Air Quality Permitting
Statement of Basis

April 16, 2008

Permit to Construct No. P-050036

Boise Moulding and Lumber Co., Inc.
Garden City, ID

Facility ID No. 001-00130

Prepared by:

Valerie Greear, Associate Engineer

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Acronyms, Units, and Chemical Nomenclature

acfm	actual cubic feet per minute
AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
ASTM	American Society for Testing and Materials
BACT	Best Available Control Technology
Btu	British thermal unit
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
gpm	gallons per minute
gr	grain (1 lb = 7,000 grains)
HAPs	Hazardous Air Pollutants
hp	horsepower
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
km	kilometer
lb/hr	pounds per hour
m	meter(s)
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NOx	nitrogen oxides
NSPS	New Source Performance Standards
O_3	ozone
OandM	Operations and Maintenance
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
ppm	parts per million
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
scf	standard cubic feet
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SM	Synthetic Minor
SO_2	sulfur dioxide
SOx	sulfur oxides
T/yr	tons per year
$\mu g/m^3$	micrograms per cubic meter
UTM	Universal Transverse Mercator
VOC	volatile organic compound

1. 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.

2. FACILITY DESCRIPTION

Boise Moulding and Lumber Company, Inc. manufactures custom architectural wood products. The facility typically produces standing and running trim for doors, windows, siding, flooring, wall paneling, wooden columns, and stair parts. Bench work involves the manufacture of fireplace mantels, kitchen cabinets, and floor/window/door interior and exterior trim. The millwork operations are located in the north side of the shop and the bench work operations are located in the south side. Wood shavings and sawdust are collected by three cyclones and conveyed to a loadout bin for storage, and then they are transferred to a truck for transport off-site.

3. FACILITY / AREA CLASSIFICATION

Boise Moulding and Lumber Co. Inc. is classified as a MINOR facility because its potential to emit is less than major source thresholds without requiring limits on its potential to emit. The AIRS classification is "B."

The facility is located within AQCR 64 and UTM zone 11. The facility is located in Ada County which is designated as attainment for CO and PM_{10} and unclassifiable for all other regulated criteria pollutants (NO_X, SO_2, lead, and ozone).

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant at Boise Moulding and Lumber. This required information is entered into the EPA AIRS database.

4. APPLICATION SCOPE

Boise Moulding and Lumber Company, Inc. has been in operation since 1979. In 1999, DEQ inspectors visited the facility and recommended that they apply for a permit. A permit application was received on January 21, 2000, and DEQ issued a Tier II operating permit, T2-990163, on June 12, 2000.

During the handoff meeting on June 19, 2000, Boise Moulding and Lumber Co., Inc. requested that the Tier II operating permit be withdrawn, which DEQ agreed to do and to conduct another engineering evaluation that would result in an operating permit that was mutually agreeable with the facility. As a result, an inspection was conducted on August 30, 2000, during which no exceedances were noted. However, the facility was in violation of the air quality rules by operating without a permit, and a warning letter was sent on October 23, 2000. In a response to this letter, the facility replied with a letter dated October 30, 2000, in which they outlined several other meetings that had taken place between DEQ staff and the facility between the handoff meeting in June and the warning letter in October.

On May 7, 2002, DEQ received an application for a PTC, which the facility applied for to replace the revoked Tier 2 permit. The project to re-permit the facility was deprioritized by DEQ until the withdrawn Tier II operating permit expired on June 12, 2005. DEQ sent a letter dated July 8, 2005 reminding the facility to renew their operating permit. An application for renewal was received on July 29, 2005. The DEQ Air Division has since determined that a permit to construct is the appropriate air permit for the facility, rather than an operating permit as previously assigned.

Modeling analysis to demonstrate compliance with NAAQS, required with the facility application, was provided for the facility by DEQ Air Division modeling staff. Staff visited the facility on two occasions to discuss physical changes to bring the facility into compliance. Several scenarios were modeled for the facility.

4.1 Application Chronology

June 12, 2000.....T2-990163 was issued.

May 7, 2002.....A PTC permit application was received.

August 5, 2002 .....An incompleteness letter was sent requesting facility-wide modeling.

October 8, 2002 .....Facility-wide modeling was received by DEQ.

February 3, 2003.....An incompleteness letter was sent further explaining what more was needed in the facility-wide modeling requested in the previous letter.

July 8, 2005 .....DEQ sent a reminder letter to renew the expired Tier II permit.

June 12, 2005.....A Tier II renewal application was received.

August 23, 2005 .....A letter requesting the application fee was sent to the facility, and the permit was designated inactive until receipt of fees.

April 25, 2006.....The permit project was reactivated.

May 3, 2006.....A second letter requesting the delinquent fees was sent.

June 5, 2006.....The application fee was received.

July 3, 2006 .....The permit application was deemed incomplete due to lack of adequate modeling.

February 22, 2007.....Draft modeling was completed by DEQ Air Division modeling staff.

February 27, 2007.....Additional information regarding bin unloading totals was received.

March 9, 2007.....The permit application was deemed complete.

May 17, 2007.....Additional information was received on the future baghouse.

August 17, 2007 .....Modeling was completed by DEQ Air Division modeling staff.

September 14, 2007.....Facility Draft was issued.

5. PERMIT ANALYSIS

This section of the Statement of Basis describes the regulatory requirements for this PTC action.

5.1 Equipment Listing

The following table contains details of the regulated equipment at the facility.

Table 5-1 Equipment Listing at Boise Moulding and Lumber Co., Inc.

Unit Description and ID	Input and Output	Stack Dimensions
High Efficiency Cyclone No. 1	Mill Mix wood dust from: Rip Saw, Resaw, Single Surfacer, Moulder, Straight Line Edger	Downward Stack Exit is 43 ft above ground level 2.5 ft exit diameter, 9000 acfm, ambient temperature
High Efficiency Cyclone No. 2	Mill Mix wood dust from: Two Moulders, Four Sided Planer	Exhausts to baghouse
High Efficiency Cyclone No. 3	Mill Mix wood dust from: Belt Sander	Exhausts to baghouse
Baghouse	Exhaust from Cyclone Nos. 2 and 3.	Horizontal exhaust, 27 ft above ground level.
Loadout Bin	Mill Mix Wood Dust From Cyclone Nos. 1, 2, and 3.	Clam shell loadout bin 15 feet above ground level. Exit diameter is 4x10 ft when fully opened.

5.2 Emissions Inventory

The only regulated pollutant emitted by Boise Moulding and Lumber Co., Inc. is PM_{10}. The facility does not dry or treat wood. Wood byproduct from the wood processing is transferred pneumatically to one of three cyclones. The cyclones separate the wood from the airstream and transfer the wood to the loadout bin. A baghouse will be installed that will receive exhaust from Cyclones No. 2 and 3.

The yearly cyclone emissions of PM_{10} in Table 5-2 are based on a 12 hour operating day, 365 days/yr. The PM_{10} emissions from the loadout bin are based on unloading 5 tons of wood into a truck each day, 365 days/yr. A control efficiency of 50% was used for the partial enclosure of the underpass of the loadout bin.

Table 5-2 Boise Moulding and Lumber Co., Inc. PM_{10} Potential to Emit

	PM_{10} Emissions Factor*	Potential to Emit PM_{10} Emissions	Yearly Emissions of PM_{10} ton/yr
Cyclone No. 1	0.011 gr/scf	0.88 lb/hr	1.93
Baghouse	0.001 gr/scf	0.17 lb/hr	0.75
Wood Waste Loadout Bin Transfer	0.6 lb/ton	3.0 lb/day	0.55
Total Emissions Increase			**3.23 ton/yr**

* The emissions factors used to estimate the PM_{10} emissions are from the memorandum titled *Correction of Air Emission Factors and Speciated Data for Idaho Wood Industry*, written by DEQ staff member Val Bohdan, dated June 30, 1997.

5.3 Modeling

All modeling for the facility was completed by DEQ Air Division staff member Darrin Mehr. Modeling demonstrated that compliance with NAAQS can only be reached through physical changes at the facility. Therefore, the facility has agreed to install a baghouse on Cyclones No. 2 and 3 and enclose two sides of the loadout bin underpass, affording an estimated 50% control efficiency. The Modeling Demonstration for Boise Moulding and Lumber Co., Facility-wide PM_{10} NAAQS Assessment for a Permit to Construct for their facility in Garden City, Idaho, is included as Appendix B.

5.4 Regulatory Review

This section describes the regulatory analysis of the applicable air quality rules with respect to this PTC.

IDAPA 58.01.01.201 ..... Permit to Construct Required

The facility's proposed project does not meet the permit to construct exemption criteria contained in Sections 220 through 223 of the Rules. Therefore, a PTC is required.

IDAPA 58.01.01.203 ..... Permit Requirements for New and Modified Stationary Sources

The applicant has shown to the satisfaction of DEQ that the facility will comply with all applicable emissions standards, ambient air quality standards, and toxic increments.

IDAPA 58.01.01.210 ..... Demonstration of Preconstruction Compliance with Toxic Standards

There are no TAP emissions at this facility.

IDAPA 58.01.01.224 ..... Permit to Construct Application Fee

The applicant satisfied the PTC application fee requirement by submitting a fee payment of $1,000.00 on May 3, 2006.

IDAPA 58.01.01.225 ..... Permit to Construct Processing Fee

The applicant satisfied the PTC processing fee requirement by submitting a fee payment of $2500.00 on April 1, 2008. See Section 6 for fee calculation.

5.5 Permit Conditions Review

This section describes the basis for the facility specific permit conditions.

The permit requirements for this facility are primarily drawn from modeling results (see Appendix B) and the necessity to bring the facility into compliance with NAAQS.

Sections 2 and 3: Cyclones
Section 2 of the permit contains conditions for Cyclone No. 1, and Section 3 contains conditions for Cyclones No. 2 and 3 and the baghouse. The emissions limits in these sections were developed based on emissions factors from the memorandum titled *Correction of Air Emission Factors and Speciated Data for Idaho Wood Industry*, by Val Bohdan of DEQ, dated June 30, 1997. The yearly emissions limits are based on 365 days of 12 hours per day operation of the cyclones.

Permit Conditions No. 2.5 and 3.5 require the facility to operate no more than 12 hours per day, with compliance determined by Permit Conditions No. 2.6 and 3.9, which require the monitoring and recording of the hours of operation of the fans associated with the cyclones. This requirement is necessary for the permittee to demonstrate compliance with NAAQS as determined in the modeling memo (see Section 5.3 above).

The permit also requires that the facility comply with opacity limits of no more than 20% per 3 minutes in any 60 minute period for all stacks, vents, or functionally equivalent openings associated with the millwork.

A baghouse is required in Permit Condition 3.6 to be installed and operational within one year of the permit issuance. Preparation of an operations and maintenance (O&M) manual is required for the baghouse prior to commencement of baghouse operation. The O&M manual will contain, at a minimum, the manufacturer's recommendations for operation, including the pressure drop range indicative of proper baghouse performance. The permit requires that the facility operate within this range and monitor and record the pressure drop on the baghouse daily.

At the time that the facility was first permitted and received Tier II Operating Permit No. T2-990163, issued June 12, 2000, the area was classified as nonattainment for PM_{10}, and therefore, a significant impact to ambient air concentration was 5 ug/m^3 (24 hour) and 1 ug/m^3 (annual). The technical analysis associated with the issuance of the Tier II permit explains that the emission factor representing actual emissions was 0.015 grains/dscf, but in order to meet the stringent modeling requirements, an emission factor of 0.0017 grains/dscf was necessary. As a result, the facility was issued a permit with the requirement to meet emissions limits of 0.13 lb/hr, 0.15 lb/hr, and 0.15 lb/hr for cyclones no. 1, 2, and 3, respectively. The facility was unable to meet these emissions requirements.

During the current permitting event, a significant impact is considered 150 ug/m^3 (24-hour average), and 50 ug/m^3 (annual), which in this case is an increase of 50 ug/m^3 (24-hour average) and 16.3 ug/m^3 (annual) above background ambient air concentration. Because the standards against which modeled concentrations are compared are different than they were during the previous permitting term, and because the facility asked that the issued operating permit be withdrawn, the previous limits were not used in the writing of this PTC permit.

Section 4: Loadout Bin
The permit conditions of Section 4 apply to the loadout bin. Permit Condition 4.4 contains a throughput limit of 5 tons/day of wood byproduct unloaded into the trucks, based on an average daily rate per calendar month. This limit is included to demonstrate compliance with NAAQS. Permit Condition 4.6 requires that the mass of wood byproduct loaded into a truck be recorded and kept for 2 years.

The facility will also write an O&M manual (Permit Condition No. 4.5) for the operations associated with the loadout bin to further the control of fugitives produced by unloading the bin. The O&M manual is expected but not required to include the following methods:

- Opening the bin doors slowly;
- Using additional enclosure around the open ends of the truck loadout;
- Using water spray to minimize dust emissions;
- When possible, avoiding the opening of the bin on windy days.

6. PERMIT FEES

The facility submitted a $1,000 PTC application fee on May 3, 2006, in accordance with IDAPA 58.01.01.224. Boise Moulding and Lumber Co. Inc.'s emissions increase is in the 1 to 10 tons range. Therefore, in accordance with IDAPA 58.01.01.225, the PTC processing fee is $2,500. The facility submitted the $2500 PTC processing fee on April 1, 2008.

Table 6.1 PTC PROCESSING FEE TABLE

Emissions Inventory			
Pollutant	**Annual Emissions Increase (T/yr)**	**Annual Emissions Reduction (T/yr)**	**Annual Emissions Change (T/yr)**
NO_X	0.0	0	0.0
SO_2	0.0	0	0.0
CO	0.0	0	0.0
PM_{10}	3.23	0	3.23
VOC	0.0	0	0.0
TAPS/HAPS	0.0	0	0.0
Total:	3.23	0	**3.23**
Fee Due	**$ 2,500.00**		

7. PERMIT REVIEW

7.1 Regional Review of Draft Permit

The Boise Regional Office was given an opportunity to comment on the draft permit on September 13, 2007.

7.2 Public Comment

An opportunity for public comment period on the PTC application was provided from March 16 through March 30, 2007, in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and no requests for a public comment period on DEQ's proposed action.

7.3 Facility Comment

The facility was given an opportunity to comment and provided with a draft of the PTC on September 14, 2007.

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APPENDIX A - AIRS INFORMATION

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

Facility Name: Boise Moulding and Lumber Co. Inc.
Facility Location: 116 E 44th St., Garden City
AIRS Number: 001-00130

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO_2								
NO_x								
CO								
PM_{10}	B	B				B	B	A
PT (Particulate)								
VOC								
THAP (Total HAPs)								
			APPLICABLE SUBPART					

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, **or** each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.

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).

APPENDIX B - MODELING REVIEW

MEMORANDUM

DATE: August 31, 2007

TO: Valerie Greear, Environmental Engineer, Permit Writer, Boise Regional Office

FROM: Darrin Mehr, Air Quality Analyst, Air Program

PROJECT NUMBER: P-050036

SUBJECT: Modeling Demonstration for Boise Moulding and Lumber Co., Facility-wide PM_{10} NAAQS Assessment for a Permit to Construct for their facility in Garden City, Idaho.

1.0 Summary

Boise Moulding and Lumber Co. (BMLC) submitted an application for a Tier II Operating Permit on July 26, 2005. The application was submitted in response to a DEQ request for a permit application to address the past construction of a facility without a PTC. One of the requirements of the permit application was the submittal of a facility-wide PM_{10} NAAQS (National Ambient Air Quality Standards) compliance demonstration. The application materials did not contain a PM_{10} NAAQS compliance demonstration. This project was subsequently altered to a Permit to Construct (PTC) action.

The facility processes wood into moulding, flooring, siding, doors, and other finished carpentry items. The July 26, 2005 application included emission estimates for three point source woodwaste material handling cyclones and a fugitive emission source truck bin loadout operation. Only emissions of PM_{10} were included. The application contained a scaled plot plan with building dimensions and the locations of the emission sources. An ambient impact assessment was not included in the permit application.

IDAPA 58.01.01.203.02 requires the facility to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). DEQ modeling staff performed analyses to estimate impacts for the BMLC facility with the approval of DEQ State Office Stationary Source Permitting Management and the facility's owner. Results are to be shared and discussed with the permit writer and the facility representative.

DEQ conducted a preliminary assessment of PM_{10} ambient impacts from BMLC for several scenarios with and without PM_{10} emission control for the truck bin loadout operation and varying exhaust parameters of release height and orientation for the process cyclones. The results of this assessment were provided to the permit writer in a draft memorandum, dated February 15, 2007. Ambient impacts from the facility, as represented in the July 26, 2005 permit application, were predicted to exceed both the 24-hour and annual PM_{10} NAAQS when ambient background concentrations were added to the assessment's design concentrations.

On May 17, 2007, BMLC submitted documentation for a baghouse that the facility planned to install in the near future to reduce PM_{10} emissions from one or more process cyclones. At this time, BMLC has constructed an enclosure system for the truck bin loadout operation that is considered to have a control efficiency of at least 50% for PM_{10} emissions.

DEQ performed the ambient air dispersion modeling demonstration for this project. The modeling analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or

conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations from emissions associated with the facility, when appropriately combined with background concentrations, were below applicable air quality standards at all receptor locations. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
DEQ modeling of existing scenario for the emissions point sources of three cyclones with downturned exhaust releases and one uncontrolled fugitive truck loadout bin for wood byproduct did not meet PM_{10} 24-hour and annual NAAQS. The facility's emission points are relatively close to the property boundary. Cyclones 2 and 3 and the fugitive emissions from the uncontrolled truck loadout bin were the primary contributors to the high ambient impacts.	Ambient impacts at the property boundary exceeded NAAQS due to impacts from the cyclones at existing stack heights and fugitive emissions from the woodwaste loadout bin. The results of the initial modeling conducted by DEQ demonstrated that additional measures would be required for the facility to comply with the PM_{10} 24-hour and annual NAAQS. Remodeling a revised scenario was necessary to complete the analysis to allow DEQ to issue a facility-wide PTC to BMLC.
DEQ modeled a new scenario based on updated information. BMLC submitted documentation reflecting the following alterations to the facility: 1) Partial enclosure of truck bin woodwaste loadout bin. 50% emission control was applied to the PM_{10} emission rate, and, 2) Emissions from Cyclone 2 and Cyclone 3 routed to proposed baghouse at the proposed location.	In order to demonstrate compliance with PM_{10} NAAQS the facility must install and maintain the enclosure around the truck bin loadout bin and the exhaust from Cyclone 2 and Cyclone 3 must be controlled by a baghouse, properly maintained and operated to reduce PM_{10} emissions to the emission rates reflected in the dispersion modeling demonstration performed by DEQ. These factors should be included as permit operating requirements.
DEQ applied operating hour assumptions of 12 hours per day, starting at 7 AM and ending at 9 PM. Modeling of emissions was assumed not to occur during late night and early morning hours when most calm wind conditions occur. Calm winds conditions can increase predicted ambient impacts from horizontal, capped, and fugitive emission releases.	An operating requirement should be included in the permit to reflect 12 hours of operation of the air pollution emitting sources. The facility representatives stated that they do not typically operate during late night and early morning hours.
The ambient air boundary included the facility's parking lot, the grass lawn on the eastern corner of the property, and the strip of property along the alleyway on the southwest side of the production building. These areas are not fenced and the facility must control public access to these areas by having staff monitor them and notify any members of the public that it is private property and access is not allowed.	The ambient air boundary is an important part of this modeling analysis. If the facility does not maintain control of the unfenced portions of the facility the modeling analysis must be altered so that the ambient air boundary is established outside of the fenced areas of the facility and along the exterior of the facilty's buildings. Considering the location of receptors for some of the highest predicted impacts, this could become an issue for NAAQS compliance demonstration. This point must be effectively conveyed to BMLC prior to handoff of the permit.
The annual ambient impact of the facility under the proposed controlled scenario is 99.8% of the annual PM_{10} NAAQS.	If the facility requires additional operating hours within a day, BMLC may perform a revised modeling run for the hours of operation desired, but annual operating days must be reduced from 365 days per year to a number that allows the facility to demonstrate compliance with the annual PM_{10} NAAQS.

2.0 Background Information

2.1 Applicable Air Quality Impact Limits and Modeling Requirements

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.1.1 *Area Classification*

The BMLC facility is located in Ada County, designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}).
The area operates under limited maintenance plans for PM_{10} and CO.

There are no Class I areas within 10 kilometers of the facility.

2.1.2 *Significant and Full Impact Analyses*

If estimated maximum pollutant impacts to ambient air from the emissions sources at the facility exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.90, then a full impact analysis is necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting maximum pollutant concentrations in ambient air are then compared to the National Ambient Air Quality Standards (NAAQS) listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. CRITERIA AIR POLLUTANTS APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
PM_{10}[e]	Annual	1.0	50[f]	Maximum 1st highest[g]
	24-hour	5.0	150[h]	Maximum 6th highest[i]
Carbon monoxide (CO)	8-hour	500	10,000[j]	Maximum 2nd highest[g]
	1-hour	2,000	40,000[j]	Maximum 2nd highest[g]
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1st highest[g]
	24-hour	5	365[j]	Maximum 2nd highest[g]
	3-hour	25	1,300[j]	Maximum 2nd highest[g]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest[g]
Lead (Pb)	Quarterly	NA	1.5[h]	Maximum 1st highest[g]

[a] IDAPA 58.01.01.006.90
[b] Micrograms per cubic meter
[c] IDAPA 58.01.01.577 for criteria pollutants
[d] The maximum 1st highest modeled value is always used for significant impact analysis
[e] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f] Never expected to be exceeded in any calendar year
[g] Concentration at any modeled receptor
[h] Never expected to be exceeded more than once in any calendar year
[i] Concentration at any modeled receptor when using five years of meteorological data
[j] Not to be exceeded more than once per year

2.1.3 *TAPs Analyses*

The increase in emissions from the proposed modification are required to demonstrate compliance with the toxic air pollutant (TAP) increments, with an ambient impact dispersion analysis for any TAP with a requested potential emission rate that exceeds the screening emission rate limit (EL) specified by IDAPA 58.01.01.585 or 58.01.01.586.

TAPs emissions were not analyzed for this project. There were no TAP emissions subject to review under IDAPA 58.01.01.210.

2.2 Background Concentrations

Ambient background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. The background concentration for the 24-hour PM_{10} average was based on the isopleth map of PM_{10} ambient background values, based on airshed modeling performed by DEQ for the Boise area. The annual average PM_{10} background concentration is based on monitoring data for Boise. These background values are listed in Table 3. PM_{10} was the only pollutant modeled for this project.

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	24-hour	100
	Annual	33.7

[a] Micrograms per cubic meter
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

Table 4 provides a summary of the modeling parameters used in DEQ's analyses.

Table 4. MODELING PARAMETERS

Parameter	Description/ Values	Documentation/Additional Description
Model	AERMOD	AERMOD, Version 07026 (Version 04300 was used for the preliminary findings modeling for the existing facility configuration)
Meteorological data	1987-1991	Boise surface and upper data were processed with AERMET. Data was for 1987 through 1991.
Land Use (urban or rural)	Rural	The rural mode for AERMOD was selected.
Terrain	Considered	Receptor 3-dimensional coordinates were obtained from USGS DEM files and used to establish elevation of ground level receptors.
Building downwash	Downwash algorithm	Building dimensions obtained from the submitted facility plot plan, and BPIP-PRIME/AERMOD was used to evaluate downwash effects.
Receptor grid	Grid 1	10 meter spacing along ambient air boundary and outward 140 meters from the ambient air boundary. All nested grids were centered on the facility and receptors were deleted inside the facility's ambient air boundary.
	Grid 2	25 meter spacing for a 480 meter (X) by 400 meter (Y) grid centered on the facility and overlapping the 10 meter grid.

3.1.1 Modeling protocol

A modeling protocol was not submitted to DEQ prior to submission of the Tier II permit application. DEQ later used a PTC project designation. DEQ agreed to conduct the modeling analyses on behalf of BMLC.

Modeling was conducted using methods in the *State of Idaho Air Quality Modeling Guideline*. Data from the original Tier II permit application and the May 2007 and July 2007 supplemental permit application submittals concerning the proposed baghouse were used to develop these modeling analyses.

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling*. Memorandum to Mary Anderson, March 14, 2003.

3.1.2 Model Selection

AERMOD was used by DEQ to conduct the ambient air analyses. AERMOD is the recommended model for this project. Building-induced downwash effects are of concern for this project because ambient air receptors are located within structure recirculation cavities. The PRIME algorithms in AERMOD and BPIP-PRIME calculate ambient impacts within recirculation cavities.

3.1.3 Meteorological Data

Boise airport meteorological station surface and upper air meteorological data from 1987 to 1991 was used for the BMLC site in Garden City, Idaho.

3.1.4 Terrain Effects

The modeling analyses conducted by DEQ considered elevated terrain. The actual elevation of each receptor was determined using United Geological Survey (USGS) digital elevation map (DEM) files for the area surrounding the facility. Elevations of emission sources, buildings, and receptors were developed based on surrounding terrain elevations from the DEM files.

3.1.5 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the scaled plot plan submitted with the application to satellite images of the site obtained from the Google Earth internet website. DEQ developed the facility boundary and building parameters from these sources. The proposed baghouse location was obtained from BMLC's July 5, 2007 submittal.

3.1.6 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program (BPIP) with the Plume Rise Model Enhancements (PRIME) algorithm was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters for AERMOD for building-induced downwash effects.

3.1.7 Ambient Air Boundary

Ambient air was determined to exist for all areas immediately exterior to the BMLC facility's property boundary. Portions of the facility are fenced. The facility does not allow the general public to access the production area of the facility, and the parking lot at the facility's entrance is for business and employee parking. Staff are on hand to monitor and control access to the facility property.

3.1.8 Receptor Network

The receptor grids used by DEQ met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline.*

Maximum impacts and design concentrations impacts were determined to occur at or very near the ambient air boundary.

3.2 Emission Rates

Emissions rates used in the dispersion modeling analyses were reviewed against those in the permit application. The following approach was used for DEQ modeling:

- All modeled criteria pollutant emissions rates were equal to the emissions calculated by the facility for Cyclone 1 in the Tier II/PTC application. Emissions from the proposed baghouse and the truck bin loadout operation were estimated by DEQ modeling staff.

DEQ modeled the existing facility's emissions from three material handling process cyclones and one truck dump loadout bin for the material transfer of wood byproduct to haul truck trailers in a baseline analysis.

DEQ modeling staff relied on the PM_{10} emission rates based on 0.015 gr/dscf of exhaust airflow that was supplied by the facility for the three cyclones presented in the July 26, 2005 application. The initial modeling analysis based on the three existing cyclones was altered to reflect the facility's request to install a baghouse to control PM_{10} emissions from Cyclone 2 and Cyclone 3. This memorandum reflects the installation of the baghouse. Therefore, Cyclones 2 and 3 are not included in this memorandum as emission release points. Baghouse PM_{10} emissions were estimated using the combined air flow rate for the pneumatic systems already in place for Cyclone 2 and Cyclone 3 and the grainloading emission factor from the *DRAFT Idaho DEQ Emission Factor Guide for Wood Industry, Attachment C*, January 8, 1997. The baghouse grainloading for mill mix and sanderdust was listed as 0.001 grains per dry standard cubic feet of exhaust air.

DEQ modeling staff noted that the PM_{10} emission estimates for the fugitive material transfer submitted in the permit application were estimated using an equation applicable to aggregate and sand material transfer instead of woodwaste. DEQ modeling staff estimated PM_{10} using an emission factor of 1.2 pounds per ton of material transferred, which was obtained from the *DRAFT Idaho DEQ Emission Factor Guide for Wood Industry, Attachment C, January 8, 1997*. If permitting staff revise the fugitive loadout or baghouse emission estimates, and this results in an emission increase, this modeling demonstration must be revised accordingly.

Daily emissions were modeled for 12 hours per day starting at 7 AM and ending at 9 PM. Annual emissions were modeled under the daily emissions scenario for 365 days per year.

Table 5. MODELED PM_{10} EMISSIONS RATES

Emissions Source	Hourly Emissions (lb/hr)[a]	Daily Emissions (lb/day)[b]	Annual Emissions (T/yr)[c]
Cyclone 1	0.88	10.56	1.93
Baghouse	0.17	2.04	0.75
Woodwaste Loadout Bin Transfer	0.25[d]	3.0[d]	0.55

[a] Pounds per hour
[b] Pounds per day
[c] Tons per year (daily emissions modeled at 365 days per year)
[d] Controlled emission rate assuming 5 tons per day of woodwaste transferred and 12 hours per day of operation. 50% control of fugitive emissions was applied to account for the loadout bin enclosure that has already been constructed.

3.3 Emission Release Parameters

Exhaust parameters listed in the July 26, 2005 permit application representing the existing facility were used as the baseline case for modeling. The results of the baseline modeling exercise did not demonstrate

compliance with the PM_{10} NAAQS. This memorandum reflects the latest information from BMLC on the point and volume source release parameters.

Cyclone 1 is a point source equipped with a downturned exhaust vent. This requires the modeling to reflect the exhaust plume being emitted as a horizontal release. The baghouse will control emissions from Cyclones 2 and 3, and has a 6-inch tall vent that extends around the entire circumference of the top of the cylindrically-shaped baghouse structure. The baghouse vent was modeled a point source with an effective diameter equal to the diameter of the baghouse. The stack gas velocity for the baghouse vent was set to 0.001 meters per second to account for a horizontal release orientation. The stack diameter was set at the diameter of the vent ring in order to include stack tip downwash effects.

Table 6 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources. Table 7 lists the volume source emission release parameters. Documentation on the baghouse was included in the May and July 2007 submittals.

Table 6. POINT SOURCE STACK PARAMETERS

Release Point	Source Type	Stack Height (m)[a]	Modeled Stack Diameter (m)	Stack Gas Flow Temperature (K)[b]	Stack Gas Flow Velocity (m/sec)[c]
CYCLONE1 - Cyclone 1	Point	13.1	0.76	293.15	0.001[d]
BAGHS_PT – Baghouse	Point	8.2	4.8	293.15	0.001[d]

[a] Meters
[b] Kelvin
[c] Meters per second
[d] Horizontal release point – exhaust plume's vertical momentum minimized

The fugitive emissions from the woodwaste transfer from the elevated storage bin to the trailer below were modeled as a single elevated volume source not on or adjacent to a building. The center of the release height was estimated at 12.5 feet (3.8 meters). The side length of the volume source was estimated at 10 feet (3.0 meters). The vertical dimension of the source was assumed to be 4 feet (1.2 meters). Table 3-1 of EPA's AERMOD User's Guide, EPA-454/B-03-001, September 2004, provides suggested methods on estimating volume source lateral and vertical dimensions.

The initial lateral dimension was estimated using the following procedure:

σ_{y0} = length of side divided by 4.3.

The initial vertical dimension was estimated using the following procedure:

σ_{y0} = vertical dimension of source divided by 4.3.

Table 7. VOLUME SOURCE EMISSION RELEASE PARAMETERS

Release Point	Release Point Description	Source Type	Source Release Height (m)[a]	σ_{Y0}, Initial Lateral Dimension (m)	σ_{Z0}, Initial Vertical Dimension (m)
Truck Dump Loadout	Elevated fugitive emission source – transfer of woodwaste materials (sanderdust, sawdust, planer shavings, and larger woodwaste materials	Volume	3.8	0.71	0.28

[a] Meters

3.4 Results for Ambient Impact Analyses

3.4.1 Full Impact Analyses

A significant contribution analysis was not performed for this application. DEQ performed a full impact analysis for the proposed baghouse installation and the recently-completed installation of a truck bin loadout enclosure to the existing facility's emission units. This is a facility-wide PTC project.

The results of the full ambient impact analysis are listed in Table 8.

Table 8. RESULTS OF FULL IMPACT ANALYSES FINAL PERMITTED SCENARIO

Pollutant	Averaging Period	Modeled Design Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Ambient Impact[a] ($\mu g/m^3$)	NAAQS[b] ($\mu g/m^3$)	Percent of NAAQS
PM_{10}[c]	24-hour	28.5	100	128.5	150	85.7%
	Annual	12.2	37.7	49.9	50	99.8%

[a] Micrograms per cubic meter
[b] National ambient air quality standards
[c] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

4.0 Conclusions

The ambient air impact analysis performed by DEQ demonstrated to DEQ's satisfaction that emissions from the facility, as represented by the applicant in the permit application, will not cause or significantly contribute to a violation of any air quality standard.