERMINATION REQUESTED BY THE APPLICANT

The applicant proposed BACT for the PSD pollutants particulate matter and VOC. BACT was proposed to be control equipment for PM emissions from the planer mill, good combustion and operation for PM emissions from the boilers and lumber drying kilns, and reasonable precautions to prevent unconfined PM emissions from the fugitive sources. The applicant proposed a limit of 5% opacity for visible emissions from the point sources. The applicant demonstrated that no controls are feasible for the VOC emissions from the lumber drying kilns.

### 4. REVIEWER

Joseph Kahn, P.E., prepared BACT determination

### 5. BACT DETERMINATION PROCEDURE

In accordance with Chapter 62-212, F.A.C., this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department of Environmental Protection (Department), on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques for control of each such pollutant. In addition, Rule 62-212.400(6)(a), F.A.C., states that in making the BACT determination, the Department shall give consideration to:

1. Any Environmental Protection Agency determination of BACT pursuant to Section 169 of the Clean Air Act, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).
2. All scientific, engineering, and technical material and other information available to the Department.
3. The emission limiting standards or BACT determination of any other state.
4. The social and economic impact of the application of such technology.

The EPA currently directs that BACT should be determined using the "top-down" approach. In this approach, available control technologies are ranked in order of control effectiveness for the emissions unit under review. The most stringent alternative is evaluated first. That alternative is selected as BACT unless the alternative is found to not be achievable based on technical considerations or energy, environmental or economic impacts. If this alternative is eliminated for these reasons, the next most stringent alternative is considered. This top-down approach is continued until BACT is determined. In general EPA has identified five key steps in the top-down BACT process: Identify alternative control technologies; eliminate technically infeasible options; rank remaining control technologies by control effectiveness; evaluate most effective controls; select BACT.

BACT evaluation should be performed for each emissions source and pollutant under consideration. BACT for particulate matter can be treated separately for the boilers, lumber drying kilns, planer mill and

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the fugitive sources. VOC emissions result from the lumber drying kilns and, to a much lesser extent, from the boilers.

The Department will consider the control or reduction of "non-regulated" air pollutants when determining the BACT limit for regulated pollutants, and will weigh control of non-regulated air pollutants favorably when considering control technologies for regulated pollutants. The Department will also favorably consider control technologies that utilize pollution prevention strategies. These approaches are consistent with EPA's consideration of environmental impacts.

The EPA has determined that a BACT determination shall not result in a selection of a control technology which would not meet any applicable emission limitation under 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants). There are no such limits applicable to this project.

In addition to the information submitted by the applicant and that information mentioned above, the Department may rely upon other available information in making its BACT determination. For this project, the Department also relied upon information from recent BACT proposals made for similar facilities in Texas (Champion, Camden, TX) and North Carolina (International Paper, Riegelwood, NC) provided by the applicant to the Department on April 23, 1999. For each emission source, the Department's BACT determination is based on the information provided by the applicant and the informed judgement of the Department.

### 6. BACT ANALYSIS AND DEPARTMENT'S DETERMINATION

For this project the PSD pollutants of concern are PM, PM<sub>10</sub> and VOC. The applicant proposed control strategies for these pollutants for the emission sources at this facility. The applicant's proposal and the Department's BACT for each pollutant and source is discussed below.

#### 6.1 BOILERS

In accordance with Rule 62-296.406, F.A.C., a BACT determination is required for boilers with a heat input of less than 250 mmBtu/hour for the pollutants PM and SO<sub>2</sub>. Both of the boilers for this project are subject to this requirement. The BACT determination discussed below includes a determination for the boilers for PM and SO<sub>2</sub> per Rule 62-296.406, F.A.C., and PM/PM<sub>10</sub> and VOC per Rule 62-212.400.

Particulate matter and VOC are pollutants formed in a boiler by the incomplete combustion of fuels fired in the boiler. When insufficient oxygen is provided or poor combustion conditions occur, incomplete combustion occurs and emissions of particulate matter and VOC are increased. Visible emissions will result from incomplete combustion, primarily as a result of particulate emissions. Sulfur dioxide is formed from the oxidation of sulfur present in the fuels fired. Control for PM, VE and VOC is generally good combustion of fuel, with an appropriate level of excess air to ensure complete combustion. Sulfur dioxide emissions in small boilers is generally reduced by reducing the sulfur in the fuel fired, a pollution prevention strategy.

The applicant proposed BACT per Rules 62-296.406 and 62-212.400, F.A.C., to be the use of only pipeline natural gas and good combustion practices. The applicant has also proposed a visible emissions limit of 5% opacity as BACT per Rule 62-212.400, F.A.C. Natural gas is a fuel that is easily burned and is low in sulfur. Good combustion of natural gas results in low emissions of PM/PM<sub>10</sub>, VOC and SO<sub>2</sub>. The use of only natural gas with good combustion will result in estimated maximum emissions of 1.4 tons per year of PM/PM<sub>10</sub>, 0.3 tons per year of SO<sub>2</sub>, and 6.5 tons per year of VOC. The applicant proposed that the use of natural gas is the top control technology for these boilers. A review of the RACT/BACT/LAER Clearinghouse (FELC) data shows that BACT is the use of natural gas in many cases.



The Department agrees with the applicant's proposed BACT. The Department believes that setting numerical mass emission limits for PM/PM<sub>10</sub>, SO<sub>2</sub>, and VOC is not warranted given the low potential emissions of these pollutants. Instead, the fuel will be limited to pipeline natural gas. This will also meet the BACT requirements of Rule 62-296.406, F.A.C., for PM and SO<sub>2</sub>. Thus, BACT shall be the use of pipeline natural gas and a VE limit of 5% opacity applicable at all times including startup and shutdown. This VE limit is more stringent than provided by Rule 62-296.406, F.A.C., but is imposed per Rule 62-212.400, F.A.C.

## 6.2 LUMBER DRYING KILNS

A BACT determination is required for the three lumber drying kilns for VOC and PM/PM<sub>10</sub> per Rule 62-212.400.

VOC emissions result from naturally occurring hydrocarbons present in the wood that are evaporated during the lumber drying operation. Particulate matter that is emitted is a combination of condensable hydrocarbons and dust (primarily sawdust) on lumber surfaces. There are presently no control systems in use for VOC and particulate matter for these types of drying kilns.

The applicant proposed that no controls are feasible for VOC emissions from these sources, and that proper operating practices and a visible emissions limit of 5% opacity are BACT for PM/PM<sub>10</sub> per Rule 62-212.400, F.A.C.

### VOC Controls

The applicant evaluated exhaust control technologies – regenerative thermal oxidation, regenerative catalytic oxidation, biofiltration – to control VOC emissions. Pollution prevention and process changes are not technically feasible because the hydrocarbons, which are inherent in the wood, are emitted as a consequence of the lumber drying cycle. The applicant suggested that exhaust controls are not technically feasible because of the difficulty designing and implementing a capture device which will accommodate the cyclical nature of the airflow through the kiln vents. The applicant noted that no such capture system is in use on these type of kilns. Regardless of this technical challenge, the applicant estimated control costs associated with the use of thermal and catalytic oxidation for VOC control. Costs are summarized below, assuming the use of one oxidizer for each kiln. The applicant concluded that the costs are prohibitive and make these controls economically infeasible.

Option	Capital Cost	Annual Operating Cost	Life	Interest	Control Cost
RTO	\$5.81 million	\$2.15 million	10 yrs	8 %	\$8,351/ton
RCO	\$5.76 million	\$1.82 million	10 yrs	8 %	\$7,051/ton

In addition to the technical challenge of capturing emissions, the applicant rejected biofiltration as infeasible because of the challenge of ducting emissions to biofilters and conditioning the exhaust, the difficulty researching and designing a biofiltration system with proper microorganisms and media to degrade the hydrocarbons, and concerns over media plugging from condensable hydrocarbons. The applicant was unable to document the use of biofiltration for these or similar sources in commercial operation.

The Department agrees with the applicant's assessment. The Department's review of the RBLC data shows that similar lumber drying kilns listed have no controls for VOC emissions, and are listed as "no controls feasible". Based on the information provided by the applicant and the informed judgement of the Department, control of VOC emissions is not feasible. BACT for this project for VOC shall be no emission controls. Lumber throughput shall be limited by permit condition to 225 million board feet per year, as proposed by the applicant, to limit potential VOC emissions to approximately 320 tons per year. The estimate of potential emissions is discussed in more detail in the TEPD.

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### PM Controls

Potential emissions of particulate matter were estimated by the applicant to be 4.2 tons per year. The applicant proposed BACT for PM/PM<sub>10</sub> to be proper operation and maintenance of the kilns, with no exhaust controls feasible because of the technical difficulties discussed above. The applicant proposed a limit for visible emissions of 5% opacity.

The Department agrees with the applicant's BACT proposal. Verifying PM emissions by source testing would be difficult, if not infeasible, so the Department will not impose a numerical limit for PM/PM<sub>10</sub> emissions. BACT for the lumber drying kilns shall be a limit for visible emissions of 5% opacity applicable at all times including startup and shutdown.

### 6.3 PLANERMILL

A BACT determination is required for the planermill for PM/PM<sub>10</sub> per Rule 62-212.400. The applicant proposed BACT for the planermill to be collection of particulate matter using a local exhaust ventilation system and control with a cyclone that exhausts to a baghouse (fabric filter). The applicant estimated that emissions from this control system will be 0.004 grains per dscf. The applicant suggested that this combination of controls is the top control strategy for particulate matter for this source. The applicant also proposed a VE limit of 5% opacity.

The Department agrees with the applicant's proposed BACT. BACT shall be the use of a local exhaust collection system exhausting to a cyclone followed by a baghouse. The limit for PM/PM<sub>10</sub> emissions shall be 2.1 pounds per hour. Visible emissions shall be limited to 5% opacity at all times including startup and shutdown.

### 6.4 FUGITIVE PM SOURCES

A BACT determination is required for the fugitive sources of particulate matter for the pollutants PM/PM<sub>10</sub> per Rule 62-212.400. The applicant proposed to use reasonable precautions to control unconfined emissions of particulate matter. The Department agrees with the proposed BACT, so BACT shall be the use of reasonable precautions to prevent unconfined emissions of particulate matter. These precautions shall be specified in the facility-wide requirements of the permit.

### 6.5 SUMMARY OF BACT DETERMINATION

Emissions Unit	Emission Source	Pollutant(s)	BACT
001	Natural gas fired boiler number 1	PM/PM <sub>10</sub> & VOC VE	Use of only pipeline natural gas 5% opacity at all times
002	Natural gas fired boiler number 2	PM/PM <sub>10</sub> & VOC VE	Use of only pipeline natural gas 5% opacity at all times
003	Lumber drying kilns 1, 2 and 3	PM/PM <sub>10</sub> & VOC VE	No controls feasible 5% opacity at all times
004	Planermill	PM/PM <sub>10</sub> VE	Local exhaust, cyclone, baghouse - 2.1 lb/hr 5% opacity at all times
005	Fugitive PM emissions	PM/PM <sub>10</sub>	Reasonable precautions to prevent emissions of unconfined particulate matter

## 7. COMPLIANCE

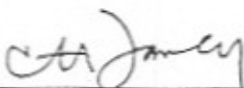
The compliance methods are briefly summarized here. Compliance with the visible emission limitations for the point sources shall be demonstrated on an annual basis by testing using EPA Method 9. Emission testing shall be required for the boilers for NOx and CO initially and upon renewal of each operation permit. Emission testing for the planer mill control device outlet for particulate matter shall not be required because an alternative limitation of 5% opacity will be specified in lieu of PM testing.

## 8. DETAILS OF THE ANALYSIS MAY BE OBTAINED BY CONTACTING:

Joseph Kahn, P.E.  
Department of Environmental Protection  
Bureau of Air Regulation  
Mail Station #5505  
2600 Blair Stone Road  
Tallahassee, Florida 32399-2400  
Prepared July 30, 1999

Recommended By:

Approved By:



C. H. Fancy, P.E., Chief  
Bureau of Air Regulation



Howard L. Rhodes, Director  
Division of Air Resources Management

9/9/99

Date:

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