



**Air Quality Permitting  
Statement of Basis**

**January 8, 2007**

**Permit to Construct No. P-2007.0165**

**Treasure Valley Forest Products,  
Mountain Home**

**Facility ID No. 039-00009**

**Prepared by:**

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Air Quality Division**

A handwritten signature in black ink, appearing to be "JP", is written over the name Jonathan Pettit.

**Final**

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## Acronyms, Units, and Chemical Nomenclature

AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
BF/yr	board feet per year
BF/day	board feet per day
Btu	British thermal unit
CAA	Clean Air Act
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
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	pound per hour
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
NO <sub>2</sub>	nitrogen dioxide
NO <sub>x</sub>	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM <sub>10</sub>	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
scf	standard cubic feet
SIC	Standard Industrial Classification
SM	synthetic minor
SO <sub>2</sub>	sulfur dioxide
SO <sub>x</sub>	sulfur oxides
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

## 1. PURPOSE

The purpose of 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

The Mountain Home Treasure Valley Forest Products (TVFP) facility will primarily receive rough cut lumber consisting of pine and douglas fir for processing into dimensional lumber. Green debarked logs may also be periodically transported to the Mountain Home facility by truck from the Boise Yamhill facility when there is a large order to dry logs for log home construction. Wood shavings from the Planer Mill are routed to the Pellet Mill for wood pellet production.

## 3. FACILITY / AREA CLASSIFICATION

Treasure Valley Forest Products is classified as a minor facility because Treasure Valley Forest Products' 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 63 and UTM zone 11. The facility is located in Elmore County, which is designated as unclassifiable/attainment for all regulated criteria pollutants (PM<sub>10</sub>, CO, NO<sub>x</sub>, SO<sub>2</sub>, lead, and ozone).

The AIRS information provided in Appendix A defines the classification for each regulated air pollutant at Treasure Valley Forest Products. This required information is entered into the EPA AIRS database.

## 4. APPLICATION SCOPE

This initial PTC for a new planer mill and pellet mill and incorporates existing previously un-permitted equipment.

### 4.1 *Application Chronology*

August 2, 2007	DEQ Received application
August 16, 2007	DEQ received a revised T-RACT Analysis.
August 17, 2007	DEQ received supplemental compliance information supporting request to rescind the existing Consent Order
August 20, 2007	DEQ received supplemental T-RACT Analysis information

## 5. PERMIT ANALYSIS

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

### 5.1 Equipment Listing

**Table 5.1 SUMMARY OF REGULATED SOURCES**

Source Description	Emissions Controls
<p><b><u>Drying Kilns</u></b>  <u>Boiler No.1 (250HP)</u>                      Rated Heat Capacity: 8.369 MMBtu/hr                      Manufacturer: Kewanee                      Fuel: Natural Gas</p> <p><u>Boiler No. 2 (70HP)</u>                      Rated Heat Capacity: 2.343 MMBtu/hr                      Manufacturer: Cleaver Brooks                      Fuel: Natural Gas</p> <p><u>Lumber Kiln No. 1 (LK1)</u>                      Max Capacity: 10.4 MMBF/yr                      Operating hours: 5,000 BF/hr                      Production Limit: 40,000 BF/day                      Fuel: Natural Gas</p> <p><u>Lumber Kiln No. 2 (LK2)</u>                      Max Capacity: 13 MMBF/yr                      Operating hours: 6,250 BF/hr                      Production Limit: 50,000 BF/day</p> <p><u>Lumber Kiln Heaters (x2)</u>                      Manufacturer: Advanced Distributor Products                      Max Capacity: 0.145 MMBtu/hr each                      Hours of operation: 8760 hrs/yr                      Fuel: Natural Gas</p>	<p style="text-align: center;">None</p>
<p><b><u>Rotary Drum Dryer</u></b>                      Manufacturer: MEC                      Max Capacity: 35 MMBtu/hr</p>	<p><b><u>Rotary Drum Dryer Cyclone</u></b>                      Micron Range: 5-10                      Efficiency: 90%</p>
<p><b><u>Planer and Pellet Mill</u></b>  <u>Pellet Mill Hopper</u>                      Max Capacity: 10 T/yr                      Hours of Operation: 2080 hrs/yr</p> <p><u>Wood Chipper (CHIP)</u>                      Max Capacity: 2,577 lb/hr                      Hours of Operations: 2080 hrs/yr</p> <p><u>Chipper Screen (CHIPSCR)</u>                      Max Capacity: 2,577 lb/hr                      Hours of Operation: 2080 hrs/yr</p>	<p><b><u>Planer Mill and Pellet Mill Cyclones (x2)</u></b>                      Micron Range: 5-10                      Efficiency: 90%</p> <p><b><u>Planer Mill Baghouse (PMB)</u></b>                      Manufacturer: Murphy Rogers                      Size (Dia x Ht): 256 square feet</p>

## 5.2 Emissions Inventory

**Table 5.2 FACILITY WIDE CRITERIA EMISSIONS INVENTORY**

Emissions Unit	PM <sub>10</sub>		SO <sub>2</sub>		NO <sub>x</sub>		CO		VOC	
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr
Boiler No.1	0.06	0.27	0.01	0.02	0.80	3.49	0.67	2.93	0.04	0.19
Boiler No.2	0.02	0.07	0.00	0.01	0.22	0.98	0.19	0.82	0.01	0.05
Lumber Kiln No.1	0.03	0.03							16.50	17.16
Lumber Kiln No.2	0.03	0.03							10.32	10.73
Rotary Drum Dryer Cyclone	0.65	0.67	0.02	0.02	2.04	2.12	3.12	3.42	11.52	12.00
Pellet Mill Cyclone	1.11	1.15								
Lumber Kiln No.1 Heaters (x2)	0.00	0.01	0.00	0.00	0.03	0.12	0.02	0.10	0.00	0.01
Planner Mill Baghouse	0.05	0.05								
Planner Mill Hopper	0.01	0.01								
Wood Chipper	0.01	0.01								
Chipper Screen	0.00	0.00								
<b>Total</b>		2.3		0.05		6.71		7.72		40.14

## 5.3 Modeling

A detailed modeling analysis is included in Appendix B. All predicted ambient concentrations are less than or equal to 90% of acceptable standards. The facility modeled all NO<sub>x</sub> emissions to be at 90% of National Ambient Air Quality Standards (NAAQS). Fuel consumption permit provisions will limit annual NO<sub>x</sub> emissions to levels to remain below significant contribution levels.

## 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.

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

The applicant has demonstrated preconstruction compliance for all TAPs identified in the permit application.

## **5.5 Permit Conditions Review**

This section describes only those permit conditions that have been revised, modified, or deleted as a result of this permit action. All other permit conditions remain unchanged.

### **DRYING KILNS**

Lumber Kiln No.1 has two 0.145 MMBtu/hr heaters that are used to augment the available heat for the drying process. All emissions from these units are vented into Lumber Kiln No.1.

#### **Permit Condition 2.3**

Permit Condition 2.3 establishes a formaldehyde emission limit from the drying kilns not to exceed 0.0083 lb/yr and  $8.77 \times 10^{-06}$  lb/yr of cadmium. Compliance shall be demonstrated through permit condition 2.6, 2.7, 2.8, 2.9, 2.10, and General Provision 7.

#### **Permit Condition 2.4**

Permit Condition 2.4 establishes that the permittee shall combust natural gas exclusively. The application was based solely on the combustion of natural gas. Compliance shall be demonstrated through Permit Condition 2.9 and General Provision 7.

#### **Permit Condition 2.5**

Permit Condition 2.5 incorporates the grain loading requirement for fuel burning equipment of IDAPA 58.01.01.677. The use of natural gas assures compliance.

#### **Permit Condition 2.6**

Permit Condition 2.6 establishes a throughput limit for the kilns. The throughput is based on application recommendation and is consistent with application modeling data that demonstrates emission compliance. Compliance shall be demonstrated through Permit Condition 2.9 and General Provision 7.

### **ROTARY DRUM DRYER**

#### **Permit Condition 3.3**

Permit condition 3.3 establishes an NO<sub>x</sub> limit of 2.04lb/hr and 2.12 T/yr to maintain the facility NO<sub>x</sub> emissions below NAAQS standards. Compliance shall be demonstrated through permit condition 3.5, 3.6, 3.8, and General Provision 7.

#### **Permit Condition 3.4**

Permit Condition 3.4 establishes that the permittee shall combust natural gas exclusively. The application was based solely on the combustion of natural gas. Compliance shall be demonstrated through Permit Condition 3.7 and General Provision 7.

#### **Permit Condition 3.5**

Permit Condition 3.5 establishes a fuel consumption limit based on maximum operational design to maintain facility wide NO<sub>x</sub> emissions remain below significant contribution levels. Compliance shall be demonstrated with Permit Condition 3.7 and General Provision 7 (see Eq.1 for conversion).

#### **Permit Condition 3.5**

Permit Condition 3.5 establishes a throughput limit for the rotary drum dryer. The throughput is based on application recommendation and is consistent with application modeling data that demonstrates emission that is used to demonstrate compliance with the applicable ambient quality requirements. Compliance shall be demonstrated through Permit Condition 3.7 and General Provision 7.

## PLANER AND PELLET MILL

### Permit Condition 4.4

Permit Condition 4.4 incorporates IDAPA 58.01.01.650-651, requiring implementation of reasonable control procedures to mitigate fugitive PM emissions. Compliance shall be demonstrated through the reasonable control measures of Permit Condition 4.5, visible emissions monitoring requirements of Permit Condition 4.6, and General Provision 7.

## 6. PERMIT FEES

The applicant satisfied the application fee requirement of IDAPA 58.01.01.224 at the time the application was received on August 2, 2007. In accordance with IDAPA 58.01.01.225, a processing fee of \$5,000 is due (see Table 6.1). The applicant satisfied the processing fee requirement on December 31, 2007.

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 <sub>x</sub>	6.7	0	6.7
SO <sub>2</sub>	0.1	0	0.1
CO	7.7	0	7.7
PM10	2.3	0	2.3
VOC	40.1	0	40.1
TAPS/HAPS			0.0
Total:			<b>56.9</b>
Fee Due		<b>\$ 5,000.00</b>	

## 7. PERMIT REVIEW

### 7.1 Regional Review of Draft Permit

A draft permit was submitted to DEQ's Boise Regional Office on October 5, 2007; no comments were received.

### 7.2 Facility Review of Draft Permit

A draft permit was submitted to Treasure Valley Forest Products on October 12, 2007 for review. The facility requested that the fuel consumption limits and associated monitoring requirements for the drying kilns and the Rotary drum dryer be removed from the permit. They felt that the consumption limit and the throughput limit was duplicative compliance demonstration of the emission limits, and that that the throughput was easier to measure and adequately demonstrated compliance with the emission limits in section 2 and 3 of the permit. All application calculations were based on the throughput limits of the dryer and the kilns. These comments have been considered and incorporated in to the permit.

### 7.3 Public Comment

An opportunity for public comment period on the PTC application was provided from August 16, 2007, to August 30, 2007, in accordance with IDAPA 58.01.01.209.01.c. During this time, no comments or requests for a public comment period were received.

## **Appendix A – AIRS Information**

## AIRS/AFS<sup>a</sup> FACILITY-WIDE CLASSIFICATION<sup>b</sup> DATA ENTRY FORM

**Facility Name:** Treasure Valley Forest Products  
**Facility Location:** Elmore County  
**AIRS Number:** 039-00009

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 <sub>2</sub>	B							U
NO <sub>x</sub>	B							U
CO	B							U
PM <sub>10</sub>	B							U
PT (Particulate)								
VOC	B							U
THAP (Total HAPs)								
APPLICABLE SUBPART								

<sup>a</sup> Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

<sup>b</sup> 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 – Emissions Inventory**

Treasure Valley Forest Products - Mountain Home  
 Facility Summary Sheet

Unit	Unit Description	AP-42	PM <sub>10</sub>		PM <sub>2.5</sub>		SO <sub>2</sub>		NO <sub>x</sub>		CO		HAPs		VOCs		
			lb/day	lb/year	lb/day	lb/year	lb/day	lb/year	lb/day	lb/year	lb/day	lb/year	lb/day	lb/year	lb/day	lb/year	lb/day
<b>Point Sources</b>																	
220HP	250 Hp Nat Gas Boiler	AP-42	0.27	0.27	3.49	0.02	2.93	0.16	1.75E-05	0.16	0.06	0.06	0.80	0.005	0.97	0.04	3.99E-06
70HP	70 Hp Nat Gas Boiler	AP-42	0.07	0.07	0.98	0.01	0.82	0.1	4.9E-06	0.04	0.02	0.02	0.22	0.001	0.18	0.01	1.17E-06
RD	Rotary Drum Dryer	NCASI, AP-42	0.67	0.67	2.12	0.02	3.24	12.0		0.03	0.05	0.05	2.04	0.02	3.12	11.52	
LK1	Lumber Klin No. 1	NCASI, AP-42	0.047	0.027				17.18		0.36	0.05	0.03				16.50	
LK2	Lumber Klin No. 2	NCASI, AP-42	0.06	0.03				21.45		0.44	0.06	0.03				20.63	
PMB	Planer Mill Baghouse	IDEQ	0.05	0.05							0.05	0.05					
PWC	Pellet Mill Cyclone	IDEQ	1.52	1.16							1.52	1.11					
<b>Fugitive Sources</b>																	
	Pellet Mill Hopper	AP-42	0.016	0.009							0.016	0.008					
	Wood Chipper	IDEQ	0.03	0.01							0.03	0.01					
	Chipper Screen	AP-42	0.002	0.001							0.002	0.001					
<b>Not Included in Modeling</b>																	
HEATLK1	Lumber Klin Heaters (No.1)	AP-42	0.01	0.01	0.12	0.001	0.10	0.01	6.05E-07	0.005	0.002	0.002	0.03	0.0002	0.02	0.002	1.38E-07
	Shavings Bin	AP-42	0.008	0.004							0.008	0.004					
	Sawdust Bin	AP-42	0.008	0.004							0.008	0.004					
<b>Facility Total</b>			2.8	2.3	6.7	0.05	7.1	50.8	2.3E-05	1.0	2.5	2.0	3.1	0.03	4.0	48.7	5.2E-06
<b>Significant Emission Rates (10%)</b>			2.5	1.5	4.0	4.0	10.0	4.0	0.6								
<b>Modeling Threshold</b>			na	1.0	1.0	1.0	na	na		na	0.2	na	0.2	14.0	na		
<b>Modeling Required</b>				Yes	Yes	No				Yes		No	No	No			

**Treasure Valley Forest Products - Mountain Home**  
250 Hp Boiler

**Assumptions:**

Hours of operation 8760 hrs/yr maximum operation  
Rate heat input 8.369 MMBtu/hr  
Fuel:  
Natural Gas<sup>a</sup> 1050 Btu/scf

**Potential to Emit Calculations**

**Criteria Pollutants<sup>b</sup>:**

Pollutant	EF (lb/10 <sup>6</sup> scf)	Emissions	
		(lb/hr)	(tpy)
NOx	100	0.80	3.49
CO	84	0.67	2.93
SO2	0.6	0.00	0.02
VOC	5.5	0.04	0.19
PM10	7.6	0.06	0.27
PM	7.6	0.06	0.27
Lead	0.0005	3.99E-06	1.75E-05

**Idaho Toxic Air Pollutants:**

**Organics<sup>c</sup>**

Pollutant	CAS No.	Natural Gas EF (lb/10 <sup>6</sup> scf)	Emissions		IDAPA 58.01.01.58 5/586 (lb/hr)	Comparison
			(lb/hr)	(tpy)		
3-Methylchloranthrene	56-49-5	1.80E-06	1.43E-08	6.28E-08	2.50E-06	Below
Benzene	71-43-2	2.10E-03	1.67E-05	7.33E-05	8.00E-04	Below
Benzo(a)pyrene	50-32-8	1.20E-06	9.56E-09	4.19E-08	2.00E-06	Below
Formaldehyde	50-00-0	7.50E-02	5.98E-04	2.62E-03	5.10E-04	Exceeds
Hexane	110-54-3	1.80E+00	1.43E-02	6.28E-02	1.20E+01	Below
Naphthalene	91-20-3	6.10E-04	4.86E-06	2.13E-05	3.33E+00	Below
Pentane	109-66-0	2.60E+00	2.07E-02	9.08E-02	1.18E+02	Below
Toluene	108-88-3	3.40E-03	2.71E-05	1.19E-04	2.50E+01	Below
Benzo(a)anthracene		1.80E-06	1.43E-08	6.28E-08		
Benzo(a)pyrene		1.20E-06	9.56E-09	4.19E-08		
Benzo(b)fluoranthene		1.80E-06	1.43E-08	6.28E-08		
Benzo(k)fluoranthene		1.80E-06	1.43E-08	6.28E-08		
Chrysene		1.80E-06	1.43E-08	6.28E-08		
Dibenzo(a,h)anthracene		1.20E-06	9.56E-09	4.19E-08		
Indeno(1,2,3-cd)pyrene		1.80E-06	1.43E-08	6.28E-08		
Total IDAPA POM			9.09E-08		2.00E-06	Below
Subtotal HAPs (tpy)				1.56E-01		

**Metals<sup>d</sup>**

Pollutant	CAS No.	Natural Gas EF (lb/10 <sup>6</sup> scf)	Emissions		IDAPA 58.01.01.58 5/586 (lb/hr)	Comparison
			(lb/hr)	(tpy)		
Arsenic	7440-38-2	2.00E-04	1.59E-06	6.98E-06	1.50E-06	Exceeds
Barium	7440-39-3	4.40E-03	3.51E-05	1.54E-04	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	9.56E-08	4.19E-07	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	8.77E-06	3.84E-05	3.70E-06	Exceeds
Chromium	7440-47-3	1.40E-03	1.12E-05	4.89E-05	3.30E-02	Below
Cobalt	7440-48-4	8.40E-05	6.70E-07	2.93E-06	3.30E-03	Below
Copper	7440-50-8	8.50E-04	6.77E-06	2.97E-05	1.30E-02	Below
Manganese	7439-96-5	3.80E-04	3.03E-06	1.33E-05	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	2.07E-06	9.08E-06	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	8.77E-06	3.84E-05	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	1.67E-05	7.33E-05	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	1.91E-07	8.38E-07	1.30E-02	Below
Vanadium	1314-62-1	2.30E-03	1.83E-05	8.03E-05	3.00E-03	Below
Zinc	7440-66-6	2.90E-02	2.31E-04	1.01E-03	3.33E-01	Below
Subtotal HAPs				1.51E-03		
Total HAPs (tpy)				0.16		

**Notes:**

<sup>a</sup> Fuel heat values from EPA AP-42, Appendix A (EPA website June 2007)

<sup>b</sup> Criteria Pollutants EPA AP-42, Section 1.4, Tables 1.4-1 and 1.4-2

<sup>c</sup> Organic Toxic Air Pollutants EPA AP-42, Section 1.4, Table 1.4-3

<sup>d</sup> Metals from EPA AP-42, Section 1.4, Table 1.4-4

**Treasure Valley Forest Products - Mountain Home  
70 Hp Boiler**

**Assumptions:**

Hours of operation 8760 hrs/yr maximum operation  
 Rate heat input 2.343 MMBtu/hr  
 Fuel:  
 Natural Gas<sup>a</sup> 1050 Btu/scf

**Potential to Emit Calculations**

**Criteria Pollutants<sup>b</sup>:**

Pollutant	EF (lb/10 <sup>6</sup> scf)	Emissions	
		(lb/hr)	(tpy)
NOx	100	0.22	0.98
CO	84	0.19	0.82
SO2	0.6	0.001	0.01
VOC	5.5	0.01	0.05
PM10	7.6	0.02	0.07
PM	7.6	0.02	0.07
Lead	0.0005	1.12E-06	4.89E-06

**Idaho Toxic Air Pollutants:**

**Organics<sup>c</sup>**

Pollutant	CAS No.	Natural Gas EF (lb/10 <sup>6</sup> scf)	Emissions		IDAPA 58.01.01.58 5/586 (lb/hr)	Comparison
			(lb/hr)	(tpy)		
3-Methylchloranthrene	56-49-5	1.80E-06	4.02E-09	1.76E-08	2.50E-06	Below
Benzene	71-43-2	2.10E-03	4.69E-06	2.05E-05	8.00E-04	Below
Benzo(a)pyrene	50-32-8	1.20E-06	2.68E-09	1.17E-08	2.00E-06	Below
Formaldehyde	50-00-0	7.50E-02	1.67E-04	7.33E-04	5.10E-04	Below
Hexane	110-54-3	1.80E+00	4.02E-03	1.76E-02	1.20E+01	Below
Naphthalene	91-20-3	6.10E-04	1.36E-06	5.96E-06	3.33E+00	Below
Pentane	109-66-0	2.60E+00	5.80E-03	2.54E-02	1.18E+02	Below
Toluene	108-88-3	3.40E-03	7.59E-06	3.32E-05	2.50E+01	Below
Benzo(a)anthracene		1.80E-06	4.02E-09	1.76E-08		
Benzo(a)pyrene		1.20E-06	2.68E-09	1.17E-08	2.00E-06	Below
Benzo(b)fluoranthene		1.80E-06	4.02E-09	1.76E-08		
Benzo(k)fluoranthene		1.80E-06	4.02E-09	1.76E-08		
Chrysene		1.80E-06	4.02E-09	1.76E-08		
Dibenzo(a,h)anthracene		1.20E-06	2.68E-09	1.17E-08		
Indeno(1,2,3-cd)pyrene		1.80E-06	4.02E-09	1.76E-08		
Total IDAPA POM			2.54E-08		2.00E-06	Below
Subtotal HAPs (tpy)					4.38E-02	

**Metals<sup>d</sup>**

Pollutant	CAS No.	Natural Gas EF (lb/10 <sup>6</sup> scf)	Emissions		IDAPA 58.01.01.58 5/586 (lb/hr)	Comparison
			(lb/hr)	(tpy)		
Arsenic	7440-38-2	2.00E-04	4.46E-07	1.95E-06	1.50E-06	Below
Barium	7440-39-3	4.40E-03	9.82E-06	4.30E-05	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	2.68E-08	1.17E-07	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	2.45E-06	1.08E-05	3.70E-06	Below
Chromium	7440-47-3	1.40E-03	3.12E-06	1.37E-05	3.30E-02	Below
Cobalt	7440-48-4	8.40E-05	1.87E-07	8.21E-07	3.30E-03	Below
Copper	7440-50-8	8.50E-04	1.90E-06	8.31E-06	1.30E-02	Below
Manganese	7439-96-5	3.80E-04	8.48E-07	3.71E-06	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	5.80E-07	2.54E-06	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	2.45E-06	1.08E-05	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	4.69E-06	2.05E-05	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	5.36E-08	2.35E-07	1.30E-02	Below
Vanadium	1314-62-1	2.30E-03	5.13E-06	2.25E-05	3.00E-03	Below
Zinc	7440-66-6	2.90E-02	6.47E-05	2.83E-04	3.33E-01	Below
Subtotal HAPs					4.22E-04	
Total HAPs (tpy)					0.04	

**Notes:**

<sup>a</sup> Fuel heat values from EPA AP-42, Appendix A (EPA website June 2007)

<sup>b</sup> Criteria Pollutants EPA AP-42, Section 1.4, Tables 1.4-1 and 1.4-2

<sup>c</sup> Organic Toxic Air Pollutants EPA AP-42, Section 1.4, Table 1.4-3

<sup>d</sup> Metals from EPA AP-42, Section 1.4, Table 1.4-4

## Treasure Valley Forest Products - Mountain Home

### Rotary Drum Dryer

Single chamber drum dryer with single burner. Direct fired, softwood.

High efficiency cyclone attached to the end of the drum dryer. Natural gas exhaust stream is vented through cyclone by fan system.

Drum dryer information provided by MEC -attached with reference information.

#### Assumptions:

Hours of operation	2080 hrs/yr maximum operation
Rate heat input	35 MMBtu/hr
Throughput	12 Oven dried tons per hour
Flow rate	12,000 cfm
Cyclone efficiency	90 %
Natural Gas <sup>a</sup>	1050 Btu/scf

#### Potential to Emit Calculations

##### Criteria Pollutants<sup>b</sup>:

Pollutant	EF	EF	Emissions	
	(lb/ODT)	(lb/10 <sup>9</sup> scf)	(lb/hr)	(tpy)
NO <sub>x</sub>	0.17		2.04	2.12
CO	0.26		3.12	3.24
SO <sub>2</sub> <sup>c</sup>		0.6	0.02	0.02
VOC	0.96		11.52	11.98
PM <sub>10</sub> <sup>d</sup>	0.54		0.65	0.67

#### Idaho Toxic Air Pollutants:

##### Organics<sup>e</sup>

Pollutant	CAS No.	Natural Gas EF (lb/ODT)	Emissions		IDAPA 58.01.01.585/58 6 (lb/hr)	Comparison
			(lb/hr)	(tpy)		
Formaldehyde	50-00-0	8.60E-03	2.87E-04	2.98E-04	5.10E-04	Below
Methanol	67-56-1	7.30E-02	2.43E-03	2.53E-03	1.73E+01	Below
Total HAPS (tpy)			0.003			

#### Notes:

<sup>a</sup> Fuel heat values from EPA AP-42, Appendix A (EPA website June 2007)

<sup>b</sup> Criteria Pollutants, 2004 NCASI, Chapter 3 - Wood Drying, Tables 3.3.1.1-1, 3.3.1.1-2, and 3.3.1.1-3.

<sup>c</sup> Criteria Pollutants EPA AP-42, Section 1.4 - Natural Gas Combustion, Table 1.4-1

<sup>d</sup> Criteria Pollutants EPA AP-42, Section 10.6.2- Particleboard Manuf., Tables 10.6.2-1. Assume PM is equal to PM10.

Emission factor includes condensibles.

<sup>e</sup> Organic Toxic Air Pollutants EPA AP-42, Section 10.6.2-Particleboard Manuf., Table 10.6.2-3

## Treasure Valley Forest Products - Lodge Logs

### Pellet Mill Hopper

Unloading residual wood products into hopper based on the predictive emissions equation, AP-42, Section 13.2.4.3.

Throughput limit of 10 ton/hr.

Maximum hourly production rate:  $10 \frac{\text{ton bone-dry wood}}{\text{hr}}$

Maximum annual production rate:  $20,800 \frac{\text{ton bone-dry wood}}{\text{yr}}$

### AP-42 Section 13.2.4 (Aggregate Handling and Storage Piles)

Wind Speed	5.0	mph
Material moisture content	35.0	%
PM Particle size multiplier	0.74	
PM =	0.002	lb/ton bone-dry wood
PM10 Particle size multiplier	0.35	
PM10 =	0.001	lb/ton bone-dry wood

### Potential Emissions

Pellet Mill Hopper	lb/hr	tpy
PM	0.016	0.016
PM10	0.008	0.008

### Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$10 \text{ ton bone-dry wood} \times \frac{0.002 \text{ lb PM}}{\text{ton bone-dry wood}} = 0.016 \text{ lb/hr PM}$$

Maximum Annual PM emissions:

$$20,800 \text{ ton bone-dry wood} \times \frac{0.002 \text{ lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.016 \text{ tpy PM}$$

Maximum Hourly PM10 emissions:

$$10 \text{ ton bone-dry wood} \times \frac{0.001 \text{ lb PM10}}{\text{ton bone-dry wood}} = 0.008 \text{ lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$20,800 \text{ ton bone-dry wood} \times \frac{0.001 \text{ lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.008 \text{ tpy PM10}$$

## Treasure Valley Forest Products - Lodge Logs

### Pellet Mill Cyclone

Wood shavings and other wood residues are drawn through a cyclone and sent to the pelletizer.  
One-8 hr shift, 5 days/wk, 52 weeks/yr

Maximum hourly production rate: 12 ton bone-dry wood  
hr

Maximum annual production rate: 24,960 ton bone-dry wood  
yr

#### Assumptions:

Idaho DEQ Emission Factor Guide for Wood Industry (1/1997), High eff. cyclone mill mix

PM = 0.015 grains/scf air

PM10 = 0.011 grains/scf air

#### Potential Emissions

Pellet Mill Cyclone	lb/hr	tpy
PM	1.52	1.58
PM10	1.11	1.15

#### Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$\frac{(11812 \text{ scf/min})}{7,000} \frac{(0.015 \text{ grains/scf}) (60 \text{ min/hr})}{\text{grains/lb}} = 1.52 \text{ lb/hr PM}$$

Maximum Annual PM emissions:

$$\frac{(1.52 \text{ lb/hr}) (2080 \text{ hr/yr})}{2000 \text{ lb/ton}} = 1.58 \text{ tpy PM}$$

Maximum Hourly PM<sub>10</sub> emissions:

$$\frac{(11812 \text{ scf/min})}{7,000} \frac{(0.011 \text{ grains/scf}) (60 \text{ min/hr})}{\text{grains/lb}} = 1.11 \text{ lb/hr PM}_{10}$$

Maximum Annual PM<sub>10</sub> emissions:

$$\frac{(1.11 \text{ lb/hr}) (2080 \text{ hr/yr})}{2000 \text{ lb/ton}} = 1.15 \text{ tpy PM}_{10}$$

## Treasure Valley Forest Products - Lodge Logs

### Wood Chipper

Planer wood shavings transferred into wood chipper.

Maximum hourly production rate: 2,577  $\frac{\text{lb}}{\text{hr}}$  See Planer Mill Baghouse assumptions

Maximum annual production rate: 2,393  $\frac{\text{ton}}{\text{yr}}$  See Planer Mill Baghouse assumptions

### Assumptions:

Idaho DEQ Emission Factor Guide for Wood Industry (1/1997), Log Debarking

PM = 0.024 lb/ton  
PM10 = 0.011 lb/ton

### Potential Emissions

Wood Chipper	lb/hr	tpy
PM	0.03	0.03
PM10	0.01	0.01

### Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$2,577 \frac{\text{lb bone-dry wood}}{\text{hr}} \times 0.024 \frac{\text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.03 \text{ lb/hr PM}$$

Maximum Annual PM emissions:

$$2,393 \frac{\text{ton bone-dry wood}}{\text{yr}} \times 0.024 \frac{\text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.03 \text{ tpy PM}$$

Maximum Hourly PM10 emissions:

$$2,577 \frac{\text{lb bone-dry wood}}{\text{hr}} \times 0.011 \frac{\text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.01 \text{ lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$2,393 \frac{\text{ton bone-dry wood}}{\text{yr}} \times 0.011 \frac{\text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.01 \text{ tpy PM10}$$

## Treasure Valley Forest Products - Lodge Logs

### Chipper Screen

Planer wood shavings from chipper are filtered through a chipper screen.

Maximum hourly production rate: 2,577  $\frac{\text{lb}}{\text{hr}}$

See Planer Mill Baghouse assumptions

Maximum annual production rate: 2,393  $\frac{\text{ton}}{\text{yr}}$

See Planer Mill Baghouse assumptions

### Assumptions:

Transfer point emissions based on material transfer factor, AP-42 Section 13.2.4

AP-42 Section 13.2.4 (Aggregate Handling and Storage Piles)

Wind Speed	5.0	mph
Material moisture content	35.0	%
PM Particle size multiplier	0.74	
PM =	0.002	lb/ton bone-dry wood
PM10 Particle size multiplier	0.35	
PM10 =	0.001	lb/ton bone-dry wood

### Potential Emissions

Chipper Screen	lb/hr	tpy
PM	0.002	0.002
PM10	0.001	0.001

### Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$2,577 \frac{\text{lb bone-dry wood}}{\text{hr}} \times 0.002 \frac{\text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.002 \text{ lb/hr PM}$$

Maximum Annual PM emissions:

$$2,393 \frac{\text{ton bone-dry wood}}{\text{yr}} \times 0.002 \frac{\text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.002 \text{ tpy PM}$$

Maximum Hourly PM10 emissions:

$$2,577 \frac{\text{lb bone-dry wood}}{\text{hr}} \times 0.001 \frac{\text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.001 \text{ lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$2,393 \frac{\text{ton bone-dry wood}}{\text{yr}} \times 0.001 \frac{\text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 0.001 \text{ tpy PM10}$$

Treasure Valley Forest Products - Mountain Home  
Planer Mill Baghouse

Planer Mill wood shavings are conveyed inside building and into a wood chipper outside of building. Wood chipper → screen → cyclone → baghouse. Wood shavings screened through the cyclone are conveyed to Pellet Mill pelletizer inside building. Fines are collected in Planer Mill Baghouse and exhaust to atmosphere. Assume 1-8hr shifts per day, 5 days per week, 52 weeks per year. Request permit limit of 60,000 Bd-ft per day.

Maximum hourly production rate:  $7,000 \frac{\text{BF}}{\text{hr}}$

Maximum annual production rate:  $13,000,000 \frac{\text{BF}}{\text{yr}}$

Assumptions:

Idaho DEQ Emission Factor Guide for Wood Industry (1/1997), Sanderdust (w/baghouse)

PM = 0.04 lb/ton dry wood

PM10 = 0.04 lb/ton dry wood

Emission Calculations:

Assume volume per board 5.3 BF

Surface area of each planed side

Top	96 in x 3.5 in	336 in <sup>2</sup>
Bottom	96 in x 3.5 in	336 in <sup>2</sup>
Right	96 in x 1.5 in	144 in <sup>2</sup>
Left	96 in x 1.5 in	144 in <sup>2</sup>
Total		960 in <sup>2</sup> per board

Total 181.1 in<sup>2</sup> per board foot

Approximately 1/8 inch is planed off of four sides. The total volume of shavings generated per BF is:  
Typically 1/32 inch is planed off however to be more conservative, 1/8 inch was used.

Vol per board = 120 in<sup>3</sup>/board

Vol per BF = 22.64 in<sup>3</sup>/BF = 0.0131 ft<sup>3</sup>/BF

Assume the density of the lumber shavings is 28.1 lb/ft<sup>3</sup>. The mass of the shavings per board foot is:

0.013 ft<sup>3</sup>/BF (28.1 lb/ft<sup>3</sup>) 0.37 lb shaving/BF

Mass of shavings routed to the wood chipper → screen → cyclone → baghouse:

$\frac{0.37 \text{ lb}}{\text{BF}} \times 7,000 \frac{\text{BF}}{\text{hr}} = 2,577.3 \frac{\text{lb}}{\text{hr}}$

$\frac{0.37 \text{ lb}}{\text{BF}} \times 13,000,000 \frac{\text{BF}}{\text{yr}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 2,393.2 \frac{\text{ton}}{\text{yr}}$

Potential Emissions

Planer Mill Baghouse	lb/hr	tpy
PM	0.05	0.05
PM10	0.05	0.05

Process Weight Calculations - Based on the amount of boards going into the planer:

Assume the typical product planed on planer is 5.3 board feet. The volume of a product can be found by multiplying the length by the cross sectional area. Therefore, the volume of the boards being sent to the planer:

96 inches x 3.5 inches x 1.5 x [1 ft<sup>3</sup>/1728 inches<sup>3</sup>] =  $0.29 \frac{\text{ft}^3}{\text{board}} = 0.055 \frac{\text{ft}^3}{\text{BF}}$

Dry weight for doug fir should be 2 #s per bf

0.055 ft<sup>3</sup>/BF (27 lb/ft<sup>3</sup>) 1.32 lb/BF

Mass of wood entering the planer:

$1.32 \frac{\text{lb}}{\text{BF}} \times 7,000 \frac{\text{BF}}{\text{hr}} = 9,245 \frac{\text{lb}}{\text{hr}}$

$1.32 \frac{\text{lb}}{\text{BF}} \times 13,000,000 \frac{\text{BF}}{\text{yr}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} = 8,585 \frac{\text{tons}}{\text{yr}}$

## Treasure Valley Forest Products - Mountain Home

Lumber Kiln Heaters No. 1

Supply heat to Lumber Kiln No. 1

### Assumptions:

Hours of operation 8760 hrs/yr maximum operation  
 Rate heat input 0.29 MMBtu/hr (2 room heaters each rated at 0.145 MMBtu/hr)  
 Fuel:  
 Natural Gas\* 1050 Btu/scf

### Potential to Emit Calculations

#### Criteria Pollutants<sup>b</sup>:

Pollutant	EF (lb/10 <sup>6</sup> scf)	Emissions	
		(lb/hr)	(tpy)
NOx	100	0.03	0.12
CO	84	0.02	0.10
SO2	0.6	0.0002	0.001
VOC	5.5	0.002	0.01
PM10	7.0	0.002	0.01
PM	7.6	0.002	0.01
Lead	0.0005	1.38E-07	6.05E-07

#### Idaho Toxic Air Pollutants:

##### Organics<sup>c</sup>

Pollutant	CAS No.	Natural Gas EF (lb/10 <sup>6</sup> scf)	Emissions		IDAPA 58.01.01.5 85/586 (lb/hr)	Comparison
			(lb/hr)	(tpy)		
3-Methylchloranthrene	56-49-5	1.80E-06	4.97E-10	2.18E-09	2.50E-06	Below
Benzene	71-43-2	2.10E-03	5.80E-07	2.54E-06	8.00E-04	Below
Benzo(a)pyrene	50-32-8	1.20E-06	3.31E-10	1.45E-09	2.00E-06	Below
Formaldehyde	50-00-0	7.50E-02	2.07E-05	9.07E-05	5.10E-04	Below
Hexane	110-54-3	1.80E+00	4.97E-04	2.18E-03	1.20E+01	Below
Naphthalene	91-20-3	6.10E-04	1.68E-07	7.38E-07	3.33E+00	Below
Penlane	109-69-0	2.60E+00	7.18E-04	3.15E-03	1.18E+02	Below
Toluene	108-88-3	3.40E-03	9.39E-07	4.11E-06	2.50E+01	Below
Benzo(a)anthracene		1.80E-06	4.97E-10	2.18E-09		
Benzo(a)pyrene		1.20E-06	3.31E-10	1.45E-09	2.00E-06	Below
Benzo(b)fluoranthene		1.80E-06	4.97E-10	2.18E-09		
Benzo(k)fluoranthene		1.80E-06	4.97E-10	2.18E-09		
Chrysene		1.80E-06	4.97E-10	2.18E-09		
Dibenzo(a,h)anthracene		1.20E-06	3.31E-10	1.45E-09		
Indeno(1,2,3-cd)pyrene		1.80E-06	4.97E-10	2.18E-09		
Total IDAPA POM			3.15E-09	4.97E-09	2.00E-06	Below
Subtotal HAPs (tpy)				5.42E-03		

##### Metals<sup>d</sup>

Pollutant	CAS No.	Natural Gas EF (lb/10 <sup>6</sup> scf)	Emissions		IDAPA 58.01.01.5 85/586 (lb/hr)	Comparison
			(lb/hr)	(tpy)		
Arsenic	7440-38-2	2.00E-04	5.52E-08	2.42E-07	1.50E-06	Below
Barium	7440-39-3	4.40E-03	1.22E-06	5.32E-06	3.30E-02	Below
Beryllium	7440-41-7	1.20E-05	3.31E-09	1.45E-08	2.80E-05	Below
Cadmium	7440-43-9	1.10E-03	3.04E-07	1.33E-06	3.70E-06	Below
Chromium	7440-47-3	1.40E-03	3.87E-07	1.69E-06	3.30E-02	Below
Cobalt	7440-48-4	8.40E-05	2.32E-08	1.02E-07	3.30E-03	Below
Copper	7440-50-8	8.50E-04	2.35E-07	1.03E-06	1.30E-02	Below
Manganese	7439-96-5	3.80E-04	1.05E-07	4.60E-07	6.70E-02	Below
Mercury	7439-97-6	2.60E-04	7.18E-08	3.15E-07	1.00E-03	Below
Molybdenum	7439-98-7	1.10E-03	3.04E-07	1.33E-06	3.33E-01	Below
Nickel	7440-02-0	2.10E-03	5.80E-07	2.54E-06	2.75E-05	Below
Selenium	7782-49-2	2.40E-05	6.63E-09	2.90E-08	1.30E-02	Below
Vanadium	1314-62-1	2.30E-03	6.35E-07	2.78E-06	3.00E-03	Below
Zinc	7440-66-6	2.90E-02	8.01E-06	3.51E-05	3.33E-01	Below
Subtotal HAPs				5.23E-05		
Total HAPs (tpy)				0.005		

#### Notes:

<sup>a</sup> Fuel heat values from EPA AP-42, Appendix A (EPA website June 2007)

<sup>b</sup> Criteria Pollutants EPA AP-42, Section 1.4, Tables 1.4-1 and 1.4-2

<sup>c</sup> Organic Toxic Air Pollutants EPA AP-42, Section 1.4, Table 1.4-3

<sup>d</sup> Metals from EPA AP-42, Section 1.4, Table 1.4-4

## Treasure Valley Forest Products - Lodge Logs

### Shavings Bin

Unloading from three-sided bin with capacity of 200 cubic yards. The bin will be filled approximately once per week of operation (not continuously).

Wood chip density is approximately 35%.

Bulk density of wood is equal to the density of dry wood (2.056 lb/bd-ft) divided by the moisture content of the wood.

Bulk density:  $\frac{80}{8}$   $\frac{\text{ton bone-dry wood}}{\text{hr}}$

Maximum hourly production rate:  $\frac{80}{8}$   $\frac{\text{ton bone-dry wood}}{\text{hr}}$

Maximum annual production rate:  $20,800$   $\frac{\text{ton bone-dry wood}}{\text{yr}}$

### AP-42 Section 13.2.4 (Aggregate Handling and Storage Piles)

Wind Speed	5.0	mph
Material moisture content	35.0	%
PM Particle size multiplier	0.74	
PM =	0.002	lb/ton bone-dry wood
PM10 Particle size multiplier	0.35	
PM10 =	0.001	lb/ton bone-dry wood

Division of Environmental Protection, Office of Air Quality for West Virginia, Reference Document for General Permit Number G10-B, for the construction, modification, relocation, operation, and prevention and control of air pollution from the operation of coal preparation plants and coal handling operations

Control Factor = 50% Based on partial enclosure

### Potential Emissions

Shavings Bin	lb/hr	tpy
PM	0.008	0.008
PM10	0.004	0.004

### Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$\frac{80}{8} \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.002 \text{ lb PM}}{\text{ton bone-dry wood}} \times 50\% = 0.0079 \text{ lb/hr PM}$$

Maximum Annual PM emissions:

$$20,800 \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.002 \text{ lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} \times 50\% = 0.0082 \text{ tpy PM}$$

Maximum Hourly PM10 emissions:

$$\frac{80}{8} \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.001 \text{ lb PM10}}{\text{ton bone-dry wood}} \times 50\% = 0.0038 \text{ lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$20,800 \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.001 \text{ lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} \times 50\% = 0.0039 \text{ tpy PM10}$$

## Treasure Valley Forest Products - Lodge Logs

### Sawdust Bin

Unloading from three-sided bin with capacity of 200 cubic yards. The bin will be filled approximately once per week of operation (not continuous).

Wood chip density is approximately 35%.

Bulk density of wood is equal to the density of dry wood (2.056 lb/bd-ft) divided by the moisture content of the wood.

Bulk density:  $38 \text{ lb/cf}$

Maximum hourly production rate:  $\frac{80}{8} \frac{\text{ton bone-dry wood}}{\text{hr}}$

Maximum annual production rate:  $20,800 \frac{\text{ton bone-dry wood}}{\text{yr}}$

### AP-42 Section 13.2.4 (Aggregate Handling and Storage Piles)

Wind Speed	5.0	mph
Material moisture content	35.0	%
PM Particle size multiplier	0.74	
PM =	0.002	lb/ton bone-dry wood
PM10 Particle size multiplier	0.35	
PM10 =	0.001	lb/ton bone-dry wood

Division of Environmental Protection, Office of Air Quality for West Virginia, Reference Document for General Permit Number G10-B, for the construction, modification, relocation, operation, and prevention and control of air pollution from the operation of coal preparation plants and coal handling operations

Control Factor =  $50\%$  Based on partial enclosure

### Potential Emissions

Sawdust Bin	lb/hr	tpy
PM	0.008	0.008
PM10	0.004	0.004

### Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$\frac{80}{8} \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.002 \text{ lb PM}}{\text{ton bone-dry wood}} \times 50\% = 0.008 \text{ lb/hr PM}$$

Maximum Annual PM emissions:

$$20,800 \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.002 \text{ lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} \times 50\% = 0.008 \text{ tpy PM}$$

Maximum Hourly PM10 emissions:

$$\frac{80}{8} \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.001 \text{ lb PM10}}{\text{ton bone-dry wood}} \times 50\% = 0.004 \text{ lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$20,800 \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.001 \text{ lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} \times 50\% = 0.004 \text{ tpy PM10}$$

**Treasure Valley Forest Products - Mountain Home**

<b>Compliance with IDAPA Rule 701 PM Standard for Process Weight</b>			
Unit	Planer Mill Baghouse	Pellet Mill Cyclone	Pellet Mill Hopper
Process Weight (lb/hr)	9,245	24,000	20,000
PM Emission Rate (lb/hr)	0.05	1.52	0.016
<b>Compliance with Allowable Emission Calculation</b>			
Calculated Allowable Emissions (E) (lb/hr) <sup>1</sup>	10.78	13.69	13.08
Compliance w/ PM Loading Standard	Yes	Yes	Yes

**General Restrictions - New Equipment:**

If PW is less than 9,250 pounds per hour  
 $E = 0.045(PW)^{0.8}$

If PW is greater than 9,250 pounds per hour  
 $E = 1.10(PW)^{0.25}$

**Treasure Valley Forest Products - Mountain Home  
PM Standard Calculations**

**Compliance with IDAPA Rule 676 PM Standard for Fuel Burning  
Equipment**

Unit	Rotary Drum Dryer
Fuel	Natural Gas
Rated Heat Input (MM Btu/hr)	35
PM Emission Rate (lb/hr)	0.65
<b>Exit/Flue Gas Flowrate Calculation</b>	
$F_d$ (Table 19-2, EPA Method 19) (dscf/MM Btu) <sup>1,2</sup>	8,710
Exit flowrate @ 0% O <sub>2</sub> : (dscfm)	5,081
<b>Exit flow rate corrected: = ACFM(Std T(°R)/Stack T(°R))(Stack P (inHg)/Std P(inHg))</b>	
Exit flowrate corrected: (dscfm) <sup>4</sup>	5,464
Exit flowrate corrected to 3% O <sub>2</sub>	6,379
Calculated Grain Loading (gr/dscf @ 3% O <sub>2</sub> ) <sup>4</sup>	0.012
PM Loading Standard (IDAPA 58.01.01.676) (gr/dscf @ 3% O <sub>2</sub> )	0.015
Compliance w/ PM Loading Standard	<b>Yes</b>

<sup>1</sup> Appendix A-7 to 40 CFR part 60, Method 19—Determination of sulfur dioxide removal efficiency and particulate, sulfur dioxide and nitrogen oxides emission rates, Table 19-2 (F Factors for Various Fuels)

<sup>2</sup>  $F_d$ , Volumes of combustion components per unit of heat content (scf/million Btu).  $F_d$  for natural gas is 8,710 scf/million Btu.

<sup>3</sup> (Flow<sub>8%</sub>) = (Flow<sub>0%</sub>) x (20.9/(20.9 - 3)), where 20.9 = Oxygen concentration in ambient air

<sup>4</sup> (Flow (dscfm) x (7,000 gr/lb) x (PM lb/hr) x (60 min/ hr) = gr/dscf

## **Appendix C – Modeling Review**

## **MEMORANDUM**

**DATE:** October 12, 2007

**TO:** Jonathan Petit, Permit Writer, Air Program

**FROM:** Darrin Mehr, Air Quality Analyst, Air Program

**PROJECT NUMBER:** P-2007.0165

**SUBJECT:** Modeling Demonstration for Treasure Valley Forest Products, Facility-wide 15-Day Pre-Permit to Construct for their facility in Mountain Home, Idaho.

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### **1.0 Summary**

Treasure Valley Forest Products (TVFP) submitted an application for a 15-Day Pre-Permit to Construct on August 2, 2007. A revised modeling demonstration to correct exhaust parameters for the pellet mill cyclone and the rotary drum dryer cyclone was received on August 28, 2007. The ambient impact analyses were revised by TVFP based on the new data and the impact results presented in this submittal replace the original application's ambient impact predictions. Emission rates were not changed in the August 28, 2007 submittal.

The facility produces kiln-dried dimensional lumber using lumber drying kilns to dry rough-cut lumber received from off-site, which is then finished in a planer mill. The drying kilns are also used to dry logs for log home construction. The logs are received in a green debarked state from the company's Yamhill facility in Boise. Woodwaste byproduct is processed into wood fuel pellets in the pellet mill. Woodwaste generated on-site at the Mountain Home facility and woodwaste from the Yamhill Boise facility provide the raw material for the pellet mill. The pellet mill will consist primarily of a hammermill for material sizing, a rotary drum dryer, a pelletizer, and a pellet cooler.

IDAPA 58.01.01.203.02 requires the facility to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS). IDAPA 58.01.01.210 requires the facility to demonstrate compliance with the toxic air pollutants (TAPs) increments, which are listed in IDAPA 58.01.01.585 and 586. This facility was constructed in 2005 without having first received a PTC. Emissions units are subject to NAAQS and pre-construction TAPs compliance requirements.

CH2M HILL Consultants performed the ambient air dispersion modeling demonstration for this project on behalf of TVFP. 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. DEQ did not re-run the modeling files for this project. Table 1 presents key assumptions and results that should be considered in the development of the permit.

<b>Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES</b>	
<b>Criteria/Assumption/Result</b>	<b>Explanation/Consideration</b>
<p>Cadmium and formaldehyde impacts exceed the allowable increments as presented in the modeling demonstration.</p> <p>If the T-RACT submittals for these pollutants are approved by the Stationary Source Programs Office, a risk factor of 1 :100,000 is applied to the TAP allowable increment instead of the 1 :1,000,000 risk ambient concentration value listed in IDAPA 58.01.01.586.</p> <p>The T-RACT increments for these pollutants are :</p> <ul style="list-style-type: none"> <li>• Cadmium : 0.0056 µg/m<sup>3</sup>, annual average, and,</li> <li>• Formaldehyde : 0.77 µg/m<sup>3</sup>, annual average.</li> </ul> <p>The corresponding T-RACT ambient design concentrations from TVFP's modeling analyses are :</p> <ul style="list-style-type: none"> <li>• Cadmium : 0.0006 µg/m<sup>3</sup>, annual average, and,</li> <li>• Formaldehyde : 0.48 µg/m<sup>3</sup>, annual average.</li> </ul>	<p>Per IDAPA 58.01.01.210.12.d, "<i>The Department shall include emission limits and other permit terms for the toxic air pollutant in the permit to construct that assure that the facility will be operated in the manner described in the preconstruction compliance demonstration.</i>"</p> <p>The annual emission rates used in the modeling analyses are:</p> <ul style="list-style-type: none"> <li>• Cadmium : 6.96E-06 tons per year, and,</li> <li>• Formaldehyde : 2.62E-03 tons per year.</li> </ul> <p>Annual TAPs emissions were estimated using the modeled hourly emission rate multiplied by 8,760 hours per year and dividing by a factor of 2000 to convert from pounds per year to tons per year.</p>
<p>Ambient impacts for PM<sub>10</sub> are at 88% of the 24-hour PM<sub>10</sub> NAAQS.</p> <p>Permit emission limits for PM<sub>10</sub> for the 24-hour averaging period and corresponding operating requirements should be considered to verify that the facility will be operated as presented in the permit application.</p> <p>Ambient impacts for the annual PM<sub>10</sub> standard are within 65% of the annual PM<sub>10</sub> NAAQS. There is no recommendation for annual PM<sub>10</sub> emission limits at this level of impact.</p>	<p>The planer mill emissions are controlled by a baghouse. Generally, woodwaste material transfer equipment is considered process equipment. However, efficient operation of the baghouse is necessary to maintain control of PM<sub>10</sub> emissions from this source. A permit requirement for an Operations and Maintenance manual and work practices is recommended for this emissions point.</p> <p>The lumber drying kilns are a source of PM<sub>10</sub> emissions. The kilns are being permitted below their unrestricted rated capacity at a permittee-requested level of 10.4 million board feet per year (MMBF/yr) and 40,000 board feet per day. Operation of the kilns at the requested hourly production rate of 5,000 board feet per hour and the requested facility operating schedule of 2,080 hours per year provides the 10.4 MMBF/yr annual kiln production rate.</p>
<p>The design concentration for NO<sub>2</sub> is at 90% of the annual NO<sub>2</sub> NAAQS. Permit emission limits for NO<sub>2</sub> and corresponding operating requirements should be considered at this ambient impact level to verify that the facility will be operated as presented in the permit application.</p> <p>The modeling demonstration submitted by the permittee does not take into account a 75% conversion factor of NO<sub>x</sub> to NO<sub>2</sub>, as allowed by EPA guidance. If the 75% conversion factor is applied to the design concentration the modeled concentration plus the background concentration results in an overall ambient impact of 75.2 µg/m<sup>3</sup>, annual average. No specific NO<sub>2</sub> emission limits and operating requirements are recommended at this level of impact.</p>	<p>The natural gas-fired boilers identified as 250HP Boiler and 70HP Boiler, the Rotary Drum Dryer are combustion sources and are the primary sources of NO<sub>x</sub> at this facility.</p> <p>DEQ modeling staff do not recommend any NO<sub>x</sub> emission limitations or operating restrictions associated with NO<sub>x</sub> emissions for this project.</p>

## **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 TVFP facility is located in Elmore County, designated as an attainment or unclassifiable area for sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), lead (Pb), ozone (O<sub>3</sub>), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM<sub>10</sub>).

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.

Pollutant	Averaging Period	Significant Contribution Levels <sup>a</sup> (µg/m <sup>3</sup> ) <sup>b</sup>	Regulatory Limit <sup>c</sup> (µg/m <sup>3</sup> )	Modeled Value Used <sup>d</sup>
PM <sub>10</sub> <sup>e</sup>	Annual	1.0	50 <sup>f</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
	24-hour	5.0	150 <sup>h</sup>	Maximum 6 <sup>th</sup> highest <sup>i</sup>
Carbon monoxide (CO)	8-hour	500	10,000 <sup>j</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
	1-hour	2,000	40,000 <sup>j</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
Sulfur Dioxide (SO <sub>2</sub> )	Annual	1.0	80 <sup>f</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
	24-hour	5	365 <sup>j</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
	3-hour	25	1,300 <sup>j</sup>	Maximum 2 <sup>nd</sup> highest <sup>g</sup>
Nitrogen Dioxide (NO <sub>2</sub> )	Annual	1.0	100 <sup>f</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>
Lead (Pb)	Quarterly	NA	1.5 <sup>h</sup>	Maximum 1 <sup>st</sup> highest <sup>g</sup>

<sup>a</sup> IDAPA 58.01.01.006.90  
<sup>b</sup> Micrograms per cubic meter  
<sup>c</sup> IDAPA 58.01.01.577 for criteria pollutants  
<sup>d</sup> The maximum 1<sup>st</sup> highest modeled value is always used for significant impact analysis  
<sup>e</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers  
<sup>f</sup> Never expected to be exceeded in any calendar year  
<sup>g</sup> Concentration at any modeled receptor  
<sup>h</sup> Never expected to be exceeded more than once in any calendar year  
<sup>i</sup> Concentration at any modeled receptor when using five years of meteorological data  
<sup>j</sup> 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.

This facility was constructed in 2005 without a PTC. The project is for a facility-wide PTC, and the submitted analyses include a facility-wide TAPs compliance demonstration per the requirements of IDAPA 58.01.01.210.

## 2.2 Background Concentrations

Ambient background concentrations were revised for all areas of Idaho by DEQ in March 2003<sup>1</sup>. The background concentrations for this site were based on the default small town/suburban background values. These background values are listed in Table 3.

Table 3. BACKGROUND CONCENTRATIONS		
Pollutant	Averaging Period	Background Concentration ( $\mu\text{g}/\text{m}^3$ ) <sup>a</sup>
PM <sub>10</sub> <sup>b</sup>	24-hour	81
	Annual	27
NO <sub>2</sub> <sup>c</sup>	Annual	32
Pb <sup>d</sup>	Quarterly	0.03
CO <sup>e</sup>	1-hour	10,200
	8-hour	3,400
SO <sub>2</sub> <sup>f</sup>	3-hour	42
	24-hour	26
	Annual	8

<sup>a</sup> Micrograms per cubic meter

<sup>b</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

<sup>c</sup> Nitrogen dioxide

<sup>d</sup> Lead

<sup>e</sup> Carbon monoxide

<sup>f</sup> Sulfur dioxide

## 3.0 Modeling Impact Assessment

### 3.1 Modeling Methodology

Table 4 provides a summary of the modeling parameters used in the submitted 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.

<b>Table 4. MODELING PARAMETERS</b>		
<b>Parameter</b>	<b>Description/ Values</b>	<b>Documentatton/Additional Description</b>
Model	AERMOD	AERMOD, Version 07026
Meteorological data	1988-1992	Boise surface and upper air data with data altered to reflect a minimum mixing height of 50 meters. This met data set contains surface land use coefficients established by DEQ to reflect the area surrounding the Boise airport met data collection site. The surface and upper air data was processed by DEQ in AERMET, and the model-ready data was provided to CH2MHILL. The surface characteristic values were not changed by CH2MHILL.
Land Use (urban or rural)	Rural	Rural dispersion coefficients were used. The modeling report did not contain a discussion on the use of rural dispersion setting. DEQ evaluated the land use for a 3-kilometer radius surrounding the facility. Over 50% of the land was either desert rangeland or agricultural. Therefore, rural land use is appropriate.
Terrain	Considered	Receptor 3-dimensional coordinates were obtained from USGS DEM files and used to establish elevation of ground level receptors. Base elevations of buildings and sources were not re-generated from the DEM files.
Building downwash	Downwash algorithm	Building dimensions obtained from the submitted facility plot plan. BPIP-PRIME and AERMOD, which contains the PRIME algorithm, were used to evaluate downwash effects.
Receptor grid	Grid 1	23 meter spacing along ambient air boundary
	Grid 2	100 meter spacing for a 2,400 meter (X) by 2,500 meter (Y) nested grid centered on the facility
	Grid 3	500 meter spacing for a 11,000 meter (X) by 11,000 meter (Y) nested grid centered on Grid 2

### **3.1.1 Modeling protocol**

A modeling protocol was submitted by CH2MHILL to DEQ on July 2, 2007, on behalf of TVFP, prior to submission of the PTC application. A revised modeling protocol was received on July 12, 2007. The modeling protocol was approved, with comments, by DEQ on July 25, 2007.

Modeling was conducted using methods documented in the modeling protocol and the *State of Idaho Air Quality Modeling Guideline*.

### **3.1.2 Model Selection**

AERMOD was used by TVFP 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 1988 to 1992 was used for the TVFP site in Mountain Home, Idaho. DEQ provided the met data for this project and CH2M Hill used the same site characteristic values for albedo, surface roughness, and Bowen ratio in developing the air pollutant dispersion analyses.

### **3.1.4 Terrain Effects**

The modeling analyses conducted by TVFP considered elevated terrain. AERMAP was used by TVFP to

determine the actual elevation of each receptor 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. Several buildings are proposed to be constructed for this project. The submitted site plan and application's data table were relied upon for location and size information for the buildings.

### **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 by the applicant 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 TVFP facility's property boundary. The entire perimeter of the facility is fenced. The facility will employ adequate methods to ensure members of the public are not allowed access onto the facility property and the property boundary is established as the ambient air boundary according to the methods specified in the *State of Idaho Air Quality Modeling Guideline*.

### **3.1.8 Receptor Network**

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

## **3.2 Emission Rates**

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

- All modeled criteria air pollutant and TAP emissions rates were equal to or greater than the facility's emissions calculated in the PTC application or requested permit allowable emission rates.

The short-term emission rates listed in Table 5 were modeled for 24 hours per day.

<b>Table 5. MODELED CRITERIA POLLUTANT SHORT-TERM EMISSIONS RATES</b>				
<b>Source ID</b>	<b>Description</b>	<b>Emission Rates (lb/hr<sup>a</sup>)</b>		
		<b>PM<sub>10</sub><sup>b</sup></b>	<b>SO<sub>2</sub><sup>c</sup>, 3-hr avg and 24-hr avg</b>	<b>CO<sup>d</sup>, 1-hr avg and 8-hr avg</b>
250HP	250 hp Boiler	0.06	0.0048	0.67
70HP	70 hp Boiler	0.02	0.001	0.19
RD	Rotary Drum Dryer Cyclone	0.65	0.02	3.12
PMB	Planer Mill Baghouse	0.05	NA <sup>e</sup>	NA
PMC	Pellet Mill Cooler Cyclone	1.11	NA	NA
LK1	Lumber Kiln No. 1 Vent No. 1	0.0065	NA	NA
LK2	Lumber Kiln No. 1 Vent No. 2	0.0065	NA	NA
LK3	Lumber Kiln No. 1 Vent No. 3	0.0065	NA	NA
LK4	Lumber Kiln No. 1 Vent No. 4	0.0065	NA	NA
LK5	Lumber Kiln No. 2 Vent No. 1	0.003	NA	NA
LK6	Lumber Kiln No. 2 Vent No. 2	0.003	NA	NA
LK7	Lumber Kiln No. 2 Vent No. 3	0.003	NA	NA
LK8	Lumber Kiln No. 2 Vent No. 4	0.003	NA	NA
LK9	Lumber Kiln No. 2 Vent No. 5	0.003	NA	NA
LK10	Lumber Kiln No. 2 Vent No. 6	0.003	NA	NA
LK11	Lumber Kiln No. 2 Vent No. 7	0.003	NA	NA
LK12	Lumber Kiln No. 2 Vent No. 8	0.003	NA	NA
LK13	Lumber Kiln No. 2 Vent No. 9	0.003	NA	NA
LK14	Lumber Kiln No. 2 Vent No. 10	0.003	NA	NA
PHOP	Planer Mill Hopper	0.0075	NA	NA
CHIP	Wood Chipper	0.014	NA	NA
CHIPSCR	Chipper Screen	0.0013	NA	NA

<sup>a</sup> Pounds per hour

<sup>b</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers, 24-hour averaging period

<sup>c</sup> Sulfur dioxide

<sup>d</sup> Carbon monoxide

<sup>e</sup> NA = not applicable—pollutant not emitted from this source

The criteria air pollutant emission rates listed below in Table 6 were modeled for 8,760 hours per year to determine compliance with the applicable TAP increments.

Table 6. MODELED CRITERIA ANNUAL EMISSIONS RATES				
Source ID	Description	Emission Rates (lb/hr <sup>a</sup> )		
		PM <sub>10</sub> <sup>b</sup>	SO <sub>2</sub> <sup>c</sup>	NO <sub>x</sub> <sup>d</sup>
250HP	250 hp Boiler	0.061	0.0048	0.797
70HP	70 hp Boiler	0.017	0.0013	0.224
RD	Rotary Drum Dryer Cyclone	0.154	0.0048	0.484
PMB	Planer Mill Baghouse	0.011	NA	NA
PMC	Pellet Mill Cooler Cyclone	0.263	NA	NA
LK1	Lumber Kiln No. 1 Vent No. 1	0.0015	NA	NA
LK2	Lumber Kiln No. 1 Vent No. 2	0.0015	NA	NA
LK3	Lumber Kiln No. 1 Vent No. 3	0.0015	NA	NA
LK4	Lumber Kiln No. 1 Vent No. 4	0.0015	NA	NA
LK5	Lumber Kiln No. 2 Vent No. 1	0.0008	NA	NA
LK6	Lumber Kiln No. 2 Vent No. 2	0.0008	NA	NA
LK7	Lumber Kiln No. 2 Vent No. 3	0.0008	NA	NA
LK8	Lumber Kiln No. 2 Vent No. 4	0.0008	NA	NA
LK9	Lumber Kiln No. 2 Vent No. 5	0.0008	NA	NA
LK10	Lumber Kiln No. 2 Vent No. 6	0.0008	NA	NA
LK11	Lumber Kiln No. 2 Vent No. 7	0.0008	NA	NA
LK12	Lumber Kiln No. 2 Vent No. 8	0.0008	NA	NA
LK13	Lumber Kiln No. 2 Vent No. 9	0.0008	NA	NA
LK14	Lumber Kiln No. 2 Vent No. 10	0.0008	NA	NA
PHOP	Planer Mill Hopper	0.0018	0.016	NA
CHIP	Wood Chipper	0.0030	0.03	NA
CHIPSCR	Chipper Screen	0.0003	0.002	NA

<sup>a</sup> Pounds per hour

<sup>b</sup> Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers

<sup>c</sup> Sulfur dioxide

<sup>d</sup> Nitrogen oxides

<sup>e</sup> NA = not applicable—pollutant not emitted from this source

The toxic air pollutant (TAP) emission rates listed below in Table 7 were modeled for 8,760 hours per year to determine compliance with the applicable TAP increments.

Table 7. MODELED TOXIC AIR POLLUTANTS EMISSIONS RATES				
Source ID	Description	Toxic Air Pollutants (carcinogenic)		
		Arsenic (lb/hr <sup>a</sup> )	Cadmium (lb/hr)	Formaldehyde (lb/hr)
250HP	250 hp Boiler	1.59E-06	8.77E-06	5.98E-04
70HP	70 hp Boiler	NA <sup>b</sup>	NA	NA
RD	Rotary Drum Dryer Cyclone	NA	NA	NA
PMB	Planer Mill Baghouse	NA	NA	NA
PMC	Pellet Mill Cooler Cyclone	NA	NA	NA
LK1	Lumber Kiln No. 1 Vent No. 1	NA	NA	8.61E-04
LK2	Lumber Kiln No. 1 Vent No. 2	NA	NA	8.61E-04
LK3	Lumber Kiln No. 1 Vent No. 3	NA	NA	8.61E-04
LK4	Lumber Kiln No. 1 Vent No. 4	NA	NA	8.61E-04
LK5	Lumber Kiln No. 2 Vent No. 1	NA	NA	4.30E-04
LK6	Lumber Kiln No. 2 Vent No. 2	NA	NA	4.30E-04
LK7	Lumber Kiln No. 2 Vent No. 3	NA	NA	4.30E-04
LK8	Lumber Kiln No. 2 Vent No. 4	NA	NA	4.30E-04
LK9	Lumber Kiln No. 2 Vent No. 5	NA	NA	4.30E-04
LK10	Lumber Kiln No. 2 Vent No. 6	NA	NA	4.30E-04
LK11	Lumber Kiln No. 2 Vent No. 7	NA	NA	4.30E-04
LK12	Lumber Kiln No. 2 Vent No. 8	NA	NA	4.30E-04
LK13	Lumber Kiln No. 2 Vent No. 9	NA	NA	4.30E-04
LK14	Lumber Kiln No. 2 Vent No. 10	NA	NA	4.30E-04
PHOP	Planer Mill Hopper	NA	NA	NA
CHIP	Wood Chipper	NA	NA	NA
CHIPSCR	Chipper Screen	NA	NA	NA

<sup>a</sup> Pounds per hour

<sup>b</sup> NA = not applicable—pollutant not emitted from this source

### 3.3 Emission Release Parameters

Table 8 provides emissions release parameters, including stack height, stack diameter, exhaust temperature, and exhaust velocity for point sources. Table 9 lists the volume source emission release parameters. Values used in the analyses appeared reasonable and within expected ranges.

The exhaust release parameters for the rotary drum dryer and the pellet mill cyclone had yet to be determined in the modeling protocol. The exhaust parameters for these emissions points were corrected in the August 28, 2007 modeling demonstration submittal.

Release Point	Description	Stack Height (m) <sup>a</sup>	Modeled Stack Diameter (m)	Stack Gas Flow Temperature (K) <sup>b</sup>	Stack Gas Flow Velocity (m/sec) <sup>c</sup>
250HP	250 hp Boiler	7.32	0.48	449.8	0.0075
70HP	70 hp Boiler	4.88	0.30	449.8	0.0053
RD	Rotary Drum Dryer Cyclone	6.10	0.20	533.2	24.50
PMB	Planer Mill Baghouse	6.10	0.54	298	0.001
PMC	Pellet Mill Cooler Cyclone	8.53	0.58	298	24.1
LK1	Lumber Kiln No. 1 Vent No. 1	7.62	0.58	298	0.001
LK2	Lumber Kiln No. 1 Vent No. 2	7.62	0.58	298	0.001
LK3	Lumber Kiln No. 1 Vent No. 3	7.62	0.58	298	0.001
LK4	Lumber Kiln No. 1 Vent No. 4	7.62	0.58	298	0.001
LK5	Lumber Kiln No. 2 Vent No. 1	7.92	0.58	298	0.001
LK6	Lumber Kiln No. 2 Vent No. 2	7.92	0.58	298	0.001
LK7	Lumber Kiln No. 2 Vent No. 3	7.92	0.58	298	0.001
LK8	Lumber Kiln No. 2 Vent No. 4	7.92	0.58	298	0.001
LK9	Lumber Kiln No. 2 Vent No. 5	7.92	0.58	298	0.001
LK10	Lumber Kiln No. 2 Vent No. 6	7.92	0.58	298	0.001
LK11	Lumber Kiln No. 2 Vent No. 7	7.92	0.58	298	0.001
LK12	Lumber Kiln No. 2 Vent No. 8	7.92	0.58	298	0.001
LK13	Lumber Kiln No. 2 Vent No. 9	7.92	0.58	298	0.001
LK14	Lumber Kiln No. 2 Vent No. 10	7.92	0.58	298	0.001

<sup>a</sup> Meters

<sup>b</sup> Kelvin

<sup>c</sup> Meters per second

<sup>d</sup> Horizontal release point – exhaust plume's vertical momentum minimized

Release Point	Release Point Description	Source Release Height (m) <sup>a</sup>	$\sigma_{y0}$ , Initial Lateral Dimension (m)	$\sigma_{z0}$ , Initial Vertical Dimension (m)
PHOP	Planer Mill Hopper	2.44	0.43	1.13
CHIP	Wood Chipper	5.49	0.43	2.55
CHIPSCR	Chipper Screen	6.1	0.28	2.83

<sup>a</sup> Meters

### 3.4 Results for Ambient Impact Analyses

#### 3.4.1 Full Impact Analyses

A significant contribution analysis was not submitted with this application. TVFP performed a full impact analysis for the permitting project.

The results of the full ambient impact analysis are listed in Table 10.

<b>Pollutant</b>	<b>Averaging Period</b>	<b>Modeled Design Concentration (<math>\mu\text{g}/\text{m}^3</math>)<sup>a</sup></b>	<b>Background Concentration (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Total Ambient Impact (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>NAAQS<sup>b</sup> (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Percent of NAAQS</b>
PM <sub>10</sub> <sup>c</sup>	24-hour	51.3	81	132.3	150	88.2%
	Annual	5.4	27	32.4	50	64.8%
SO <sub>2</sub> <sup>d</sup>	3-hour	2.0	42	44.0	1,300	3.4%
	24-hour	1.1	26	27.1	365	7.4%
	Annual	1.3	8	9.3	80	11.6%
CO <sup>e</sup>	1-hour	499.8	10,200	10,699.8	40,000	26.7%
	8-hour	228.0	3,400	3,628.0	10,000	36.3%
NO <sub>2</sub> <sup>f</sup>	Annual	57.6 <sup>g</sup>	32	89.6 <sup>g</sup>	100	89.6%

<sup>a</sup>Micrograms per cubic meter

<sup>b</sup>National ambient air quality standards

<sup>c</sup>Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

<sup>d</sup>Sulfur dioxide

<sup>e</sup>Carbon monoxide

<sup>f</sup>Nitrogen dioxide

<sup>g</sup>DEQ's evaluation of the NO<sub>2</sub> impacts considers using the submitted NO<sub>2</sub> design concentration multiplied by a factor of 0.75 to account for a 75% conversion of NO<sub>x</sub> to NO<sub>2</sub> from combustion sources per EPA modeling guidance. The total ambient impact of NO<sub>2</sub> is 75.2  $\mu\text{g}/\text{m}^3$ , annual average.

### 3.4.2 Toxic Air Pollutant Impact Analyses

Modeling for three TAPs was required to demonstrate compliance with the TAP increments specified by IDAPA 58.01.01.586. The predicted ambient concentrations at an ambient receptor exceeded the allowable TAP increments for cadmium and formaldehyde.

<b>Carcinogenic TAP</b>	<b>Averaging Period</b>	<b>Maximum Modeled Concentration (<math>\mu\text{g}/\text{m}^3</math>)<sup>a</sup></b>	<b>AACC<sup>b</sup> (<math>\mu\text{g}/\text{m}^3</math>)</b>	<b>Percent of AACC</b>
Arsenic	Annual	0.00011	0.00023	47.8%
Cadmium	Annual	0.0006	0.00056	107%
Formaldehyde	Annual	0.478	0.077	621%

<sup>a</sup> Micrograms per cubic meter

## 4.0 Conclusions

The ambient air impact analysis submitted, in combination with DEQ's verification analyses, 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.