

PERMIT BOOK

STATE OF MISSOURI



DEPARTMENT OF NATURAL RESOURCES

MISSOURI AIR CONSERVATION COMMISSION

PERMIT TO CONSTRUCT

Under the authority of RSMo 643 and the Federal Clean Air Act the applicant is authorized to construct the air contaminant source(s) described below, in accordance with the laws, rules and conditions as set forth herein.

Permit Number: **05 2 0 1 0 - 0 1 2** Project Number: 2009-11-024

Parent Company: LG Biomass Missouri LLC

Parent Company Address: 500 Dallas St., Level 31, Houston, TX 77002

Installation Name: Perryville Renewable Energy Center

Installation Number: 157-0043

Installation Address: 393 Highway V, Perryville, MO 63775

Location Information: Perry County, S12, T35N, R10E

Application for Authority to Construct was made for:
Construction of a 32.5 MW (nominal) biomass fired renewable energy power generating plant. This review was conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*.

Standard Conditions (on reverse) are applicable to this permit.

Standard Conditions (on reverse) and Special Conditions are applicable to this permit.

MAY 14 2010

EFFECTIVE DATE

A handwritten signature in black ink, appearing to read "James K. Kawamura".

DIRECTOR OR DESIGNEE
DEPARTMENT OF NATURAL RESOURCES

STANDARD CONDITIONS:

Permission to construct may be revoked if you fail to begin construction or modification within two years from the effective date of this permit. Permittee should notify the Air Pollution Control Program if construction or modification is not started within two years after the effective date of this permit, or if construction or modification is suspended for one year or more.

You will be in violation of 10 CSR 10-6.060 if you fail to adhere to the specifications and conditions listed in your application, this permit and the project review. In the event that there is a discrepancy between the permit application and this permit, the conditions of this permit shall take precedence. Specifically, all air contaminant control devices shall be operated and maintained as specified in the application, associated plans and specifications.

You must notify the Departments' Air Pollution Control Program of the anticipated date of start up of this (these) air contaminant source(s). The information must be made available within 30 days of actual startup. Also, you must notify the Department of Natural Resources Regional office responsible for the area within which you are located within 15 days after the actual start up of this (these) air contaminant source(s).

A copy of this permit and permit review shall be kept at the installation address and shall be made available to Department of Natural Resources' personnel upon request.

You may appeal this permit or any of the listed special conditions to the Administrative Hearing Commission (AHC), P.O. Box 1557, Jefferson City, MO 65102, as provided in RSMo 643.075.6 and 621.250.3. If you choose to appeal, you must file a petition with the AHC within 30 days after the date this decision was mailed or the date it was delivered, whichever date was earlier. If any such petition is sent by registered mail or certified mail, it will be deemed filed on the date it is mailed. If it is sent by any method other than registered mail or certified mail, it will be deemed filed on the date it is received by the AHC.

If you choose not to appeal, this certificate, the project review and your application and associated correspondence constitutes your permit to construct. The permit allows you to construct and operate your air contaminant source(s), but in no way relieves you of your obligation to comply with all applicable provisions of the Missouri Air Conservation Law, regulations of the Missouri Department of Natural Resources and other applicable federal, state and local laws and ordinances.

The Air Pollution Control Program invites your questions regarding this air pollution permit. Please contact the Construction Permit Unit at (573) 751-4817. If you prefer to write, please address your correspondence to the Missouri Department of Natural Resources, Air Pollution Control Program, P.O. Box 176, Jefferson City, MO 65102-0176, attention: Construction Permit Unit.

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SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

The special conditions listed in this permit were included based on the authority granted the Missouri Air Pollution Control Program by the Missouri Air Conservation Law (specifically 643.075) and by the Missouri Rules listed in Title 10, Division 10 of the Code of State Regulations (specifically 10 CSR 10-6.060). For specific details regarding conditions, see 10 CSR 10-6.060 paragraph (12)(A)10. "Conditions required by permitting authority."

Perryville Renewable Energy Center
Perry County, S12, T35N, R10E

1. Biomass-Fired Boiler (Emission Unit 1) - Specifications, Operating Limits and Emission Limits
 - A. Heat input to the main boiler shall not exceed 480 million British thermal units per hour (MMBtu/hr).
 - B. The boiler shall not use more than 412 million cubic feet (MMcf) per year of natural gas.
 - C. The boiler shall use no other fuels other than the biomass listed below and natural gas without receiving prior written authorization from the Air Pollution Control Program. The boiler shall be fired with biomass as the primary fuel.
 - (1) Acceptable biomass fuel categories include:
 - (a) Wood waste and associated incidental soils and leaves including: Tree and forest-related resources, including mill residues, harvesting residues, tree chips, thinning and trimming debris; orchard tree crops and prunings; vineyard prunings; solid wood waste materials, including waste pallets, crates, dunnage, other wood waste that are untreated, unstained, and unpainted; wood waste from land clearing; wood waste from right-of-way clearing; and other woody crop by-products or residues.
 - (b) Agricultural material, including grain, switch grass, corn stover, and other crop by-products or residues,
 - (c) A blend of any of the above fuels.
 - (2) Unacceptable biomass fuels include, but are not limited to:
 - (a) Peat
 - (b) Waste oil
 - (c) Farm chemicals
 - (d) Pesticide containers
 - (e) Contaminated soil*
 - (f) Demolition waste, except for untreated/unstained/unpainted clean wood,

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- (g) Treated wood (chromated copper arsenate[CCA], pentachlorophenol [PCP], painted and stained)
- (h) Fiberboard
- (i) Contaminated feedstock*
- (j) Contaminated agricultural grains*
- (k) Waste from farms from an open dump
- (l) Tire derived fuel, tires
- (m) Non-agricultural industrial process wastes
- (n) Municipal solid waste

*Contaminated means it is no longer fit for its intended use due to contact with some chemical.

- (3) All biomass shall have an ash content of less than 5.75% by weight.
- (4) If absorbent injection is not needed for control of hydrogen chloride emissions, all biomass shall have a chlorine content less than the content used to demonstrate compliance as per Special Condition 1.G(3).

D. The following controls will be utilized to reduce emissions from the the biomass-fired boiler (EU 1). EU 1 shall effectively operate:

- (1) Fabric filtration system (baghouse) for the control of filterable particulate matter less than ten (10) microns in diameter (filterable PM₁₀), filterable particulate matter (PM) and hydrogen chloride (HCl) emissions.
- (2) Selective Non-Catalytic Reduction (SNCR) for the control of nitrogen oxide (NO_x) emissions, as necessary to comply with Special Condition 1.E(1).
- (3) An alkaline sorbent injection system for the control of HCl emissions, as necessary to comply with Special Condition 1.E(3).

E. Perryville Renewable Energy Center shall not discharge the following pollutants into the atmosphere from the biomass-fired boiler (EU 1) in excess of the listed amounts:

- (1) Perryville Renewable Energy Center shall emit less than 54.7 pounds per hour of nitrogen oxides (NO_x) from the biomass-fired boiler.
- (2) Perryville Renewable Energy Center shall emit less than 39.8 pounds per hour of sulfur dioxide (SO₂) from the biomass-fired boiler.
- (3) Perryville Renewable Energy Center shall emit less than ten (10.0) tons of hydrogen chloride from the biomass-fired boiler in any consecutive 12-month period.

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- (4) Perryville Renewable Energy Center shall not discharge the following pollutants into the atmosphere in excess of the listed amounts:
 - (a) PM₁₀ filterable – 14.4 pounds per hour
 - (b) PM condensable – 8.16 pounds per hour
 - (c) Carbon monoxide (CO) – 51.4 pounds per hour
 - (5) Perryville Renewable Energy Center shall emit less than 0.232 pounds of 2,3,7,8-tetrachlorodibenzo-p-dioxins (TCDD) toxic equivalents (TEQ) from the biomass-fired boiler in any consecutive 12-month period.
- F. Continuous Emission Monitoring System (CEMS)/Continuous Opacity Monitoring System (COMS) – Biomass Boiler (EU 1)
- (1) Compliance with the NO_x and SO₂ emission limits given in Special Condition 1.E(1) and 1.E(2) for the biomass boiler shall be demonstrated through the use of CEMS.
 - (2) In the event that Perryville Renewable Energy Center installs the optional CO CEMS, compliance with the CO emission limit given in 1.E(4)(c) shall be demonstrated through the use of the CO CEMS.
 - (3) Perryville Renewable Energy Center shall install, certify, operate, calibrate, test and maintain all applicable CEMS, as well as any necessary auxiliary monitoring equipment, in accordance with all applicable regulations. If there are conflicting regulatory requirements, the more stringent shall apply. In addition, Perryville Renewable Energy Center shall effectively quality control and quality assure all applicable CEMS in accordance with 40 CFR Part 60, Appendix F.
 - (4) Perryville Renewable Energy Center shall install and operate a data acquisition and handling system to calculate emissions in terms of the emission limitations specified in this permit.
 - (5) After the initial performance testing as required in Special Condition 1.G, continued compliance with the PM₁₀ limits given in Special Condition 1.E(4)(a) and 1.E(4)(b) for the biomass boiler shall be demonstrated through the use of COMS.
 - (6) Perryville Renewable Energy Center shall install, certify, operate, calibrate, test and maintain COMS for opacity in accordance with all applicable regulations. If there are conflicting regulatory requirements, the more stringent shall apply.
 - (7) Perryville Renewable Energy Center shall maintain a record of emission verification data for all applicable pieces of equipment including CEMS and COMS data.

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G. Compliance Testing

- (1) An initial performance test shall be conducted for each biomass fuel category in Special Condition 1.C(1) or blends of biomass fuel categories in Special Condition 1.C(1) in order to establish emission factors for aggregate HAPs and individual HAP in pounds per ton and pounds per MMBtu from the biomass boiler stack (EU 1). The emission factor for hydrogen chloride and 2,3,7,8-tetrachlorodibenzo-p-dioxins (TCDD) toxic equivalents (TEQ) established in the performance testing shall be used in Attachment A in order to show compliance with special conditions 1.E(3) and 1.E(5). Testing for a previously untested biomass fuel category in Special Condition 1.C(1) or blends of biomass fuel categories in Special Condition 1.C(1) shall be conducted within 90 days of burning such biomass fuel category or biomass fuel categories and results will be submitted to the Permits Section of the Air Pollution Control Program for review and approval. Approval shall specify the maximum percentage of each biomass fuel category that may be used in any blend. Thereafter, the approved category may be in a blend at a percentage up to the approved percentage.
- (2) The following HAPs shall be quantified in order to establish emission factors as required by Special Condition 1.G(1) and verify that aggregate HAPs are below 25.0 tons per year:
 - (a) Acetaldehyde
 - (b) Benzene
 - (c) Carbon Disulfide
 - (d) Chlorine
 - (e) Dichloromethane
 - (f) Formaldehyde
 - (g) Hydrogen Chloride (HCl)
 - (h) Manganese
 - (i) Methanol
 - (j) Polycyclic organic matter (POM)
- (3) Testing for hydrogen chloride shall be conducted with sorbent injection and without sorbent injection in accordance with Special Condition 1.G(1). If testing for hydrogen chloride without sorbent injection results in emissions at or below 8.0 tons on an annual basis, no additional initial testing is required. However, the chlorine content at which testing was conducted shall become the maximum chlorine content allowable to be burned. If testing for hydrogen chloride without sorbent injection results in emissions in excess of

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8.0 tons on an annual basis, Perryville Renewable Energy Center shall be required to use sorbent injection. During testing with sorbent injection, Perryville Renewable Energy Center shall develop a curve of sorbent injection amount to heat input to the boiler in order to assess how much sorbent is needed to ensure that hydrogen chloride emissions remain below 10.0 tons per year as required by Special Condition 1.E(3).

- (4) An initial performance test shall be conducted for each biomass fuel category in Special Condition 1.C(1) or blends of biomass fuel categories in Special Condition 1.C(1) in order to verify that the filterable and condensable emission rates listed in 1.E(4)(a) and 1.E(4)(b) are not exceeded from the biomass boiler stack (EU 1). In addition, testing shall be conducted on direct particulate matter less than 2.5 microns in diameter (PM_{2.5}). Testing for a previously untested biomass fuel category in Special Condition 1.C(1) or blends of biomass fuel categories in Special Condition 1.C(1) shall be conducted within 90 days of burning such biomass fuel category or biomass fuel categories and results will be submitted to the Permits Section of the Air Pollution Control Program for review and approval. Approval shall specify the maximum percentage of each biomass fuel category that may be used in any blend. Thereafter, the approved category may be in a blend at a percentage up to the approved percentage.
- (5) An initial performance test shall be conducted for each biomass fuel category in Special Condition 1.C(1) or blends of biomass fuel categories in Special Condition 1.C(1) in order to verify that the CO emission rate listed in 1.E(4)(c) is not exceeded from the biomass boiler (EU 1) stack. The Perryville Renewable Energy Center shall conduct CO stack testing every five (5) years for each category or category blend in order to verify continued compliance with Special Condition 1.E(4)(c). Testing for a previously untested biomass fuel category in Special Condition 1.C(1) or blends of biomass fuel categories in Special Condition 1.C(1) shall be conducted within 90 days of burning such biomass fuel category or biomass fuel categories and results will be submitted to the Permits Section of the Air Pollution Control Program for review and approval. Approval shall specify the maximum percentage of each biomass fuel category that may be used in any blend. Thereafter, the approved category may be in a blend at a percentage up to the approved percentage.

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- (6) Optional: The Perryville Renewable Energy Center may install a CO CEMS to show compliance with the CO emission limit given in Special Condition 1.E(4)(c). In the event that the Perryville Renewable Energy Center installs a CO CEMS, performance testing for CO as required by Special Condition 1.G(5) will not be required.
- (7) In order to obtain a waiver from all or a portion of compliance testing, the Perryville Renewable Energy Center may submit an emissions analysis to the Department of Natural Resources. The analysis must contain sufficient documentation to show compliance with the emissions limits and/or rates specified in Special Condition 1.E while burning a new biomass fuel category in Special Condition 1.C(1) or blends of biomass fuel categories in Special Condition 1.C(1). Upon review of the supplied documentation, the Department will provide written authorization in the event that they agree with the assessment provided. The emissions analysis documentation shall include at minimum the following:
 - (a) An analysis of the category of biomass fuel including at minimum: moisture content, ash content, higher heating value, sulfur content, and chlorine content;
 - (b) An analysis of expected potential emissions from each pollutant that is required to be tested. Testing, studies or other resources may be used to make the justification for the proposed potential emissions.
 - (c) Optional: A mass balance method approved by the Department of Natural Resources showing compliance may be used in lieu of testing.
- (8) Optional: Perryville Renewable Energy Center may establish an emissions profile for each specific HAP and filterable PM₁₀. To establish the emission profile, Perryville Renewable Energy Center shall conduct a minimum of one stack test in accordance to Special Condition 1.G(1) and 1.G(4). The stack test shall consist of three separate test runs in order to establish the emissions profile. Upon initial approval by the Enforcement Section of the Air pollution Control Program, and based upon the stack testing, the profile may be used to show continued compliance with Special Condition 1.E(3) and 1.E(4)(a).

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- H. Additional Monitoring and Recordkeeping
 - (1) Perryville Renewable Energy Center shall maintain a record of fuel input to the biomass boiler (EU 1) which shall include, at minimum, the following:
 - (a) An analysis of higher heating value, ash, chlorine content and moisture content of the fuel that is delivered to the installation. Compliance with this condition may be demonstrated by recording the analytical results from the fuel supplier or Perryville Renewable Energy Center from truck delivered material or by the supplier at the source. A minimum of two samples per month shall be collected.
 - (b) The heat content calculated as part of CEMS reporting shall be used to demonstrate compliance with Special Condition 1.A.
 - (c) The amount and category of biomass being combusted for demonstrating compliance with Special Condition 1.C. The use of the delivery source description from truck deliveries shall be adequate to demonstrate compliance.
 - (2) Perryville Renewable Energy Center shall maintain a record of natural gas used in the biomass boiler to demonstrate compliance with Special Condition 1.B.
 - (3) Perryville Renewable Energy Center shall maintain an operational log, which shall detail each startup, shutdown, and malfunction of the biomass boiler (EU 1) and associated pollution control systems. This operational log shall include a running total of the hours per year the biomass boiler is on-line.
 - (4) Perryville Renewable Energy Center shall maintain inspection, maintenance, and repair log(s) for the biomass boiler and associated pollution control systems.
 - (5) Attachment A or equivalent forms approved by the Air Pollution Control Program shall be used to demonstrate compliance with Special Conditions 1.E(3) and 1.E(5).
 - (6) If required, Perryville Renewable Energy Center shall maintain a record of sorbent injection rates to the biomass boiler along with the heat input to sorbent amount curve established during testing.
- 2. Wood Processing Building (EU 2a) – Control Device Requirements
 - A. Perryville Renewable Energy Center shall control emissions from the wood processing building (EU 2a) using a vent filter.
 - B. The vent filter shall be operated and maintained in accordance with the

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manufacturer's specifications. The vent filter shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that the Department of Natural Resource employees may easily observe them.

- C. Replacement filters for the vent filter shall be kept on hand at all times. The filters shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
 - D. Monitoring and Recordkeeping
 - (1) During operation, Perryville Renewable Energy Center shall monitor and record the operating pressure drop across the vent filter at least once every 24 hours. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.
 - (2) Perryville Renewable Energy Center shall maintain an operating and maintenance log for the vent filters which shall include the following:
 - (a) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - (b) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
 - (c) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.
3. Wood Storage Piles (EU 3) - Visible Emissions
- A. The wood storage piles shall be maintained such that no visible emissions occur from these sources due to wind erosion.
 - B. Monitoring and Recordkeeping
 - (1) Perryville Renewable Energy Center shall conduct a visual inspection of the storage piles at least once a day to ensure compliance with Special Condition 3.A. A record shall be maintained acknowledging that the wood storage pile have been observed.
 - (2) If wind erosion emissions from these sources are observed, then Perryville Renewable Energy Center shall either
 - (a) Develop, implement and maintain a Fugitive Dust Control Plan to control the emissions from the storage piles to insure compliance with Special Condition 3.A within 30 days of

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The permittee is authorized to construct and operate subject to the following special conditions:

observance of visible emissions. Perryville Renewable Energy Center shall implement any such plan immediately upon its approval by the Director. The plan shall contain at minimum the following components:

1. Methods for eliminating visible emissions,
 2. A daily survey of the storage piles to determine if visible emissions are being generated and are leaving the property.
 3. A daily log of all maintenance, corrective actions and observations from the surveys, or
- (b) Perryville Renewable Energy Center must amend the permit to account for wind erosion emissions from the storage pile and submit new modeling showing compliance. The amendment must be submitted within 60 days of observance of visible emissions from the storage piles.

4. Material Handling Silos (EU 4, EU 6, EU 11, EU 12a and EU 12b) - Specifications, Operating Limits and Emission Limits

- A. Perryville Renewable Energy Center shall control PM₁₀ emissions from the emission units listed in Table 1 by enclosing and venting each PM₁₀ point source listed in Table 1 to a vent filter. The enclosures of the emissions units shall be constructed and maintained such that no visible emissions are allowed to occur from these sources except through the gases exiting from the vent filter. The vent filters shall be operated and maintained in accordance with the manufacturer's specifications.

Table 1: Material Handling Point Sources Requiring PM₁₀ Control

ID #	Description	Annual Hours of Operation	Maximum Flowrate (acfm)	Grain Loadout (grains/acf)
EU 04	Bed Sand Silo Vent Filter	58	1,500	0.01
EU 06	Ash Silo Vent Filter	N/A	1,500	0.01
EU 11	HCl Reagent Silo Vent Filter	44	1,500	0.02
EU 12a	Mechanical Exhuaster	N/A	2,000	N/A
EU 12b	Mechanical Exhuaster	N/A	2,000	N/A

(1) *acfm = actual cubic feet per minute, N/A = not applicable

- B. Perryville Renewable Energy Center shall not emit more than 0.010 grains per dry actual cubic foot (gr/acf) of filterable PM₁₀ from EU 4 and EU 6 and 0.020 gr/acf from EU 11 as listed in Table 1. Verification of grain loading as specified in Table 1 shall be by manufacturer's guarantee and shall be kept on site and made readily available to Department of Natural Resources' employees upon request.

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The permittee is authorized to construct and operate subject to the following special conditions:

- C. Perryville Renewable Energy Center shall not exceed the flowrate to the control device for any emission point listed in Table 1. Verification of the flowrates for each emission unit listed in Table 1 shall be by the manufacturer's maximum design rate and shall be kept onsite and be made readily available to Department of Natural Resources' personnel upon request.
- D. The vent filters shall be equipped with a gauge or meter, which indicates the pressure drop across the control device. These gauges or meters shall be located such that the Department of Natural Resources' employees may easily observe them.
- E. A spare for each vent filter shall be kept on hand at all times to serve as replacement filters. The bags shall be made of fibers appropriate for operating conditions expected to occur (i.e. temperature limits, acidic and alkali resistance, and abrasion resistance).
- F. Perryville Renewable Energy Center shall not receive sand into or unload bed sand from the Bed Sand Silo (EU 4) in excess of 58 hours in any consecutive 12-month period.
- G. Perryville Renewable Energy Center shall not receive HCl reagent into or unload HCl reagent from the HCl Reagent Silo (EU 11) in excess of 44 hours in any consecutive 12-month period.
- H. Initial Compliance Testing
Perryville Renewable Energy Center shall conduct a visible emissions observation using EPA Method 9 of the vent filters in order to verify compliance with Special Condition 4.A. A reading of 7% or less opacity shall indicate compliance.
- I. Monitoring and Recordkeeping
 - (1) Perryville Renewable Energy Center shall develop and maintain a detailed inspection plan for the material handling silos and their associated ducting. A detailed visual inspection of the enclosures listed in Table 1 shall be conducted at least once each week to ensure compliance with Special Condition 4.A. Records shall be maintained of the visual inspections of the material handling system.
 - (2) Perryville Renewable Energy Center shall monitor and record the operating pressure drop across each of the vent filters at least once during each fill operation for EU04, EU06, and EU11. For EU12a

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and 12b, the operator will monitor the operating pressure drop across the fly ash baghouse every 24 hours either manually or electronically in the facility's process control system. The operating pressure drop shall be maintained within the design conditions specified by the manufacturer's performance warranty.

- (3) Perryville Renewable Energy Center shall maintain an operating and maintenance log for the vent filters which shall include the following:
 - (a) Incidents of malfunction, with impact on emissions, duration of event, probable cause, and corrective actions; and
 - (b) Maintenance activities, with inspection schedule, repair actions, and replacements, etc.
 - (c) A written record of regular inspection schedule, the date and results of all inspections including any actions or maintenance activities that result from that inspection.
- (4) Perryville Renewable Energy Center shall maintain a log for the bed sand silo (EU 4) and the HCl Reagent Silo (EU 11) that includes a running total of the hours per year these units are in use.

5. Haul Roads (EU 7a and 7b)- Specifications and Operating Limits

- A. Perryville Renewable Energy Center shall not exceed the following maximum trips per day limits. If any parameters affecting the emission factors for the haul roads change, these daily limits are subject to amendment. The parameters affecting the haul road emission factors include the length of the haul road, surface material silt content, and mean vehicle weight.

Table 2: Daily Truck Haul Frequency

Description	Limit – Trips/Day
Wood Truck Traffic (EU 7a)	63
Ash and HCl Reagent Truck Traffic (EU 7b)	6

- B. Haul road activity is limited to the hours of 7 a.m. to 7 p.m., Monday through Saturday during the winter months of December, January and February with no activity on Sundays. Haul road activity for the spring, summer and fall months are limited to the hours of 6 a.m. to 8 p.m. Monday through Saturday with no activity on Sundays.
- C. Perryville Renewable Energy Center shall pave the wood and ash/HCl haul roads (EU 7a and EU 7b) with materials such as asphalt, concrete, and/or other materials approved by the Air Pollution Control Program. The pavement will be applied in accordance with industry standards for such pavement so as to achieve control of fugitive emissions while the plant is

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- operating.
- D. Maintenance and repair of the road surface will be conducted as necessary to ensure that the physical integrity of the pavement is adequate to achieve control of fugitive emissions from these roads while the plant is operating.
 - E. Perryville Renewable Energy Center shall periodically water, wash and/or otherwise clean all of the paved portions of the haul roads as necessary to achieve control of fugitive emissions from these roads.
 - F. **Monitoring and Recordkeeping**
Perryville Renewable Energy Center shall maintain a daily log of the number of wood trucks and the number of ash and HCl Reagent trucks to demonstrate compliance with Special Condition 5.A.
6. **Cooling Tower (EU 8) - Specifications, Operating Limits and Emission Limits**
- A. The cooling tower shall be operated and maintained in accordance with the manufacturer's specifications. Manufacturer's specifications shall be kept on site and made readily available to Department of Natural Resources' employees.
 - B. The cooling tower shall be equipped with high efficiency drift eliminators that are designed to reduce drift to less than 0.0005 percent of the circulating water flow rate. Verification of drift loss shall be by manufacturer's guaranteed drift loss and shall be kept on site and made readily available to Department of Natural Resources' employees upon request.
 - C. The cooling water circulation rate shall not exceed 2.04 million gallons per hour on a daily average. Verification of the circulation rate shall be by the manufacturer's maximum design rate and shall be kept onsite and be made readily available to Department of Natural Resources' personnel upon request.
 - D. The total dissolved solids (TDS) concentration in the circulated cooling water shall not exceed a TDS concentration of 2,551 parts per million by weight (ppmw). A TDS sample of the circulated cooling water shall be collected weekly to verify the TDS concentration. Following six (6) consecutive months of compliance, sampling shall be allowed on a bi-monthly basis. If at any time, non-compliance is shown, sampling shall return to a weekly basis until six (6) months of further compliance is demonstrated.

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The permittee is authorized to construct and operate subject to the following special conditions:

7. Emergency Generator (EU 9) and Firewater Pump (EU 10) - Specifications, Operating Limits and Emission Limits
 - A. The emergency generator and firewater pump shall be fired with diesel fuel. The sulfur content of the fuel oil shall not exceed 0.015 percent sulfur by weight. No other fuels shall be used without receiving prior written authorization from the Air Pollution Control Program. Perryville Renewable Energy Center shall keep records for each shipment from the fuel vendor including proof of the sulfur content per EPA requirements.
 - B. The emergency generator shall not be operated more than 26 hours per calendar year each and shall be equipped with a non-resettable meter
 - C. The firewater pump shall not be operated more than 26 hours per calendar year each and shall be equipped with a non-resettable meter.
 - D. The emergency generator and fire water pump can only be operated for 30 minutes each day between the hours of 9 a.m. and 11 a.m. in the morning for purposes of testing the emergency equipment.
 - E. Perryville Renewable Energy Center shall meet the requirements of the applicable CI ICE standards by using engines that are certified to meet the applicable standards based on size and model.
 - F. Perryville Renewable Energy Center shall maintain inspection, maintenance, and repair log(s) for the emergency diesel generator and firewater pump.
 - G. Perryville Renewable Energy Center shall maintain a log for the emergency diesel generator and firewater pump which records running total of the hours per year that the emergency diesel generator and firewater pump are in operation.
8. General Compliance Testing
 - A. These tests shall be performed within 60 days after achieving the maximum production rate of the installation, but not later than 180 days after initial start-up for commercial operation and shall be conducted in accordance with the applicable EPA test method for each specified pollutant and the Stack Test Procedures outlined in Special Condition 1.G and 4.H. Testing for previously untested biomass fuel category as specified in Special Condition 1(c)(1) or blends of biomass fuel categories

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The permittee is authorized to construct and operate subject to the following special conditions:

specified in Special Condition 1(c)(1) shall be conducted within 90 days of burning such biomass fuel category or blends of biomass fuel categories.

- B. The date on which performance/certification tests are conducted and the date on which the initial and subsequent stack tests are conducted shall be pre-arranged with the Air Pollution Control Program a minimum of 30 days prior to the proposed test so that a pretest meeting may be arranged if necessary, and to assure that the test date is acceptable for an observer to be present. A completed Proposed Test Plan form (copy enclosed) may serve the purpose of notification and must be approved by the Air Pollution Control Program prior to conducting the required emission testing.
- C. Two (2) copies of a written report of the performance test results shall be submitted to the Director of the Air Pollution Control Program within 30 days of completion of any required testing. The report must include legible copies of the raw data sheets, analytical instrument laboratory data, and complete sample calculations from the required EPA method for at least one (1) sample run.
- D. The test report is to fully account for all operational and emission parameters addressed both in the permit conditions as well as in any other applicable state or federal rules or regulations.
- E. If the performance testing required by the Special Conditions of this permit indicates that any of the emission limits specified in Special Condition 1.E. is being exceeded, Perryville Renewable Energy Center shall evaluate what effects these higher emission rates would have had on the permit applicability of this project. Perryville Renewable Energy Center shall submit the results of any such evaluation in a timely manner to the Enforcement Section of the Air Pollution Control Program. In addition, Perryville Renewable Energy Center shall propose a plan to the Air Pollution Control Program demonstrating how Perryville Renewable Energy Center will reduce the emission rates below those stated in Special Condition 1.E. Perryville Renewable Energy Center shall submit the plan within 30 days of submitting the performance test results and implement any such plan immediately upon its approval by the Director.

Page No.	17
Permit No.	
Project No.	2009-11-024

SPECIAL CONDITIONS:

The permittee is authorized to construct and operate subject to the following special conditions:

9. Pre-Authorization of Additional Biomass Fuel Testing
 - A. Perryville Renewable Energy Center is pre-authorized to conduct test burns of acceptable biomass fuels as stated in Special Condition 1.C(1) for the purposes of testing technical feasibility and developing emission factors.
 - B. The test burn shall not exceed 90 days from the first day the additional biomass fuel is burned in EU 1.
 - C. Perryville Renewable Energy Center shall notify the Enforcement Section of the Air Pollution Control Program of any test burns. Performance testing during test burns shall be conducted in accordance with Special Condition 8.B and 8.C. Records of the amounts and category of biomass fuel burned as well as the dates of the test burns shall be maintained.
10. Recordkeeping and Reporting
 - A. Perryville Renewable Energy Center shall maintain all records required by this permit for not less than 5 years and shall make them available immediately to any Missouri Department of Natural Resources' personnel upon request.
 - B. Perryville Renewable Energy Center shall report to the Air Pollution Control Program's Enforcement Section, P.O. Box 176, Jefferson City, MO 65102, no later than 10 days after the end of the month during which operation of equipment at this installation is not in accordance with any operational limitation or condition established by this permit.
11. Future Modifications
 - A. Any modification to the facility design that could impact the release parameter and/or emission rates must be submitted to the Air Pollution Control Program for review. If the agency determines that the changes are significant, the facility will be required to submit and updated air quality analysis that continues to demonstrate compliance with the NAAQS and increment standards.
 - B. If significant alterations are made to the facility design, Perryville Renewable Energy Center will be required to submit an updated air quality analysis in order to ensure continued compliance with the air quality standards.

REVIEW OF APPLICATION FOR AUTHORITY TO CONSTRUCT AND OPERATE
SECTION (6) REVIEW

Project Number: 2009-11-024
Installation ID Number: 157-0043
Permit Number:

Perryville Renewable Energy Center
393 Highway V
Perryville, MO 63775

Complete: November 12, 2009

Parent Company:
LG Biomass Missouri LLC
500 Dallas St., Level 31
Houston, TX 77002

Perry County, S12, T35N, R10E

REVIEW SUMMARY

- Perryville Renewable Energy Center has applied for authority to construct a 32.5 MW (nominal) biomass fired renewable energy power generating plant.
- Hazardous Air Pollutant (HAP) emissions are expected from combustion of biomass in the biomass-fired bubbling fluidized bed boiler (EU 1). The main HAPs of concern from this process are acetaldehyde, benzene, chlorine, dichloromethane, formaldehyde, n-hexane, hydrogen chloride, manganese, methanol, and polycyclic organic matter.
- 40 CFR 60 Subpart Db, *Standards of Performance for Industrial-Commercial-Institutional Steam Generating Units* applies to the biomass-fired bubbling fluidized bed boiler.
- 40 CFR 60 Subpart IIII, *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines* applies to the diesel-fired emergency generator and the diesel-fired firewater pump.
- 40 CFR Part 63, Subpart ZZZZ, *National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines* applies to the diesel-fired emergency generator and the diesel-fired firewater pump.
- None of the National Emission Standards for Hazardous Air Pollutants (NESHAPs) apply to this installation.
- A baghouse will be used to control particulate and HCl emissions from the bubbling fluidized bed boiler. Selective non-catalytic reduction (SNCR) technology will be used to control NO_x emissions. If needed, as determined by testing, sorbent injection prior to the baghouse will be used to control HCl emissions.

- Bin vent filters will be used to control emissions from the bed sand silo, the HCl reagent silo and the ash silo. A pug mill mixer will be used to condition ash for transport by trucks to an off-site location. Haul roads will be paved and watered to control fugitive particulate emissions.
- This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, Construction Permits Required. Potential emissions of all pollutants are below major source levels.
- This installation is located in Perry County, an attainment area for all criteria pollutants.
- This installation is not on the List of Named Installations found in 10 CSR 10-6.020(3)(B), Table 2. The installation's major source level is 250 tons per year and fugitive emissions are not counted toward major source applicability.
- Ambient air quality modeling was performed to determine the ambient impact of PM₁₀, NO_x, SO₂, CO, acrolein, arsenic, chlorine, manganese, lead, hexavalent chromium, polycyclic organic matter (POM), and dibenzo dioxins and furans.
- Emissions testing is required for the equipment.
- A Part 70 Operating Permit application is required for this installation within 1 year of equipment startup.
- Approval of this permit is recommended with special conditions.

INSTALLATION / PROJECT DESCRIPTION

LG Biomass Missouri, LLC (LGBM) is seeking authority to construct a 32.5 MW net (nominal) renewable power generating plant known as Perryville Renewable Energy Center (PREC) which will use clean (untreated) wood as its primary source of fuel. Since this is a new facility, Perryville Renewable Energy Center has no other New Source Review or Operating Permits from the Air Pollution Control Program.

Boiler (EU 1)

The wood-fired boiler will have capacity of 480 million British thermal unit per hour (MMBtu/hr) heat input (nominal) and burn a maximum 53.8 tons per hour of biomass based on a minimum heat content of 4,464 Btu per pound. The boiler will generate steam which will be used to drive a steam turbine and generate 32.5 MW net (nominal) of energy.

The primary fuel is expected to be wood chips; however, LGBM will be permitted to burn other types of biomass fuel as described in the Special Conditions. Natural gas will be used as the fuel during startup. Emissions associated with combustion of natural gas are less than those with biomass; therefore, potential emissions are based solely on biomass combustion. During startup on natural gas, the maximum heat input is 240

MMBtu/hr. Natural gas usage in the boiler is limited to 10% annual capacity as per the Special Condition 1.B in order to exempt the boiler from natural gas NO_x standards as per the NSPS, Subpart Db.

Selective non-catalytic reduction (SNCR) will be used to control NO_x emissions by injecting 19% aqueous ammonia into the boiler flue gas. A baghouse will be used to control particulate and hydrogen chloride (HCl) emissions. An alkaline sorbent injection system, as described below, will be used to supplement the baghouse HCl control as necessary to maintain emissions below the major source threshold for individual HAPs. The use of this sorbent injection may or may not be necessary, depending on the removal efficiency inherently achieved by the presence and capture of fly ash. The unit will be tested without the sorbent injection to quantify the level of HCl removal from the alkalinity in the wood ash and to determine if sorbent injection is necessary to remain under the individual HAP limitation of 10 tons per year for HCl. If testing shows that HCl emissions will be above 8 tons per year, sorbent injection will be required.

Raw Material Receiving, Storage and Handling (EU 2, EU 3 and EU 4)

Biomass will be received by truck and unloaded into a receiving hopper. Two trucks can be unloaded at a time via two truck dumpers (EUs 2e, 2f). The unloading cycle time is estimated to be 15 minutes for a 24 ton load. Thus, the peak unloading rate per bay is 96 tons per hour. Using a series of conveyors (EUs 2a, 2b) from the hopper, the wood will be transferred to one of two wood storage piles after being uniformly sized via a wood hogger (EU 2a), also at a maximum rate of 96 tons per hour. Biomass types other than wood will be added directly to the wood storage piles. The biomass fuel from the storage piles will be reclaimed, and then conveyed to day bins using conveyors and/or bucket elevators (EU 2c, 2d). Since the wood pile will need to be turned over during prolonged unit maintenance periods, short-term emissions are based on the maximum size of the conveyors at 200 tons per hour for EU 2c and 2d. Annual emissions for EU 2, however, are based on the maximum amount of wood the boiler can burn which is limited to 53.8 ton/hr based on a minimum heat content of the biomass of 4,464 Btu per pound and maximum heat input of 480 MMBtu/hr. Fuel will then be fed to the boiler (EU 1).

The wood storage pile (EU 3) is considered a negligible source of particulate emissions due to its high moisture content and the size of the wood chips being transferred. However, if visible emissions are encountered, Perryville will submit a Fugitive Dust Plan that will address any emissions encountered as specified in the Special Conditions.

The boiler uses bed sand in the bubbling fluidized bed process. Bed sand will be received in sack and pneumatically conveyed to a bed sand silo (EU 04) equipped with a vent filter. All sand receiving emissions will be vented to the silo.

The sorbent injection system will include an alkaline sorbent storage bin. The bin will be filled pneumatically from a truck. Pneumatic transport air will be exhausted through a bin vent filter on top of the storage bin (EU 11) to control particulate emissions.

Ash Handling and Loadout (EU 5, EU 6, EU 12a, EU 12b)

The boiler will generate bottom ash and fly ash. 1.2 ton per hour of bottom ash is expected to be generated from the boiler. The bottom ash will be conveyed from the boiler to the bottom ash surge bin (EU 5). The bottom ash will be loaded to dump trucks or a rollway dumpster for disposal.

Fly ash will be removed from the boiler's flue gas stream by a fabric filter. The collected fly ash will be pneumatically conveyed from the fabric filter to an ash silo (EU 6) for storage. Fly ash will then be either pneumatically loaded to trucks for shipment offsite, or the fly ash that is not suitable for sale to concrete manufacturers will be conditioned with water in a pug mill mixer and then loaded to ash dump trucks for disposal. The ash silo will be equipped with a vent filter (Control Device No. 06). Emissions from conveying, silo loading and ash loadout will be vented to the ash bin vent filter. Displaced air from the pug mill will be also vented to the storage silo. No emissions are expected from the ash dump truck loading due to the wet nature of the conditioned ash.

Lastly, the vacuum pumps used to create the vacuum to pneumatically convey the ash from the baghouse and back pass hoppers to the ash silo are equipped with two mechanical exhausters (EU 12a and 12b), only one of which is used at a time. The mechanical exhausters are each equipped with a filter to control PM₁₀ emissions.

Haul Roads (EU 7a, EU 7b)

The facility will have fugitive particulate emissions from vehicle traffic on paved haul roads. The haul road for wood traffic (EU 7a) is 0.91 miles in length and the haul road for ash/HCl traffic (EU 7b) is 0.42 miles in length. Watering and/or sweeping will be used to further control fugitive emissions.

Cooling Tower (EU 8)

A wet cooling tower will be used to cool water from the plant. The towers are used to cool water by exposing droplets to ambient air. The cooling towers are designed with a circulation rate of 34,000 gal/min. When water is evaporated, the solids are left behind and result in particulate emissions.

Emergency Generator (EU 9)

A 350 horsepower emergency diesel generator will be installed. Heat input to this unit will be 2.5 MMBTU/hr (18 gal/hr). Hours of operation for the generator will not exceed 26 hours per year.

Emergency Firewater Pump (EU 10)

A 250 horsepower emergency diesel generator will be installed. Heat input to this unit will be 1.8 MMBTU/hr (12.9 gal/hr). Hours of operation for the generator will not exceed 26 hours per year.

EMISSIONS/CONTROLS EVALUATION

The emission factors and control efficiencies used in this analysis as well as the calculation method are explained in the following sections.

Boiler (EU 01)

The emission factors for uncontrolled NO_x, filterable PM, condensable PM, filterable PM₁₀ and PM_{2.5}, and many of the individual HAPs were obtained from the Environmental Protection Agency (EPA) document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition, Section 1.6, *Wood Residue Combustion in Boilers* (September 2003). The emission factors for the remaining individual HAPs were obtained from the National Council for Air and Stream Improvement (NCASI) Technical bulletin No. 858, Table 20A. The NACSI paper reassessed emission factors for many HAPs based on data pertaining to only those boilers that were considered relevant to the burning of wood residues in forest products industry boilers. Thus, emissions data corresponding to wood combustion in furniture industry boilers and combustion of biomass other than virgin wood residues (e.g., agricultural waste, treated wood, etc.) were not included. H₂SO₄ emissions are based on the assumption that 10% of the SO₂ is converted to SO₃ and that 100% of the SO₃ is converted to H₂SO₄.

Controlled filterable particulate matter emissions are based on the limitation stated in 40 CFR §60.43(h)(1). The controlled NO_x, CO, SO₂ and VOC emission factors are based on vendor estimates and will be tested for validity. The controlled HCl emission factor is based on an estimated control efficiency of 77.5% by inherent control of the alkaline ash and/or absorbent control. This estimate will also be verified during testing.

Although total HAP potential emissions are estimated to be less than 25 tons per year, this permit covers the combustion of a variety of biomass fuels. In order to verify that total HAPs remain below 25 tons per year, testing of several target HAPs are required by this permit.

Raw Material Receiving, Storage and Handling (EU 02, EU 03, EU 04 and EU11)

The PM, PM₁₀ and PM_{2.5} emission factors for the handling of biomass are based on the drop point equation found in AP-42, Section 13.2.4, *Aggregate Handling and Storage Piles* (November 2006). A wind speed of 1 mile per hour is used due to all transfer points being enclosed. The minimum moisture content of the wood is assumed to equal 10%. This value is considered to be conservative since preliminary surface moisture content testing conducted by Perryville Renewable Energy Center shows values ranging from 27.7% to 38.8%. Due to the conservatism of the moisture content, further moisture content testing is not required as a part of this permit. The emission factors for the wood hogger are based on log debarking emission factors from the EPA document Factor Information Retrieval (FIRE) V6.25, *Source Classification Codes (SCC) and Emission Factors Listing for Criteria Air Pollutants* (SCC 3-07-008-02). A vent filter (Control Device No. 2) is located on the wood processing building to control particulate emissions. The minimum control efficiency of the vent filter is 99%.

Emissions from the bed sand silo (EU 4) are based on a grain loadout of 0.01 grains per actual cubic foot (gr/acf) from the bed sand silo vent filter (Control Device No. 4). Estimated air flow through the filter is equal to 1,500 actual cubic feet per minute (acfm). The flow rate was estimated based on the displacement of air during filling of the silo and the additional air utilizing pneumatically driven conveyance during the filling of the silo. Calculations assume that emissions are only generated during loading of the bed sand which is limited to 58 hours of total operation annually. Emissions from the HCl reagent silo (EU 11) are based on a grain loadout of 0.02 gr/acf from the HCl reagent

silos vent filter (Control Device No. 11). Estimated air flow through the filter is equal to 1,500 acfm. The flow rate was estimated using the same method as used to estimate flow rates for EU 4. Calculations assume that emissions are only generated during loading of the HCl reagent which is limited to 44 hours of total operation annually.

Ash Handling and Loadout (EU 5, EU 6, EU12a and 12b)

The PM, PM₁₀ and PM_{2.5} emission factors for the handling of ash are based on the drop point equation found in AP-42, Section 13.2.4. A wind speed of 1 mile per hour is used due to the enclosure of the transfer point. The minimum moisture content of the ash is assumed to equal 5%. The use of the drop point equation was determined to be more appropriate than other emission factors typically used for bottom ash since the bottom ash generated by this type of boiler is larger and more consistent with varying sized aggregate.

Emissions from ash handling and storage (EU 6) are based on the grain loadout of 0.01 gr/acf) from the ash silo vent filter (Control Device No. 06). Estimated air flow through the filter is equal to 1,500 acfm. The flow rate was estimated using the same method as used to estimate flow rates for EU 4 and EU 11.

Vacuum pumps are used to convey the ash. Approximately 5% of the ash silo emissions are emitted at the mechanical exhausters located on the vacuum pumps. The mechanical exhausters are equipped with filters which will control particulate emissions in excess of 99%.

Haul Roads (EU 7)

The wood traffic haul road (7a) and the ash/HCl haul road (7b) will be washed and/or cleaned periodically to provide at least 95% control of filterable PM₁₀ emissions. Emission factors for the haul roads were taken from the AP-42, Section 13.2.2, *Unpaved Roads* (November 2006).

Cooling Towers (EU 8)

A wet cooling tower will be used to cool water from the plant. Filterable PM₁₀ emissions occur from the towers when impurities in the water droplets entrained in the air stream are emitted as "drift". Drift eliminators will be installed to reduce the amount of drift to 0.0005% of the circulating water leaving the cooling towers. The amount of filterable PM₁₀ emissions is also directly related to the level of impurities (or dissolved solids) in the drift droplets. The dissolved solids in the make-up water will not exceed 2,551 ppmw. The cooling tower is designed to operate with three cells. Potential emissions from the cooling towers were based on a mass balance using the assumptions on TDS and the level of drift. Emissions were adjusted in accordance with guidance document "Calculating Realistic PM₁₀ Emissions From Cooling Towers" presented at the 2001 AWMA Annual Meeting. Calculation based on this document estimate the PM₁₀ and PM_{2.5} fraction of total particulate emissions to equal 55.2% and 0.21% of total particulate generated, respectively.

Emergency Generator (EU 9)

NO_x, CO and PM emission factors are based on EPA's Tier II Nonroad Diesel Engine Emission Standards from 40 CFR §89.112. All emission factors from these standards are lower than those given in AP-42, Section 3.3 *Gasoline and Diesel Industrial Engines* (October 1996). SO₂ emission factors were obtained from AP-42, Section 3.4 *Large*

Stationary Diesel and All Stationary Dual-fuel Engines (October 1996). SO₂ emissions are based on a fuel sulfur content of less than 15 ppm. Section 3.4 was used instead of Section 3.3 for estimated SO₂ emissions since Section 3.4 allows for the use of sulfur content. VOC and HAP emissions are based on emission factors from Section 3.3. Potential emissions of all pollutants are based on limited hours of operation of the generator equal to 26 hours per year.

Emergency Firewater Pump (EU 10)

NO_x, CO, VOC and PM emission factors are based on standards set in 40 CFR 60, Subpart IIII *Standards of Performance for Stationary Compression Ignition Internal Combustion Engines*. SO₂ emission factors were obtained from AP-42, Section 3.4. SO₂ emissions are based on a fuel sulfur content of less than 15 ppm. Section 3.4 was used instead of Section 3.3 since Section 3.4 allows for the use of sulfur content. HAP emissions are based on emission factors from Section 3.3. Potential emissions of all pollutants are based on limited hour of operation of the pump equal to 26 hours per year.

The following table provides an emissions summary for this project. Potential emissions of the application represent the potential of the new equipment with controls, assuming continuous operation (8,760 hours per year) for all equipment except those pieces of equipment that limited hours of operation as stated in the Special Conditions. Since this is a new installation, there are no existing potential or actual emissions.

Table 2: Emissions Summary (tons per year)

Pollutant	Regulatory De Minimis Levels	Existing Potential Emissions	Existing Actual Emissions (2009 EIQ)	Potential Emissions of the Application	New Installation Conditioned Potential
PM ₁₀	15.0	N/A	N/A	101.00	
SO _x	40.0	N/A	N/A	174.50	
NO _x	40.0	N/A	N/A	239.75	
VOC	40.0	N/A	N/A	48.37	
CO	100.0	N/A	N/A	225.00	
HAPs	10.0/25.0	N/A	N/A	22.50 total	<10.0 individual HAPS
Acetaldehyde	9.0	N/A	N/A	0.48	
Benzene	2.0	N/A	N/A	0.57	
Carbon Disulfide	1.00	N/A	N/A	0.27	
Chlorine	0.10	N/A	N/A	1.66	
Dichloro-methane	10.0	N/A	N/A	0.74	
Formaldehyde	2.0	N/A	N/A	1.49	
n-Hexane	10.0	N/A	N/A	0.61	
Hydrogen chloride	10.0	N/A	N/A	9.00	
Methanol	10.0	N/A	N/A	1.81	
POM	0.01	N/A	N/A	0.27	
1,1,2-Trichloroethane	1.0	N/A	N/A	0.25	

N/A = Not Applicable; N/D = Not Determined

¹ The regulatory level listed for each individual HAP is the Screen Modeling Action Level (SMAL).

² All individual HAPs with emissions greater than 0.2 tpy are listed in the above table. For a complete list, see the project's emission calculations.

PERMIT RULE APPLICABILITY

This review was conducted in accordance with Section (6) of Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*. Potential emissions of all pollutants are below major source levels.

APPLICABLE REQUIREMENTS

Perryville Renewable Energy Center shall comply with the following applicable requirements. The Missouri Air Conservation Laws and Regulations should be consulted for specific record keeping, monitoring, and reporting requirements. Compliance with these emission standards, based on information submitted in the application, has been verified at the time this application was approved. For a complete list of applicable requirements for your installation, please consult your operating permit.

GENERAL REQUIREMENTS

- *Submission of Emission Data, Emission Fees and Process Information*, 10 CSR 10-6.110
The emission fee is the amount established by the Missouri Air Conservation Commission annually under Missouri Air Law 643.079(1). Submission of an Emissions Inventory Questionnaire (EIQ) is required June 1 for the previous year's emissions.
- *Operating Permits*, 10 CSR 10-6.065
- *Restriction of Particulate Matter to the Ambient Air Beyond the Premises of Origin*, 10 CSR 10-6.170
- *Restriction of Emission of Visible Air Contaminants*, 10 CSR 10-6.220
- *Restriction of Emission of Odors*, 10 CSR 10-3.090

SPECIFIC REQUIREMENTS

- *Restriction of Emission of Particulate Matter From Industrial Processes*, 10 CSR 10-6.400
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Industrial-Commercial-Institutional Steam Generating Units*, 40 CFR Part 60, Subpart Db
- *New Source Performance Regulations*, 10 CSR 10-6.070 – *New Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines*, 40 CFR Part 60, Subpart IIII

- *Maximum Achievable Control Technology (MACT) Regulations, 10 CSR 10-6.075, National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines, 40 CFR Part 63, Subpart ZZZZ*
- *Restriction of Emission of Sulfur Compounds, 10 CSR 10-6.260*

AMBIENT AIR QUALITY IMPACT ANALYSIS

Ambient air quality modeling was performed to determine the ambient impact of PM₁₀, SO_x, NO_x, and CO as well as the following HAPs: acrolein, formaldehyde and polycyclic aromatic hydrocarbons (PAH). For further details on the modeling, please refer to the memorandums titled “Ambient Air Quality Impact Analysis (AAQIA) for LG Biomass Missouri LLC - Perryville Renewable Energy Center” dated April 6, 2010 and “1-Hour Nitrogen Oxide (NO_x) Ambient Air Quality Analysis (AAQIA) for LG Biomass Missouri LLC – Perryville Renewable Energy Center (Perryville)”. The ambient air quality impact analyses indicates that this project will not cause ambient air concentrations above acceptable levels.

STAFF RECOMMENDATION

On the basis of this review conducted in accordance with Section (6), Missouri State Rule 10 CSR 10-6.060, *Construction Permits Required*, I recommend this permit be granted with/without special conditions.

Susan Heckenkamp
Environmental Engineer

Date

PERMIT DOCUMENTS

The following documents are incorporated by reference into this permit:

- The Application for Authority to Construct form, dated November 11, 2009, received November 12, 2009, designating LG Biomass Missouri LLC as the owner and operator of the installation.
- U.S. EPA document AP-42, *Compilation of Air Pollutant Emission Factors*, Fifth Edition.
- Southeast Regional Office Regional Office Site Survey, dated December 3, 2009.
- Responses to MDNR comments and questions on application and emission calculations, received via email on January 20, 2010, January 26, 2010.

Attachment A: Monthly Individual HAP Emission Tracking Record for EU 1

Perryville Renewable Energy Center
 Perry County, S12, T35N, R10E
 Project Number: 2009-11-024
 Installation ID Number: 157-0043
 Permit Number:

HAP Name: _____ CAS No.: _____

This sheet covers the month of _____ in the year _____.

Copy this sheet as needed

Column A	Column B	Column C	Column D	Column E
Date(s)	Biomass fuel Description	Amount Processed (tons)*	Individual HAP Emission Factor (lb/ton)	(a) Individual HAP Emissions (tons)
(b) Total Individual HAP Emissions Calculated for this Month in Tons:				
(c) 12-Month Individual HAP Emissions Total From Previous Month's Attachment A, in Tons:				
(d) Monthly Individual HAP Emissions Total (b) from Previously year's Attachment A, In Tons:				
(e) Current 12-month Total of Individual HAP Emissions in Tons : [(b) + (c) - (d)]				

- (a) [Column E] = [Column C] x [Column D] x 0.0005. Emission factor obtained from performance tests required by this permit.
- (b) Summation of [Column E] in Tons;
- (c) 12-Month Individual HAP emissions total (e) from last month's Attachment A, in Tons;
- (d) Monthly Individual HAP emissions total (b) from previous year's Attachment A, in Tons;
- (e) Calculate the new 12-month Individual HAP emissions total.

A 12-Month Individual HAP emissions total (e) of less than 10.0 tons for Hydrogen Chloride indicates compliance.

A 12-Month dioxin/furan total (e) of less than 0.232 pounds indicates compliance.

*Calculation based on 4650 Btu/lb HHV, 14,000 Btu/kW-hr and hourly generated kW-hr.