Air Quality Permitting
Statement of Basis

July 22, 2005

Permit to Construct No. P-040123

JD Lumber, Priest River

Facility ID No. 017-00030

Prepared by:

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AIR QUALITY DIVISION

FINAL

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Acronyms, Units, and Chemical Nomenclatures

AFS	AIRS Facility Subsystem
AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
Btu	British thermal unit
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
dscf	dry standard cubic feet
EPA	U.S. Environmental Protection Agency
gr	grain (1 lb = 7,000 grains)
HAPs	Hazardous Air Pollutants
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
JDL	JD Lumber
lb/hr	pound per hour
m	meter, minute
MACT	Maximum Achievable Control Technology
MMBtu	million British thermal units
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_X	nitrogen oxides
NSPS	New Source Performance Standards
PM	particulate matter
PM_{10}	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
Rules	Rules for the Control of Air Pollution in Idaho
scf	standard cubic feet
SIP	State Implementation Plan
SO_2	sulfur dioxide
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

JD Lumber (JDL) is a dimensional lumber sawmill. Logs are debarked, sawn to rough dimensions, dried in kilns, and planed to final dimensions. The kilns are steam heated by a waste wood boiler which utilizes bark, sawdust, hogged fuel, and planer shavings as fuel.

3. FACILITY / AREA CLASSIFICATION

JD Lumber is defined as a synthetic minor facility because without permit limits on the potential to emit, the PM_{10} emissions would exceed 100 tons per year. The AIRS classification is "SM80" because the potential to emit PM_{10} is limited to greater than 80% of the Tier I operating permit major source level.

The facility is located within AQCR 63 and UTM zone 11. The facility is located in Bonner County which is designated as unclassifiable for all criteria pollutants (PM_{10}, CO, NO_x, SO_2, lead, and ozone).

The AIRS information provided in Appendix B defines the classification for each regulated air pollutant at JDL. This required information is entered into the EPA AIRs database.

4. APPLICATION SCOPE

JDL submitted an application to increase the annual kiln throughput limit from 140 million board feet per year to 200 million board feet per year. The application also requested to add pine as an allowable species, and in volumes of up to 20% (40 million board feet per year) of the annual throughput.

In the process of amending the PTC for increased throughput, the following amendments were also incorporated into the permit:

- Periodic emission testing for particulate matter (PM), PM_{10}, and CO was added as a requirement for the boiler.
- Periodic monitoring of boiler steam production was added as a requirement.
- Periodic monitoring of facility visible emissions was added as a requirement.
- The Operation and Maintenance (O&M) provisions for the boiler multiclone and the planer cyclone incorporate routine maintenance and recordkeeping.
- Air dispersion modeling results require the kiln vent exhaust stacks be raised by 15 feet each. There are two stacks on each kiln, both of which have different heights. The lower stack shall be raised to 39 feet and the taller one shall be raised to 47 feet.
- JDL requested that the boiler PM emission limit be 15.91 lb/hr (14.48 lb/hr PM_{10}). However, air dispersion modeling results require that the boiler emission limit be reduced to 12.0 lb/hr for PM_{10} (13.19 lb/hr PM).

4.1 Application Chronology

Previous Chronology

11/24/87	PTC 017-00030 was issued to JD Lumber for the green lumber sawmill.
2/19/03	PTC 017-0030 was issued allowing lumber drying in amounts up to 140 MM bf/yr.

Current Application Chronology

10/8/04	DEQ received permit application to increase throughput to 200 MM bf/yr.
10/13/04	DEQ received permit application fee.
11/4/04	Application is deemed complete.
11/12/04	Public notification period starts.
1/6/05	Draft PTC was sent to JDL.
8/12/05	Final PTC was sent to JDL.

5. PERMIT ANALYSIS

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

5.1 Equipment Listing

Boiler

The boiler was custom built in 2003 in a Wellons-type fuel cell configuration. The steam generation components from a 1973 Cleaver Brooks DL-60 boiler were combined with the combustion chamber from a Riley boiler; both components were sized to 50,000 lb/hr of steam. The unit burns waste wood: bark, wood chips and sawdust. PM emissions are controlled by a Zurn multiclone with a claimed efficiency of 99.9%.

The boiler was permitted at 89.53 MMBtu/hr and stack flow was estimated at a maximum of 23,199 dscfm, but the boiler has never demonstrated that capacity. Although the unit was determined non-NSPS, a maximum heat input test was conducted in November 2003 according to NSPS Subpart Dc – STANDARDS OF PERFORMANCE FOR SMALL INDUSTRIAL-COMMERCIAL-INSTITUTIONAL STEAM GENERATING UNITS. The source reported capacity only as 31,000 lb/hr of steam, with no heat input (MMBtu/hr) results. However, based on test data, the boiler combusted 1.96 T/hr of fuel with a lab analysis of 5400 Btu/lb, for a total of 22.3 MMBtu/hr; the test average stack flow was 7,101 dscfm. See *Emissions Inventory*, Section 5.2 below, for a discussion of rated heat input and emission estimates.

Kilns

The facility utilizes four Carter-Sprague kilns to dry the lumber. Heat is provided by boiler steam. There are no emission controls on the kilns.

Planer Cyclone

The facility uses a cyclone of unknown manufacturer to collect and transfer planer shavings. Shavings generated by the planer are collected by a pneumatic system and are transferred out of the air stream by the cyclone and onto a drag chain.

Miscellaneous

Log debarking, wood waste hogging and material transfer – or the movement of bark, planer chips, sawdust, and hogged fuel – do not have emission controls.

5.2 Emissions Inventory

A detailed emission inventory is included as Appendix A. Potential to Emit (PTE) was reduced to Synthetic Minor levels by limiting lumber production (throughput) to 200 MM bf/yr. There are several significant issues concerning the PTE estimates:

1. Maximum Capacity and PTE
   - JDL verified that the kiln is the limiting process (or bottleneck) for the facility. Therefore, the PTC throughput limit of 200 MM bf/yr results in emission calculations for the timber handling processes (non-kiln and non-boiler activities) which are based on material throughput, and not 8760 hr/yr. Kiln and boiler emissions were calculated at full time operation, or 8760 hr/yr.

2. The exceptionally high PM & PM_{10} uncontrolled emissions are due to:
   - Emission factors which were applied to 89.53 MMBtu/hr for the boiler, instead of the source tested HI, which appears to be approximately 22 to 26 MMBtu/hr.
   - The PTC application claimed 99.9% efficiencies for both the boiler multiclone and the planer cyclone. Using such high efficiency results in a very high uncontrolled emission rate.
   - Instead of actual stack test results (PM emissions = 1.57 lb/hr) for the boiler, JDL chose to use the PM_{10} emission limit of 12.0 lb/hr as dictated by air dispersion modeling conducted by DEQ.

3. Boiler NO_x and CO Potential to Emit and the CO emission limit are based on AP-42 emission factors applied to 89.53 MMBtu/hr heat input for the boiler.

Table 5.1 is a summary of criteria air pollutants. Appendix A contains a detailed emissions inventory including a HAP summary. In accordance with 40 CFR 51.165, PM is not an NSR regulated pollutant for the purposes of SIP applicability; consequently, the AIRS classification is NA for PM. PM_{10} is the used for Tier I (Title V) operating permit applicability. The AIRS classification for SIP and Tier I permitting programs is SM80 for PM_{10}, NO_x, and VOC. The facility is classified as natural minor (B) for PSD applicability.

Table 5.1 JD LUMBER POTENTIAL TO EMIT AND ACTUAL EMISSIONS

Potential to Emit

Process	VOC		PM		PM_{10}		SO_2		NO_X		CO	
	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Kiln	18.39	80.55	8	33	4	19	0.00	0.00	0.00	0.00	0.00	0.00
Planer (cyclone)	0.00	0.00	5,503	13,735	5,008	12,499	0.00	0.00	0.00	0.00	0.00	0.00
By-products	0.00	0.00	3	7	3	6	0.00	0.00	0.00	0.00	0.00	0.00
Boiler	1.52	6.67	13,187	57,758	12,000	52,560	2.24	9.80	19.70	86.27	9.88	43.25
Total	**19.91**	**87.2**	**18,700**	**71,533**	**17,014**	**65,084**	**2.24**	**9.8**	**19.70**	**86.3**	**9.88**	**43.3**

Actual Emissions

Process	VOC		PM		PM_{10}		SO_2		NO_X		CO	
	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)	(lb/hr)	(T/yr)
Kiln	18.39	80.55	7.53	33.00	4.34	19.00	0	0	0	0	0	0
Planer (cyclone)	0	0	5.50	13.74	2.75	6.87	0	0	0	0	0	0
By-products	0	0	2.75	6.86	1.26	3.15	0	0	0	0	0	0
Boiler	1.52	6.67	13.19	57.76	12.00	52.56	2.24	9.80	19.70	86.27	9.88	43.25
Total	**19.91**	**87.2**	**28.97**	**111.4**	**20.35**	**81.6**	**2.24**	**9.8**	**19.70**	**86.3**	**9.88**	**43.3**

5.3 *Modeling*

Modeling review is summarized below in Table 5.2. The complete modeling analysis memo is included as Appendix C.

Table 5.2 FULL IMPACT ANALYSIS RESULTS

Pollutant	Averaging Period	Facility ambient impact ($\mu g/m^3$)	Background concentration ($\mu g/m^3$)	Total ambient concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
PM_{10}	24-hr	70.6[a]	73	143.6	150	95.7
	Annual	13.6	26	39.6	50	79.2

[a] Impact with 12.0 lb/hr emission rate using ISCPRIME

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

Emission increases due to increased throughput require a PTC.

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

The facility has demonstrated preconstruction compliance with toxic standards. All of the toxic pollutants that have emissions rates greater than the applicable screening emission limit were modeled at 8,760 hr/yr at the time of the original PTC for the boiler and kilns. The resulting concentrations were all within the applicable AAC and AACC limit for toxic pollutants.

IDAPA 58.01.01.205 ..... Prevention of Significant Deterioration

This facility is not a designated facility and the emission of any single pollutant is less than 250 T/yr. Therefore, this facility is not subject to PSD requirements.

40 CFR 60 ..... New Source Performance Standards

According to the application, the boiler at this facility was constructed or last modified before the applicable date in 40 CFR 60. Therefore, no NSPS requirements apply to the boiler.

40 CFR 61 and 63 ..... National Emission Standards for Hazardous Air Pollutants and MACT

No NESHAP or MACT standards apply to this facility.

5.5 *Fee Review*

JD Lumber submitted the $1,000 PTC application fee on October 13, 2004.

The facility required engineering review, and the requested throughput increase resulted in increased emissions of 10 to less than 100 T/yr. The resultant PTC processing fee of $5,000 was paid on August 8, 2005.

Table 5.2 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}	0	9	-9
VOC	24.2	0	24.2
TAPS/HAPS	0.0	0	0.0
Total:	**24.2**	**9**	**15.2**
Fee Due	**$ 5,000.00**		

6. PERMIT CONDITIONS

The following permit conditions were revised:

Permit Condition 2.2: Facility Wide Visible Emissions

The permit condition revised the existing permit by requiring monthly facility-wide inspections of potential sources of visible emissions. Any visible emission violation must be reported to the IDEQ regional office within 24 hours.

Permit Condition 3.3: Boiler Emission Limits

The permit condition revised the existing permit emission limit for PM_{10} from 14.48 pounds per hour and 63.4 tons per year to 12.0 pounds per hour and 52.6 tons per year.

Permit Condition 3.6: Boiler Operating Requirements – Multiclone O&M Manual Requirements

The permit condition revised the Operations and Maintenance manual requirements to establish and record dates of routine maintenance along with operating parameter values. Periodic maintenance measures shall be defined in procedure as well as frequency, and the dates of the measures shall be recorded. Operating parameter values shall be defined, and the dates and observed values of the parameters shall be recorded according to the frequency established in the O&M manual. Operating parameter values may include, but are not limited to:

- Ideal volumetric flow rate (acfm) through the multiclone;
- Ideal pressure drop across the multiclone.

Permit Condition 3.7: Boiler Operating Requirements – Steam Production Limit

The permit condition limits steam production to the design capacity of the boiler, or 50,000 lb/hr of steam. Although not NSPS applicable, the facility conducted NSPS Subpart Dc testing in November 2003 and determined the heat capacity of the boiler is around 30,000 to 32,000 lb/hr steam production.

Permit Condition 3.8: Boiler Operating Requirements – Steam Production Measuring Device

The permit condition requires installation of a steam production rate measuring device.

Permit Condition 3.9: Boiler Monitoring and Recordkeeping Requirements – Steam Production

The permit condition revised the previous PTC to include hourly records of boiler steam production.

Permit Condition 3.10: Boiler Monitoring and Recordkeeping Requirements – Performance Test

The condition establishes periodic boiler performance testing for PM, PM_{10}, and CO. The boiler shall be operated at the worst case normal production rate during the performance test. A description of how this requirement was met shall be included in the performance test report.

Permit Condition 4.4: Kiln Operating Requirements – Throughput Limits

The permit condition increases kiln throughput from 140 million board feet of lumber per year to 200 million board feet of lumber per year, with a maximum of 40 million board feet as pine species.

Permit Condition 4.6: Kiln Monitoring and Recordkeeping Requirements – Lumber Production

The permit condition requires total pine species and total lumber production to be monitored and recorded on a monthly and yearly basis.

Note that kiln performance test requirements were removed from the PTC.

Permit Condition 5.5: Planer Cyclone Operating Requirements – Cyclone O&M Manual Requirements

The permit condition revised the Operations and Maintenance manual requirements to establish and record dates of routine maintenance along with operating parameter values. Periodic maintenance measures shall be defined in procedure as well as frequency, and the dates of the measures shall be recorded. Operating parameter values shall be defined, and the dates and observed values of the parameters shall be recorded according to the frequency established in the O&M manual. Operating parameter values may include, but are not limited to:

- Ideal volumetric flow rate (acfm) through the cyclone;

- Ideal pressure drop across the cyclone.

7. PUBLIC COMMENT

A draft permit was provided to JD Lumber for their review on January 3, 2005.

A draft permit was made available for regional office review on December 21, 2004. Comments were received and incorporated.

An opportunity for public comment on the PTC application was provided, in accordance with IDAPA 58.01.01.209.01.c.

8. RECOMMENDATION

Based on review of application materials, and all applicable state and federal rules and regulations, staff recommends that JD Lumber be issued final PTC No. P-040123. The project does not involve PSD requirements.

CM/sd Permit No. P-040123

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Appendix A

Emissions Estimates

P-040123

JD Lumber
Priest River, ID

Estimated Emissions with Federally Enforceable Conditions

Summary

Process	VOC (lb/hr)	VOC (T/yr)	PM (lb/hr)	PM (T/yr)	PM_{10} (lb/hr)	PM_{10} (T/yr)	SO_2 (lb/hr)	SO_2 (T/yr)	NO_x (lb/hr)	NO_x (T/yr)	CO (lb/hr)	CO (T/yr)
Kiln	18.39	80.5	7.53	33.0	4.34	19.0						
Planer (cyclone)			5.50	13.7	2.75	6.9						
By-products			2.75	6.9	1.26	3.1						
Boiler	1.52	6.7	13.19	57.8	12.00	52.6	2.24	9.8	19.70	86.3	9.88	43.3
Total	19.91	87.2	28.97	111.4	20.35	81.6	2.24	9.8	19.70	86.3	9.88	43.3

Note: The cyclone efficiencies (all cyclones) submitted were: 99.90% efficient.

Process	Estimate by	Throughput	Units	VOC E factor	Units	VOC Emissions (lb/hr)	(lb/yr)	(T/yr)	PM E factor	Units	PM Emissions (lb/hr)	(lb/yr)	(T/yr)	PM_{10} E factor	Units	PM_{10} Emissions (lb/hr)	(lb/yr)	(T/yr)
Kiln	JD Lumber	156,000	T/yr	no data														
8760 hr/yr		200,000	Mbf/yr	0.8055	lb C/Mbf	18.39	161,093	80.5						0.190	lb/Mbf	4.34	38,000	19.0
	IDEQ	177,406	T/yr	0.8423	lb C/T dry	17.46	152,971	76.5										
		200,000	Mbf/yr	0.8055	lb C/ Mbf	18.39	161,093	80.5	0.33	lb/Mbf	7.53	66,000	33.0	0.190	lb/Mbf	4.34	38,000	19.0
Planer (cyclone)	JD Lumber	21,400	scfm											0.015	gr/scf	2.75	13,735	6.9
	IDEQ	177,406	T/yr						0.2	lb/T	7.11	35,481	17.7	0.160	lb/T	5.69	28,365	14.2
		21,400	scfm						0.03	gr/scf	5.50	27,470	13.7	0.015	gr/scf	2.75	13,735	6.9
By-products																		
Coarse wd. Res.		29.98	T/hr						1.49E-04	lb/T	0.00	22	0.0	7.06E-05	lb/T	0.00	11	0.0
Sawdust		15.34	T/hr						1.49E-04	lb/T	0.00	11	0.0	7.06E-05	lb/T	0.00	5	0.0
Planer shavings		8.23	T/hr						2.02E-03	lb/T	0.02	83	0.0	9.55E-04	lb/T	0.01	39	0.0
Bark																		
Hog		13.25	T/hr						1.49E-04	lb/T	0.00	10	0.0	7.06E-05	lb/T	0.00	5	0.0
Transfer		13.25	T/hr						2.40E-02	lb/T	0.32	1,587	0.8	1.10E-02	lb/T	0.15	727	0.4
Log debark		100.23	T/hr						2.40E-02	lb/T	2.41	12,008	6.0	1.10E-02	lb/T	1.10	5,504	2.8
Fuel surge bin		9.13	T/hr						1.49E-04	lb/T	0.00	7	0.0	7.06E-05	lb/T	0.00	3	0.0
Boiler		89.53	MMBtu/hr	0.017	lb/MMBtu	1.52	13,333	6.7	13.19	lb/hr	13.19	115,516	57.8	12.00	lb/hr	12.00	105,120	52.6
		8,760	hr/yr															
Totals:								87.2					111.4					81.6

Process	Estimate by	Throughput	Units	SO_2 E factor	Units	SO_2 Emissions (lb/hr)	(lb/yr)	(T/yr)	NO_x E factor	Units	NO_x Emissions (lb/hr)	(lb/yr)	(T/yr)	CO E factor	Units	CO Emissions (lb/hr)	(lb/yr)	(T/yr)
Kiln	JD Lumber																	
Planer (cyclone)																		
By-products																		
Boiler		89.53	MMBtu/hr	0.025	lb/MMBtu	2.24	19,607	9.8	0.22	lb/MMBtu	19.70	172,542	86.3	0.1103	lb/MMBtu	9.88	86,506	43.3
		8,760	hr/yr															
Totals:								9.8					86.3					43.3

Notes:

1. Emissions based on hours of operation use 16 hrs/d, 6 d/wk, & 52 wk/yr, or 4,992 hr/yr.
2. JD Lumber claims that 200,000 bf of lumber is the kiln maximum capacity; therefore, the estimated emissions are equal to the Potential to Emit.

Abbreviations:

Mbf: 1,000 board feet.

By-products

Coarse wd. Res.: Coarse wood residue. Application name is Chip bin material transfer.
Sawdust: Application name is Sawdust bin material transfer.
Planer shavings: Application name is Planer shavings material transfer.

The 60% control efficiency for indoor operations, as used in the application, are not considered in this PTE.

Bark:
Hog: Hog fuel bin transfer; equivalent to bark produced during production.
Transfer: Hog fuel bin transfer; equivalent to bark produced during production.
Log debark: based on total log weight debarked.
Fuel surge bin: is equivalent to dry weight of bark produced during production.

TAP AND HAP BOILER EMISSIONS

Parameters:

8,760 hr/yr operation.
89.53 MMBtu/hr boiler heat input.
2.55E-02 lb/MMBtu is the emission factor threshold for any HAP to surpass 10 T/yr.

Conclusions:

There are no HAPs listed in AP-42 Chapter 1.6: *Wood Residue Combustion in Boilers*, which surpass the emission factor threshold; therefore, none of the HAPs are emitted at 10 T/yr or more. Also, the total of all HAPs is less than 25 T/yr.

Phosphorus, an IDEQ TAP (not a HAP), is the highest emitted specie of those listed in AP-42 Chapter 1.6. The AP-42 emission factor for phosphorus is 3.9E-02 lb/MMBtu.

3.90E-02 lb/MMBtu phosphorus = 3.5 lb/hr = 15.3 T/yr.

HAPS Associated with wood residue combustion

Specie	Emission factor lb/MMBtu	Emissions lb/hr	Emissions T/yr
acetaldehyde	8.3E-04	7.4E-02	3.3E-01
acetophenone	3.2E-09	2.9E-07	1.3E-06
acrolein	4.0E-03	3.6E-01	1.6E+00
benzene	4.2E-03	3.8E-01	1.6E+00
bis(2-ethylhexyl)phthalate	4.7E-08	4.2E-06	1.8E-05
carbon terachloride	4.5E-05	4.0E-03	1.8E-02
chlorobenzene	3.3E-05	3.0E-03	1.3E-02
ethylbenzene	3.1E-05	2.8E-03	1.2E-02
formaldehyde	4.4E-03	3.9E-01	1.7E+00
napthalene	9.7E-05	8.7E-03	3.8E-02
phenol	5.1E-05	4.6E-03	2.0E-02
styrene	1.9E-03	1.7E-01	7.5E-01
2,3,7,8 tetrachlorodibenzo-p-dioxins	8.6E-12	7.7E-10	3.4E-09
toluene	9.2E-04	8.2E-02	3.6E-01
vinyl chloride	1.8E-05	1.6E-03	7.1E-03
0-xylene	2.5E-05	2.2E-03	9.8E-03
TOTALS		**1.5**	**6.5**

Appendix B

AIRS Information

P-040123
JD Lumber
Priest River, ID

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

Facility Name: JD Lumber – P-040123
Facility Location: Priest River
AIRS Number: 017-00030

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	B						B	U
NO_x	B						B	U
CO	B						B	U
PM_{10}	SM					Y	SM	U
PT (Particulate)	SM					Y		U
VOC	B						B	U
THAP (Total HAPs)	B						B	U
			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 C

Air Dispersion Modeling Memo

P-040123
JD Lumber
Priest River, ID

MEMORANDUM

DATE: April 11, 2005

TO: Charlie Mazzone, Air Quality Division

THROUGH: Kevin Schilling, Stationary Source Modeling Coordinator, Air Quality Division

FROM: Dustin Holloway, Modeling Analyst, Air Quality Division DH

PROJECT NUMBER: P-040123

SUBJECT: Modeling Review for the J.D. Lumber, Inc. Facility in Priest River

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1. SUMMARY

Spidell and Associates conducted facility-wide PM_{10} dispersion modeling for J.D. Lumber, Inc. (JD Lumber) in support of a permit to construct (PTC) application for an increase in production limits. The applicant submitted an ISCST3 analysis in support of the PTC application. Upon review DEQ determined that a more refined downwash algorithm should be used to estimate concentrations in the cavity regions of the facility's buildings. The analysis was rerun by DEQ with ISCPRIME. The resulting concentrations with the proposed emission limits did not demonstrate compliance with the applicable national ambient air quality standards (NAAQS) for PM_{10}. JD Lumber agreed to reduce the PM_{10} emission limit on their boiler in order to demonstrate compliance with the applicable NAAQS. The following table summarizes the key assumptions which should be considered when developing the permit.

Table 1.1 KEY ASSUMPTIONS USED IN MODELING ANALYSIS

Assumption	Explanation
The PM_{10} emission limit in the PTC will be reduced to 12 lb/hr.	This is the rate used in DEQ's analysis which demonstrates compliance with the NAAQS for PM_{10}.
The kiln vent exhaust stacks will each be raised by 15 feet.	The applicant used this assumption to demonstrate compliance with the applicable ambient air quality standards

Based on the results of the submitted analysis and DEQ's analysis, DEQ has determined that the modeling analysis: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) appropriately adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed that predicted pollutant concentrations at all receptor locations, when appropriately combined with background concentrations, were below stated air quality standards.

2. BACKGROUND INFORMATION

2.1 Applicable Air Quality Impact Limits

JD Lumber is located near Priest River in Bonner County. The area around Priest River is designated attainment or unclassifiable for all criteria air pollutants. This facility does not significantly impact the Sandpoint PM_{10} nonattainment area. The following table summarizes the applicable air quality standards for this project.

Table 2.1 APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels ($\mu g/m^3$)[a, b]	Regulatory Limit ($\mu g/m^3$)[c]	Modeled Value Used[d]
PM_{10}[e]	Annual	1	50[f]	Maximum 1st highest[g]
	24-hour	5	150[h]	Maximum 6th highest[i] Highest 2nd highest[j]

[a] IDAPA 58.01.01.006.93
[b] Micrograms per cubic meter
[c] IDAPA 58.01.01.577 for criteria pollutants, IDAPA 58.01.01.585 for non-carcinogenic toxic air pollutants IDAPA 58.01.01.586 for carcinogenic toxic air pollutants.
[d] The maximum 1st highest modeled value is always used for significant impact analysis and for all toxic air pollutants.
[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] The highest 2nd high is considered to be conservative for five years of meteorological data.

2.2 *Background Concentrations*

DEQ updated the background concentration data for Idaho in the Spring of 2003[1]. The background PM_{10} concentrations used in this analysis are those for rural/agricultural areas in Idaho. The following table summarizes the background concentrations used in this analysis.

Table 2.2 BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background concentrations ($\mu g/m^3$)[a]
PM_{10}	24-hour	73
	Annual	26

[a] Micrograms per cubic meter

3. ASSESSMENT OF MODELING ANALYSIS

3.1 *Modeling Methodology*

JD Lumber submitted PM_{10} dispersion modeling to demonstrate that the increase in emissions associated with increasing production and processing pine will not cause or contribute to a violation of any ambient air quality standards. PM_{10} is the only pollutant whose emission rate increased as a result of this proposed modification. Therefore, PM_{10} was the only pollutant modeled. The analysis submitted by JD Lumber used the ISCST3 dispersion model to estimate the concentrations from the facility. DEQ reviewed the analysis and determined that a more refined downwash algorithm was necessary to estimate the concentrations in building cavity regions. DEQ ran the model input parameters in ISCPRIME. The resulting concentrations were above the 24-hour PM_{10} standard. Review of the permitted emission limits and performance testing on the boiler showed that the actual emissions from the boiler were much lower than the permit limit of 14.48 lb/hr. JD Lumber agreed to reduce the permitted emission limit to 12.0 lb/hr. DEQ ran ISCPRIME with a 12.0 lb/hr emission rate from the boiler. The resulting concentrations were within the applicable PM_{10} NAAQS. The following table summarizes the modeled parameters and DEQ's review of those parameters.

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

Table 3.1 MODELING PARAMETERS

Parameter	What Facility Submitted	DEQ's Review/Determination
Modeling protocol	None submitted	Although the applicant did not submit a protocol, the submitted analysis combined with DEQ's sensitivity analysis demonstrates compliance with the applicable standards
Model Selection	ISCST3	ISCST3 does not calculate concentrations in the building cavity regions. DEQ ran the analysis with ISCPRIME to account for building cavities.
Meteorological Data	1987-1991 Spokane meteorological data	This is the most representative data available for this area.
Model Options	Regulatory default	This is appropriate for this analysis.
Land Use	Rural	The population density around this facility is less than 750 people per square kilometer.
Terrain	Simple and complex	Receptor elevations were included in the analysis.
Building Downwash	Calculated with the PRIME algorithm	The PRIME algorithm calculates both building wake concentrations and building cavity concentrations.
Receptor Network	25 meter spacing along the fenceline and out to 200 meters; 50 meter spacing out to 700 meters; 100 meter spacing out to 2,000 meters	This receptor network is sufficient for this analysis.
Facility Layout	N/A	The facility layout was compared to facility plot plans submitted by the applicant and determined to be appropriate.

3.2 Emission Rates

The emission rates used in the analysis are shown in the following table.

Table 3.2 EMISSION RATES

Source ID	Source Description	Emission Rate (lb/hr)
BOILER	Boiler	14.48 (12.0)[a]
PLCYC	Planer Cyclone	2.75
KLN1N	Kiln 1 North Vent	0.54
KLN1S	Kiln 1 South Vent	0.54
KLN2N	Kiln 2 North Vent	0.54
KILN2S	Kiln 2 South Vent	0.54
KLN3N	Kiln 3 North Vent	0.54
KLN3S	Kiln 3 South Vent	0.54
KLN4N	Kiln 4 North Vent	0.54
KLN4S	Kiln 4 South Vent	0.54

[a] The emission rate for the boiler was reduced to 12.0 lb/hr to demonstrate compliance with the PM_{10} NAAQS

3.3 Emission Release Parameters

The following table summarizes the stack release parameters used in the model.

Table 3.3 EMISSION RELEASE PARAMETERS

Stack ID	Easting (m)	Northing (m)	Elevation (m)	Stack Height (ft)	Temperature (°F)	Exit Velocity (m/s)	Stack Diameter (ft)
BOILER	505,325.1	5,336,684.6	679.7	60	360	9.7	3
PLCYC	505,315.9	5,336,711.4	679.7	78	70	0.001	2.33
KLN1N	505,354.7	5,336,717.8	679.7	39	150	7.9	2
KLN1S	505,354.7	5,336,676.0	679.7	47	150	7.9	2
KLN2N	505,368.1	5,336,717.8	679.7	39	150	7.9	2
KILN2S	505,368.1	5,336,676.0	679.7	47	150	7.9	2
KLN3N	505,381.5	5,336,717.8	679.7	39	150	7.9	2
KLN3S	505,381.5	5,336,676.0	679.7	47	150	7.9	2
KLN4N	505,394.9	5,336,717.8	679.7	39	150	7.9	2
KLN4S	505,394.9	5,336,676.0	679.7	47	150	7.9	2

3.4 Results

3.4.1 Full Impact Analysis Results

Table 3.4 FULL IMPACT ANALYSIS RESULTS

Pollutant	Averaging Period	Facility Ambient Impact (μg/m³)	Background Concentration (μg/m³)	Total Ambient concentration (μg/m³)	NAAQS (μg/m³)	Percent of NAAQS
PM_{10}	24-hour	70.6[a]	73	143.6	150	95.7%
	Annual	13.6	26	39.6	50	79.2%

[a] Impact with 12.0 lb/hr emission rate using ISCPRIME

The results of the analysis demonstrate, to DEQ's satisfaction that the JD Lumber facility will not cause or contribute to a violation of any ambient air quality standards.