

May 8, 2001

**MEMORANDUM**

TO: Stephen West, Administrator  
Boise Regional Office

FROM: Allan Johnson, Air Quality Engineer  
State Office of Technical Services

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MAY 15 2001  
DEPARTMENT OF  
ENVIRONMENTAL QUALITY  
BOISE REGIONAL OFFICE

SUBJECT: **PERMIT TO CONSTRUCT TECHNICAL ANALYSIS**  
P-000737, Boise Cascade Corporation, Emmett  
(Laminated Beam Plant Expansion, PTC No. 0445-00001)

**PURPOSE**

The purpose for this memorandum is to satisfy the requirements of IDAPA 58.01.01.200 (*Rules for the Control of Air Pollution in Idaho*) for issuing Permits to Construct (PTC).

**PROJECT DESCRIPTION**

Boise Cascade is proposing to expand the laminated beam plant located at their Emmett facility. The proposed project includes the installation of a radio frequency continuous press system and the associated increased production rates.

**SUMMARY OF EVENTS**

On February 20, 2001, the Idaho Department of Environmental Quality (DEQ) received an application from Boise Cascade for the expansion of their laminated beam plant. On March 23, 2001, the application was determined complete.

**DISCUSSION**

1. **Process Description**

The Boise Cascade facility in Emmett consists of three major processes, steam production and electrical cogeneration, plywood, and specialty lumber (which includes the manufacture of laminated beams). Boise Cascade has announced the closure of the plywood mill and part of the specialty lumber operation by the end of June 2001, and plans to operate only the cogeneration boilers and the laminated beam plant after that. Since the other major processes at the facility are closing, Boise Cascade plans to expand the laminated beam plant and increase production of laminated beams.

The specialty lumber manufacturing process consists of a finger jointer operation and a laminated beam manufacturing operation, which are separate processes linked through production. The finger jointer purchases dry Douglas fir lumber and attaches individual boards end to end to produce laminated beam stock of variable lengths. The end of each board is trimmed to produce a serrated edge where resin is applied and jointed with another board. Trimmed wood byproducts are processed through a hog and transferred pneumatically to cyclone 14 (C14), which is then routed to the shavings bin baghouse (BH3). Several boards are jointed the produce 12 to 66 foot long beam stock boards which are stacked for transportation via lift truck to the laminated beam plant.

The laminated beam plant receives beam stock material from the finger jointer operation. An adhesive resin is applied to the entire surface of finger jointed lumber, which is then stacked in manual jigs and cured overnight. During the adhesive application and curing process, small quantities of volatile organic compounds (VOCs) are emitted. Emissions from the curing process are not collected and are passively vented from the building.

Cured beams are removed from the jigs and planed, sanded or textured, cut to length by the beam trim saw, then wrapped to produce the finished product. The sander dust, planer shavings, texturing molder, and trim saw dust are captured and routed through cyclone 9 (C9) and into baghouse 1 (BH1).

The proposed equipment modification at the laminated beam plant involves installation of a new continuous press system which will allow finger jointed lumber to be laminated, pressed, and cured through a radio frequency process. The new system will replace the manual jigs and reduce the curing time from overnight to a few minutes. VOC and toxic air pollutant (TAP) emissions from the vicinity of the radio frequency dryer will be collected and vented through C9 and BH1.

The proposed modification to the facility will increase potential production through the entire process from 45,000,000 to 100,000,000 board feet per year (Bdft/yr). The production increase will result in an increased volume of trimmed and hogged board ends processed through the finger jointer/cyclone C14 and baghouse BH3, respectively. In addition, wood byproduct volumes will increase through the laminated beam plant collection system and result in an increase of potential particulate emissions from C9 and BH1.

Boise Cascade is also proposing to move the texturing molder system from the laminated beam plant to the planning mill building, replacing planer #2. Cyclones C8, C11, and C14 and baghouse BH3 are associated with this process.

## 2. Equipment Listing

The equipment associated with the manufacture of laminated beams includes the finger jointer and trim ends hog, the radio frequency press, the beam plant sander and planer, and the beam texturing molder. All of these operations generate particulate matter (PM) and fine particulate matter with an aerodynamic diameter less than or equal to 10 microns in diameter (PM<sub>10</sub>). The finger jointer and radio frequency press are sources of the TAPs phenol, formaldehyde, and methanol.

The following is a list of all PM<sub>10</sub> emission points and the parameters that were used in the emission estimates and modeling.

### 2.1 Cyclone C8

|                     |   |
|---------------------|---|
| Function            | Collects shavings and dust from the beam texturing molder, planer #4, and planer #5 |
| Stack Height (m)    | 16.8  |
| Stack Diameter (m)  | 2.13  |
| Exit Velocity (m/s) | 0.001 (horizontal stack)  |
| Temperature (K)     | 294 (ambient)   |

2.2 Cyclone C11

|                     |  |
|---------------------|--|
| Function            | Handles the material from C8, then sends material to C27 (truck bin cyclone) |
| Stack Height (m)    | 16.8   |
| Stack Diameter (m)  | 0.91   |
| Exit Velocity (m/s) | 0.001 (horizontal stack)   |
| Temperature (K)     | 294 (ambient)  |

2.3 Cyclone C14

|                     |   |
|---------------------|---|
| Function            | Collects shavings and dust from the finger jointer and trim ends hog; sends material to C27 (truck bin cyclone) |
| Stack Height (m)    | 16.8  |
| Stack Diameter (m)  | 1.52  |
| Exit Velocity (m/s) | 0.001 (horizontal stack)  |
| Temperature (K)     | 294 (ambient)   |

2.4 Baghouse BH1

|                     |   |
|---------------------|---|
| Function            | Controls the exhaust of C9, which collects shavings and dust from the beam plant planer, trim saw, and sander |
| Stack Height (m)    | 13.1  |
| Stack Diameter (m)  | 0.61  |
| Exit Velocity (m/s) | 35.2  |
| Temperature (K)     | 294 (ambient)   |

2.5 Baghouse BH3

|                     |   |
|---------------------|---|
| Function            | Controls the exhaust of C27 (truck bin cyclone) |
| Stack Height (m)    | 12.2  |
| Stack Diameter (m)  | 0.23  |
| Exit Velocity (m/s) | 0.001 (horizontal stack)                        |
| Temperature (K)     | 294 (ambient)                                   |

3. Emission Estimates

Kleinfelder, Inc. engineering consultants estimated the emissions associated with this modification for Boise Cascade. The emissions were estimated based on the maximum amount of laminated beams that could be produced and the maximum amount of wood removed in the finger jointing, sanding, planing, trimming, and molding processes as well as the maximum amount of resin used in finger jointing and producing laminated beams. For PM<sub>10</sub> estimates, it was assumed that all the sawdust and shavings produced are potentially PM<sub>10</sub>. Emission factors published by DEQ for the wood products industry were used to estimate PM<sub>10</sub> emissions from the cyclones. The baghouse emission rates were calculated by applying an efficiency rating of 99 percent to the cyclone exhaust emissions from the cyclone that is vented to the baghouse.

Since Boise Cascade utilizes the cyclones to collect wood chips, sawdust, and shavings that are later sold for a profit, cyclones C8, C9, C11, C14, and C27 are considered process equipment rather than emission control devices. This determination was made as a case-by case determination after consulting a letter from the U.S. EPA dated November 27, 1995. The following questions were answered in determining whether or not the cyclones are control devices or

process equipment: 1) Is the primary purpose of the equipment to control air pollution; 2) where the equipment is recovering product, how do the cost savings from the product recovery compare with the cost of the equipment; and 3) would the equipment be installed if no air quality regulations were in place? The answers to each of the questions support the determination that the cyclones are process equipment. In addition to the above questions, it is clear that the cyclones associated with this project were not designed or installed to control air pollution. The baghouses BH1 and BH3 on the other hand, are pollution control equipment since their sole purpose in being at the facility is to control PM<sub>10</sub> emissions from C9 and C27.

Emissions of PM<sub>10</sub> are expected to increase slightly due to this modification. TAP emissions of phenol, formaldehyde, and methanol are also expected to increase slightly due to this modification. It should be noted that the applicant did not quantify the net emissions increase of TAPs but rather reported the total. This methodology is more conservative than the requirements of IDAPA 58.01.01.210.09, which allows a source to demonstrate that the net emissions increase due to a modification is below the screening level in IDAPA 58.01.01.585 or 586, or that the ambient concentration due to the net emissions increase is below the acceptable ambient concentration (AAC) for non-carcinogenic TAP or below the acceptable ambient concentration for carcinogens (AACC) for carcinogenic TAPs. The emissions from every point source of PM<sub>10</sub> and point and area sources of TAPs are summarized in Appendix A of this technical memorandum.

#### 4. Modeling

Two separate consultants performed the modeling for the facility. Boise Cascade contracted Kleinfelder to model PM<sub>10</sub> emissions from all the point sources (C8, C11, C14, BH1, and BH3) and formaldehyde emissions from the finger jointer building. Another consultant, CH2MHill, was retained by Boise Cascade to model the formaldehyde emissions from beam plant baghouse BH1. Both models were performed using the Industrial Source Complex Short-Term dispersion model (ISCST3). In order to determine if the combined formaldehyde emissions would meet the AACC increment, DEQ modeling staff combined the two models. The modeling results for PM<sub>10</sub> were less than the significant contribution levels of 5 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) 24-hour average and 1  $\mu\text{g}/\text{m}^3$  on an annual average. The modeling results also indicate that the formaldehyde emissions will result in concentrations much lower than the AACC for formaldehyde. A summary of the modeling is contained in Appendix B of this technical memorandum.

#### 5. Facility Classification

Boise Cascade is a timber and wood products facility. The Standard Industrial Classification (SIC) code for the specialty lumber portion of the facility is 2421, which refers to establishments primarily engaged in sawing rough lumber and timber from logs and bolts, or resawing cants and flitches into lumber, including box lumber and softwood cut stock; planing mills combined with sawmills; and separately operated planing mills which are engaged primarily in producing surfaced lumber and standard workings or patterns of lumber. The facility is classified as a major facility as defined in IDAPA 58.01.01.006.55. The Aerometric Information Retrieval System (AIRS) facility subsystem classification for this facility is "A," which means the facility has the potential to emit more than 100 tons per year of at least one criteria air pollutant. The facility is not a designated facility as defined in IDAPA 58.01.01.006.27.

6. Area Classification

The Boise Cascade Emmett facility is located in Emmett, Idaho, which is in Zone 11 and Air Quality Control Region (AQCR) 63. The area is classified as attainment or unclassifiable for all criteria pollutants in accordance with 40 CFR 81.313

7. Regulatory Review

The following regulations have been reviewed as a part of this technical analysis.

IDAPA 58.01.01.201                      Permit to Construct Required

Boise Cascade is proposing a physical change to an emissions unit, which will increase the amount of air pollutants emitted into the atmosphere. This constitutes a modification as defined in IDAPA 58.01.01.006.58. Since the emission increase from the modification is expected to be above the level defined in IDAPA 58.01.01.221.01, this project is not exempt from the requirements to obtain a PTC.

IDAPA 58.01.01.203                      Permit Requirements for New and Modified Stationary Sources

Emission limits, operating requirements, monitoring requirements, and recordkeeping requirements for this source have been placed in the permit to comply with the National Ambient Air Quality Standards (NAAQS) and the TAP standards.

IDAPA 58.01.01.210                      Demonstration of Preconstruction Compliance with Toxic Standards

Uncontrolled emissions of formaldehyde were estimated and modeled to determine their ambient impacts. The expected emissions of formaldehyde are higher than the screening level; however, the modeled impact of the formaldehyde emissions is much less than the AACC; therefore, the requirements of IDAPA 58.01.01.210 are satisfied.

IDAPA 58.01.01.577                      Ambient Air Quality Standards for Specific Air Pollutants - NAAQS

Emissions of NAAQS pollutants were modeled and none are expected at levels approaching the standards for each air pollutant.

IDAPA 58.01.01.585                      Toxic Air Pollutants – Non-Carcinogenic Increments

No emissions of non-carcinogenic TAPs were estimated at levels above the screening levels; therefore, no additional analysis was required.

IDAPA 58.01.01.586                      Toxic Air Pollutants – Carcinogenic Increments

Emissions of one carcinogenic TAP, formaldehyde, were estimated at levels above the screening level. The uncontrolled emission increases of formaldehyde emissions were modeled below the AACC. Therefore preconstruction compliance is demonstrated in accordance with IDAPA 58.01.01.210 and no permit requirements are needed for formaldehyde emissions.

40 CFR 52

Prevention of Significant Deterioration (PSD)

The facility is a PSD major facility as defined in IDAPA 58.01.01.006.55, and has the potential to emit more than 250 tons per year of any criteria air pollutant. The emission increases due to this modification are not significant as defined in IDAPA 58.01.01.006.92 therefore PSD review is not applicable.

40 CFR 60

New Source Performance Standards (NSPS)

There is no NSPS applicable to this modification.

40 CFR 61 & 63

National Emission Standards for Hazardous Air Pollutants (NESHAP) and Maximum Achievable Control Technology (MACT)

There are no applicable NESHAP or MACT requirements for this facility.

8. Permit Requirements

8.1 Emission Limits

Even though emission increases corresponding to this modification are small, PM<sub>10</sub> emission limits are contained in the permit for each point source (C8, C11, C14, BH1, and BH3). The emission limits are based on the laminated beam plant operating at 120 percent of planned production. Conversations with Boise Cascade indicate that these emission limits, while not providing maximum flexibility, represent reasonable limits on emissions.

The PM<sub>10</sub> emission limits in the permit are based on the control devices being operated properly. Requirements for the proper operation of the control devices are contained in the operating requirements section of the permit.

8.2 Operating Requirements

Throughput limits on the daily and annual board feet of lumber through each process are contained in the permit. These limits are based on 120 percent of planned production. Processes that have throughput limits include the beam texturing molder, finger jointer operation, beam plant sander, and beam plant planer. Each one of these processes has a separate throughput limit of 350,000 Bdft/day and 120,000,000 Bdft/yr. These throughput limits are designed to provide flexibility for Boise Cascade in manufacturing laminated beams. The throughput limits for each process directly correspond to the emission limits for the points of emission at the facility and Boise Cascade can demonstrate compliance with the emission limits complying with the throughput limits.

The other operating requirements in the permit correspond to the proper operation of the pollution control devices. There are requirements in the permit for Boise Cascade to keep the pressure drop across the baghouses within the range specified by the manufacturer and the Operation and maintenance manual.

9. Permit Coordination

A Title V permit for this facility was drafted and a copy sent to Boise Cascade for review on January 12, 2001. Since that time, Boise Cascade has announced the closure of the majority of

the Emmett facility by the middle of June 2001. DEQ is awaiting a Title V application update from Boise Cascade reflecting the status of the facility after the closure. This permit will be issued in time for the terms and conditions contained herein to be incorporated into the Title V permit. The engineer responsible for writing the Title V permit has been made aware of the changes taking place at the facility.

10. AIRS Information

**AIRS/AFS FACILITY-WIDE CLASSIFICATION DATA ENTRY FORM**

| Air Program Description              | SIP | PSD | NESHAP | NSPS | MACT | TITLE V | AREA CLASSIFICATION                                       |
|--------------------------------------|-----|-----|--------|------|------|---------|---|
|                                      |     |     |        |      |      |         | A - Attainment<br>U - Unclassifiable<br>N - Nonattainment |
| SO <sub>2</sub>                      | B   | B   |        |      |      | B       |   |
| NO <sub>x</sub>                      | A   | A   |        |      |      | A       |   |
| CO                                   | A   | A   |        |      |      | A       |   |
| PM <sub>10</sub>                     | A   | A   |        |      |      | A       |   |
| PT (Particulate)                     | A   | A   |        |      |      | A       |   |
| VOC                                  | A   | B   |        |      |      | A       |   |
| THAP (Total HAPs)                    | B   | B   |        |      |      | B       |   |
| Other (specify below:)               |     |     |        |      |      |         |   |
|                                      |     |     |        |      |      |         |   |
| (Add additional lines if necessary.) |     |     |        |      |      |         |   |
| VE/FE/FD                             | ND  | ND  | ND     | ND   | ND   | ND      |   |

\* VE/FE/FD (VISIBLE EMISSIONS, FUGITIVE EMISSIONS, AND FUGITIVE DUST) ARE ENTERED FOR COMPLIANCE PURPOSES ONLY AND DO NOT REQUIRE EVALUATION BY THE PERMIT ENGINEER.

**AIRS/AFS CLASSIFICATION CODES:**

- A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For NESHAP only, class "A" is applied to each pollutant which is below the 10 ton-per-year (T/yr) threshold, but which contributes to a plant total in excess of 25 T/yr of all NESHAP pollutants.
- SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.
- B = Actual and potential emissions below all applicable major source thresholds.
- C = Class is unknown.
- ND = Major source thresholds are not defined (e.g., radionuclides).

FEES

The Boise Cascade facility is a major facility as defined in IDAPA 58.01.01.008.10 and is therefore subject to registration and registration fees in accordance with IDAPA 58.01.01.527. According to the Air Emissions Data Base Master List for 2001, the Boise Cascade, Emmett facility has registered 641 tons of pollutants by paying fees. This modification will not increase annual fees because this facility is subject to an emission fee cap of \$17,500 in accordance with IDAPA 58.01.01.527.06.a.ii(4).

RECOMMENDATION

Based on review of application materials and all applicable state and federal rules and regulations, DEQ staff recommend that Boise Cascade Corporation be issued modified PTC No. 045-00001 for the

laminated beam plant expansion. No public comment period is recommended; no entity has requested a comment period, and the project does not involve PSD requirements.

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cc:    DEQ State Office  
      Boise Regional Office

# **Appendix A**

## ***Emission Estimate Calculations***

***P-000737***

***Boise Cascade Corporation; Emmett, ID***

Boise Cascade Corporation  
Laminated Beam Plant Expansion  
Summary of Emissions

| PM-10 Emission Points                            | Hourly Throughput |        | Annual Throughput (T/yr) | Controlled Emissions |             | Permit Limits |        |
|--|-------------------|--------|--------------------------|----------------------|-------------|---------------|--------|
|  | (lb/hr)           | (T/yr) |                          | (lb/hr)              | (T/yr)      | (lb/hr)       | (T/yr) |
| Cyclone 8 (Beam Molder, Planers #4 & #5)         | 1,152             | 5,046  | 0.14                     | 0.63                 | 0.17        | 0.8           |        |
| Cyclone 11 (Cyclone 8 bottoms)                   | 1,152             | 5,046  | 0.14                     | 0.63                 | 0.17        | 0.8           |        |
| Cyclone 14 (Finger Jointer & Trim Ends Hog)      | 1,775             | 7,775  | 0.22                     | 0.97                 | 0.27        | 1.2           |        |
| Cyclone 27 (C11, C12, C13, C14, and C21 bottoms) | 16,945            | 74,220 | N/A                      | N/A                  | N/A         | N/A           |        |
| Baghouse 3 (Cyclone 27 Exhaust)                  | 2.12              | 9      | 0.02                     | 0.09                 | 0.03        | 0.11          |        |
| Cyclone 9 (Beam Planer and Sander)               | 984               | 4,310  | N/A                      | N/A                  | N/A         | N/A           |        |
| Baghouse 1 (Cyclone 9 Exhaust)                   | 0.12              | 1      | 0.0012                   | 0.005                | 0.0015      | 0.006         |        |
| <b>TOTAL</b>                                     |                   |        | <b>0.53</b>              | <b>2.33</b>          | <b>0.64</b> | <b>2.8</b>    |        |

| PM-10 Generating Processes  | Planned Potential Production Rates |                  |                 | Permit Limits on Production Rates |                  |                  |
|-----------------------------|------------------------------------|------------------|-----------------|-----------------------------------|------------------|------------------|
|                             | (Board Feet/yr)                    | (Board Feet/day) | (Board Feet/hr) | (Board Feet/yr)                   | (Board Feet/day) | (Board Feet/day) |
| Beam Texturing Molder (C8)  | 100,000,000                        | 273,973          | 11,416          | 120,000,000                       |                  | 350,000          |
| Finger Jointer (C14)        | 100,000,000                        | 273,973          | 11,416          | 120,000,000                       |                  | 350,000          |
| Beam Plant Sander (C9, BH1) | 100,000,000                        | 273,973          | 11,416          | 120,000,000                       |                  | 350,000          |
| Beam Plant Planer (C9, BH1) | 100,000,000                        | 273,973          | 11,416          | 120,000,000                       |                  | 350,000          |

| TAP Emission Estimates          | Increased Throughput (bdft/yr) | Total Emissions |        | Net Increase (lb/hr) | Net Increase (T/yr) | Screening Level (lb/hr) | Modeling Required |
|---------------------------------|--------------------------------|-----------------|--------|----------------------|---------------------|-------------------------|-------------------|
|                                 |                                | (lb/hr)         | (T/yr) |                      |                     |                         |                   |
| <b>TAP Point Source</b>         |                                |                 |        |                      |                     |                         |                   |
| Baghouse 1 (Beam Plant Exhaust) | 55,000,000                     |                 |        |                      |                     |                         |                   |
| Formaldehyde                    |                                | 0.051           | 0.223  | 0.028                | 0.123               | 0.00051                 | YES               |
| Phenol                          |                                | 0.098           | 0.429  | 0.054                | 0.236               | 1.27                    | NO                |
| Methanol                        |                                | 0.0002          | 0.001  | 0.00011              | 0.00048             | 17.3                    | NO                |
| <b>TAP Area Source</b>          |                                |                 |        |                      |                     |                         |                   |
| Finger Jointer                  | 55,000,000                     |                 |        |                      |                     |                         |                   |
| Formaldehyde                    |                                | 0.00228         | 0.010  | 0.0013               | 0.005               | 0.00051                 | YES               |
| Phenol                          |                                | 0.022           | 0.096  | 0.012                | 0.053               | 1.27                    | NO                |
| Methanol                        |                                | 0.0076          | 0.033  | 0.0042               | 0.0183              | 17.3                    | NO                |

# **Appendix B**

## ***Modeling Results***

***P-000737***

***Boise Cascade Corporation; Emmett, ID***

## MEMORANDUM

TO: Allan Johnson, Technical Services Office

FROM: Mary Anderson, <sup>mt</sup> Air Quality Modeler, Technical Services Office

SUBJECT: Review of the Modeling Analysis for the Boise Cascade, Emmett PTC Application

DATE: May 8, 2001

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### 1. SUMMARY:

The Boise Cascade facility in Emmett, Idaho submitted a Permit to Construct Application in February of 2001. This application is for the installation of a Continuous Press and Radio Frequency Dryer for the Laminated Beam Plant. This modification will result in an increase of particulate and HAP (formaldehyde) emissions caused by an increase in potential beam production for 4.5E+7 to 1.0E+8 board feet per year (BF/yr). Three separate cyclones, two independent baghouses, and the Finger Joints building are affected by the increase in beam production.

Boise Cascade Corporation requested two separate consulting firms to perform the modeling analysis required. Kleinfelder was contracted to model the PM-10 emissions from the cyclones (C8, C11, and C14), the Laminated Beam Plant Baghouse (BH1), and the Shavings Bin Baghouse (BH3). Kleinfelder also modeled the increase in formaldehyde emissions from the Finger Joints Building. CH2MHILL modeled the increase in formaldehyde emissions from the Laminated Beam Plant Baghouse only.

Because this is all one project, the ambient concentrations from all the sources must be estimated. Therefore, DEQ modeling staff combined the modeling runs for the formaldehyde analysis. After additional information and a new modeling analysis was submitted, Boise Cascade Corporation demonstrated compliance with all applicable requirements

### 2. DISCUSSION:

#### **2.1 Project Description**

This application is for the installation of a Continuous Press and Radio Frequency Dryer for the Laminated Beam Plant. This modification will result in an increase of particulate and HAP (formaldehyde) emissions caused by an increase in potential beam production for 4.5E+7 to 1.0E+8 board feet per year (BF/yr). Three separate cyclones, two independent baghouses, and the Finger Joints building are affected by the increase in beam production.

#### **2.2 Applicable Air Quality Impact Limits**

This facility is located in Gem County which is designated an attainment or unclassifiable area for PM<sub>10</sub>. Therefore ambient impacts for this criteria pollutant must be below the National Ambient Air Quality Standards (NAAQS), listed in Table 1. The ambient impacts for formaldehyde must be below the acceptable ambient concentration for carcinogens (AACC).

| Table 1. Applicable Regulatory Standards.   |                  |  |
|---|------------------|--|
| Pollutant   | Averaging Period | Regulatory Standard<br>( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup> |
| PM <sub>10</sub>  | Annual           | 50 (1) <sup>b</sup>  |
|   | 24-hour          | 150 (5) <sup>b</sup>   |
| Formaldehyde  | Annual           | 0.077  |
| a. IDAPA 58.01.01.577 for PM <sub>10</sub> and IDAPA 58.01.01.586 for formaldehyde. |                  |  |
| b. Significant contribution level (IDAPA 58.01.01.006.93).                          |                  |  |

### 2.3 Background Concentrations

Background concentrations were not needed for the PM<sub>10</sub> analysis because the maximum ambient concentration resulting from the increase in emissions were below the significant contribution levels (IDAPA 58.01.01.006.93). There are no background concentrations for formaldehyde.

### 2.4 Co-contributing Sources

Co-contributing sources are assumed to be included in the definition of the background concentrations.

### 2.5 Modeling Impact Assessment

The Boise Cascade facility in Emmett, Idaho submitted a Permit to Construct Application in February of 2001. This application is for the installation of a Continuous Press and Radio Frequency Dryer for the Laminated Beam Plant. This modification will result in an increase of particulate and HAP (formaldehyde) emissions caused by an increase in potential beam production for 4.5E+7 to 1.0E+8 board feet per year (BF/yr). Three separate cyclones, two independent baghouses, and the Finger Jointer building are affected by the increase in beam production.

Boise Cascade Corporation requested two separate consulting firms to perform the modeling analysis required. Kleinfelder was contracted to model the PM-10 emissions from the cyclones (C8, C11, and C14), the Laminated Beam Plant Baghouse (BH1), and the Shavings Bin Baghouse (BH3). Kleinfelder also modeled the increase in formaldehyde emissions from the Finger Jointer Building. CH2MHILL modeled the increase in formaldehyde emissions from the Laminated Beam Plant Baghouse only. Because this is all one project, the ambient concentrations from all the sources must be estimated. Therefore, DEQ modeling staff combined

the modeling runs for the formaldehyde analysis.

In the initial submittal, BH1 was indicated as a horizontal stack. Therefore, the exit velocity should be modeled as 0.001 m/s. After discussion with the facility, they determined that the BH1 stack would be changed to a vertical stack. Kleinfelder then remodeled this change and submitted the results on May 2, 2001.

Table 2 presents the stack information used in the final modeling analysis. The Finger Jointer building was modeled as a volume source. This is accurate because the emissions from this building exit through building doors and ceiling vents. Table 3 presents the emission rates used in the modeling analysis.

| <b>Source Identifier</b>    | <b>Emission rates (lb/hr)</b> |                     |
|-----------------------------|-------------------------------|---------------------|
|                             | <b>PM<sub>10</sub></b>        | <b>Formaldehyde</b> |
| Cyclone 8 (C8)              | 0.14                          | 0.0                 |
| Cyclone 11 (C11)            | 0.14                          | 0.0                 |
| Cyclone 14 (C14)            | 0.22                          | 0.0                 |
| Beam Plant Baghouse (BH1)   | 0.001                         | 0.51                |
| Shavings Bin Baghouse (BH3) | 0.02                          | 0.0                 |
| Finger Jointer Building     | 0.0                           | 0.00228             |

### 3. MODELING RESULTS:

Table 4 presents the results of the modeling analysis for both PM<sub>10</sub> and formaldehyde. The results demonstrated that the increase in PM<sub>10</sub> emissions did not cause a significant increase in ambient concentrations. The resulting ambient concentrations due to the increase in emissions of formaldehyde are below the AACC. Therefore, Boise Cascade Corporation in Emmett, Idaho has demonstrated compliance with all applicable requirements.

| <b>Table 4. Ambient concentrations for each meteorological year.</b>   |  |                                    |                                   |
|--|--|------------------------------------|-----------------------------------|
| <b>Meteorological Year</b>   | <b>PM<sub>10</sub> concentrations (μg/m<sup>3</sup>)</b> |                                    | <b>Formaldehyde</b>               |
|  | <b>Annual<br/>(highest value)</b>                        | <b>24-hour<br/>(highest value)</b> | <b>Annual (highest<br/>value)</b> |
| 1987   | 0.613  | 2.57                               | 0.027                             |
| 1988   | 0.706  | 3.01                               | 0.030                             |
| 1989   | 0.658  | 3.24                               | 0.026                             |
| 1990   | 0.641  | 2.66                               | 0.028                             |
| 1991   | 0.752  | 3.68                               | 0.029                             |
| <b>Maximum Value</b>   | 0.752  | 3.68                               | 0.030                             |
| <b>Applicable Standard<sup>a</sup></b>   | 1.0  | 5.0                                | 0.077                             |
| <b>Compliant Y or N?</b>   | Y  | Y                                  | Y                                 |
| a. For PM <sub>10</sub> the significant contribution levels (IDAPA 58.01.01.006.93) and the acceptable ambient concentration for carcinogens (IDAPA 58.01.01.586). |  |                                    |                                   |

Table 2. Stack information.

| Stack Identifier            | Height (m) | Diameter (m) | Temperature (°K) | Stack Velocity (m/s) | UTM Easting (m) | UTM Northing (m) | Elevation (m) | Syinit (m) | Szinit (m) |
|-----------------------------|------------|--------------|------------------|----------------------|-----------------|------------------|---------------|------------|------------|
| Cyclone 8 (C8)              | 16.8       | 2.13         | 294              | 0.001                | 539164.9        | 4857696.5        | 719.3         | N/A        | N/A        |
| Cyclone 11 (C11)            | 16.8       | 0.91         | 294              | 0.001                | 539128.6        | 4857732          | 719.3         | N/A        | N/A        |
| Cyclone 14 (C14)            | 16.8       | 1.52         | 294              | 0.001                | 539133.9        | 4857733.5        | 719.3         | N/A        | N/A        |
| Beam Plant Baghouse (BH1)   | 13.1       | 0.61         | 294              | 35.2                 | 539444.2        | 4857789.5        | 719.3         | N/A        | N/A        |
| Shavings Bin Baghouse (BG3) | 12.2       | 0.23         | 294              | 0.001                | 539019.6        | 4857995          | 719.3         | N/A        | N/A        |
| Finger Jointer Building     | 5.05       | N/A          | N/A              | N/A                  | 539139          | 4857826          | 719.3         | 24.1       | 4.7        |

a. For an volume source:

Release Height - 1/2 height of building = 1/2 (10.1m) = 5.05 m

Syinit = Initial lateral dimension of the volume in meters

Single volume source = length of side divided by 4.3 = (103.6m)/4.3 = 24.1m

Szinit = Initial vertical dimension of the volume in meters

Elevated source on or adjacent to a building = building height divided by 2.15 = (10.1m)/2.15 = 4.7m