State of Idaho
Department of Environmental Quality
Air Quality Division

AIR QUALITY PERMIT
STATEMENT OF BASIS

Permit to Construct No. P-2008.0150

Final Permit

Filler King Company

Homedale, Idaho

Facility ID No. 073-00008

February 13, 2009

CZ

Carole Zundel

Permit Writer

The purpose of this Statement of Basis is to satisfy the requirements of IDAPA 58.01.01.et seq, Rules for the Control of Air Pollution in Idaho, for issuing air permits.

Table of Contents

Acronyms, Units, and Chemical Nomenclature

AIRS	Aerometric Information Retrieval System
AQCR	Air Quality Control Region
CFR	Code of Federal Regulations
CO	carbon monoxide
DEQ	Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
HAP	Hazardous Air Pollutant
IDAPA	a numbering designation for all administrative rules in Idaho promulgated in accordance with the Idaho Administrative Procedures Act
lb/hr	pounds per hour
MACT	Maximum Achievable Control Technology
$\mu g/m^3$	micrograms per cubic meter
MMBtu/hr	million British thermal units per hour
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO_2	nitrogen dioxide
NO_x	nitrogen oxides
NSPS	New Source Performance Standards
PC	permit condition
PM	particulate matter
PM_{10}	particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
ppm	parts per million
PRF	phenol resorcinol formaldehyde
PSD	Prevention of Significant Deterioration
PTC	permit to construct
PTE	potential to emit
Rules	Rules for the Control of Air Pollution in Idaho
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SO_x	sulfur oxides
T-RACT	toxic air pollutant reasonably available control technology
TAP	Toxic Air Pollutant
T/yr	tons per year
UTM	Universal Transverse Mercator
VOC	volatile organic compound

STATEMENT OF BASIS			
Permittee:	Filler King Company	**Permit No.**	P-2008.0150
Location:	Homedale, Idaho	**Facility ID No.**	073-00008

1. FACILITY INFORMATION

1.1 Facility Description

The Filler King facility manufactures laminated beams and roof decking from purchased softwood lumber. The facility consists of two manufacturing operations, laminated beams and a decking line.

The beam line is comprised of Line 1 and Line 2. In the beam lines, pre-dried, graded western softwood lumber is processed through a finger-joiner. In this process, the lumber ends are cut to a special joint, glued and joined, and cured in a radio frequency drier to form long lengths of lumber. These finger-joined lumber pieces are then used for beam manufacture. In the beam plant, the cured lengths are glued face-to-face with adhesive to form large, structural beams. These beams are then clamped and cured. After curing, the beams are planed, finished, and wrapped for shipment to retail dealers.

In the roof decking line, the lumber is graded, glue is applied face-to-face, and placed in a cold press for curing. The ends are squared and cut with a tongue and groove (end-matched) and the deck boards are then molded. The roof deck members are sanded and wrapped for shipment to a retailer. Supporting equipment and operations for these processes include lumber receiving and storage, glue receiving storage, mixing and transfer, maintenance and administrative buildings, equipment and raw material storage, finished product storage, a small fueling station, and storage of miscellaneous materials such as drums, metal, surplus parts, and other used items. A fire pond is present on the site. The water to supply this pond is pumped from the Snake River with an electric surface water pump. A diesel-powered emergency pump is present to pressurize the fire system in the event of a power outage. This diesel pump operates approximately 10 hours per year for testing or maintenance purposes. The pump would be operated as needed to address an emergency situation, if necessary.

Three shop-constructed wood stoves located in Beam Plant Line 1 and Line 2 areas and the Roof Deck plant provide room heat during cool weather periods.

A retail building materials store is also located on the contiguous property owned by Filler King. The retail operation (Snake River Lumber) is operated by others under a lease agreement to Filler King. The retail operation contains no applicable atmospheric emissions sources.

1.2 Permitting Action and Facility Permitting History

This permit is the initial PTC for this facility.

2. APPLICATION SCOPE AND APPLICATION CHRONOLOGY

2.1 Application Scope

Filler King Company has applied for a PTC for their existing engineered wood products facility.

2.2 Application Chronology

September 16, 2008	DEQ receives PTC application
October 15, 2008	DEQ issues incompleteness letter
October 21, 2008	DEQ receives portion of response to incompleteness
November 18, 2008	DEQ receives portion of response to incompleteness

December 5, 2008	DEQ issues completeness letter
December 30, 2008	DEQ issues facility draft permit
February 2, 2009	DEQ receives additional information
February 13, 2009	DEQ receives permit processing fee

3. TECHNICAL ANALYSIS

3.1 Emission Unit and Control Device

Table 3.1 EMISSION UNIT AND CONTROL DEVICE INFORMATION

Emission Unit /ID No.	Emissions Unit Description	Control Device Description	Emissions Discharge Point ID No. and/or Description
2	Beam plant planer shavings Manufacturer: Buss Planers Model: 60" and 30" Date of construction: 1988 and January 2007	Cyclone Manufacturer: Western Pneumatics Control efficiency: 99% for PM Date of installation: 1988	2
1	Beam plant sander Manufacturer: Model: Date of construction: 1993	Baghouse Manufacturer: Murphy Rogers Control efficiency: 99% for PM_{10} Date of installation: 1993	N/A
3	Deck plant moulder Manufacturer: Madison Model: Madison Moulder Date of construction: 1993	Cyclone Manufacturer: Control efficiency: 99% for PM_{10} Date of installation: 1993	3
N/A	Beam plant bin	Enclosed drop point	N/A
N/A	Deck plant bin	Enclosed drop point	N/A
N/A	Emergency fire pump Manufacturer: Unknown Model: Unknown Rating: 75 brake horsepower Fuel: Diesel Sulfur content: 0.5% Date of construction: 1995 or earlier	None	N/A
N/A	Three building-heat wood stoves Manufacturer: Shop constructed Rating: 0.11 MMBtu/hr Fuel: Wood Construction date: Prior to May 1, 1994.	None	N/A

3.2 Emissions Inventory

The emission sources are as follows:

- Beam plant cyclone
- Beam plant sanderdust baghouse
- Deck plant cyclone
- Beam plant truck loading from bin
- Deck plant truck loading from bin
- Three wood stoves
- Emergency generator

Emissions for particulates from the cyclones and baghouse are based on actual production data from 2006, plus a 40% projected increase in production. The emission factors used for the cyclones and baghouse are from the 1997 Idaho DEQ Emission Factor Guide for Wood Industry. The estimated cyclone and baghouse efficiencies of 99% were not used to estimate emissions, so the efficiency rating was not verified.

For woodstoves, the emission factors are from AP-42 for 1.10-1 for conventional, pre-EPA certified stoves. The stoves are used for space heating. The glues will not cure properly if the ambient temperature is too low. It is estimated that each stove uses 300 lb/day of scrap wood for five months of the year.

Uncontrolled emissions for PM_{10} for cyclones were calculated by assuming 80% control of PM_{10} by the cyclones, so controlled emissions divided by 20%. Uncontrolled PM_{10} emissions from the baghouse were estimated based on 99% control efficiency (divide controlled emissions by 1%). Then the hours of operation were scaled up to 8760 hours per year. The application contains a normal schedule of 8 hours per day, 5 to 6 days per week. This is an average of 5.5 days per week times 8 hours per day, or 44 hours per week. Based on 52 weeks per year, this is 2,288 hours per year operation. Uncontrolled emissions were estimated by multiplying the annual uncontrolled estimate by 8760/2288.

Example:

Beam plant cyclone: 0.39 lb/hr / 0.2 x 8760 / 2288 = 7.47 tons per year

Uncontrolled emissions from the wood stoves will not change because they operate up to 24 hours a day as needed for cold weather and will not operate more frequently unless the building size is increased. The emissions from the emergency fire pump also will not change.

Table 3.2 UNCONTROLLED EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS

Emissions Unit	PM_{10}		SO_2		NOx		CO		VOC		LEAD
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/quarter
Point Sources Affected by this Permitting Action											
Beam plant cyclone		7.47		---		---		---		8.54	---
Beam plant sanderdust baghouse		3.83		---		---		---		---	---
Deck plant cyclone		3.63		---		---		---		1.32	---
Beam plant bin		0.003		---		---		---		---	---
Deck plant bin		0.0001		---		---		---		---	---
Wood Stoves (3)		1.05		0.015		0.096		7.89		1.8	---
Fire pump generator		0.12		0.04		0.58		0.13		0.05	---
Total, Point Sources		16.1		0.055		0.676		8.02		11.72	---

Table 3.3 CONTROLLED EMISSIONS ESTIMATES OF CRITERIA POLLUTANTS

Emissions Unit	PM_{10}		SO_2		NOx		CO		VOC		LEAD
	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/hr	T/yr	lb/quarter
Point Sources Affected by this Permitting Action											
Beam plant cyclone	0.22	0.39	---	---	---	---	---	---	3.65	8.54	---
Beam plant sanderdust baghouse	0.01	0.01	---	---	---	---	---	---	---	---	---
Deck plant cyclone	0.15	0.18	---	---	---	---	---	---	1.13	1.32	---
Beam plant bin	0.0002	0.0002	---	---	---	---	---	---	---	---	---
Deck plant bin	0.00001	0.00001	---	---	---	---	---	---	---	---	---
Wood Stoves (3)	0.57	1.05	0.0075	0.015	0.054	0.096	4.32	7.89	0.99	1.8	---
Fire pump generator	0.51	0.04	0.15	0.04	2.33	0.58	0.50	0.13	0.19	0.05	---
Total, Point Sources	1.46	1.67	0.16	0.05	2.38	0.68	4.83	8.02	5.96	11.72	---

Appendix B shows the TAP and HAP emissions from this project. The TAP and HAP emissions from existing operations are not included as they are not part of this project for TAP purposes. This TAP project is the increase in production, with TAP coming from the adhesives used. The wood stoves were installed prior to the promulgation of the TAP rules in 1994 and are therefore exempt from the TAP preconstruction compliance demonstration requirement.

3.3 Ambient Air Quality Impact Analysis

The ambient air impact analysis demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard. The modeling technical memorandum is included as Appendix C.

3.4 Origin of Existing Emissions Limits

This is the original permit for the facility, so there are no existing emissions limits.

4. REGULATORY REVIEW

4.1 Attainment Designation (40 CFR 81.313)

The facility is located in Owyhee County which is designated as attainment or unclassifiable for PM_{10}, $PM_{2.5}$, CO, NO_2, SO_X, and Ozone. Reference 40 CFR 81.313.

4.2 Permit to Construct (IDAPA 58.01.01.201)

A permit to construct is required because the facility's proposed increase in emissions of toxic air pollutants does not qualify for an exemption.

T-RACT (IDAPA 58.01.01.210.12 and 13)

Part of the requirements for obtaining a permit to construct is a demonstration of preconstruction compliance with toxics standards (IDAPA 58.01.01.210). Because the proposed emissions of formaldehyde exceeded the acceptable ambient concentration for carcinogens in IDAPA 58.01.01.586, the toxic air pollutant reasonably available control technology (T-RACT) provision (IDAPA 58.01.01.210.12) is used to demonstrate preconstruction compliance with the toxics standards. The analysis is included in Appendix B.

This analysis is for the increase in tap emissions from the increased production. The fire pump emissions will not increase as a result of the production increase because it is for emergency use only and is tested on the same schedule regardless of production rate.

IDAPA 58.01.01.210.12. T-RACT Ambient Concentration for Carcinogens.

a. As provided in Subsections 210.12 and 210.13, the owner or operator may use T-RACT to demonstrate preconstruction compliance for toxic air pollutants listed in Section 586.

i. This method may be used in conjunction with netting (Subsection 210.09), and offsets (Subsection 210.11).

ii. This method is not to be used to demonstrate preconstruction compliance for toxic air pollutants listed in Section 585.

b. Compare the source's or modification's approved T-RACT ambient concentration at the point of compliance for the toxic air pollutant to the amount of the toxic air pollutant that would contribute an ambient air cancer risk probability of less than one to one hundred thousand (1:100,000) (which amount is equivalent to ten (10) times the applicable acceptable ambient concentration listed in Section 586).

The modeled ambient concentration of formaldehyde is 0.47 $\mu g/m^3$. The acceptable ambient concentration for carcinogens (AACC) for formaldehyde is 0.077 $\mu g/m^3$. Ten times the AACC is 0.77 $\mu g/m^3$, which is greater than the modeled ambient concentration of 0.47 $\mu g/m^3$.

c. *If the source's or modification's approved T-RACT ambient concentration at the point of compliance is less than or equal to the amount of the toxic air pollutant that would contribute an ambient air cancer risk probability of less than one to one hundred thousand (1:100,000), no further procedures for demonstrating preconstruction compliance will be required for that toxic air pollutant as part of the application process.*

d. *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.*

Permit conditions are written to limit the amount of coatings used and the concentration of formaldehyde in the coating. Tracking is required.

14. *T-RACT Determination. T-RACT shall be determined on a case-by-case basis by the Department as follows:*

a. *The applicant shall submit information to the Department identifying and documenting which control technologies or other requirements the applicant believes to be T-RACT.*

The application contains this information.

b. *The Department shall review the information submitted by the applicant and determine whether the applicant has proposed T-RACT.*

c. *The technological feasibility of a control technology or other requirements for a particular source shall be determined considering several factors including, but not limited to:*

i. *Process and operating procedures, raw materials and physical plant layout.*

ii. *The environmental impacts caused by the control technology that cannot be mitigated, including, but not limited to, water pollution and the production of solid wastes.*

iii. *The energy requirements of the control technology.*

d. *The economic feasibility of a control technology or other requirement, including the costs of necessary mitigation measures, for a particular source shall be determined considering several factors including, but not limited to:*

i. *Capital costs.*

ii. *Cost effectiveness, which is the annualized cost of the control technology divided by the amount of emission reduction.*

iii. *The difference in costs between the particular source and other similar sources, if any, that have implemented emissions reductions.*

e. *If the Department determines that the applicant has proposed T-RACT, the Department shall determine which of the options, or combination of options, will result in the lowest emission of toxic air pollutants, develop the emission standards constituting T-RACT and incorporate the emission standards into the permit to construct.*

The T-RACT analysis (Appendix B) demonstrated that no control technology has been identified as technologically feasible for the control of formaldehyde for the plywood industry. One facility used a reduced-formaldehyde formula, but this formula is not adequate for beam and deck plant adhesives, as Filler King must use glues that must achieve high load-bearing performance. There is not a suitable formula at this time for Filler King's operation, but the application states that the facility will check annually to determine if a high-performance low-formaldehyde formula is developed that will work for their operation.

Based on the T-RACT analysis, DEQ has determined that limiting the quantity of formaldehyde used as proposed in the application constitutes T-RACT at this time.

4.3 Tier II Operating Permit (IDAPA 58.01.01.401)

A Tier II operating permit is not required because this permitting action qualifies for a PTC.

4.4 Title V Classification (IDAPA 58.01.01.300, 40 CFR Part 70)

The facility does not require a Title V permit because the emissions do not meet or exceed the major source threshold of any applicable pollutant.

4.5 PSD Classification (40 CFR 52.21)

The facility is a minor source.

4.6 NSPS Applicability (40 CFR 60)

NSPS Subpart AAA for residential wood heaters does not apply to the two wood-burning stoves at the facility because these are not being used in a residence. This subpart applies only to residential wood-burning stoves. EPA concurrence with this assessment was received via e-mail on 10/1/08.

NSPS Subpart IIII does not apply to the fire pump generator because, although the date of construction is unknown, it was installed in 1995. The earliest applicable date for any type of stationary compression ignition internal combustion engine regulated by this subpart is July 11, 2005. Therefore, because this generator was manufactured sometime prior to the installation date, which was in 1995, this subpart does not apply.

4.7 NESHAP Applicability (40 CFR 61)

No NESHAP applies to this facility.

4.8 MACT Applicability (40 CFR 63)

No MACT applies to this facility.

4.9 CAM Applicability (40 CFR 64)

CAM applies to Title V facilities, and this is not a Title V facility.

4.10 Permit Conditions Review

This section describes the permit conditions for this initial permit.

No PM, PM_{10}, or wood throughput or hours of operation limits were set for the cyclones or baghouse because the PM_{10} emissions for the facility at 8,760 hours per year are much less than the National Ambient Air Quality Standards (NAAQS), and the PM_{10} emissions are much less than the major source threshold for Title V permit requirements. The cyclones are primarily process equipment because without them, the process would not run correctly. The cyclones are high efficiency in order to control emissions. Therefore, they are regulated as control devices.

The formaldehyde emissions and the resin and catalyst usage are limited, which effectively limits the amount of wood that is used, so no limits are put on the throughput of wood.

New PC

No emission rate limit was set for methanol because the projected emissions are 0.9 lb/hr, and the screening level is 17.3 lb/hr. An emission rate limit was set for formaldehyde because the T-RACT rules (IDAPA 58.01.01.210.14.e) require that limits be set for any TAPs requiring T-RACT to ensure that the emission rate determined to meet the requirements of T-RACT is not exceeded.

New PC

An opacity limit was included which applies to all sources. Monitoring and recordkeeping are required quarterly.

New PC

The wood stoves' emissions were estimated by emission factors for wood and did not include estimates for wood with glues or other coatings. Therefore, the type of wood burned is limited to wood without coatings because the emissions may be different if wood with coatings is burned.

New PCs

To determine compliance with the formaldehyde emission limit, the amount of catalyst is limited to the amounts proposed in the application and used to estimate the emissions. The emissions are not based on 100% of the formaldehyde in the material being volatilized. Some is contained in the product. The manufacturer of the material has tested the emissions and determined an emission from the use of the product. This emission amount was measured from a product with a certain concentration of formaldehyde, so the concentration of formaldehyde in the product was limited to what was tested.

New PC

A requirement to use the sanderdust baghouse to control particulate emissions was written because reductions in emissions were estimated based on the fact that this baghouse was being used.

New PCs

Monitoring and recordkeeping is required for the amount catalyst used at each plant (as modeling is based on the point of release, so it is important to know that the amount used at each emission point does not exceed the amount modeled) and for the concentration of formaldehyde in the product used. This monitoring and recordkeeping demonstrates compliance with the T-RACT formaldehyde limit.

5. PERMIT FEES

Table 5.1 lists the processing fee associated with this permitting action. The facility is subject to a processing fee of $5,000 because its permitted emissions are 22.2 T/yr. Note: The HAP emissions were not added to the total because these were already included as PM_{10} or VOC. Refer to the chronology for fee receipt dates.

Table 5.1 PROCESSING FEE TABLE

Emissions Inventory			
Pollutant	**Annual Emissions Increase (T/yr)**	**Annual Emissions Reduction (T/yr)**	**Annual Emissions Change (T/yr)**
NO_X	0.7	0	0.7
SO_2	0.1	0	0.1
CO	8.0	0	8.0
PM_{10}	1.7	0	1.7
VOC	11.7	0	11.7
HAPS	2.3	0	2.3
Total:	22.2	0	**22.2**
Fee Due	**$ 5,000.00**		

6. PUBLIC COMMENT

An opportunity for public comment period on the PTC application was provided from October 2, 2008, to October 16, 2008 in accordance with IDAPA 58.01.01.209.01.c. During this time, there were no comments on the application and there was no request for a public comment period on DEQ's proposed action.

Appendix A – AIRS Information

AIRS/AFS Facility-wide Classification Form

Facility Name: Filler King Company

Facility Location: East Pioneer Road

Facility ID: 073-00008 **Date:** February 3, 2009

Project/Permit No.: P-2008.0150 **Completed By:** Carole Zundel

☐ Check if there are no changes to the facilitywide classification resulting from this action. (compare to form with last permit)

☐ Yes, this facility is an SM80 source.

Identify the facility's area classification as A (attainment), N (nonattainment), or U (unclassified) for the following pollutants:

	SO2	PM10	VOC
Area Classification:	U	U	U

DO NOT LEAVE ANY BLANK

Check one of the following:

☐ **SIP** [0] - Yes, this facility is subject to SIP requirements. (do not use if facility is Title V)

OR

☐ **Title V** [V] - Yes, this facility is subject to Title V requirements. (If yes, do not also use SIP listed above.)

For SIP or TV, identify the classification (A, SM, B, C, or ND) for the pollutants listed below. Leave box blank if pollutant is not applicable to facility.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:							

☐ **PSD** [6] - Yes, this facility has a PSD permit.

If yes, identify the pollutant(s) listed below that apply to PSD. Leave box blank if pollutant does not apply to PSD.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **NSR - NAA** [7] - Yes, this facility is subject to NSR nonattainment area (IDAPA 58.01.01.204) requirements.

Note: As of 9/12/08, Idaho has no facility in this category.

If yes, identify the pollutant(s) listed below that apply to NSR-NAA. Leave box blank if pollutant does not apply to NSR - NAA.

	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **NESHAP** [8] - Yes, this facility is subject to NESHAP (Part 61) requirements. (THAP only)

If yes, what CFR Subpart(s) is applicable?

☐ **NSPS** [9] - Yes, this facility is subject to NSPS (Part 60) requirements.

If yes, what CFR Subpart(s) is applicable?

If yes, identify the pollutant(s) regulated by the subpart(s) listed above. Leave box blank if pollutant does not apply to the NSPS.

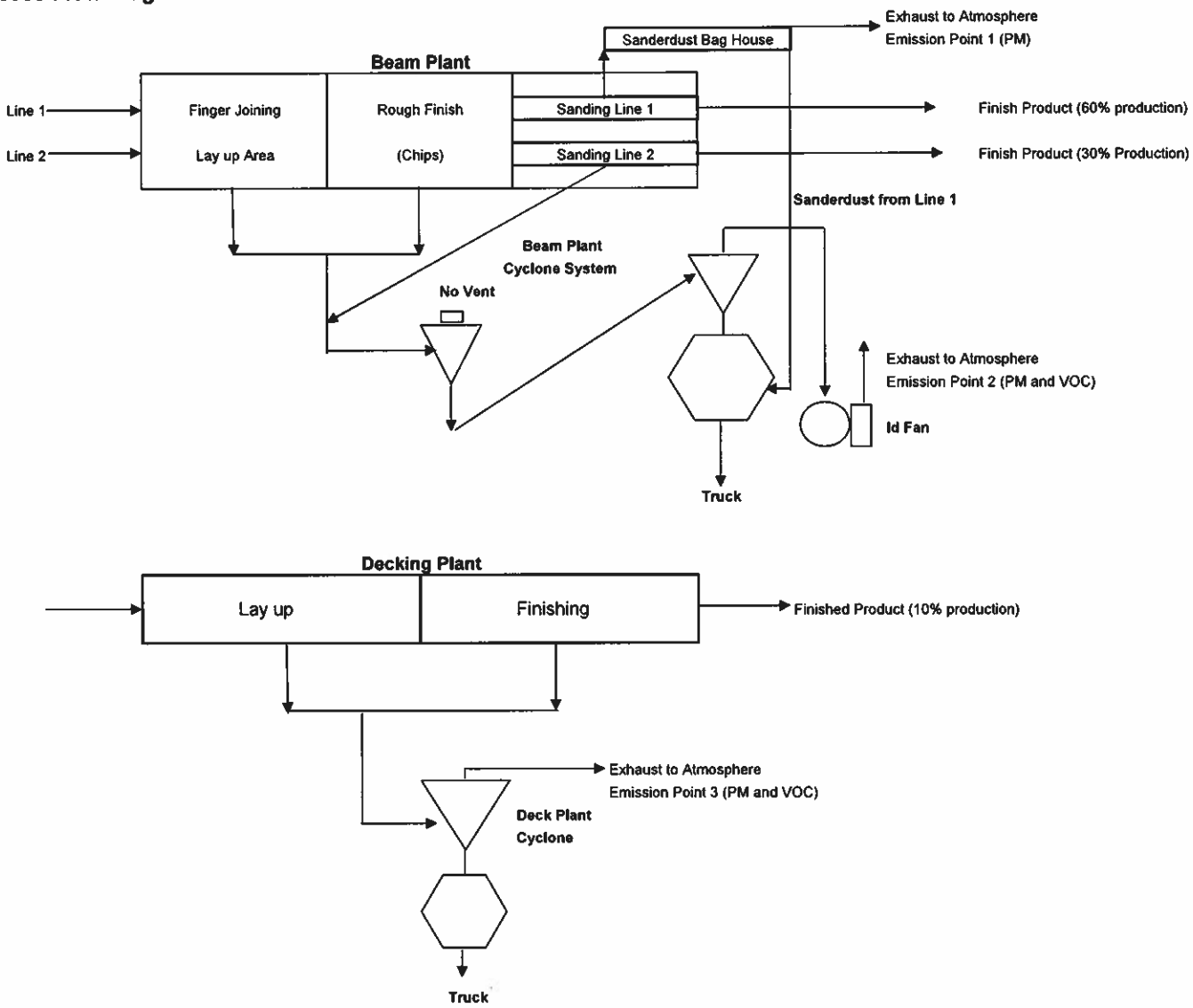
	SO2	NOx	CO	PM10	PT (PM)	VOC	THAP
Classification:	☐	☐	☐	☐	☐	☐	☐

☐ **MACT** [M] - Yes, this facility is subject to MACT (Part 63) requirements. (THAP only)

If yes, what CFR Subpart(s) is applicable?

Appendix B – Emissions Inventory

Filler King Company
Process Flow Diagram



Filler King Company
Facility-Wide Summary of Criteria Pollutants

Potential Facility Emissions (ton/yr)

Emission Point	Pollutant					
	CO	NOx	SO2	PM	PM10	VOC
Beam Plant Bag House				0.01	0.01	
Beam Plant Cyclone				0.39	0.39	8.54
Deck Plant Cyclone				0.18	0.18	1.32
Wood Stove #1	2.63	0.032	0.005	0.35	0.35	0.60
Wood Stove #2	2.63	0.032	0.005	0.35	0.35	0.60
Wood Stove #3	2.63	0.032	0.005	0.35	0.35	0.60
Emergency Fire Pump	0.13	0.58	0.04	0.04	0.04	0.047
Beam Plant Bin				0.0005	0.0002	
Deck Plant Bin				0.00002	0.00001	
Total Emissions	8.02	0.68	0.05	1.67	1.67	11.72

Potential Facility Emissions (lb/hr)

Emission Point	Pollutant					
	CO	NOx	SO2	PM	PM10	VOC
Beam Plant Bag House				0.01	0.01	
Beam Plant Cyclone				0.22	0.22	3.65
Deck Plant Cyclone				0.15	0.15	1.13
Wood Stove #1	1.44	0.018	0.0025	0.19	0.19	0.33
Wood Stove #2	1.44	0.018	0.0025	0.19	0.19	0.33
Wood Stove #3	1.44	0.018	0.0025	0.19	0.19	0.33
Emergency Fire Pump	0.50	2.33	0.15	0.17	0.17	0.189
Beam Plant Bin				0.0005	0.0002	
Deck Plant Bin				0.00002	0.00001	
Total Emissions	4.83	2.38	0.16	1.13	1.13	5.96

Filler King Company
Modeling Summary of Criteria Pollutants for Facility

Potential Facility Emissions (ton/yr)

Emission Point	Pollutant					
	CO	NOx	SO2	PM	PM10	VOC
Beam Plant Bag House				0.01	0.01	
Beam Plant Cyclone				0.39	0.39	8.54
Deck Plant Cyclone				0.18	0.18	1.32
Total Emissions	0.00	0.00	0.00	0.58	0.58	9.86
Modeling Threshold		1	1		1	
Modeling Required		No	No		No	

Potential Facility Emissions (lb/hr)

Emission Point	Pollutant					
	CO	NOx	SO2	PM	PM10	VOC
Beam Plant Bag House				0.01	0.01	
Beam Plant Cyclone				0.22	0.22	3.65
Deck Plant Cyclone				0.15	0.15	1.13
Total Emissions	0.00	0.00	0.00	0.39	0.39	4.78
Modeling Threshold	14		0.2		0.2	
Modeling Required	No		No		**Yes**	

Filler King Company
Summary of Toxic Air Pollutants for the Facility

Pollutant	CAS Number	Wood Stove #1 (lb/hr)	Wood Stove #2 (lb/hr)	Wood Stove #3 (lb/hr)	Emergency Generator (lb/hr)	Beam Plant (lb/hr)	Deck Plant (lb/hr)	Total (lb/hr)	HAP		IDAPA 58.01.01.585/586 - EL	
									(Yes/No)	Total (ton/yr)	(lb/hr)	Exceed?
Benzene	71-43-2	0.00E+00	0.00E+00	0.00E+00	4.90E-04			4.90E-04	Yes	1.22E-04	8.00E-04	Below
Toluene	108-88-3	4.56E-03	4.56E-03	4.56E-03	2.15E-04			1.39E-02	Yes	2.50E-02	2.50E+01	Below
Methyl Ethyl Ketone	78-93-3	1.81E-03	1.81E-03	1.81E-03				5.44E-03	Yes	9.92E-03	3.93E+01	Below
Frufural	98-01-1	3.04E-03	3.04E-03	3.04E-03				9.11E-03	No		5.33E-01	Below
Xylene	1330-20-7	1.26E-03	1.26E-03	1.26E-03	1.50E-04			3.94E-03	Yes	6.95E-03	2.90E+01	Below
Naphthalene	91-20-3	1.80E-03	1.80E-03	1.80E-03	4.45E-05			5.44E-03	Yes	9.87E-03	3.33E+00	Below
1,3-Butadiene	106-99-0				2.05E-05			2.05E-05	Yes	5.13E-06	2.40E-05	Below
Formaldehyde	50-00-0				6.20E-04	1.71E-01	5.29E-02	2.24E-01	Yes	4.62E-01	5.10E-04	Exceeds
Acetaldehyde	75-07-0				4.03E-04			4.03E-04	Yes	1.01E-04	3.00E-03	Below
Acrolein	107-02-8				4.86E-05			4.86E-05	Yes	1.21E-05	1.70E-02	Below
Methanol	67-56-1					6.76E-01	2.09E-01	8.85E-01	Yes	1.83E+00	1.73E+01	Below
Furan		2.14E-03	2.14E-03	2.14E-03				6.41E-03	No			
2-Methyl Furan		4.10E-03	4.10E-03	4.10E-03				1.23E-02	No			
2,5-Dimethyl Furan		1.01E-03	1.01E-03	1.01E-03				3.04E-03	No			
Total Furans[2]		7.25E-03	7.25E-03	7.25E-03				2.18E-02			1.50E-10	Exceeds
Benzo(a)Anthracene	56-55-3	1.25E-04	1.25E-04	1.25E-04	8.82E-07			3.76E-04	No			
Benzo(b)Fluoranthene	205-99-2	3.75E-05	3.75E-05	3.75E-05	5.20E-08			1.13E-04	No			
Benzo(k)Fluoranthene	205-82-3	1.25E-05	1.25E-05	1.25E-05	8.14E-08			3.76E-05	No			
Benzo(g,h,i)Perylene	191-24-2	2.50E-05	2.50E-05	2.50E-05	2.57E-07			7.53E-05	No			
Benzo(a)Pyrene	50-32-8	2.50E-05	2.50E-05	2.50E-05	9.87E-08			7.51E-05	No		2.00E-06	Exceeds
Chrysene	218-01-9	7.50E-05	7.50E-05	7.50E-05	1.85E-07			2.25E-04	No			
Indeno(1,2,3-cd)pyrene	193-39-5				1.97E-07			1.97E-07	No			
Dibenz(a,h)anthracene	53-70-3				3.06E-07			3.06E-07	No			
Total PAH[3]		3.00E-04	3.00E-04	3.00E-04	2.06E-06			9.02E-04			9.10E-05	Exceeds
Cadmium	7440-43-9	1.38E-07	1.38E-07	1.38E-07				4.13E-07	No		3.70E-06	Below
Chromium	7440-47-3	6.25E-09	6.25E-09	6.25E-09				1.88E-08	No		3.30E-02	Below
Manganese	7439-96-5	1.06E-06	1.06E-06	1.06E-06				3.19E-06	No		6.70E-02	Below
Nickel	7440-02-0	8.75E-08	8.75E-08	8.75E-08				2.63E-07	No		2.70E-05	Below
Total HAPS (Ton/yr)										2.34E+00		

Filler King Company
Modeling Summary of Toxic Air Pollutants for Facility

Pollutant	CAS Number	Beam Plant (lb/hr)	Deck Plant (lb/hr)	Total (lb/hr)	IDAPA 58.01.01.585/586 - (lb/hr)	All Exceed?
Benzene	71-43-2			0.00E+00	8.00E-04	Below
Toluene	108-88-3			0.00E+00	2.50E+01	Below
Methyl Ethyl Ketone	78-93-3			0.00E+00	3.93E+01	Below
Frufural	98-01-1			0.00E+00	5.33E-01	Below
Xylene	1330-20-7			0.00E+00	2.90E+01	Below
Naphthalene	91-20-3			0.00E+00	3.33E+00	Below
1,3-Butadiene	106-99-0			0.00E+00	2.40E-05	Below
Formaldehyde	50-00-0	1.71E-01	5.29E-02	2.24E-01	5.10E-04	**Exceeds**
Acetaldehyde	75-07-0			0.00E+00	3.00E-03	Below
Acrolein	107-02-8			0.00E+00	1.70E-02	Below
Methanol	67-56-1	6.76E-01	2.09E-01	8.85E-01	1.73E+01	Below
Benzo(a)Anthracene	56-55-3			0.00E+00		
Benzo(b)Fluoranthene	205-99-2			0.00E+00		
Benzo(k)Fluoranthene	205-82-3			0.00E+00		
Benzo(g,h,i)Perylene	191-24-2			0.00E+00		
Benzo(a)Pyrene	50-32-8			0.00E+00	2.00E-06	Below
Chrysene	218-01-9			0.00E+00		
Indeno(1,2,3-cd)pyrene	193-39-5			0.00E+00		
Dibenz(a,h)anthracene	53-70-3			0.00E+00		
Total PAH[3]				0.00E+00	9.10E-05	Below

Filler King Company
Wood Stove Comfort Heater Criteria Pollutant Emissions

Assumptions:

Each Stove burns	300	lb/day
Stoves burn for	24	hrs/day
	5	months/yr
	3650	hrs/yr
Heat value of wood[1]	8900	Btu/lb
Capacity of Stoves	111,250	Btu/hr input

Qualify for Cattegory II Exemption: IDAPA 58.01.01.220.02.d
"Other fuel burning equipment for indirect heating with a capacity of less than one million (1,000,000) btu's per hour input."

Criteria Pollutant Emissions for One Stove:

Pollutant	Emission Factor[2]	Potential Emmissions	
	(lb/ton)	(lb/hr)	(ton/yr)
CO	230.8	1.44	2.63
NO_x	2.8	0.02	0.03
SO_2	0.4	0.0025	0.005
PM[3]	30.6	0.19	0.35
VOC[4]	53	0.33	0.60

Notes

[1] Heat value for dry white pine from www.worldbank.org/html/fpd/em/power/sources/easrbiom.stm

[2] Emission Factors from USEPA AP-42 Section 1.10 Table 1.10-1, web site May 2007

[3] PM emission factor is for PM-10 therefore this value will be used for both.

[4] VOC is the total nonmethane organic compounds

Filler King Company
Wood Stove Comfort Heater HAP Emissions

Toxic Air Pollutant Emissions for One Stove:

Pollutant	CAS Number	EF[1] (lb/ton)	Potential Emissions (lb/hr)	Potential Emissions (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	IDAPA 58.01.01.585/586 - EL Exceed?
Benzene	71-43-2	1.94E+00	0.00E+00	0.00E+00	8.00E-04	**Below**
Toluene	108-88-3	7.30E-01	4.56E-03	8.33E-03	2.50E+01	Below
Furan		3.42E-01	2.14E-03	3.90E-03		
2-Methyl Furan		6.56E-01	4.10E-03	7.48E-03		
2,5-Dimethyl Furan		1.62E-01	1.01E-03	1.85E-03		
Methyl Ethyl Ketone	78-93-3	2.90E-01	1.81E-03	3.31E-03	3.93E+01	Below
Frufural	98-01-1	4.86E-01	3.04E-03	5.54E-03	5.33E-01	Below
Xylene	1330-20-7	2.02E-01	1.26E-03	2.30E-03	2.90E+01	Below
Benzo(a)Anthracene	56-55-3	2.00E-02	1.25E-04	2.28E-04		
Benzo(b)Fluoranthene	205-99-2	6.00E-03	3.75E-05	6.84E-05		
Benzo(k)Fluoranthene	205-82-3	2.00E-03	1.25E-05	2.28E-05		
Benzo(g,h,i)Perylene	191-24-2	4.00E-03	2.50E-05	4.56E-05		
Benzo(a)Pyrene	50-32-8	4.00E-03	2.50E-05	4.56E-05	2.00E-06	**Exceeds**
Chrysene	218-01-9	1.20E-02	7.50E-05	1.37E-04		
		Total PAH[3]	3.00E-04		9.10E-05	**Exceeds**
Naphthalene	91-20-3	2.88E-01	1.80E-03	3.29E-03	3.33E+00	Below
Cadmium	7440-43-9	2.20E-05	1.38E-07	2.51E-07	3.70E-06	Below
Chromium	7440-47-3	1.00E-06	6.25E-09	1.14E-08	3.30E-02	Below
Manganese	7439-96-5	1.70E-04	1.06E-06	1.94E-06	6.70E-02	Below
Nickel	7440-02-0	1.40E-05	8.75E-08	1.60E-07	2.70E-05	Below

Notes

[1] Emission Factors from USEPA, AP-42 Tables 1.10-2, 1.10-3 and 1.10-4, web site May 2007

[2] Furans are expressed as one TAP equivalent to 2,3,7,8 TCDD

[3] Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, chrysene, benzo(b)anthracene, benzo(k)anthracene, benzo(a)pyrene, benzo(g,h,i)perylene.

Filler King Company
Emergency Fire Pump Emissions

Assumptions:

Size	75	hp	
Operation	500	hrs / yr	Based on EPA guidance for emergency generators
Fuel	Diesel		

Qualify for Cattegory II Exemption: IDAPA 58.01.01.222.01.c.i
c. Stationary internal combustion engines of less than or equal to six hundred (600) horsepower and which are fueled by natural gas, propane gas, liquefied petroleum gas, distillate fuel oils, residual fuel oils, and diesel fuel; waste oil, gasoline, or refined gasoline shall not be used. To qualify for this exemption, the source must be operated in accordance with the following: (5-1-94)
i. One hundred (100) horsepower or less -- unlimited hours of operation.

Criteria Pollutants:

Pollutant	EF[1]	Potential Emissions	
	(lb/hp-hr)	(lb/hr)	(ton/yr)
CO	0.007	0.50	0.13
NO_x	0.031	2.33	0.58
SO_2	0.002	0.15	0.04
PM	0.002	0.17	0.04
VOC	0.003	0.19	0.05

Toxic Air Pollutants

Pollutant	CAS Number	EF[2] (lb/MMBtu)	Potential Emissions (lb/hr)	Potential Emissions (ton/yr)	IDAPA 58.01.01.585/586 - EL (lb/hr)	IDAPA 58.01.01.585/586 - EL Exceed
Benzene	71-43-2	9.33E-04	4.90E-04	1.22E-04	8.00E-04	Below
Toluene	108-88-3	4.09E-04	2.15E-04	5.37E-05	2.50E+01	Below
Xylenes	1330-20-7	2.85E-04	1.50E-04	3.74E-05	2.90E+01	Below
1,3-Butadiene	106-99-0	3.91E-05	2.05E-05	5.13E-06	2.40E-05	Below
Formaldehyde	50-00-0	1.18E-03	6.20E-04	1.55E-04	5.10E-04	**Exceeds**
Acetaldehyde	75-07-0	7.67E-04	4.03E-04	1.01E-04	3.00E-03	Below
Acrolein	107-02-8	9.25E-05	4.86E-05	1.21E-05	1.70E-02	Below
Napathalene	91-20-3	8.48E-05	4.45E-05	1.11E-05	3.33E+00	Below
Benzo(a)anthracene	56-55-3	1.68E-06	8.82E-07	2.21E-07		
Chrysene	218-01-9	3.53E-07	1.85E-07	4.63E-08		
Benzo(b)anthracene	205-99-2	9.91E-08	5.20E-08	1.30E-08		
Benzo(k)anthracene	205-82-3	1.55E-07	8.14E-08	2.03E-08		
Benzo(a)pyrene	50-32-8	1.88E-07	9.87E-08	2.47E-08	2.00E-06	Below
Indeno(1,2,3-cd)pyrene	193-39-5	3.75E-07	1.97E-07	4.92E-08		
Dibenz(a,h)anthracene	53-70-3	5.83E-07	3.06E-07	7.65E-08		
Benzo(g,h,i)perylene	191-24-2	4.89E-07	2.57E-07	6.42E-08		
		Total PAH[3]	2.06E-06	5.15E-07	9.10E-05	Below

Notes
[1] Emission Factors from USEPA, AP-42 Table 3.3.1, web site May 2007
[2] Emission Factors from USEPA, AP-42 Table 3.3.2, web site May 2007
[3] Polynuclear aromatic hydrocarbons is the sum of benz(a)anthracene, chrysene, benzo(b)anthracene, benzo(k)anthracene, benzo(a)pyrene, indeno (1,2,3-cd)pyrene, dibenz(a,h)anthracene, benzo(g,h,i)perylene.

Filler King Company
PM Emmission Calculations from Process

Assumption:

Emissions based on Shavings Production data received from Filler King for 2006

Potential Emissions will be based on a	40	% increase in production
Hours of operation at potential production rate:	4680	hrs/year Line 1
	4160	hrs/year Line 2
	2340	hrs/year Deck Plant
	2340	Finish (Sanding) All lines

2006 Shavings: 2,534 bone dry tons

Chip Production:

Process Area	Production % by Area	Amount of Shavings by Area bone dry tons	Chip % by Area	Amount of Chips by Area bone dry tons	IDEQ Emission Factor for High Efficiency Cyclone[1]	Actual PM (ton/yr)	Potential PM (lb/hr)	Potential PM (ton/yr)
Line #1	55.1%	1396	89.4%	1,248	0.2	0.12	0.07	0.17
Line #2	31.5%	798	89.4%	714	0.2	0.07	0.05	0.10
Decking	13.4%	340	70.0%	238	0.2	0.02	0.03	0.03
					Subtotal	0.22	0.15	0.31

Sander Dust Produciton:

Process Area	Production % by Area	Amount of Shavings by Area bone dry tons	Sander Dust % by Area	Amount of Sander Dust by Area bone dry tons	IDEQ Emission Factor for High Efficiency Cyclone[1]	IDEQ Emission Factor for Target Box[1]	IDEQ Emission Factor for Bag	Actual PM ton/yr	Potential PM (lb/hr)	Potential PM (ton/yr)
Line #1	55.1%	1396	10.6%	148		0.1	0.04	0.01	0.01	0.01
Line #2	31.5%	798	10.6%	85	2.0			0.08	0.10	0.12
Decking	13.4%	340	30.0%	102	2.0			0.10	0.12	0.14
							Subtotal	0.20	0.24	0.28

Total PM Production:

Product	Actual Total by Product (ton/yr)	Potential Total By Product (lb/hr)	Potential Total By Product (ton/yr)	IDAPA Significant Level ton/yr	BRC Level ton/yr	Below BRC?
Chips	0.22	0.15	0.31			
Sander Dust	0.20	0.24	0.28			
Total	**0.42**	**0.39**	**0.58**	**25**	**2.5**	**Yes**

Notes:

[1]1997 Idaho DEQ Emission Factor Guide for Wood Industry: pound of PM per bone dry ton of shavings

Process Weight Calculation (IDAPA 58.01.01.701)

PW line 1 =	597	lb/hr
PW line 2 =	384	lb/hr
PW decking =	290	lb/hr
Total	1,270	

Filler King Company
Chemical Emmission Calculations from Process

Assumptions:

Emissions based on data received from Filler King for 2006

Potential Emissions will be based on a	40	% increase in production
Hours of operation at potential production rate:	4680	hrs/year Beam Plant
	2340	hrs/year Deck Plant

% Product Split	86.7	Beam Plant
	13.4	Deck Plant

Emission Calculations:

Emissions based on VOC data received from Hexion derived from tests conducted on Hexion Phenol Resourcinol Formaldehyde (PRF) adhesives using the BSCPM Method. Tested adhesive glue was mixed at a 2.5:1 ratio of resin to catalyst.

2006 PRF Resin Used:	724,559	lbs
2006 Catalyst Used:	289,828	lbs
2006 Mixed Glue (2.5:1):	1,014,387	lbs

Constituents:	CAS No.	g/g VOC/glue ratio	Actual VOC Emissions (lb/yr)	Potential Emissions				IDAPA 58.01.01.585/586 - EL		
				Beam Plant (lb/hr)	Deck Plant (lb/hr)	Beam Plant (ton/yr)	Deck Plant (ton/yr)	(lb/hr)	Beam Plant Exceed?	Deck Plant Exceed?
Ethanol	64-17-5	0.01065	10,803	2.8	0.9	6.6	1.0			
Methanol	67-56-1	0.00257	2,607	0.7	0.2	1.6	0.2	17.3	Below	Below
Formaldehyde	50-00-0	0.00065	659	0.2	0.1	0.4	0.1	5.10E-04	**Exceeds**	**Exceeds**
			Total	3.65	1.13	8.54	1.32			

Filler King Company

Beam Plant Shavings Bin

Capacity of bin is 5000 cubic feet. Each bin will be filled every 16 hours of operation (not continuously).
Wood is 12% moisture

Bulk density wood shavings * 8 lb/cf

Maximum hourly production rate: $\frac{20 \text{ ton bone-dry wood}}{16 \text{ hrs}}$

Maximum annual production rate: 2,568 $\frac{\text{ton bone-dry wood}}{\text{yr}}$

Bin Load-out dimensions 12' x 6' doors. Drop is 6' to truck box.

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

Wind Speed	3.5	mph
Material moisture content	4.3	%
PM Particle size multiplier	0.74	
PM =	0.001	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 = 70% Based on full enclosure from truck

Potential Emissions

Beam Bin	lb/hr	tpy
PM	0.0005	0.0005
PM10	0.0002	0.0002

Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$\frac{20}{16} \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.001 \text{ lb PM}}{\text{ton bone-dry wood}} \times 30\% = 0.0005 \text{ lb/hr PM}$$

Maximum Annual PM emissions:

$$2{,}568 \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.001 \text{ lb PM}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} \times 30\% = 0.0005 \text{ tpy PM}$$

Maximum Hourly PM10 emissions:

$$\frac{20}{16} \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.001 \text{ lb PM10}}{\text{ton bone-dry wood}} \times 30\% = 0.0002 \text{ lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$2{,}568 \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.001 \text{ lb PM10}}{\text{ton bone-dry wood}} \times \frac{1 \text{ ton}}{2000 \text{ lb}} \times 30\% = 0.0002 \text{ tpy PM10}$$

*Source: www.ruraltech.org/projects/conversions/briggs_conversions/briggs_ch07/briggs_chapter07complete.asp#loose

Filler King Company

Deck Plant Shavings Bin

Capacity of bin is 2800 cubic feet. Each bin will be filled every 9 days of operation (not continuously).
Wood is 12% moisture

Bulk density wood shavings * 8 lb/cf

Maximum hourly production rate: 11 ton bone-dry wood / 216 hr

Maximum annual production rate: 107 ton bone-dry wood / yr

Bin Load-out door dimensions - 12' x 6' opening. Drop is 6' to truck box.

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

Wind Speed	3.5	mph
Material moisture cont	4.3	%
PM Particle size multi	0.74	
PM =	0.001	lb/ton bone-dry wood
PM10 Particle size mu	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 = 70% Based on full enclosure from truck

Potential Emissions

Deck Bin	lb/hr	tpy
PM	0.00002	0.00002
PM10	0.00001	0.00001

Potential Emissions Calculations:

Maximum Hourly PM emissions:

$$\frac{11}{216}\ \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.001\ \text{lb PM}}{\text{ton bone-dry wood}} \times 30\% = 0.00002\ \text{lb/hr PM}$$

Maximum Annual PM emissions:

$$107\ \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.001\ \text{lb PM}}{\text{ton bone-dry wood}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} \times 30\% = 0.00002\ \text{tpy PM}$$

Maximum Hourly PM10 emissions:

$$\frac{11}{216}\ \frac{\text{ton bone-dry wood}}{\text{hr}} \times \frac{0.001\ \text{lb PM10}}{\text{ton bone-dry wood}} \times 30\% = 0.00001\ \text{lb/hr PM10}$$

Maximum Annual PM10 emissions:

$$107\ \frac{\text{ton bone-dry wood}}{\text{yr}} \times \frac{0.001\ \text{lb PM10}}{\text{ton bone-dry wood}} \times \frac{1\ \text{ton}}{2000\ \text{lb}} \times 30\% = 0.00001\ \text{tpy PM10}$$

*Source: www.ruraltech.org/projects/conversions/briggs_conversions/briggs_ch07/briggs_chapter07complete.asp#loose

Filler King Company
Table 1 - Process Weight Rule
Treasure Valley Forest Products - Mountain Home

Compliance with IDAPA Rule 701 PM Standard for Process Weight			
Unit	Beam Plant Baghouse	Beam Plant Cyclone	Deck Plant Cyclone
Process Weight (lb/hr)	597	384	290
PM Emission Rate (lb/hr)	0.09	0.15	0.15
Compliance with Allowable Emission Calculation			
Calculated Allowable Emissions (E) (lb/hr)	2.08	4.87	4.54
Compliance w/ PM Loading Standard	**Yes**	**Yes**	**Yes**

General Restrictions - New Equipment:

If PW is less than 9,250 pounds per hour
$E = 0.045(PW)^{0.6}$

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

Appendix C – Ambient Air Quality Impact Analysis

MEMORANDUM

DATE: February 13, 2009

TO: Carole Zundel, Permit Writer, Air Program

FROM: Kevin Schilling, Stationary Source Modeling Coordinator, Air Program

PROJECT NUMBER: P-2008.0150

SUBJECT: Modeling Review for the Filler King Company, Permit to Construct Application for their Facility in Homedale, Idaho

1.0 Summary

Filler King Company (Filler King) submitted a Permit to Construct (PTC) application for their engineered wood products facility located in Homedale, Idaho. Air quality analyses involving atmospheric dispersion modeling of emissions associated with potential normal operations of the facility were performed to demonstrate the facility would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02 [Idaho Air Rules Section 203.02]). CH2M HILL (CH2M), Filler King's consultant, performed the site-specific ambient air quality impact analyses.

A technical review of the submitted analyses was conducted by DEQ. The submitted information in combination with DEQ's 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 either a) that predicted pollutant concentrations from emissions associated with the proposed facility were below significant contribution levels (SCLs) or other applicable regulatory thresholds; or b) that predicted pollutant concentrations from emissions associated with the facility and any potentially co-contributing sources, when appropriately combined with background concentrations, were below applicable air quality standards at all locations outside of the facility's property boundary. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY CONDITIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
Emissions from the fire pump were not included in the modeling analyses.	Emissions are negligible provided operations are limited to not more than 2 hours per day and 10 hours per year.
Emissions from woodstoves were not included in the criteria pollutant impact analyses.	DEQ determined emissions quantities could not reasonably be expected to result in impacts exceeding standards, given the characteristics of the site and the sources.
Modeled formaldehyde impacts were greater than the AACC but below a level of 10 times the AACC.	Impacts are acceptable provided T-RACT is used to control formaldehyde emissions.

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 Filler King facility is located in Homedale, Idaho. The area is designated as attainment or unclassifiable for all criteria pollutants.

2.1.2 Significant and Cumulative NAAQS Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources associated with the facility exceed the significant contribution levels (SCLs) of Idaho Air Rules Section 006.102, then a cumulative NAAQS impact analysis is necessary to demonstrate compliance with National Ambient Air Quality Standards (NAAQS) and Idaho Air Rules Section 203.02. A cumulative NAAQS impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions, and emissions from any nearby co-contributing sources, 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 NAAQS listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
PM_{10}[e]	Annual[f]	1.0	50[g]	Maximum 1st highest[h]
	24-hour	5.0	150[i]	Maximum 6th highest[j]
$PM_{2.5}$[k]	Annual	Not established	15	Use PM_{10} as surrogate
	24-hour	Not established	35	Use PM_{10} as surrogate
Carbon monoxide (CO)	8-hour	500	10,000[l]	Maximum 2nd highest[h]
	1-hour	2,000	40,000[l]	Maximum 2nd highest[h]
Sulfur Dioxide (SO_2)	Annual	1.0	80[g]	Maximum 1st highest[h]
	24-hour	5	365[l]	Maximum 2nd highest[h]
	3-hour	25	1,300[l]	Maximum 2nd highest[h]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[g]	Maximum 1st highest[h]
Lead (Pb)	Quarterly	NA	1.5[i]	Maximum 1st highest[h]

[a]Idaho Air Rules Section 006.102
[b]Micrograms per cubic meter
[c]Idaho Air Rules Section 577 for criteria pollutants
[d]The maximum 1st highest modeled value is always used for the significant impact analysis
[e]Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[f]The annual PM_{10} standard was revoked in 2006. The standard is still listed because compliance with the annual $PM_{2.5}$ standard is demonstrated by a PM_{10} analysis that demonstrates compliance with the revoked PM_{10} standard.
[g]Never expected to be exceeded in any calendar year
[h]Concentration at any modeled receptor
[i]Never expected to be exceeded more than once in any calendar year
[j]Concentration at any modeled receptor when using five years of meteorological data
[k]Particulate matter with an aerodynamic diameter less than or equal to a nominal 2.5 micrometers
[l]Not to be exceeded more than once per year

New source review requirements for assuring compliance with $PM_{2.5}$ standards have not yet been completed and promulgated into regulation. EPA has asserted through a policy memorandum that compliance with $PM_{2.5}$ standards will be assured through an air quality analysis for the corresponding PM_{10} standard. Although the PM_{10} annual standard was revoked in 2006, compliance with the revoked PM_{10} annual standard must be demonstrated as a surrogate to the annual $PM_{2.5}$ standard.

2.1.3 Toxic Air Pollutant Analyses

Emissions of toxic substances are generally addressed by Idaho Air Rules Section 161:

> *Any contaminant which is by its nature toxic to human or animal life or vegetation shall not be emitted in such quantities or concentrations as to alone, or in combination with other contaminants, injure or unreasonably affect human or animal life or vegetation.*

Permit requirements for toxic air pollutants from new or modified sources are specifically addressed by Idaho Air Rules Section 203.03 and require the applicant to demonstrate to the satisfaction of DEQ the following:

> *Using the methods provided in Section 210, the emissions of toxic air pollutants from the stationary source or modification would not injure or unreasonably affect human or animal life or vegetation as required by Section 161. Compliance with all applicable toxic air pollutant carcinogenic increments and toxic air pollutant non-carcinogenic increments will also demonstrate preconstruction compliance with Section 161 with regards to the pollutants listed in Sections 585 and 586.*

Per Section 210, if the emissions increase associated with a new source or modification exceeds screening emission levels (ELs) of Idaho Air Rules Section 585 or 586, then the ambient impact of the emissions increase must be estimated. If ambient impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of Idaho Air Rules Section 585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of Idaho Air Rules Section 586, then compliance with TAP requirements has been demonstrated. If DEQ determines T-RACT is used to control emissions of carcinogenic TAPs, then modeled concentrations of 10 times the AACC are considered acceptable, as per Idaho Air Rules Section 210.12.

2.2 Background Concentrations

Background concentrations are used in the cumulative NAAQS impact analyses to account for impacts from sources not explicitly modeled. Table 3 lists appropriate background concentrations for the Homedale, Idaho area.

Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources. Background concentrations in these analyses were based on DEQ default values for small town/suburban areas.

---

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. BACKGROUND CONCENTRATIONS		
Pollutant	**Averaging Period**	**Background Concentration ($\mu g/m^3$)[a]**
PM_{10}[b]	24-hour	81
	Annual	27
Carbon monoxide (CO)	1-hour	10,200
	8-hour	3,400
Sulfur dioxide (SO_2)	3-hour	42
	24-hour	26
	Annual	8
Nitrogen dioxide (NO_2)	Annual	32
Lead (Pb)	Quarterly	0.03

[a]Micrograms per cubic meter
[b]Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

3.0 Modeling Impact Assessment

3.1 Modeling Methodology

This section describes the modeling methods used by the applicant to demonstrate compliance with applicable air quality standards.

3.1.1 Overview of Analyses

Table 4 provides a brief description of parameters used in the submitted modeling analyses.

Table 4. MODELING PARAMETERS		
Parameter	**Description/Values**	**Documentation/Addition Description[a]**
General facility location	Homedale, Idaho	
Model	AERMOD	AERMOD with the PRIME downwash algorithm, version 07026
Meteorological data	Boise	Model-ready data provided by DEQ
Terrain	Considered	Receptor, building, and emissions source elevations were determined using Digital Elevation Model (DEM) files
Building downwash	Considered	Buildings present on the site that could reasonably cause plume downwash were included in the analyses through the use of the BPIP-PRIME program
Receptor Grid	Grid 1	25-meter spacing along the property boundary out 100 meters
	Grid 2	100-meter spacing out to 1,000 meters
	Grid 3	500-meter spacing out to 5,000 meters

3.1.2 Modeling protocol and Methodology

Refined air impact analyses were performed by CH2M. A modeling protocol was submitted to DEQ prior to the application and DEQ provided conditional approval of the protocol to CH2M. Modeling was generally conducted using data and methods described in the protocol and/or in the *State of Idaho Air Quality Modeling Guideline.*

3.1.3 Model Selection

Idaho Air Rules Section 202.03 require that estimates of ambient concentrations be based on air quality models specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models). The refined, steady state, multiple source, Gaussian dispersion model AERMOD was promulgated as the replacement model for ISCST3 in December 2005. EPA provided a 1-year transition period during which either ISCST3 or AERMOD could be used at the discretion of the permitting agency. AERMOD must be used for all air impact analyses, performed in support of air quality permitting, conducted after November 2006.

AERMOD retains the single straight line trajectory of ISCST3, but includes more advanced algorithms to assess turbulent mixing processes in the planetary boundary layer for both convective and stable stratified layers.

AERMOD offers the following improvements over ISCST3:

- Improved dispersion in the convective boundary layer and the stable boundary layer
- Improved plume rise and buoyancy calculations
- Improved treatment of terrain affects on dispersion
- New vertical profiles of wind, turbulence, and temperature

AERMOD was used in the submitted analyses and DEQ verification analyses.

3.1.4 Meteorological Data

Five years of hourly meteorological data collected a National Weather Service tower at the Boise Airport were used in the modeling analyses. These data were preprocessed by DEQ and were provided to CH2M in model-ready format. DEQ has determined these data are reasonably representative meteorological data for use in these dispersion modeling analyses for the Homedale area.

3.1.5 Terrain Effects

Terrain effects on dispersion were considered in the analyses. Receptor elevations and hill heights were obtained by CH2M using AERMAP and Digital Elevation Model (DEM) 7.5-minute files. DEQ verification analyses were performed without considering affects from terrain. The area is relatively flat with regard to affects on pollutant dispersion. DEQ's verification analyses were performed to address an ambient air boundary issue on property leased from Filler King. Elevation changes on this property were minimal; therefore, to minimize use of DEQ resources, elevations of receptors on this property were not determined.

3.1.6 Building Downwash

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

3.1.7 Ambient Air Boundary

CH2M used the facility's fenceline as the ambient air boundary for much of the site. DEQ modeling staff learned, during the modeling review, that part of the Filler King property was leased to a retail building materials business. The regulatory interpretation of "ambient air" requires that all areas not under the direct control of the applicant be considered as ambient air. Property leased to another business is not under direct control, is considered as ambient air, and pollutant concentrations on such property must be evaluated for compliance with air quality standards.

DEQ obtained coordinates for the boundary of the leased property and adjusted the ambient air boundary accordingly. DEQ assumed reasonable measures will be taken by the facility to preclude public access to the property, excluding the property leased.

3.1.8 Receptor Network

Table 4 describes the receptor grid used in the submitted analyses. The receptor grid met the minimum recommendations specified in the *State of Idaho Air Quality Modeling Guideline*. DEQ determined this grid assured maximum impacts were reasonably resolved by the model. DEQ verification analyses were performed using 10-meter grid spacing out to 50 meters, 25-meter grid spacing out to 200 meters, and 50-meter grid spacing out to 500 meters.

3.2 Emission Rates

Emissions rates used in the modeling analyses for the proposed project were equal to those presented in other sections of the permit application or the DEQ Statement of Basis.

3.2.1 Criteria Pollutant Emissions Rates

Table 5 provides criteria pollutant emissions rates for the facility. The Filler King PTC application resolves past permitting violations. The wood stoves were not included in the submitted modeling analyses. CH2M indicated they were excluded because of their size. However, upon review of the emissions inventory it appeared these sources were not inconsequential compared to other sources at the facility.

Emissions from the fire pump were also excluded from the modeling analyses. This source only operates a maximum of 10 hours per year and two hours per test. DEQ determined impacts from such a source would be negligible, given the magnitude of emissions and infrequent operational schedule.

Emissions of NOx, SO_2, and CO were well below DEQ modeling thresholds established in the DEQ *State of Idaho Air Modeling Guideline*. Annual and 24-hour emissions of PM_{10} were above the threshold identified as a trigger for requiring a site-specific air impact analysis for the proposed project, and CH2M submitted PM_{10} impact analyses.

DEQ has also developed secondary thresholds that can be used on a case-by-case basis, considering the characteristics of the facility and the specific sources modeled. The secondary thresholds for PM_{10} were established at 0.9 pounds per hour for the 24-hour standard and 7 tons per year for the annual standard using generic modeling analyses with parameters that are conservative in most cases. These project-specific thresholds were established to assure impacts are below the significant contribution level of 5.0

$\mu g/m^3$ for the 24-hour standard and 1.0 $\mu g/m^3$ for the annual standard. A significant impact would trigger a cumulative NAAQS analysis, including facility-wide emissions and background concentrations.

Total facility-wide PM_{10} emissions at the Filler King facility are at about 0.96 pounds per hour and 1.7 tons per year. Since facility-wide 24-hour emissions are only slightly above the level assuring impacts are below significance levels, it is reasonably certain that facility-wide emissions of 0.96 lb/hr, when combined with background concentrations, will not cause a violation of the 24-hour PM_{10} NAAQS.

Table 5. PM_{10}[a] EMISSIONS RATES USED FOR AIR IMPACT MODELING

Emissions Point	Description	24-Hour (lb/hr)	Annual (ton/yr)
BAGHOUSE	Bag House	0.0124	0.01
BEAMCYC	Beam Plant Cyclone	0.2240	0.39
DECKCYC	Deck Plant Cyclone	0.15	0.18
BEAMBIN	Beam Plant Bin	5.55E-4	0.0002
DECKBIN	Deck Plant Bin	2.30E-5	0.00001
STOVE1[b]	Wood Stove No. 1	0.191	0.35
STOVE2[b]	Wood Stove No. 2	0.191	0.35
STOVE3[b]	Wood Stove No. 3	0.191	0.35

[a] Particulate matter with an aerodynamic diameter less than or equal to a nominal ten micrometers
[b] Not included in submitted analyses

3.2.2 TAP Emissions Rates

TAP emissions regulations under Idaho Air Rules Section 220 are only applicable for new or modified sources constructed before July 1, 1995. The submitted application specified those sources subject to TAPs review and these were verified by the DEQ permit writer. Table 6 provides TAP emissions for those sources where emissions from applicable sources exceeded AACs/AACCs. Formaldehyde was the only TAP requiring modeling to demonstrate compliance with AACCs.

Table 6. EMISSIONS RATES USED FOR TAPS IMPACT MODELING

Emissions Source	Emissions Rates (lb/hr)
	Formaldehyde
BEAMCYC	0.0913[a]
DECKCYC	0.0142[b]

[a] Annualized value based on 0.2 lb/hr for 4680 hr/year
[b] Annualized value based on 0.1 lb/hr for 2340 hr/year

3.3 Emission Release Parameters

Table 7 provides emissions release parameters used in the modeling analyses, including stack height, stack diameter, exhaust temperature, and exhaust velocity. All parameters appear to be within reasonably expected ranges, considering the type of sources.

Table 7. EMISSIONS RELEASE PARAMETERS					
Point Sources					
Release Point /Location	**Source Type**	**Stack Height (m)[a]**	**Modeled Diameter (m)**	**Stack Gas Temp. (K)[b]**	**Stack Gas Flow Velocity (m/sec)[c]**
BAGHOUSE	vertical	3.7	0.43	305	19.6
BEAMCYC	vertical	8.5	0.61	297	21.0
DECKCYC	capped	8.5	0.91	297	0.001[d]
STOVE1[e]	vertical	7.3	0.30	450	0.65
STOVE2[e]	vertical	7.3	0.30	450	0.65
STOVE3[e]	vertical	7.3	0.30	450	0.65
Volume Sources					
Release Point /Location	**Source Type**	**Release Height (m)**	**Initial Horizontal Dispersion Coefficient σ_{y0} (m)**	**Initial Vertical Dispersion Coefficient σ_{z0} (m)**	
BEAMBIN	volume	2.44	0.47	1.13	
DECKBIN	volume	2.44	0.47	1.13	

[a]Meters
[b]Kelvin
[c]Meters per second
[d]Rain-capped source – flow set to 0.001 m/sec to minimize model calculated plume momentum flux
[e]Not included in submitted analyses

3.4 Results for Full NAAQS Impact Analyses

CH2M performed a cumulative NAAQS impact analyses to evaluate compliance with PM_{10} NAAQS. Results of the cumulative NAAQS impact analyses are provided in Table 8.

Table 8. RESULTS FOR CUMULATIVE IMPACT ANALYSES						
Pollutant	**Averaging Period**	**Maximum Modeled Concentration[a] ($\mu g/m^3$)[b]**	**Background Concentration ($\mu g/m^3$)**	**Total Ambient Impact ($\mu g/m^3$)**	**NAAQS[c] ($\mu g/m^3$)**	**Percent of NAAQS**
PM_{10}[d]	24-hour[e]	4.06	81	85.06	150	57
	Annual[f]	0.52	27	27.52	50	55

[a]Values in parentheses were obtained through DEQ verification modeling
[b]Micrograms per cubic meter.
[c]National ambient air quality standards
[d]Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
[e]Modeled design values are the maximum 6th highest modeled value from a 5-year meteorological data set
[f]Modeled design values are the maximum 1st highest modeled value from a 5-year meteorological data set

The submitted PM_{10} modeling analyses did not account for emissions from the woodstoves, which are a substantial portion of facility-wide PM_{10} emissions. Therefore, impacts may be under-estimated. DEQ is reasonably confident, after reviewing the analyses and supporting information, that both 24-hour and annual PM_{10} impacts from facility-wide emissions will not cause or significantly contribute to a violation of the NAAQS. This conclusion was based on the following:

- Facility-wide annual PM_{10} emissions are below secondary modeling threshold, which was established to assure impacts are below significance levels of 1.0 ug/m^3. With a background annual PM_{10} concentration of 27 ug/m^3, an impact of 23 ug/m^3 would be needed to violate the NAAQS.

- Facility-wide 24-hour PM_{10} emissions are slightly above the secondary modeling threshold; therefore, DEQ can be reasonably assured that impacts are less than "slightly above" the significance level of 5.0 ug/m^3. With a background 24-hour PM_{10} concentration of 81 ug/m^3, an impact of 69 ug/m^3 would be needed to violate the NAAQS. It is very unlikely that Filler King's emissions would cause impacts that much greater than the significance level.

- Modeling submitted with the application (without the woodstoves) indicated impacts were below the significant contribution levels.

- Emissions from the woodstoves are relatively hot and the plume will have substantial thermal buoyancy. Since maximum modeled impacts are observed in model results for wintertime conditions, the temperature difference between the plume and ambient air will further increase the plume buoyancy and reduce fenceline impacts from these sources.

3.5 Results for TAPs Analyses

CH2M performed TAPs impact analyses to evaluate compliance with applicable increments for those TAPs having emissions above screening levels of Idaho Air Rules Section 585 and 586. TAPs from the woodstoves were not included in the analyses because they were in operation before the promulgation of TAPs rules (1994), and were not part of the modification that triggered permitting requirements.

Formaldehyde emissions were the only TAP having emissions greater than the screening emissions levels (ELs) of either Idaho Air Rules Section 585 or 586. Modeled impacts of formaldehyde exceeded the AACC increment and Filler King submitted a T-RACT analysis for formaldehyde. DEQ determined T-RACT was being used for formaldehyde emissions, thereby allowing impacts of up to 10 times the AACC.

Table 9 provides modeling results for formaldehyde. DEQ performed verification analyses because an area of ambient air was excluded from the analyses, as indicated in Section 3.1.7 of the memorandum. DEQ added receptors in the area leased to a retail business and tightened the receptor spacing in other areas. DEQ's results were very close to those obtained from CH2M, and both demonstrate compliance with applicable increments if T-RACT is used to control emissions.

Table 9. RESULTS FOR TAP IMPACT ANALYSES

Pollutant	Averaging Period	Modeled Impact[a] (µg/m^3)[b]	AAC/AACC[c] (µg/m^3)
Formaldehyde	Annual	0.47 (0.52)	0.077

[a]Values in parentheses are those obtained from DEQ's verification analysis
[b]Micrograms per cubic meter
[c]Defined in Idaho Air Rules Section 585 and 586

4.0 Conclusions

The ambient air impact analyses demonstrated to DEQ's satisfaction that emissions from the facility will not cause or significantly contribute to a violation of any air quality standard.