

STATE OF MISSOURI  
DEPARTMENT OF NATURAL RESOURCES

Matt Blunt, Governor • Doyle Childers, Director

www.dnr.mo.gov

APR 26 2007

Mr. Martin J. Kasper  
Environmental Specialist  
University of Missouri – Columbia  
Campus Facilities/Energy Management  
417 South Fifth Street  
Columbia, MO 65211-2030

Re: New Source Review Temporary Permit Request – Project Number: 2007-02-061  
Installation ID Number: 019-0004  
Temporary Permit Number: 042007-019  
Expiration Date: May 1, 2009

Dear Mr. Kasper:

The Missouri Department of Natural Resources' Air Pollution Control Program has completed a review of your request to temporarily burn biomass fuels in your boiler. The Air Pollution Control Program is hereby granting your request to conduct these temporary operations at this location according to Missouri State Rule 10 CSR 10-6.060(3). Permission to conduct the above activities is hereby granted provided that no more than 7,500 tons of solid during each year of this trial is burned in the boilers.

The University of Missouri Power Plant proposes to burn up to 7,500 tons of solid biofuels for each year of the trials in order to assess the functionality of burning biomass fuels in their coal-fired boilers and gain experience with material handling and general combustion issues. The biofuel will consist of some combination of corn stover, chipped/ground wood, paper pellets, switchgrass, and dried distiller grains. This amount of biofuel will replace approximately 20% of the solid fuel content by mass (approximately 15% by heat input). Existing equipment will be used during the trial evaluation. The usage of the biomass fuel is not expected to change or cause an increase in design capacity of the boiler and the raw material handling/processing operations. An accurate record of the total amount of biomass fuel combusted in the boiler shall be maintained for not less than five years.

There are currently no emission factors available for the introduction of biomass fuel into the boiler except for those of chipped wood. These emission factors were obtained from Environmental Protection Agency document AP-42, *Compilation of Air Pollutant*

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*Emission Factors*, Fifth Edition, Section 1.6, *Wood Residue Combustion in Boilers (9/03)* and the emissions for burning 7,500 tons of chipped ground wood is shown in Table 1.

Table 1: Emissions based on 7,500 tons of wood consumed per year

	PM <sub>10</sub>	Sulfur Oxides	Nitrogen Oxides	Carbon Monoxide	VOC*	HAPs
Potential Emissions	25.65	1.78	34.91	42.75	1.21	2.60

\*VOC = Volatile Organic Compound

Emissions for all pollutants from the burning of other type of biofuels are expected to be similar or less than emissions from burning the chipped/ground wood except for possibly particulate matter emissions. Table 2 lists some of the key characteristics of the proposed biofuels as well as bituminous coals.

Table 2: Fuel Characteristics

Biomass Fuel	Moisture (%)	Ash (%)	Sulfur (%)	HHV (BTU/lb)
Corn Stover	12 – 18	1.0 – 6.5	0.0 – 0.6	7,400 – 8,000
Chipped/Ground Wood	15 – 20	0.5 – 2.0	0.0 – 0.7	8,000 – 9,500
Paper Pellets	8 – 12	5.0 – 7.0	0.1 – 0.2	7,000 – 8,000
Switchgrass	25 – 30	6.0 – 8.0	0.05 – 0.2	7,000 – 8,000
Dried Distiller Grains	8 – 15	5.0 – 7.0	0.1 – 0.2	7,500 – 9,000
Bituminous Coal	2.2 – 15.9	3.3 – 11.7	0.7 – 4.0	10,500 – 15,000

The ash content for chipped/ground wood is 0.5 to 2.0% as compared to 6 to 8% for switchgrass. Estimating particulate matter less than 10 microns in diameter for switchgrass is based on the ratio of ash content of chipped wood to switchgrass and subtracting the emissions from the coal that is replaced by the biofuel results in PM<sub>10</sub> emissions well below the required 100 tons per year for temporary permits. Since all pollutants are expected to have emissions below 100 tons per year, permission to temporarily burn the biofuels is granted up to the expiration date stated above. In order to continue burning the biofuels past the expiration date, the University of Missouri Power Plant will need to seek permission from the Air Pollution Control Program.

You are still obligated to meet all applicable air pollution control rules, Department of Natural Resources' rules, or any other applicable federal, state, or local agency

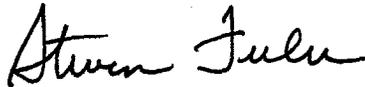
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regulations. Specifically, you should avoid violating 10 CSR 10-6.170, *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*; 10 CSR 10-6.220, *Restriction of Emission of Visible Air Contaminants*; 10-3.030, *Open Burning Restriction*; and 10 CSR 10-3.090, *Restriction of Emission of Odors*.

A copy of this letter should be kept on-site and be made immediately available to Department of Natural Resources' personnel upon request. If you have any questions regarding this temporary permit, please contact Susan Heckenkamp at the Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102 or by telephone at (573) 751-4817. Thank you for your time and attention to this matter.

Sincerely,

AIR POLLUTION CONTROL PROGRAM



for James L. Kavanaugh  
Director

JLK:shl

Attachment

c: Mr. Steve Feeler, Compliance/Enforcement Section  
Southeast Regional Office  
PAMS File 2007-02-061

